Assignment 3

Where appropriate, for each question you must write a **Main class** with a **main method** that shows your answer code running **on some sensible example input**.

Submit the input and the output of your program along with your code (all the classes that you used including your **Main** class).

Question 1

Consider the following code:

```
int count = 0;
while(count < 100)
{
    //    Point A
    System.out.println("Java");
    count++;
    //    Point B
}
//    Point C
```

Is **count < 100** always true, always false, or sometimes true or sometimes false at Points **A**, **B** and **C** in the code?

Question 2

Write a program that prints the sum of the odd numbers between 0 and 50.

Question 3

Write a program that reads from the keyboard a value, **N**, and prints the sum of the odd numbers between 0 and **N**.

Question 4

Write a program which reads (from the keyboard) numbers (doubles) until a zero is input and computes the maximum and minimum of all the read numbers (**excluding the terminating zero**).

Note: you must allow for negative as well as positive numbers.

Hint: look at **java.lang.Double.MAX_VALUE** and **java.lang.Double.MIN_VALUE**.

Question 5

Write a program that reads from the keyboard:

- A double, **P**, representing the principal of the investment (i.e. the initial amount of the investment).
- An integer, **N**, representing the term of an investment (i.e. the number of years for the investment).
- A double, **R**, representing the rate of return of the investment per year as a percentage (e.g: an input of 25.5 means you earn 25.5% interest per year).

For each year of the investment your program must then output the value of the investment at the beginning of the year, the interest earned that year, and the value of the investment at the end of the year.

Question 6

Write a Java program that uses **for** loops to print out the products **I * J**, for **I** between 1 and 5, and **J** between 1 and 5.

Question 7

Write a program that finds the smallest positive integer, **N**, such that $N^2 > 12000$.
Do NOT use the Math.sqrt function!

Question 8 (harder!)

You can approximate π using the following series

$$\pi = 4(1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + \ldots + 1/(2i\text{-}1) - 1/(2i+1))$$

Write a program that displays the π value for i = 10000, 20000, …, 100000.