

# Evaluating Free Rides and Observational Advantages in Set Visualizations

## Supplementary Material: Study Materials

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Received: date / Accepted: date

**Abstract** This document contains the study materials associated with the submitted manuscript.

### 1 Introduction

This document contains all of the statements and diagrams used in each of the two empirical studies. Each set of statements and diagram is presented alongside the associated question and answer. All of the diagrams are scaled to 45% of the actual size used in the study in order to fit all text and diagrams for any given question on a single page. For study 1, section 2.1 shows the information given to participants. Section 2.2 covers the training phase, section 2.3 presents the performance phase stimuli, and section 2.4 shows the questions designed to identify inattentive participants. Similar sections are included for study 2.

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This research was partially funded by a Leverhulme Trust Research Project Grant RPG-2016-082 for the project entitled Accessible Reasoning with Diagrams.

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## 2 Study 1 Materials

### 2.1 Information

The information given to the participants at the beginning of the study is as follows:

### Scientific Study on Diagram Visualization



This is a scientific study conducted by the University of Kent and the University of Brighton.

**Important:**

By consenting to take part, you agree that the data we collect from you can be used for the purposes of research into the effectiveness of representations of information. You also consent to the data being shared, after anonymization, for the purposes of peer review and to be placed online with any associated research publication. These data include information on your responses to the study questions along with basic demographic information you provide us with regarding your age, gender, and whether you are colour blind. We will not use your data for other purposes. By taking part in the study you are providing your consent for us to use your data in the way just described.

You can participate in this study **only once**. Multiple attempts by the same participant will not be permitted. Once starting the study, continue on through all the pages. If you fail to complete the study after starting you will not be allowed another attempt and will not be paid.

This study is split up into 28 pages and each page takes up to 1 minute to complete. The whole study takes about 30 minutes with a maximum of 45 minutes permitted.

Read the instructions carefully and answer the question before proceeding to the next page. Attempts that are not completed carefully will be rejected and you will not be paid. 100% of a number of attention checking questions must be answered correctly for you to complete the study successfully.

You should maintain concentration on the study and answer questions without delay, unless a question explicitly allows you to take a break, in which case you can have a rest before continuing.

Do not use the back button on your browser: you cannot access the previous pages, and if you click on it, you might be unable to complete the study.

The next 4 pages are for training. You will need to read these pages carefully to answer the later questions correctly.

Please choose "Yes" and click on the "Next Page" button to consent to take part and to start the study.

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(you cannot return to this page afterwards)

## 2.2 Training

This section contains the statements and diagrams presented to participants for the purposes of training. After attempting each question, participants were given the correct answer, an explanation of the correct answer (with reference to the text and, where appropriate, diagram) and a modified diagram with the regions of interest highlighted. These modified diagrams are presented alongside the explanatory text.

### Question t1: Text and Diagrams used for Training

– **Options (All Groups):**

Everyone who visited Estonia visited Turkey  
 No one visited both Botswana and Estonia  
 Everyone who visited Estonia visited Botswana  
 No one visited both Botswana and Turkey

– **Task Type:** Disjoint

**Answer:** 2

– **Text Group:**

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey

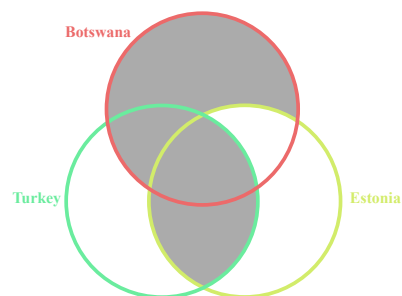
– **Linear Diagram Group:**

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey



– **Venn Diagram Group:**

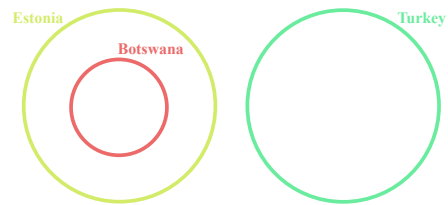
Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey



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– **Euler Diagram Group:**

Everyone who visited Botswana visited Estonia  
No one visited both Estonia and Turkey





## Question t1: Text and Diagrams Used to Explain The Answer

## – Text Group Image:

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey

## – Text Group Explanation:

The correct answer is 'No one visited both Botswana and Turkey'.

We can make this deduction from the statements.

Suppose someone visited Botswana. Then the first statement tells us that they also visited Estonia. So, from the second statement, this person did not visit Turkey. Therefore, no one visited both Botswana and Turkey.

## – Linear Diagram Group Image:

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey



## – Linear Diagram Group Explanation:

The correct answer is 'No one visited both Botswana and Turkey'.

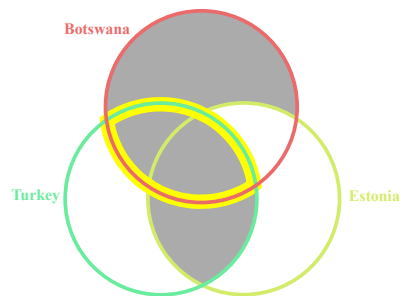
We can make this deduction from the statements and from the diagram.

Suppose someone visited Botswana. Then the first statement tells us that they also visited Estonia. So, from the second statement, this person did not visit Turkey. Therefore, no one visited both Botswana and Turkey.

In the diagram, the lines for Botswana and Turkey do not overlap, so no one visited both Botswana and Turkey.

## – Venn Diagram Group Image:

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey



– **Venn Diagram Group Explanation:**

The correct answer is 'No one visited both Botswana and Turkey'.

We can make this deduction from the statements and from the diagram.

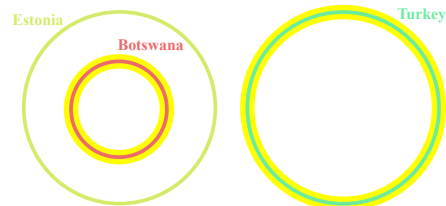
Suppose someone visited Botswana. Then the first statement tells us that they also visited Estonia. So, from the second statement, this person did not visit Turkey. Therefore, no one visited both Botswana and Turkey.

In the diagram, the region inside both Botswana and Turkey is completely shaded, so no one visited both Botswana and Turkey.

– **Euler Diagram Group Image:**

Everyone who visited Botswana visited Estonia

No one visited both Estonia and Turkey



– **Euler Diagram Group Explanation:**

The correct answer is 'No one visited both Botswana and Turkey'.

We can make this deduction from the statements and from the diagram.

Suppose someone visited Botswana. Then the first statement tells us that they also visited Estonia. So, from the second statement, this person did not visit Turkey. Therefore, no one visited both Botswana and Turkey.

In the diagram, the circles for Botswana and Turkey do not overlap, so no one visited both Botswana and Turkey.

Question t2: Text and Diagrams used for Training

– Options (All Groups):

No one visited both Croatia and Niger  
 No one visited both Croatia and Denmark  
 Everyone who visited Denmark visited Libya  
 Everyone who visited Niger visited Denmark

– Task Type: Subset

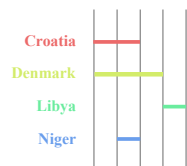
**Answer: 4**

– Text Group:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia

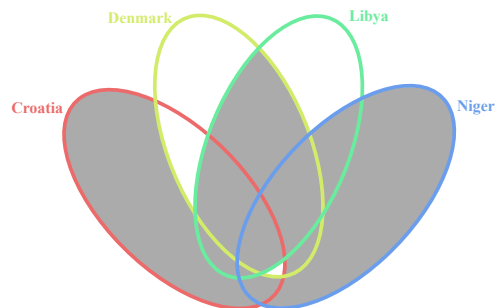
– Linear Diagram Group:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia



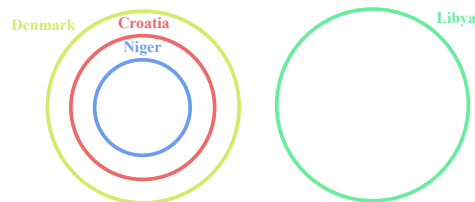
– Venn Diagram Group:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia



– Euler Diagram Group:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia



## Question t2: Text and Diagrams Used to Explain The Answer

## – Text Group Image:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia

## – Text Group Explanation:

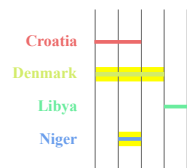
The correct answer is 'Everyone who visited Niger visited Denmark'.

We can make this deduction from the statements.

Suppose someone visited Niger. Then the third statement tells us that they also visited Croatia. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Niger visited Denmark.

## – Linear Diagram Group Image:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia



## – Linear Diagram Group Explanation:

The correct answer is 'Everyone who visited Niger visited Denmark'.

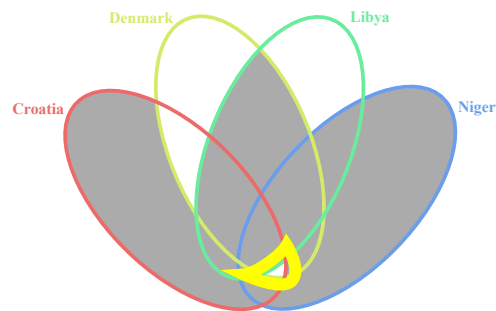
We can make this deduction from the statements and from the diagram.

Suppose someone visited Niger. Then the third statement tells us that they also visited Croatia. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Niger visited Denmark.

In the diagram, the line for Niger is completely overlapped by the line for Denmark, so everyone who visited Niger visited Denmark.

## – Venn Diagram Group Image:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia



– **Venn Diagram Group Explanation:**

The correct answer is 'Everyone who visited Niger visited Denmark'.

We can make this deduction from the statements and from the diagram.

Suppose someone visited Niger. Then the third statement tells us that they also visited Croatia. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Niger visited Denmark.

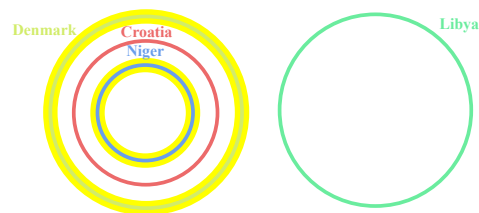
In the diagram, the non-shaded region inside Niger is completely inside completely inside Denmark, so everyone who visited Niger visited Denmark.

– **Euler Diagram Group Image:**

Everyone who visited Croatia visited Denmark

No one visited both Denmark and Libya

Everyone who visited Niger visited Croatia



– **Euler Diagram Group Explanation:**

The correct answer is 'Everyone who visited Niger visited Denmark'.

We can make this deduction from the statements and from the diagram.

Suppose someone visited Niger. Then the third statement tells us that they also visited Croatia. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Niger visited Denmark.

In the diagram, the circle for Niger is inside the circle for Denmark, so everyone who visited Niger visited Denmark.

## Question t3: Text and Diagrams used for Training

## – Options (All Groups):

Everyone who visited Germany visited Peru  
 No one visited both Denmark and Kenya  
 No one visited both Kenya and Peru  
 Everyone who visited Denmark visited Libya

## – Task Type: Disjoint

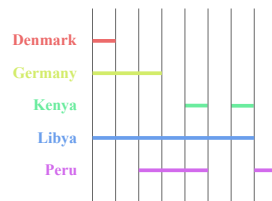
**Answer: 2**

## – Text Group:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya

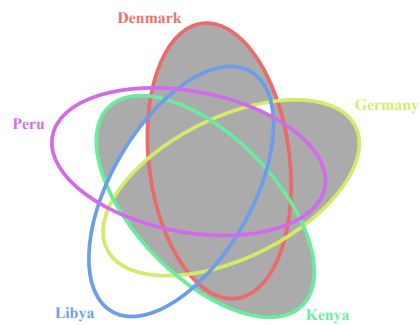
## – Linear Diagram Group:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya



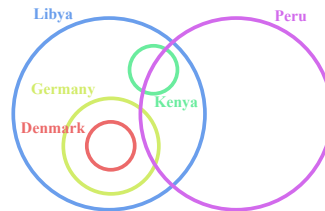
## – Venn Diagram Group:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya



**– Euler Diagram Group:**

No one visited both Denmark and Peru  
Everyone who visited Denmark visited Germany  
Everyone who visited Kenya visited Libya  
No one visited both Germany and Kenya  
Everyone who visited Germany visited Libya



### Question t3: Text and Diagrams Used to Explain The Answer

#### – Text Group Image:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya

#### – Text Group Explanation:

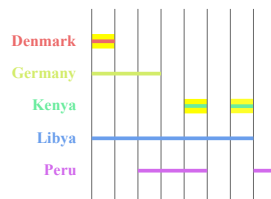
The correct answer is 'No one visited both Denmark and Kenya'.

We can make this deduction from the statements.

Suppose someone visited Denmark. Then the second statement tells us that they also visited Germany. So, from the fourth statement, this person did not visit Kenya. Therefore, no one visited both Denmark and Kenya.

#### – Linear Diagram Group Image:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya



#### – Linear Diagram Group Explanation:

The correct answer is 'No one visited both Denmark and Kenya'.

We can make this deduction from the statements and from the diagram.

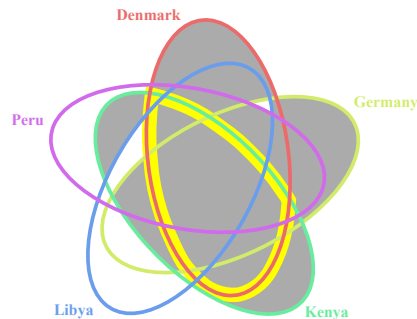
Suppose someone visited Denmark. Then the second statement tells us that they also visited Germany. So, from the fourth statement, this person did not visit Kenya. Therefore, no one visited both Denmark and Kenya.

In the diagram, the lines for Denmark and Kenya do not overlap, so no one visited both Denmark and Kenya.



– **Venn Diagram Group Image:**

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya



– **Venn Diagram Group Explanation:**

The correct answer is 'No one visited both Denmark and Kenya'.

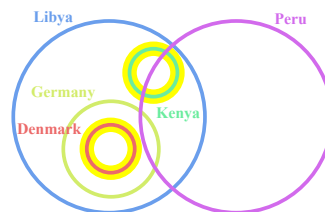
We can make this deduction from the statements and from the diagram.

Suppose someone visited Denmark. Then the second statement tells us that they also visited Germany. So, from the fourth statement, this person did not visit Kenya. Therefore, no one visited both Denmark and Kenya.

In the diagram, the region inside both Denmark and Kenya is completely shaded, so no one visited both Denmark and Kenya.

– **Euler Diagram Group Image:**

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya



– **Euler Diagram Group Explanation:**

The correct answer is 'No one visited both Denmark and Kenya'.

We can make this deduction from the statements and from the diagram.

Suppose someone visited Denmark. Then the second statement tells us that they also visited Germany. So, from the fourth statement, this person did not visit Kenya. Therefore, no one visited both Denmark and Kenya.

In the diagram, the circles for Denmark and Kenya do not overlap, so no one visited both Denmark and Kenya.

## Question t4: Text and Diagrams used for Training

## – Options (All Groups):

Everyone who visited Vietnam visited Denmark  
 Everyone who visited Denmark visited Qatar  
 No one visited both Botswana and Qatar  
 No one visited both Qatar and Vietnam

## – Task Type: Subset

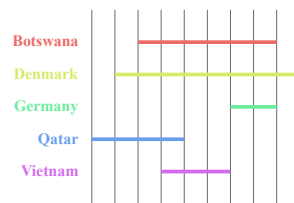
**Answer: 1**

## – Text Group:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana

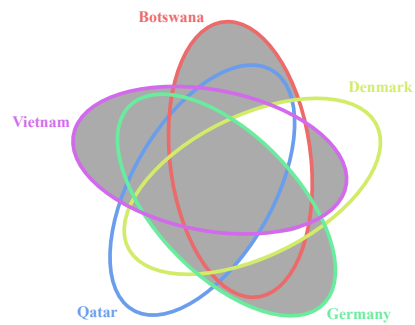
## – Linear Diagram Group:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana



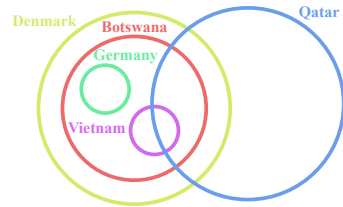
## – Venn Diagram Group:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana



**– Euler Diagram Group:**

Everyone who visited Botswana visited Denmark  
Everyone who visited Germany visited Botswana  
No one visited both Germany and Vietnam  
No one visited both Germany and Qatar  
Everyone who visited Vietnam visited Botswana



### Question t4: Text and Diagrams Used to Explain The Answer

#### – Text Group Image:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana

#### – Text Group Explanation:

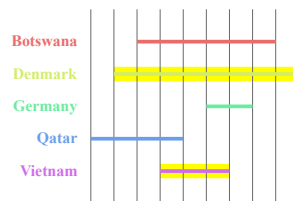
The correct answer is 'Everyone who visited Vietnam visited Denmark'.

We can make this deduction from the statements.

Suppose someone visited Vietnam. Then the fifth statement tells us that they also visited Botswana. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Vietnam visited Denmark.

#### – Linear Diagram Group Image:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana



#### – Linear Diagram Group Explanation:

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

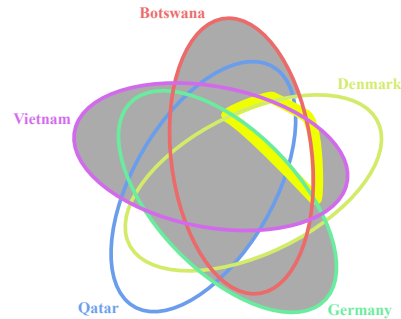
We can make this deduction from the statements and from the diagram.

Suppose someone visited Vietnam. Then the fifth statement tells us that they also visited Botswana. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Vietnam visited Denmark.

In the diagram, the line for Vietnam is completely overlapped by the line for Denmark, so everyone who visited Vietnam visited Denmark.

