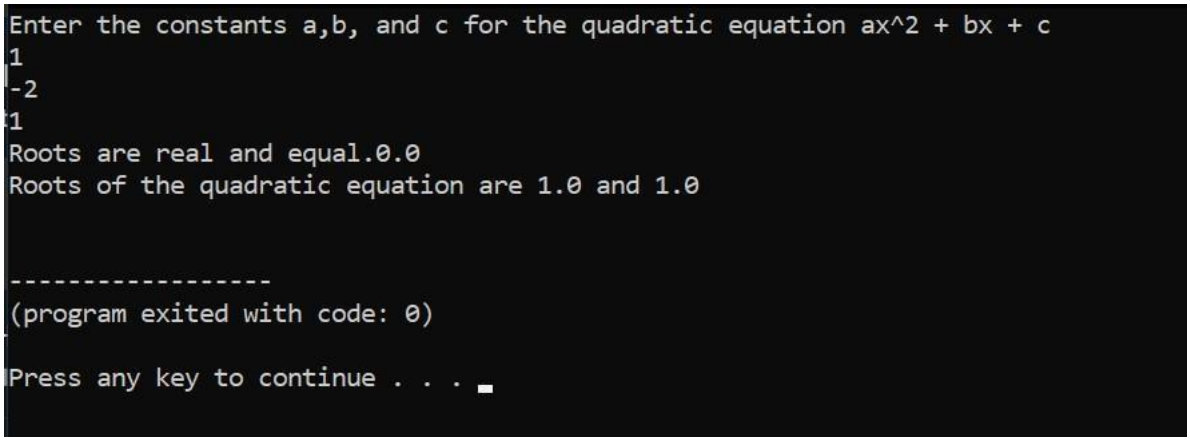
LAB1_QuadraticEquatinos

```
import java.util.Scanner;


class QuadraticEquations
{
	public static void main(String args[])
	{
		double a,b,c,D;
		double r1,r2;


		Scanner in = new Scanner(System.in);
 System.out.println("Enter the constants a,b and c of the quadratic equation a(x)^2+b(x)+c=0 : ");
		a = in.nextDouble();
		b = in.nextDouble();
		c = in.nextDouble();
		System.out.println();
		System.out.println("Input Quadration Equation : "+a+"(x)^2 + "+b+"(x) + "+c+" = 0");
		System.out.println();


		D = (b*b)-(4*a*c);


		if(D>0)
		{
			System.out.println("Roots are real and unequal since Discriminant = "+D);
			r1 = (-b + Math.sqrt(D))/(2*a);
		r2 = (-b - Math.sqrt(D))/(2*a);
			System.out.println();
			System.out.println("Roots of the quadratic equation are "+r1+" and "+r2);

		}
```

```
            else if(D==0)
            {
                  System.out.println("Roots are real and equal since Discriminant = "+D);
                  r1 = r2 = (-b)/(2*a);
                  System.out.println();
System.out.println("Roots of the quadratic equation are "+r1+" and "+r2);
            }
            else
            {
                  System.out.println();
                  System.out.println("Roots are unreal since Discriminant = "+D);
            }

      }
      }
```



Aditya Satish Kumar

1BM19CS191

DATE: PAGE:

```
import java.util.Scanner;
class quadratic_equation
{
    public static void main (String [] args)
    {
        double a, b, c, sum, root1, root2;

        Scanner in = new Scanner (System.in);

        System.out.println ("Enter the constants a, b, and c for the
quadratic expression ax^2 + bx + c");

        a = in.nextDouble();
        b = in.nextDouble();
        c = in.nextDouble();

        sum = (b*b) - (4*a*c);

        if (sum > 0)
        {
            System.out.println ("Roots are real and unequal" + sum);
            root1 = (-b + Math.sqrt(sum)) / (2*a);
            root2 = (-b - Math.sqrt(sum)) / (2*a);
            System.out.println ("Roots are real and unequal." + root1 +
            root2);
        }
```

```
    else if (sum==0)
    {
        System.out.println("Roots are real and equal. "+sum);
        root1 = root2 = (-b)/(2*a);
        System.out.println("Roots of the quadratic equation are"
            + root1 "and" + root2);  sum);
    }
    else if (sum<0)
    {
        System.out.println("Roots are unreal "}+sum);
    }
}
}
```

