EXPERIMENT : No. Assignment - 2.

DATE

* Set A.

1. Wtite a program that create 2 threads - each displaying a message (Pass the message as a parameter to the constructor). The threads should display the messages continuously till the user presses ctrl-c. Also display the thread information as its is running.

→

Ass2SetA1.java

```
class NewThread implements Runnable
{
   Thread t;
   Stsing str;

  NewThread (Stsing str)
  {
    t = new Thread(this);
       this.str = str;
     System.out.psintln (t);
     t.start();
  }

public void run()
{
   tsy
   {
   fos(;;)
```

Teacher's Sign.:

```
        {
            Thread.sleep (500);
            System.out.println (str);
        }
    } catch (InterruptedException e) {}
  }
}
class Ass2SetA1
{
  public static void main (String args[])
  {
     new NewThread ("One");
     new NewThread ("\t Two");
  }
}
```

2] Write a java program to calculate the sum and average of an array of 1000 integers (generated randomly) using 10 threads. Each thread calculates the sum of 100 integers. Use these values to calculate average. [Use join method].

→ Ass2SetA2.java

```
import java.util.*;
class NewThread implements Runnable
{
   int i, sum=0, start, end, avg, arr[];
   Thread t;

 NewThread (int arr[], int start, int end)
 {
      this.arr = arr;
      this.start = start;
this.end = end;
t = new Thread(this);
System.out.println(t+"Range = "+start+" - "+
    end);
  t.start();
}
 public void run()
 {
   try
   {
     for(i=start ; i<=end ; i++)
     {
        sum = sum+arr[i];
        Thread.sleep(500);
     }
    avg = sum/100;
    System.out.println(t+"Sum = "+sum+"
    Avg = "+avg);
  } catch(InterruptedException e) {}
 }
}
class Ass2SetA2
{
 public static void main(String args[])
 {
   NewThread obj[] = new NewThread[10];
   int i, cnt = -1, arr[];
   Random r = new Random();
```

```
arr = new int [1000];
for (i=0; i<1000 ; i++)
 arr[i] = r.nextInt (1000);
for(i=0; i<10; i++)
  obj [i] = new NewThread (arr, ++cnt , cnt = cnt +99);

try
{
   System.out.println ("\n *** waiting for threads to
    finish *** \n");
     for (i=0; i<10; i++)
      obj [i] .t.join ();
   } catch (InterruptedException e) {}
  System.out.println ("\n *** Main thread
        exiting. *** \n");
 }
}
```

* Set A Extra programs for practice

3. Define a thread called "PrintText_Thread" for printing text on command prompt for n number of times. Create three threads and run them. Pass the text and n as parameters to the thread constructor. Example:

   i. First thread prints "I am in FY" 10 times.

   ii. Second thread prints "I am in SY" 20 times.

   iii. Third thread prints "I am in TY" 30 times.

→ <u>Ass2SetAExtra.java</u>

```
class printText_Thread implements Runnable
{
    string name;
    Thread t;
    int i, cnt;

    printText_Thread (string name, int cnt)
    {
        this.name = name;
         this.cnt = cnt;
        t = new Thread (this, name);
        System.out.println("New Thrd :"+t);
        t.start();
    }
    public void run()
    {
        try
        {
            for (i=1; i<=cnt; i++)
            {
                System.out.println("\t I am in "+name
                +":"+i);
                Thread.sleep(1000);
            }
        } catch (InterruptedException e) {}
    System.out.println("***"+name+" exiting.
        ***");
    }
}
class Ass2SetA Extra
{
  public static void main (String args [])
   {
      new printText_Thread ("FY", 10);
      new printText_Thread ("SY", 20);
      new printText_Thread ("TY", 30);
   }
}
```

* Set B.

1. Write a program for a simple search engine. Accept a string to be searched. Search for the string in all text files in the current folder. Use a separate thread for each file. The result should display the filename, line number where the string is found.

