B.M.S. College of Engineering (Autonomous Institution affiliated to VTU, Belagavi)

Department of Computer Science and Engineering



JAVA

Laboratory Experiments

NAME: MAHIKA D

CLASS: 3C

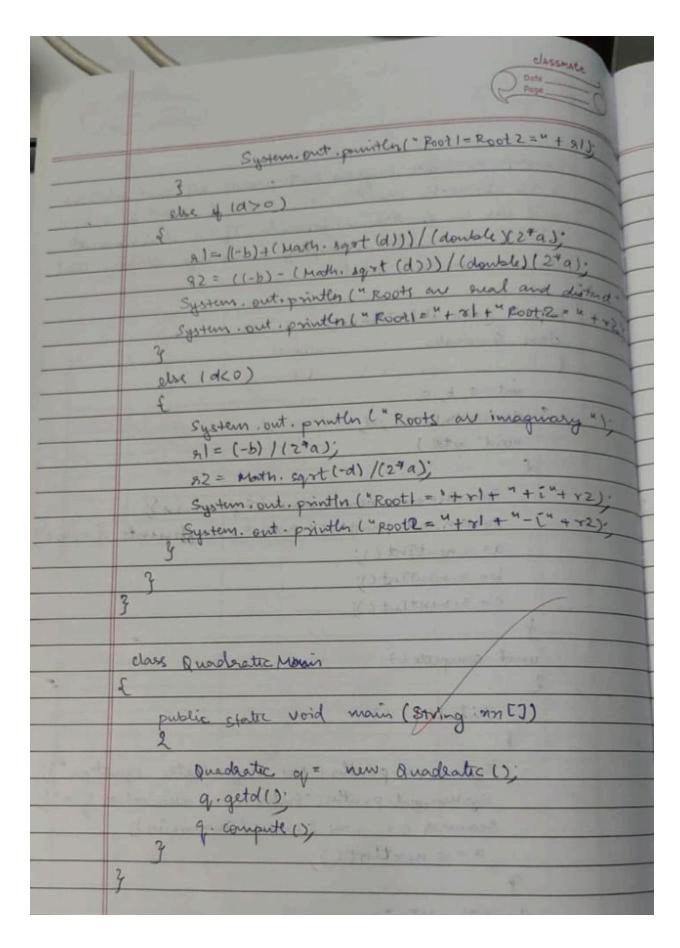
USN:1BM22CS142

BATCH: II

- Q1) 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 discriminant b2-4ac is negative,

display a message stating that there are no real solutions.

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9)	Touchop a Java program that points all and solution to the quadratic equation as +6x+c=0. Read in 9,6, and us the quadratic formula. If the diss investible - unc is negative, display a nurseap stating the three are no real solutions.
9.5.	The state of the s
	import java. util . Scanner;
	class Quadratic
	internal and a second a second and a second
5/7/	int a, b, c
	wind the
	double only one di
-64	Setund Setund
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	while (a==0)
	*
	System. and printly (" Not a graduatic equation
	System. out. printly ("Enter a non zero value of
	Scanner 5 = new Scanner (System in);
	a=s.nextInt();
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	d= b*b-H*a*c;
	if (d==0)
	91=(-6)/(2*a);
	System. out. pountlis 1 "Roots are real and e
	signim. tun. puntiture c poors are real and



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Roots are neal and
 Root1 = 4.0 and Root2 = 3.0
Enter the wefficients of a, b and c
Poots are imaginary
 Root1 = -2.0 + iNAN
 Koot 2 - 2-0 - INAN
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```

```
import java.util.Scanner;
class Quadratic
{
  int a,b,c;
  double r1,r2,d;
  void getd()
{
    Scanner s = new Scanner(System.in);
    System.out.println("Enter the coefficients of a,b and c");
    a=s.nextInt();
    b=s.nextInt();
    c=s.nextInt();
```

