# Java Assignment 2 and 3

By

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18BCA037 – T.Y – BCA (SEM5)

## Q1. Write a program to show output like:

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*** ***

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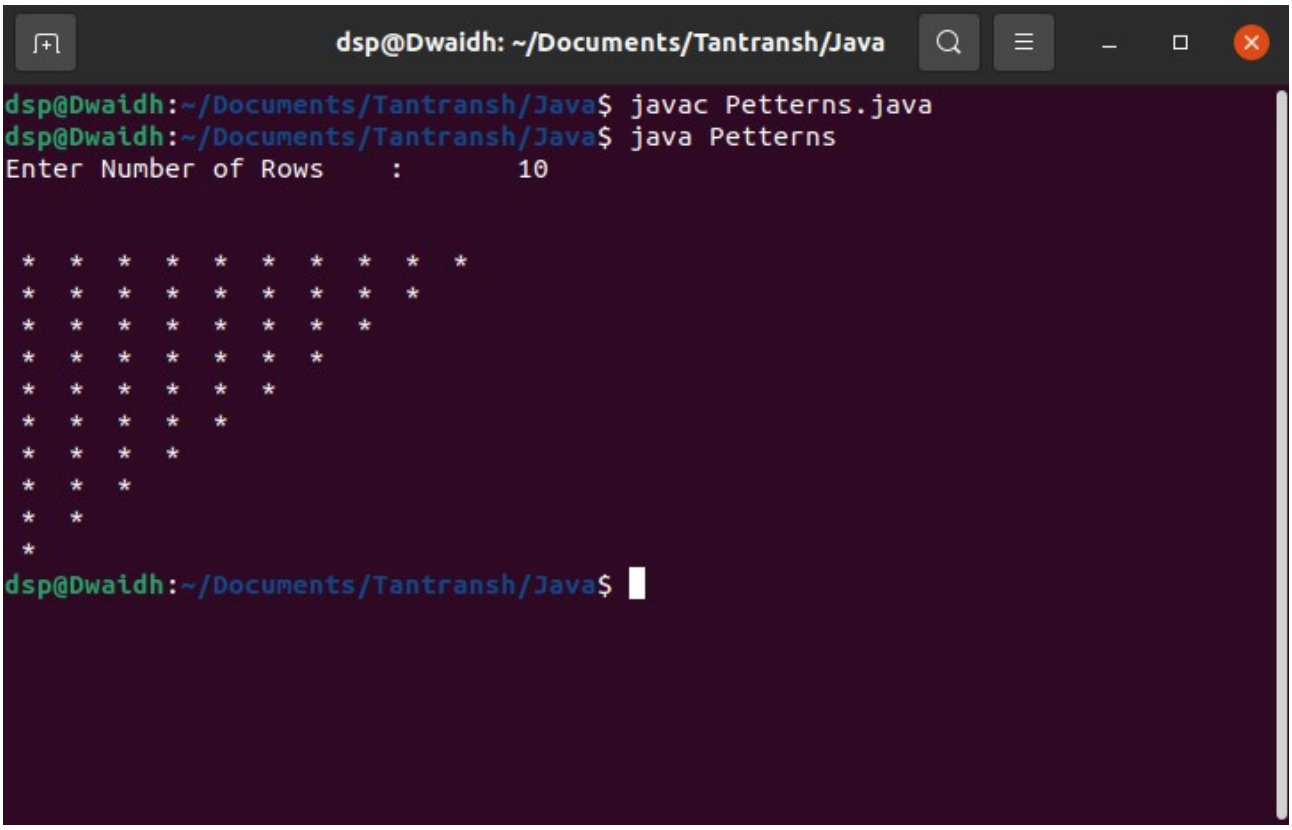
*Filename : Petterns.java*

*code:*

```
import java.util.Scanner;
class Petterns
{
   public static void main(String[] args)
   {
      Scanner sc= new Scanner(System.in);
      System.out.print("Enter Number of Rows\t:\t");
      int limit = sc.nextInt();
      System.out.print("\n\n");
      for (int i = limit; i >= 1; i--)
      {
         for (int j = 1; j <= i; j++)
         {
            System.out.print(" * ");
         }
         System.out.println();
      }
   }
}
```

Output:




## Q2. Write an application that creates a two dimension array with int values. The first, second and third elements should be arrays with one, two and three numbers respectively. Display the length of each dimension.

