Supporting Software Sustainability With Lightweight Specifications

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Example: units-of-measure specifications

```fortran
program energy
  != unit kg :: mass
  != unit m :: height
  real :: mass = 3.00, gravity = 9.91, height = 4.20
  != unit kg m**2/s**2 :: potential_energy
  real :: potential_energy

  potential_energy = mass * gravity * height
end program energy
```
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end program energy
```

Check

```
$ camfort units-check energy1.f90
energy1.f90: Consistent. 4 variables checked.
```
Example: units-of-measure specifications

1  program energy
2    != unit kg :: mass
3    != unit m :: height
4  real :: mass = 3.00, gravity = 9.91, height = 4.20
5    != unit kg m**2/s**2 :: potential_energy
6  real :: potential_energy
7
8    potential_energy = mass * gravity * height
9  end program energy

Synthesise

$ camfort units-synth energy1.f90 energy1.f90

Synthesising units for energy1.f90
Example: units-of-measure specifications

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program energy
  != unit kg :: mass
  != unit m :: height
  != unit m/s**2 :: gravity
real :: mass = 3.00, gravity = 9.91, height = 4.20
  != unit kg m**2/s**2 :: potential_energy
real :: potential_energy

  potential_energy = mass * gravity * height
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Synthesise

```
$ camfort units-synth energy1.f90 energy1.f90
Synthesising units for energy1.f90
```
Currently:

- units-of-measure
- stencil specifications (shape of array access)

In progress:

- general boolean properties with auto-tests (QuickCheck)

Future?

- Get in touch and tell us what you need!!!