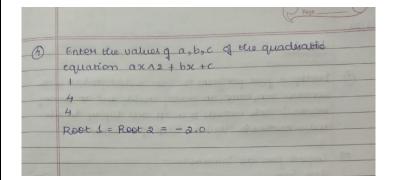
LAB PROGRAMS

1. Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

```
import java.util.Scanner;
class Quadratic
     public static void main(String args[])
           Scanner sc=new Scanner(System.in);
           int a,b,c;double d,r1,r2;
           System.out.println("Enter the values of a,b,c of the quadratic
equation ax^2+bx+c");
           a=sc.nextInt();
           b=sc.nextInt();
           c=sc.nextInt();
           if(a==0)
                 System.out.println("Invalid entry for the value of
\'a\'");
           else
                 d=(b*b)-4*a*c;
                 if(d<0)
                       System.out.println("No real solutions exist!");
                 else if(d>0)
                      r1=(-b+Math.sqrt(d))/(2*a);r2=(-b-
Math.sqrt(d))/(2*a);
                      System.out.println("Root 1 = "+r1+"\nRoot 2 = "+r2);
                 else
                 {
                      r1=-b/(2*a);
                       System.out.println("Root 1 = Root 2 = "+r1);
                 }
           }
     }
}
```

	LAB-OI
Q .	Develop a jour program that prints all real solutions to the quadratic equation ax2+bx+c=0. Read in
	a, b, c and use the quadratic formula. If the
	discriminate b'- 400 is negative, display a mexage
	stating that there are no real solutions.
7	import java util Scanners;
	days Quadratic
	§
	public static void main (String args[])
	Scanner sc = new Scanner (System.in);
	int a,b,c; double d,on, ora;
	System out println ("Enter the values of
	a,b,c of the quadratic equation ax^2+bx+c"
	a=sc.nextInt();
	b=sc.nextInt();
	C= sc.nextInt();
	ij(a==0)
	System out printin ("Invalid entry for the value of 'a'");
	else
	å d=(b*b)-4*a*c;
	if (9<0)
	System out println ("No real solutions
	exut!");
	else y (d<0)
	9
	911=(-b+ Math. squt(d))/(x a);
	912= (-b-Math. equt(d))/(2*a);
	Systemout. println("Root 1"= Root +011+
	"Root 2 = " + 912);

367.	& Parks
	3
	che
	1
	MI = -b/(2*a);
	System.out.posintln("Root 1 = Root 2 ="+31);
	3
	3
	3
	<u>3</u>
	Output.
1). Enter the values of a, b, c of the quadratic
	equation axx2 + bx + c
	0
	I was a second but and the second
	a
	Invalid entry for the value of 'a'
(2)	Enter the values of a, b, c of the quadratic
	equation ax 12 + bx +c
-	h
	3
	2
	No real solutions exist!
-	(pak)ul
3	Enter the values of a, b, c of the quadratic
1000	equation axx2 + bx+c
	The state of the s
	-12
	-28
	Root 1 = 14.0
1	Root 2 = -2,0
	A CONTRACTOR OF THE PARTY OF TH



2. Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.

```
import java.util.Scanner;
class Sgpa
{
String usn, name; int credits[]=new int[100]; float marks[]=new float[100];
void Sgpa(){}
int accept(){
Scanner sc=new Scanner(System.in);
System.out.println("Enter the name and usn of the student:");
name=sc.nextLine();
usn=sc.next();
System.out.println("Enter the number of the subjects:");
int n=sc.nextInt();
for(int i=0;i<n;i++){
System.out.println("Enter the credits of the subject followed by the marks
obtained in the subject:");
credits[i]=sc.nextInt();
marks[i]=sc.nextFloat();}
return n;
}
void display(int n){
System.out.println("Name of the student:"+name+"\nUSN of the
student:"+usn);
for(int i=0;i<n;i++)</pre>
System.out.println("Credits of subject"+(i+1)+":"+credits[i]+"\tMarks of
subject"+(i+1)+":"+marks[i]);
double sqpa_cal(int n){
double agg=0.0,s=0.0;int cr=0,crsum=0;
for(int i=0;i<n;i++){</pre>
if(marks[i]>=90)
cr=10;
else if(marks[i]>=80 && marks[i]<90)
else if(marks[i]>=70 && marks[i]<80)
else if(marks[i]>=60 && marks[i]<70)
cr=7;
else if(marks[i]>=50 && marks[i]<60)
cr=6;
else if(marks[i]>=40 && marks[i]<50)
cr=5;
else
cr=0;
agg+=credits[i]*cr;
crsum+=credits[i];
s=(agg/crsum);}
```

```
return s;
}
}
class Sgpa_main
{
public static void main(String args[]){
Sgpa a=new Sgpa();
int n=a.accept();
a.display(n);
System.out.println("SGPA :"+(a.sgpa_cal(n)));}
}
```

	Page
/1/24	The same of the sa
	LAB - 2
-	Develop a java program to create a class student with
1	member um, name, an array credits and an array
	marks Include methods to accept and display details
	and a method to calculate SGPA & a student
9	import javo util Scanner;
	class Sgpa
	String usn, name; int credital = new int[10]; float
	mark, []= new float [100];
	void sapa() Et
	int accept()
	1
	Scanner sc= new Scanner (system.in);
	System but printin ("Enten the USN and name of
	the student:");
	usn = sc.next(); name = scmextLine();
	System.out. println("Enter the number of subjects:");
	int n = sc.nextInt();
	System. Out. pointln("Enter the cuedite of the
	subject followed by marks obtained in the subject of jou lint i=0; icn; i++)
	(cueditati) = sc. next Int(); marks[i] = se. next Ital
	3 vietuan n;
	\$
	vold display (ht n)
	System but pointin ("Name of the student:"+
	name + "In USN of the student:" + usn);
	for (int i=0; i <n; i++)<="" td=""></n;>
	System out paintln ("Credit of subject" + (0":"+
	anodits[i]+ "It Marks of subject" + iii" + ""+
	marks[i]);
3	,

	C tele
	double sgpalal (int n)
	{ double agg = 0.0, s = 0.0; int on = 0, cusum = 0;
	for (int i=0; i <n; it+)<="" td=""></n;>
	ij (marks [i]>=90)
	Ot = 10;
	clse if (marks[i]>=80 & marks[i]<90)
	CM = 9;
	else if (marks [i]>= to & marks [i] < 80)
	CN = 8;
	else if (marks[i]>= 60 &8 marks[i]<70)
	어= 국;
	else ij (marks[i]>= 50 && marks[i]<60)
	o(=6;
	olse if (marks [i] >= 40 hb marks [i] < 50)
	01=5;
	else
	C4 = O;
	agg + = credits[i] * cr;
	cusum + = crediti [i];
	s= (agg/cusum);
	vetuens;
	2 Outlours,
/	
	class Sapa-main
	1
	public static void main (String args[])
	§ sgpaa=new sgpa();
	int n= a.accept();
	a. duplay (n):
	System. Out. posintly ("SGPA:"+ (a.sgpa-cal
	4
	2

Output:

Enter the USA and name of the student:

18M225111

Madhinholes

Firen the number of subjects:

2

Enter the number of subjects:

4

98

Enter the credit of the subject followed by marks
obtained in the subject:

3

88

Name of the student: Madhinholes

USN of the student: 18M2251111

Credit of subject: 3

Marks of subject: 32.0

Credit of subject: 3

Marks of subject: 32.0

Credit of subject: 3

Marks of subject: 32.0

Credit of subject: 3

3. Create a class Book which contains four members: name, author, price, num_pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a toString() method that could display the complete details of the book. Develop a Java program to create n book objects.

```
import java.util.Scanner;
class Book
String name, author; double price; int num_pages;
Book(){
name="";author="";price=0.0;num_pages=0;}
Book(String nme, String authr, double pric, int pages){
this.name=nme; this.author=authr; this.price=pric; this.num_pages=pages; }
/*void set(String nme, String authr, double pric, int pages){
this.name=nme; this.author=authr; this.price=pric; this.num_pages=pages; }*/
/*void display(){
System.out.println("Name of the book:"+name);
System.out.println("Author of the book:"+author);
System.out.println("Price of the book:"+price);
System.out.println("Number of pages of the book:"+num_pages);
}*/
public String toString()
return "\nDetails of the book:\nName of the book:"+name+"\nAuthor of the
book: "+author+"\nPrice of the book: "+price+"\nNumber of pages of the
book: "+num_pages;
}
void get(){
Scanner sc=new Scanner(System.in);
String nme; String authr; double pric; int pages;
System.out.println("Enter the number of books:");
int n=sc.nextInt();
Book a[]=new Book[n];
for(int i=0;i<n;i++){</pre>
System.out.println("Enter the name of the book:");
nme=sc.next();
System.out.println("Enter the name of the author of the book:");
authr=sc.next();
System.out.println("Enter the price of the book:");
pric=sc.nextDouble();
System.out.println("Enter the number of pages of the book:");
pages=sc.nextInt();
a[i]=new Book(nme,authr,pric,pages);
/*a[i].set(nme,authr,pric,pages);*/}
for(int i=0;i<n;i++){</pre>
System.out.println(a[i].toString());
```

```
class BookD
{
public static void main(String args[])
{
Book b=new Book();
b.get();
}
}
```

(1) Greate a days book which contains 4 members: name, author, price, nun pager Include a constructor to set the valuer for the members Includer of methods to set and get the details of the objects. Include a tostringer method that could display the complete details of the book. Dovelop a Java program to create a book objects. > import java util Scanner; class Book string name, author; double price; int num-pages; void Book () { name =" "; author=" "; price = 0.0; num pager = 0; Book void set (string nove, string author, double pric, int pages)
i this name = nme; this author = author; this price = pric; this parnum pages = pages; public string tostring() "n Detail of the book: "n Name of the book:"
+ hame + "n Author of the book: " + author +" "n Force of the book. + power

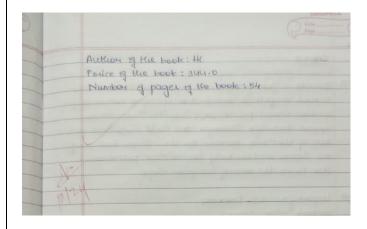
g the book." + num pages;

System out printin ("Enternos losts

for n= sc. restint); Police of the book: " + price + " In Number of pages void get() Scanney sc= now Scanner (Systemia):

Book at = now ecoting; double pric; int pages;
String nme, author; double pric; int pages;
System out printin ("Enter the name of the book.") + name nme = sc. next(); System out, pointin ("Enter the name of the author of the book: "); author = sc. next ();

System out pountly ("Enter the new pointer of the book:"); poric = sc nextDouble(); Systemour println ("Enter the number of pages of the book: "); pages = sc. nextInt(); a[i] = new Book ()me, author, pric, pages; a (i) set (nme, author, poric, pages); 4 for (int i=0; ixn; i++) System. out, printin (acil to string ()); { public static upid main (String augs []) Book to = new Book (); b. get (); Output Enter the number of books: Enter the name of the book: Hello Enter the name of the author of the book; Hi Enter the price of the book: 344 Enter the number of pager of the book: 54 Details of the book: Name of the book: Hello



4. Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.

```
import java.util.Scanner;
abstract class Shape
int a,b;
abstract void printArea();
class Rectangle extends Shape
{ void printArea(){
System.out.println("Area of Rectangle:" + (a*b));}
class Triangle extends Shape
{ void printArea(){
System.out.println("Area of Triangle:" + (.5*a*b));}
class Circle extends Shape
{ void printArea(){
System.out.println("Area of Circle: " +((22.0/7)*a*a));}
}
class Abs
public static void main(String args[])
{ Scanner sc= new Scanner(System.in);
Rectangle aa=new Rectangle();
Triangle bb=new Triangle();
Circle cc=new Circle();
System.out.println("Enter 1.Area of Rectangle\n2.Area of Triangle\n2.Area
of Circle");
int n=sc.nextInt();
switch(n)
{case 1:
System.out.println("Enter length and breadth of rectangle:");
aa.a=sc.nextInt();
aa.b=sc.nextInt();
aa.printArea();
break;
case 2:
System.out.println("Enter length and height of triangle:");
bb.a=sc.nextInt();
bb.b=sc.nextInt();
bb.printArea();
break;
System.out.println("Enter radius of circle:");
cc.a=sc.nextInt();
cc.printArea();
break;
```

```
default:System.out.println("Invalid choice");
}
}
```

3/1/24	
	LAB-3
0	Develop a Java program to areate an abstract class
	named shape that contains two integers, and an empty method named printhreal) Provide three classes
	hamed Rectarale, Triangle and arde said that
	one & the classes extends the class shape that a
	the classes contain only the method pountains
	that points the area of the given shape.
4	import java util Scanner;
	abstract class Shape
	{ int a,b;
	abstract void printAreal);
	class Rectangle extends Shape
	{ void paintAsea() }
	System out printin("Area of Rectargle: "+(a*b)
	3
	class Triangle extends Shape
	{ void printAnca() {
	System.out printin("Asea of Isriangle:"+ ((1/2.0) * a*b));
	4 ((9 8.0) # 442)),
	3
	days (inde extends shape
	{ void printarea() {
	System out pointin (" Assea of circle:"
	((sa.0/4) + a + a));
	4

class	, 01-
5	& Abs
1	public static void main (String angs[]) 3 Scanner &c = new Scanner (System in);
	Scanner & - new Pertanole ():
	Rectangle as = new pectangle ();
	Touangle bb = new Touangle (); Circle cc = new Circle();
	System out pointin ("Enter). Area of Reco
	In a. Assea of triangle \n3. Assea of circle
	int n = sc. nextInt();
	switch (n)
	i case 1:
	System out printing "Enter length an
	breadth of vectangle:");
	aa, a = sc. nextInt();
	aa · b = sc. nextInt();
	aa. print Area();
	break;
	coue 2:
	System.out. println("Enter length ar
	height & triangle;");
	bb. a = sc. nextInt();
	bb.b=sc.nextInt();
	bb. pointAvea();
	boreak;
	case 3:
	system out, pointin ("Enter oradius of
	cc.a=sc.nextInt();
	cc. pointAvea();
	break;
	default:
	System. out. pointln ("Irvalid choice"
	3
	3

	Output:
3.	Enter 1. Asiea of Rectangle
	2. Ausa of Triangle
	3. Asson & Civile
	1
	Enter length and breadth of suctaingle:
	2
	3
	Auea & Rectargle: 6
	. 4
II.	Enter 1. Area of Rectangle
	8. Area of Triongle
	3. Assert of circle
	Q .
	Enter length and height of triangle:
	2 0 0 0
11-16	3
	Area of triangle: 3.0
ba	C 1914 The State of Control of the State of Control of
TII.	Enter 1. Area of Rectangle
	2. Ausa of Triangle
	3. Area of circle
	3
	Enter Madius of ance:
	4
Section 1	Area of Circle: 154.0
	V

5. Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Cur-acct and Savacct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks: a) Accept deposit from customer and update the balance. b) Display the balance. c) Compute and deposit interest d) Permit withdrawal and update the balance Check for the minimum balance, impose penalty if necessary and update the balance.

```
import java.util.Scanner;
class Bank
{
    float balance;
}
class Account extends Bank
    String cus_name,acc_type;int acc_no;
    Account(String name,int acc_no,String acc_type)
this.cus_name=name;this.acc_no=acc_no;this.acc_type=acc_type;balance=0.0f;
    void setBal(float amt)
    {
        balance+=amt;
    void disBal(){
    System.out.println("Balance:Rs "+this.balance);
}
class Sav_acct extends Account
{
    float comp_int, withdrawal;
    Sav_acct(String name,int acc_no,String acc_type)
    {
        super(name,acc_no,acc_type);
    }
    void inter(float rate)
        System.out.println("Interest:"+(balance*rate/100));
        balance+=(balance*rate/100);
    }
}
class Cur_acct extends Account
    float comp_int,withdrawal;
    Cur_acct(String name,int acc_no,String acc_type)
    {
        super(name,acc_no,acc_type);
```

```
balance=0.0f;
    }
    void with(float amt){
        if(amt<balance)</pre>
        balance-=amt;
        else
        System.out.println("Amount exceeds balance!");
    if(balance<500)
            System.out.println("No minimum balance maintained!Rs.500 fine
levied."):
            balance-=500;
    }
}
class LabQ5
    public static void main(String args[])
        Scanner sc=new Scanner(System.in);
        int k=0, j=0; int ch; boolean t=true, t1=true;
        System.out.println("Enter the number of customers:");
        int n=sc.nextInt();
        Sav_acct a[]=new Sav_acct[n];Cur_acct b[]=new Cur_acct[n];
        for(int i=0;i<n;i++)</pre>
            System.out.println("Enter the name, Account type and Account
number of user" +(i+1)+":");
            String name=sc.next();
            String acc_type=sc.next();
            int acc_no=sc.nextInt();
            if(acc_type.equalsIgnoreCase("savings"))
                a[k]=new Sav_acct(name,acc_no,acc_type);
                while(t)
                    System.out.println("Enter 1.Update balance.\n2.Display
balance.\n3.Compute and deposit interest.\n4.End");
                    ch=sc.nextInt();
                    switch(ch){
                    case 1:System.out. println("Enter the deposit
amount:");
                    a[k].setBal(sc.nextFloat());
                    break;
                    case 2:
                    a[k].disBal();
                    break;
                    case 3:System.out.println("Enter the rate of
interest:");
                    a[k].inter(sc.nextFloat());
                    break;
```

```
case 4:t=false;break;
                    default:System.out.println("Invalid choice");
                }
                k++;
            }
            if(acc_type.equalsIgnoreCase("current"))
                b[j]=new Cur_acct(name,acc_no,acc_type);
                while(t1)
                    System.out.println("Enter 1.Update balance.\n2.Display
balance.\n3.withdraw and update balance.\n 4.End");
                    ch=sc.nextInt();
                    switch(ch){
                    case 1:System.out. println("Enter the deposit
amount:");
                    b[j].setBal(sc.nextFloat());
                    break;
                    case 2:
                    b[j].disBal();
                    break;
                    case 3:System.out. println("Enter the withdraw
amount:");
                    b[j].with(sc.nextFloat());
                    break;
                    case 4:t1=false;break;
                    default:System.out.println("Invalid choice");
                }j++;
            }
        }
    }
}
```

```
22/4/24
                   LAB-04
    es. Develop a jaw program to areate a days Bank Wat-
maintains two kinds of account jointh customers,
one cared ravings account and we other account
current account the savings account probables
compound interest and withdrawal facilities but no
thems had best to the control of themse had best to the control of the con
                    cheque book facility the current account perevides cheque book facility but no interest Current account holder should also maintain a minimum.
                         balance and if the balance falls below this level, a
                         sowice change is imposed Greate a class Account
                       that stones customer name, account number and type
                         of account Forem this donive the classes Cur-act
                         and Savacet to make them more specific to
                         their requirements. Include the necessary methods
                       In order to achieve the following tasks:
                        a) Accept deposit from customers and update the
                            b) Duplay the balance
                             c) Compute and deposit interest
                            d) Perimit withdrawal and update the balance.
                      Check for the minimum balance, impose penalty if
                     necessary and update the balance.
                     import java util scanner;
                     1 floar balance; 3 class Account extends Bank
                           string cus-name, acc-type; int acc-no;
                                       Account (string name, int acc-no, string acc_type)
                                     i this cu-name = name;
                                              this acc no = acc no;
                             this acc-type= acc-type; balance = 0;
```

```
void setBal (floar amt)
   } balance + = anit; &
   void disbal () }
    System out printin ("Balance: Rs" + Kin, balance);
dass law acct extends Account
I float comp_int, withwardfal;
      saw act ( string name, int acc no, string acc type)
     i super (name, acc-no, acc-type); 3
      void inter ( floar mare)
      3 System. Dut. pointin ("Interest:" + (barance *
      mite/100));
         balance + = (balance * rate /100);
class Cur acct extends Account
I float comp-int, withdrawal;
     Cur-acet (string name, int acc-no, string acc-type)
     & super (hame, acc-no, acc-type)
     1 balance = 0.0f; }
    void with ( float amt) {
if (amt < balance)
balance = amt;
         System aut println ("Amount exceeds balance!
        if (balance < 500)
         System out println ("No minimum balance
          maintained! Rs. 500 fine levied. ");
          balance - = 500;
```

```
class Lab 95
 public static void main ( string augs ( ))
     Scanner Lc= new Scanner (System.in);
       int k=0, j=0; int ch; boolean t= true;
       System out println ("Enter the number of
       customers: ");
        int n= sc. nextInt();
        Say acct all = new Say acct[n];
        Curacet b[] = new Curacet [n];
         for (int i=0; ixn; i++)
       & system out printin (" Enter the name,
  Account type and Account Number: ");
      String name = sc. next();
      String acc-type = sc. next();
           acc-no = sc nextInt();
        if (acc-type equal Ignorelase ("savings"))
          alk J = new Sav_acct (name, acc_no,
            acc-type);
           while (t)
          & system out printin ("Enter 1. Update
  balance Ind Display balance on 3, Compute and
  deposit interest. In 4. End");
             ch = sc. nextInt();
             switch (ch) &
             case 1: System out pointly (" Enter the
  deposit amount:");
             a[k]. setBal(sc. next Float());
             break;
             case 2: a[k]. dispall); break;
             System out paintin ("Enter the sinte of
   interest: "); alk J. inter (sc. next Float (); break;
             case 4: t= jake; bueak;
             default: System out pountin ("Invalid choice"
```

```
y (acc type equalifynous (are ("awwent"))
   blj] = new Cust-acct (name, acc_ne, acc_type);
      System our printin ("Enter 1. Update balance to
    while (t)
 2. Diplay kalance in 3. Wikiduan and update balance
 In 4. End ");
        ch = (c, next Intl);
        switch (ch){
        case 1: System out point in ("Enter the deposit
  amount:");
         bljJ. retBal (sc. next Float ()); break;
        case 2: b[j] disBal(); boreak;
        care 3: System out pointin ("Enter the
  withdraw amount: ");
         bljl. with (sc. next Float()); break;
        care 4: t= Jake; break;
        default: System out printin ("Invalid choice");
     3j++; €
 Output:
Enter the number of customers:
Enter the name, Account type and Account number of well:
 A
savings
123
Enter 1. Update balance
a. Display balance
```

	3. Compute and deposit interest.
	H. End
	4
	Enter the deposit amount:
	1200
	Enter 1. Update balance
	2. Duplay balance
-	3. Compute and deposit interest
	4. End
	3
	Enter the rate of interest:
	8
	Interest: 96.0
	Enter 1. Update balance
	2. Display balance
	3. Compute and deposit interest
	4. End
	3
	Balance: Rs 1296.0
	Entou 1. Update balance
	2. Duplay balance
	3. Compute and deposit into rest
	4. End
	4
	Entere the name, Account type and Account number of user
	В
	current
	334
	Enter 1. Update balance.
	3. Display balance
Ī	3. Withdraw and update balance
	4. End
	4. tha

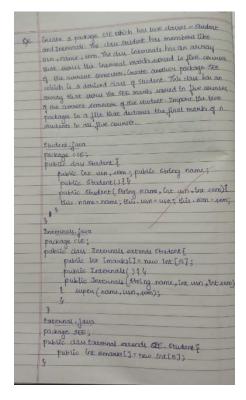
	The state of the s
26-	1200
	Enter 1. Update balance
	3. Display Datate.
	M. End
	8
	Balance: Ps 1200.0
	Enter 1. Update balance
	2. Display balance
	3. withdraw and update balance
	4. End
	Enter the withdraw amount:
	500
	Enter 1. Update balance
	2. Display balance
	3. withdraw and update balance
	4.End
	2
	Balance : Rs 700.0
	Enter 1, update balance
	8. Duplay balance
	3. Withdraw and update balance
	4. End
	3
	Enter the withdraw amount:
	401
	Amount exceeds balance!
	Enter 1. Update balance
	a. Display balance
	3. withdraw and update balance
	4. End
	3
	Enter the withdraw amount:

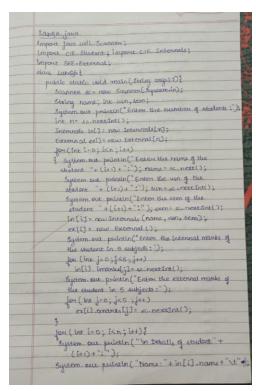
	Dets
600	
No minimum balance maintained 1, Rs 500	fine levied
Enter 1. Update balance	
2. Diplay balance 2. withdraw and update balance	
3. withdraw and update balance	
H. End	The same of the sa
2	- 13 Lab 19
Balance: Rs -400.0	
Enter 1. Update balance	
2. Diplay balance. 3. withdraw and update balance	
4. End	To the state of th
4. End	200000
4.	A. Krignie
	States .
The second secon	
The state of the s	interes.

6. Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student. Import the two packages in a file that declares the final marks of n students in all five courses.

```
<u>Student.java</u>
package CIE;
public class Student{
public int usn, sem; public String name;
Student(){}
Student(String name,int usn,int sem)
{this.name=name;this.usn=usn;this.sem=sem;
}
<u>Internals.java</u>
package CIE;
public class Internals extends Student{
public int imarks[]=new int[5];
Internals(){}
Internals(String name,int usn,int sem)
{super(name, usn, sem);
}
External.java
package SEE;
/*import CIE.Student;*/
public class External extends CIE.Student{
public int emarks[]=new int[5];
}
<u>LabQ6.java</u>
import java.util.Scanner;
import CIE.Student;import CIE.Internals;import SEE.External;
class LabQ6{
public static void main(String args[]){
Scanner sc=new Scanner(System.in);
String name; int usn, sem;
System.out.println("Enter the number of students:");
int n=sc.nextInt();
Internals in[]=new Internals[n];
External ex[]=new External[n];
for(int i=0;i<n;i++)</pre>
System.out.println("Enter the name of the student "+(i+1)+":");
name=sc.next();
System.out.println("Enter the usn of the student "+(i+1)+":");
usn=sc.nextInt();
System.out.println("Enter the sem of the student "+(i+1)+":");
sem=sc.nextInt();
```

```
in[i]=new Internals(name, usn, sem);
ex[i]=new External();
System.out.println("Enter the internal marks of the student in 5
subjects:");
for(int j=0;j<5;j++)
in[i].imarks[j]=sc.nextInt();
System.out.println("Enter the external marks of the student in 5
subjects:");
for(int j=0;j<5;j++)
ex[i].emarks[j]=sc.nextInt();
for(int i=0;i<n;i++)
System.out.println("\nDetails of student "+(i+1)+":");
System.out.print("Name:"+in[i].name+"\t");
System.out.print("USN:"+in[i].usn+"\t");
System.out.print("Sem:"+in[i].sem+"\t");
System.out.println("\nInternal marks:");
for(int j=0;j<5;j++)
System.out.print("Subject "+(j+1)+":"+in[i].imarks[j]+"\t");
System.out.println("\nExternal marks:");
for(int j=0;j<5;j++)
System.out.print("Subject "+(j+1)+":"+ex[i].emarks[j]+"\t");
System.out.println("Final marks:");
for(int j=0; j<5; j++)
System.out.println("Subject "+(j+1)+":"+(in[i].imarks[j]+ex[i].emarks[j]));
}
}
```





System and print ("USN: "+ in[i] usn+" \t")+

"Sen" + in[i] som + \t");

System and print ("M Internal marks");

System and print ("M Internal marks");

System and print ("Subject "+ (j+1)+" "+

System and print ("Subject "+ (j+1)+" "+

System and print ("Subject "+ (j+1)+" "+

EN[i] emark [j] + 't");

System and print ("Subject "+ (j+1)+" "+

en[in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

(in [in j=0; j=5; j++)

System and print ("Subject "+ (j+1)+" "+

enter the number of student :

2

Enter the number of student :

103

Enter the sem of the student :

104

25

Enter the internal marks of the student in 5 subjects:

105

23

Enter the external marks of the student in 5 subjects:

107

23

Enter the external marks of the student in 5 subjects:

108

209

Enter the external marks of the student in 5 subjects:

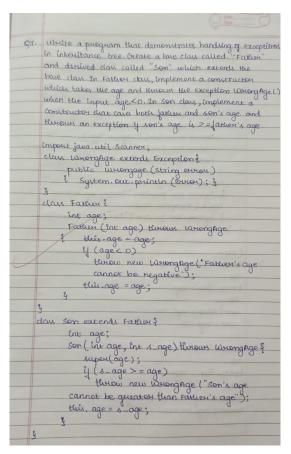
Subject 3:46
Subject 4:64
Subject 5:63

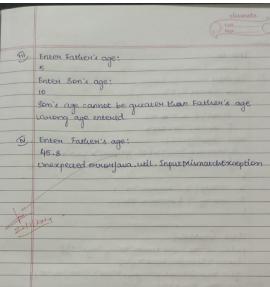
Tetails of student of:
Name: B USSI:345 Sem:3
Internal mouth:
Subject 1:145 Subject 3:34 Subject 4:09
Subject 5:10
Enternal mouth:
Subject 1:23 Subject 8:32 Subject 3:34 Subject 4:45.
Subject 5:4i
Float mouth:
Subject 1:68
Subject 3:46
Subject 1:44
3ubject 5:51

	34
	42
	21
	31
	Enter the name of the student &:
	B Enter the up of the student 2:
	345
	Enter the sem of the student of:
	3
400	Enter the internal marks of the student in 5 subjects:
	45
	4
	34
	29
	10
	Enter the external marks of the sandont in 5 subjects:
-/	a3
/	3
	34
	45
	Al
	Details of student 1:
	Name: A USN: 123 Sem: 2
	Internal marks:
	Subject 1:12 Subject 2:23 Subject 3:34 Subject 4:43
	Subject 5:32
	External marks:
	Subject 1:43 Subject 2:34 Subject 3:42 Subject 4:21
	Subject 5:31
	Final marks:
	Subject 1:55
	Subject 2:51
	- Long-

7. Write a program that demonstrates handling of exceptions in inheritance tree. Create a base class called "Father" and derived class called "Son" which extends the base class. In Father class, implement a constructor which takes the age and throws the exception WrongAge() when the input age=father's age.

```
import java.util.Scanner;
class WrongAge extends Exception{
WrongAge(String error)
{
     System.out.println(error);
}
}
class Father
int age;
Father(int age) throws WrongAge{
if(age<0)
throw new WrongAge("Father's age cannot be negative");
this.age=age;
}
}
class Son extends Father{
int age;
Son(int age,int s_age) throws WrongAge{
super(age);
if(s_age>=age)
throw new WrongAge("Son's age connot be greater than Father's age");
this.age=s_age;
}
}
class LabQ7{
public static void main(String args[]){
Scanner sc=new Scanner(System.in);
try{
System.out.println("Enter Father's age:");
int f_age=sc.nextInt();
System.out.println("Enter Son's age:");
int s_age=sc.nextInt();
Son a=new Son(f_age,s_age);
System.out.println("Father's age:"+f_age);
System.out.println("Son's age:"+s_age);
catch(WrongAge e)
{System.out.println("Wrong age entered");}
catch(Exception ee)
{System.out.println("Unexpected error"+ee);}
}}
```