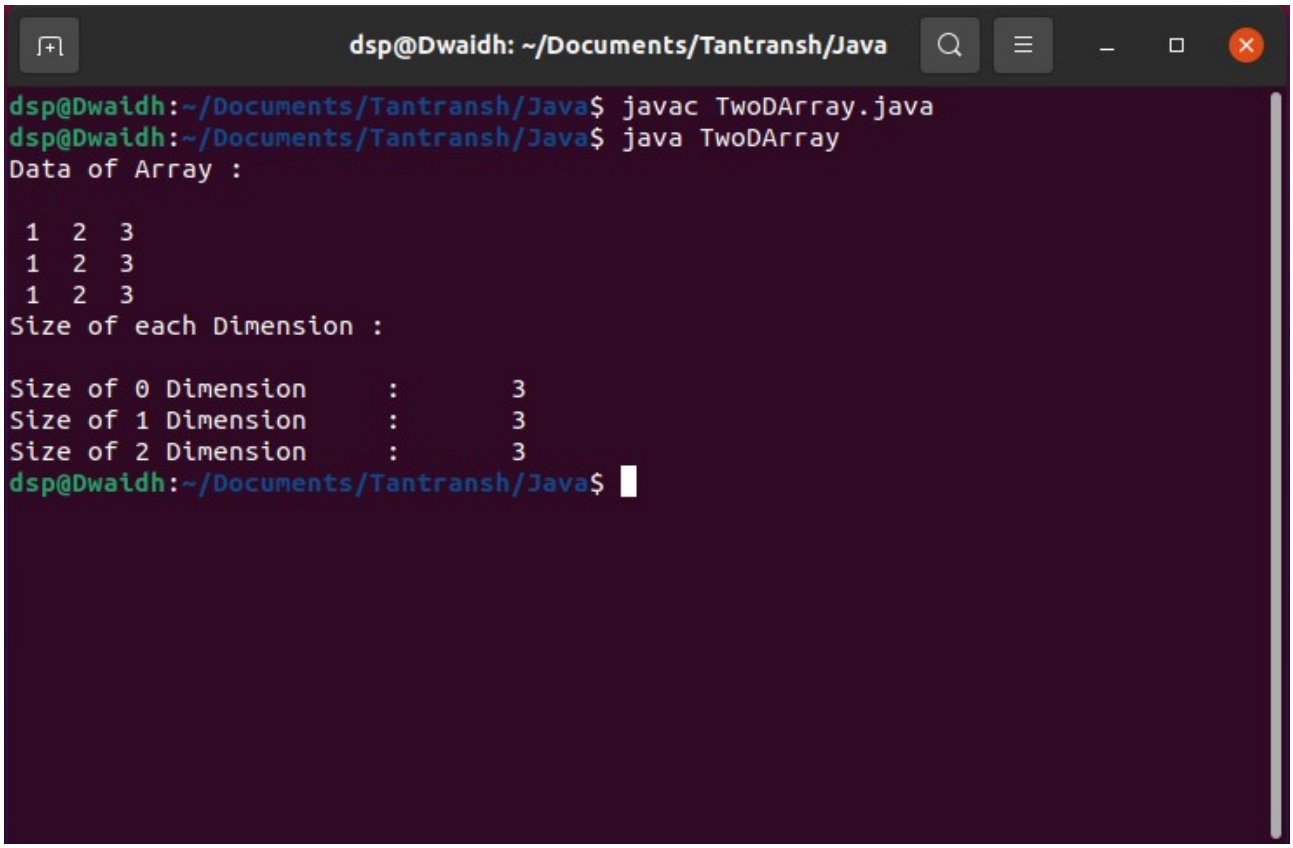
*Filename : TwoDArray.java*

code:

```
class TwoDArray
{
   public static void main(String[] args)
   {
      int Array[][] = new int[3][3];

      for (int i=0; i < Array.length; i++)
      {
         Array[i][0] = 1;
         Array[i][1] = 2;
         Array[i][2] = 3;
```

```
        }
        System.out.println("Data of Array : \n ");
        for (int i=0; i < Array.length; i++)
        {
           for (int j=0; j < Array.length; j++)
           {
              System.out.print(" " + Array[i][j] + " ");
           }
           System.out.println();
        }

        System.out.println("Size of each Dimension : \n ");
        for (int i=0; i < Array.length; i++)
        {
           System.out.println("Size of " + i + " Dimension\t:\t" + Array[i].length);
        }
     }
  }
```

