Exercises - Simple Textual

1 Simple Textual Modeling Exercises

1.1 Try DrModelica with VanDerPol

Locate the VanDerPol model in DrModelica (link from Section 2.1), run it, change it slightly, and re-run it.

1.2 HelloWorld

Simulate and plot the following example with one differential equation and one initial condition. Do a slight change in the model, re-simulate and re-plot

```
model HelloWorld "A simple equation"
  Real x(start=1);
equation
  der(x)= -x;
end HelloWorld;
```

Push shift-tab for command completion, fill in the name HelloWorld, and simulate it!

```
simul
```

Push shift-tab for command completion, fill in a variable name (x), and plot it!

```
plo
```

Take a look at the intepolated value of the variable x at time=0.5 using the val(variableName,time) function:

```
val(x,0.5)
```

Also take a look at the value at time=0.0:

```
val(x,0.)
```

1.3 A Simple Systems of Equations

Make a Modelica model that solves the equation system below with initial conditions. Hint: initial conditions are often specified using the start attribute.

$$\dot{x} = 2 * x * y - 3 * x$$
$$\dot{y} = 5 * y - 7 * x * y$$
$$x(0) = 2$$
$$y(0) = 3$$

```
model ...
```

1.4 Creating a Class

Create a class, `Multiply`, that calculates the product of two parameter variables, which are equal to `Real` numbers with given values.

1.5 Creating Instances

```
class Dog
  constant Real legs = 4;
  parameter String name = "Dummy";
end Dog;
```

Create an instance of the class `Dog` by declaring a variable.

Create another dog instance and give this dog the name "Tim".

2 Creating a Function and Making a Function Call

Write a function, `addTen`, that returns the input number plus the Integer 10.

Make a function call to addTen with the input 3.5.
Also do that inside a class, and simulate the class.