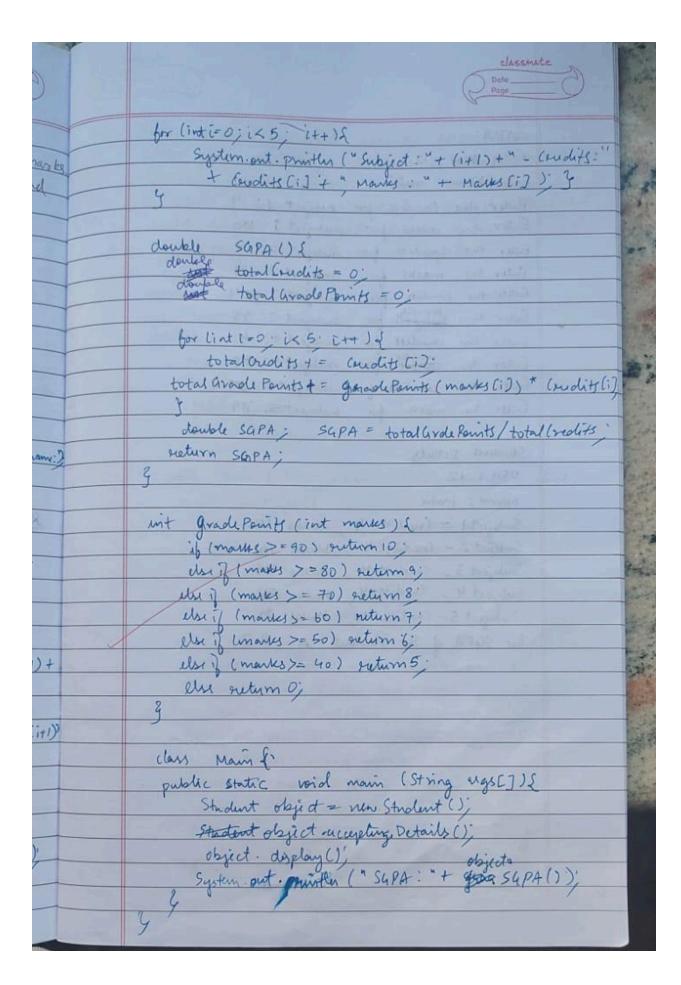
```
void compute()
while(a==0)
System.out.println("Not a quadratic equation, enter a non zero value of a");
Scanner s= new Scanner(System.in);
a=s.nextInt();
}
d=b*b-4*a*c;
if(d==0)
{
r1=(-b)/(2*a);
System.out.println("Roots are real and equal");
System.out.println("Root1 = Root2 ="+r1);
else if(d>0)
r1=((-b)+(Math.sqrt(d)))/(double)(2*a);
r2=((-b)-(Math.sqrt(d)))/(double)(2*a);
System.out.println("Roots are real and distinct");
System.out.println("Root1 ="+r1+" Root2 ="+r2);
}
else
System.out.println("Roots are imaginary");
r1=(-b)/(double)(2*a);
r2=(Math.sqrt(d))/(double)(2*a);
System.out.println("Root1 ="+r1+ "+ i"+r2);
System.out.println("Root2 ="+r1+ "- i"+r2);
class QuadraticMain
public static void main(String args[])
Quadratic q = new Quadratic();
q.getd();
q.compute();
```

Q2) 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.

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9.	Develop a Java perogram to counte class Student with	
	members new home, an other renders and an array market	
77-7-	Include method to accept and display details and	
	a method to calculate SGPA of a stardent	
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	class student &	
	Storing USN;	
	Staning Name;	
	not (matite 67)	
	int Marks (7)	
	void accepting Details if	
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	this. USN = s. nent (); System out. printler ("Enter name")	
	Trang - Struck CI,	
	ust Coudits = new int [6];	
	Marks = new int [5];	
	System. out. printly (" Enter The clutarits of credite and	
2	markes in pader: ");	
	attend white politice transmitted	ī
	for (int i=0; i<5; i+1)f	
100	· System. out printles ("Enter crudits for Subject" + (i+1)+.	
187 JE 1	h : -)	
	Crudits[i] = s. nentInt();	Ī
	System out puistly ("Enter the marks for subject" + (i+1)	
	+ · · ·);	
	Marks[i] = s.next Ent()'	
	3 STANKE LINE C.	i
	void dieder () S Sure I I I I'm () I I I I'm	
	Void display () & System god printly (" Strolent details:")	
	System - gett. grintles (" USN: " + USN);	
	System out . printles ("Name: "+ Name);	



