Software Workshop – Exercises

20 October 2015

Submissions must be made using Canvas, in the following format.

SUBMISSIONS NOT COMPLYING WITH THESE GUIDELINES WILL HAVE 2 MARKS DEDUCTED.

Uploaded file must be: studentid.zip
in the zip format. Rar or tar.gz will not be accepted.

Archive must contain: Person.java, Population.java and Infection.java (containing your test code).

All submissions must be made by midnight on the Sunday the exercise is due. Submissions after this time WILL NOT BE MARKED and will receive ZERO.

Your answers should be based on the classes **`Person`** and **`Population`** which we developed in the lab on Tuesday. You can find these classes on Canvas.

Don't forget that every time you write a method you should test it in Infection.java. You should also document your code with comments using the javadoc format.

Question 1 [8 marks]

Change the implementation of the **`Population`** class so that it uses an ArrayList instead of an array for the population as follows. N.B. You should only have to change Population.java – the rest of the program should continue to work exactly the same.

(a) Change the declaration of the field and add code to the constructor to create the ArrayList.

[4 marks]

(b) Change any methods which use the population so they work with the ArrayList rather than an array.

[4 marks]

Question 2 [8 marks]

(a) Add a new field **`deathRate`** to the **`Population`** class that gives the probability of dying from the infection. Assign this a value of `0.0` in the constructor. Now add a *second* constructor which initialises **`deathRate`** as a parameter as well as all the other fields. Document using the javadoc format. Test each constructor.

[4 marks]

(b) Write "get" and "set" methods for **`deathRate`**. Document using the javadoc format. Test your methods.

[4 marks]

Question 3 [8 marks]

Change the **`update`** method in **`Population`** so that infected people die with probability given by deathRate. Remove them from the population when this happens.

HINT: this is tricky to get right – I suggest creating an ArrayList to record which people die in one iteration. Then go through that ArrayList removing them from the population.