**Multithreading Programs (Discussed in class)**

// Controlling the main Thread.

class CurrentThreadDemo {

public static void main(String args[]) {

Thread t = Thread.currentThread();

System.out.println("Current thread: " + t);

// change the name of the thread

t.setName("My Thread");

System.out.println("Priority: " + t.getPriority());

System.out.println("After name change: " + t);

try {

for(int n = 5; n > 0; n--) {

System.out.println(n);

Thread.sleep(1000);

}

} catch (InterruptedException e) {

System.out.println("Main thread interrupted");

}

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

/\*Java program that uses three threads to print even numbers, odd numbers, and Fibonacci numbers in the range of 1 to 10000\*/

public class MultiThreadedNumbers extends Thread {

public static void main(String[] args) {

Thread evenThread = new EvenThread();

Thread oddThread = new OddThread();

Thread fibonacciThread = new FibonacciThread();

evenThread.start();

oddThread.start();

fibonacciThread.start();

}

static class EvenThread extends Thread {

@Override

public void run() {

for (int i = 1; i <= 10000; i++) {

if (i % 2 == 0) {

System.out.println("Even: " + i);

}

}

}

}

static class OddThread extends Thread {

@Override

public void run() {

for (int i = 1; i <= 10000; i++) {

if (i % 2 != 0) {

System.out.println("Odd: " + i);

}

}

}

}

static class FibonacciThread extends Thread {

@Override

public void run() {

int prev = 0, current = 1;

while (prev <= 10000) {

System.out.println("Fibonacci: " + prev);

int next = prev + current;

prev = current;

current = next;

}

}

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

class Table{

void printTable(int n){//method not synchronized

for(int i=1;i<=5;i++){

System.out.println(n\*i);

try{

Thread.sleep(5000);

}catch(Exception e){System.out.println(e);}

}

}

}

class MyThread1 extends Thread{ //defining one thread for Table Object

Table t;

MyThread1(Table t){

this.t=t;

}

public void run(){

t.printTable(5);

}

}

class MyThread2 extends Thread{ //defining another thread for Table Object

Table t;

MyThread2(Table t){

this.t=t;

}

public void run(){

t.printTable(100);

}

}

class TestSynchronization1{

public static void main(String args[]){

Table obj = new Table();//only one object

MyThread1 t1=new MyThread1(obj);

MyThread2 t2=new MyThread2(obj);

t1.start();

t2.start();

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

//example of java synchronized method

class Table{

synchronized void printTable(int n){//synchronized method

for(int i=1;i<=5;i++){

System.out.println(n\*i);

try{

Thread.sleep(400);

}catch(Exception e){System.out.println(e);}

}

}

}

class MyThread1 extends Thread{

Table t;

MyThread1(Table t){

this.t=t;

}

public void run(){

t.printTable(5);

}

}

class MyThread2 extends Thread{

Table t;

MyThread2(Table t){

this.t=t;

}

public void run(){

t.printTable(100);

}

}

public class TestSynchronization2{

public static void main(String args[]){

Table obj = new Table();//only one object

MyThread1 t1=new MyThread1(obj);

MyThread2 t2=new MyThread2(obj);

t1.start();

t2.start();

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

class MyThread1 extends Thread{

MyThread1(String s){

super(s);

start();

}

public void run(){

for(int i=0;i<3;i++){

Thread cur=Thread.currentThread();

cur.setPriority(Thread.MAX\_PRIORITY);

int p=cur.getPriority();

System.out.println("Thread Name :"+Thread.currentThread().getName());

System.out.println("Thread Priority :"+cur);

}

}

}

class MyThread2 extends Thread{

MyThread2(String s){

super(s);

start();

}

public void run(){

for(int i=0;i<3;i++){

Thread cur=Thread.currentThread();

cur.setPriority(Thread.MIN\_PRIORITY);

int p=cur.getPriority();

System.out.println("Thread Name :"+Thread.currentThread().getName());

System.out.println("Thread Priority :"+cur);

}

}

}

public class ThreadPriority{

public static void main(String args[]){

MyThread1 m1=new MyThread1("My Thread 1");

MyThread2 m2=new MyThread2("My Thread 2");

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

class SampleThread extends Thread {

public void run() {

for (int i = 1; i <= 5; i++) {

System.out.println("SampleThread: " + i);

try {

Thread.sleep(500);

} catch (InterruptedException e) {

e.printStackTrace();

}

}

}

}

public class MainJoin {

public static void main(String[] args) {

SampleThread sampleThread = new SampleThread();

sampleThread.start();

try {

sampleThread.join(); // Main thread will wait for sampleThread to complete.