## Output:



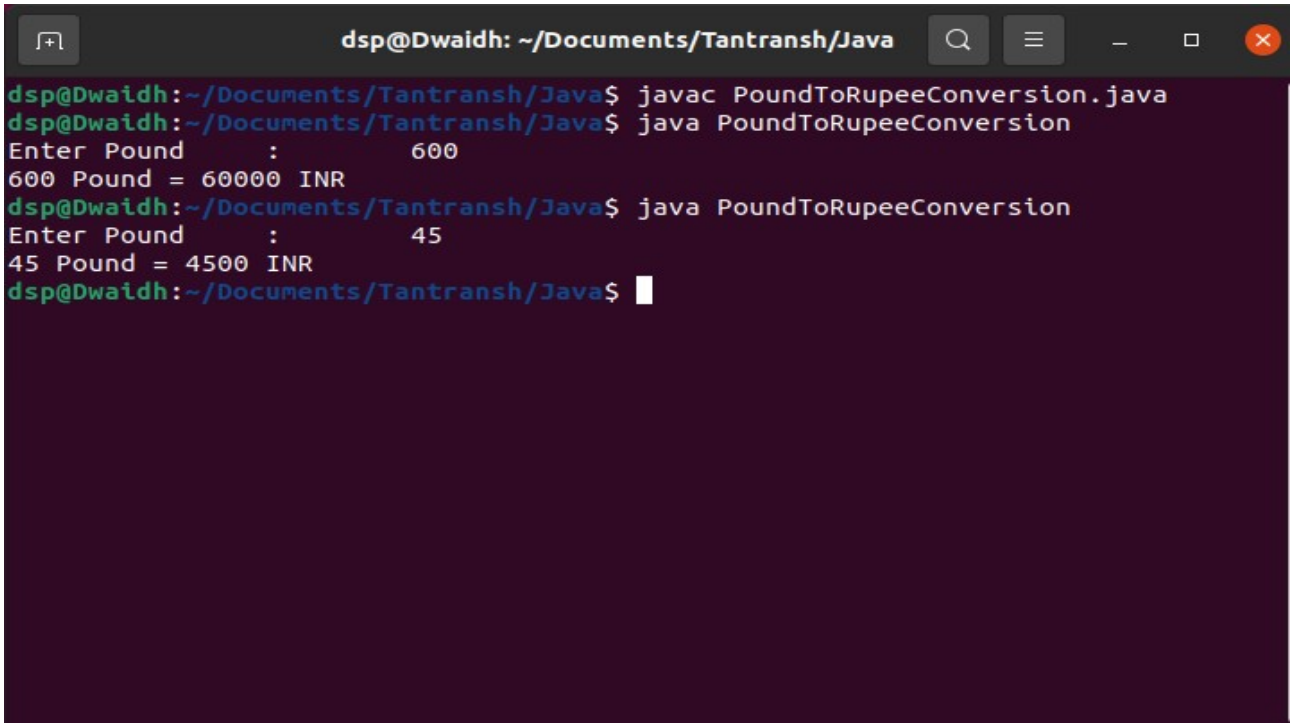
## Q3. Write a java program for converting Pound into Rupees. ( using scanner class also and take 1 Pound = 100 Rupees.)

*Filename : PoundToRupeeConversion.java*

*Code :*

```
import java.util.Scanner;

public class PoundToRupeeConversion
{
   public static void main(String[] args)
   {
      int RupeesAmountOfPound = 100;
      Scanner sc = new Scanner(System.in);

      System.out.print("Enter Pound \t:\t ");
      int Pound = sc.nextInt();

      int RupeeAmount = Pound * RupeesAmountOfPound;

      System.out.println(Pound + " Pound = " + RupeeAmount + " INR");
   }
}
```

*Output:*



## Q4. Create a class named 'Member' having the following members:

- Data members
  1. Name
  2. Salary
  3. Address
  4. Phone Number
  5. Age

**It also has a method named 'printSalary' which prints the salary of the members. Two classes 'Employee' and 'Manager' inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'specialization' and 'department' respectively. Now, assign name, age, phone number, address and salary to an employee and a manager by making an object of both of these classes and print the same .**