days Labort public static void main (String augst 1)? Scanner sc = new Scanner (System. in); trys System. out, pulntin ("Enter Fathor's age:"); int f-age = 10. nextIntl); System out println ("Enter som's age:"); int sage = sc.nextInt(); son a =new son(f-age,s-age); system.out.println("Fallor's age:"+f-age); system.out.println("son's age;"+s-age); catch (whong Age e) { System our phintln(" whong age entered "); } cauch (Exception ee) 1 System. out. printin ("Unexpected everor fa); 3 Output: 2. Enter Father's age: 50 Enter Son's age: Son-Father's age: 50
Son's age: 20 1. Enter Father's age: Enter son's age: Father's age cannot be negative wrong age entered.

8. Write a program which creates two threads, one thread displaying "BMS College of Engineering" once every ten seconds and another displaying "CSE" once every two seconds.

```
class NewThread1 implements Runnable{
Thread t1;
NewThread1(){
t1=new Thread(this, "BMS_Thread");
public void run(){
try{
for(;;){
System.out.println("BMS College of Engineering");
Thread.sleep(10000);}
catch(InterruptedException e)
{System.out.println("Interruption detected while executing child thread
:");
}
}
}
class NewThread2 implements Runnable{
Thread t2;
NewThread2(){
t2=new Thread(this, "CSE_Thread");
public void run(){
try{
for(;;){
System.out.println("CSE");
Thread.sleep(2000);}
catch(InterruptedException e)
{System.out.println("Interruption detected while executing child thread
:");
}
}
}
class ThreadDemo{
public static void main(String args[]){
NewThread1 a=new NewThread1();
NewThread2 b=new NewThread2();
a.t1.start();
b.t2.start();
}
}
```

5.2.24 LAB- 06 98. wello a pringeran which areates & thereads, one thread displaying "EMS college of Engineering" once every ten seconds and another duplaying "CSE" once every two seconds. dass NowThroads implements Rumable ? Thoroad tt: NewThread () { t1 = new Thread (this," BMS_Thread"); 4 public void orun () { tryl for(;;){
 system.out.pointln("BMS College of Engineering"); Thread sleep (10000); 3 catch (Intersupted Exception e) & System. out. println ("Interocuption detected while executing duild thread "); 3 3 class NewThousand implements Runnable & Thread ta: New Threada () { ta = new Thread (this " CSE Thread"); 3 fublic void oun() } try { for(;;) ? System. out. pointin ("CSE"); Thread sleep (2000); 33 catch (Interrupted Exception e) E System out printin ("Interruption detected while executing

child thread"); 433 clay ThreadDemo ? public staric void main (string angs ()) { NewThreads a = new NewThreads (); Newthreads b = new Newthreads (); a.tl. start(); b. ta. staru(); Output: BMS college & Engineering CSE CKE CSE CSE BIMS courge of Engineering CSE CSE CSE CSE CSE

AWT Programs Observations:

LAB-01 AWT programs - REPORT (1) buttendereg. java - It spens a Button Game window with 3x3 tiles with numbers and provides used with buttons for vieret, stork and viertant. Once clicked on start, user can click on two tiles and simultaneously clicked tiles get swapped User can click on visset to start the game again. @. Buttonlist jaca - It opens a Buttonlist window with three buttons-yes, no, undecided and has a default text HELLD Once dicking on yes, the wirdow writes the text - you pressed yes. Similarly on dicking No, -> You possed No.

and on dicking Undecided -> You pressed Undecided 3 ButtonList D. java - It opens ButtonList D window with three puttons - yes, no, undecided on clicking yes, a Dialog window appears with message you powed yes and an OK button Similarly en dicking No, You preced No and on dicking Undecided, You pressed Undecided in Departe dialog bonces (4) DivisionMain java - It opens DivisionOf Truegess wirdow with jields to order a numbers and a button RESULT, on dicking which the two numbers and quotient will appear on the window after Result: It gives and intakes numbers in float data type.

DevisionMaint. juva - It opens a Phrision Itargesu window similar to last pregnam But the negatite provided will be integers. numbers and the quotient in float.

(Extical Demo. java - It opens a IF-Latel Demo window with fields for entering name and password on clicking enter after entering the name, the text entered appears after Name. Similarly on clicking enter agen entering the password, it appears next to Password on selecting some letters in name field and clicking enter, the selected text appears next to select text in name. Password exceives the input and displays it three after encuyting it to?