} catch (InterruptedException e) {

e.printStackTrace();

}

for (int i = 1; i <= 5; i++) {

System.out.println("Main thread: " + i);

try {

Thread.sleep(500);

} catch (InterruptedException e) {

e.printStackTrace();

}

}

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

class MyThread extends Thread {

private String threadName;

public MyThread(String threadName) {

this.threadName = threadName;

}

@Override

public void run() {

for (int i = 1; i <= 5; i++) {

System.out.println(threadName + ": " + i);

try {

Thread.sleep(1000);

} catch (InterruptedException e) {

System.out.println(threadName + " interrupted.");

}

}

System.out.println(threadName + " exiting.");

}

}

public class JoinWithTimeExample {

public static void main(String[] args) {

MyThread t1 = new MyThread("Thread 1");

MyThread t2 = new MyThread("Thread 2");

System.out.println("Starting threads...");

t1.start();

t2.start();

try {

System.out.println("Waiting for Thread 1 to finish for a maximum of 2000 milliseconds.");

t1.join(2000);

System.out.println("Either Thread 1 finished or the timeout expired.");

System.out.println("Waiting for Thread 2 to finish for a maximum of 4000 milliseconds.");

t2.join(4000);

System.out.println("Either Thread 2 finished or the timeout expired.");

} catch (InterruptedException e) {

System.out.println("Main thread interrupted.");

}

System.out.println("Main thread exiting.");

}

}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

class MyThread extends Thread {

private String threadName;

public MyThread(String threadName) {

this.threadName = threadName;

}

@Override

public void run() {

for (int i = 1; i <= 3; i++) {

System.out.println(threadName + ": " + i);

try {

Thread.sleep(500);

} catch (InterruptedException e) {

System.out.println(threadName + " interrupted.");

}

}

System.out.println(threadName + " exiting.");

}

}

public class JoinIsAliveExample {

public static void main(String[] args) {

MyThread t1 = new MyThread("Thread 1");

MyThread t2 = new MyThread("Thread 2");

System.out.println("Starting threads...");

t1.start();

t2.start();

System.out.println("Thread 1 is alive: " + t1.isAlive());

System.out.println("Thread 2 is alive: " + t2.isAlive());

try {

System.out.println("Waiting for threads to finish.");

t1.join();

//t2.join();

} catch (InterruptedException e) {

System.out.println("Main thread interrupted.");

}

System.out.println("Thread 1 is alive: " + t1.isAlive());

System.out.println("Thread 2 is alive: " + t2.isAlive());

System.out.println("Main thread exiting.");

}

}

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**AWT and Events Programs (Discussed in class)**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**import java.awt.\*;**

