EXERCISE 1

Q 1.A (3 pts)

Suppose we have four variables: i = 1, j = 2, k = 3, and m = 2. Write the output of every statement of the following:

```java
System.out.println((i >= 1) && (j < 4));
System.out.println((m < 99) && (k < m));
System.out.println(!(k > m));
```

**Answer:**
true
false
false

Q 1.B (2 pts)

What is wrong with the following java code?

```java
int z = 1;
int sum = 0;
while (0 >= z >= 5) { should be: (z >= 0 && z <= 5)
    sum += z;
    z++;
}
```
EXERCISE 2 (4 pts)

Write the output of the following program.

```java
public class Mystery {
    public static void main(String[] args) {
        int y = 0;
        int x = 1;
        int total = 0;
        while (x <= 5) {
            y = x * x;
            if (x % 2 == 1) {
                System.out.println("Square: "+ y);
            }
            total = total + y;
            x++;
        }
        System.out.println("Total: " + total);
    }
}
```

**Answer:**

```
Square: 1
Square: 9
Square: 25
Total: 55
```
EXERCISE 3 (6 pts)

<table>
<thead>
<tr>
<th>Employee</th>
<th>TestEmployee</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ name: string</td>
<td>+ main(args: string[])</td>
</tr>
<tr>
<td>+ fulltime: boolean</td>
<td>uses</td>
</tr>
<tr>
<td>+ nbHours: integer</td>
<td></td>
</tr>
<tr>
<td>+ compensation: double</td>
<td></td>
</tr>
</tbody>
</table>

1. Write in java the class Employee. Note that nbHours means the number of hours the employee has worked.

2. Write in Java the class TestEmployee and its method main, which performs the following:
   - Creates an object of type Employee.
   - Reads from the keyboard the employee’s name, number of worked hours, and whether he is a fulltime worker or not.
   - Calculates the employee’s compensation according to the tables below. (compensation = base compensation + additional compensation.)
   - Writes the employee’s compensation on the screen.

<table>
<thead>
<tr>
<th></th>
<th>Fulltime</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base compensation</td>
<td>nbHours * 15 + 1200</td>
<td>nbHours * 12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Nb hours</th>
<th>Additional compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulltime</td>
<td>&gt;= 50</td>
<td>1000</td>
</tr>
<tr>
<td>Part-time</td>
<td>&gt;= 80</td>
<td>800</td>
</tr>
</tbody>
</table>

Answer:

```java
public class Employee {
    public String name;
    public boolean fulltime;
    public int nbHours;
    public double compensation;
}
```
import java.util.Scanner;

public class TestEmployee {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        Employee emp = new Employee();
        emp.name = input.next();
        emp.fulltime = input.nextBoolean();
        emp.nbHours = input.nextInt();
        if (emp.fulltime) {
            emp.compensation = emp.nbHours * 15 + 1200;
            if (emp.nbHours >= 50) {
                emp.compensation += 1000;
            }
        } else {
            emp.compensation = emp.nbHours * 12;
            if (emp.nbHours >= 80) {
                emp.compensation += 800;
            }
        }
        System.out.println("Compensation: "+ emp.compensation);
    }
}