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	OUTPUT:
5	Enter USN: 12
-	Enter Name: mahi
City	Enter the coudits for subject 1: 4
267	Futer the malks for surject
4	Enter the Coudits for subject 2: 4
	Enter the marks for subject 2:89
	Enter the condits for subject 3: 98 4
3	Enter the subjects for embried 3: 98
2	Enter the condits for subject 4: 48 Enter the condits for subject 4: 78
	Enter the contest for some
Lale (March	Enter the condits for subject 5: 89 4
	Enter the mass for subject 5: '89
- Stolenes	
	Student Petails:
	USn : 12
-	Nam: Wahi
	Subject 1 - Coudits: 4, Marks: 100
	Subject 2 - Credits: 4, Mays; 89
	Subject 3 - Consolits: 4, Marley. 98
	Subject 4 - Chedits: 4, narry: 78
-	Subject 5 - Credits: 4, Marles: 39
7	The SGPA of The student is : 9.2
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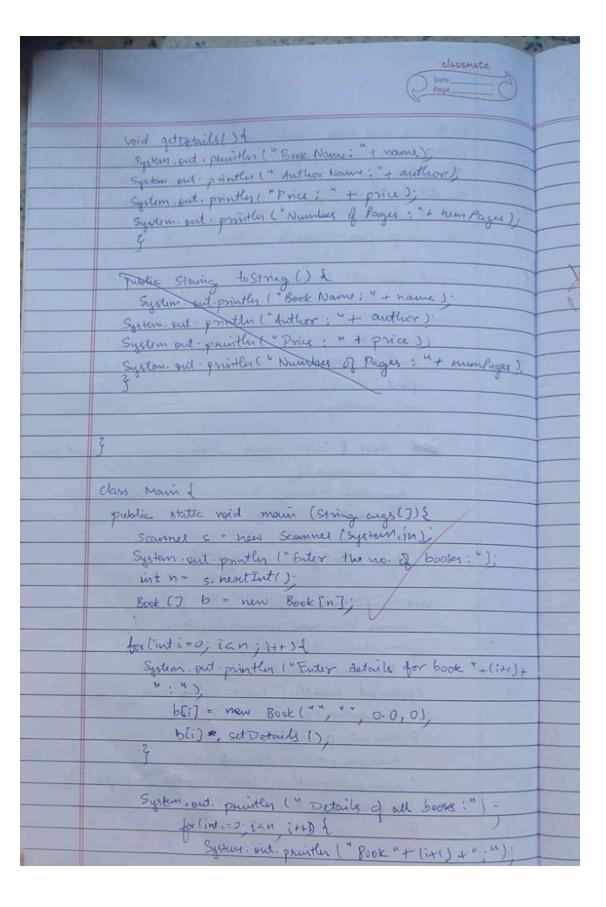
import java.util.Scanner;
class Student {
 String usn,name;
 int[] credits,marks;

```
void acceptDetails() {
  Scanner hello = new Scanner(System.in);
  System.out.print("Enter USN: ");
  this.usn = hello.next();
  System.out.print("Enter Name: ");
  this.name = hello.next();
  credits = new int[4];
  marks = new int[4];
  System.out.println("Enter details of credits and marks in order for 4 subjects:");
  for (int i = 0; i < 4; i++) {
     System.out.print("Enter credits for Subject " + (i + 1) + ": ");
     credits[i] = hello.nextInt();
     System.out.print("Enter marks for Subject " + (i + 1) + ": ");
     marks[i] = hello.nextInt();
  }
}
void display() {
  System.out.println("Student Details.");
  System.out.println("USN: " + usn);
  System.out.println("Name: " + name);
  for (int i = 0; i < 4; i++) {
     System.out.println("Subject " + (i + 1) + " - Credits: " + credits[i] + ", Marks: " + marks[i]);
  }
}
double calc() {
  int totalCredits = 0;
  double totalGradePoints = 0;
  for (int i = 0; i < 4; i++) {
     totalCredits += credits[i];
     totalGradePoints += gradePoints(marks[i]) * credits[i];
  }
```

```
return totalGradePoints / totalCredits;
  }
  int gradePoints(int marks) {
     if (marks >= 90) return 10;
     else if (marks >= 80) return 9;
     else if (marks >= 70) return 8;
     else if (marks >= 60) return 7;
     else if (marks >= 50) return 6;
     else if (marks >= 40) return 5;
     else return 0;
  }
}
public class SGPA {
  public static void main(String[] args) {
     Student student = new Student();
     student.acceptDetails();
     System.out.println("\nStudent Details:");
     student.display();
     System.out.println("\nSGPA: " + student.calc());
  }
}
```

Q3) 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.

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3.	Counte a class Book which contains four nembers: name,
	author, price, num pages. Include a constructor to set
	the value for the members. Tirelade method to set and get
	The details of the objects. Include to Storing is nother than
III BAIL	would desplay the complete details of the book Davidge
	a java praggam to create or book dejects.
	import java. util. Scanner;
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	class 8 ock f
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Luna	Storing Author
	floor puice;
	int numpages;
	Book & String name String author, float price
	int numPages){
	this name = name;
	ther author = author
	This paine = paine;
	this, numPages = numPages, 3
	- Stad Street - A Contract
	void set Details () {
	Scanner 5 - new Scanner (System. in);
	System out printle (" Enter Book name: ")
113577	this name = s-nextline();
+	System out penisther ("Fixer author name");
	this author = s. negttline();
	System out - penintlin ("Entro price: ");
	this. price = S. herot Double ();
	System and printled "Enter humber of pages:"),
	this numbages = sineret Int()
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queturn "Book Details: \n" t "Name; " + name + "Author" " + author + " \" + " Price ? " + price + "In" + " Number of Pages - + + numpages . for (int i=0; i<n; i++){
System. out. printler ("In Book "+ (i+1)+":m"+ books[i]. tostong ());

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	Enter author name: A
	actor price : 12
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	Constant No. 3 state	160
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```
import java.util.Scanner;
class Book {
String name;
String author;
double price;
int numPages;
public Book(String name, String author, double price, int numPages) {
this.name = name;
this.author = author;
this.price = price;
this.numPages = numPages;
  }
  public void setDetails() {
     Scanner scanner = new Scanner(System.in);
     System.out.print("Enter book name: ");
     this.name = scanner.nextLine();
     System.out.print("Enter author name: ");
     this.author = scanner.nextLine();
     System.out.print("Enter price: ");
     this.price = scanner.nextDouble();
     System.out.print("Enter number of pages: ");
     this.numPages = scanner.nextInt();
  }
  public void getDetails() {
     System.out.println("Book Name: " + name);
     System.out.println("Author: " + author);
     System.out.println("Price: $" + price);
     System.out.println("Number of Pages: " + numPages);
  }
  public String toString() {
```

```
return "Book Details using toString method:\n" +"Name: " + name + "\n" +"Author: " +
author + "\n" +"Price: " + price + "\n" +"Number of Pages: " + numPages ;
  }
}
class BOOK1 {
  public static void main(String[] args) {
     Scanner scanner = new Scanner(System.in);
     System.out.print("Enter the number of books: ");
     int n = scanner.nextInt();
     Book[] books = new Book[n];
     for (int i = 0; i < n; i++) {
        System.out.println("\nEnter details for Book " + (i + 1) + ":");
       books[i] = new Book("", "", 0.0, 0);
       books[i].setDetails();
     }
     System.out.println("\nDetails of all books:");
     for (int i = 0; i < n; i++) {
       System.out.println("\nBook " + (i + 1) + ":");
       books[i].getDetails();
     }
     for (int i = 0; i < n; i++) {
        System.out.println("\nBook " + (i + 1) + ":\n" + books[i].toString());
     }
  }
```

Q4) 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.

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-	clas Abstract {
	public static and main (String args [7) {
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	2. 2. Sustant 1 . 10 14
	case 3: System out printles (" Enles the height of
	and base of the triangle: ");
	t.m = s. next Int()
	t. n 2 8. nent Int ()
	i siem since
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	chefault: System. out-printer ("Invalic choice. Fully
	again "); bruak;
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	3
1 1 4 A SE	OUTPUT:
P. F.	Enter your choice:
Sheek 49	1. Pectangle 2. Corcle
	3. terlangle 4. Exit
)	Enter the breadth and height of the suctangle:
	The area of sectangle is: 70
4 4003	Inter your choice: 1. lectorigle
	2. Circle 2. Tuiangle
	4. Enit
	inter the geodies of the circle:
1	he area of circle is; 3.14286
E	inter your choice;
	1- Rectangle 2. arch
2	2. archi 3. Taianofi 1. Enit
3	

```
Enter the height and base of the triangle:

The area of triangle is: 12.0

Enter your choice:

1 Rectangle
2: Carele
3. Thiangle
4. Exit
```

```
import java.util.Scanner;
abstract class Shape{
int m, n;
abstract void printArea();
}
class Rectangle extends Shape{
void printArea(){
System.out.println("The area of rectangle is :"+(m*n));
}
class Circle extends Shape{
void printArea(){
System.out.println("The area of circle is :"+((22.0/7)*m*m));
}
}
class Triangle extends Shape{
void printArea(){
```

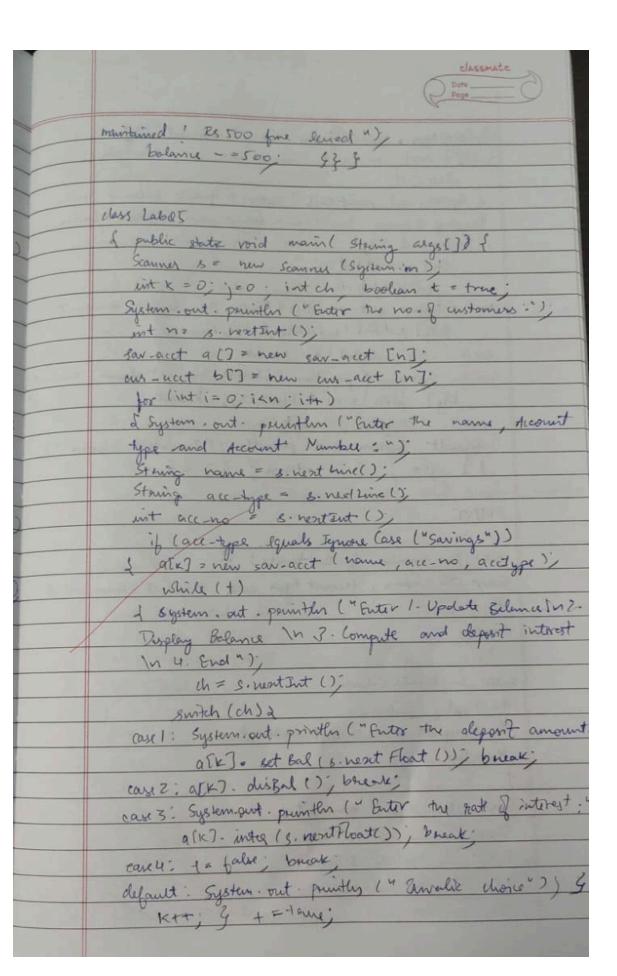
```
System.out.println("The area of triangle is :"+((1/2.0)*m*n));
}
}
class Abstract{
public static void main(String args[]){
Scanner s = new Scanner(System.in);
Rectangle r = new Rectangle();
Circle c = new Circle();
Triangle t=new Triangle();
while(true){
System.out.println("Enter your choice : \n 1.Rectangle \n 2.Circle \n 3.Triangle \n 4.Exit ");
int choice = s.nextInt();
switch(choice)
{
case 1 : System.out.println("Enter The breadth and height of the rectangle :");
        r.m=s.nextInt();
        r.n=s.nextInt();
        r.printArea();
        break;
case 2 : System.out.println("Enter the radius of the circle :");
        c.m=s.nextInt();
        c.printArea();
        break;
case 3: System.out.println("Enter The height and base of the triangle:");
        t.m=s.nextInt();
        t.n=s.nextInt();
        t.printArea();
        break;
case 4 :System.exit(0);
default :System.out.println("Invalid choice . Enter again");
        break;
```

Q5) 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 Sav-acct 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.

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	{ float balance; }
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	void disal () {
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	class son-acct extends account
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	a super (name, acc-no, acc-type); &
	void witer (float mete)
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	balance += (balance + rate /100); 33
	day an-acet extends tecourt
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	of super (name, are no, are type) & balance corof
	void with (float aint) ?
	of cant < belance)
	balance = ant;
	else
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	1 (balance (500)
	1 System. out - printler ("No minimum balance



1/ (acc-type , equals ignore (as 1" wrent ")) } i btj] = new an -act (name, acc-no, accetypes); whole (+1) System. out point kind " Buter 1. Update balance in 2. Display Elance in 3- Withdraw and Update Volan. 114. End -) ch = s. next Int (); entel(h) { ase 1: System out pointly 1 Forter The deposit amount. 657 set Bal 15. nent Hoat (S); Ismale cast 2: 507, duBal L); break Case 3: System and pountly (: bufer the withdraw amount bij]. with 15 next Float (1); break; case 4: + + false & break; default: System out - praintly / " In volid choice " 3 5 j++; } + + + + + + ; 3 3 2 3 OUTPUT: Futer the number of they tomels; 2 Enter the name, Account type and Account mumber of Savings 123 Enter 1. Vpolate Balance a. Display Balance. 3. Compute and aleposit interest 4- End Enter the digest amount; 1200 Enter 2. Upalate Salance 2. Display Balance 5. Computs and deposit interest

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	2. Display balance
	3 Compute and deposit interest
	4. End
	Balance: Rs 1296.0
	Enter 1. Update balance
	2. Display balance
	3. Compute and deposit interset
	4- End
	Enter the name, Account type and Account number
	of men2;
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	2-Display balance
	3. Withdraw and update bulance
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```
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)
     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++)
    {
       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++;
       }
    }
 }
```

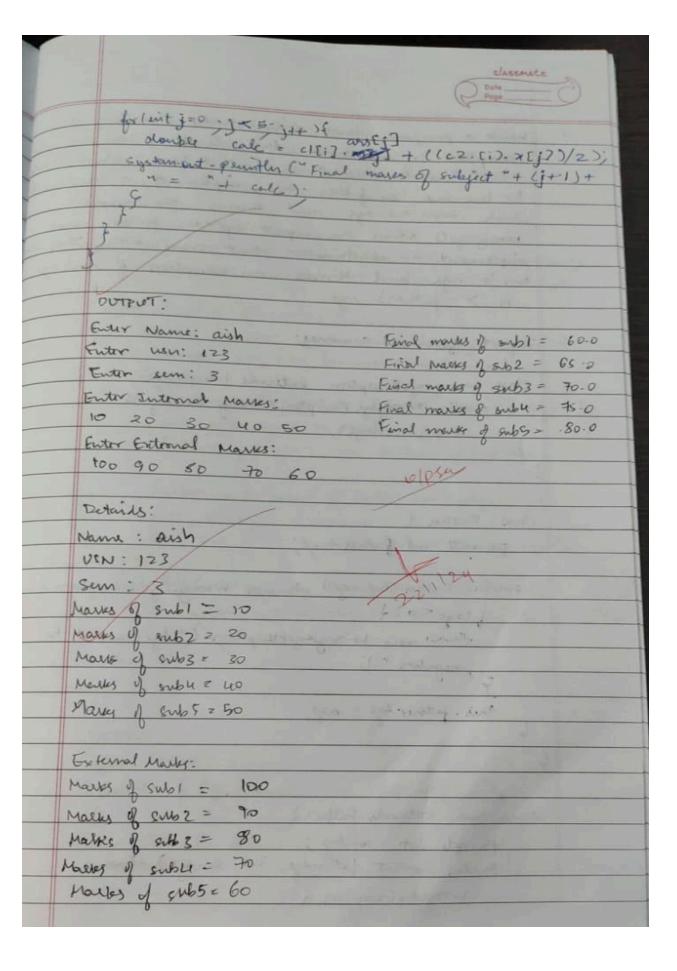
Q6)Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External 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.

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6.	Caesate a package CIE which has two classes - Student and Internals. The class student has members like cum, your
	The stand without her and among the
545	
1	class Externals which is a derived class of student
	class Externals which is a derived class of student onis class has an array, that stones the SET walks scored in
13	5 courses of this current semester of the student. Temport the
	the packages in a file that accounts
	gladente in all fire courses.
	package (IE,
	import java utile Scanner;
	public class Student &
	public string user,
	public String name:
	public int sem;
	public void accept () {
	Sommer S= new Scanner (System. 181)
	System out points (" Futer name "?
	thu name = s. next lunc
	System. out. pountly (" Enter Ven: ");
	that user = 8-nearthine ()
	System. port. pourolly ("Enter sem");
	thu, sum = s. neart Int ();
	7
	1 110
	public roid display. (12
	System-out pountly (" Name: "+ this name + 10
	Systemout. printler ("Name: "+ this.name +" le VSN; " + this. VSN + " IN Sens: "+ this. sem
	¥
	ç

simport java util scanner. public clars Internal enterry CIE. Student & public Int ars[] = new int(5); CIE student Student = new CIE. Student () public roid accept() { Student . Accept ()! Scanner 5 = new Scanner Csystem in); System out. pourtly ("Futer Justemal maries: ") for lived i=0; ix5; i++)d 3 aux (i) = s. next Iret () public void display () & System. out. possithis 1" Mary of subject "+ (i+1)+ " = " 4 ari [i]); package SEE , was a to 19 hours at import java util . Scanner import CIE. Student; public class Enternal entends (IE. Student { public int x[] = new int [5]; public void accept () } System. out-printly 1 the External Marks: ") porlint i= 0, ix5; i+1) & 2(1) = S. neutsut ();

public void display () 4. forlint i=0; izs, itid & ... System. out pourten ("Marks of sub" + (1+1)+" = 4 public class Maint public south void made (Storing arge []) & import java. util. Scanner impost SEE; public class Final of public state void main (strying args [3) } Scanner s= new Scanner (system in) System. oud. printles ("Enter n:") int 9 = s. next Int () CLE. Internal PJ (1 = new CLE. Internal [n]) SEE-Enternal [] (2 - new SEE. External En] for (not i=0; ix it) d CIPIZ = new CIE - Internal (); c2Ci72 new SEE. Britanal (); (IEI]. accept(); c(ti)-display ():



```
package CIE;
import java.util.Scanner;
public class Internal extends CIE.Student{
  public int m[] = new int[5];
  CIE.Student student = new CIE.Student();
  public void accept(){
     student.accept();
     Scanner s1 = new Scanner(System.in);
     System.out.println("Enter Internal Marks:");
     for(int i=0; i<5; i++){
       m[i] = s1.nextInt();
  }
  public void display(){
     student.display();
     for(int i=0;i<5;i++){
        System.out.println("Marks of sub" + (i+1) + " = " + m[i]);
  }
}
package SEE;
import java.util.Scanner;
import CIE.Internal;
import CIE.Student;
public class External extends CIE.Student{
  public int x[] = new int[5];
  public void accept(){
     Scanner s2 = new Scanner(System.in);
     System.out.println("Enter External Marks:");
     for(int i=0; i<5; i++){
       x[i] = s2.nextInt();
```

```
}
  }
  public void display(){
     for(int i=0;i<5;i++){
       System.out.println("Marks of sub" + (i+1) + " = " + x[i]);
     }
  }
}
package CIE;
import java.util.Scanner;
public class Student{
  public String usn;
  public String name;
  public int sem;
  public void accept(){
     Scanner s = new Scanner(System.in);
     System.out.println("Enter Name:");
     this.name = s.nextLine();
     System.out.println("Enter usn:");
     this.usn = s.nextLine();
     System.out.println("Enter sem");
     this.sem = s.nextInt();
  }
  public void display(){
     System.out.println("Name: " + this.name + "\nUSN: " + this.usn + "\nSem: " + this.sem);
  }
}
import java.util.Scanner;
import CIE.Student;
import CIE.Internal;
import SEE.External;
public class Final{
```

```
public static void main(String[] args) {
     Scanner n = new Scanner(System.in);
     System.out.println("Enter n:");
     int y = n.nextInt();
     CIE.Internal[] c1 = new CIE.Internal[y];
     SEE.External[] c2 = new SEE.External[y];
     for(int i=0;i< y;i++){
        c1[i] = new CIE.Internal();
        c2[i] = new SEE.External();
        c1[i].accept();
        c2[i].accept();
        // c1[i].accept();c2[i].accept();
        c1[i].display();c2[i].display();
        for(int j=0; j<5; j++){
          double calc = c1[i].m[j]+((c2[i].x[j])/2);
          System.out.println("Final marks of sub["+(j+1)+"]= "+calc);
       }
    }
  }
}
```

Q7)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<0. In Son class, implement a constructor that cases both father and son's age and throws an exception if son's age is >=father's age.

	Classinate Comp.
4.	work a program that demonstrates landling of
-	exceptions in inheritance true. Count a law class all
	toother and olivined class called som which eve
	the base class in father class, implement a constant
	which takes the age and throws the exception
	wrong type when the input age < 0. In som class
	implement a constauctor that cases both father a
	bon's age and throws an exception of son's egg
	is > father's age.
2611	
41.55	impost jang. util. Scanner.
200	Clay are a constant
0.4	Clare wronging Exception enterede Enceptioned
2 -0	public wrong tye Exception (String message) {
	Super (menoge);
2	Stand bunks wid
8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	CALL SINGLE STATE OF THE STATE
	Class Forthy (
	private and father tage;
	public Foother (ind age) therows wrong age Emception of
	il lane (0) }
	the state of the s
	throw rare wrong sojetniception (" Age cannot be negative ");
- 1	Z, negative ");
	The second of th
	This father Age = age;
	0 8/
14	
	TO STATE THAT IS NOT THE OWNER, AND
	901 - 110 6 mill
ch	es son enteredy Futher of
	pservate int bondage;
	Public Conflict lather but a 1 1
	public Contint fatherage, int Sonage) - Knows
-	Wrong Age Exception of