*Filename : Company.java*

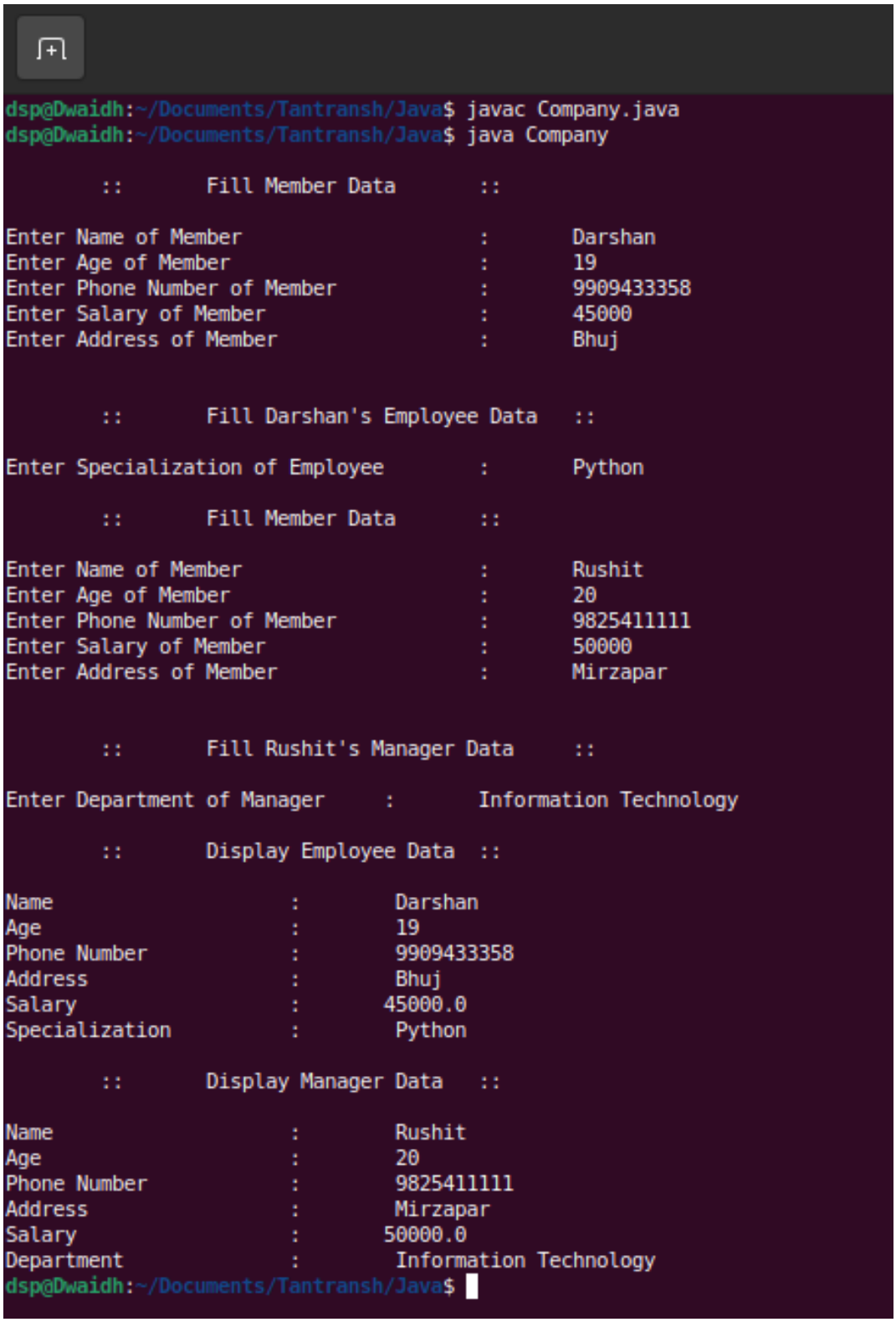
*Code :*

```
import java.util.Scanner;
class Member
{
   String Name, PhoneNumber, Address;
   int Age;
   double Salary;

   Member()
   {
      System.out.println("\n\t::\t Fill Member Data \t::\n");
      Scanner sc = new Scanner(System.in);

      System.out.print("Enter Name of Member\t\t\t:\t");
      this.Name = sc.nextLine();

      System.out.print("Enter Age of Member\t\t\t:\t");
      this.Age = Integer.parseInt(sc.nextLine());

      System.out.print("Enter Phone Number of Member\t\t:\t");
      this.PhoneNumber = sc.nextLine();

      System.out.print("Enter Salary of Member\t\t\t:\t");
```

```
        this.Salary = Double.parseDouble(sc.nextLine());

        System.out.print("Enter Address of Member\t\t\t:\t");
        this.Address = sc.nextLine();

    }

    void printSalary()
    {
        System.out.println("Salary \t\t\t:\t" + this.Salary);
    }
}

class Employee extends Member
{
    String Specialization;

    Employee()
    {
        super();
        System.out.println("\n\n\t::\t Fill " + this.Name + "'s Employee Data \t::\n");
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter Specialization of Employee\t:\t");
        this.Specialization = sc.nextLine();
    }
}
class Manager extends Member
{
    String Department;

    Manager()
    {
        super();
        System.out.println("\n\n\t::\t Fill " + this.Name + "'s Manager Data \t::\n");
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter Department of Manager\t:\t");
        this.Department = sc.nextLine();
    }
}
class Company
{
```

```
    public static void main(String[] args)
    {
       Employee Karmchari = new Employee();
       Manager Vyavsthapak = new Manager();

       System.out.println("\n\t::\t Display Employee Data\t::\n");

       System.out.println("Name \t\t\t:\t " + Karmchari.Name);
       System.out.println("Age \t\t\t:\t " + Karmchari.Age);
       System.out.println("Phone Number \t\t:\t " + Karmchari.PhoneNumber);
       System.out.println("Address \t\t:\t " + Karmchari.Address);
       Karmchari.printSalary();
       System.out.println("Specialization \t\t:\t " + Karmchari.Specialization);


       System.out.println("\n\t::\t Display Manager Data\t::\n");

       System.out.println("Name \t\t\t:\t " + Vyavsthapak.Name);
       System.out.println("Age \t\t\t:\t " + Vyavsthapak.Age);
       System.out.println("Phone Number \t\t:\t " + Vyavsthapak.PhoneNumber);
       System.out.println("Address \t\t:\t " + Vyavsthapak.Address);
       Vyavsthapak.printSalary();
       System.out.println("Department \t\t:\t " + Vyavsthapak.Department);
    }
}
```

*Output :*



```
dsp@Dwaidh:~/Documents/Tantransh/Java$ javac Company.java
dsp@Dwaidh:~/Documents/Tantransh/Java$ java Company

        ::      Fill Member Data       ::

Enter Name of Member                    :       Darshan
Enter Age of Member                     :       19
Enter Phone Number of Member            :       9909433358
Enter Salary of Member                  :       45000
Enter Address of Member                 :       Bhuj


        ::      Fill Darshan's Employee Data   ::

Enter Specialization of Employee        :       Python

        ::      Fill Member Data       ::

Enter Name of Member                    :       Rushit
Enter Age of Member                     :       20
Enter Phone Number of Member            :       9825411111
Enter Salary of Member                  :       50000
Enter Address of Member                 :       Mirzapar


        ::      Fill Rushit's Manager Data     ::

Enter Department of Manager     :       Information Technology

        ::      Display Employee Data  ::

Name                    :       Darshan
Age                     :       19
Phone Number            :       9909433358
Address                 :       Bhuj
Salary                  :       45000.0
Specialization          :       Python

        ::      Display Manager Data   ::

Name                    :       Rushit
Age                     :       20
Phone Number            :       9825411111
Address                 :       Mirzapar
Salary                  :       50000.0
Department              :       Information Technology
dsp@Dwaidh:~/Documents/Tantransh/Java$
```

