**Name: Arzoo Ajmera RollNo.:02 Date: 20/10/22**

**OS Practical-5**

**Threads**

**Q1. Write a java program to create a simple thread to display a message as ‘welcome to KC College’.**

**Code**:

class ThreadDemo1 extends Thread{

    public void run(){

        System.out.println("Welcome to KC College");

    }

}

public class ThreadProgram1{

    public static void main(String[] args){

        ThreadDemo1 t1 = new ThreadDemo1();

        t1.start();

    }

}

**Output**:

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram1'

Welcome to KC College

**Q2. Write java thread programs for the following:**

1. **To add subtract multiply and divide two numbers.**

**Code:**

import java.util.\*;

class ThreadDemo2 extends Thread{

    public void run(int a, int b){

        System.out.println("Addition: " + (a+b));

        System.out.println("Subtraction: " + (a-b));

        System.out.println("Divide: " + (a/b));

        System.out.println("Multiply: " + (a\*b));

    }

}

class ThreadProgram2{

    public static void main(String[] args){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the first number: ");

        int a = sc.nextInt();

        System.out.println("Enter the second number: ");

        int b = sc.nextInt();

        ThreadDemo2 t1 = new ThreadDemo2();

        t1.run(a,b);

        t1.start();

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram2'

Enter the first number:

5

Enter the second number:

7

Addition: 12

Subtraction: -2

Divide: 0

Multiply: 35

1. **To find sum of non-negative integers**

**Code:**

import java.util.\*;

class ThreadDemo3 extends Thread{

    public void run(){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter how many numbers you want: ");

        int n = sc.nextInt();

        int arr[]= new int[n];

        for(int i=0;i<n;i++){

            System.out.print((i+1) + "enter value: ");

            int val = sc.nextInt();

            arr[i] = val;

        }

        int total = 0;

        for(int i:arr){

            if(i>0){

                total+=i;

            }

            else{

                continue;

            }

        }

        System.out.println("In total of non-negative numbers: "+total);

    }

    public static void main(String args[]){

        ThreadDemo3 t1= new ThreadDemo3();

        t1.start();

    }

}

**Output**:

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadDemo3'

Enter how many numbers you want:

5

1enter value: 2

2enter value: 2

3enter value: -9

4enter value: 2

5enter value: -1

In total of non-negative numbers: 6

1. **To find the table of factorials**

**Code:**

import java.util.\*;

class ThreadProgram4 extends Thread{

    public void run(int n){

        int fact = 1;

        for(int j=1;j<=n; j++){

            fact = fact\*j;

            System.out.println("Factorial of "+ j +" = "+ fact);

        }

    }

}

class ThreadDemo4{

    public static void main(String[] args){

        Scanner sc  = new Scanner(System.in);

        System.out.println("Enter a number: ");

        int n = sc.nextInt();

        ThreadProgram4 t1 = new ThreadProgram4();

        t1.start();

        t1.run(n);

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadDemo4'

Enter a number:

5

Factorial of 1 = 1

Factorial of 2 = 2

Factorial of 3 = 6

Factorial of 4 = 24

Factorial of 5 = 120

1. **To print the Fibonacci series**

**Code:**

import java.util.Scanner;

public class ThreadProgram5 extends Thread {

    public static void main(String[] args) {

        ThreadProgram5 t=new ThreadProgram5();

        t.start();

    }

    public void run(){

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the a number: ");

        int n=sc.nextInt();

        int f=0,s=1;

        System.out.println("Fibonacci Series : ");

        for (int i = 1; i <=n ; i++) {

            System.out.print(f+" , ");

            int r=f+s;

            f=s;

            s=r;

        }

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram5'

Enter the a number:

6

Fibonacci Series :

0 , 1 , 1 , 2 , 3 , 5 ,

1. **To find the factorial of a number**

**Code:**

import java.util.Scanner;

public class ThreadProgram6 extends Thread {

        public static void main(String[] args) {

            ThreadProgram6 t=new ThreadProgram6();

            t.start();

        }

        public void run(){

            Scanner sc=new Scanner(System.in);

            System.out.println("Enter the a number: ");

            int n=sc.nextInt();

            int r=1;

            for (int i = 1; i <=n ; i++) {

                r\*=i;//r=r\*i

            }

            System.out.println("Factorial of a "+n+" is : "+r);