LAB2_StudentSGPA

```
import java.util.Scanner;
class Student{
   Scanner ss= new Scanner(System.in);
                String USN;     String
Name;     int credits[]= new int[5];
double marks[]= new double[5];
   int points[]= new int[5];
double SGPA;
   int totalCredits= 0;

   void getDetails(){
      System.out.println("Enter the Student USN: ");
      USN= ss.nextLine();
      System.out.println("Enter the name of the Student: ");
Name= ss.nextLine();
      for(int i=0;i<5;i++){
         System.out.println("Enter the amount of Credits for Subject " + (i+1) + ":
");            credits[i]= ss.nextInt();            totalCredits+= credits[i];
         System.out.println("Enter the Marks obtained by the student for Subject " + (i+1) + " out of 100: ");
marks[i]= ss.nextDouble();
      }
   }

   void printDetails(){

      System.out.println("Student USN: " + USN);
System.out.println("Student Name: " + Name);
      for(int i=0;i<5;i++){

     System.out.println("Subject " + (i+1) + " :       Credits: " + credits[i] + "    --> Marks: " + marks[i]);
```

```
            }
    System.out.println("SGPA of " + Name + " is: " + (double)(SGPA/totalCredits));
}

    void sumSGPA(){


        for(int i=0;i<5;i++){

                            if(marks[i] >= 91){

                points[i] = 10;

                            }
                            else if(marks[i] >= 81){

                                    points[i] = 9;

                            }
                            else if(marks[i] >= 71){

                                    points[i] = 8;

                            }
                            else if(marks[i] >= 61){

                                    points[i] = 7;

                            }
                            else if(marks[i] >= 51){
```

```
                    points[i] = 5;

                }
                else if(marks[i] >= 41){

                    points[i] = 4;

                }
                else{

                    points[i] = 0;

            }

            SGPA += (points[i]*credits[i]);
        }
    }
}

public class LAB2 {     public static void
main(String args[]){        Student s1=
new Student();        s1.getDetails();
s1.sumSGPA();        s1.printDetails();

    }
}
```

```
C:\Users\adity\Desktop\3-D\OOJ\OOJ LAB>java LAB2
Enter the Student USN:
1BM19CS191
Enter the name of the Student:
ADITYA SATISH KUMAR
Enter the amount of Credits for Subject 1:
5
Enter the Marks obtained by the student for Subject 1 out of 100:

93
Enter the amount of Credits for Subject 2:
4
Enter the Marks obtained by the student for Subject 2 out of 100:
84
Enter the amount of Credits for Subject 3:
5
Enter the Marks obtained by the student for Subject 3 out of 100:
88
Enter the amount of Credits for Subject 4:
5
Enter the Marks obtained by the student for Subject 4 out of 100:
99
Enter the amount of Credits for Subject 5:
5
Enter the Marks obtained by the student for Subject 5 out of 100:
95
```

```
Enter the amount of Credits for Subject 5:
5
Enter the Marks obtained by the student for Subject 5 out of 100:
95
Student USN: 1BM19CS191
Student Name: ADITYA SATISH KUMAR
Subject 1 :       Credits: 5    --> Marks: 93.0
Subject 2 :       Credits: 4    --> Marks: 84.0
Subject 3 :       Credits: 5    --> Marks: 88.0
Subject 4 :       Credits: 5    --> Marks: 99.0
Subject 5 :       Credits: 5    --> Marks: 95.0
SGPA of ADITYA SATISH KUMAR is: 9.625

C:\Users\adity\Desktop\3-D\OOJ\OOJ LAB>
```

1BM19CS191 DATE: PAGE:

Aditya Satish Kumar

```
Import java.util.Scanner
class Student {
    Scanner ss = new Scanner (System.in);
    String USN;
    String Name;
    int credits[] = new int[5]
    double marks[] = new double[5];
    int points[] = new int[5];
    double SGPA;
    int totalCredits = 0;

    void getDetails(){
        System.out.println("Enter the Student USN: ");
        USN = ss.nextLine();
        System.out.println("Enter the name of the Student: ");
        Name = ss.nextLine();

        for(int i = 0; i < 5; i++){
            System.out.println("Enter the amount of credits: ");
            credits[i] = ss.nextInt();
            System.out.println("Enter the marks obtained
                                for subject" + (i+1) + "out of 100");
            marks[i] = ss.nextDouble();
        }
    }
```

Aditya Satish kumar

```
void printDetails(){
        System.out.println("Student USN:"+USN);
        System.out.println("Student Name:"+Name);
        for(int i=0;i<5;i++){
                System.out.println("Subject"+(i+1)+":  Credits:
                        +credits[i]+"->Marks:"
                        +marks[i]);
        }
}

void sumSGPA(){
        for(int i=0;i<5;i++){

                if(marks[i]>=91){
                        points[i]=10;
                }
                else if(marks[i]>=81){
                        points[i]=9;
                }
                else if(marks[i]>=71){
                        points[i]=8;
                }
                else if(marks[i]>=61){
                        points[i]=7;
                }
                else if(marks[i]>=51){
                        points[i]=6;
                }
                else if(marks[i]>=41){
                        points[i]=5;
                }
```

DATE: PAGE:

Aditya Sakith kumar.