## Q5. Write a java program which shows importing of classes from other user define packages.

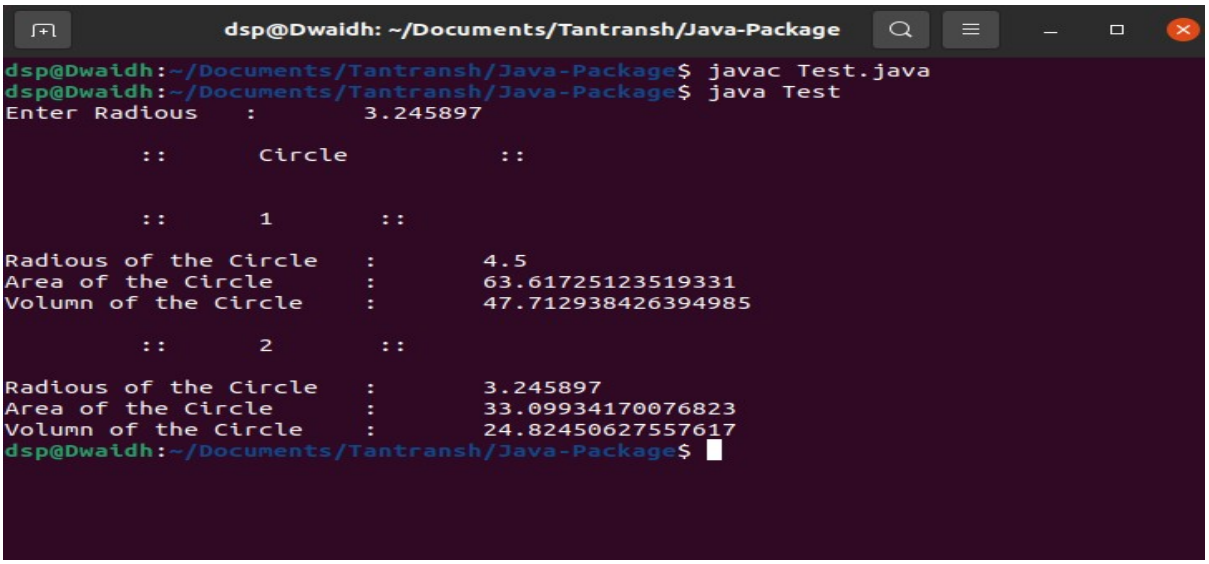
*UD Package Stored in 'shape' Directory Contains Circle.java, Square.java, Rectangle.java and Triangle.java files.*

*Filename : Test.java*

*Code :*

```
import shape.*;

class Test
{
	public static void main(String[] s)
	{
		Circle round[] = {new Circle(4.5f), new Circle()};

		System.out.println("\n \t :: \t Circle \t ::\n");

		for (int i= 0; i < round.length; i++)
		{
			System.out.println("\n \t :: \t "+ (int)(i+1) +" \t ::\n");
			System.out.println("Radious of the Circle \t:\t" + round[i].Radious);
			System.out.println("Area of the Circle \t:\t" + round[i].Area());
			System.out.println("Volumn of the Circle \t:\t" + round[i].Volumn());
		}
	}
}
```

