COMP1039 – PGP - Java
Lab 2

Part 1

Declare two classes A and B in the same file, what should be the name of this file? A or B?

```
class A {
      int x;
}

class B{
      int y;
}
```

1) What will happen if we compile this file?
2) If we add a 'public' access modifier to the class B, then what will happen?

If the name of the file is A.java, what will happen if the main method is declared in class B?

```
class A {
      int x;
}

class B{
      public static void main(String[] args){
            System.out.println("B");
      }
}
```

Part 2

2.1

Use the statement `x = Math.random()` to calculate what percentage of iterations produces a value greater than 0.5. Display this value for 10, 100 and 1000 iterations.

Hint: you could use (int) to translate a double into integer.

2.2

Write a recursive method to calculate the factorial of a given number. Such that the main body looks like:

```
public static void main(String[] args)
{
      System.out.println("The factorial of 8 is: " + factorial(8));
}
```

2.3

Create a DieDemo class that creates 2 Die objects, rolls each dice and records the total score 1000 times.

Display the number of times each possible value was rolled

2.4

Write a recursive method countdown() that takes an integer n as its parameter. It prints the integers from n down to 0, one per line, and then its prints “Blast off!”.

Once finished, try using iteration to do the same task and find out the time efficiency differences between these two.

Hint: You could use *System.currentTimeMillis()* to return a long number which represent the current time in milliseconds.

2.5

Create a USMoney class with two integer instance variables: dollar and cents. Add a constructor with two parameters for initializing a USMoney object. The constructor should check that the cents value is between 0 and 99. If not, it will transfer some of the cents to the dollars variable to make it between 0 and 99. Add a plus method to the class that takes a USMoney object as its parameter. It creates and returns a new USMoney object representing the sum of the object whose plus() method is being invoked and the parameter. It does not modify the values of the two existing objects. It also ensures that the value of the cents instance variable of the new object is between 0 and 99.

2.6

A person wants to determine the most expensive computer keyboard and USB drive that can be purchased with a given budget. Given price lists for keyboards and USB drives and a budget, find the price to buy them. If it is not possible to buy both items, return -1.

For example, given

Budget = 60;

Keyboards = [40, 50, 60];

USB = [5, 8, 12];

The output will be 58.