King Abdulaziz University
Faculty of Engineering
Electrical and Computer Engineering
EE-202-Object-Oriented Computer Programming
Lab-7

Q-1 Complete the following program to determine the raise and new salary for an employee by adding **if … else statements** to compute the raise. The input to the program includes the current annual salary for the employee and a number indicating the performance rating (1=excellent, 2=good, and 3=poor). An employee with a rating of 1 will receive a 6% raise, an employee with a rating of 2 will receive a 4% raise, and one with a rating of 3 will receive a 1.5% raise.

```
import java.util.Scanner;

public class Salary {
        public static void main(String[] args) {
                double currentSalary; // current annual salary
                double rating; // performance rating
                double raise; // dollar amount of the raise
                Scanner scan = new Scanner(System.in);

                // Get the current salary and performance rating
                System.out.print("Enter the current salary: ");
                currentSalary = scan.nextDouble();
                System.out.print("Enter the performance rating: ");
                rating = scan.nextDouble();
        // Compute the raise -- Use if ... else ...

                // Print the results
                System.out.println("Amount of your raise: $" + raise);
                System.out.println("Your new salary: $" + (currentSalary + raise));
        }

}
```

Sample Output:

```
Enter the current salary: 40000
Enter the performance rating: 1
Amount of your raise: $2400.0
Your new salary: $42400.0
```

Answer:

```
"C:\Program Files\Java\jdk-15.0.2\bin\java.exe
Enter the current salary: 40000
Enter the performance rating: 1
Amount of your raise: $2400.0
Your new salary: $42400.0

Process finished with exit code 0
```

PowerOf2.java

```java
package lab7;
import java.util.Scanner;

public class PowerOf2 {
    public static void main(String[] args) {
        int numPowersOf2;
        int nextPowerOf2 = 1;
        int exponent = 0;

        Scanner scan = new Scanner(System.in);
        System.out.println("How many powers of 2 would you like printed?");
        numPowersOf2 = scan.nextInt();
        System.out.printf("Here are the first %d powers of 2:%n",numPowersOf2);

        while (numPowersOf2 > exponent) {
            System.out.print("2^"+ exponent+ " = ");
            System.out.println(nextPowerOf2);
            nextPowerOf2 *= 2;
            exponent++;
        }
    }
```

Q-2 The program in **LoveJava.java** prints "I love Java!!" 10 times.

```
public class LoveJava {

	public static void main(String[] args) {
		int LIMIT = 10;
		int count = 1;

		while (count <= LIMIT)
		{
			System.out.println("I love Java!!");
			count++;
		}
	}

}
```

Copy it to your directory and compile and run it to see how it works. Then modify it as follows:

1. Instead of using constant LIMIT, ask the user how many times the message should be printed.
2. Number each line in the output, and add a message at the end of the loop that says how many times the message was printed. So if the user enters 3, your program should print this:

```
Enter the number of times the message should be printed: 3
1 I love Java!!
2 I love Java!!
3 I love Java!!

Message was printed 3 times.
```

3. If the message is printed N times, compute and print the sum of the numbers from 1 to N. So for the example above, the last line would now read:

```
The sum of the numbers from 1 to 3 is 6.
```

Sample Output:

```
Enter the number of times the message should be printed: 4
1 I love Java!!
2 I love Java!!
3 I love Java!!
4 I love Java!!
Message was printed 4 times.
The sum of the numbers from 1 to 4 is 10.
```

Answer:

Salary.java × LoveJava.java ×

```java
package lab7;
import java.util.Scanner;

public class LoveJava {
    public static void main(String[] args) {
        int LIMIT;
        int count = 1;
        int sum = 0;
        Scanner inp = new Scanner(System.in);
        System.out.print("Enter the number of times the message should be printed: ");
        LIMIT = inp.nextInt();

        while (count <= LIMIT) {
            System.out.println(count + " I love Java!! ");
            sum += count;
            count++;
        }
        System.out.printf("Message was printed %d times.%n",LIMIT);
        System.out.printf("The sum of the numbers from 1 to %d is %d.",LIMIT,sum);
    }
}
```

```
Enter the number of times the message should be printed:4
1 I love Java!!
2 I love Java!!
3 I love Java!!
4 I love Java!!
Message was printed 4 times.
The sum of the numbers from 1 to 4 is 10.
```