*Output :*



## Q6. Write a java program to generate user defined exception using “throw” and “throws” keyword.

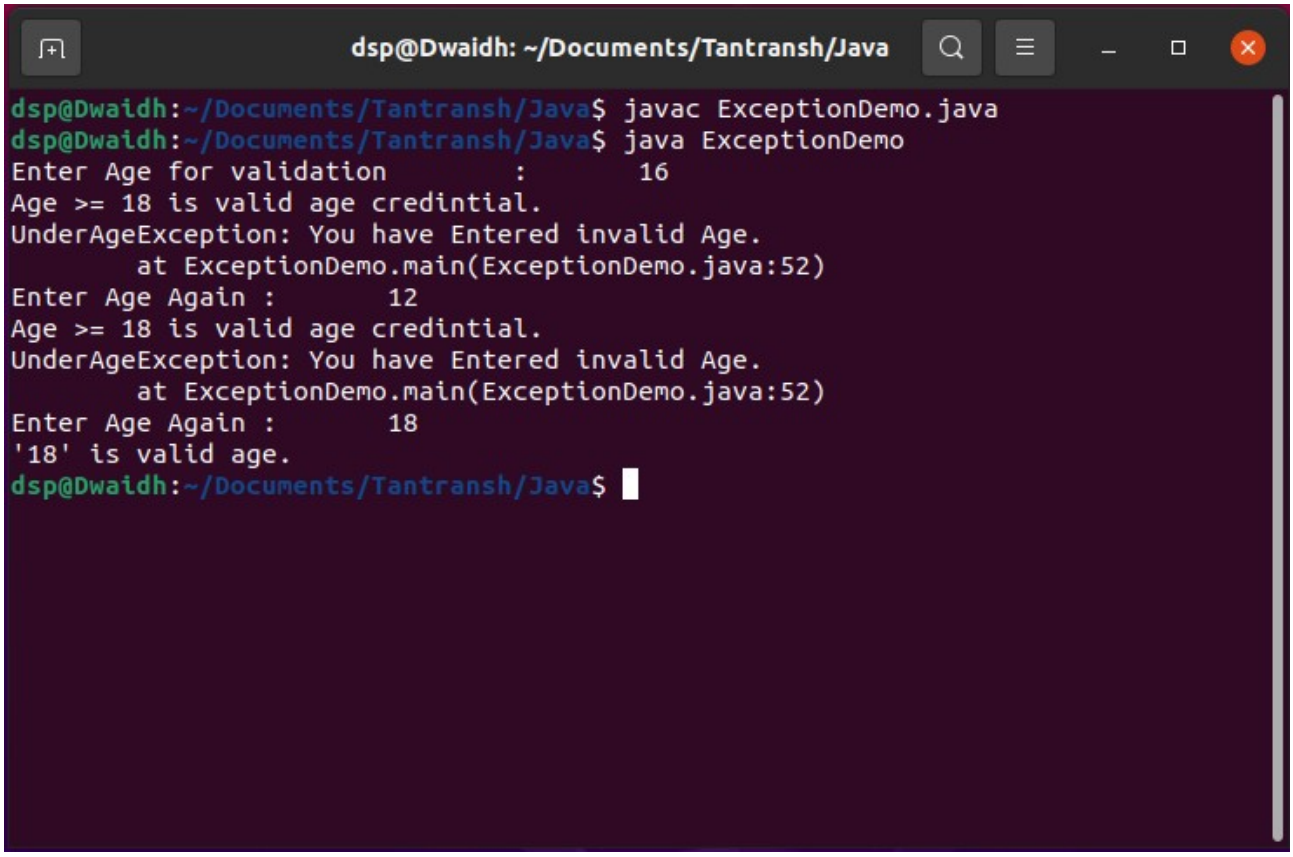
*Filename : ExceptionDemo.java*

*Code :*

```
import java.util.Scanner;

/* For Checked Exception (Compile time Exception) use below class defination. */

class UnderAgeException extends Exception
{
   UnderAgeException()
   {
      super("Age is restricted.");
   }
   UnderAgeException(String Message)
   {
      super(Message);
   }
}

/*
-- For Unchecked Exception (Run time Exception) use below class defination. --

class UnderAgeException extends RuntimeException
{
   UnderAgeException()
   {
      super("Age is restricted.");
   }
   UnderAgeException(String Message)
   {
      super(Message);
   }
}
*/
```

```
class ExceptionDemo
{
   /* -- Using 'throw' and 'throws' Keywords. -- */

   public static void main(String[] args) throws UnderAgeException
   {
      Scanner sc = new Scanner(System.in);

      System.out.print("Enter Age for validation \t:\t");
      int Age = sc.nextInt();

      while (true)
      {
         try
         {
            if ( Age < 18 )
               throw new UnderAgeException("You have Entered invalid Age.");
            else
            {
               System.out.println("'" + Age +"' is valid age." );
               break;
            }
         }
         catch (UnderAgeException UAE)
         {
            System.out.println("Age >= 18 is valid age credintial.");
            UAE.printStackTrace();

            System.out.print("Enter Age Again\t:\t");
            Age = sc.nextInt();
         }
      }
      sc.close();
   }
}
```