        }

    }

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram6'

Enter the a number:

6

Factorial of a 6 is : 720

1. **To print prime number series**

**Code:**

import java.util.Scanner;

public class ThreadProgram7 extends Thread{

    public static void main(String[] args) {

        ThreadProgram7 t=new ThreadProgram7();

            t.start();

    }

public void run(){

    Scanner sc = new Scanner(System.in);

    System.out.println("Enter your number");

    int s= sc.nextInt();

    int p,i=1;

    for (i = 1; i<=s; i++) {

        p=0;

        for (int j = 2; j <= i/2; j++) {

            if(i%j==0){

                p=1;

                break;

            }

        }

        if(p==0 && i!=1 ){

            System.out.print(i+" ");

        }

    }

}

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram7'

Enter your number

10

2 3 5 7

1. **To print odd and even number series up to n**

**Code:**

import java.util.Scanner;;

public class ThreadProgram8 extends Thread{

    public static void main(String[] args) {

        ThreadProgram8 t=new ThreadProgram8();

            t.start();

    }

    public void run(){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter your number");

        int s= sc.nextInt();

        for (int i = 1; i<=s; i++) {

            if(i%2==0){

                System.out.println(i+": is even");

            }

            else{

                System.out.println(i+": is odd");

            }

        }

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram8'

Enter your number

10

1: is odd

2: is even

3: is odd

4: is even

5: is odd

6: is even

7: is odd

8: is even

9: is odd

10: is even

1. **To print table of squares and cubes up to n**

**Code:**

import java.util.Scanner;

public class ThreadProgram9 extends Thread{

    public static void main(String[] args) {

        ThreadProgram9 t=new ThreadProgram9();

            t.start();

    }

    public void run(){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter your number");

        int s= sc.nextInt();

        for (int i = 1; i<=s; i++) {

            int sq = i\*i;

            System.out.println("Square of number is "+sq);

            int c = i\*i\*i;

            System.out.println("Cube of number is "+c);

        }

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram9'

Enter your number

5

Square of number is 1

Cube of number is 1

Square of number is 4

Cube of number is 8

Square of number is 9

Cube of number is 27

Square of number is 16

Cube of number is 64

Square of number is 25

Cube of number is 125

1. **To print multiplication table of a positive number**

**Code:**

import java.util.Scanner;

public class ThreadProgram10 extends Thread{

    public static void main(String[] args) {

        ThreadProgram10 t=new ThreadProgram10();

            t.start();

    }

    public void run(){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter your number");

        int s= sc.nextInt();

        if(s>0){

            for (int i = 1; i<=10; i++) {

            int r = i\*s;

            System.out.println(s+"X"+i+"="+r);

            }

        }

        else{

            System.out.println("Please enter positive number only!!!!!!!");

        }

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram10'

Enter your number

6

6X1=6

6X2=12

6X3=18

6X4=24

6X5=30

6X6=36

6X7=42

6X8=48

6X9=54

6X10=60

1. **To print first n natural numbers and their sum**

**Code:**

import java.util.Scanner;

public class ThreadProgram11 extends Thread{

    public static void main(String[] args) {

        ThreadProgram11 t=new ThreadProgram11();

        t.start();

    }

    public void run(){

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter your number");

        int s= sc.nextInt();

        int e = 0;

        if(s>0){

        System.out.println("Natural numbers");

        for (int i = 1; i<=s; i++) {

            System.out.print(i+" ");

            e+=i;

        }

        System.out.println("\nSum of all natural numbers until "+ s +" is "+e);

    }

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram11'

Enter your number

5

Natural numbers

1 2 3 4 5

Sum of all natural numbers until 5 is 15

1. **To print table of factorials and their sums**

**Code:**

import java.util.Scanner;

public class ThreadProgram12 extends Thread{

    public static void main(String[] args) {

        ThreadProgram12 t=new ThreadProgram12();

        t.start();

    }

    public void run(){

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the a number: ");

        int n=sc.nextInt();

        int r=1,sr=0;

        for (int i = 1; i <=n ; i++) {

            r\*=i;//r=r\*i

            System.out.println("Factorial of "+i+ " is: "+r);

            sr+=r;

