JAVA IN SYLLABUS LAB PROGRAMS

1. Write a program to find the factorial of a given number.

import java.util.Scanner;

class Factorial{

public static int factorial(int n){

if (n >= 2)

return(n \* factorial(n-1));

else

return 1;

}

public static void main(String args[]){

int fact=1;

Scanner in=new Scanner(System.in);

System.out.println("Enter the number");

int number=in.nextInt();

fact = factorial(number);

System.out.println("Factorial of "+number+" is: "+fact);

}

}

2. Write a program to print numbers in sorting order.

import java.util.Scanner;

class Sort{

public static void main(String args[]){

Scanner s=new Scanner(System.in);

int i,j,k;

int a[]=new int[10];

System.out.println("Enter the total size of array");

int n=s.nextInt();

System.out.println("enter the elements to be inserted");

for(i=0;i<n;i++){

a[i]=s.nextInt();

}

for(i=0;i<n;i++){

for(j=i+1;j<n;j++){

if(a[i]>a[j]){

k=a[i];

a[i]=a[j];

a[j]=k;

}

}

}

System.out.println("Sorted numbers are:");

for(i=0;i<n;i++){

System.out.print(a[i]+"\t");

}

}

}

3. Create a class Odometer that displays the number of kilometers a vehicle run. Give samples as

trip information like number of kilometers travelled, fuel consumption per litre. The task is to

find the mileage of the vehicle running at different samples of trip information.

import java.util.Scanner;

class Odometer

{

public static void main(String args[])

{

float kilometersTravelled[]=new float[100];

float fuelConsumed[]=new float[100];

int cases;

float mileage=0.0f;

int i;

Scanner inp=new Scanner(System.in);

System.out.println("Enter total no. of sample cases");

cases=inp.nextInt();

for(i=0;i<cases;i++){

System.out.println("Enter no. of kilometers travelled");

kilometersTravelled[i]=inp.nextFloat();

System.out.println("Enter the fuel consumed in litres");

fuelConsumed[i]=inp.nextFloat();

mileage=mileage+kilometersTravelled[i]/fuelConsumed[i];

}

System.out.println("Mileage of vehicle="+mileage/cases);

}

}

4. Create a class Day that represents day, month and year of the calendar day. The class Day

should be able to accept the date, update the date, delete the date from a calendar list of

activities. Create a class Time that represents hours, minutes, seconds of a clock. The class

Time should accept the time, update the time, delete the time from a list of events created for

a day using the Day Class.

import java.util.Scanner;

import java.lang.\*;

class Day

{

int day,month,year,i;

void accept()

{

System.out.println("Enter day month and year:");

Scanner s=new Scanner(System.in);

day=s.nextInt();

month=s.nextInt();

year=s.nextInt();

}

void show()

{

System.out.println("Date=" +day+ "/" +month+ "/" +year);

}

}

class Time extends Day

{

int hrs,min,sec;

void intake()

{

System.out.println("Enter time in hours minutes and seconds:");

Scanner s =new Scanner(System.in);

hrs=s.nextInt();

min=s.nextInt();

sec=s.nextInt();

}

void display()

{

System.out.println("Time=" +hrs+ "/" +min+ "/" +sec);

}

}

class Event

{

public static void main(String args[])

{

int n,i,k,ch=1,d=1;

System.out.println("How many dates you want to store:");

Scanner obj=new Scanner(System.in);

n=obj.nextInt();

Time[] o=new Time[n];

for(i=0;i<n;i++)

{

o[i]=new Time();

o[i].accept();

o[i].intake();

}

for(i=0;i<n;i++)

{

o[i].show();

o[i].display();

}

while(ch==1)

{

System.out.println("Do you want to modify press 1 or Exit to press any button:");

ch=obj.nextInt();

if(ch==1)

{

System.out.println("Enter number of event:" );

k=obj.nextInt();

o[k-1].accept();

o[k-1].intake();

}

else

System.exit(0);

}

for(i=0;i<n;i++)

{

o[i].show();

o[i].display();

}

while(d==1)

{

System.out.println("Do you want to delete press 1 or Exit to press any button:");

d=obj.nextInt();

if(d==1)

{

System.out.println("Enter no. of event");

k=obj.nextInt();

o[k-1]=null;

for(i=0;i<n;i++)

{

if(i!=k-1)

{

o[i].show();

o[i].display();

}

}

}

else

System.exit(0);

}

}

}

**5. Write a Java program to illustrate the use of packages**

**Program:**

//In MyPack….

package MyPackage;

import java.util.\*;

public class MyPack

{

public int fact(int n)

{

int i,fact1=1;

for(i=1;i<=n;i++)

{

fact1\*=i;

}

return fact1;

}

public static void main(String args[])

{

int n;

MyPack m1=new MyPack();

Scanner ob=new Scanner(System.in);

System.out.print("Enter a number to find factorial ");

n=ob.nextInt();

System.out.println(m1.fact(n));

}

}

//In Main Class importing the package

import java.io.\*;

import java.util.\*;

import MyPackage.\*;

class Demo

{

public static void main(String[] args)

{

MyPack p=new MyPack();

Scanner ob=new Scanner(System.in);

System.out.print("Enter a number to find factorial ");

n=ob.nextInt();

System.out.println("Using MyPack method: Factorial "+p.fact(n));

}

}

**6. Write a Java program to implement interfaces.**

import java.util.Scanner;

interface Bank{

public void payment();

public void display();

}

class Creditcard implements Bank{

String cno=new String();

public void payment(){

String key=new String();

Scanner n=new Scanner(System.in);

System.out.println("Enter card no.:");

cno=n.nextLine();

System.out.println("Enter key");

key=n.nextLine();

}

public void display(){

System.out.println("Payment Details:");

System.out.println("Card no.="+cno);

System.out.println("Item name:Hard Disk");

System.out.println("Item cost=Rs.7000");

}

}

class Debitcard implements Bank{

String cno=new String();

public void payment(){

String key=new String();

Scanner n=new Scanner(System.in);

System.out.println("Enter card no.:");

cno=n.nextLine();

System.out.println("Enter key");

key=n.nextLine();

}

public void display(){

System.out.println("Payment Details:");

System.out.println("Card no.="+cno);

System.out.println("Item name:Hard Disk");

System.out.println("Item cost=Rs.7000");

}

}

class Cod implements Bank{

public void payment(){}

public void display(){

System.out.println("Payment Details:");

System.out.println("Item name:Hard Disk");

System.out.println("Item cost=Rs.7000");

}

}

class NetBanking implements Bank{

String cno=new String();

public void payment(){

String bankname=new String();

String key=new String();

Scanner n=new Scanner(System.in);

System.out.println("Enter bank name");

bankname=n.nextLine();

System.out.println("Enter card no.:");

cno=n.nextLine();

System.out.println("Enter key");

key=n.nextLine();

}

public void display(){

System.out.println("Payment Details:");

System.out.println("Card no.="+cno);

System.out.println("Item name:Hard Disk");

System.out.println("Item cost=Rs.7000");

}

}

class Pay{

public static void main(String args[])

{

int choice,i;

Scanner n=new Scanner(System.in);

System.out.println("Enter\n1.Credit card\n2.Debit card\n3.Cash on delivery\n4.Net Banking\n5.To cancel\n6.To Confirm");

for(i=0;i<2;i++){

choice=n.nextInt();

switch(choice){

case 1:

Creditcard c=new Creditcard();

c.payment();

c.display();

break;

case 2:

Debitcard d=new Debitcard();

d.payment();

d.display();

break;

case 3:

Cod co=new Cod();

co.payment();

co.display();

break;

case 4:

NetBanking nb=new NetBanking();

nb.payment();

nb.display();

break;

case 5:

System.out.println("Payment Cancelled");

break;

case 6:

System.out.println("Payment Successful");

break;

default:

System.out.println("Please try again later!");

break;

}

}

}

}

7. Write a program that implements a stack ADT that converts infix expression into postfix

expression

import java.util.Scanner;

class Postfix{

char st[]=new char[20];

int top=-1;

int stackfull(){

if(top==19)

return 1;

else

return 0;

}

int stack\_empty(){

if(top==-1)

return 1;

else

return 0;

}

void push(char ele){

if(stackfull()==0)

st[++top]=ele;

}

char pop(){

char del=' ';

if(stack\_empty()==0)

del=st[top--];

return del;

}

int precedence(char x){

switch(x){

case '-':return 1;

case '+':return 1;

case '\*':return 2;

case '/':return 2;

default:return 0;

}

}

void intopost(String s){

char output[]=new char[20];

char ch,x;

int i,t=-1;

for(i=0;i<s.length();i++){

ch=s.charAt(i);

if(ch>='a'&&ch<='z'||ch>='A'&&ch<='Z'||ch>='0'&&ch<='9'){

output[++t]=ch;

}

else if(ch=='(')

push(ch);

else if(ch==')'){

while((x=pop())!='(')

output[++t]=x;

}

else{

if(top==-1)

push(ch);

else{

if(precedence(st[top])<precedence(ch)){

push(ch);

}

if(precedence(st[top])>=precedence(ch)){

output[++t]=pop();

push(ch);

}

}

}

}

for(int j=0;j<20;j++){

System.out.print(output[j]);

}

while(top!=-1){

System.out.print(pop());

}

}

}

class StackAdt{

public static void main(String args[]){

String k=new String();

System.out.println("Enter the Infix Expression");

Scanner in=new Scanner(System.in);

k=in.nextLine();

System.out.println("Postfix Expression is: ");

Postfix p=new Postfix();

p.intopost(k);

}

}

8. Write a program to read a file and displays the file on the screen within line number before

each line

import java.io.\*;

class FileDisplay{

public static void main(String args[])throws IOException,FileNotFoundException{

FileInputStream fin=new FileInputStream("ABCD.txt");

BufferedReader br=new BufferedReader(new InputStreamReader(fin));

String str;

int n=0;

while((str=br.readLine())!=null){

n++;

System.out.println(n+". "+str);

}

br.close();

fin.close();

}

}

9. Write a program to copy contents of a file into another file using File streams.

import java.io.\*;

class Fileread{

public static void main(String args[])throws IOException,FileNotFoundException{

int num=0;

try{

FileInputStream fin=new FileInputStream("ABC.txt");

FileOutputStream fout=new FileOutputStream("XYZ.txt");

while((num=fin.read())!=-1)

fout.write((char)num);

fin.close();

fout.close();

}

catch(FileNotFoundException e){

System.out.println(e);

}

}

}

10. Write a program for handling ArrayIndexOutofBoundsException and Divide-by-zero Exception.

import java.io.\*;

class Exception1

{

public static void main(String args[])

{

int a[]=new int[3],c,d=20,b=0;

try

{

c=d/b;

System.out.println(c);

}

catch(Exception e)

{

System.out.println(e);

}

try

{

System.out.println(a[4]);

}

catch(Exception e)

{

System.out.println(e);

}

}

}

11. Write a program for custom exception creation.

import java.util.Scanner;

class InvalidAtmpinnumberException extends Exception

{

Long pin;

int n=0;

void checkpin(Long pin) throws InvalidAtmpinnumberException

{

this.pin=pin;

while(pin>0)

{

pin=pin/10;

n++;

}

if(n!=4)

{

throw new InvalidAtmpinnumberException();

}

else

{

System.out.println("valid pin number");

}

}

}

class CustomException

{

public static void main(String args[])

{

Long pin;

System.out.println("enter pin number");

Scanner s=new Scanner(System.in);

pin=s.nextLong();

InvalidAtmpinnumberException i=new InvalidAtmpinnumberException();

try

{

i.checkpin(pin);

}

catch(InvalidAtmpinnumberException e)

{

System.out.println(e);

}

}

}

12. Write a program on multi-threading showing how CPU time is shared among all the threads.

import java.util.Date;

class A implements Runnable{

String s;

long startTime=0;

A(String s){

this.s=s;

Thread t=new Thread(this,s);

t.start();

startTime=System.nanoTime();

}

public void run(){

try{

Thread.sleep(5000);

}

catch(InterruptedException e){

}

long endTime=System.nanoTime();

System.out.printf("%-5s spent %d CPU time in Nanoseconds\n",s,(endTime-startTime));

}

}

class TestTh{

public static void main(String args[]){

new A("Hello");

new A("Hi");

}

}

13. Write a program for Producer-Consumer problem using threads.

class Shared{

int n=0;

boolean turn=false;

synchronized void get(){

while(!turn){

try{

wait();

}

catch(InterruptedException e){}

}

System.out.println("GOT:"+n);

turn=false;

notify();

}

synchronized void put(int n){

while(turn){

try{

wait();

}

catch(InterruptedException e){}

}

this.n=n;

System.out.println("PUT:"+n);

turn=true;

notify();

}

}

class Producer implements Runnable{

Shared s;

int n;

Producer(Shared s){

this.s=s;

Thread t=new Thread(this,"Producer");

t.start();

}

public void run(){

while(true){

try{

n++;

s.put(n);

}

catch(Exception e){}

}

}

}

class Consumer implements Runnable{

Shared s;

Consumer(Shared s){

this.s=s;

Thread t=new Thread(this,"Consumer");

t.start();

}

public void run(){

while(true){

try{

s.get();

}

catch(Exception e){}

}

}

}

class ProCon{

public static void main(String args[]){

Shared s=new Shared();

new Producer(s);

new Consumer(s);

}

}

14. Write an applet that displays a simple message.

/\* <applet code = "BannerApplet" width = 1000 height = 600> </applet> \*/

import java.applet.\*;

import java.applet.\*;

import java.awt.\*;

public class BannerApplet extends Applet implements Runnable{

String str,str1;

Thread t;

char c,c1;

public void init(){

str="HELLO WORLD...THIS IS ROBO 2.0 :-) ";

str1="WELCOME TO THE WORLD OF ROBOTS ;-)";

}

public void start(){

t=new Thread(this);

t.start();

}

public void run(){

while(true){

try{

Thread.sleep(100);

repaint();

}

catch(InterruptedException e){}

}

}

public void paint(Graphics g)

{

g.setFont(new Font("Monospaced",Font.BOLD,50));

g.setColor(Color.orange);

c=str.charAt(0);

str=str.substring(1,str.length())+c;

g.drawString(str,0,200);

g.setColor(Color.blue);

c1=str1.charAt(0);

str1=str1.substring(1,str1.length())+c1;

g.drawString(str1,0,400);

}}

15. Write an applet to handle the mouse events and keyboard events.

/\*<applet code="MyEvent" width=1000 height=600>

</applet>\*/

import java.applet.Applet;

import java.awt.\*;

import java.awt.event.\*;

public class MyEvent extends Applet implements MouseListener,MouseMotionListener,KeyListener{

int x=0;

int y=0;

String msg="";

Font f;

public void init(){

setBackground(Color.blue);

addMouseListener(this);

addMouseMotionListener(this);

addKeyListener(this);

f=new Font("Serif",Font.BOLD,40);

}

public void mouseEntered(MouseEvent me){

showStatus("MouseEntered");

repaint();

}

public void mouseExited(MouseEvent me){

showStatus("Mouse Exited");

repaint();

}

public void mousePressed(MouseEvent me){

x=me.getX();

y=me.getY();

msg="The Mouse is Pressed at:"+x+","+y;

showStatus("Mouse Pressed");

repaint();

}

public void mouseReleased(MouseEvent me){

showStatus("Mouse Released");

repaint();

}

public void mouseMoved(MouseEvent me){

showStatus("Mouse Moved");

repaint();

}

public void mouseDragged(MouseEvent me){

showStatus("Mouse Dragged");

repaint();

}

public void mouseClicked(MouseEvent me){

showStatus("Mouse Clicked");

repaint();

}

public void keyTyped(KeyEvent k){

msg=msg+k.getKeyChar();

repaint();

}

public void keyPressed(KeyEvent k){

int key=k.getKeyCode();

switch(key){

case KeyEvent.VK\_UP:

msg="Pressed UP";

repaint();

break;

case KeyEvent.VK\_DOWN:

msg="Pressed Down";

repaint();

break;

case KeyEvent.VK\_SHIFT:

msg="Pressed Shift";

repaint();

break;

}

}

public void keyReleased(KeyEvent k){

showStatus("Key is Released");

}

public void paint(Graphics g){

g.setFont(f);

g.drawString(msg,x,y);

}

}

16. Write a program to develop a simple calculator. Using Grid layout arrange buttons for the digits and +,-,\* % operations. The computation should be performed with a button click “Compute”. Display the result on a text field.

/\*<applet code="Calculator" width=320 height=540>

</applet>\*/

import java.applet.\*;

import java.awt.\*;

import java.awt.event.\*;

import javax.swing.\*;

import javax.swing.event.\*;

public class Calculator extends Applet implements ActionListener{

Button b[]=new Button[20];

TextArea ta;

String str="";

public Insets getInsets(){

return new Insets(30,5,5,5);

}

public void init(){

setBackground(Color.black);

setForeground(Color.black);

ta=new TextArea(1,10);

ta.setVisible(true);

Font f=new Font("Monospaced",Font.BOLD,25);

Font f1=new Font("Monospaced",Font.BOLD,30);

ta.setFont(f1);

setFont(f);

setLayout(new BorderLayout());

add(ta,BorderLayout.NORTH);

Panel p1=new Panel();

Panel p2=new Panel();

p1.setLayout(new GridBagLayout());

p2.setLayout(new GridBagLayout());

GridBagConstraints gbc=new GridBagConstraints();

gbc.ipadx=50;

gbc.ipady=60;

b[1]=new Button("1");

gbc.gridx=0;

gbc.gridy=0;

p1.add(b[1],gbc);

b[1].addActionListener(this);

b[2]=new Button("2");

gbc.gridx=1;

gbc.gridy=0;

p1.add(b[2],gbc);

b[2].addActionListener(this);

b[3]=new Button("3");

gbc.gridx=2;

gbc.gridy=0;

p1.add(b[3],gbc);

b[3].addActionListener(this);

b[4]=new Button("4");

gbc.gridx=0;

gbc.gridy=1;

p1.add(b[4],gbc);

b[4].addActionListener(this);

b[5]=new Button("5");

gbc.gridx=1;

gbc.gridy=1;

p1.add(b[5],gbc);

b[5].addActionListener(this);

b[6]=new Button("6");

gbc.gridx=2;

gbc.gridy=1;

p1.add(b[6],gbc);

b[6].addActionListener(this);

b[7]=new Button("7");

gbc.gridx=0;

gbc.gridy=3;

p1.add(b[7],gbc);

b[7].addActionListener(this);

b[8]=new Button("8");

gbc.gridx=1;

gbc.gridy=3;

p1.add(b[8],gbc);

b[8].addActionListener(this);

b[9]=new Button("9");

gbc.gridx=2;

gbc.gridy=3;

p1.add(b[9],gbc);

b[9].addActionListener(this);

b[10]=new Button(".");

gbc.gridx=0;

gbc.gridy=4;

p1.add(b[10],gbc);

b[10].addActionListener(this);

b[11]=new Button("0");

gbc.gridx=1;

gbc.gridy=4;

p1.add(b[11],gbc);

b[11].addActionListener(this);

b[12]=new Button("x");

gbc.gridx=2;

gbc.gridy=4;

p1.add(b[12],gbc);

b[12].addActionListener(this);

b[13]=new Button("+");

gbc.gridx=0;

gbc.gridy=0;

gbc.ipadx=30;

gbc.ipady=60;

p2.add(b[13],gbc);

b[13].addActionListener(this);

b[14]=new Button("-");

gbc.gridx=0;

gbc.gridy=1;

gbc.ipadx=30;

gbc.ipady=30;

p2.add(b[14],gbc);

b[14].addActionListener(this);

b[15]=new Button("/");

gbc.gridx=0;

gbc.gridy=2;

gbc.ipadx=30;

gbc.ipady=30;

p2.add(b[15],gbc);

b[15].addActionListener(this);

b[16]=new Button("\*");

gbc.gridx=0;

gbc.gridy=3;

gbc.ipadx=12;

gbc.ipady=30;

gbc.fill=GridBagConstraints.HORIZONTAL;

p2.add(b[16],gbc);

b[16].addActionListener(this);

b[17]=new Button("=");

gbc.gridx=0;

gbc.gridy=4;

gbc.ipadx=12;

gbc.ipady=55;

p2.add(b[17],gbc);

b[17].addActionListener(this);

b[18]=new Button("CLEAR");

add(b[18],BorderLayout.SOUTH);

b[18].setBackground(new Color(255,140,0));

b[18].addActionListener(this);

add(p1,BorderLayout.WEST);

add(p2,BorderLayout.EAST);

}

public void actionPerformed(ActionEvent ae){

if(ae.getSource()==b[18])

{

str="";

ta.setText("");

}

if(ae.getSource()==b[1])

{

ta.setText(str+='1');

}

if(ae.getSource()==b[2])

{

ta.setText(str+='2');

}

if(ae.getSource()==b[3])

{

ta.setText(str+='3');

}

if(ae.getSource()==b[4])

{

ta.setText(str+='4');

}

if(ae.getSource()==b[5])

{

ta.setText(str+='5');

}

if(ae.getSource()==b[6])

{

ta.setText(str+='6');

}

if(ae.getSource()==b[7])

{

ta.setText(str+='7');

}

if(ae.getSource()==b[8])

{

ta.setText(str+='8');

}

if(ae.getSource()==b[9])

{

ta.setText(str+='9');

}

if(ae.getSource()==b[10])

{

ta.setText(str+='.');

}

if(ae.getSource()==b[11])

{

ta.setText(str+='0');

}

if(ae.getSource()==b[12])

{

ta.setText(str=str.substring(0,str.length()-1));

}

if(ae.getSource()==b[13])

{

ta.setText(str+='+');

}

if(ae.getSource()==b[14])

{

ta.setText(str+='-');

}

if(ae.getSource()==b[16])

{

ta.setText(str+='\*');

}

if(ae.getSource()==b[15])

{

ta.setText(str+='/');

}

if(ae.getSource()==b[17])

{

float result=0;

char x='w';

boolean op=false;

String first,second;

first=second="";

float a,b;a=b=1;

for(int i=0;i<=str.length()-1;i++){

if(str.charAt(i)=='+'||str.charAt(i)=='-'||str.charAt(i)=='\*'||str.charAt(i)=='/'){

op=true;

x=str.charAt(i);

continue;

}

if(op==false)

first=first+str.charAt(i);

else

second=second+str.charAt(i);

}

a=Float.valueOf(first);

b=Float.valueOf(second);

if(x=='+')

result=(a+b);

if(x=='-')

result=(a-b);

if(x=='\*')

result=(a\*b);

if(x=='/')

result=(a/b);

ta.setText(""+result);

}

}

}