Object Oriented Design and Programming

Workshop2

Go through the questions below and answer the questions:

1. Taking length and breadth of a rectangle from user and check if it is square or not.

->Source code:

```java
import java.util.Scanner;

public class Workshop2 {
    Run | Debug
    public static void main(String[] args) {

        //1 Taking length and breadth of a rectangle from user and check if it is square or not.
        Scanner in = new Scanner(System.in);
        System.out.println(x:"To check whether your rectangle is square or not ");
        System.out.println(x:"Enter length: ");
        int length = in.nextInt() ;
        System.out.println(x:"Enter breadth: ");
        int breadth = in.nextInt() ;

        if (length==breadth){
            System.out.println(x:"Your rectangle is a square.");
        }
        else{
            System.out.println(x:"Your rectangle is not a square.");
        }
        in.close();

    }
}
```

Output:

```
To check whether your rectangle is square or not
Enter length:
4
Enter breadth:
4
Your rectangle is a square.
```

2. A college has following rules for grading system:

a. 40 to 50 - C

b. 50 to 60 - C+

c. 60 to 70 - B

d. 70 to 80 - B+

e. 80 to 90 - A

f. Above 90 - A+

Ask user to enter marks and print the corresponding grade using if-else-if statement.

->Source code:

```
public class Workshop2 {
    Run | Debug
    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);
        System.out.println(x:"Enter your final score for evaluation: ");
        double finalScore = in.nextDouble() ;

        if (finalScore>90 && finalScore<=100){
            System.out.println(x:" A+");
        } else if(finalScore>80 && finalScore<=90){
            System.out.println(x:" A ");
        } else if(finalScore>70 && finalScore<=80){
            System.out.println(x:" B+ ");
        } else if(finalScore>60 && finalScore<=70){
            System.out.println(x:" B ");
        }
         else if(finalScore>50 && finalScore<=60){
            System.out.println(x:" C+ ");
        }
         else if(finalScore>40 && finalScore<=50){
            System.out.println(x:"C");
        } else if(finalScore>=0 && finalScore<=40){
            System.out.println(x:"You have failed!");
        }else{
            System.out.println(x:"Invalid input!!");
        }
        in.close();
    }
}
```

Output->

```
<oads/Year2/sem III/OOPs/Workshop/" && javac Wo
Enter your final score for evaluation:
45.55
C
sambriddhi@Sankalpas-MacBook-Pro Workshop %
```

3. Determine oldest and youngest among the people taking the using input.

->Source code:

```java
public class Workshop2 {
    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);
        System.out.println("Enter your age for evaluation: ");
        System.out.println("Enter first age: ");
        int age1 = in.nextInt() ;
        System.out.println("Enter second age: ");
        int age2 = in.nextInt() ;
        System.out.println("Enter third age: ");
        int age3 = in.nextInt() ;

        if (age1>age2 & age1>age3 ){
            System.out.println("The oldest is the first.");
        }
        else if (age2>age3 & age2>age1 ){
            System.out.println("The oldest is the second.");
        }
        else{
            System.out.println("The oldest is the third.");
        }

        if (age1<age2 & age1<age3 ){
            System.out.println("The youngest is the first.");
        }else if (age2<age3 & age2<age1 ){
            System.out.println("The youngest is the second.");
        }else{
            System.out.println("The youngest is the third.");
        }

        in.close();
    }
}
```

Output->

```
Enter your age for evaluation:
Enter first age:
13
Enter second age:
15
Enter third age:
14
The oldest is the second.
The youngest is the first.
```

4. If x = 2 y = 5 z = 0 then find values of the following expressions:

a. x == 2

b. x != 5

c. x != 5 && y >= 5

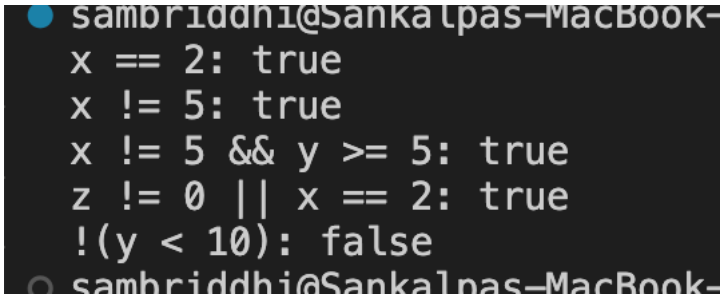
d. z != 0 || x == 2

e. !(y < 10)