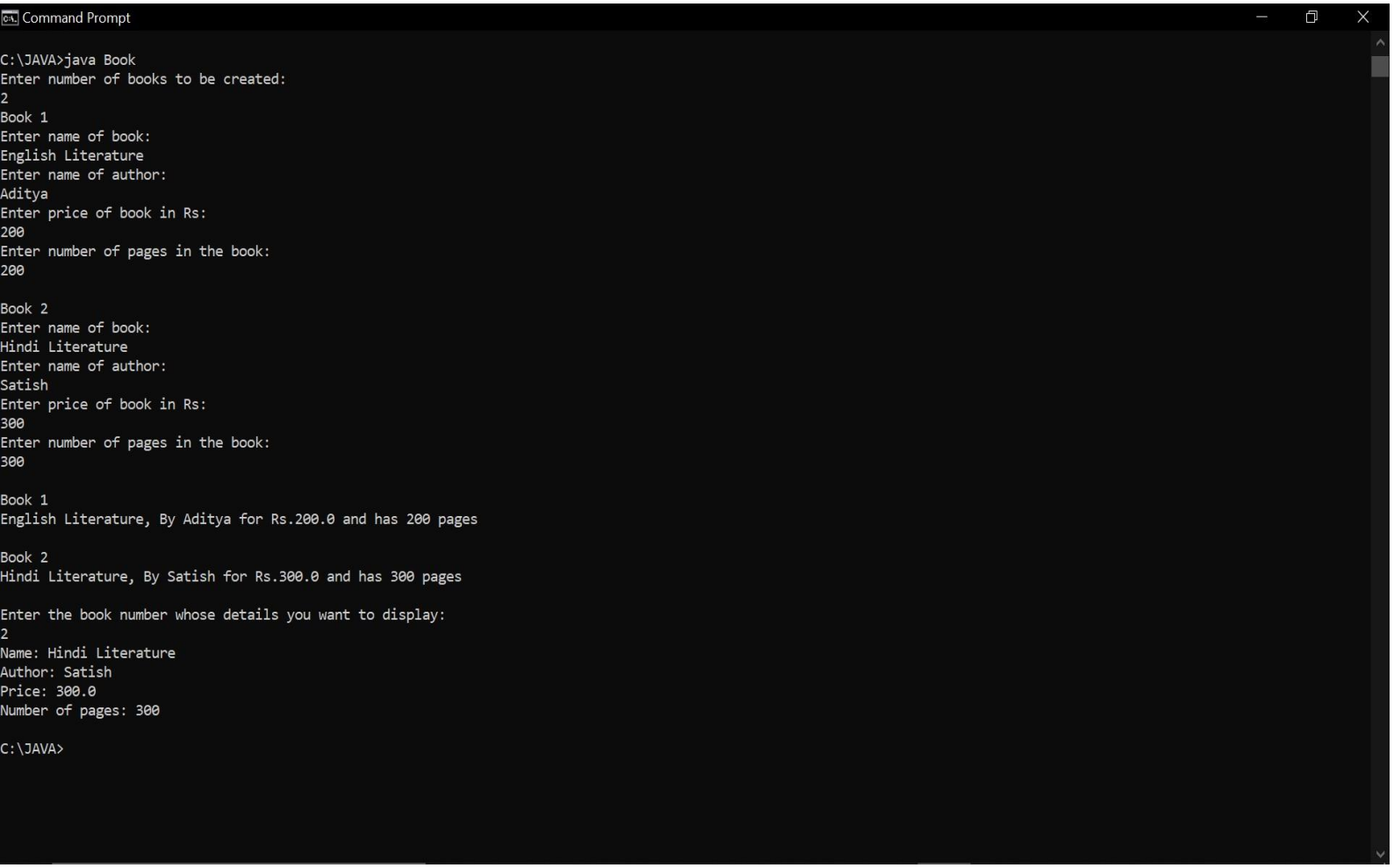
```
                else {
                    points[i] = 0;
                }.

                SGPA += (points[i] * credits[i]);
            }
        }
    }
public class LAB2 {
    public static void main(String args[]){
        Student s1 = new Student();
        s1. getDetails();
        s1. sumSGPA();
        s1. printDetails();
    }
}.
```

