Software Development 3
1 hour 50 mins
Continuous Assessment (26%)

Create a folder called CA1X000??? (Use your ID number). In NetBeans, create a new Project using this folder. At the end of the CA you must compress this folder and upload to Moodle.

Note: Marks will lost for incorrect upload.

In this exercise you are required to write a set of classes to store details about motor car races and the drivers that take part. Make sure to read this sheet fully before you start coding your solution.

You are required to write code for a class called MotorRace and an inner class called Driver. To test your program you will need to write the code for a class called TestDriver.

The requirements for each of the classes you need to create are documented below.

MotorRace class (outer class)

The class has 3 member variables.
- location e.g. Brazil (String)
- competition e.g. Grand Prix (String)
- a list of drivers (ArrayList)

Create a suitable constructor to initialize the 1st two member variables using a parameter list. Make sure to also initialize the array list.

Create an addDriver() method that takes a reference variable of type Driver as a parameter and adds it to the array list.

Create a calculateHighestEarner() method that calculates and returns a string containing the name, country and average prize money for the driver who earns the highest average prize money. The average prize money is calculated in a method in the inner class.

Create a toString() method to display appropriate details as shown in the sample output.

Driver class (inner class)

The Driver class has 3 member variables.
- name (String)
- country (String)
- prizeMoney (array of type double which holds the prize money for the last 3 races driver competed)

Create a suitable constructor to initialize all 3 member variables using the parameter list.

Create a calcAvgPrizeMoney() method that calculates and returns the average prize money (double) for the driver.

Create an appropriate toString() method.

TestDriver class

Create and initialize a MotorRace object reference as follows:

        MotorRace gp = new MotorRace("Brazil", "Grand Prix");

Write Java code that takes the details for the drivers in from a text file. Create Driver object references and adds them to the array list defined in the Driver class. Create a text file data.txt with the following data:

        Alonso,Spain,34000,23000,56000
        Vettel,Germany,80000,90000,78000
        Hamilton,UK,70000,90000,90000

Call on the methods toString() and calculateHighestEarner() to display the output as shown in the sample output.

Final question

You need to write Java method(s) (NOT in the test class) to calculate the total prize money paid out to all the drivers. Do not define any new member variables. You can call the method in the test class. See the last line of the sample output to check out this should be formatted.

Sample output

Race Location: Brazil   Competition: Grand Prix

Driver Name: Alonso
Country: Spain
Prize Money 1: €34,000.00   Prize Money 2: €23,000.00   Prize Money 3: €56,000.00
Average Prize Money: €37,666.67

Driver Name: Vettel
Country: Germany
Prize Money 1: €80,000.00   Prize Money 2: 90,000.00€   Prize Money 3: €78,000.00
Average Prize Money: €82,666.67

Driver Name: Hamilton
Country: UK
Prize Money 1: €70,000.00   Prize Money 2: €90,000.00   Prize Money 3: €90,000.00
Average Prize Money: €

The highest earner: Hamilton from UK with average prize money of: €83,333.33
The total prize money paid out is: €611,000.00