**JAVA EXERCISE 10 PROGRAMS**

**1.Write a temperature conversion applet that converts from Fahrenheit to Celsius. The Fahrenheit temperature should be entered from the keyboard (via a JTextField). A JLabel should be used to display the converted temperature. Use the following formula for the conversion: Celcius = ((5/9)\*(Ferenheit‐32)). Enhance the temperature conversion applet of Q1 by adding the Kelvin temperature scale. The applet should also allow the user to make conversions between any two scales. Use the following formula for the conversion between Kelvin and Celsius (in addition to the formulain Q1): Kelvin = Celcius + 273.15**

import javax.swing.\*;

import java.awt.\*;

import java.awt.event.\*;

import java.text.\*;

public class TempCon extends JApplet implements ActionListener {

JTextField txtInput;

JLabel lblResult;

JRadioButton rbCelcius, rbKelvin;

public void init(){

Container conpane = getContentPane();

conpane.setLayout (new FlowLayout());

txtInput = new JTextField("",10);

conpane.add(txtInput);

rbCelcius= new JRadioButton ("to Celcius", true);

conpane.add(rbCelcius);

rbKelvin = new JRadioButton("to Kelvin", false);

conpane.add(rbKelvin);

ButtonGroup selection = new ButtonGroup();

selection.add(rbCelcius);

selection.add(rbKelvin);

JButton button1 = new JButton ("Show Result");

button1.addActionListener(this);

conpane.add(button1);

lblResult= new JLabel ("Enter Ferenheit, Choose an option to convert and Click Show Result");

conpane.add(lblResult);

}

public void actionPerformed(ActionEvent e) {

DecimalFormat df = new DecimalFormat ("#.##");

double ferenheit = Double.parseDouble(txtInput.getText());

double answer = 0.0;

answer = ((5.0/9.0)\*(ferenheit - 32.0));

if (rbKelvin.isSelected())

answer += 273.15;

lblResult.setText(String.valueOf(df.format(answer)));

}

}

**2. Calculator using AWT controls**

import java.awt.\*;

import java.awt.event.\*;

class Calculator implements ActionListener

{

//Declaring Objects

Frame f=new Frame();

Label l1=new Label("First Number");

Label l2=new Label("Second Number");

Label l3=new Label("Result");

TextField t1=new TextField();

TextField t2=new TextField();

TextField t3=new TextField();

Button b1=new Button("Add");

Button b2=new Button("Sub");

Button b3=new Button("Mul");

Button b4=new Button("Div");

Button b5=new Button("Cancel");

Calculator()

{

//Giving Coordinates

l1.setBounds(50,100,100,20);

l2.setBounds(50,140,100,20);

l3.setBounds(50,180,100,20);

t1.setBounds(200,100,100,20);

t2.setBounds(200,140,100,20);

t3.setBounds(200,180,100,20);

b1.setBounds(50,250,50,20);

b2.setBounds(110,250,50,20);

b3.setBounds(170,250,50,20);

b4.setBounds(230,250,50,20);

b5.setBounds(290,250,50,20);

//Adding components to the frame

f.add(l1);

f.add(l2);

f.add(l3);

f.add(t1);

f.add(t2);

f.add(t3);

f.add(b1);

f.add(b2);

f.add(b3);

f.add(b4);

f.add(b5);

b1.addActionListener(this);

b2.addActionListener(this);

b3.addActionListener(this);

b4.addActionListener(this);

b5.addActionListener(this);

f.setLayout(null);

f.setVisible(true);

f.setSize(400,350);

}

public void actionPerformed(ActionEvent e)

{

int n1=Integer.parseInt(t1.getText());

int n2=Integer.parseInt(t2.getText());

if(e.getSource()==b1)

{

t3.setText(String.valueOf(n1+n2));

}

if(e.getSource()==b2)

{

t3.setText(String.valueOf(n1-n2));

}

if(e.getSource()==b3)

{

t3.setText(String.valueOf(n1\*n2));

}

if(e.getSource()==b4)

{

t3.setText(String.valueOf(n1/n2));

}

if(e.getSource()==b5)

{

System.exit(0);

}

}

public static void main(String...s)

{

new Calculator();

}

}

**3. Authentication check using AWT controls**

import java.awt.event.\*;

public class UserPassValidation extends Frame implements ActionListener

{

TextField nameField, passField, resultField;

Label lab1, lab2, lab3;

public UserPassValidation()

{                       // set layout

setLayout(new GridLayout(3, 2, 0, 10));

setBackground(Color.pink);  // fill the gap with color

// create components

nameField = new TextField(15);

passField = new TextField(15);

resultField = new TextField(15);

lab1 = new Label("Enter User Name");

lab2 = new Label("Enter Password");

lab3 = new Label("Display Result");

// register the listener

passField.addActionListener(this);

// beautification

passField.setEchoChar('\*');

resultField.setEditable(false);

add(lab1);   add(nameField);

add(lab2);   add(passField);

add(lab3);   add(resultField);

setTitle("User Name & Password Validation");

setSize(300, 300);

setVisible(true);

}

public void actionPerformed(ActionEvent e)

{                   // get the values entered by the user

String str1 = nameField.getText();

String str2 = passField.getText();

// some validation code

if(str1.equals("snrao") && str2.equals("java"))

{

resultField.setText("VALID");

}

else

{

resultField.setText("INVALID, TRY AGAIN");

}

}

public static void main(String args[])

{

new UserPassValidation();

}

}

**4. Design a calculator using event-driven programming paradigm of Java with the following options. a) Decimal manipulations b) Scientific manipulations**

import java.awt.\*;

import javax.swing.\*;

import java.awt.event.\*;

import javax.swing.event.\*;

public class ScientificCalculator extends JFrame implements ActionListener

{

JTextField tfield;

double temp, temp1, result, a;

static double m1, m2;

int k = 1, x = 0, y = 0, z = 0;

char ch;

JButton b1, b2, b3, b4, b5, b6, b7, b8, b9, zero, clr, pow2, pow3, exp,

fac, plus, min, div, log, rec, mul, eq, addSub, dot, mr, mc, mp,

mm, sqrt, sin, cos, tan;

Container cont;

JPanel textPanel, buttonpanel;

ScientificCalculator()

{

cont = getContentPane();

cont.setLayout(new BorderLayout());

JPanel textpanel = new JPanel();

tfield = new JTextField(25);

tfield.setHorizontalAlignment(SwingConstants.RIGHT);

tfield.addKeyListener(new KeyAdapter() {

public void keyTyped(KeyEvent keyevent) {

char c = keyevent.getKeyChar();

if (c >= ‘0’ && c <= ‘9’) {

}

else

{

keyevent.consume();

}

}

});

textpanel.add(tfield);

buttonpanel = new JPanel();

buttonpanel.setLayout(new GridLayout(8, 4, 2, 2));

boolean t = true;

mr = new JButton(“MR”);

buttonpanel.add(mr);

mr.addActionListener(this);

mc = new JButton(“MC”);

buttonpanel.add(mc);

mc.addActionListener(this);

mp = new JButton(“M+”);

buttonpanel.add(mp);

mp.addActionListener(this);

mm = new JButton(“M-“);

buttonpanel.add(mm);

mm.addActionListener(this);

b1 = new JButton(“1”);

buttonpanel.add(b1);

b1.addActionListener(this);

b2 = new JButton(“2”);

buttonpanel.add(b2);

b2.addActionListener(this);

b3 = new JButton(“3”);

buttonpanel.add(b3);

b3.addActionListener(this);

b4 = new JButton(“4”);

buttonpanel.add(b4);

b4.addActionListener(this);

b5 = new JButton(“5”);

buttonpanel.add(b5);

b5.addActionListener(this);

b6 = new JButton(“6”);

buttonpanel.add(b6);

b6.addActionListener(this);

b7 = new JButton(“7”);

buttonpanel.add(b7);

b7.addActionListener(this);

b8 = new JButton(“8”);

buttonpanel.add(b8);

b8.addActionListener(this);

b9 = new JButton(“9”);

buttonpanel.add(b9);

b9.addActionListener(this);

zero = new JButton(“0”);

buttonpanel.add(zero);

zero.addActionListener(this);

plus = new JButton(“+”);

buttonpanel.add(plus);

plus.addActionListener(this);

min = new JButton(“-“);

buttonpanel.add(min);

min.addActionListener(this);

mul = new JButton(“\*”);

buttonpanel.add(mul);

mul.addActionListener(this);

div = new JButton(“/”);

div.addActionListener(this);

buttonpanel.add(div);

addSub = new JButton(“+/-“);

buttonpanel.add(addSub);

addSub.addActionListener(this);

dot = new JButton(“.”);

buttonpanel.add(dot);

dot.addActionListener(this);

eq = new JButton(“=”);

buttonpanel.add(eq);

eq.addActionListener(this);

rec = new JButton(“1/x”);

buttonpanel.add(rec);

rec.addActionListener(this);

sqrt = new JButton(“Sqrt”);

buttonpanel.add(sqrt);

sqrt.addActionListener(this);

log = new JButton(“log”);

buttonpanel.add(log);

log.addActionListener(this);

sin = new JButton(“SIN”);

buttonpanel.add(sin);

sin.addActionListener(this);

cos = new JButton(“COS”);

buttonpanel.add(cos);

cos.addActionListener(this);

tan = new JButton(“TAN”);

buttonpanel.add(tan);

tan.addActionListener(this);

pow2 = new JButton(“x^2”);

buttonpanel.add(pow2);

pow2.addActionListener(this);

pow3 = new JButton(“x^3”);

buttonpanel.add(pow3);

pow3.addActionListener(this);

exp = new JButton(“Exp”);

exp.addActionListener(this);

buttonpanel.add(exp);

fac = new JButton(“n!”);

fac.addActionListener(this);

buttonpanel.add(fac);

clr = new JButton(“AC”);

buttonpanel.add(clr);

clr.addActionListener(this);

cont.add(“Center”, buttonpanel);

cont.add(“North”, textpanel);

setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

}

public void actionPerformed(ActionEvent e)

{

String s = e.getActionCommand();

if (s.equals(“1”))

{

if (z == 0)

{

tfield.setText(tfield.getText() + “1”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “1”);

z = 0;

}

}

if (s.equals(“2”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “2”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “2”);

z = 0;

}

}

if (s.equals(“3”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “3”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “3”);

z = 0;

}

}

if (s.equals(“4”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “4”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “4”);

z = 0;

}

}

if (s.equals(“5”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “5”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “5”);

z = 0;

}

}

if (s.equals(“6”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “6”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “6”);

z = 0;

}

}

if (s.equals(“7”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “7”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “7”);

z = 0;

}

}

if (s.equals(“8”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “8”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “8”);

z = 0;

}

}

if (s.equals(“9”)) {

if (z == 0) {

tfield.setText(tfield.getText() + “9”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “9”);

z = 0;

}

}

if (s.equals(“0”))

{

if (z == 0) {

tfield.setText(tfield.getText() + “0”);

}

else

{

tfield.setText(“”);

tfield.setText(tfield.getText() + “0”);

z = 0;

}

}

if (s.equals(“AC”)) {

tfield.setText(“”);

x = 0;

y = 0;

z = 0;

}

if (s.equals(“log”))

{

if (tfield.getText().equals(“”)) {

tfield.setText(“”);

}

else

{

a = Math.log(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“1/x”)) {

if (tfield.getText().equals(“”)) {

tfield.setText(“”);

}

else

{

a = 1 / Double.parseDouble(tfield.getText());

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“Exp”)) {

if (tfield.getText().equals(“”)) {

tfield.setText(“”);

}

else

{

a = Math.exp(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“x^2”)) {

if (tfield.getText().equals(“”)) {

tfield.setText(“”);

}

else

{

a = Math.pow(Double.parseDouble(tfield.getText()), 2);

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“x^3”)) {

if (tfield.getText().equals(“”)) {

tfield.setText(“”);

}

else

{

a = Math.pow(Double.parseDouble(tfield.getText()), 3);

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“+/-“)) {

if (x == 0) {

tfield.setText(“-” + tfield.getText());

x = 1;

}

else

{

tfield.setText(tfield.getText());

}

}

if (s.equals(“.”)) {

if (y == 0) {

tfield.setText(tfield.getText() + “.”);

y = 1;

}

else

{

tfield.setText(tfield.getText());

}

}

if (s.equals(“+”))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

temp = 0;

ch = ‘+’;

}

else

{

temp = Double.parseDouble(tfield.getText());

tfield.setText(“”);

ch = ‘+’;

y = 0;

x = 0;

}

tfield.requestFocus();

}

if (s.equals(“-“))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

temp = 0;

ch = ‘-‘;

}

else

{

x = 0;

y = 0;

temp = Double.parseDouble(tfield.getText());

tfield.setText(“”);

ch = ‘-‘;

}

tfield.requestFocus();

}

if (s.equals(“/”)) {

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

temp = 1;

ch = ‘/’;

}

else

{

x = 0;

y = 0;

temp = Double.parseDouble(tfield.getText());

ch = ‘/’;

tfield.setText(“”);

}

tfield.requestFocus();

}

if (s.equals(“\*”)) {

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

temp = 1;

ch = ‘\*’;

}

else

{

x = 0;

y = 0;

temp = Double.parseDouble(tfield.getText());

ch = ‘\*’;

tfield.setText(“”);

}

tfield.requestFocus();

}

if (s.equals(“MC”))

{

m1 = 0;

tfield.setText(“”);

}

if (s.equals(“MR”))

{

tfield.setText(“”);

tfield.setText(tfield.getText() + m1);

}

if (s.equals(“M+”))

{

if (k == 1) {

m1 = Double.parseDouble(tfield.getText());

k++;

}

else

{

m1 += Double.parseDouble(tfield.getText());

tfield.setText(“” + m1);

}

}

if (s.equals(“M-“))

{

if (k == 1) {

m1 = Double.parseDouble(tfield.getText());

k++;

}

else

{

m1 -= Double.parseDouble(tfield.getText());

tfield.setText(“” + m1);

}

}

if (s.equals(“Sqrt”))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

}

else

{

a = Math.sqrt(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

field.setText(tfield.getText() + a);

}

}

if (s.equals(“SIN”))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

}

else

{

a = Math.sin(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“COS”))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

}

else

{

a = Math.cos(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“TAN”)) {

if (tfield.getText().equals(“”)) {

tfield.setText(“”);

}

else

{

a = Math.tan(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

if (s.equals(“=”))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

}

else

{

temp1 = Double.parseDouble(tfield.getText());

switch (ch)

{

case ‘+’:

result = temp + temp1;

break;

case ‘-‘:

result = temp – temp1;

break;

case ‘/’:

result = temp / temp1;

break;

case ‘\*’:

result = temp \* temp1;

break;

}

tfield.setText(“”);

tfield.setText(tfield.getText() + result);

z = 1;

}

}

if (s.equals(“n!”))

{

if (tfield.getText().equals(“”))

{

tfield.setText(“”);

}

else

{

a = fact(Double.parseDouble(tfield.getText()));

tfield.setText(“”);

tfield.setText(tfield.getText() + a);

}

}

tfield.requestFocus();

}

double fact(double x)

{

int er = 0;

if (x < 0)

{

er = 20;

return 0;

}

double i, s = 1;

for (i = 2; i <= x; i += 1.0)

s \*= i;

return s;

}

public static void main(String args[])

{

try

{

UIManager.setLookAndFeel(“com.sun.java.swing.plaf.windows.WindowsLookAndFeel”);

}

catch (Exception e)

{

}

ScientificCalculator f = new ScientificCalculator();

f.setTitle(“ScientificCalculator”);

f.pack();

f.setVisible(true);

} }