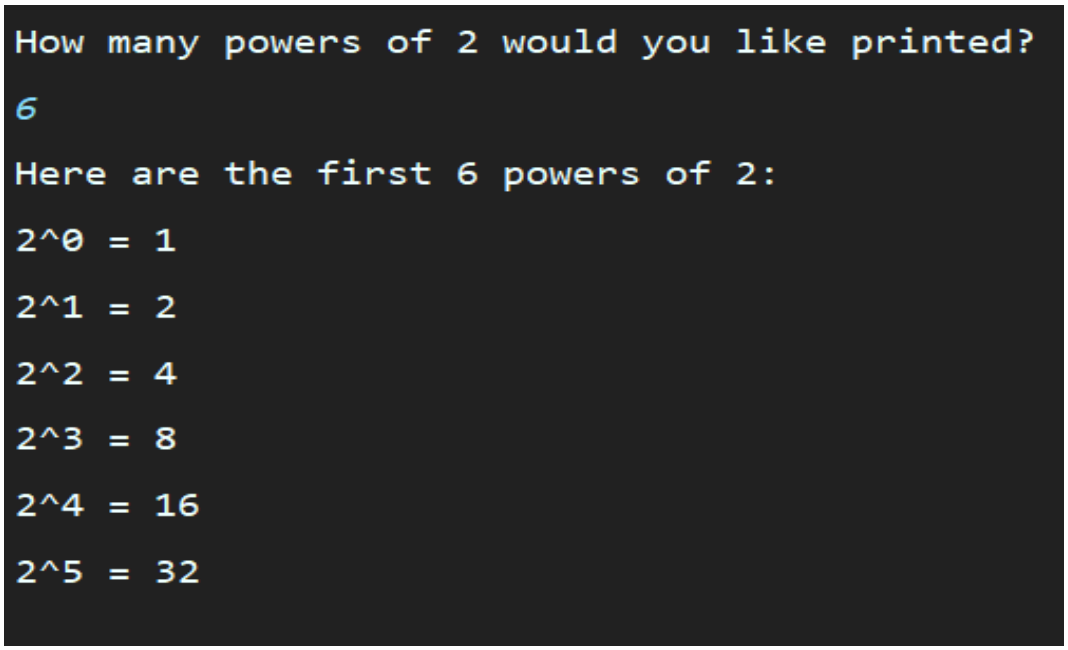
Q-3 File **PowersOf2.java** contains a skeleton of a program to read in an integer from the user and print out that many powers of 2, starting with 2^0=1

```
import java.util.Scanner;

public class PowersOf2 {
	public static void main(String[] args) {

		int numPowersOf2; // How many powers of 2 to compute
		int nextPowerOf2 = 1; // Current power of 2
		int exponent; // Exponent for current power of 2 -- this
		// also serves as a counter for the loop

		Scanner scan = new Scanner(System.in);

		System.out.println("How many powers of 2 would you like printed?");
		numPowersOf2 = scan.nextInt();

		// print a message to indicate how many powers of 2 will be printed
		// initialize exponent -- the first thing printed is 2 to the what?

		while () {
			// print out current power of 2
			// find next power of 2 -- how do you get this from the last one?
			// increment exponent
		}
	}
}
```

Sample Output:

```
How many powers of 2 would you like printed?
6
Here are the first 6 powers of 2:
2^0 = 1
2^1 = 2
2^2 = 4
2^3 = 8
2^4 = 16
2^5 = 32
```

Answer:



PowerOf2.java

```java
package lab7;
import java.util.Scanner;

public class PowerOf2 {
    public static void main(String[] args) {
        int numPowersOf2;
        int nextPowerOf2 = 1;
        int exponent = 0;

        Scanner scan = new Scanner(System.in);
        System.out.println("How many powers of 2 would you like printed?");
        numPowersOf2 = scan.nextInt();
        System.out.printf("Here are the first %d powers of 2:%n",numPowersOf2);

        while (numPowersOf2 > exponent) {
            System.out.print("2^"+ exponent+ " = ");
            System.out.println(nextPowerOf2);
            nextPowerOf2 *= 2;
            exponent++;
        }
    }
```

Q-4 Write a program to display the n terms of odd natural number and their sum.

Sample Output:

```
Input number of terms is: 5

The odd numbers are :
1
3
5
7
9
The Sum of odd Natural Number up to 5 terms is: 25
```

Answer: