190905514 **MOHAMMAD TOFIK**

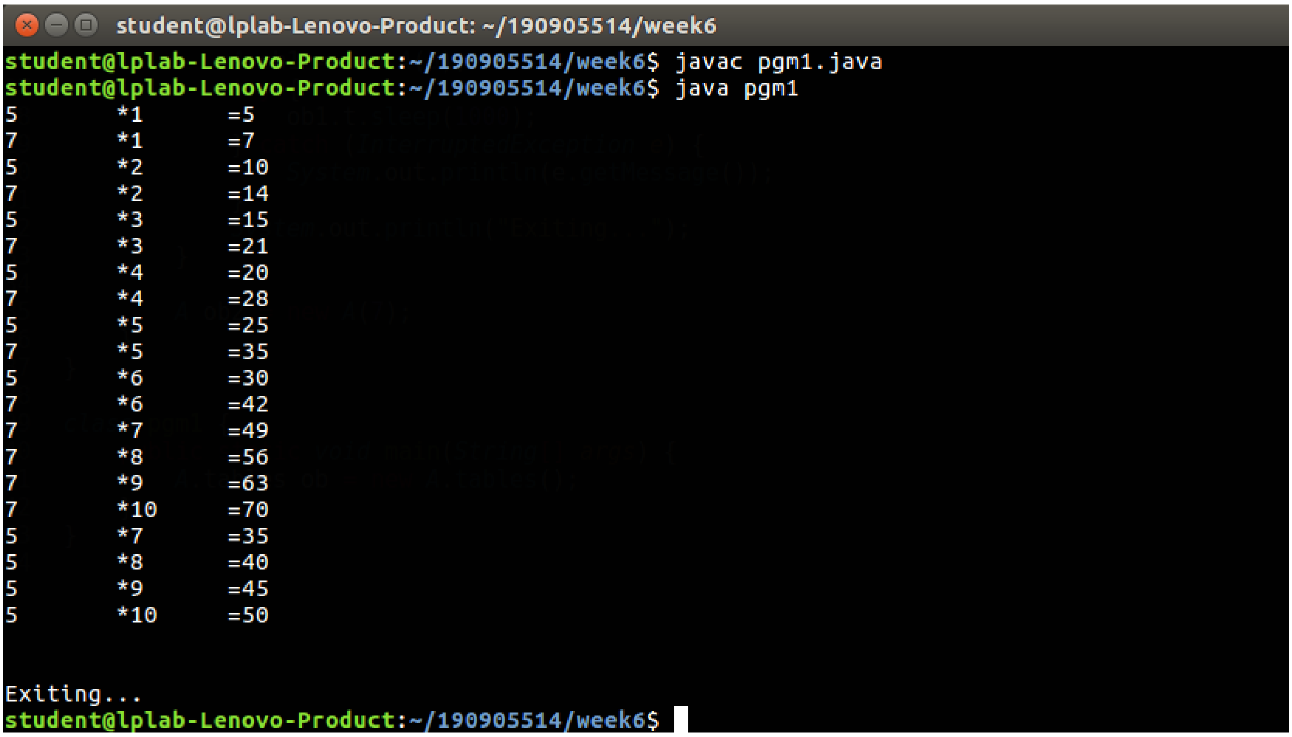
SESSION 4 LAB 8 :

1.Create a class by extending Thread Class to print a multiplication table of a number supplied as parameter. Create another class Tables which will instantiate two objects of the above class to print multiplication table of 5 and 7.

pgm1.java

```
class A implements Runnable {
    Thread t;
    int n;

    A(int a) {
        t = new Thread(this);
        n = a;
        t.start();

    }

    public void run() {
        try {
            for (int i = 1; i <= 10; i++) {
                System.out.println(n + "\t*" + i + "\t=" + (n * i));
            }
            t.sleep(500);
        } catch (InterruptedException e) {
            System.out.println(e.getMessage());
        }
        System.out.println();
    }

    static class tables {
        tables() {
            A ob1 = new A(5);
            try {
                ob1.t.sleep(1000);
            } catch (InterruptedException e) {
                System.out.println(e.getMessage());
            }
            System.out.println("Exiting...");
        }

        A ob2 = new A(7);
    }
}

class pgm1 {
    public static void main(String[] args) {
        A.tables ob = new A.tables();
    }
}
```

OUTPUT :



```
student@lplab-Lenovo-Product:~/190905514/week6$ javac pgm1.java
student@lplab-Lenovo-Product:~/190905514/week6$ java pgm1
5       *1      =5
7       *1      =7
5       *2      =10
7       *2      =14
5       *3      =15
7       *3      =21
5       *4      =20
7       *4      =28
5       *5      =25
7       *5      =35
5       *6      =30
7       *6      =42
7       *7      =49
7       *8      =56
7       *9      =63
7       *10     =70
5       *7      =35
5       *8      =40
5       *9      =45
5       *10     =50


Exiting...
student@lplab-Lenovo-Product:~/190905514/week6$ 
```

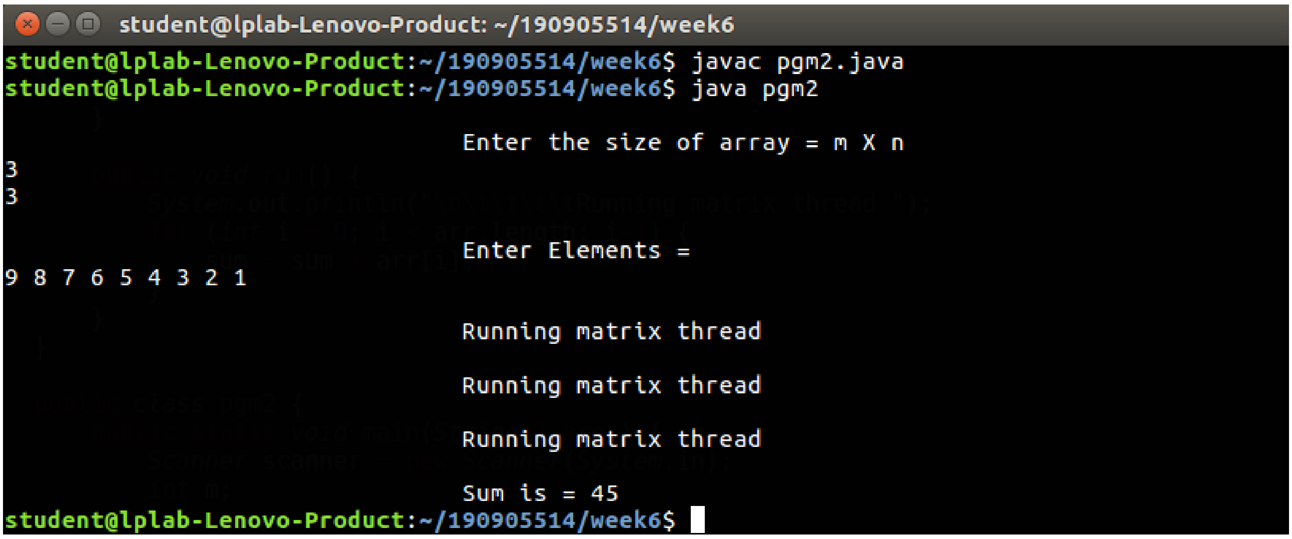
2.Write and execute a java program to create and initialize a matrix of integers. Create n threads(by implementing Runnable interface) where n is equal to the number of rows in the matrix. Each of these threads should compute a distinct row sum. The main thread computes the complete sum by looking into the partial sums given by the threads.

pgm2.java

```
import java.util.Scanner;

class matrixAdd implements Runnable {
   int arr[];
   int sum;
   Thread t;

   matrixAdd(int a[]) {
      arr = a;
      t = new Thread(this);
      t.start();
   }

   public void run() {
         System.out.println("\n\t\t\t\tRunning matrix thread ");
      for (int i = 0; i < arr.length; i++) {
         sum = sum + arr[i];
      }
   }
}

public class pgm2 {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      int m;
```

```
        int n;
        int mSum = 0;
        System.out.println("\n\t\t\t\tEnter the size of array = m X n ");
        m = scanner.nextInt();
        n = scanner.nextInt();
        int matrix[][] = new int[m][n];
        System.out.println("\n\t\t\t\tEnter Elements = ");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                matrix[i][j] = scanner.nextInt();
            }
        }
        matrixAdd mobj[] = new matrixAdd[matrix.length];
        for (int x = 0; x < matrix.length; x++)
            mobj[x] = new matrixAdd(matrix[x]);
            try {
                for (int i = 0; i < matrix.length; i++)
                    mobj[i].t.join();
            } catch (InterruptedException e) {
                System.out.println(e.getMessage());
            }
            for (int i = 0; i < matrix.length; i++) {
                mSum =mSum+ mobj[i].sum;
            }
            System.out.println("\n\t\t\t\tSum is = " + mSum);
    }
}
```