Super (father Age). If (son Age > = father Age) theores new Wrongsge Foxeption ("Son's age should be lus than Father's age") System.out. pourtles ("tather's Age: "+ father age) 5 Que System. out printh ("son 's Age: " + son Age gublic class Exception Inheritance of public state void wais (String arget7) of Scanner s= new Scanner (System. in); System . out . print en ("Enter Father's Age!") Father father onen Father (father Age) System out print ("Buter Son's Age: ") int son Age - Scanner next Int (); Sol son = new Son C fatherage, sonAge): cattleh (Wrong age traception e) of System. aut puirtle ("Exception: "+ e. get menage (1) QUTPUT: Enter Father's age = -1 Enception: Age commet be negetive Enter Father's Age : 50 Pather's Ag Enter Son's Age: 59

```
Enception: Son's age should be less than Father's age

Ender Father's Age: 60

Fular Son's Age: 40

Son's Age: 40.
```

CODE:

```
import java.util.Scanner;

class WrongAgeException extends Exception {
    public WrongAgeException(String message) {
        super(message);
    }
}

class Father {
    private int fatherAge;

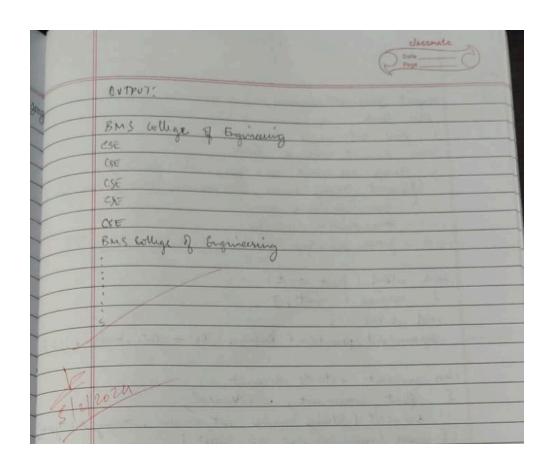
    public Father(int age) throws WrongAgeException {
        if (age < 0) {
            throw new WrongAgeException("Age cannot be negative");
        }
        this.fatherAge = age;
    }
}

class Son extends Father {
    private int sonAge;
    public Son(int fatherAge, int sonAge) throws WrongAgeException {</pre>
```

```
super(fatherAge);
     if (sonAge >= fatherAge) {
       throw new WrongAgeException("Son's age should be less than Father's age");
     this.sonAge = sonAge;
     System.out.println("Father's Age: " + fatherAge);
     System.out.println("Son's Age: " + sonAge);
  }
}
public class ExceptionInheritanceDemo {
  public static void main(String[] args) {
     Scanner scanner = new Scanner(System.in);
     try {
       System.out.print("Enter Father's Age: ");
       int fatherAge = scanner.nextInt();
       Father father = new Father(fatherAge);
       System.out.print("Enter Son's Age: ");
       int sonAge = scanner.nextInt();
       Son son = new Son(fatherAge, sonAge);
     } catch (WrongAgeException e) {
       System.out.println("Exception: " + e.getMessage());
     }
```

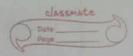
Q8)Write a program which creates two threads, one thread displaying "BMS College of Engineering" once every ten seconds and another displaying "CSE" once every two seconds.

W. T.	Classmate Dute Page
8	Wente a program which constes 2 threads, one thread displaying "Bris college of Engineering" once every ten seconde and the another displaying BE "est" ones every 2 seconds
w-	another displaying est "est" one arey 2 seconds
	was Thread portends Thread &
_	System out pointles ("BMS college of Engineering");
	Theread - sleep (10000);
	iatch (Interrupted Exception e) { }
	3.63
	class There d'2 enterells Three of &
1 1000	while (tours) &
0	System act. puntln ("SICSE")
2	try (it is all my to pertain
	Theread. sleep (2000)
	Catch / Interrupted Exception e St 3
	public class Thousands &
	public states void many (Stung argel) &
	Thread 1 to = new Twend(). Wead 2 t2 = new Thread 2()
	+1. start();
	the grant ();
	3

