BITS PILANI, DUBAI CAMPUS
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI

FIRST SEMESTER 2021 – 2022
COURSE: F213 (Object Oriented Programming)
COMPONENT: Practical Sheet 2 **DATE:**14th-19thSeptember 2021

Q.1 Program to find the smallest of three numbers using ternary operator.

Solution:

```
import java.util.Scanner;
public class Smallest
{
public static void main(String[] args)
{
    int a, b, c, smallest;
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter the first number:");
    a = sc.nextInt();
    System.out.println("Enter the second number:");
    b = sc.nextInt();
    System.out.println("Enter the third number:");
    c = sc.nextInt();
    smallest = c < (a < b ? a : b) ? c : ((a < b) ? a : b);
    System.out.println("The smallest number is: "+smallest);
    }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/OOPS/Practical/Practical_1
$ java Smallest.java
Enter the first number: 34
Enter the second number: 17
Enter the third number: 65
The smallest number is: 17
```

Q.2. Write a program to calculate the area of geometric objects like square, triangle, circle, rectangle and cylinder using methods. Call the appropriate method by its name from main() method.

Solution:

```
import java.util.Scanner;
public class Area {


    static void square(){
        Scanner sc = new Scanner(System.in);
        System.out.println("Input the side: ");
        float side = sc.nextFloat();
        System.out.printf("Area is: %.2f", side*side);
    }

    static void triangle(){
        Scanner sc = new Scanner(System.in);
        System.out.println("Input the base: ");
        float base = sc.nextFloat();
        System.out.println("Input the height: ");
        float height = sc.nextFloat();
        System.out.printf("Area is: %.2f", 0.5 * base * height);
    }

    static void circle(){
        Scanner sc = new Scanner(System.in);
        System.out.println("Input the radius: ");
        float radius = sc.nextFloat();
        System.out.printf("Area is: %.2f", Math.PI * radius * radius);
    }

    static void rectangle(){
        Scanner sc = new Scanner(System.in);
        System.out.println("Input the length: ");
        float l = sc.nextFloat();
        System.out.println("Input the breadth: ");
        float b = sc.nextFloat();
        System.out.printf("Area is: %.2f", l * b);
    }

    static void cylinder(){
        Scanner sc = new Scanner(System.in);
        System.out.println("Input the radius: ");
```

```
        float r = sc.nextFloat();
        System.out.println("Input the height: ");
        float h = sc.nextFloat();
        System.out.printf("Area is: %.2f", (2 * Math.PI * r *h) + (2 * Math.PI *
r *r));
    }

    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        while(true){
            System.out.println("Please select the shape you want to find area of:
 ");
            System.out.println("1: Square");
            System.out.println("2: Triangle");
            System.out.println("3: Circle");
            System.out.println("4: Rectangle");
            System.out.println("5: Cylinder");
            System.out.println("Input Your Choice: ");
            int choice = sc.nextInt();
            if(choice == 1){
                square();
                break;
            }
            else if(choice == 2){
                triangle();
                break;
            }
            else if(choice == 3){
                circle();
                break;
            }
            else if(choice == 4){
                rectangle();
                break;
            }
            else if(choice == 5){
                cylinder();
                break;
            }
            else{
                System.out.println("Sorry! Invalid choice. Please choose again.")
;
```

```
            }
        }
    }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/Second_Year/OOPS/Practical/Practical_2
$ java Area
Please select the shape you want to find area of:
1: Square
2: Triangle
3: Circle
4: Rectangle
5: Cylinder
Input Your Choice:
5
Input the radius:
12
Input the height:
5
Area is: 1281.77
```

Q.3. Generate all the prime numbers between a specified range.

a. Read the lower and upper bound as input from the user

b. Read the lower and upper bound as command line arguments.

Solution:

(a)

```
import java.util.Scanner;
public class GenPrime {


    static boolean check(int n){
        if(n<2){
            return false;
        }
        else if (n == 2){
            return true;
        }
        else if (n % 2 == 0){
            return false;
        }
        for (int i =3; i<= Math.sqrt(n); i+=2){
            if (n % i == 0){
                return false;
            }
        }
        return true;
        }

    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        int a, b, i;


        System.out.println("Enter lower bound of the interval: ");
        a = sc.nextInt();


        System.out.println("Enter upper bound of the interval: ");
        b = sc.nextInt();
```

```
        System.out.println("Prime numbers between %d and %d are: ", a, b);


        for (i = a; i <= b; i++) {
            if(check(i)){
                System.out.print(i + " ");
            }
        }
    }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/Second_Year/OOPS/Practical/Practical_2
$ java GenPrime
Enter lower bound of the interval: 5

Enter upper bound of the interval: 27

Prime numbers between 5 and 27 are: 5 7 11 13 17 19 23
```

(b)

```
import java.util.*;
public class GenPrimecommand {


    static boolean check(int n){
        if(n<2){
            return false;
        }
        else if (n == 2){
            return true;
        }
        else if (n % 2 == 0){
            return false;
        }
        for (int i =3; i<= Math.sqrt(n); i+=2){
            if (n % i == 0){
                return false;
            }
        }
        return true;
        }

    public static void main(String[] args)
```

```
    {
        Scanner sc = new Scanner(System.in);
        int i;
        if(args.length > 0)
           {
                try{
                    int a = Integer.parseInt(args[0]);
                    int b = Integer.parseInt(args[1]);


                    System.out.printf("Prime numbers between %d and %d are: ", a,
 b);


                    for (i = a; i <= b; i++){
                        if(check(i)){
                            System.out.print(i + " ");
                        }
                    }
                }
               catch(NumberFormatException nfe)
                 {
                     System.out.println("Argument/s must be the integer value");
                 }
           }


    }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/Second_Year/OOPS/Practical/Practical_2
$ java GenPrimecommand.java 3 30
Prime numbers between 3 and 30 are: 3 5 7 11 13 17 19 23 29
```

Q.4. Write a program to develop an Arithmetic Calculator Application. Read the two operands and the operator from the user. Use a switch statement to check the operator type and perform the appropriate calculation.

Solution:

```
import java.util.Scanner;

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

    char operator;
    Double number1, number2, result;
    Scanner input = new Scanner(System.in);

    System.out.println("Enter first number: ");
    number1 = input.nextDouble();

    System.out.println("Enter second number: ");
    number2 = input.nextDouble();

    System.out.println("Choose an operator: +, -, *, or /: ");
    operator = input.next().charAt(0);

    switch (operator) {
      case '+':
        result = number1 + number2;
        System.out.println(number1 + " + " + number2 + " = " + result);
        break;


      case '-':
        result = number1 - number2;
        System.out.println(number1 + " - " + number2 + " = " + result);
        break;


      case '*':
        result = number1 * number2;
        System.out.println(number1 + " * " + number2 + " = " + result);
        break;


      case '/':
```

```
        result = number1 / number2;
        System.out.println(number1 + " / " + number2 + " = " + result);
        break;

      default:
        System.out.println("Invalid operator!");
        break;
    }

    input.close();
  }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/Second_Year/OOPS/Practical/Practical_2
$ java Calc
Enter first number:
5
Enter second number:
12
Choose an operator: +, -, *, or /:
+
5.0 + 12.0 = 17.0
```