CIF302 Portfolio Element 1

Relational Algebra and SQL

This is an individual exercise. Complete the following tasks below:

1. A number of tables are given in appendix I. Create an SQL script file which will create these tables in Oracle. Ensure that all primary and foreign keys are correctly defined, and that you use types which accurately reflect the type of data that is being stored.
2. For each of the following natural language query descriptions, create the corresponding query in both the relational algebra and SQL, ensuring that you show all output from your SQL queries:
    a. Output the item and quantity of all items that make up order 324;
    b. For each customer that has made an order, print all customer's details, the order number and date, as well as the quantity and name of each item ordered;
    c. List the name and street of each customer who has not made an order;
3. For the following natural language query description, create the corresponding query in SQL, ensuring that you show all output.
    a. At the end of the month the organisation likes to produce a report which details each customer's real balance taking into account, firstly their current balance, and then all orders made during that month. They always ensure that each item ordered comes from the cheapest supplier. The report must include the following information: customer's name, address, old balance, new balance and number of items that have been ordered by that customer during that period (you do not need to count the number of orders for any one customer). Your task is to produce the report for March 2009, assuming that current balances shown are correct as of the end of February 2009. *Note that the report should be written using the* ***minimal*** *number of SQL statements possible.*

    It is important that for each query, it is written in such a way that it could deal with a larger (more general) data set than the example partial data set given. This means that you should not include any assumptions (e.g. names of customers) in your queries which would stop that query working for a larger data set.

This element will be part of your final portfolio submission. You will be expected to submit a Word document (and an electronic copy saved as an RTF file) which contains your algebra and SQL queries (each SQL query must include output). You must also submit your SQL script file as a separate document. These will be submitted according to the guidelines given for the whole portfolio.

Marking Scheme

This element will be marked as part of your final portfolio submission. The marking criteria for each element is given in the overall portfolio guidelines. However, this element will be judged according to the given criteria on the following page:

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Name _____

	Weight	Not attempted	Major Errors in solution	Minor errors in Solution	Correct Solution
Script File correctly models tables given and inserts data correctly	10%				
Script file uses valid data types and contains valid integrity rules	10%				
Script file contains no errors and would work in Oracle	5%				
Query 2 a: Algebra	10%				
Query 2a: SQL	10%				
Query 2 b: Algebra	10%				
Query 2b: SQL	10%				
Query 2c : Algebra	10%				
Query 2c: SQL	10%				
Query 3 a: SQL	15%				

Appendix 1

customers

name	address	balance
Shaun Turtle	4 Family Avenue	-200
Samantha Salamander	53 Lois Lane	-50
Ruth Raptor	21 Stony Street	43

orders

order_no	date	cust
324	10/03/09	Shaun Turtle
325	20/03/09	Ruth Raptor
326	25/03/09	Shaun Turtle

includes

order_no	item	qty
324	Cheddar	3
324	Chardonnay	6
325	Cheddar	5
325	Escargot	12
325	Rocket	1
325	Walnuts	1024
326	Walnuts	2048

supplies

name	item	price
Acme	Cheddar	3.49
Acme	Chardonnay	5.19
Acme	Walnuts	0.06
Acme	Escargot	.25
Ajax	Cheddar	3.90
Ajax	Chardonnay	5.09
Ajax	Rocket	0.69