– **Venn Diagram Group Image:**

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana



– **Venn Diagram Group Explanation:**

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

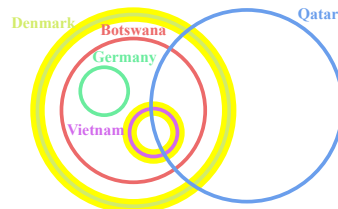
We can make this deduction from the statements and from the diagram.

Suppose someone visited Vietnam. Then the fifth statement tells us that they also visited Botswana. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Vietnam visited Denmark.

In the diagram, the non-shaded region inside Vietnam is completely inside Denmark, so everyone who visited Vietnam visited Denmark.

– **Euler Diagram Group Image:**

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana



– **Euler Diagram Group Explanation:**

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

We can make this deduction from the statements and from the diagram.

Suppose someone visited Vietnam. Then the fifth statement tells us that they also visited Botswana. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Vietnam visited Denmark.

In the diagram, the circle for Vietnam is inside the circle for Denmark, so everyone who visited Vietnam visited Denmark.

## 2.3 Performance Phase

This section shows, firstly, the stimuli for ten subset tasks, followed by the stimuli for the ten disjointness tasks. At the end of this section, the stimuli are presented in groups, allowing an overview of the range of tasks to be seen.

Question m1

– **Options (All Groups):**

Everyone who visited Jamaica visited Vietnam  
 Everyone who visited Jamaica visited France  
 No one visited both Mali and Vietnam  
 No one visited both Denmark and Vietnam

– **Task Type:** Subset

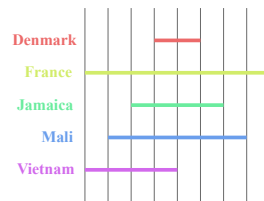
**Answer: 2**

– **Text Group:**

Everyone who visited Denmark visited France  
 Everyone who visited Denmark visited Jamaica  
 Everyone who visited Jamaica visited Mali  
 Everyone who visited Mali visited France  
 Everyone who visited Vietnam visited France

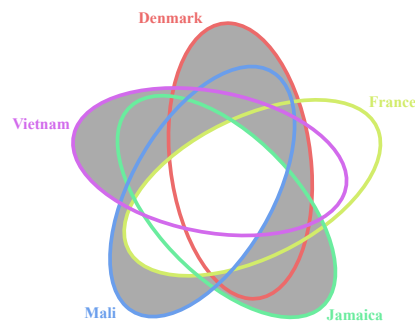
– **Linear Diagram Group:**

Everyone who visited Denmark visited France  
 Everyone who visited Denmark visited Jamaica  
 Everyone who visited Jamaica visited Mali  
 Everyone who visited Mali visited France  
 Everyone who visited Vietnam visited France



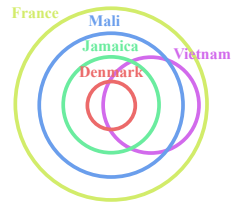
– **Venn Diagram Group:**

Everyone who visited Denmark visited France  
 Everyone who visited Denmark visited Jamaica  
 Everyone who visited Jamaica visited Mali  
 Everyone who visited Mali visited France  
 Everyone who visited Vietnam visited France



**– Euler Diagram Group:**

Everyone who visited Denmark visited France  
Everyone who visited Denmark visited Jamaica  
Everyone who visited Jamaica visited Mali  
Everyone who visited Mali visited France  
Everyone who visited Vietnam visited France



## Question m2

## – Options (All Groups):

No one visited both Mali and Oman  
 Everyone who visited Germany visited Mali  
 No one visited both Libya and Oman  
 Everyone who visited Uganda visited Libya

## – Task Type: Subset

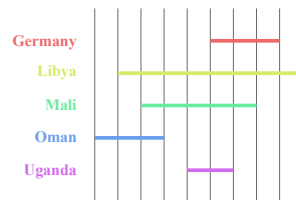
**Answer: 4**

## – Text Group:

Everyone who visited Germany visited Libya  
 No one visited both Germany and Oman  
 Everyone who visited Mali visited Libya  
 No one visited both Oman and Uganda  
 Everyone who visited Uganda visited Mali

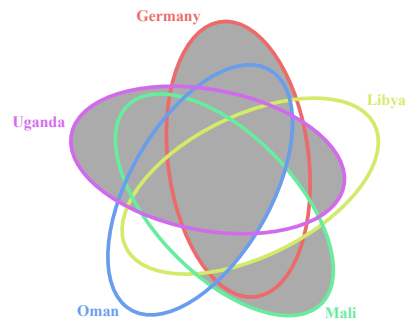
## – Linear Diagram Group:

Everyone who visited Germany visited Libya  
 No one visited both Germany and Oman  
 Everyone who visited Mali visited Libya  
 No one visited both Oman and Uganda  
 Everyone who visited Uganda visited Mali



## – Venn Diagram Group:

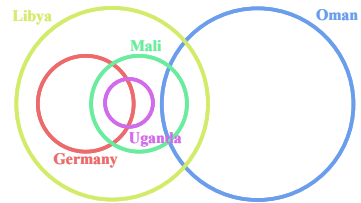
Everyone who visited Germany visited Libya  
 No one visited both Germany and Oman  
 Everyone who visited Mali visited Libya  
 No one visited both Oman and Uganda  
 Everyone who visited Uganda visited Mali





**– Euler Diagram Group:**

Everyone who visited Germany visited Libya  
No one visited both Germany and Oman  
Everyone who visited Mali visited Libya  
No one visited both Oman and Uganda  
Everyone who visited Uganda visited Mali



## Question m3

## – Options (All Groups):

No one visited both France and Jamaica  
 Everyone who visited Jamaica visited Estonia  
 No one visited both Estonia and Italy  
 Everyone who visited Croatia visited France

## – Task Type: Subset

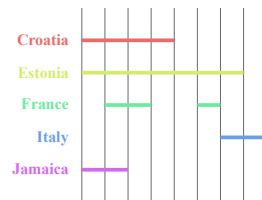
## – Text Group:

**Answer: 2**

Everyone who visited Croatia visited Estonia  
 No one visited both Croatia and Italy  
 Everyone who visited France visited Estonia  
 No one visited both France and Italy  
 Everyone who visited Jamaica visited Croatia

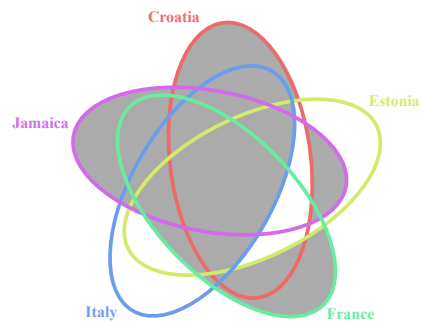
## – Linear Diagram Group:

Everyone who visited Croatia visited Estonia  
 No one visited both Croatia and Italy  
 Everyone who visited France visited Estonia  
 No one visited both France and Italy  
 Everyone who visited Jamaica visited Croatia



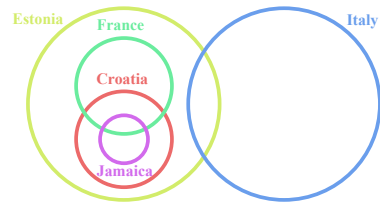
## – Venn Diagram Group:

Everyone who visited Croatia visited Estonia  
 No one visited both Croatia and Italy  
 Everyone who visited France visited Estonia  
 No one visited both France and Italy  
 Everyone who visited Jamaica visited Croatia



**– Euler Diagram Group:**

Everyone who visited Croatia visited Estonia  
No one visited both Croatia and Italy  
Everyone who visited France visited Estonia  
No one visited both France and Italy  
Everyone who visited Jamaica visited Croatia



## Question m4

## – Options (All Groups):

Everyone who visited Libya visited France  
 Everyone who visited Libya visited Vietnam  
 No one visited both France and Vietnam  
 No one visited both France and Sudan

## – Task Type: Subset

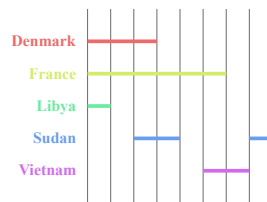
**Answer: 1**

## – Text Group:

Everyone who visited Denmark visited France  
 No one visited both Denmark and Vietnam  
 Everyone who visited Libya visited Denmark  
 No one visited both Libya and Sudan  
 No one visited both Sudan and Vietnam

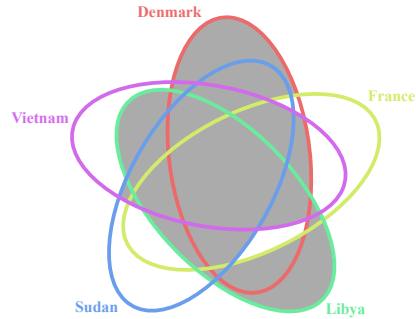
## – Linear Diagram Group:

Everyone who visited Denmark visited France  
 No one visited both Denmark and Vietnam  
 Everyone who visited Libya visited Denmark  
 No one visited both Libya and Sudan  
 No one visited both Sudan and Vietnam



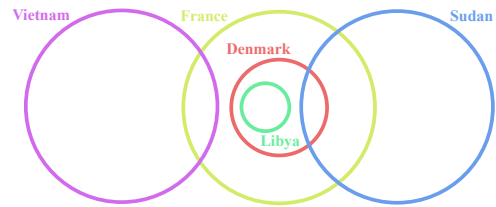
## – Venn Diagram Group:

Everyone who visited Denmark visited France  
 No one visited both Denmark and Vietnam  
 Everyone who visited Libya visited Denmark  
 No one visited both Libya and Sudan  
 No one visited both Sudan and Vietnam



**– Euler Diagram Group:**

Everyone who visited Denmark visited France  
No one visited both Denmark and Vietnam  
Everyone who visited Libya visited Denmark  
No one visited both Libya and Sudan  
No one visited both Sudan and Vietnam



## Question m5

## – Options (All Groups):

No one visited both France and Germany  
 Everyone who visited Botswana visited Sudan  
 Everyone who visited France visited Sudan  
 No one visited both France and Oman

## – Task Type: Subset

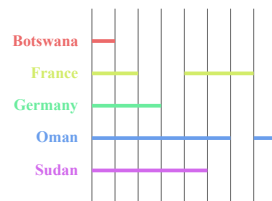
**Answer: 2**

## – Text Group:

Everyone who visited Botswana visited Germany  
 Everyone who visited Botswana visited France  
 Everyone who visited Germany visited Oman  
 Everyone who visited Germany visited Sudan  
 Everyone who visited Sudan visited Oman

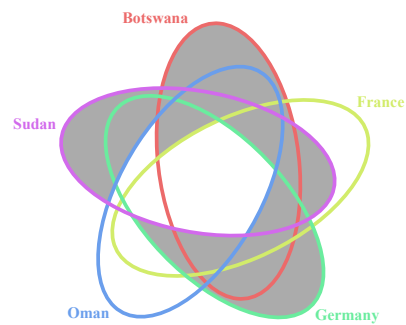
## – Linear Diagram Group:

Everyone who visited Botswana visited Germany  
 Everyone who visited Botswana visited France  
 Everyone who visited Germany visited Oman  
 Everyone who visited Germany visited Sudan  
 Everyone who visited Sudan visited Oman



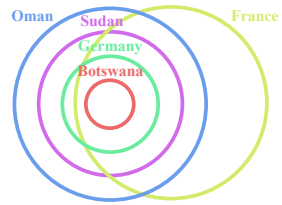
## – Venn Diagram Group:

Everyone who visited Botswana visited Germany  
 Everyone who visited Botswana visited France  
 Everyone who visited Germany visited Oman  
 Everyone who visited Germany visited Sudan  
 Everyone who visited Sudan visited Oman



**– Euler Diagram Group:**

Everyone who visited Botswana visited Germany  
Everyone who visited Botswana visited France  
Everyone who visited Germany visited Oman  
Everyone who visited Germany visited Sudan  
Everyone who visited Sudan visited Oman



## Question m6

## – Options (All Groups):

Everyone who visited Libya visited Qatar  
 No one visited both Botswana and Qatar  
 No one visited both Qatar and Turkey  
 Everyone who visited Botswana visited Turkey

## – Task Type: Subset

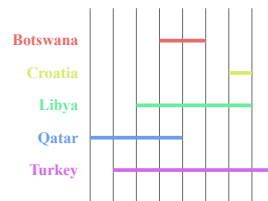
**Answer: 4**

## – Text Group:

No one visited both Botswana and Croatia  
 Everyone who visited Botswana visited Libya  
 Everyone who visited Croatia and Libya  
 No one visited both Croatia and Qatar  
 Everyone who visited Libya visited Turkey

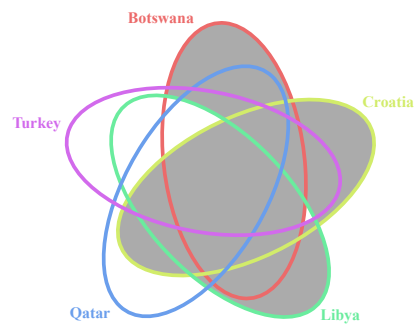
## – Linear Diagram Group:

No one visited both Botswana and Croatia  
 Everyone who visited Botswana visited Libya  
 Everyone who visited Croatia and Libya  
 No one visited both Croatia and Qatar  
 Everyone who visited Libya visited Turkey



## – Venn Diagram Group:

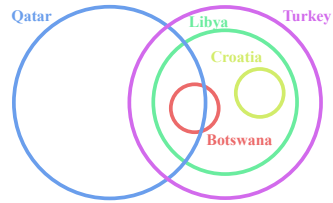
No one visited both Botswana and Croatia  
 Everyone who visited Botswana visited Libya  
 Everyone who visited Croatia and Libya  
 No one visited both Croatia and Qatar  
 Everyone who visited Libya visited Turkey





– **Euler Diagram Group:**

No one visited both Botswana and Croatia  
Everyone who visited Botswana visited Libya  
Everyone who visited Croatia and Libya  
No one visited both Croatia and Qatar  
Everyone who visited Libya visited Turkey



## Question m7

## – Options (All Groups):

Everyone who visited Italy visited Mali  
 No one visited both Germany and Italy  
 Everyone who visited Germany visited Qatar  
 No one visited both Mali and Qatar

## – Task Type: Subset

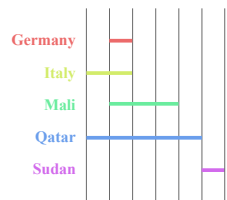
**Answer: 3**

## – Text Group:

Everyone who visited Germany visited Italy  
 Everyone who visited Germany visited Mali  
 Everyone who visited Italy visited Qatar  
 Everyone who visited Mali visited Qatar  
 No one visited both Qatar and Sudan

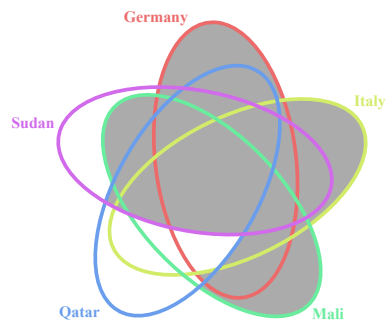
## – Linear Diagram Group:

Everyone who visited Germany visited Italy  
 Everyone who visited Germany visited Mali  
 Everyone who visited Italy visited Qatar  
 Everyone who visited Mali visited Qatar  
 No one visited both Qatar and Sudan



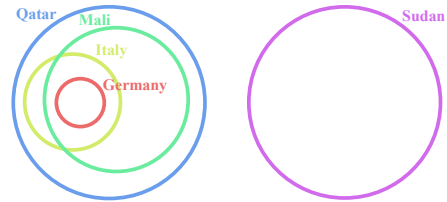
## – Venn Diagram Group:

Everyone who visited Germany visited Italy  
 Everyone who visited Germany visited Mali  
 Everyone who visited Italy visited Qatar  
 Everyone who visited Mali visited Qatar  
 No one visited both Qatar and Sudan



**– Euler Diagram Group:**

Everyone who visited Germany visited Italy  
Everyone who visited Germany visited Mali  
Everyone who visited Italy visited Qatar  
Everyone who visited Mali visited Qatar  
No one visited both Qatar and Sudan



## Question m8

## – Options (All Groups):

No one visited both Oman and Germany  
 Everyone who visited Denmark visited Oman  
 Everyone who visited Oman visited Germany  
 No one visited both Denmark and Germany

## – Task Type: Subset

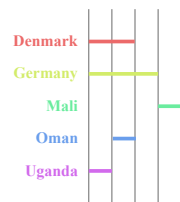
**Answer: 3**

## – Text Group:

Everyone who visited Denmark visited Germany  
 No one visited both Germany and Mali  
 Everyone who visited Oman visited Denmark  
 Everyone who visited Uganda visited Denmark  
 No one visited both Uganda and Oman

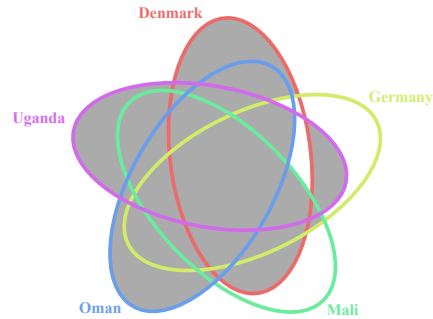
## – Linear Diagram Group:

Everyone who visited Denmark visited Germany  
 No one visited both Germany and Mali  
 Everyone who visited Oman visited Denmark  
 Everyone who visited Uganda visited Denmark  
 No one visited both Uganda and Oman



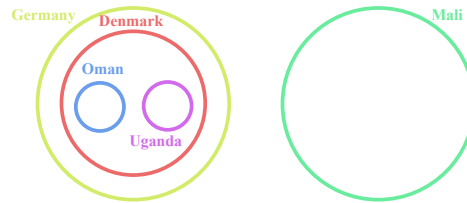
## – Venn Diagram Group:

Everyone who visited Denmark visited Germany  
 No one visited both Germany and Mali  
 Everyone who visited Oman visited Denmark  
 Everyone who visited Uganda visited Denmark  
 No one visited both Uganda and Oman



**– Euler Diagram Group:**

Everyone who visited Denmark visited Germany  
No one visited both Germany and Mali  
Everyone who visited Oman visited Denmark  
Everyone who visited Uganda visited Denmark  
No one visited both Uganda and Oman



## Question m9

## – Options (All Groups):

No one visited both Germany and Libya  
 No one visited both Germany and Hungary  
 Everyone who visited Albania visited Libya  
 Everyone who visited France visited Germany

## – Task Type: Subset

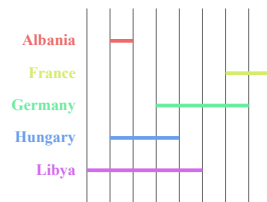
**Answer: 3**

## – Text Group:

No one visited both Albania and France  
 No one visited both Albania and Germany  
 Everyone who visited Albania visited Hungary  
 No one visited both France and Libya  
 Everyone who visited Hungary visited Libya

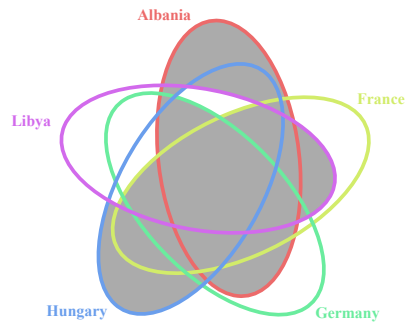
## – Linear Diagram Group:

No one visited both Albania and France  
 No one visited both Albania and Germany  
 Everyone who visited Albania visited Hungary  
 No one visited both France and Libya  
 Everyone who visited Hungary visited Libya



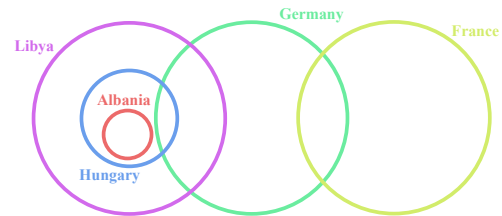
## – Venn Diagram Group:

No one visited both Albania and France  
 No one visited both Albania and Germany  
 Everyone who visited Albania visited Hungary  
 No one visited both France and Libya  
 Everyone who visited Hungary visited Libya



**– Euler Diagram Group:**

No one visited both Albania and France  
No one visited both Albania and Germany  
Everyone who visited Albania visited Hungary  
No one visited both France and Libya  
Everyone who visited Hungary visited Libya



## Question m10

## – Options (All Groups):

Everyone who visited Uganda visited Oman  
 No one visited both Oman and Peru  
 Everyone who visited Peru visited Russia  
 No one visited both France and Russia

## – Task Type: Subset

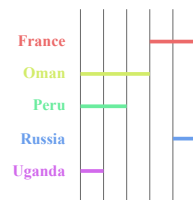
**Answer: 1**

## – Text Group:

No one visited both France and Oman  
 No one visited both Peru and Russia  
 Everyone who visited Russia visited France  
 Everyone who visited Peru visited Oman  
 Everyone who visited Uganda visited Peru

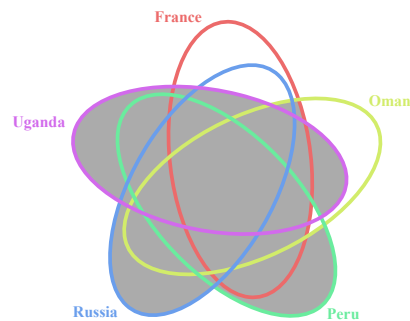
## – Linear Diagram Group:

No one visited both France and Oman  
 No one visited both Peru and Russia  
 Everyone who visited Russia visited France  
 Everyone who visited Peru visited Oman  
 Everyone who visited Uganda visited Peru



## – Venn Diagram Group:

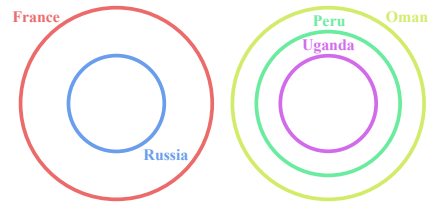
No one visited both France and Oman  
 No one visited both Peru and Russia  
 Everyone who visited Russia visited France  
 Everyone who visited Peru visited Oman  
 Everyone who visited Uganda visited Peru





**– Euler Diagram Group:**

No one visited both France and Oman  
No one visited both Peru and Russia  
Everyone who visited Russia visited France  
Everyone who visited Peru visited Oman  
Everyone who visited Uganda visited Peru



## Question m11

## – Options (All Groups):

Everyone who visited Croatia visited Oman  
 No one visited both Croatia and Denmark  
 No one visited both Mali and Oman  
 Everyone who visited Denmark visited Oman

## – Task Type: Disjoint

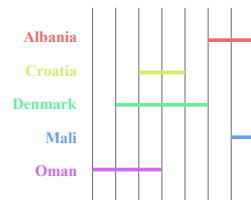
**Answer: 3**

## – Text Group:

No one visited both Albania and Croatia  
 No one visited both Albania and Denmark  
 No one visited both Albania and Oman  
 Everyone who visited Croatia visited Denmark  
 Everyone who visited Mali visited Albania

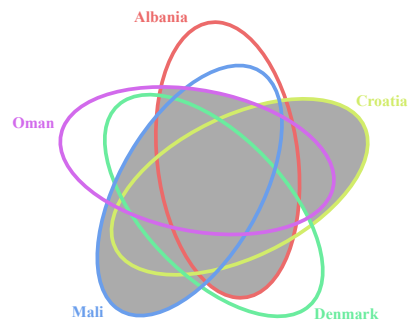
## – Linear Diagram Group:

No one visited both Albania and Croatia  
 No one visited both Albania and Denmark  
 No one visited both Albania and Oman  
 Everyone who visited Croatia visited Denmark  
 Everyone who visited Mali visited Albania



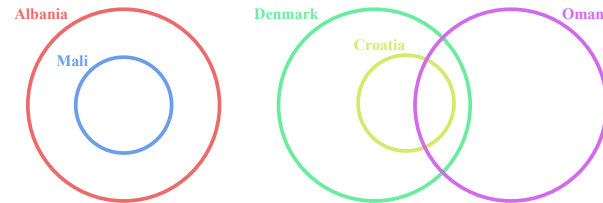
## – Venn Diagram Group:

No one visited both Albania and Croatia  
 No one visited both Albania and Denmark  
 No one visited both Albania and Oman  
 Everyone who visited Croatia visited Denmark  
 Everyone who visited Mali visited Albania



**– Euler Diagram Group:**

No one visited both Albania and Croatia  
No one visited both Albania and Denmark  
No one visited both Albania and Oman  
Everyone who visited Croatia visited Denmark  
Everyone who visited Mali visited Albania



## Question m12

## – Options (All Groups):

Everyone who visited Peru visited Turkey  
 Everyone who visited Oman visited Turkey  
 No one visited both Kenya and Peru  
 No one visited both Croatia and Oman

## – Task Type: Disjoint

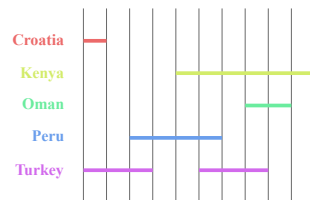
**Answer: 4**

## – Text Group:

No one visited both Croatia and Kenya  
 No one visited both Croatia and Peru  
 Everyone who visited Croatia visited Turkey  
 Everyone who visited Oman visited Kenya  
 No one visited both Oman and Peru

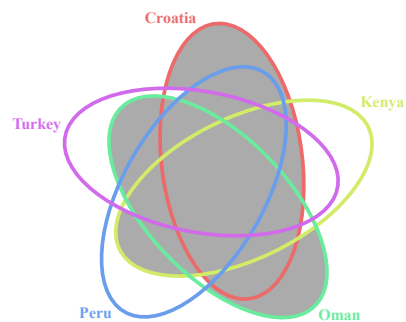
## – Linear Diagram Group:

No one visited both Croatia and Kenya  
 No one visited both Croatia and Peru  
 Everyone who visited Croatia visited Turkey  
 Everyone who visited Oman visited Kenya  
 No one visited both Oman and Peru



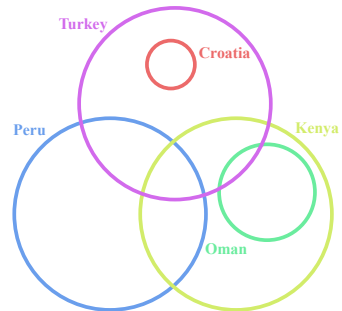
## – Venn Diagram Group:

No one visited both Croatia and Kenya  
 No one visited both Croatia and Peru  
 Everyone who visited Croatia visited Turkey  
 Everyone who visited Oman visited Kenya  
 No one visited both Oman and Peru



**– Euler Diagram Group:**

No one visited both Croatia and Kenya  
No one visited both Croatia and Peru  
Everyone who visited Croatia visited Turkey  
Everyone who visited Oman visited Kenya  
No one visited both Oman and Peru



## Question m13

## – Options (All Groups):

No one visited both Botswana and Peru  
 Everyone who visited Peru visited Mali  
 Everyone who visited Botswana visited Germany  
 No one visited both Mali and Russia

## – Task Type: Disjoint

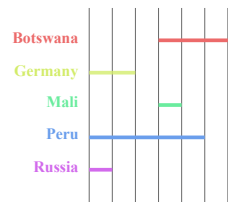
**Answer: 4**

## – Text Group:

No one visited both Botswana and Germany  
 Everyone who visited Germany visited Peru  
 Everyone who visited Mali visited Botswana  
 Everyone who visited Mali visited Peru  
 Everyone who visited Russia visited Germany

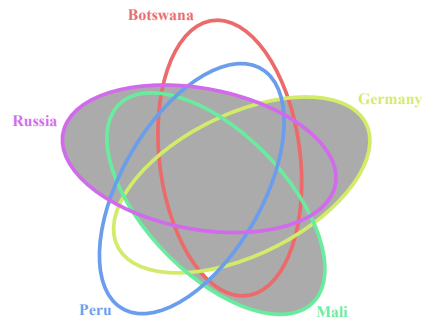
## – Linear Diagram Group:

No one visited both Botswana and Germany  
 Everyone who visited Germany visited Peru  
 Everyone who visited Mali visited Botswana  
 Everyone who visited Mali visited Peru  
 Everyone who visited Russia visited Germany



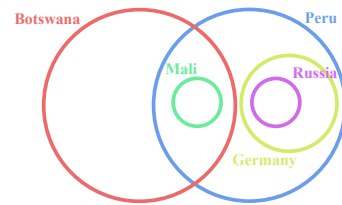
## – Venn Diagram Group:

No one visited both Botswana and Germany  
 Everyone who visited Germany visited Peru  
 Everyone who visited Mali visited Botswana  
 Everyone who visited Mali visited Peru  
 Everyone who visited Russia visited Germany



**– Euler Diagram Group:**

No one visited both Botswana and Germany  
Everyone who visited Germany visited Peru  
Everyone who visited Mali visited Botswana  
Everyone who visited Mali visited Peru  
Everyone who visited Russia visited Germany



## Question m14

## – Options (All Groups):

No one visited both Italy and Qatar  
 No one visited both Denmark and Italy  
 Everyone who visited Germany visited Qatar  
 Everyone who visited Germany visited Peru

## – Task Type: Disjoint

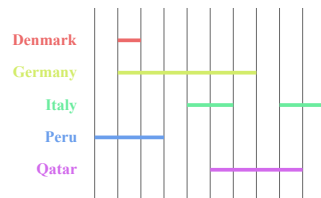
**Answer: 2**

## – Text Group:

Everyone who visited Denmark visited Germany  
 No one visited both Denmark and Qatar  
 No one visited both Italy and Peru  
 Everyone who visited Denmark visited Peru  
 No one visited both Qatar and Peru

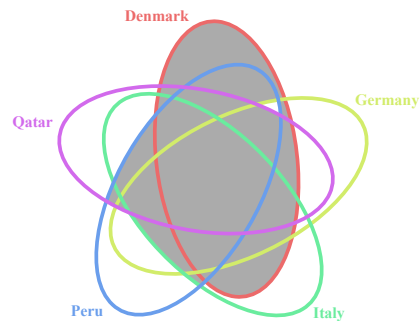
## – Linear Diagram Group:

Everyone who visited Denmark visited Germany  
 No one visited both Denmark and Qatar  
 No one visited both Italy and Peru  
 Everyone who visited Denmark visited Peru  
 No one visited both Qatar and Peru



## – Venn Diagram Group:

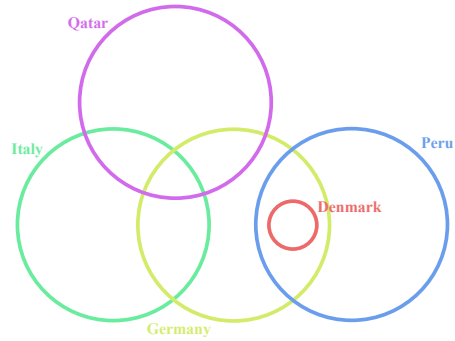
Everyone who visited Denmark visited Germany  
 No one visited both Denmark and Qatar  
 No one visited both Italy and Peru  
 Everyone who visited Denmark visited Peru  
 No one visited both Qatar and Peru





**– Euler Diagram Group:**

Everyone who visited Denmark visited Germany  
No one visited both Denmark and Qatar  
No one visited both Italy and Peru  
Everyone who visited Denmark visited Peru  
No one visited both Qatar and Peru



## Question m15

## – Options (All Groups):

Everyone who visited Niger visited Oman  
 No one visited both Albania and Oman  
 No one visited both Niger and Russia  
 Everyone who visited France visited Russia

## – Task Type: Disjoint

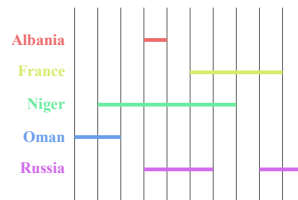
**Answer: 2**

## – Text Group:

No one visited both Albania and France  
 Everyone who visited Albania visited Niger  
 Everyone who visited Albania visited Russia  
 No one visited both France and Oman  
 No one visited both Oman and Russia

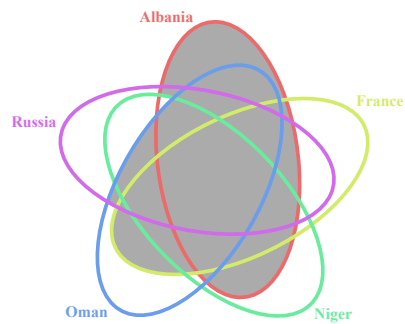
## – Linear Diagram Group:

No one visited both Albania and France  
 Everyone who visited Albania visited Niger  
 Everyone who visited Albania visited Russia  
 No one visited both France and Oman  
 No one visited both Oman and Russia



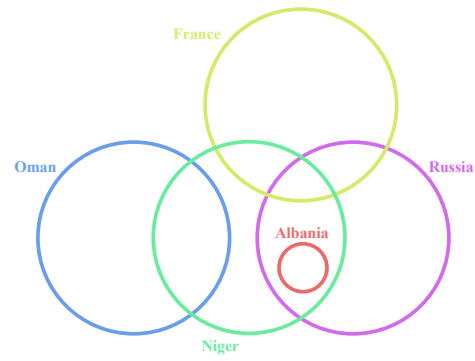
## – Venn Diagram Group:

No one visited both Albania and France  
 Everyone who visited Albania visited Niger  
 Everyone who visited Albania visited Russia  
 No one visited both France and Oman  
 No one visited both Oman and Russia



– **Euler Diagram Group:**

No one visited both Albania and France  
Everyone who visited Albania visited Niger  
Everyone who visited Albania visited Russia  
No one visited both France and Oman  
No one visited both Oman and Russia



## Question m16

## – Options (All Groups):

Everyone who visited Hungary visited France  
 No one visited both France and Jamaica  
 Everyone who visited Albania visited Jamaica  
 No one visited both Albania and France

## – Task Type: Disjoint

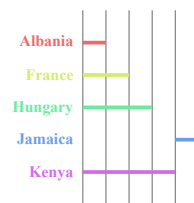
**Answer: 2**

## – Text Group:

Everyone who visited Albania visited France  
 Everyone who visited France visited Hungary  
 No one visited both Hungary and Jamaica  
 Everyone who visited Hungary visited Kenya  
 No one visited both Jamaica and Kenya

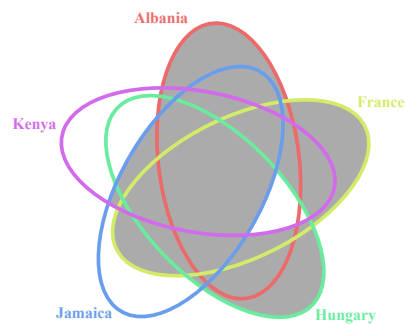
## – Linear Diagram Group:

Everyone who visited Albania visited France  
 Everyone who visited France visited Hungary  
 No one visited both Hungary and Jamaica  
 Everyone who visited Hungary visited Kenya  
 No one visited both Jamaica and Kenya



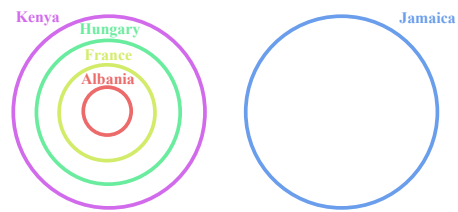
## – Venn Diagram Group:

Everyone who visited Albania visited France  
 Everyone who visited France visited Hungary  
 No one visited both Hungary and Jamaica  
 Everyone who visited Hungary visited Kenya  
 No one visited both Jamaica and Kenya



**– Euler Diagram Group:**

Everyone who visited Albania visited France  
Everyone who visited France visited Hungary  
No one visited both Hungary and Jamaica  
Everyone who visited Hungary visited Kenya  
No one visited both Jamaica and Kenya



## Question m17

## – Options (All Groups):

Everyone who visited France visited Kenya  
 Everyone who visited France visited Mali  
 No one visited both Botswana and Kenya  
 No one visited both Botswana and Italy

## – Task Type: Disjoint

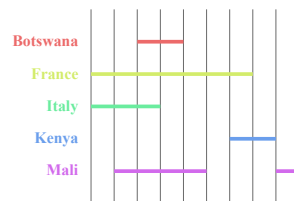
**Answer: 3**

## – Text Group:

Everyone who visited Botswana visited France  
 Everyone who visited Botswana visited Mali  
 Everyone who visited Italy visited France  
 No one visited both Italy and Kenya  
 No one visited both Kenya and Mali

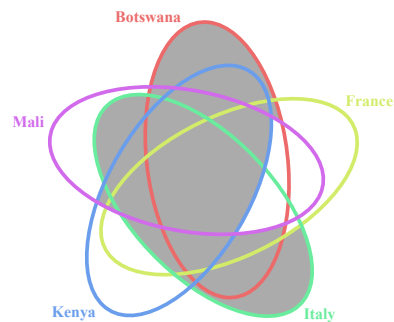
## – Linear Diagram Group:

Everyone who visited Botswana visited France  
 Everyone who visited Botswana visited Mali  
 Everyone who visited Italy visited France  
 No one visited both Italy and Kenya  
 No one visited both Kenya and Mali



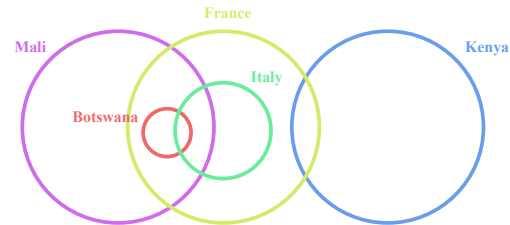
## – Venn Diagram Group:

Everyone who visited Botswana visited France  
 Everyone who visited Botswana visited Mali  
 Everyone who visited Italy visited France  
 No one visited both Italy and Kenya  
 No one visited both Kenya and Mali



**– Euler Diagram Group:**

Everyone who visited Botswana visited France  
Everyone who visited Botswana visited Mali  
Everyone who visited Italy visited France  
No one visited both Italy and Kenya  
No one visited both Kenya and Mali



## Question m18

## – Options (All Groups):

Everyone who visited Mali visited Niger  
 No one visited both Jamaica and Peru  
 No one visited both Hungary and Peru  
 Everyone who visited Jamaica visited Niger

## – Task Type: Disjoint

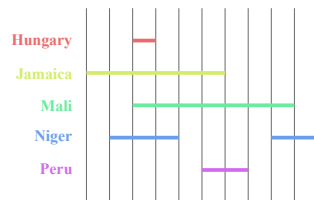
## – Text Group:

**Answer: 3**

Everyone who visited Hungary visited Jamaica  
 Everyone who visited Hungary visited Mali  
 Everyone who visited Hungary visited Niger  
 No one visited both Niger and Peru  
 Everyone who visited Peru visited Mali

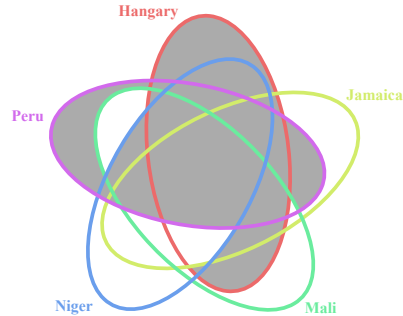
## – Linear Diagram Group:

Everyone who visited Hungary visited Jamaica  
 Everyone who visited Hungary visited Mali  
 Everyone who visited Hungary visited Niger  
 No one visited both Niger and Peru  
 Everyone who visited Peru visited Mali



## – Venn Diagram Group:

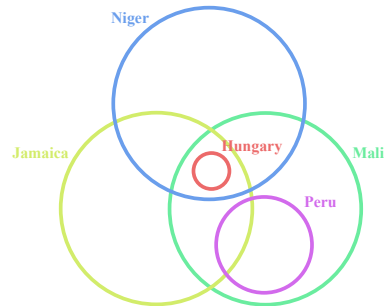
Everyone who visited Hungary visited Jamaica  
 Everyone who visited Hungary visited Mali  
 Everyone who visited Hungary visited Niger  
 No one visited both Niger and Peru  
 Everyone who visited Peru visited Mali





**– Euler Diagram Group:**

Everyone who visited Hungary visited Jamaica  
Everyone who visited Hungary visited Mali  
Everyone who visited Hungary visited Niger  
No one visited both Niger and Peru  
Everyone who visited Peru visited Mali



## Question m19

## – Options (All Groups):

No one visited both Albania and Kenya  
 No one visited both Germany and Italy  
 Everyone who visited Albania visited Italy  
 Everyone who visited Italy visited Kenya

## – Task Type: Disjoint

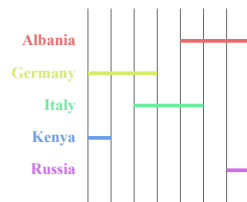
**Answer: 1**

## – Text Group:

No one visited both Albania and Germany  
 No one visited both Italy and Kenya  
 No one visited both Italy and Russia  
 Everyone who visited Kenya visited Germany  
 Everyone who visited Russia visited Albania

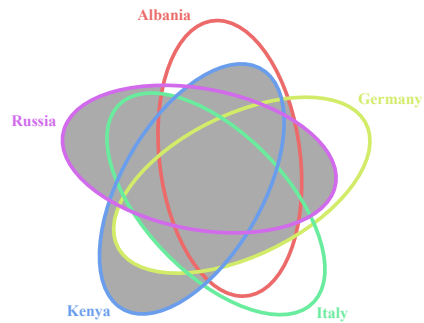
## – Linear Diagram Group:

No one visited both Albania and Germany  
 No one visited both Italy and Kenya  
 No one visited both Italy and Russia  
 Everyone who visited Kenya visited Germany  
 Everyone who visited Russia visited Albania



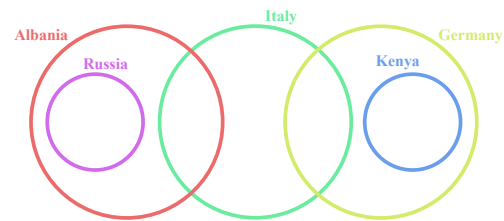
## – Venn Diagram Group:

No one visited both Albania and Germany  
 No one visited both Italy and Kenya  
 No one visited both Italy and Russia  
 Everyone who visited Kenya visited Germany  
 Everyone who visited Russia visited Albania



**– Euler Diagram Group:**

No one visited both Albania and Germany  
No one visited both Italy and Kenya  
No one visited both Italy and Russia  
Everyone who visited Kenya visited Germany  
Everyone who visited Russia visited Albania



## Question m20

## – Options (All Groups):

No one visited both Albania and Peru  
 Everyone who visited Peru visited Uganda  
 Everyone who visited Croatia visited Uganda  
 No one visited both Albania and Yemen

## – Task Type: Disjoint

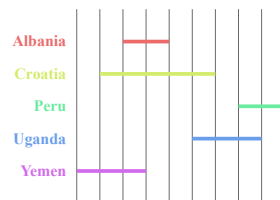
**Answer: 1**

## – Text Group:

Everyone who visited Albania visited Croatia  
 No one visited both Albania and Uganda  
 No one visited both Croatia and Peru  
 No one visited both Peru and Yemen  
 No visited both Uganda and Yemen

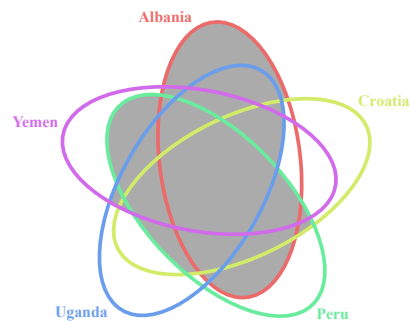
## – Linear Diagram Group:

Everyone who visited Albania visited Croatia  
 No one visited both Albania and Uganda  
 No one visited both Croatia and Peru  
 No one visited both Peru and Yemen  
 No visited both Uganda and Yemen



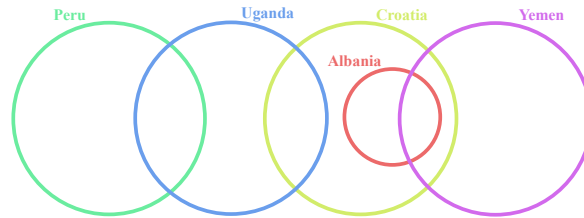
## – Venn Diagram Group:

Everyone who visited Albania visited Croatia  
 No one visited both Albania and Uganda  
 No one visited both Croatia and Peru  
 No one visited both Peru and Yemen  
 No visited both Uganda and Yemen



**– Euler Diagram Group:**

Everyone who visited Albania visited Croatia  
No one visited both Albania and Uganda  
No one visited both Croatia and Peru  
No one visited both Peru and Yemen  
No visited both Uganda and Yemen



2.3.1 Text Stimuli

This page shows all of the textual stimuli for the 20 performance phase questions.

Everyone who visited Denmark visited France Everyone who visited Denmark visited Jamaica Everyone who visited Jamaica visited Mali Everyone who visited Mali visited France Everyone who visited Vietnam visited France	Everyone who visited Germany visited Libya No one visited both Germany and Oman Everyone who visited Mali visited Libya No one visited both Oman and Uganda Everyone who visited Uganda visited Mali	Everyone who visited Croatia visited Estonia No one visited both Croatia and Italy Everyone who visited France visited Estonia No one visited both France and Italy Everyone who visited Jamaica visited Croatia
Everyone who visited Denmark visited France No one visited both Denmark and Vietnam Everyone who visited Libya visited Denmark No one visited both Libya and Sudan No one visited both Sudan and Vietnam	Everyone who visited Botswana visited Germany Everyone who visited Botswana visited France Everyone who visited Germany visited Oman Everyone who visited Germany visited Sudan Everyone who visited Sudan visited Oman	No one visited both Botswana and Croatia Everyone who visited Botswana visited Libya Everyone who visited Croatia and Libya No one visited both Croatia and Qatar Everyone who visited Libya visited Turkey
Everyone who visited Germany visited Italy Everyone who visited Germany visited Mali Everyone who visited Italy visited Qatar Everyone who visited Mali visited Qatar No one visited both Qatar and Sudan	Everyone who visited Denmark visited Germany No one visited both Germany and Mali Everyone who visited Oman visited Denmark Everyone who visited Uganda visited Denmark No one visited both Uganda and Oman	No one visited both Albania and France No one visited both Albania and Germany Everyone who visited Albania visited Hungary No one visited both France and Libya Everyone who visited Hungary visited Libya
No one visited both France and Oman No one visited both Peru and Russia Everyone who visited Russia visited France Everyone who visited Peru visited Oman Everyone who visited Uganda visited Peru	No one visited both Albania and Croatia No one visited both Albania and Denmark No one visited both Albania and Oman Everyone who visited Croatia visited Denmark Everyone who visited Mali visited Albania	No one visited both Croatia and Kenya No one visited both Croatia and Peru Everyone who visited Croatia visited Turkey Everyone who visited Oman visited Kenya No one visited both Oman and Peru
No one visited both Botswana and Germany Everyone who visited Germany visited Peru Everyone who visited Mali visited Botswana Everyone who visited Mali visited Peru Everyone who visited Russia visited Germany	Everyone who visited Denmark visited Germany No one visited both Denmark and Qatar No one visited both Italy and Peru Everyone who visited Denmark visited Peru No one visited both Qatar and Peru	No one visited both Albania and France Everyone who visited Albania visited Niger Everyone who visited Albania visited Russia No one visited both France and Oman No one visited both Oman and Russia
Everyone who visited Albania visited France Everyone who visited France visited Hungary No one visited both Hungary and Jamaica Everyone who visited Hungary visited Kenya No one visited both Jamaica and Kenya	Everyone who visited Botswana visited France Everyone who visited Botswana visited Mali Everyone who visited Italy visited France No one visited both Italy and Kenya No one visited both Kenya and Mali	Everyone who visited Hungary visited Jamaica Everyone who visited Hungary visited Mali Everyone who visited Hungary visited Niger No one visited both Niger and Peru Everyone who visited Peru visited Mali
No one visited both Albania and Germany No one visited both Italy and Kenya No one visited both Italy and Russia Everyone who visited Kenya visited Germany Everyone who visited Russia visited Albania	Everyone who visited Albania visited Croatia No one visited both Albania and Uganda No one visited both Croatia and Peru No one visited both Peru and Yemen No one visited both Uganda and Yemen	the end

### *2.3.2 Linear Diagrams and Text Stimuli*

This page shows all of the L&T stimuli for the 20 performance phase questions.

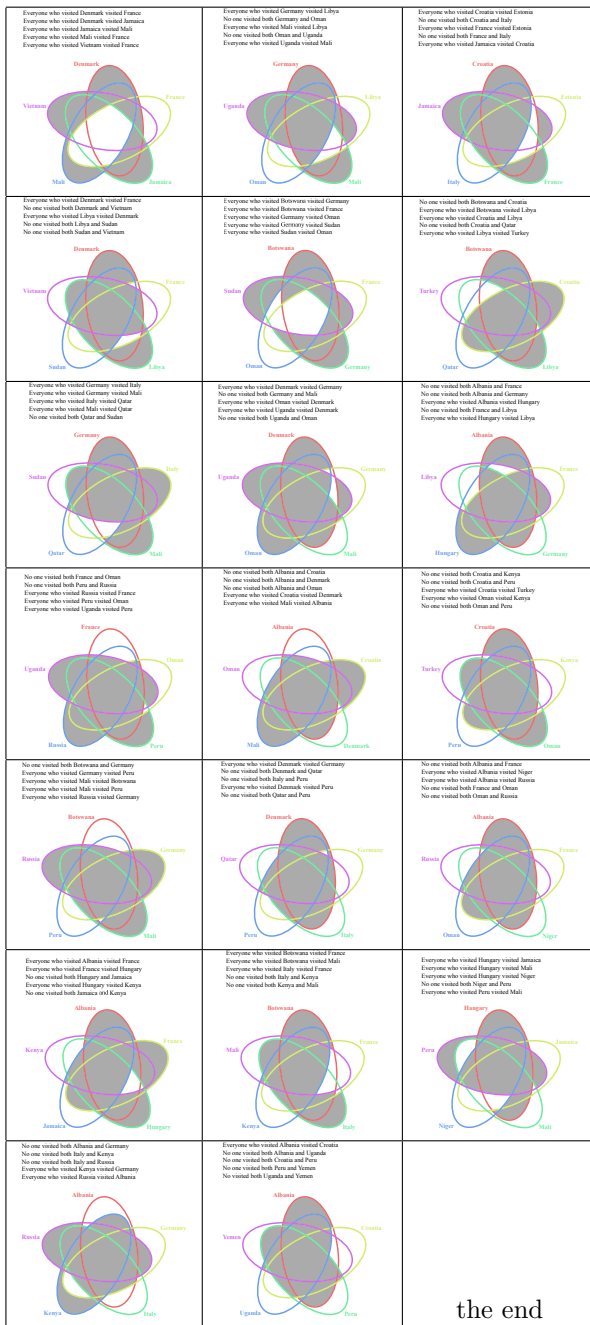
<p>Everyone who visited Denmark visited France                      Everyone who visited Denmark visited Jamaica                      Everyone who visited Jamaica visited Mali                      Everyone who visited Mali visited France                      Everyone who visited Vietnam visited France</p>	<p>Everyone who visited Germany visited Libya                      No one visited both Germany and Oman                      Everyone who visited Mali visited Libya                      No one visited both Oman and Uganda                      Everyone who visited Uganda visited Mali</p>	<p>Everyone who visited Croatia visited Estonia                      No one visited both Croatia and Italy                      Everyone who visited France visited Estonia                      No one visited both France and Italy                      Everyone who visited Jamaica visited Croatia</p>
<p>Everyone who visited Denmark visited France                      No one visited both Denmark and Vietnam                      Everyone who visited Libya visited Denmark                      No one visited both Libya and Sudan                      No one visited both Sudan and Vietnam</p>	<p>Everyone who visited Botswana visited Germany                      Everyone who visited Botswana visited France                      Everyone who visited Germany visited Oman                      Everyone who visited Germany visited Sudan                      Everyone who visited Sudan visited Oman</p>	<p>No one visited both Botswana and Croatia                      Everyone who visited Botswana visited Libya                      Everyone who visited Croatia and Libya                      No one visited both Croatia and Qatar                      Everyone who visited Libya visited Turkey</p>
<p>Everyone who visited Germany visited Italy                      No one visited both Germany and Mali                      Everyone who visited Italy visited Qatar                      Everyone who visited Mali visited Qatar                      No one visited both Qatar and Sudan</p>	<p>Everyone who visited Denmark visited Germany                      No one visited both Germany and Mali                      Everyone who visited Oman visited Denmark                      Everyone who visited Uganda visited Denmark                      No one visited both Uganda and Oman</p>	<p>No one visited both Albania and France                      No one visited both Albania and Germany                      Everyone who visited Albania visited Hungary                      No one visited both France and Libya                      Everyone who visited Hungary visited Libya</p>
<p>No one visited both France and Oman                      No one visited both Peru and Russia                      Everyone who visited Russia visited France                      Everyone who visited Peru visited Oman                      Everyone who visited Uganda visited Peru</p>	<p>No one visited both Albania and Croatia                      No one visited both Albania and Denmark                      No one visited both Albania and Oman                      Everyone who visited Croatia visited Denmark                      Everyone who visited Mali visited Albania</p>	<p>No one visited both Croatia and Kenya                      Everyone who visited Croatia visited Turkey                      Everyone who visited Oman visited Kenya                      No one visited both Oman and Peru</p>
<p>No one visited both Botswana and Germany                      Everyone who visited Germany visited Peru                      Everyone who visited Mali visited Botswana                      Everyone who visited Mali visited Peru                      Everyone who visited Russia visited Germany</p>	<p>Everyone who visited Denmark visited Germany                      No one visited both Denmark and Qatar                      No one visited both Italy and Peru                      Everyone who visited Denmark visited Peru                      No one visited both Qatar and Peru</p>	<p>No one visited both Albania and France                      Everyone who visited Albania visited Niger                      Everyone who visited Albania visited Russia                      No one visited both France and Oman                      No one visited both Oman and Russia</p>
<p>Everyone who visited Albania visited France                      Everyone who visited France visited Hungary                      No one visited both Hungary and Jamaica                      Everyone who visited Hungary visited Kenya                      No one visited both Jamaica and Kenya</p>	<p>Everyone who visited Botswana visited France                      Everyone who visited Botswana visited Mali                      Everyone who visited Italy visited France                      No one visited both Italy and Kenya                      No one visited both Kenya and Mali</p>	<p>Everyone who visited Hungary visited Jamaica                      Everyone who visited Hungary visited Mali                      Everyone who visited Hungary visited Niger                      No one visited both Niger and Peru                      Everyone who visited Peru visited Mali</p>
<p>No one visited both Albania and Germany                      No one visited both Italy and Kenya                      No one visited both Italy and Russia                      Everyone who visited Kenya visited Germany                      Everyone who visited Russia visited Albania</p>	<p>Everyone who visited Albania visited Croatia                      No one visited both Albania and Uganda                      No one visited both Croatia and Peru                      No one visited both Peru and Yemen                      No visited both Uganda and Yemen</p>	<p>the end</p>



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### *2.3.3 Venn Diagrams and Text Stimuli*

This page shows all of the V&T stimuli for the 20 performance phase questions. Note that these diagrams are scaled differently to the other treatments in order to fit them on one page.