LAB3_BookDisplay

```
import java.util.*;
import java.lang.*;
class Book{

 String name,
author;  double
price;  int
num_pages;
Scanner in = new Scanner(System.in);

 Book(){

 System.out.println("Enter name of book: ");  name
= in.nextLine();
 System.out.println("Enter name of author: ");  author
= in.nextLine();
 System.out.println("Enter price of book in Rs: ");  price
= in.nextDouble();
 System.out.println("Enter number of pages in the book: ");  num_pages
= in.nextInt();

 }

 void show(){

  System.out.println("Name: " + name);
  System.out.println("Author: " + author);
  System.out.println("Price: " + price);
System.out.println("Number of pages: " + num_pages);

 }

 public String toString(){
```

```
                return name + ", By " + author + " for Rs." + price + " and has " +
num_pages + " pages";

                }

                public static void main(String[]args){

                 Scanner in = new Scanner(System.in);
                int n, x;

                System.out.println("Enter number of books to be created: ");  n
                = in.nextInt();
                Book B[] = new Book[n];

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

                        System.out.println("Book " + (i+1));
                        B[i] = new Book();
                        System.out.println();

                }

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

                        System.out.println("Book " + (i+1));
                        System.out.println(B[i]);
                        System.out.println();

                }
                do {

                        System.out.println("Enter the book number whose details
you want to display: ");
                        x = in.nextInt();
```

```
                    }

                    while(x < 1 && x > n);
                    B[x-1].show();

                    }
    }
```



LAB-3 Q-3

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```
import java.util.*;
import java.lang.*;
class Book {
    String name, author;
    double price;
    int num_pages;
    Scanner in = new Scanner(System.in);

    Book() {
        System.out.println("Enter name of book: ");
        name = in.nextLine();
        System.out.println("Enter name of author");
        author = in.nextLine();
        System.out.println("Enter price of book ");
        price = in.nextDouble();
        System.out.println("Enter number of pages in the book: ");
        num_pages = in.nextInt();
    }

    void show() {
        System.out.println("Name: "+name);
        System.out.println("Author: "+author);
        System.out.println("Price: "+price);
        System.out.println("Number of pages: "+num_pages);
    }

    Public String toString() {
        return name + ", By " + author + " for Rs " + price + " and has "
                + num_pages + " pages";
    }
```

DATE: PAGE:

```
public static void main (String [] args) { }
        Scanner in = new Scanner (System.in);
        int n, x;

        System.out.println ("Enter the number of books to be created: ");
        n = in.nextInt();
        Book B[] = new Book [n];

        for (int i=0; i<n; i++) {
            System.out.println ("Book " + (i+1));
            System.out.println ();
            B[i] = new Book();
        }

        for (int i=0; i<n; i++) {
            System.out.println ("Book " + (i+1));
            System.out.println (B[i]);
        }

        do {
            System.out.println ("Enter the book number whose details you want
                                                    to display");
            x = in.nextInt();
        }

        while (x<1 && x>n);
    }
}
```

LAB4_AbstractClass

```
import java.util.*; import
java.lang.*;

abstract class Shape{

        Scanner in = new Scanner(System.in);
        int x1, x2;
        Shape(){

                                        System.out.println("Enter two numbers:");
                                        System.out.println("");
         x1=in.nextInt();                    x2=in.nextInt();

        }
        abstract void printarea();

}

class Rectangle extends Shape{

        void printarea(){

                                        System.out.println("Area of Rectangle: " + (x1 * x2));

        }

}

class Triangle extends Shape{

        void printarea(){

                                        System.out.println("Area of Triangle: " + (x1 * x2)/2);
```

```
        }

}

class Circle extends Shape{

        void printarea(){

                System.out.println("Area of Circle 1: " + (3.14 * x1 * x1));
                System.out.println("Area of Circle 2: " + (3.14 * x2 * x2));

        }

}

class Abstract{

        public static void main(String[]args){

                        Shape s;

                        s = new Rectangle();
                        s.printarea();

                        s = new Triangle();
                        s.printarea();

                        s = new Circle();
                        s.printarea();

        }

}
```

```
C:\Users\Aditya\Desktop\3-D\OOJ LAB>javac Abstract.java

C:\Users\Aditya\Desktop\3-D\OOJ LAB>java abstract
Error: Could not find or load main class abstract

C:\Users\Aditya\Desktop\3-D\OOJ LAB>java Abstract
Enter two numbers:

2
4
Area of Rectangle: 8
Enter two numbers:

2
3
Area of Triangle: 3
Enter two numbers:

3
4
Area of Circle 1: 28.259999999999998
Area of Circle 2: 50.24

C:\Users\Aditya\Desktop\3-D\OOJ LAB>D
```

8

```
import java.util.*;
import java.lang.*;

abstract class Shape {
    Scanner in = new Scanner(System.in);
    int x1, x2;
    Shape() {
        System.out.println("Enter two numbers:");
        x1 = in.nextInt();
        x2 = in.nextInt();
    }
    abstract void printarea();
}

class Rectangle extends Shape {
    void printarea() {
        System.out.println("Area of Rectangle: " + (x1*x2));
    }
}

class Triangle extends Shape {
    void printarea() {
        System.out.println("Area of triangle: " + (x1*x2)/2);
    }
}

class Circle extends Shape {
    void printarea() {
        System.out.println("Area of Circle 1: " + (3.14*x1*x1));
        System.out.println("Area of Circle 2: " + (3.14*x2*x2));
    }
}
```

DATE: PAGE:

```
class Abstract {
    public static void main (String [] args) {
        Shape s;

        s = new Rectangle();
        s.printarea();

        s = new Triangle();
        s.printarea();

        s = new Circle();
        s.printarea();
    }
}
```

LAB5_BankDetails

```
import java.util.*; import
java.lang.*;


class Bank{


        String name, abc;
        int accNo;        char
accType;          double balance
= 0;      double deposit;
        double
chequeAmount;


        Scanner in = new Scanner(System.in);


        void inputData() {


                                        System.out.println("Enter your account type (Savings/Current):");
                abc = in.nextLine();                accType =
abc.charAt(0);
        }


        void deposit() {


                                        System.out.println("Enter an amount to deposit: ");
                                        deposit = in.nextDouble();


                                        balance += deposit;
                                        System.out.println("Balance has been updated ");
                                        System.out.println("");

}


void viewBalance(){
```

```
                                        System.out.println("Balance = " + balance);
                                        System.out.println("");

}

public static void main(String[]args){

                                        Scanner s = new Scanner(System.in);
                                        int x;
                                        Bank a1 = new Bank();
                                        a1.inputData();

                                        if(a1.accType == 'C' || a1.accType == 'c'){

                                            Current a2 = new Current();

                                            do{

                                                    System.out.println("WELCOME TO YOUR CURRENT
ACCOUNT");
                                                    System.out.println("");
                                                    System.out.println("(1) Deposit ");
                                                    System.out.println("(2) Check balance ");
                                                    System.out.println("(3) Issue Cheque ");
                                                    System.out.println("(4) Exit");
                                                    System.out.println("Enter your choice: ");
                                                    x = s.nextInt();
                                                    System.out.println("");

                                                    switch(x){

                                                        case 1: a2.deposit();
                                                        break;
                                                        case 2: a2.checkBalance();
                                                        break;
```

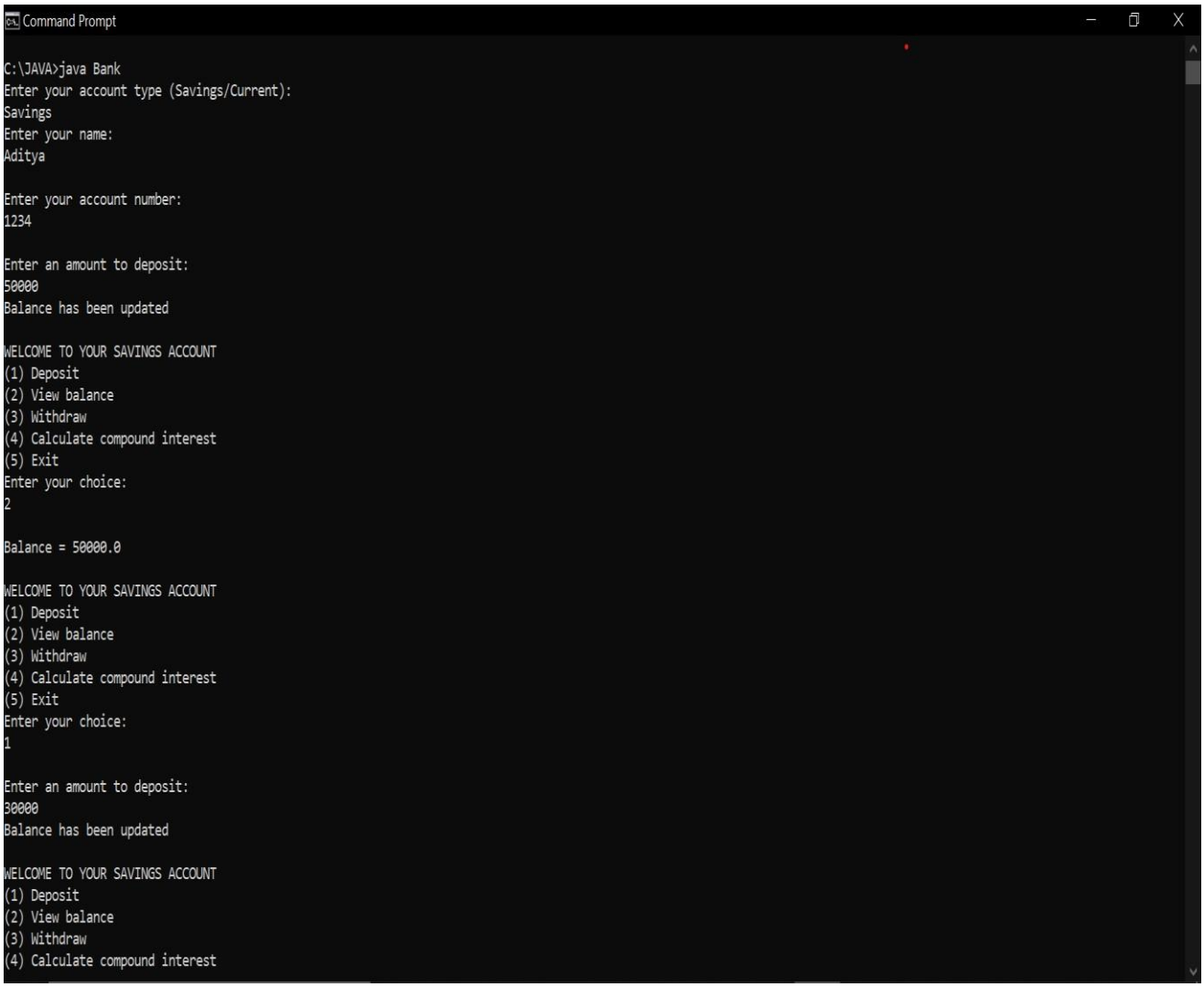
```
                                        case 3: a2.issueCheque();
                                        break;
                                        case 4: System.exit(0);
                                        break;
                                        default: System.out.println("ERROR. INVALID
    CHOICE.");

