Tutorial 2 (Loganathan Bhavaneetharan – 20201212)

1. Write a program to read in a temperature value, and if the temperature is above a certain value display 'Hot', otherwise display 'Cold'.

```
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args) {
		Scanner input = new Scanner(System.in);
		System.out.print("Enter temperature => ");
		int temp = input.nextInt();
		String value = (temp > 50) ? "Hot" : "Cold";
		System.out.println(value);
	}
}
```

```
Enter temperature => 55
Hot

Enter temperature => 40
Cold
```

2. Which is right?

```
if ((age < 17 || > 150)) { //don't drive! }
-> Wrong syntax.

if ((age < 17 ) || (age > 150)) { //don't drive! }
-> correct.

if ((age < 17 ) && (age > 150)) { //don't drive! }
-> the condition will never be true.
```

3. A school has following rules for grading system:
   a. Below 25 - F
   b. 25 to 45 - E
   c. 45 to 50 - D
   d. 50 to 60 - C
   e. 60 to 80 - B
   f. Above 80 - A
   Ask user to enter marks and print the corresponding grade.

```
import java.util.Scanner;
public class Tutorial{
        public static void main(String[] args) {
                Scanner input = new Scanner(System.in);
                System.out.print("Enter marks => ");
                int marks = input.nextInt();
                if(marks < 25) {
                        System.out.println("F");
                } else if(marks < 45) {
                        System.out.println("E");
                } else if(marks < 50) {
                        System.out.println("D");
                } else if(marks < 60) {
                        System.out.println("C");
                } else if(marks < 80) {
                        System.out.println("B");
                } else {
                        System.out.println("A");
                }
        }
}
```

```
Enter marks => 95
A
Enter marks => 68
B
Enter marks => 55
C
Enter marks => 25
E
Enter marks => 20
F
```

4. if
   x = 2
   y = 5
   z = 0
   then find values of the following expressions:
   a. x == 2 ----------→ true
   b. x != 5 ----------→ true
   c. x != 5 && y >= 5 ----------→ true
   d. z != 0 || x == 2 ----------→ true
   e. !(y < 10) ----------→ false

5. Write a program to check whether a entered character is lowercase (a to z) or uppercase (A to Z).

```
import java.util.Scanner;
public class Tutorial{
        public static void main(String[] args) {
                Scanner input = new Scanner(System.in);
                System.out.print("Enter Character => ");
                char letter = input.next().charAt(0);
                boolean isUpper = Character.isUpperCase(letter);
                String value = (isUpper) ? "UPPERCASE" : "LOWERCASE";
                System.out.println(value);
        }
}
```

```
Enter Character => a
LOWERCASE
Enter Character => B
UPPERCASE
```

6. Rewrite in Java the following statement without using the NOT (!) operator:
   item = !((i<10) || (v>=50))
   item = ((i >= **10**) && (v < **50**))

7. Two programs are equivalent if given the same input they produce the same output. Which of the following programs are equivalent? Why?

```
// Program A
import java.util.Scanner;
class TestPositive {
 public static void main(String [] args) {
 Scanner S = new Scanner(System.in);
 System.out.print("Enter a value: ");
 int x = S.nextInt();
 if (x > 0) {
      System.out.println("The value is positive:");
 }
 else {
      if (x < 0) {
           System.out.println("The value is negative:");
      }
      else {
           System.out.println("The value is zero:");
      }
 }
      System.out.println("Good Bye!");
 }
}
```

```
// Program B
import java.util.Scanner;
class TestPositive {
 public static void main(String [] args) {
 Scanner S = new Scanner(System.in);
 System.out.print("Enter a value: ");
 int x = S.nextInt();
 if (x > 0) {
      System.out.println("The value is positive:");
 }
 if (x < 0) {
      System.out.println("The value is negative:");
 }
 else {
      System.out.println("The value is zero:");
 }
 System.out.println("Good Bye!");
 }
}
```

```
// Program C
import java.util.Scanner;
class TestPositive {
 public static void main(String [] args) {
 Scanner S = new Scanner(System.in);
 System.out.print("Enter a value: ");
 int x = S.nextInt();
 if (x > 0) {
      System.out.println("The value is positive:");
 }
 if (x < 0) {
      System.out.println("The value is negative:");
 }
 if (x ==0) {
      System.out.println("The value is zero:");
 }
 System.out.println("Good Bye!");
 }
}
```

Program A , Program B

"Same outputs for inputs (-1,0,1)"

```
------------1
Enter a value: -1
The value is negative:
Good Bye!
------------2
Enter a value: -1
The value is negative:
Good Bye!
------------3
Enter a value: -1
The value is negative:
Good Bye!


------------1
Enter a value: 0
The value is zero:
Good Bye!
------------2
Enter a value: 0
The value is zero:
Good Bye!
------------3
Enter a value: 0
The value is zero:
Good Bye!


------------1
Enter a value: 1
The value is positive:
Good Bye!
------------2
Enter a value: 1
The value is positive:
The value is zero:
Good Bye!
------------3
Enter a value: 1
The value is positive:
Good Bye!
```

8. Guess the output. Explain the flow of the program.

```
//program 1
public static void main(String [] args)
    {
        int x= 0;
        int y= 0;
        for (int i = 0; i < 5; i++)
        {
            if (( ++x > 2 ) && (++y > 2))
            {
                x++;
            }
        }
        System.out.println(x + " " + y);
    }
```

Output => 6 3

```
6 3
```

```
//program 2
public static void main(String [] args)
    {
        int x= 0;
        int y= 0;
        for (int i = 0; i < 5; i++)
        {
            if (( ++x > 2 ) || (++y > 2))
            {
                x++;
            }
        }
      System.out.println("x= "+x+" y="+y);
      }
```

Output => x=8 y=2

```
x=8 y=2
```

9. Predict the output

```
int i = 1;
 i += ++i + i++ + ++i;
int j = 1;
 j += ++j + j++ + ++j;
 int k = 1;
 k += k++ + k++ + ++k;
 int m = 1;

 System.out.println("i = " + i);          --------→  i = 9
 System.out.println("j = " + j);          --------→  j = 9
 System.out.println("k = " + k);          --------→  k = 8
```

10. Use switch-case construct to calculate number of days in a year when you give month as the input
    You are only allowed to call the switch only once for the whole calculation

```java
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args) {
		Scanner input = new Scanner(System.in);
		int month = input.nextInt();
		switch (month) {
			case 1:
				System.out.println("Jan 31");
				break;
			case 2:
				System.out.println("Feb 29/28");
				break;
			case 3:
				System.out.println("Mar 31");
				break;
			case 4:
				System.out.println("Apr 30");
				break;
			case 5:
				System.out.println("May 31");
				break;
			case 6:
				System.out.println("June 30");
				break;
			case 7:
				System.out.println("July 31");
				break;
			case 8:
				System.out.println("Aug 31");
				break;
			case 9:
				System.out.println("Sep 30");
				break;
			case 10:
				System.out.println("Oct 31");
				break;
			case 11:
				System.out.println("Nov 30");
				break;
			case 12:
				System.out.println("Dec 31");
				break;
			default:
				System.out.println("Invalid Input");
				break;
		}
	}
}
```