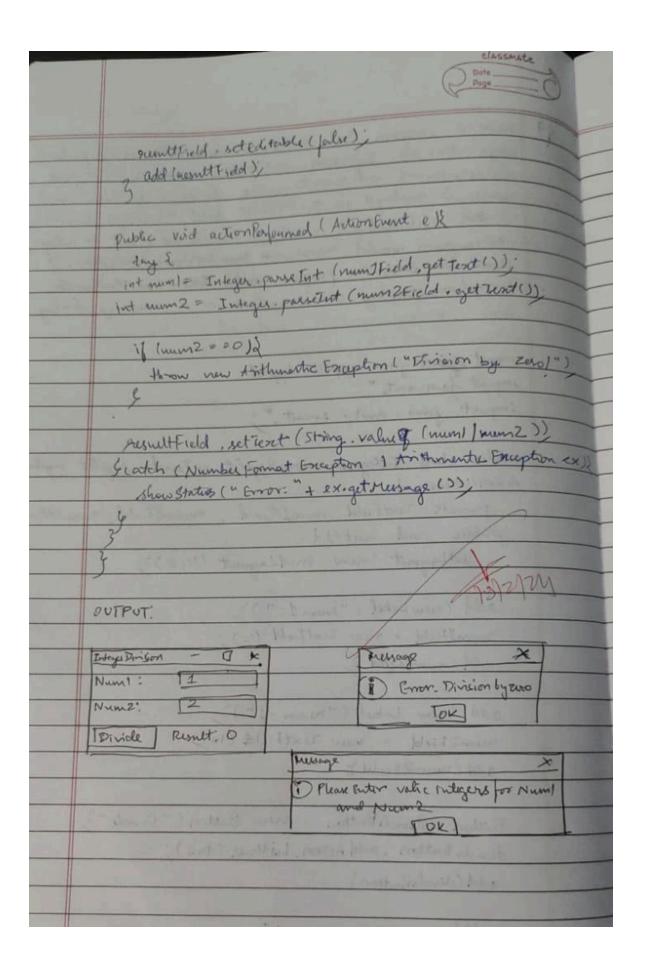


CODE:

Q9) Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.



White a passesam that eneater a user interface to perform integer divining, The uses outers two numbers with fest fields, Num I and Num 2. The division of Num I and Num? is displayed in the Result field when the Divide Button is dicked. I sum I so Num 2 were not an integer The powgram would throw our Number Format Exception. If Num2 well zero, the grageam would throw an Authmetic Exception Display the exception in a message dialog import java. applet. Applet import java. awt. ". impost java. aut. event. public class Integer Princion Applet entereds Applet inglant Action Listener of private Textfield num I Field, num 2 Field, resultifield public void mit() } sotlayout (new midLayout (4,2)) add (new Label (" Num 1: ")) num I Field = new Tent Field (10); add (numIt idd) add (new Label ("Num ?: ")); numafield = new Textfield (10) add (num & Field); Button divide Button = new Button (" Divide "); divide Button add Action . Listener (this); add (divide Button) add (new Lable (" Remit: ")) resultfield z new Tentfild (10);



CODE:

```
import java.applet.Applet;
import java.awt.*;
import java.awt.event.*;
public class IntegerDivisionApplet extends Applet implements ActionListener {
  private TextField num1Field, num2Field, resultField;
  public void init() {
     setLayout(new GridLayout(4, 2));
     add(new Label("Num1:"));
     num1Field = new TextField(10);
     add(num1Field);
     add(new Label("Num2:"));
     num2Field = new TextField(10);
     add(num2Field);
     Button divideButton = new Button("Divide");
     divideButton.addActionListener(this);
     add(divideButton);
     add(new Label("Result:"));
     resultField = new TextField(10);
    resultField.setEditable(false);
     add(resultField);
  }
  public void actionPerformed(ActionEvent e) {
    try {
       int num1 = Integer.parseInt(num1Field.getText());
       int num2 = Integer.parseInt(num2Field.getText());
       if (num2 == 0) {
          throw new ArithmeticException("Division by zero!");
       }
       resultField.setText(String.valueOf(num1 / num2));
    } catch (NumberFormatException | ArithmeticException ex) {
       showStatus("Error: " + ex.getMessage());
  }}
```

REPORT ON AWT PROGRAMS:

19/02/2024	Classmate Dure Page
	REPORT.
5	Button Demo
	First the java file should be compiled. After that
	an orite to the min same want should be stoned
	and souther as applet never Button Demo. Little.
	ins no open a window with 3 Buttons yes, no and
	undecided. As you disk on each of them, a message
	will appeal.
1)	Putton drag
	On executing this, a window appears with 9 grids 1-9
	On executing this, a window appears with 9 grids 1-9 and 3 buttons reset, Start 2 Restart. On clicking 2
	goods, they introchange the numbers. You can click
	stret to play the game and next to next.
-	9 45 4
3)	Button list
	on the compiling and summing a mindow appeals.
	each button, a musage appears.
/	X 17
4)	Button list D
	This is similar to premary on except when you dick
	on a button, a musage appears on a new pap-up mindor
	with another button tok when clicked closes the propulse
	The state of the s
1 3)	Division Main
	When executed, I has 2 input fields, when entered,
	and clicked on the button (RESVET), it displays the
	I now and the quotient all in front.
()	Division ham
	Similiar to previous one, it has 2 tent fillds. When entered, the number is mad of 2 members mot
	quotrent-

	Parte Page
7	Tent Field Damo. This when executed, has 2 tent fields Name and Parmond when typing possword, it hides it and displays? Symbol. Once thicked enter, it displays the name and password. when a group of tetters is elected in Norme and entered thele, it is also displayed as a message.
	In all of me above ANT programs, one can set title and it appears as The mission rame
	A STANDER TO SEE STANDER OF THE SEE