->Source code:

```java
public class Workshop2 {

    public static void main(String[] args) {
        int x = 2, y = 5, z = 0;
        //a
        boolean a = (x == 2);
        //b
        boolean b = (x != 5);
        //c
        boolean c = (x != 5 && y >= 5);
        //d
        boolean d = (z != 0 || x == 2);
        //e
        boolean e = (!(y < 10));

        System.err.println("x == 2: " + a);
        System.err.println("x != 5: " + b);
        System.err.println("x != 5 && y >= 5: " + c);
        System.err.println("z != 0 || x == 2: " + d);
        System.err.println("!(y < 10): " + e);

    }
}

```

Output ->


sambriddhi@Sankalpas-MacBook-
x == 2: true
x != 5: true
x != 5 && y >= 5: true
z != 0 || x == 2: true
!(y < 10): false
sambriddhi@Sankalpas-MacBook-

5. Ask student if he/she has medical cause or not ('y or 'n'). if (‘y’) print you are not allowed to sit in the exam and if(‘n’’) print you can sit in the exam.

->Source code:

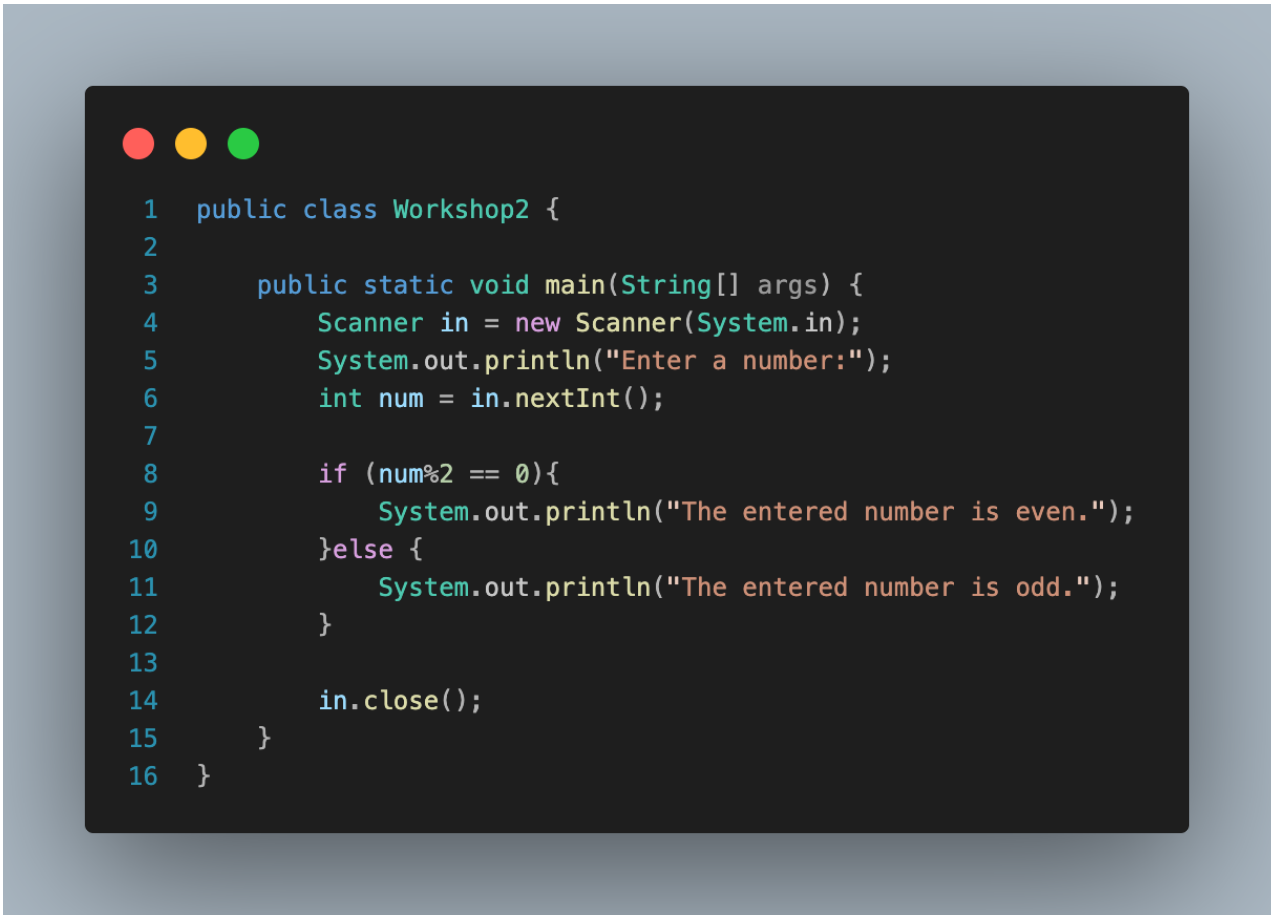
```java
public class Workshop2 {

    public static void main(String[] args) {
        // 5
        Scanner in = new Scanner(System.in);
        System.out.println("Do you have a medical condition? (y/n) ");
        char medicalCause = in.next().charAt(0);

        switch(Character.toLowerCase(medicalCause)){
            case 'y':
            System.out.println("You are not allowed to sit in the exam.");
            break;
            case 'n':
            System.out.println("You are allowed to sit in the exam.");
            break;
            default:
            System.out.println("Invalid input!!");
        }
        in.close();
    }
}
```

Output->

```
Do you have a medical condition? (y/n)
N
You are allowed to sit in the exam.
```

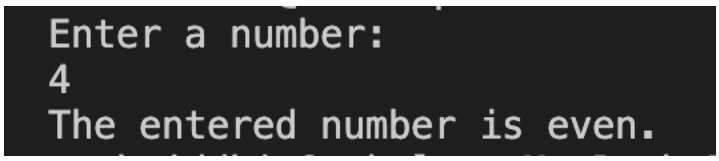
6. Write a program to check the odd and even numbers using user input.

->Source code:



```java
public class Workshop2 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter a number:");
        int num = in.nextInt();

        if (num%2 == 0){
            System.out.println("The entered number is even.");
        }else {
            System.out.println("The entered number is odd.");
        }

        in.close();
    }
}
```

Output->



```
Enter a number:
4
The entered number is even.
```

7. Write a program to print the value of x ,if and only if the value of x is x>5 and less x<15 taking user input.

->Source code:

```java
public class Workshop2 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter a number:");
        int x = in.nextInt();

        if (x>5 & x<15){
            System.out.println("The value of x is: " + x + ".");
        }else {
            System.out.println("The value of x did not satisy the condition. ");
        }
        in.close();
    }
}
```

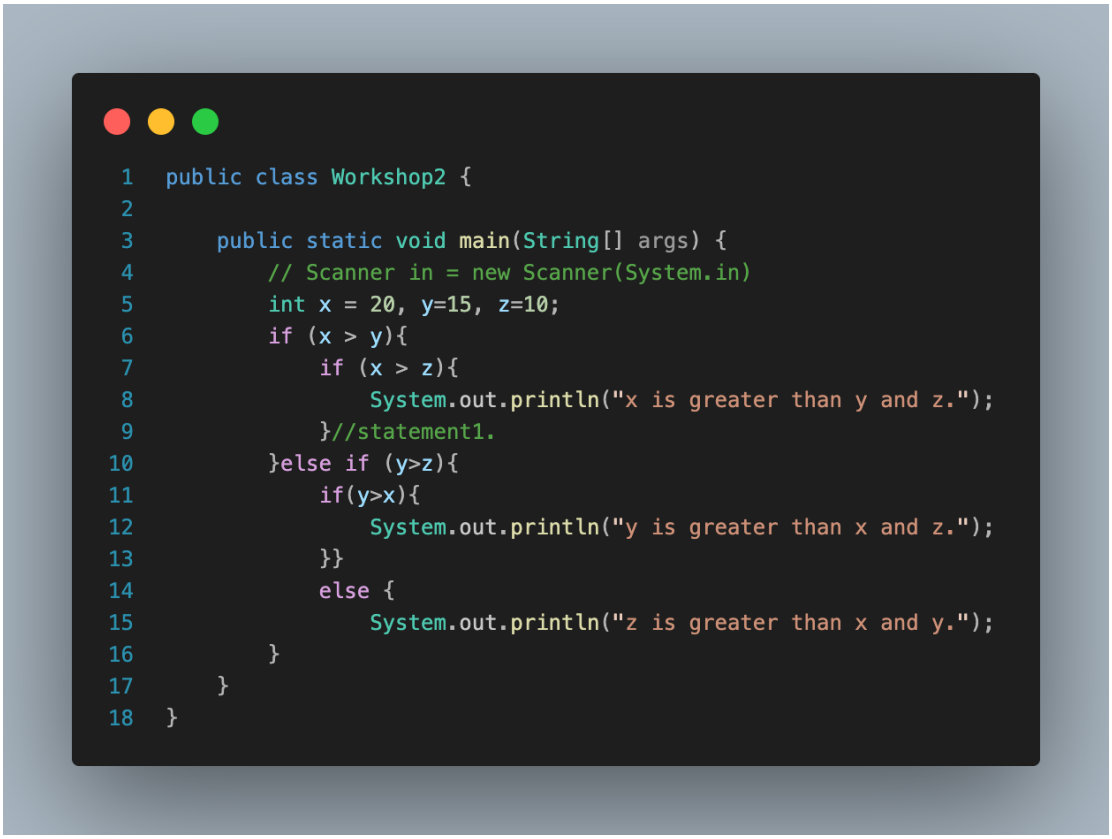
Output->

```
Enter a number:
14
The value of x is: 14.
sambriddhi@Sankalpas-MacBook-Pro Workshop % cd "/
Enter a number:
1
The value of x did not satisy the condition.
sambriddhi@Sankalpas-MacBook-Pro Workshop %
```

8. Assuming the value: x=20, y=15, z=10.Complete the code below and observe the result.

```
if (x > y)

{

    if (y > z){ System.out.println("x is greater than y and z");}     // statement1.

}

else

 System.out.println("x is less than or equal to y"); // statement2.
```

> Source code:



```java
public class Workshop2 {

    public static void main(String[] args) {
        // Scanner in = new Scanner(System.in)
        int x = 20, y=15, z=10;
        if (x > y){
            if (x > z){
                System.out.println("x is greater than y and z.");
            }//statement1.
        }else if (y>z){
            if(y>x){
                System.out.println("y is greater than x and z.");
            }}
            else {
                System.out.println("z is greater than x and y.");
        }
    }
}
```

Output ->

```
sambriddhi@Sankalpas-MacBook-Pro
x is greater than y and z.
sambriddhi@Sankalpas-MacBook-Pro
```

9. A college has following rules for grading system:

a. grade -A+ print ("Excellent !")
b. grade -A print ("Outstanding !")
c. grade -B+ print ("Good !")
d. grade -B print ("Can do better !")
e. grade -C+ print ("Just Passed !")
f. grade -C print ("You Failed !")
print ("Invalid grade!") for default case

Ask user to enter grade and print the corresponding grade using switch statement

->Source code:

```java
public class Workshop2 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter you grade(A+,A,B+,B,C+,C)");
        String grade = in.nextLine();

        switch (grade){
            case "A+":
            System.out.println("Excellent!");
            break;
            case "A":
            System.out.println("Outstanding!");
            break;
            case "B+":
            System.out.println("Good!");
            break;
            case "B":
            System.out.println("Can do better!");
            break;
            case "C+":
            System.out.println("Just passes!");
            break;
            case "C":
            System.out.println("You Failed!");
            break;
            default:
            System.out.println("Invalid grade!");
        }
        in.close();

    }
}
```

Output:

```
sambriddhi@Sankalpas-MacBook-Pro Work
Enter you grade(A+,A,B+,B,C+,C)
A
Outstanding!
sambriddhi@Sankalpas-MacBook-Pro Work
```

10. Run the code below and observe how the break statement works.

```
class Student {
    public static void main(String[] args) {
        int roll_no = 12;
        switch (i) {
            case 1:
                System.out.println("Your roll number is 10");
                break;
            case 2:
                System.out.println("Your roll number is 12");
                break;
            default:
                System.out.println("Your roll number is greater than 12");
        }
    }
}
```

> Source code

```java
public class Workshop2 {

    Run | Debug
    public static void main(String[] args) {

        int roll_no = 12;
        Scanner in = new Scanner(System.in);
        System.out.println(x:"Enter 1/2:");
        int i = in.nextInt();

        switch (i) {
            case 1:
            System.out.println(x:"Your roll number is 10");
            break;
            case 2:
            System.out.println(x:"Your roll number is 12");
            break;
            default:
            System.out.println(x:"Your roll number is greater than 12");
            }
            in.close();

    }
}
```

Output->

```
Enter 1/2:
1
Your roll number is 10
sambriddhi@Sankalpas-MacBook-Pro Work
Enter 1/2:
2
Your roll number is 12
sambriddhi@Sankalpas-MacBook-Pro Work
Enter 1/2:
5
Your roll number is greater than 12
```

11. Write a program to take two string user input and perform the following string methods and observe the result

a) length()

b) compareTo()

c) charAt()

d) substring()

e) Equals

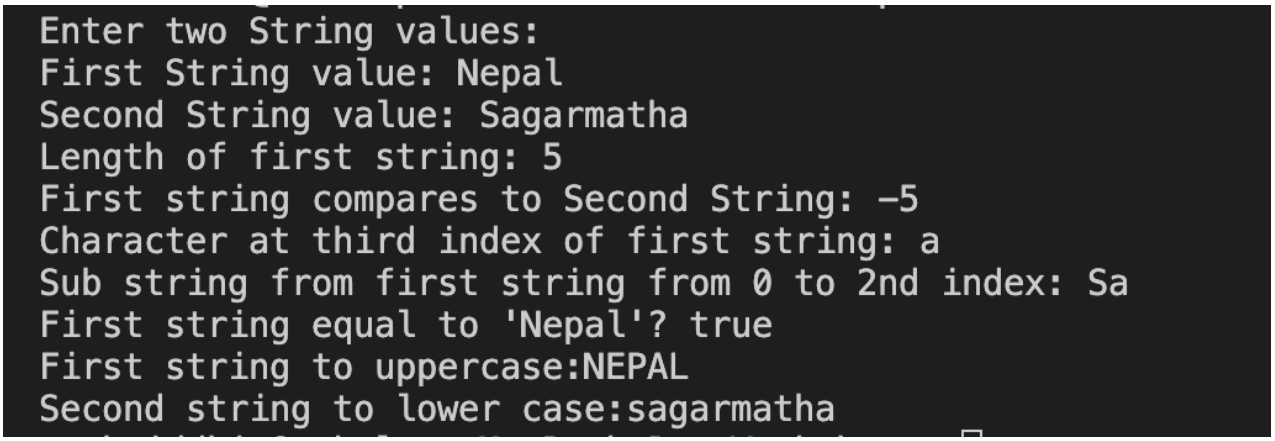
f) toUpperCase()

g) toLowerCase()

->Source code:

```java
public class Workshop2 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in) ;
        System.out.println("Enter two String values: ");
        System.out.print("First String value: ");
        String firstString = in.nextLine();
        System.out.print("Second String value: ");
        String secondString = in.nextLine();

        //a
        System.out.println("Length of first string: " + firstString.length());
        //b
        System.out.println("First string compares to Second String: " + firstString.compareTo(secondString));
        //c
        System.out.println("Character at third index of first string: " + firstString.charAt(3));
        //d
        System.out.println("Sub string from first string from 0 to 2nd index: " + secondString.substring(0,2));
        //e
        System.out.println("First string equal to 'Nepal'? " + firstString.equals("Nepal"));
        //f
        System.out.println("First string to uppercase:" + firstString.toUpperCase());
        //g
        System.out.println("Second string to lower case:" + secondString.toLowerCase());
        in.close();
    }
}
```

Output:


Enter two String values:
First String value: Nepal
Second String value: Sagarmatha
Length of first string: 5
First string compares to Second String: -5
Character at third index of first string: a
Sub string from first string from 0 to 2nd index: Sa
First string equal to 'Nepal'? true
First string to uppercase:NEPAL
Second string to lower case:sagarmatha