**public class LabelExample1 {**

**public static void main(String args[]){**

**// creating the object of Frame class and Label class**

**Frame f = new Frame ("Label example");**

**Label l1, l2;**

**// initializing the labels**

**l1 = new Label ("Enter User Name:");**

**l2 = new Label ("Enter Password:");**

**// set the location of label**

**l1.setBounds(50, 100, 100, 30);**

**l2.setBounds(50, 150, 100, 30);**

**// adding labels to the frame**

**f.add(l1);**

**f.add(l2);**

**// setting size, layout and visibility of frame**

**f.setSize(400,400);**

**f.setLayout(null);**

**f.setVisible(true);**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**import java.awt.\*;**

**public class ButtonExample {**

**public static void main (String[] args) {**

**// create instance of frame with the label**

**Frame f = new Frame("Button Example");**

**// create instance of button with label**

**Button b = new Button("Click Here");**

**// set the position for the button in frame**

**b.setBounds(50,100,80,30);**

**// add button to the frame**

**f.add(b);**

**// set size, layout and visibility of frame**

**f.setSize(400,400);**

**f.setLayout(null);**

**f.setVisible(true);**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**// importing necessary libraries**

**import java.awt.\*;**

**import java.awt.event.\*;**

**public class ButtonExample2 {**

**public static void main(String[] args) {**

**// create instance of frame with the label**

**Frame f = new Frame("Button Example");**

**final TextField tf=new TextField();**

**tf.setBounds(50,50, 150,20);**

**// create instance of button with label**

**Button b=new Button("Click Here");**

**// set the position for the button in frame**

**b.setBounds(50,100,60,30);**

**b.addActionListener(new ActionListener() {**

**public void actionPerformed (ActionEvent e) {**

**tf.setText("Button Event Handling!!!");**

**}**

**});**

**// adding button the frame**

**f.add(b);**

**// adding textfield the frame**

**f.add(tf);**

**// setting size, layout and visibility**

**f.setSize(400,400);**

**f.setLayout(null);**

**f.setVisible(true);**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**// importing necessary libraries**

**import java.awt.\*;**

**import java.awt.event.\*;**

**public class ButtonExample3 implements ActionListener {**

**TextField tf;Button b;**

**public static void main(String[] args) {**

**// create instance of frame with the label**

**Frame f = new Frame("Button Example");**

**TextField tf=new TextField();**

**tf.setBounds(50,50, 150,20);**

**// create instance of button with label**

**Button b=new Button("Click Here");**

**// set the position for the button in frame**

**b.setBounds(50,100,60,30);**

**// Register with source-Button b**

**b.addActionListener(this);**

**// adding button the frame**

**f.add(b);**

**// adding textfield the frame**

**f.add(tf);**

**// setting size, layout and visibility**

**f.setSize(400,400);**

**f.setLayout(null);**

**f.setVisible(true);**

**}**

**public void actionPerformed (ActionEvent e) {**

**tf.setText("Button Event Handling!!!");**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**import java.awt.\*;**

**import java.awt.event.\*;**

**class EventHandling extends Frame implements ActionListener**

**{**

**TextField textField;**

**EventHandling ()**

**{**

**textField = new TextField ();**

**textField.setBounds (60, 50, 170, 20);**

**Button button = new Button ("Show");**

**button.setBounds (90, 140, 75, 40);**

**button.addActionListener (this);**

**add (button);**

**add (textField);**

**setSize (250, 250);**

**setLayout (null);**

**setVisible (true);**

**}**

**public void actionPerformed (ActionEvent e)**

**{**

**textField.setText ("Hello World");**

**}**

**public static void main (String args[])**

**{**

**new EventHandling ();**

**}**

**}**

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**import javax.swing.\*;**

**import java.awt.\*;**

**import java.awt.event.\*;**

**public class TextFieldEx2 implements ActionListener**

**{**

**JButton button;**

**Label label1, label2, label3, label4;**

**TextField field1, field2, field3;**

**Frame jf;**

**TextFieldEx2()**

**{**

**jf = new JFrame("Handling TextField Event");**

**jf.setSize(500,500);**

**label1= new Label("Enter your name");**

**label2= new Label("Enter your city");**

**label3= new Label("Enter your password");**

**field1 = new TextField(20);**

**field2 = new TextField("Chennai"); //calling TextField(String)**

**field3 = new TextField(20);**

**field3.setEchoChar('\*');**

**button = new JButton("Submit");**

**jf.setLayout(new FlowLayout());**

**jf.add(label1);**

**jf.add(field1);**

**jf.add(label2);**

**jf.add(field2);**

**jf.add(label3);**

**jf.add(field3);**

**jf.add(button);**

**button.addActionListener(this);**

**jf.setVisible(true);**

**}**

**public void actionPerformed(ActionEvent ae)**

**{**

**if(ae.getActionCommand().equals("Submit"))**

**{**

**label4= new Label("", Label.CENTER);**

**label4.setText("Your name : " + field1.getText()+ ", Your city : " + field2.getText()+ ", Your password :" + field3.getText());**

**jf.add(label4);**

**jf.setVisible(true);**

**}**

**}**

**public static void main(String[] args)**

**{**

**new TextFieldEx2();**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**import javax.swing.\*;**

**import java.awt.\*;**

**import java.awt.event.\*;**

**public class JButtonEx2 implements ActionListener**

**{**

**JFrame jf;**

**JButton button1, button2;**

**JLabel label;**

**JButtonEx2()**

**{**

**jf= new JFrame("Button click events");**

**button1= new JButton("Yes");**

**button2= new JButton("No");**

**label = new JLabel();**

**jf.add(button1);**

**jf.add(button2);**

**jf.add(label);**

**button1.addActionListener(this);**

**button2.addActionListener(this);**

**jf.setLayout(new FlowLayout(FlowLayout.CENTER,60,10));**

**jf.setSize(600,550);**

**jf.setVisible(true);**

**}**

**public void actionPerformed(ActionEvent ae)**

**{**

**if(ae.getActionCommand().equals("Yes")) //if(ae.getSource() == button1)**

**{**

**label.setText("You've clicked Yes");**

**jf.add(label);**

**jf.setVisible(true);**

**}**

**if(ae.getActionCommand().equals("No")) //if(ae.getSource() == button2)**

**{**

**label.setText("You've clicked No");**

**jf.add(label);**

**jf.setVisible(true);**

**}**

**}**

**public static void main(String ar[])**

**{**

**new JButtonEx2();**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**import java.awt.\*;**

**import java.awt.event.ActionEvent;**

**import java.awt.event.ActionListener;**

**public class SumCalculator {**

**public static void main(String[] args) {**

**Frame frame = new Frame("AWT Sum Calculator");**

**frame.setSize(400, 200);**

**frame.setLayout(new GridLayout(4, 2));**

**Label label1 = new Label("Number 1:");**

**TextField textField1 = new TextField();**

**Label label2 = new Label("Number 2:");**

**TextField textField2 = new TextField();**

**Label label3 = new Label("Sum:");**

**TextField textField3 = new TextField();**

**textField3.setEditable(false);**

**Button button = new Button("Submit");**

**button.addActionListener(new ActionListener() {**

**@Override**

**public void actionPerformed(ActionEvent e) {**

**try {**

**double num1 = Double.parseDouble(textField1.getText());**

**double num2 = Double.parseDouble(textField2.getText());**

**double sum = num1 + num2;**

**textField3.setText(Double.toString(sum));**

**} catch (NumberFormatException ex) {**

**textField3.setText("Invalid input!");**

**}**

**}**

**});**

**frame.add(label1);**

**frame.add(textField1);**

**frame.add(label2);**

**frame.add(textField2);**

**frame.add(label3);**

**frame.add(textField3);**

**frame.add(new Label());**

**frame.add(button);**

**frame.setVisible(true);**

**frame.addWindowListener(new java.awt.event.WindowAdapter() {**

**@Override**

**public void windowClosing(java.awt.event.WindowEvent windowEvent) {**

**System.exit(0);**

**}**

**});**

**}**

**}**

**%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%**

**import javax.swing.\*;**

**import java.awt.\*;**

**import java.awt.event.ActionEvent;**

**import java.awt.event.ActionListener;**

**public class SumCalculatorSwing {**

**public static void main(String[] args) {**

**JFrame frame = new JFrame("Swing Sum Calculator");**

**frame.setSize(400, 200);**

**frame.setLayout(new GridLayout(4, 2));**

**frame.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);**

**JLabel label1 = new JLabel("Number 1:");**

**JTextField textField1 = new JTextField();**

**JLabel label2 = new JLabel("Number 2:");**

**JTextField textField2 = new JTextField();**

**JLabel label3 = new JLabel("Sum:");**

**JTextField textField3 = new JTextField();**

**textField3.setEditable(false);**

**JButton button = new JButton("Submit");**

**button.addActionListener(new ActionListener() {**

**@Override**

**public void actionPerformed(ActionEvent e) {**

**try {**

**double num1 = Double.parseDouble(textField1.getText());**

**double num2 = Double.parseDouble(textField2.getText());**

**double sum = num1 + num2;**

**textField3.setText(Double.toString(sum));**

**} catch (NumberFormatException ex) {**

**textField3.setText("Invalid input!");**

**}**

**}**

**});**

**frame.add(label1);**

**frame.add(textField1);**

**frame.add(label2);**

**frame.add(textField2);**

**frame.add(label3);**

**frame.add(textField3);**

**frame.add(new JLabel());**

**frame.add(button);**

**frame.setVisible(true);**

**}**

**}**