OUTPUT :



student@lplab-Lenovo-Product: ~/190905514/week6

```
student@lplab-Lenovo-Product:~/190905514/week6$ javac pgm2.java
student@lplab-Lenovo-Product:~/190905514/week6$ java pgm2

                                Enter the size of array = m X n
3
3

                                Enter Elements =
9 8 7 6 5 4 3 2 1

                                Running matrix thread

                                Running matrix thread

                                Running matrix thread

                                Sum is = 45
student@lplab-Lenovo-Product:~/190905514/week6$ 
```

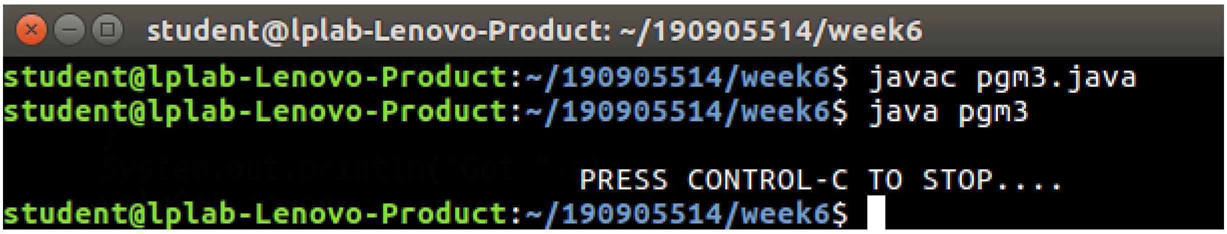
3.Write and execute a java program to implement a producer and consumer problem.

pgm3.java

```
class Q{
    int n;
    boolean valuSet=false;
    synchronized int get(){
        if(!valuSet){
            try{
                wait();
            }catch (InterruptedException e){
                System.out.println(e.getMessage());
```

```
         }
      }
      System.out.println("Got "+n);
      valuSet=false;
      notify();
      return n;
   }
   synchronized int Rest(int n){
      if(valuSet){
         try{
            wait();
         }catch (InterruptedException e){
            System.out.println(e.getMessage());
         }
      }
      System.out.println("Got "+n);
      valuSet=false;
      notify();
      return n ;
   }
   synchronized void put(int n){
      if(!valuSet){
         try{
            wait();
         }catch (InterruptedException e){
            System.out.println(e.getMessage());
         }
      }
      this.n=n;
      valuSet=true;
      System.out.println("put : "+n);
      notify();
   }
}

abstract class Producer implements Runnable{
   Q q;
   Producer(Q q){
      this.q=q;
      new Thread(this,"producer");
   }
   public void mainly(){
      int i=0;
      while (true){
         q.put(i++);
      }
   }
}

 abstract class Consumer implements Runnable{
   Q q;
   Thread thra;
   Consumer(Q q){
      this.q=q;
      thra=new Thread(this,"comsumer");
   }
   public void main(){
      while (true){
         q.get();
      }
   }
}
public class pgm3 {
  public static void main(String[] args) {
    Q q=new Q();
    new Producer(q) {
      @Override
      public void run() {

      }
    };
    new Consumer(q) {
      @Override
      public void run() {
          int i=0;
          while (true){
            q.put(i++);
        }
      }
    };
    System.out.println("\n\t\t\t\tPRESS CONTROL-C TO STOP....");
  }
}
```

OUTPUT :



```
student@lplab-Lenovo-Product:~/190905514/week6$ javac pgm3.java
student@lplab-Lenovo-Product:~/190905514/week6$ java pgm3

                                PRESS CONTROL-C TO STOP....
student@lplab-Lenovo-Product:~/190905514/week6$ 
```