7.5 Creating Multiple Threads

The multiple threads can be created both by extending Thread class and b implementing the Runnable interface.

1. Java Program for creating multiple threads by extending Thread Class

```
class A extends Thread
{
   public void run()
   {
      for(int i=0;i<=5;i++)//printing 0 to 5
      {
         System.out.println(i);
      }
   }
}
class B extends Thread
{
```

```
    public void run()
    {
      for(int i=10;i>=5;i--)//printing 10 to 5
      {
        System.out.println(i);
      }
    }
}
class ThreadProg
{
   public static void main(String args[])
   {
     A t1=new A();
     B t2=new B();
     t1.start();
     t2.start();
   }
}
```

Output

```
0
1
2
3
4
5
10
9
8
7
6
5
```

2. Java Program for creating multiple threads by implementing the Runnable interface

```
class A implements Runnable
{
   public void run()
   {
     for(int i=0;i<=5;i++)//printing 0 to 5
     {
       System.out.println(i);
     }
   }
}
class B implements Runnable
{
```

```
public void run()
{
  for(int i=10;i>=5;i--)//printing 10 to 5
  {
    System.out.println(i);
  }
}
class ThreadProgRunn
{
public static void main(String args[])
{
  A obj1=new A();
  B obj2=new B();
  Thread t1=new Thread(obj1);
  Thread t2=new Thread(obj2);
  t1.start();
  t2.start();
}
}
```

Output

```
0
1
2
3
4
5
10
9
8
7
6
5
```

Example 7.5.1 *Write a Java application program for generating four threads to perform the following operations - i) Getting N numbers as input ii) Printing the numbers divisible by five iii) Printing prime numbers iv) Computing the average.*

Solution :

```
import java.io.*;
import java.util.*;
class FirstThread extends Thread
{
 public void run() //generating N numbers
 {

   int i;
```

```
    System.out.println("\nGenerating Numbers: ");
    for (i=1;i<=10;i++)
    {
      System.out.println(i);
    }
}


lass SecondThread extends Thread

public void run() //Displaying the numbers divisible by five
{
    int i;
    System.out.println("\nDivisible by Five: ");
    for (i=1;i<=10;i++) //10 can be replaced by any desired value
    {
       if (i%5==0)
          System.out.println(i);

    }

}
}
lass ThirdThread extends Thread
{

public void run() //generating the prime numbers
{
    int i;
    System.out.println("\nPrime Numbers: ");
    for (i=1;i<=10;i++) //10 can be replaced by any desired value
    {
     int j;
     for (j=2; j<i; j++)
     {
      int n = i%j;
      if (n==0)
         break;
     }
     if(i == j)
         System.out.println(i);

    }

}
```

```
class FourthThread extends Thread

{

public void run() //generating the prime numbers

{
  int i,sum;
  double avg;
  sum=0;
  System.out.println("\nComputing Average: ");
  for (i=1;i<=10;i++) //10 can be replaced by any desired value
    sum=sum+i;
  avg=sum/(i-1);
  System.out.println(avg);

 }
}

class MainThread
{
 public static void main(String[] args) throws IOException
 {
  FirstThread T1 = new FirstThread(); //creating first thread
  SecondThread T2 = new SecondThread(); //creating second thread
  ThirdThread T3 = new ThirdThread(); //creating Third thread
  FourthThread T4 = new FourthThread(); //creating Fourth thread
  T1.start(); //First Thread starts executing
  T2.start();//Second Thread starts executing
  T3.start();//Third Thread starts executing
  T4.start();//Fourth Thread starts executing
 }
}
```

Output

```
Generating Numbers:
1
2
3
4
5
6
7
8
9
10

Divisible by Five:
5
10
```