→ Ass2set B1.java

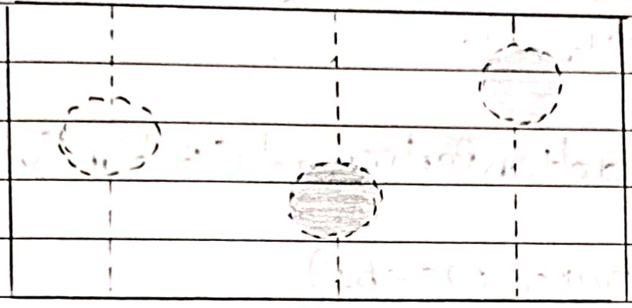
```
import java.io.*;
class FileWatcher extends Thread.
{
  String filename;
  int count = 0, countBuffer = 0, countLine = 0;
  String lineNumber = "";
  BufferedReader br;
  String inputSearch;
  String line = "";

  FileWatcher(String filename, String srch)
  {
     this.filename = filename;
```

```
        inputSearch = srch;
    }
    public void run( )
    {
        try
        {
            br = new BufferReader(new FileReader
            ("C:\\Demo\\"+filename));
            while ((line = br.readLine ())!=null)
            {
                countline++;
                steing words[] = line.split(" ");
            for (string i : words)
              {
                if (i.equals (inputSearch))
                {
                  count++;
                  countBuffer++;
                }
              }
             if (countBuffer>0)
              {
                countBuffer =0;
                lineNumber += countline+ ",";
              }
        }
        br.close();
```

```
      System.out.println("\n Thread Name = " + this +
      "\n File Name = " + filename +"\n ~~Thi~~ Times found at = "
         + count +"\n Word found at line no = "+ lineNumber);
      }
       catch (Exception e)
       {
         e.printStackTrace();
       }
    }
 }
 class Ass2Set81
 {
    public static void main (String arg[])
    {
        int i;
        File f1;
        File dir = new File("C:\\Demo");
         String files[] = dir.list();
         FileWatcher fw[] = new FileWatcher[files.length];
        for (i=0; i<files.length ; i++)
        {
           if (files[i].endsWith(".java"))
            {
              fw[i] = new FileWatcher(files[i], args[0]);
              fw[i].start();
            }
        }
    }
}
```

2] Define a thread to move a ball inside a panel vestically. The Ball should be created when user clicks on the start Button. Each ball should have a different color and vertical position.



→

Ass2setB2.java

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
import java.util.*;

class Ass2setB2 extends JFrame implements ActionListener
{
  JPanel pnl1, pnl2;
  JButton b1, b2;

   Ass5setB2()
   {
      setSize(600,600);
      setTitle("Ass5SetB2");
      setLocation(300,100);
   pnl2 = new JPanel();
   pnl2.add(b1);
   pnl2.add(b2);
   b1.addActionListener(this);
   b2.addActionListener(this);
   add(pnl2,"South");

   setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
   setVisible(true);
  }
  public void actionPerformed(ActionEvent e)
  {
     if(e.getSource()==b1)
     {
        Ball b = new Ball(pnl1);
        b.start();
     }
     if(e.getSource()==b2)
        system.exit(0);
  }
  public static void main(String args[])
  {
     new Ass5SetB2();
  }
}
class Ball extends Thread
{
   JPanel pnl;
   int x=0, y=0, flg=0;
   Color c;
```

```
Ball (JPanel pns)
{
   this.pns = pns;
   int rc = randomInteger (0,255);
   int gc = randomInteger (0,255);
   int bc = randomInteger (0,255);
    c = new Color (rc, gc, bc);
    x = randomInteger (10,550);
  }
public int randomInteger (int min, int max)
 {
     Random rand = new Random ();
     int randomNum = rand.nextInt ((max-min)
      +1 )+min;
     return randomNum;
 }
 public void draw()
  {
      Graphics g = pns.getGraphics ();
      g.setColor (c);
      g.fillOval (x, y, 50, 50);
   }
 void move ()
 {
     Graphics g = pns.getGraphics ();
     g.setXORMode (pns.getBackground ());
     g.setColor (c);
     g.fillOval (x, y, 50, 50);
if(flg==0)
{
  y=y+10;
  if(y==480)
      flg=1;
}
else
{
  y=y-10;
  if(y==0)
      flg=0;
}
  g.fillOval(x,y,50,50);
  g.dispose();
}
public void run()
{
  try
  {
   draw();
   for(;;)
   {
     move();
     ~~sete~~ sleep(100);
   }
  }
  catch(InterruptedException e)
  { }
} .
}.
```

C

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