        }

        System.out.println();

        System.out.println("Sum of factorial: "+sr);

    }

}

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram12'

Enter the a number:

5

Factorial of 1 is: 1

Factorial of 2 is: 2

Factorial of 3 is: 6

Factorial of 4 is: 24

Factorial of 5 is: 120

Sum of factorial: 153

1. **To check whether the number is perfect or not**

**Code:**

import java.util.Scanner;

public class ThreadProgram13 extends Thread {

        public static void main(String[] args) {

            ThreadProgram13 t=new ThreadProgram13();

            t.start();

        }

        public void run(){

            Scanner sc=new Scanner(System.in);

            System.out.println("Enter the a number: ");

            int n=sc.nextInt();

            int i=1;

            long sum =0;

            while(i <=n/2){

                if(n%i == 0){

                    sum = sum+i;

                }

                i++;

            }

            if(sum==n){

                System.out.println(n +" is a perfect number.");

            }else{

                System.out.println(n +" is not a perfect number.");

            }

        }

    }

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram13'

Enter the a number:

4558

4558 is not a perfect number.

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram13'

Enter the a number:

28

28 is a perfect number.

1. **To check whether number is prime or not**

**Code:**

import java.util.Scanner;

public class ThreadProgram14 extends Thread {

        public static void main(String[] args) {

            ThreadProgram14 t=new ThreadProgram14();

            t.start();

        }

        public void run(){

            Scanner sc=new Scanner(System.in);

            System.out.println("Enter the a number: ");

            int n=sc.nextInt();

            int i=2;

            boolean flag = false;

            while(i<=n/2){

                if(n%i ==0){

                    flag = true;

                    break;

                }

                i++;

            }

            if(!flag){

                System.out.println(n +" is a prime number.");

            }else{

                System.out.println(n +" is not a prime number");

            }

        }

    }

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram14'

Enter the a number:

29

29 is a prime number.

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram14'

Enter the a number:

15

15 is not a prime number

1. **To check whether number is an Armstrong or not**

**Code:**

import java.util.Scanner;

public class ThreadProgram15 extends Thread {

        public static void main(String[] args) {

            ThreadProgram15 t=new ThreadProgram15();

            t.start();

        }

        public void run(){

            Scanner sc=new Scanner(System.in);

            System.out.println("Enter the number: ");

            int n=sc.nextInt();

            int temp = n;

            int p=0;

            while(n>0){

                int rem = n % 10;

                p = (p)+(rem \* rem \* rem);

                n = n/ 10;

            }

            if (temp==p){

                System.out.println("The number is armstong");

            }else{

                System.out.println("The number is not armstrong");

            }

        }

    }

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram15'

Enter the number:

153

The number is armstong

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram15'

Enter the number:

201

The number is not armstrong

1. **To find the GCD and LCM of two numbers.**

**Code:**

import java.util.Scanner;

public class ThreadProgram16 extends Thread {

        public static void main(String[] args) {

            ThreadProgram16 t=new ThreadProgram16();

            t.start();

        }

        public void run(){

            Scanner sc=new Scanner(System.in);

            System.out.println("Enter a number: ");

            int a=sc.nextInt();

            System.out.println("Enter another number: ");

            int b=sc.nextInt();

            int lcm;

            int gcd = 1;

            lcm = (a > b) ?  a : b;

            while(true){

                if(lcm % a == 0 && lcm % b == 0){

                    System.out.println("The LCM of " + a + " and " + b + " is " + lcm);

                    break;

                }

                ++lcm;

            }

            for(int i = 1; i<= a && i<=b;i++){

                if(a%i==0 && b%i == 0){

                    gcd = i;

                }

            }

            System.out.println("The GCD of " + a + " and " + b + " is " + gcd);

            }

        }

**Output:**

PS C:\xampp\htdocs\Arzoo\_java> c:; cd 'c:\xampp\htdocs\Arzoo\_java'; & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Arzoo\AppData\Roaming\Code\User\workspaceStorage\2bce296e82bd68761020a84a9430c3c8\redhat.java\jdt\_ws\Arzoo\_java\_84d1651d\bin' 'ThreadProgram16'

Enter a number:

12

Enter another number:

8

The LCM of 12 and 8 is 24

The GCD of 12 and 8 is 4