*Output :*




## Q7. Write a program to create thread which display “Hello World” message.

### A) by extending Thread class
### B) by using Runnable interface.

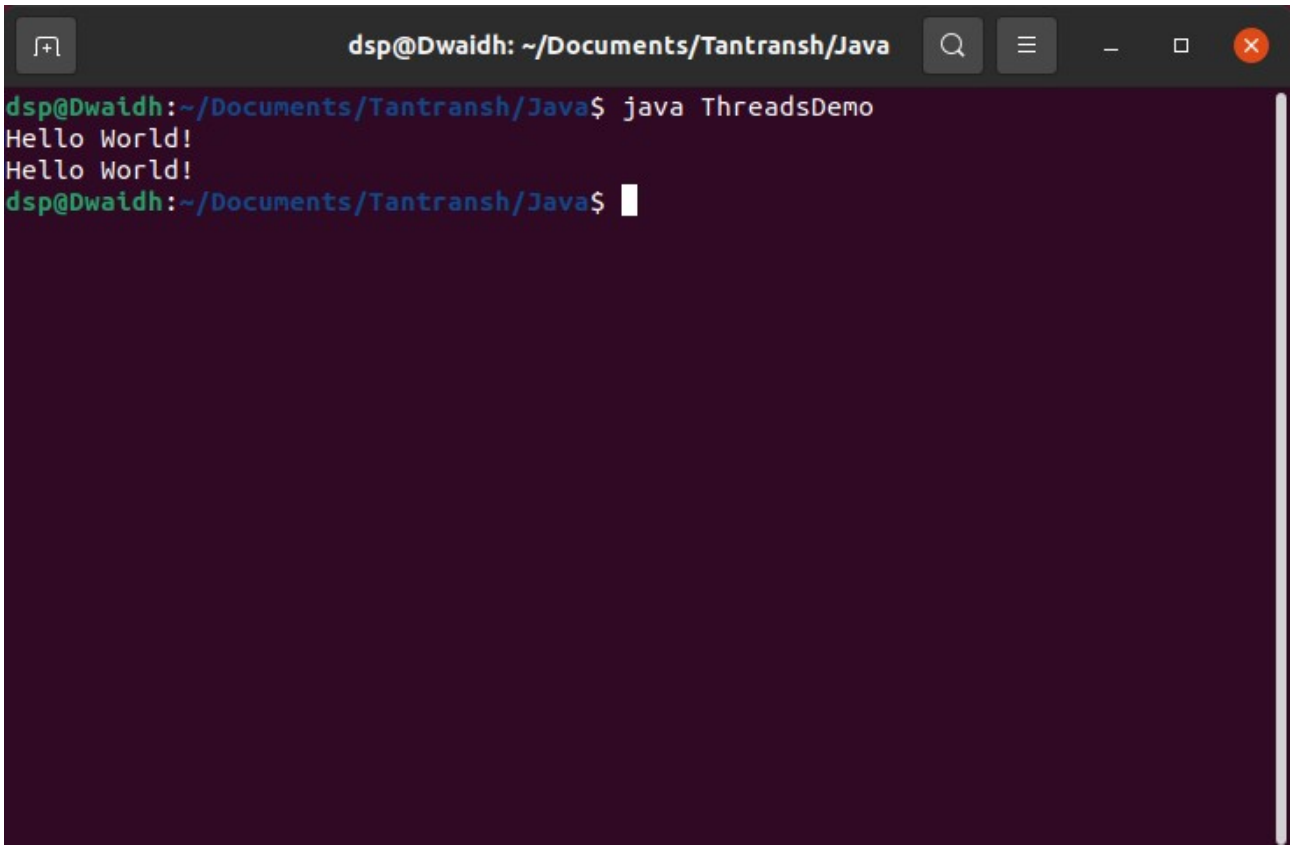
*Filename : ThreadsDemo.java*

*Code :*

```
class MyThread extends Thread implements Runnable
{
   public void run()
   {
        System.out.println("Hello World!");
        }
}
class ThreadsDemo
{
        public static void main(String[] args)
        {
```

```
                MyThread Thread1 = new MyThread();
                Thread1.start();

                Thread Thread2 = new Thread(Thread1);
                Thread2.start();
            }
        }
```

*Output :*



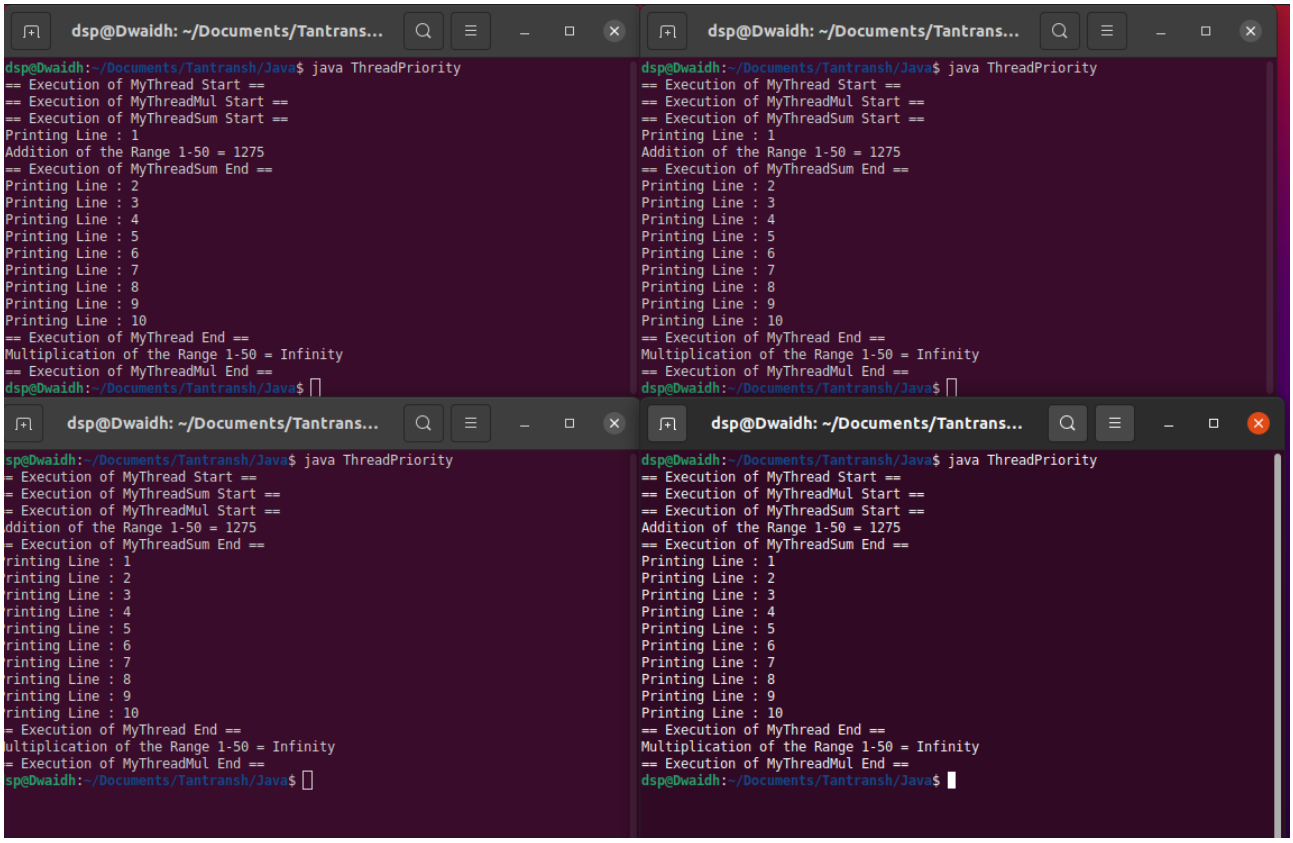
## Q8. Write a program to create three threads ‘FIRST’, ‘SECOND’, ‘THIRD’. Set the priority of the ‘FIRST’ thread to 3, the ‘SECOND’ thread to 5(default) and the ‘THIRD’ thread to 7.

*Filename : ThreadPriority.java*
*Code :*

```
class FIRST extends Thread
{
   public void run()
   {
      System.out.println("== Execution of FIRST Start ==");

      for (int i = 1; i<=10; i++)
         System.out.println("Printing Line : " + i);

      System.out.println("== Execution of FIRST End ==");
   }
}



class SECOND extends Thread
{
   public void run()
   {
      System.out.println("== Execution of SECOND Start ==");

      int sum = 0;

      for (int i = 1; i<=50; i++)
         sum += i;

         System.out.println("Addition of the Range 1-50 = " + sum);
      System.out.println("== Execution of SECOND End ==");

   }

}
```

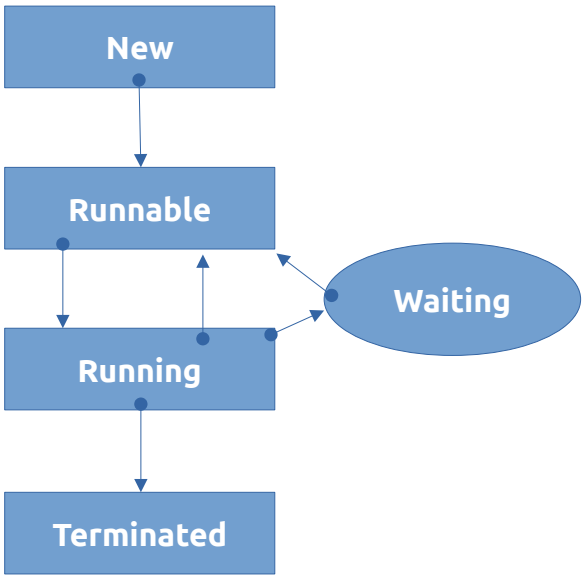
```
class THIRD extends Thread
{
   public void run()
   {
      System.out.println("== Execution of THIRD Start ==");

      float multiplication = 1f;

      for (int i = 1; i<=50; i++)
         multiplication *= i;

      System.out.println("Multiplication of the Range 1-50 = " + multiplication);

      System.out.println("== Execution of THIRD End ==");
   }
}

class ThreadPriority
{
   public static void main(String args[])
   {
      FIRST t1 = new FIRST();
      SECOND t2 = new SECOND();
      THIRD t3 = new THIRD();

      t1.setPriority(3);
      t2.setPriority(7);
      t3.setPriority(1);

      t1.start();
      t2.start();
      t3.start();
   }
}
```

*Output :*




## Q9. Draw & explain Thread life Cycle.

*Answer :*



**New:** A new Thread begin its life cycle in this state and remain here until the program starts the thread. It is also know as **'Born Thread'.**

**Runnable:** Once a newly born thread strats, the thread comes under runnable state. A Thread stays in this state until it is executing its block.

**Running:** In this state, Thread start executing its run() method and yeild() method can send back them to the RUNNABLE state.

**Waiting :** A thread enters this state when it is temporary in a inactive state.
i.e It is still alive but is not eligible to run. It can be in waiting, sleep or blocked state.

**Terminated :** A running thread enters in Terminated state when it completes its task**.**

## Q10. Write a java program that implements an interface AdvancedArithmetic which contains a method signature int divisor_sum(int n).You need to write a class called MyCalculator which implements the interface. divisor_Sum function just takes an integer as input and return the sum of all its divisors.

*Filename : Test.java*
*Code :*

```
import java.util.Scanner;

interface AdvancedArithmatic
{
   int divisor_sum(int n);
}
class MyCalculator implements AdvancedArithmatic
{
   public int divisor_sum(int n)
   {
      int sum = 0;
      for (int i=1; i <= n; i++)
      {
         if (n%i == 0)
            sum += i;
      }
      return sum;
   }
```

```
}
class Test
{
   public static void main(String[] args)
   {
      MyCalculator Cal = new MyCalculator();
      Scanner sc = new Scanner(System.in);

      System.out.print("Enter Number to find Divisor Sum\t:\t");
      int number = sc.nextInt();

      System.out.println("Divisior Sum of "+ number + " = " + Cal.divisor_sum(number));
   }
}
```

## Output :