### 2.3.4 Euler Diagrams and Text Stimuli

This page shows all of the E&T stimuli for the 20 performance phase questions.

<p>Everyone who visited Denmark visited France                      Everyone who visited Denmark visited Jamaica                      Everyone who visited Jamaica visited Mali                      Everyone who visited Mali visited France                      Everyone who visited Vietnam visited France</p>	<p>Everyone who visited Germany visited Libya                      No one visited both Germany and Oman                      Everyone who visited Mali visited Libya                      No one visited both Oman and Uganda                      Everyone who visited Uganda visited Mali</p>	<p>Everyone who visited Croatia visited Estonia                      No one visited both Croatia and Italy                      Everyone who visited France visited Estonia                      No one visited both France and Italy                      Everyone who visited Jamaica visited Croatia</p>
<p>Everyone who visited Denmark visited France                      No one visited both Denmark and Vietnam                      Everyone who visited Libya visited Denmark                      No one visited both Libya and Sudan                      No one visited both Sudan and Vietnam</p>	<p>Everyone who visited Botswana visited Germany                      Everyone who visited Botswana visited France                      Everyone who visited Germany visited Oman                      Everyone who visited Oman visited Sudan                      Everyone who visited Sudan visited Oman</p>	<p>No one visited both Botswana and Croatia                      Everyone who visited Botswana visited Libya                      Everyone who visited Croatia and Libya                      No one visited both Croatia and Qatar                      Everyone who visited Libya visited Turkey</p>
<p>Everyone who visited Germany visited Italy                      Everyone who visited Germany visited Mali                      Everyone who visited Italy visited Qatar                      Everyone who visited Mali visited Qatar                      No one visited both Qatar and Sudan</p>	<p>Everyone who visited Denmark visited Germany                      No one visited both Germany and Mali                      Everyone who visited Oman visited Denmark                      Everyone who visited Uganda visited Denmark                      No one visited both Uganda and Oman</p>	<p>No one visited both Albania and France                      No one visited both Albania and Germany                      Everyone who visited Albania visited Hungary                      No one visited both France and Libya                      Everyone who visited Hungary visited Libya</p>
<p>No one visited both France and Oman                      No one visited both Peru and Russia                      Everyone who visited Russia visited France                      Everyone who visited Peru visited Oman                      Everyone who visited Uganda visited Peru</p>	<p>No one visited both Albania and Croatia                      No one visited both Albania and Denmark                      No one visited both Albania and Oman                      Everyone who visited Croatia visited Denmark                      Everyone who visited Mali visited Albania</p>	<p>No one visited both Croatia and Kenya                      No one visited both Croatia and Peru                      Everyone who visited Croatia visited Turkey                      Everyone who visited Oman visited Kenya                      No one visited both Oman and Peru</p>
<p>No one visited both Botswana and Germany                      Everyone who visited Germany visited Peru                      Everyone who visited Mali visited Botswana                      Everyone who visited Mali visited Peru                      Everyone who visited Russia visited Germany</p>	<p>Everyone who visited Denmark visited Germany                      No one visited both Denmark and Qatar                      No one visited both Italy and Peru                      Everyone who visited Denmark visited Peru                      No one visited both Qatar and Peru</p>	<p>No one visited both Albania and France                      Everyone who visited Albania visited Niger                      Everyone who visited Albania visited Russia                      No one visited both France and Oman                      No one visited both Oman and Russia</p>
<p>Everyone who visited Albania visited France                      Everyone who visited France visited Hungary                      No one visited both Hungary and Jamaica                      Everyone who visited Hungary visited Kenya                      No one visited both Jamaica and Kenya</p>	<p>Everyone who visited Botswana visited France                      Everyone who visited Botswana visited Mali                      Everyone who visited Italy visited France                      No one visited both Italy and Kenya                      No one visited both Kenya and Mali</p>	<p>Everyone who visited Hungary visited Jamaica                      Everyone who visited Hungary visited Mali                      Everyone who visited Hungary visited Niger                      No one visited both Niger and Peru                      Everyone who visited Peru visited Mali</p>
<p>No one visited both Albania and Germany                      No one visited both Italy and Kenya                      No one visited both Italy and Russia                      Everyone who visited Kenya visited Germany                      Everyone who visited Russia visited Albania</p>	<p>Everyone who visited Albania visited Croatia                      No one visited both Albania and Uganda                      No one visited both Croatia and Peru                      No one visited both Peru and Yemen                      No one visited both Uganda and Yemen</p>	<p>the end</p>

## 2.4 Inattentive Questions

Question s1

## – Options (All Groups):

Everyone who visited Kenya visited Niger  
 No one visited both Albania and Kenya  
 No one visited both Hungary and Peru  
 Everyone who visited Jamaica visited Niger  
 Please choose this option

## – Task Type: Inattentive

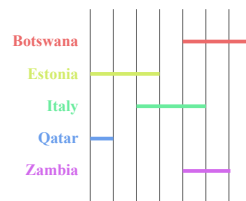
**Answer: 5**

## – Text Group:

This is an Attention Check Question  
 It is not timed, You May Rest Now  
 Please Click on the Indicated Option  
 You Must Do This  
 In Order to be Paid

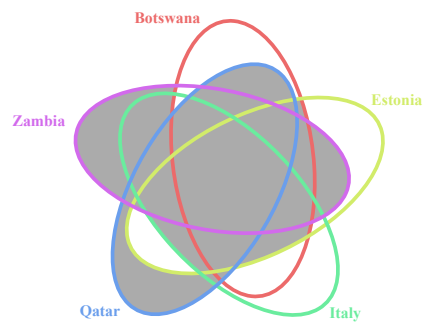
## – Linear Diagram Group:

This is an Attention Check Question  
 It is not timed, You May Rest Now  
 Please Click on the Indicated Option  
 You Must Do This  
 In Order to be Paid



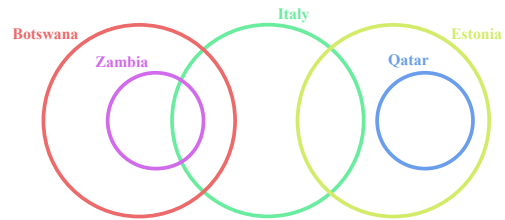
## – Venn Diagram Group:

This is an Attention Check Question  
 It is not timed, You May Rest Now  
 Please Click on the Indicated Option  
 You Must Do This  
 In Order to be Paid



**– Euler Diagram Group:**

This is an Attention Check Question  
It is not timed, You May Rest Now  
Please Click on the Indicated Option  
You Must Do This  
In Order to be Paid



## Question s2

## – Options (All Groups):

Everyone who visited Libya visited Croatia  
 No one visited both Libya and Denmark  
 No one visited both Qatar and Croatia  
 Everyone who visited Libya visited  
 Please choose this option

## – Task Type: Inattentive

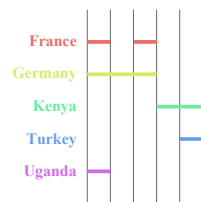
**Answer: 5**

## – Text Group:

This is an Attention Check Question  
 It is not timed, You May Rest Now  
 Please Click on the Indicated Option  
 You Must Do This  
 In Order to be Paid

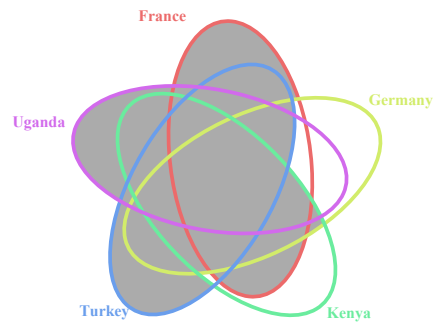
## – Linear Diagram Group:

This is an Attention Check Question  
 It is not timed, You May Rest Now  
 Please Click on the Indicated Option  
 You Must Do This  
 In Order to be Paid



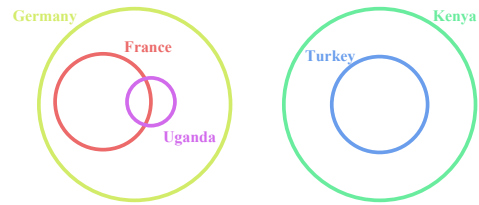
## – Venn Diagram Group:

This is an Attention Check Question  
 It is not timed, You May Rest Now  
 Please Click on the Indicated Option  
 You Must Do This  
 In Order to be Paid



**– Euler Diagram Group:**

This is an Attention Check Question  
It is not timed, You May Rest Now  
Please Click on the Indicated Option  
You Must Do This  
In Order to be Paid





### 3 Study 2 Materials

#### 3.1 Information

The information given to the participants at the beginning of the study is as follows:

**Scientific Study on Diagram Visualization**



This is a scientific study conducted by the University of Kent and the University of Brighton.

**Important:**

By consenting to take part, you agree that the data we collect from you can be used for the purposes of research into the effectiveness of representations of information. You also consent to the data being shared, after anonymization, for the purposes of peer review and to be placed online with any associated research publication. These data include information on your responses to the study questions along with basic demographic information you provide us with regarding your age, gender, and whether you are colour blind. We will not use your data for other purposes. By taking part in the study you are providing your consent for us to use your data in the way just described.

You can participate in this study **only once**. Multiple attempts by the same participant will not be permitted. Once starting the study, continue on through all the pages. If you fail to complete the study after starting you will not be allowed another attempt and will not be paid.

This study is split up into 28 pages and each page takes up to 1 minute to complete. The whole study takes about 20 minutes with a maximum of 45 minutes permitted.

Read the instructions carefully and answer the question before proceeding to the next page. Attempts that are not completed carefully will be rejected and you will not be paid. 100% of a number of attention checking questions must be answered correctly for you to complete the study successfully.

You should maintain concentration on the study and answer questions without delay, unless a question explicitly allows you to take a break, in which case you can have a rest before continuing.

Do not use the back button on your browser: you cannot access the previous pages, and if you click on it, you might be unable to complete the study.

The next 4 pages are for training. You will need to read these pages carefully to answer the later questions correctly.

Please choose "Yes" and click on the "Next Page" button to consent to take part and to start the study.

---

(you cannot return to this page afterwards)



### 3.2 Training

This section contains the statements and diagrams presented to participants for the purposes of training. After attempting each question, participants were given the correct answer, an explanation of the correct answer (with reference to the text or the diagram displayed).

#### Question t1: Text and Diagrams used for Training

– **Options (All Groups):**

Everyone who visited Estonia visited Turkey  
 No one visited both Botswana and Estonia  
 Everyone who visited Estonia visited Botswana  
 No one visited both Botswana and Turkey

– **Task Type:** Disjoint

**Answer:** 2

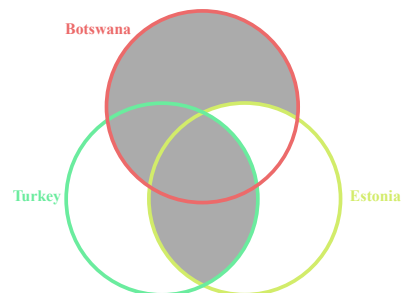
– **Text Group:**

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey

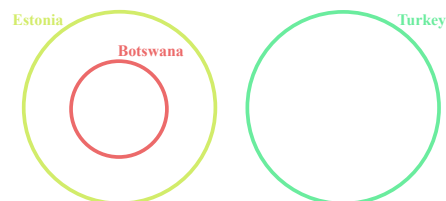
– **Linear Diagram Group:**



– **Venn Diagram Group:**



– **Euler Diagram Group:**



## Question t1: Text and Diagrams Used to Explain The Answer

### – Text Group Image:

Everyone who visited Botswana visited Estonia  
 No one visited both Estonia and Turkey

### – Text Group Explanation:

The correct answer is 'No one visited both Botswana and Turkey'.

We can make this deduction from the statements.

Suppose someone visited Botswana. Then the first statement tells us that they also visited Estonia. So, from the second statement, this person did not visit Turkey. Therefore, no one visited both Botswana and Turkey.

### – Linear Diagram Group Image:



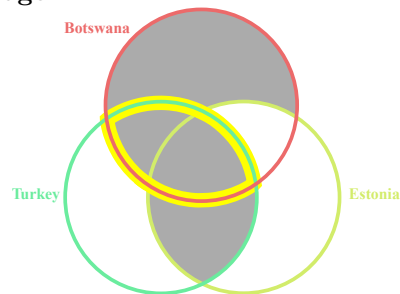
### – Linear Diagram Group Explanation:

The correct answer is 'No one visited both Botswana and Turkey'.

In the diagram, the lines for Botswana and Turkey do not overlap, so no one visited both Botswana and Turkey.

Click "Next page" to move on to the next training question.

### – Venn Diagram Group Image:



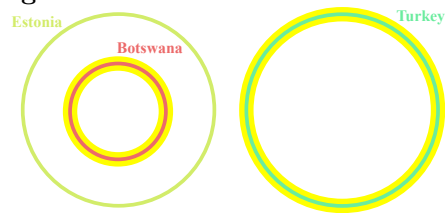
### – Venn Diagram Group Explanation:

The correct answer is 'No one visited both Botswana and Turkey'.

In the diagram, the region inside both Botswana and Turkey is completely shaded, so no one visited both Botswana and Turkey.

Click "Next page" to move on to the next training question.

– **Euler Diagram Group Image:**



– **Euler Diagram Group Explanation:**

The correct answer is 'No one visited both Botswana and Turkey'.

In the diagram, the circles for Botswana and Turkey do not overlap, so no one visited both Botswana and Turkey.

Click "Next page" to move on to the next training question.

## Question t2: Text and Diagrams used for Training

## – Options (All Groups):

No one visited both Croatia and Niger  
 No one visited both Croatia and Denmark  
 Everyone who visited Denmark visited Libya  
 Everyone who visited Niger visited Denmark

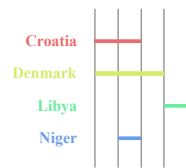
## – Task Type: Subset

**Answer: 4**

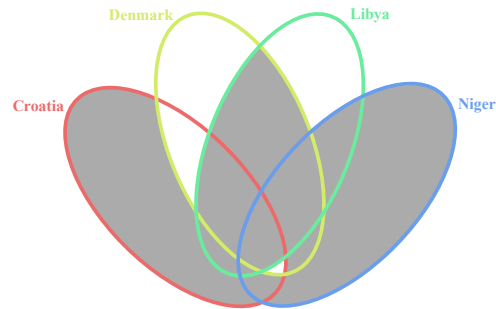
## – Text Group:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia

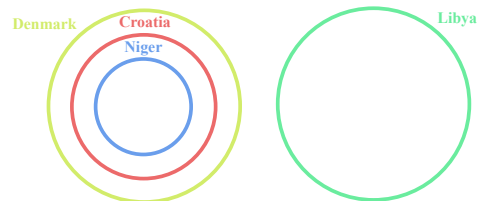
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question t2: Text and Diagrams Used to Explain The Answer

## – Text Group Image:

Everyone who visited Croatia visited Denmark  
 No one visited both Denmark and Libya  
 Everyone who visited Niger visited Croatia

## – Text Group Explanation:

The correct answer is 'Everyone who visited Niger visited Denmark'.

We can make this deduction from the statements.

Suppose someone visited Niger. Then the third statement tells us that they also visited Croatia. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Niger visited Denmark.

## – Linear Diagram Group Image:



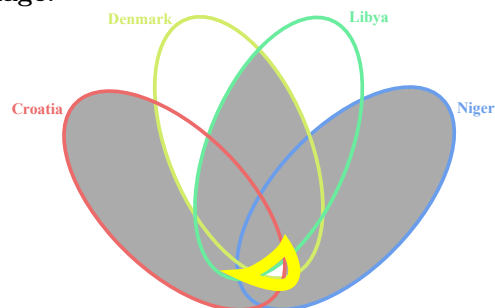
## – Linear Diagram Group Explanation:

The correct answer is 'Everyone who visited Niger visited Denmark'.

In the diagram, the line for Niger is completely overlapped by the line for Denmark, so everyone who visited Niger visited Denmark.

Click "Next page" to move on to the next training question.

## – Venn Diagram Group Image:



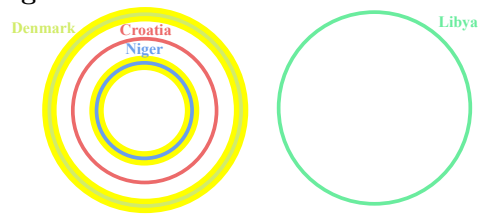
## – Venn Diagram Group Explanation:

The correct answer is 'Everyone who visited Niger visited Denmark'.

In the diagram, the non-shaded region inside Niger is completely inside completely inside Denmark, so everyone who visited Niger visited Denmark.

Click "Next page" to move on to the next training question.

– Euler Diagram Group Image:



– Euler Diagram Group Explanation:

The correct answer is 'Everyone who visited Niger visited Denmark'.

In the diagram, the circle for Niger is inside the circle for Denmark, so everyone who visited Niger visited Denmark.

Click "Next page" to move on to the next training question.

## Question t3: Text and Diagrams used for Training

## – Options (All Groups):

Everyone who visited Germany visited Peru  
 No one visited both Denmark and Kenya  
 No one visited both Kenya and Peru  
 Everyone who visited Denmark visited Libya

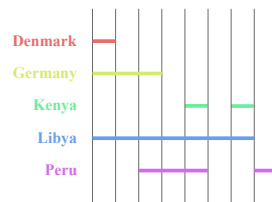
## – Task Type: Disjoint

**Answer: 2**

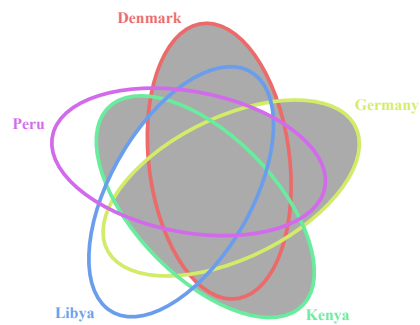
## – Text Group:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya

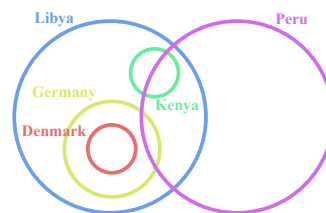
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question t3: Text and Diagrams Used to Explain The Answer

## – Text Group Image:

No one visited both Denmark and Peru  
 Everyone who visited Denmark visited Germany  
 Everyone who visited Kenya visited Libya  
 No one visited both Germany and Kenya  
 Everyone who visited Germany visited Libya

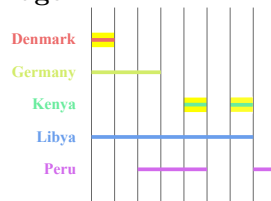
## – Text Group Explanation:

The correct answer is 'No one visited both Denmark and Kenya'.

We can make this deduction from the statements.

Suppose someone visited Denmark. Then the second statement tells us that they also visited Germany. So, from the fourth statement, this person did not visit Kenya. Therefore, no one visited both Denmark and Kenya.

## – Linear Diagram Group Image:



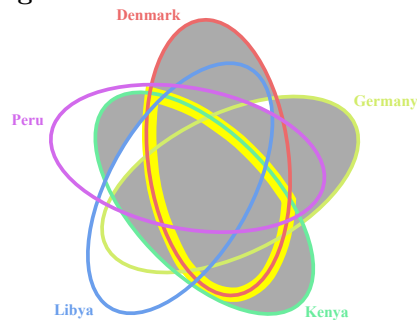
## – Linear Diagram Group Explanation:

The correct answer is 'No one visited both Denmark and Kenya'.

In the diagram, the lines for Denmark and Kenya do not overlap, so no one visited both Denmark and Kenya.

Click "Next page" to move on to the next training question.

## – Venn Diagram Group Image:



## – Venn Diagram Group Explanation:

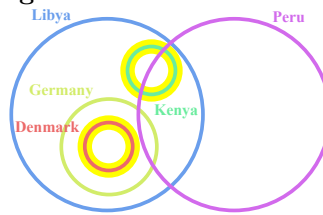
The correct answer is 'No one visited both Denmark and Kenya'.

In the diagram, the region inside both Denmark and Kenya is completely shaded, so no one visited both Denmark and Kenya.

Click "Next page" to move on to the next training question.



– **Euler Diagram Group Image:**



– **Euler Diagram Group Explanation:**

The correct answer is 'No one visited both Denmark and Kenya'.

In the diagram, the circles for Denmark and Kenya do not overlap, so no one visited both Denmark and Kenya.

Click "Next page" to move on to the next training question.

## Question t4: Text and Diagrams used for Training

## – Options (All Groups):

Everyone who visited Vietnam visited Denmark  
 Everyone who visited Denmark visited Qatar  
 No one visited both Botswana and Qatar  
 No one visited both Qatar and Vietnam

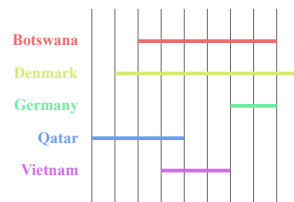
## – Task Type: Subset

**Answer: 1**

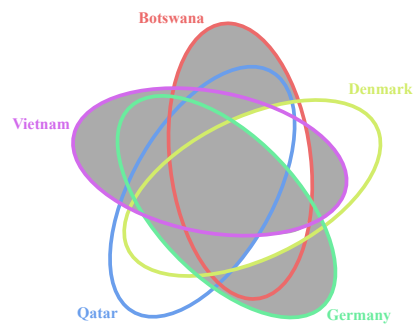
## – Text Group:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana

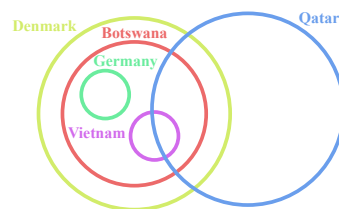
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question t4: Text and Diagrams Used to Explain The Answer

## – Text Group Image:

Everyone who visited Botswana visited Denmark  
 Everyone who visited Germany visited Botswana  
 No one visited both Germany and Vietnam  
 No one visited both Germany and Qatar  
 Everyone who visited Vietnam visited Botswana

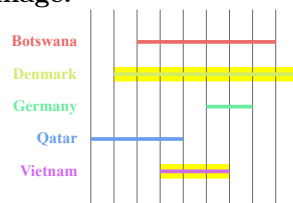
## – Text Group Explanation:

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

We can make this deduction from the statements.

Suppose someone visited Vietnam. Then the fifth statement tells us that they also visited Botswana. So, from the first statement, this person also visited Denmark. Therefore, everyone who visited Vietnam visited Denmark.

## – Linear Diagram Group Image:



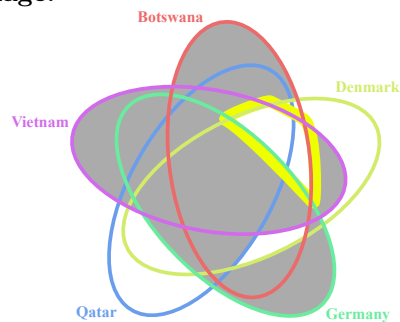
## – Linear Diagram Group Explanation:

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

In the diagram, the line for Vietnam is completely overlapped by the line for Denmark, so everyone who visited Vietnam visited Denmark.

Click "Next page" to move on to the first real question.

## – Venn Diagram Group Image:



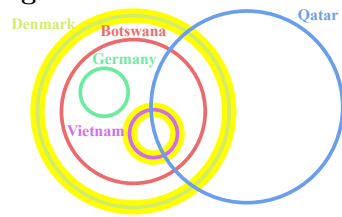
## – Venn Diagram Group Explanation:

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

In the diagram, the non-shaded region inside Vietnam is completely inside Denmark, so everyone who visited Vietnam visited Denmark.

Click "Next page" to move on to the first real question.

– **Euler Diagram Group Image:**



– **Euler Diagram Group Explanation:**

The correct answer is 'Everyone who visited Vietnam visited Denmark'.

In the diagram, the circle for Vietnam is inside the circle for Denmark, so everyone who visited Vietnam visited Denmark.

Click "Next page" to move on to the first real question.

### 3.3 Performance Phase

This section shows, firstly, the stimuli for ten subset tasks, followed by the stimuli for the ten disjointness tasks. At the end of this section, the stimuli are presented in groups, allowing an overview of the range of tasks to be seen.

Question m1

– **Options (All Groups):**

Everyone who visited Jamaica visited Vietnam  
 Everyone who visited Jamaica visited France  
 No one visited both Mali and Vietnam  
 No one visited both Denmark and Vietnam

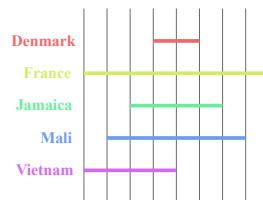
– **Task Type:** Subset

**Answer: 2**

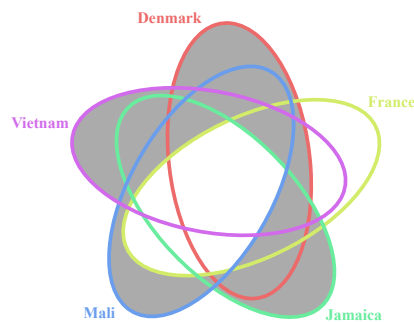
– **Text Group:**

Everyone who visited Denmark visited France  
 Everyone who visited Denmark visited Jamaica  
 Everyone who visited Jamaica visited Mali  
 Everyone who visited Mali visited France  
 Everyone who visited Vietnam visited France

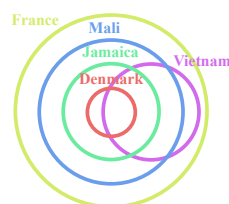
– **Linear Diagram Group:**



– **Venn Diagram Group:**



– **Euler Diagram Group:**



## Question m2

## – Options (All Groups):

No one visited both Mali and Oman  
 Everyone who visited Germany visited Mali  
 No one visited both Libya and Oman  
 Everyone who visited Uganda visited Libya

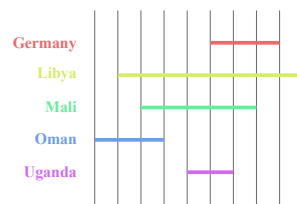
## – Task Type: Subset

**Answer: 4**

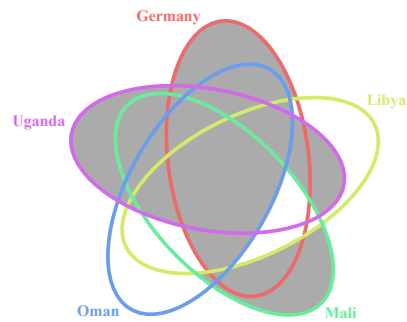
## – Text Group:

Everyone who visited Germany visited Libya  
 No one visited both Germany and Oman  
 Everyone who visited Mali visited Libya  
 No one visited both Oman and Uganda  
 Everyone who visited Uganda visited Mali

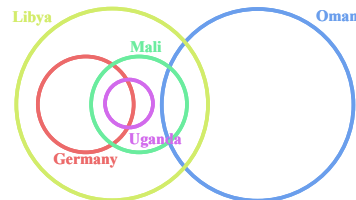
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m3

## – Options (All Groups):

No one visited both France and Jamaica  
 Everyone who visited Jamaica visited Estonia  
 No one visited both Estonia and Italy  
 Everyone who visited Croatia visited France

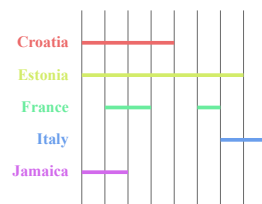
## – Task Type: Subset

**Answer: 2**

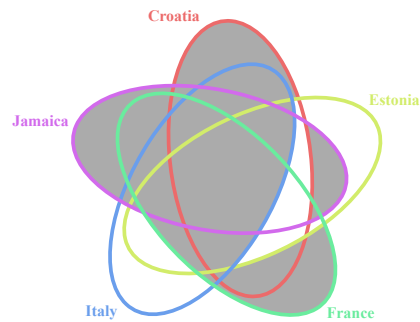
## – Text Group:

Everyone who visited Croatia visited Estonia  
 No one visited both Croatia and Italy  
 Everyone who visited France visited Estonia  
 No one visited both France and Italy  
 Everyone who visited Jamaica visited Croatia

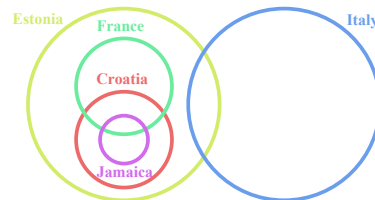
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m4

## – Options (All Groups):

Everyone who visited Libya visited France  
 Everyone who visited Libya visited Vietnam  
 No one visited both France and Vietnam  
 No one visited both France and Sudan

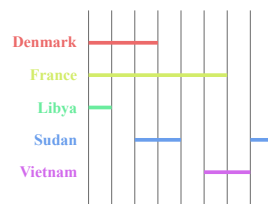
## – Task Type: Subset

**Answer: 1**

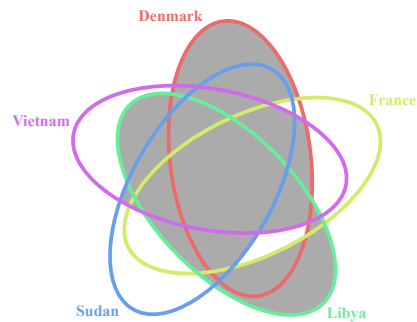
## – Text Group:

Everyone who visited Denmark visited France  
 No one visited both Denmark and Vietnam  
 Everyone who visited Libya visited Denmark  
 No one visited both Libya and Sudan  
 No one visited both Sudan and Vietnam

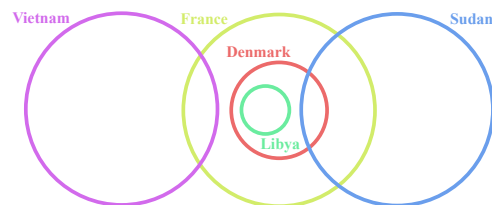
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:





## Question m5

## – Options (All Groups):

No one visited both France and Germany  
 Everyone who visited Botswana visited Sudan  
 Everyone who visited France visited Sudan  
 No one visited both France and Oman

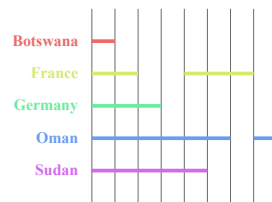
## – Task Type: Subset

**Answer: 2**

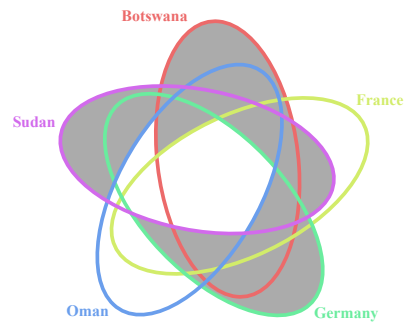
## – Text Group:

Everyone who visited Botswana visited Germany  
 Everyone who visited Botswana visited France  
 Everyone who visited Germany visited Oman  
 Everyone who visited Germany visited Sudan  
 Everyone who visited Sudan visited Oman

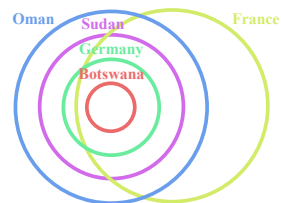
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m6

## – Options (All Groups):

Everyone who visited Libya visited Qatar  
 No one visited both Botswana and Qatar  
 No one visited both Qatar and Turkey  
 Everyone who visited Botswana visited Turkey

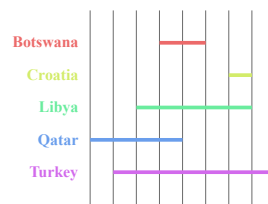
## – Task Type: Subset

**Answer: 4**

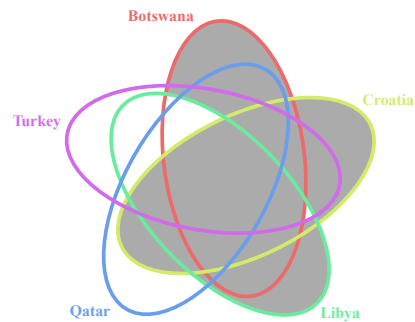
## – Text Group:

No one visited both Botswana and Croatia  
 Everyone who visited Botswana visited Libya  
 Everyone who visited Croatia and Libya  
 No one visited both Croatia and Qatar  
 Everyone who visited Libya visited Turkey

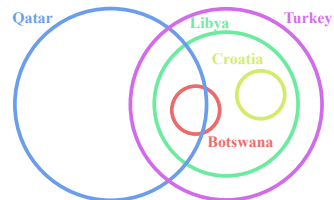
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m7

## – Options (All Groups):

Everyone who visited Italy visited Mali  
 No one visited both Germany and Italy  
 Everyone who visited Germany visited Qatar  
 No one visited both Mali and Qatar

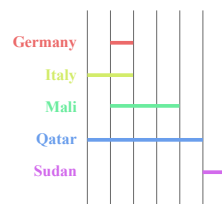
## – Task Type: Subset

**Answer: 3**

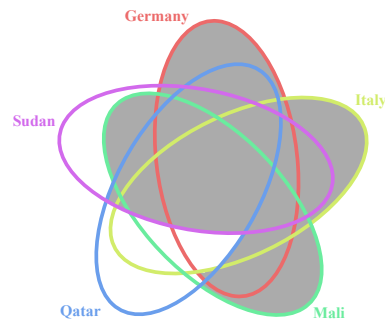
## – Text Group:

Everyone who visited Germany visited Italy  
 Everyone who visited Germany visited Mali  
 Everyone who visited Italy visited Qatar  
 Everyone who visited Mali visited Qatar  
 No one visited both Qatar and Sudan

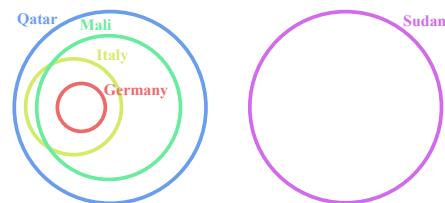
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m8

## – Options (All Groups):

No one visited both Oman and Germany  
 Everyone who visited Denmark visited Oman  
 Everyone who visited Oman visited Germany  
 No one visited both Denmark and Germany

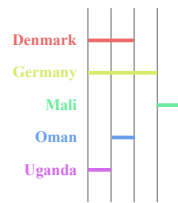
## – Task Type: Subset

**Answer: 3**

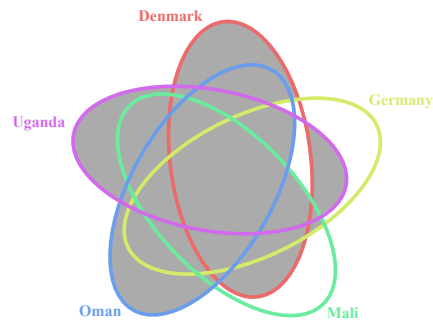
## – Text Group:

Everyone who visited Denmark visited Germany  
 No one visited both Germany and Mali  
 Everyone who visited Oman visited Denmark  
 Everyone who visited Uganda visited Denmark  
 No one visited both Uganda and Oman

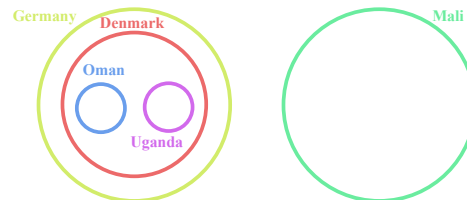
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m9

## – Options (All Groups):

No one visited both Germany and Libya  
 No one visited both Germany and Hungary  
 Everyone who visited Albania visited Libya  
 Everyone who visited France visited Germany

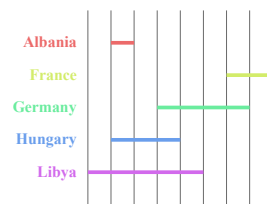
## – Task Type: Subset

**Answer: 3**

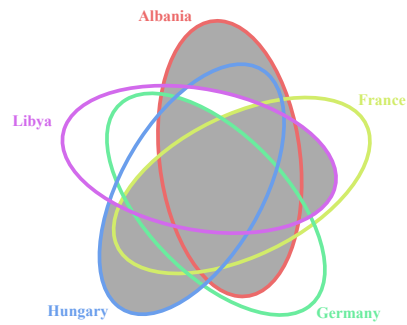
## – Text Group:

No one visited both Albania and France  
 No one visited both Albania and Germany  
 Everyone who visited Albania visited Hungary  
 No one visited both France and Libya  
 Everyone who visited Hungary visited Libya

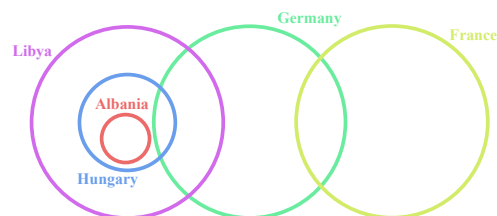
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



Question m10

– **Options (All Groups):**

Everyone who visited Uganda visited Oman  
 No one visited both Oman and Peru  
 Everyone who visited Peru visited Russia  
 No one visited both France and Russia

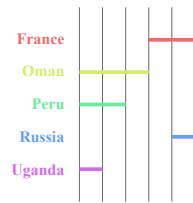
– **Task Type:** Subset

**Answer: 1**

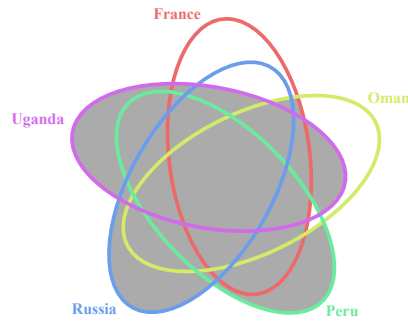
– **Text Group:**

No one visited both France and Oman  
 No one visited both Peru and Russia  
 Everyone who visited Russia visited France  
 Everyone who visited Peru visited Oman  
 Everyone who visited Uganda visited Peru

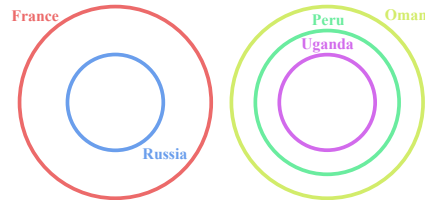
– **Linear Diagram Group:**



– **Venn Diagram Group:**



– **Euler Diagram Group:**



## Question m11

## – Options (All Groups):

Everyone who visited Croatia visited Oman  
 No one visited both Croatia and Denmark  
 No one visited both Mali and Oman  
 Everyone who visited Denmark visited Oman

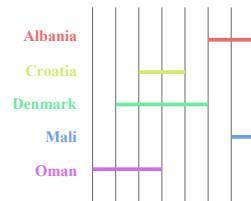
## – Task Type: Disjoint

**Answer: 3**

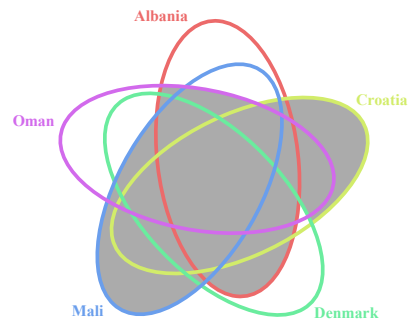
## – Text Group:

No one visited both Albania and Croatia  
 No one visited both Albania and Denmark  
 No one visited both Albania and Oman  
 Everyone who visited Croatia visited Denmark  
 Everyone who visited Mali visited Albania

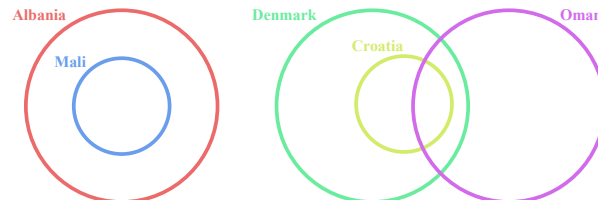
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



Question m12

– Options (All Groups):

Everyone who visited Peru visited Turkey  
 Everyone who visited Oman visited Turkey  
 No one visited both Kenya and Peru  
 No one visited both Croatia and Oman

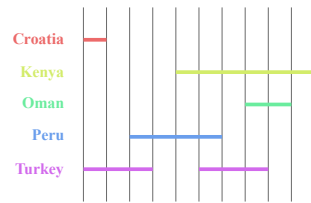
– Task Type: Disjoint

**Answer: 4**

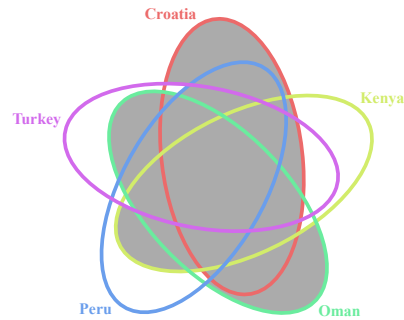
– Text Group:

No one visited both Croatia and Kenya  
 No one visited both Croatia and Peru  
 Everyone who visited Croatia visited Turkey  
 Everyone who visited Oman visited Kenya  
 No one visited both Oman and Peru

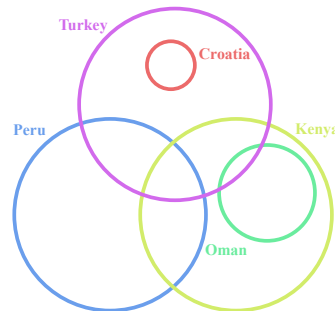
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:





Question m13

– Options (All Groups):

- No one visited both Botswana and Peru
- Everyone who visited Peru visited Mali
- Everyone who visited Botswana visited Germany
- No one visited both Mali and Russia

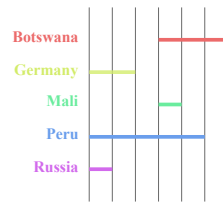
– Task Type: Disjoint

**Answer: 4**

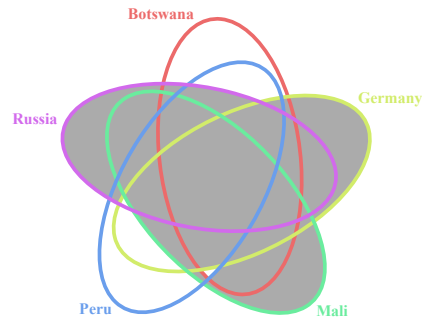
– Text Group:

- No one visited both Botswana and Germany
- Everyone who visited Germany visited Peru
- Everyone who visited Mali visited Botswana
- Everyone who visited Mali visited Peru
- Everyone who visited Russia visited Germany

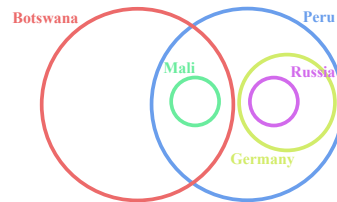
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:



Question m14

– Options (All Groups):

No one visited both Italy and Qatar  
 No one visited both Denmark and Italy  
 Everyone who visited Germany visited Qatar  
 Everyone who visited Germany visited Peru

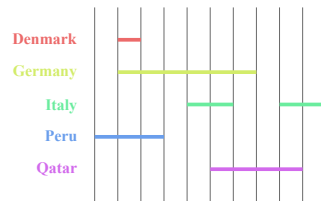
– Task Type: Disjoint

**Answer: 2**

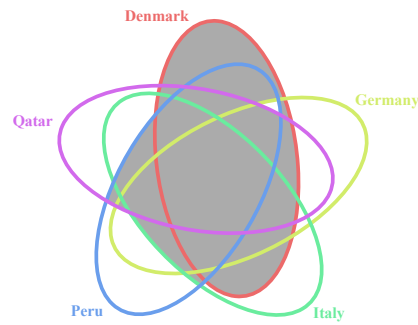
– Text Group:

Everyone who visited Denmark visited Germany  
 No one visited both Denmark and Qatar  
 No one visited both Italy and Peru  
 Everyone who visited Denmark visited Peru  
 No one visited both Qatar and Peru

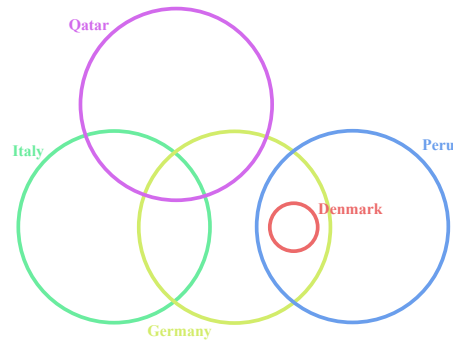
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:



Question m15

– Options (All Groups):

Everyone who visited Niger visited Oman  
 No one visited both Albania and Oman  
 No one visited both Niger and Russia  
 Everyone who visited France visited Russia

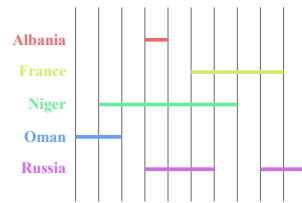
– Task Type: Disjoint

**Answer: 2**

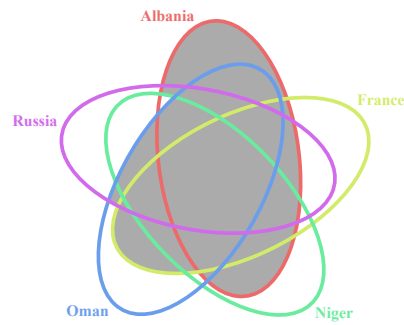
– Text Group:

No one visited both Albania and France  
 Everyone who visited Albania visited Niger  
 Everyone who visited Albania visited Russia  
 No one visited both France and Oman  
 No one visited both Oman and Russia

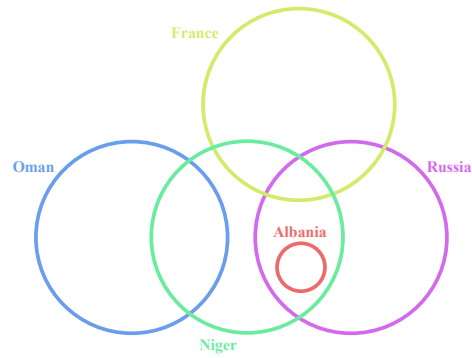
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:



Question m16

– Options (All Groups):

Everyone who visited Hungary visited France  
 No one visited both France and Jamaica  
 Everyone who visited Albania visited Jamaica  
 No one visited both Albania and France

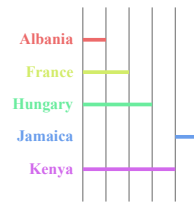
– Task Type: Disjoint

**Answer: 2**

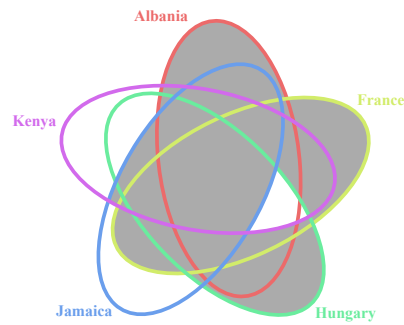
– Text Group:

Everyone who visited Albania visited France  
 Everyone who visited France visited Hungary  
 No one visited both Hungary and Jamaica  
 Everyone who visited Hungary visited Kenya  
 No one visited both Jamaica and Kenya

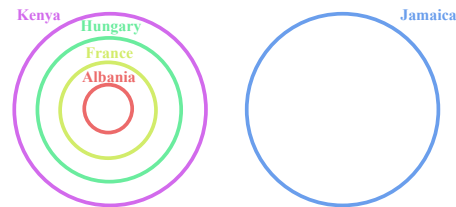
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:



## Question m17

## – Options (All Groups):

Everyone who visited France visited Kenya  
 Everyone who visited France visited Mali  
 No one visited both Botswana and Kenya  
 No one visited both Botswana and Italy

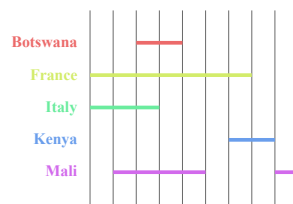
## – Task Type: Disjoint

**Answer: 3**

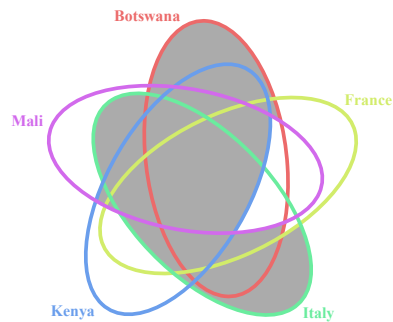
## – Text Group:

Everyone who visited Botswana visited France  
 Everyone who visited Botswana visited Mali  
 Everyone who visited Italy visited France  
 No one visited both Italy and Kenya  
 No one visited both Kenya and Mali

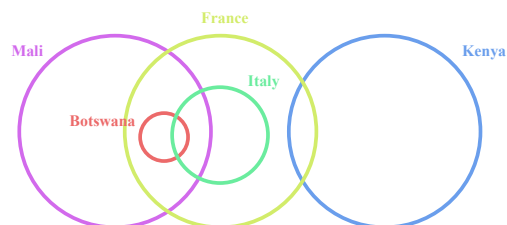
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



Question m18

– Options (All Groups):

Everyone who visited Mali visited Niger  
 No one visited both Jamaica and Peru  
 No one visited both Hungary and Peru  
 Everyone who visited Jamaica visited Niger

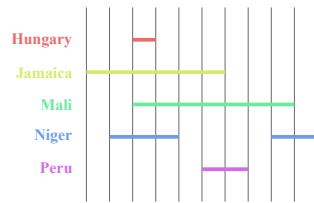
– Task Type: Disjoint

**Answer: 3**

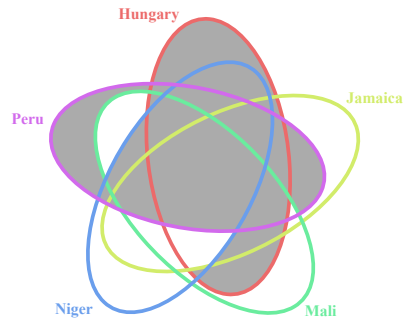
– Text Group:

Everyone who visited Hungary visited Jamaica  
 Everyone who visited Hungary visited Mali  
 Everyone who visited Hungary visited Niger  
 No one visited both Niger and Peru  
 Everyone who visited Peru visited Mali

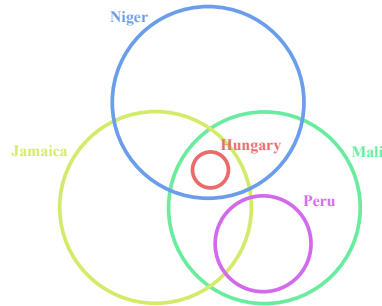
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:



## Question m19

## – Options (All Groups):

No one visited both Albania and Kenya  
 No one visited both Germany and Italy  
 Everyone who visited Albania visited Italy  
 Everyone who visited Italy visited Kenya

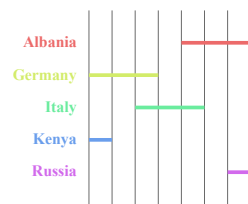
## – Task Type: Disjoint

**Answer: 1**

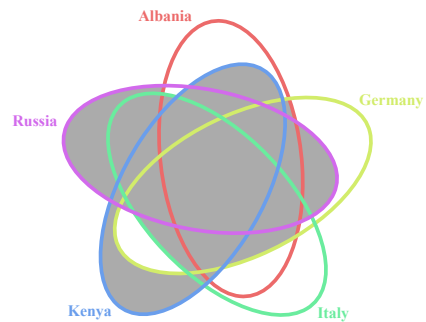
## – Text Group:

No one visited both Albania and Germany  
 No one visited both Italy and Kenya  
 No one visited both Italy and Russia  
 Everyone who visited Kenya visited Germany  
 Everyone who visited Russia visited Albania

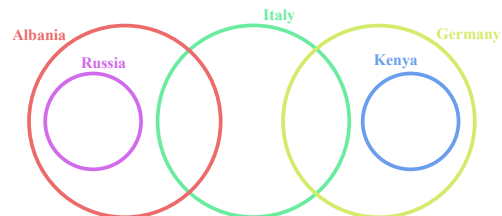
## – Linear Diagram Group:



## – Venn Diagram Group:



## – Euler Diagram Group:



## Question m20

## – Options (All Groups):

No one visited both Albania and Peru  
 Everyone who visited Peru visited Uganda  
 Everyone who visited Croatia visited Uganda  
 No one visited both Albania and Yemen

## – Task Type: Disjoint

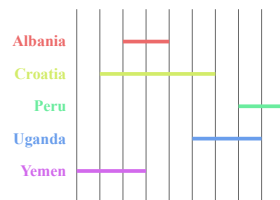
**Answer: 1**

## – Text Group:

Everyone who visited Albania visited Croatia  
 No one visited both Albania and Uganda  
 No one visited both Croatia and Peru  
 No one visited both Peru and Yemen  
 No visited both Uganda and Yemen

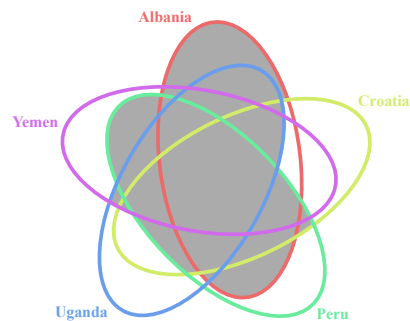
## – Linear Diagram Group:

Everyone who visited Albania visited Croatia  
 No one visited both Albania and Uganda  
 No one visited both Croatia and Peru  
 No one visited both Peru and Yemen  
 No visited both Uganda and Yemen



## – Venn Diagram Group:

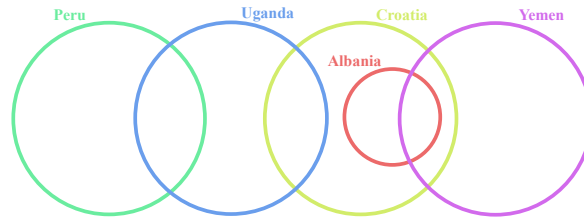
Everyone who visited Albania visited Croatia  
 No one visited both Albania and Uganda  
 No one visited both Croatia and Peru  
 No one visited both Peru and Yemen  
 No visited both Uganda and Yemen





**– Euler Diagram Group:**

Everyone who visited Albania visited Croatia  
No one visited both Albania and Uganda  
No one visited both Croatia and Peru  
No one visited both Peru and Yemen  
No visited both Uganda and Yemen



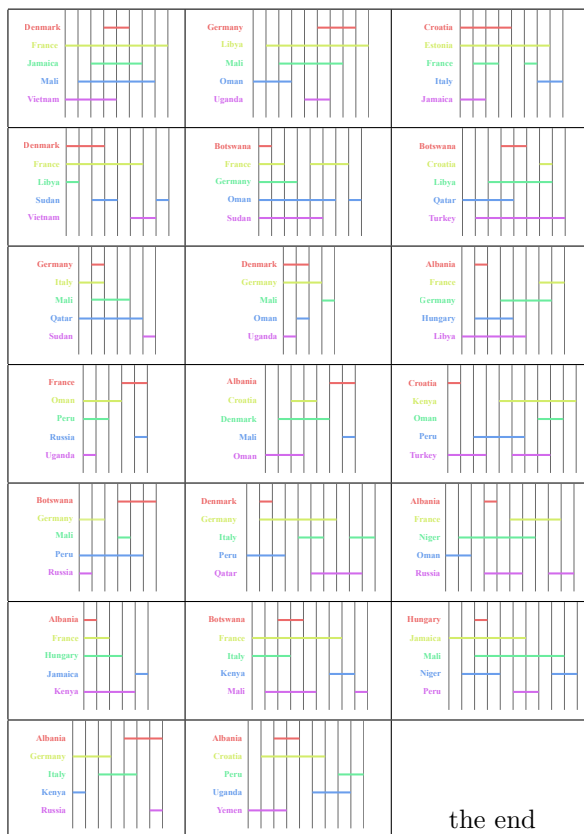
3.3.1 Text Stimuli

This page shows all of the textual stimuli for the 20 performance phase questions.

Everyone who visited Denmark visited France Everyone who visited Denmark visited Jamaica Everyone who visited Jamaica visited Mali Everyone who visited Mali visited France Everyone who visited Vietnam visited France	Everyone who visited Germany visited Libya No one visited both Germany and Oman Everyone who visited Mali visited Libya No one visited both Oman and Uganda Everyone who visited Uganda visited Mali	Everyone who visited Croatia visited Estonia No one visited both Croatia and Italy Everyone who visited France visited Estonia No one visited both France and Italy Everyone who visited Jamaica visited Croatia
Everyone who visited Denmark visited France No one visited both Denmark and Vietnam Everyone who visited Libya visited Denmark No one visited both Libya and Sudan No one visited both Sudan and Vietnam	Everyone who visited Botswana visited Germany Everyone who visited Botswana visited France Everyone who visited Germany visited Oman Everyone who visited Germany visited Sudan Everyone who visited Sudan visited Oman	No one visited both Botswana and Croatia Everyone who visited Botswana visited Libya Everyone who visited Croatia and Libya No one visited both Croatia and Qatar Everyone who visited Libya visited Turkey
Everyone who visited Germany visited Italy Everyone who visited Germany visited Mali Everyone who visited Italy visited Qatar Everyone who visited Mali visited Qatar No one visited both Qatar and Sudan	Everyone who visited Denmark visited Germany No one visited both Germany and Mali Everyone who visited Oman visited Denmark Everyone who visited Uganda visited Denmark No one visited both Uganda and Oman	No one visited both Albania and France No one visited both Albania and Germany Everyone who visited Albania visited Hungary No one visited both France and Libya Everyone who visited Hungary visited Libya
No one visited both France and Oman No one visited both Peru and Russia Everyone who visited Russia visited France Everyone who visited Peru visited Oman Everyone who visited Uganda visited Peru	No one visited both Albania and Croatia No one visited both Albania and Denmark No one visited both Albania and Oman Everyone who visited Croatia visited Denmark Everyone who visited Mali visited Albania	No one visited both Croatia and Kenya No one visited both Croatia and Peru Everyone who visited Croatia visited Turkey Everyone who visited Oman visited Kenya No one visited both Oman and Peru
No one visited both Botswana and Germany Everyone who visited Germany visited Peru Everyone who visited Mali visited Botswana Everyone who visited Mali visited Peru Everyone who visited Russia visited Germany	Everyone who visited Denmark visited Germany No one visited both Denmark and Qatar No one visited both Italy and Peru Everyone who visited Denmark visited Peru No one visited both Qatar and Peru	No one visited both Albania and France Everyone who visited Albania visited Niger Everyone who visited Albania visited Russia No one visited both France and Oman No one visited both Oman and Russia
Everyone who visited Albania visited France Everyone who visited France visited Hungary No one visited both Hungary and Jamaica Everyone who visited Hungary visited Kenya No one visited both Jamaica and Kenya	Everyone who visited Botswana visited France Everyone who visited Botswana visited Mali Everyone who visited Italy visited France No one visited both Italy and Kenya No one visited both Kenya and Mali	Everyone who visited Hungary visited Jamaica Everyone who visited Hungary visited Mali Everyone who visited Hungary visited Niger No one visited both Niger and Peru Everyone who visited Peru visited Mali
No one visited both Albania and Germany No one visited both Italy and Kenya No one visited both Italy and Russia Everyone who visited Kenya visited Germany Everyone who visited Russia visited Albania	Everyone who visited Albania visited Croatia No one visited both Albania and Uganda No one visited both Croatia and Peru No one visited both Peru and Yemen No visited both Uganda and Yemen	the end

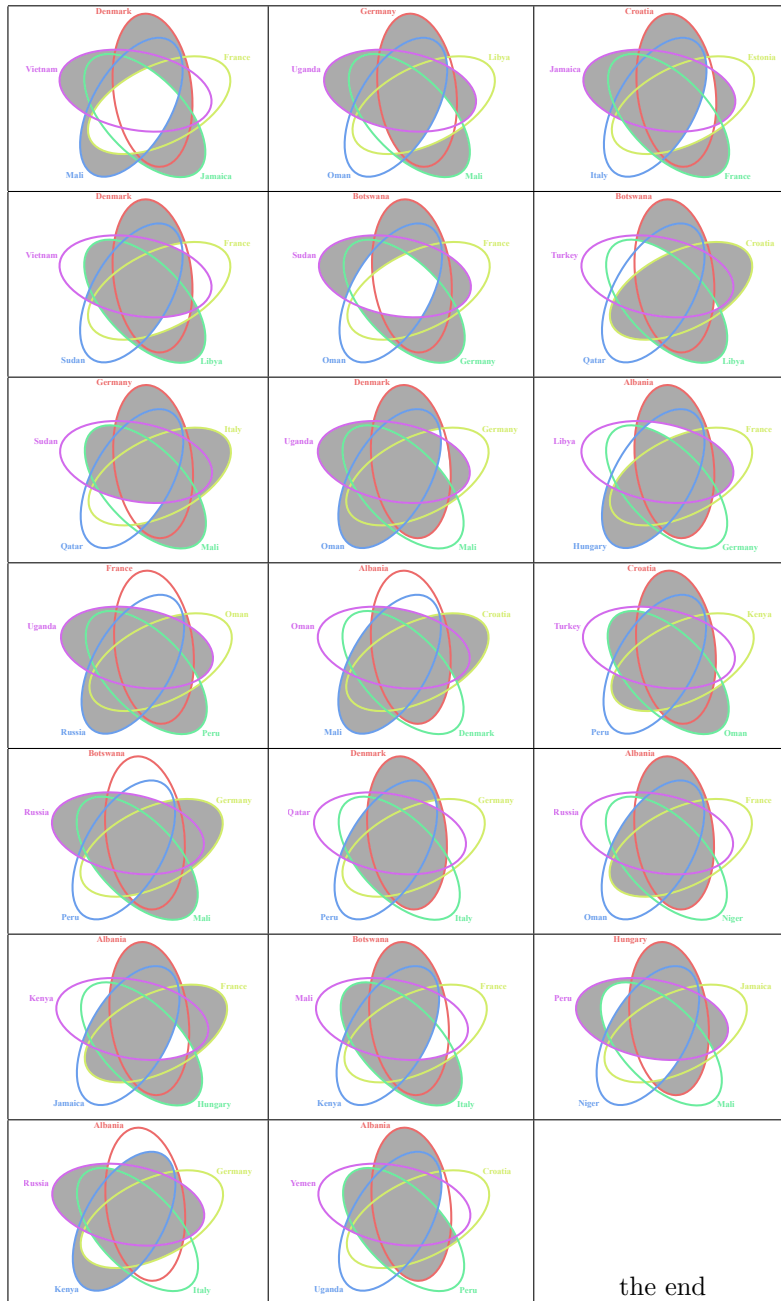
## 3.3.2 Linear Diagrams Stimuli

This page shows all of the L stimuli for the 20 performance phase questions.



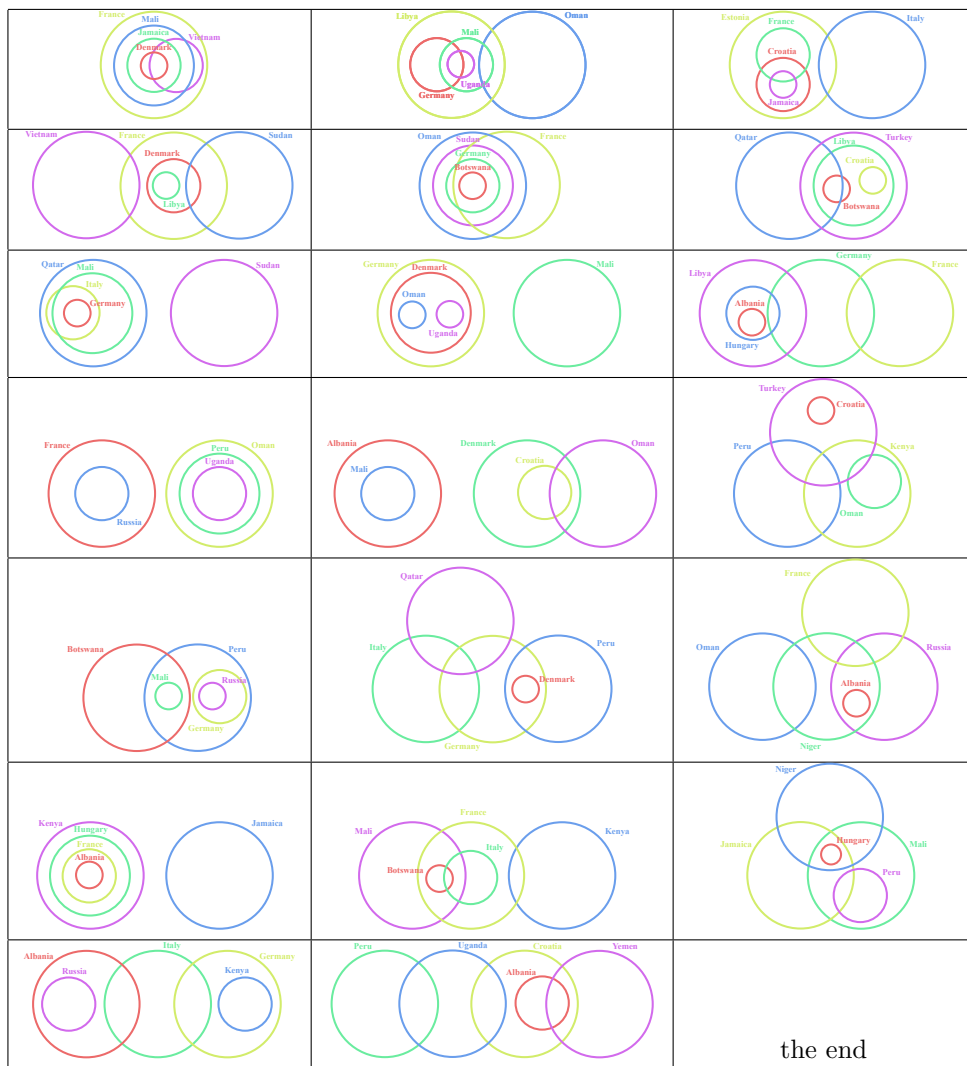
3.3.3 Venn Diagrams Stimuli

This page shows all of the V stimuli for the 20 performance phase questions.



3.3.4 Euler Diagrams Stimuli

This page shows all of the E stimuli for the 20 performance phase questions.



3.4 Inattentive Questions

Question s1

– Options (All Groups):

Choose this Option This is an Attention Check  
 Everyone who visited Hungary visited Mali  
 No one visited both Jamaica and Hungary  
 Everyone who visited Hungary visited Albania  
 None of the above

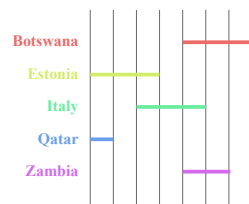
– Task Type: Inattentive

**Answer: 1**

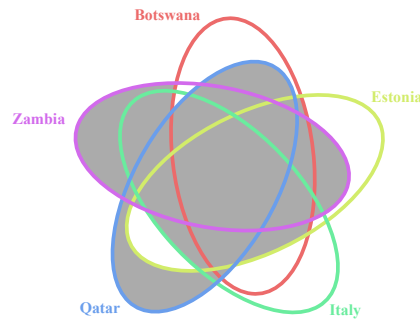
– Text Group:

No one visited both Botswana and Estonia  
 Everyone who visited Zambia visited Botswana  
 No one visited both Italy and Qatar  
 Everyone who visited Qatar visited Estonia  
 No one visited both Zambia and Qatar

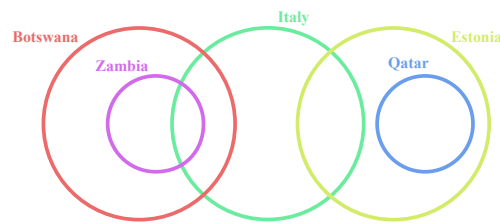
– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:



Question s2

– Options (All Groups):

Choose this Option This is an Attention Check  
 Everyone who visited Peru visited Botswana  
 No one visited both Botswana and Italy  
 No one visited both Albania and Italy  
 None of the above

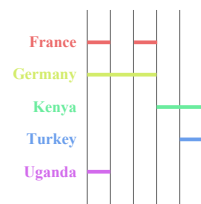
– Task Type: Inattentive

**Answer: 1**

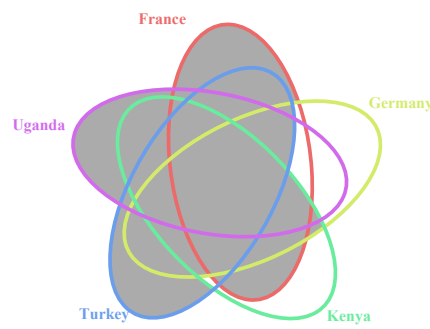
– Text Group:

No one visited both Germany and Kenya  
 Everyone who visited France visited Germany  
 Everyone who visited Turkey visited Kenya  
 Everyone who visited Uganda visited Germany  
 No one visited both Uganda and Turkey

– Linear Diagram Group:



– Venn Diagram Group:



– Euler Diagram Group:

