**1)Semester exam mark calculation inheritance and interface**

**Program:**

import java.util.\*;

interface grade

{

int S=10,A=9,B=8,C=7,D=6,E=5,p=4,U=0,ab=0,w=0,i=0;

}

class semmarks implements grade

{

/\*int m1,m2,m3,m4,m5,m6;

semmarks(int m1,int m2,int m3,int m4,int m5,int m6)

{

m1=m1;m2=m2;m3=m3;m4=m4;m5=m5;m6=m6;

}\*/

void calculate(int a[],int n)

{

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

{

if(a[i]>=90)

a[i]=10;

else if(a[i]>=80)

a[i]=9;

else if(a[i]>=70)

a[i]=8;

else if(a[i]>=60)

a[i]=7;

else if(a[i]>=50)

a[i]=6;

else if(a[i]>=40)

a[i]=5;

else

a[i]=0;

}

float gpa=(1\*a[0]+3\*a[1]+3\*a[2]+4\*a[3]+5\*a[4]+5\*a[5])/(21);

System.out.println("your gpa is: " + gpa);

}

}

class Semcala

{

public static void main(String args[])

{

int a[]=new int[6];

System.out.println("enter the credit wise subjects starting from 1");

Scanner s=new Scanner(System.in);

for(int i=0;i<6;i++)

{

a[i]=s.nextInt();

}

semmarkssm=new semmarks();

sm.calculate(a,6);

}

}

**Output:**

**C:\Users\mhite\Documents\java programing\java>javac Semcala.java**

**C:\Users\mhite\Documents\java programing\java>java Semcala**

**enter the credit wise subjects starting from 1**

**48**

**67**

**56**

**65**

**76**

**67**

**your gpa is: 7.0**

**2)Area calculation using interface**

**Program:**

interface Figure

{

double pi=3.14;

float area1();

}

class circle implements Figure

{

float r;

double area;

{

r=20;

}

public float area1()

{

area=pi\*r\*r;

System.out.println("Area of circle"+area);

return 0;

}

}

class triangle implements Figure

{

float l;

float h;

float area;

{

l=10;

h=20;

}

public float area1()

{

area=l\*h/2;

System.out.println("Area of triangle"+area);

return 0;

}

}

class rectangle implements Figure

{

float l;

float b;

float area;

{

l=10;

b=20;

}

public float area1()

{

area=l\*b;

System.out.println("Area of rectangle"+area);

return 0;

}

}

class Testareass

{

public static void main(String args[])

{

circle c=new circle();

rectangle r=new rectangle();

triangle t=new triangle();

Figure f;

f=c;

f.area1();

f=r;

f.area1();

f=t;

f.area1();

}

}

**Output**

**C:\Users\mhite\Documents\java programing\java>javac Testareass.java**

**C:\Users\mhite\Documents\java programing\java>java Testareass**

**Area of circle1256.0**

**Area of rectangle200.0**

**Area of triangle100.0**

**3)write a program to perform string operations using array list**

**Program:**

import java.util.\*;

import java.io.\*;

public class Arraylistexample1

{

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

{

ArrayList<String> obj = new ArrayList<String>();

DataInputStream in=new DataInputStream(System.in);

int c,ch;

int i,j;

String str,str1;

do

{

System.out.println("STRING MANIPULATION");

System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

System.out.println("1. Append at end \t 2.Insert at particular index \t 3.Search \t");

System.out.println("4. List string that starting with letter \t");

System.out.println("5. Size \t 6.Remove \t 7.Sort \t 8.Display\t" );

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

c=Integer.parseInt(in.readLine());

switch(c)

{

case 1:

{

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

str=in.readLine();

obj.add(str);

break;

}

case 2:

{

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

str=in.readLine();

System.out.println("Specify the index/position to insert");

i=Integer.parseInt(in.readLine());

obj.add(i-1,str);

System.out.println("The array list has following elements:"+obj);

break;

}

case 3:

{

System.out.println("Enter the string to search ");

str=in.readLine();

j=obj.indexOf(str);

if(j==-1)

System.out.println("Element not found");

else

System.out.println("Index of:"+str+"is"+j);

break;

}

case 4:

{

System.out.println("Enter the character to List string that starts with specified character");

str=in.readLine();

for(i=0;i<(obj.size()-1);i++)

{

str1=obj.get(i);

if(str1.startsWith(str))

{

System.out.println(str1);

}

}

break;

}

case 5:

{

System.out.println("Size of the list "+obj.size());

break;

}

case 6:

{

System.out.println("Enter the element to remove");

str=in.readLine();

if(obj.remove(str))

{

System.out.println("Element Removed"+str);

}

else

{

System.out.println("Element not present");

}

break;

}

case 7:

{

Collections.sort(obj);

System.out.println("The array list has following elements:"+obj);

break;

}

case 8:

{

System.out.println("The array list has following elements:"+obj);

break;

}

}

System.out.println("Please Enter 0 to break and 1 to continue");

ch=Integer.parseInt(in.readLine());

}while(ch==1);

}

}

**Output:**

**C:\Users\mhite\Documents\java programing\java>javac Testareass.java**

**C:\Users\mhite\Documents\java programing\java>java Testareass**

**STRING MANIPULATION**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**1. Append at end 2.Insert at particular index 3.Search**

**4. List string that starting with letter**

**5. Size 6.Remove 7.Sort 8.Display**

**Enter the choice**

**1**

**Enter the string**

**l**

**Please Enter 0 to break and 1 to continue**

**0**

**4) ADT stack**

**Program:**

import java.io.\*;

interface Stackoperation

{

public void push(int i);

public void pop();

}

class Astack implements Stackoperation

{

int stack[]=new int[5];

int top=-1;

int i;

public void push(int item)

{

if(top>=4)

{

System.out.println("Overflow");

}

else

{

top=top+1;

stack[top]=item;

System.out.print("Element pushed: "+stack[top]);

}

}

public void pop()

{

if(top<0)

System.out.println("Underflow");

else

{

System.out.print("Element popped: "+stack[top]);

top=top-1;

}

}

public void display() { if(top<0) System.out.println("No Element in stack"); else { for(i=0;i<=top;i++) System.out.println("Element:"+stack[i]); } }

}

class Testa

{

public static void main(String args[])

throws IOException

{

int ch,c;

int i;

Astack s=new Astack();

DataInputStream in=new DataInputStream(System.in);

do

{

try

{

System.out.println("ARRAY STACK");

System.out.println("1.Push 2.Pop 3.Display 4.Exit");

System.out.print("Enter your Choice:");

ch=Integer.parseInt(in.readLine());

switch(ch)

{

case 1: System.out.print("Enter the value to push:");

i=Integer.parseInt(in.readLine());

s.push(i);

break;

case 2: s.pop();

break;

case 3: System.out.println("The elements are: ");

s.display();

break;

default:

break;

}

}

catch(IOException e)

{

System.out.println("IO Error");

}

System.out.println("Please enter 0 to quit and 1 to continue ");

c=Integer.parseInt(in.readLine());

}

while(c==1);

}

}

**Output:**

**C:\Users\mhite\Documents\java programing\java>javac Testa.java**

**C:\Users\mhite\Documents\java programing java>java Testa**

**ARRAY STACK**

**1.Push 2.Pop 3.Display 4.Exit**

**Enter your Choice:1**

**Enter the value to push:1**

**Element pushed: 1Please enter 0 to quit and 1 to continue**

**0**

**5) Areas**

**Program:**

abstract class Shape

{

public int length=10;

public int breadth=20;

abstract void area();

}

class Rectangle extends Shape

{

void area()

{

int area = length\*breadth;

System.out.println("Area of Rectangle:"+area);

}

}

class Triangle extends Shape

{

void area()

{

int area = length\*breadth/2;

System.out.println("Area of Triangle :"+area);

}

}

class Cricle extends Shape

{

void area()

{

float area = 3.14f \* length \* length;

System.out.println("Area of circle:"+ area);

}

}

class Areas

{

public static void main(String arg[])

{

Rectangle r = new Rectangle();

r.area();

Triangle t = new Triangle();

t.area();

Cricle c = new Cricle();

c.area();

}

}

**Output:**

**C:\Users\mhite\Documents\java programing\java>javac Areas.java**

**C:\Users\mhite\Documents\java programing java>java Areas**

**Area of Rectangle:200**

**Area of Triangle :100**

**Area of circle:314.0**

**6)program to calculate area of different figures using interfaces**

interface Figure

{

double pi=3.14;

float area1();

}

class circle implements Figure

{

float r;

double area;

{

r=20;

}

public float area1()

{

area=pi\*r\*r;

System.out.println("Area of circle"+area);

return 0;}

}

class triangle implements Figure

{

float l;

float h;

float area;

{

l=10;

h=20;

}

public float area1()

{

area=l\*h/2;

System.out.println("Area of triangle"+area);

return 0;}

}

class rectangle implements Figure

{

float l;

float b;

float area;

{

l=10;

b=20;

}

public float area1()

{

area=l\*b;

System.out.println("Area of rectangle"+area);

return 0;}

}

class Testareass

{

public static void main(String args[])

{

circle c=new circle();

rectangle r=new rectangle();

triangle t=new triangle();

Figure f;

f=c;

f.area1();

f=r;

f.area1();

f=t;

f.area1();}

}

**Output:**

**C:\Users\mhite\Documents\java programing\java>javac Testareass.java**

**C:\Users\mhite\Documents\java programing java>java Testareass**

**Area of rectangle200.0**

**Area of triangle100.0**