                                    }

                                }

                                while(x <= 4 && x >= 1);

            }
                            else if (a1.accType == 'S' || a1.accType == 's'){

                                Savings a3 = new Savings();

                                do{

                            System.out.println("WELCOME TO YOUR SAVINGS ACCOUNT");
                            System.out.println("(1) Deposit");          System.out.println("(2) View
balance");
                                    System.out.println("(3) Withdraw ");
                                    System.out.println("(4) Calculate compound interest
");
                        System.out.println("(5) Exit ");
System.out.println("Enter your choice: ");
                                    x = s.nextInt();
                                    System.out.println("");

                                    switch(x){

                                        case 1: a3.deposit();
                                        break;
```

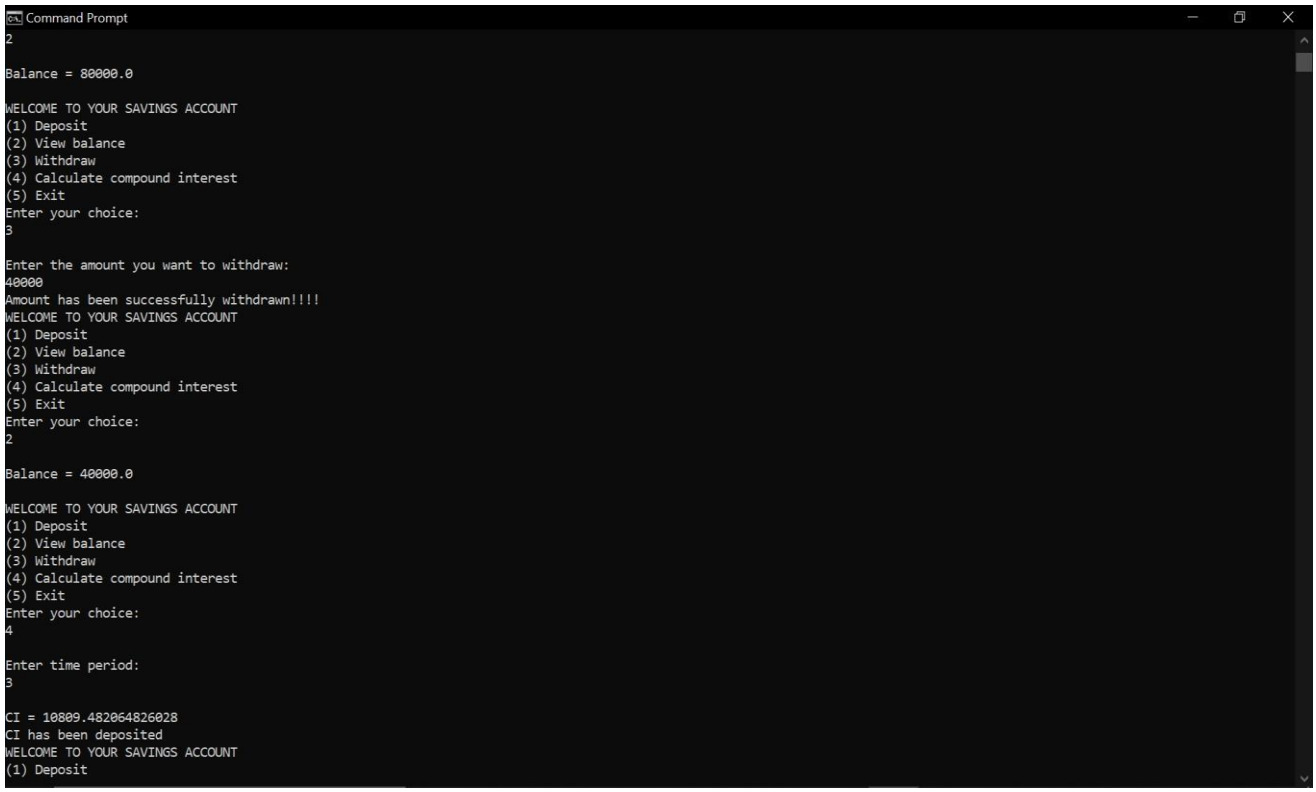
```
                                        case 2: a3.viewBalance();
                                        break;
                                        case 3: a3.balanceAfterWithdrawal();
                                        break;
                                        case 4: a3.computeCI();
                                        break;
                                        case 5: System.exit(0);
                                        break;
                                        default: System.out.println("ERROR.
INVALID CHOICE.");

                                    }

                                }

                                while(x <= 5 && x >=1);

                            }

                            else System.out.println("INVALID ACCOUNT TYPE");

        }

}

class Current extends Bank {

        Current(){

                            System.out.println("Enter your name: ");
                            name = in.nextLine();
                            System.out.println("");


                            System.out.println("Enter your account number: ");
```

```
                                        accNo = in.nextInt();
                                        System.out.println("");

                                        deposit();
                }

                void issueCheque(){

                                        System.out.println("Enter amount for which cheque is to be issued.");
                                        chequeAmount = in.nextDouble();
                                        System.out.println("");

                                        if(chequeAmount > balance){

                                System.out.println("ERROR! Insufficient amount in your account."); }
                                        else{

                                            balance -= chequeAmount;
System.out.println("Cheque has been issued SUCCESSFULLY");
                                            System.out.println("");

                                        }

        }

        void checkBalance(){

                                        if(balance < 1000){

                                            System.out.println("Current available balance is lesser than
        minimum required balance.");
                                            balance -= 100;
                                            System.out.println("Service charge of Rs.100 has been
        deducted from your balance.");
```

```
                                        }

                                        viewBalance();

        }

}

        class Savings extends Bank{

                double CI, withdrawalAmount, time;

                Savings(){

                                        System.out.println("Enter your name: ");
                                        name = in.nextLine();
                                        System.out.println("");

                                        System.out.println("Enter your account number: ");
                                        accNo = in.nextInt();
                                        System.out.println("");

                                        deposit();
                }

                void computeCI() {

            System.out.println("Enter time period: ");
        time = in.nextInt();
            System.out.println("");

                                        CI = balance * Math.pow(1 + (0.08 / 12), 12 * time) - balance;
            System.out.println("CI = " + CI);
        balance += CI;
            System.out.println("CI has been deposited");
```

```
    }

        void balanceAfterWithdrawal(){

                                        System.out.println("Enter the amount you want to withdraw:
");
                                        withdrawalAmount = in.nextDouble();

                                        if(withdrawalAmount > balance){

                                            System.out.println("ERROR! The entered amount is greater
than the available balance...");

                                        }

                                        else {

                                            balance -= withdrawalAmount;
                                            System.out.println("Amount has been successfully
withdrawn!!!!");

                                        }
        }

}
```


Command Prompt
C:\JAVA>java Bank
Enter your account type (Savings/Current):
Savings
Enter your name:
Aditya
Enter your account number:
1234
Enter an amount to deposit:
50000
Balance has been updated
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
2
Balance = 50000.0
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
1
Enter an amount to deposit:
30000
Balance has been updated
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest


Command Prompt
2
Balance = 80000.0
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
3
Enter the amount you want to withdraw:
40000
Amount has been successfully withdrawn!!!!
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
2
Balance = 40000.0
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
4
Enter time period:
3
CI = 10809.482064826028
CI has been deposited
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit


Command Prompt
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
5
C:\JAVA>

LAB3 Q-5 DATE: PAGE:

```
import java.util.*;
import lang.util.*;

class Bank {
    String name, abc;
    int accNo;
    char accType;
    double balance = 0;
    double deposit;
    double chequeAmount;

    Scanner in = new Scanner(System.in);

    void inputData() {
        System.out.println("Enter your account type (Savings/Current): ");
        abc = in.nextLine();
        accType = abc.charAt(0);
    }

    void deposit() {
        System.out.println("Enter an amount to deposit: ");
        deposit = in.nextDouble();
        balance += deposit;
        System.out.println("Balance has been updated");
    }

    void viewBalance() {
        System.out.println("Balance = " + balance);
    }
```

DATE: PAGE:

```
public static void main (String [] args) {
    Scanner s = new Scanner (System.in);
    int x;
    Bank a1 = new Bank ();
    a1.inputData ();

    if (a1.acctype == 'c' || a1.acctype == 'C') {
        Current a2 = new Current ();

        do {
            System.out.println ("Welcome To Your Current Acc
            System.out.println ("(1) Deposit");
            System.out.println ("(2) Check Balance");
            System.out.println ("(3) Issue Cheque");
            System.out.println ("(4) Exit");
            System.out.println ("Enter your choice");

            switch (x) {
            case 1: a2.deposit ();
            break;
            case 2: a2.checkBalance ();
            break;
            case 3: a2.issuecheque ();
            break;
            case 4: System.exit (0);
            default: System.out.println ("Invalid choice
            }.
        }
        while (x <= 4 && x >= 1);
    }
```

```
else if (a1.accType == 's' || a1.accType == 'S') {
    Savings a3 = new Savings();

    do {
        System.out.println("WELCOME TO YOUR SAVINGS ACCOUNT");
        System.out.println("(1) Deposit");
        System.out.println("(2) View Balance");
        System.out.println("(3) Withdraw");
        System.out.println("(4) Calculate Compound Interest");
        System.out.println("(5) Exit");
        System.out.println("Enter your choice");
        x = s.nextInt();

        switch(x) {
            case 1: a3.deposit();
            break;
            case 2: a3.viewBalance();
            break;
            case 3: a3.balanceAfterWithdrawal();
            break;
            case 4: a3.compoundCI();
            break;
            default: System.out.println("Invalid choice");
        }
    }
    while(x<=5 && x>=1);
}
else System.out.println("Invalid Account Type");
}
```

```
class Current extends Bank {
    Current() {
        System.out.println("Enter your name: ");
        name = in.nextLine();
        System.out.println("");
    }

    System.out.println("Enter your account number ");
    accNo = in.nextInt();

    deposit();
}

void issueCheque() {
    System.out.println("Enter the amount for which the cheque is
                        to be issued ");

    chequeAmount = in.nextDouble();

    if (chequeAmount > balance) {
        System.out.println("Insufficient amounts");
    }
    else() {
        balance -= chequeAmount();
        System.out.println("Cheque has been issued successfully");
    }
}

void checkBalance() {
    if (balance < 1000) {
        System.out.println("Current available balance is insuff
        balance -= 100;
    }
    viewBalance();
}
}
```

DATE: PAGE:

```
class Savings extends Bank {
    double CI, withdrawalAmount, time;

    Savings () {
        System.out.println ("Enter your name: ");
        name = in.nextLine();
        System.out.println ("Enter your account number");
        accNo = in.nextInt();

        deposit();
    }

    void computeCI() {
        System.out.println ("Enter time period: ");
        time = in.nextInt();

        CI = balance * Math.pow(1+(0.08/12), 12*time) - balance;
        System.out.println ("CI = " + CI);
        balance += CI;
        System.out.println ("CI has been deposited");
    }

    void balanceAfterWithdrawal() {
        System.out.println ("Enter the amount you want to withdraw");
        withdrawalAmount = in.nextDouble();
        if (withdrawalAmount > balance) {
            System.out.println ("Entered amount is greater than balance");
        }
        else {
            balance += withdrawalAmount;
            System.out.println ("Successfull");
        }
    }
}
```

LAB6_PACKAGES

```
import CIE.*;
import SEE.*;
import java.util.*;

class Main
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the number of students");
		int n= sc.nextInt();
		CIE.internals in[]= new CIE.internals[n];
		SEE.externals en[]= new SEE.externals[n];
		CIE.student gn[]=new CIE.student[n];
		int i,j;
		for(i=0;i<n;i++)
		{
			System.out.println("Student "+(i+1));
			in[i] = new CIE.internals();
			en[i] = new SEE.externals();
			gn[i] = new CIE.student();
			gn[i].getDetails();


			System.out.println("CIE MARKS:");
			in[i].accept();
			System.out.println("SEE MARKS:");
			en[i].get();
			System.out.println();
			gn[i].display();
```

```
                for(j=0;j<5;j++)

                System.out.println("Total Marks "+(j+1)+": "+(in[i].cie[j] + (en[i].see[j]/2)));
            }
        }
}
```

```
package CIE;
import java.util.*;
public class student
{
    public String name;
    public int sem;
    public String usn;

    public void getDetails()
    {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the name");
        name = ss.next();
        System.out.println("Enter the semester");
        sem = ss.nextInt();
        System.out.println("Enter the USN:");
        usn = ss.next();
    }
    public void display()
    {
        System.out.println("Student details: ");
        System.out.println("Name: "+ name);
        System.out.println("USN: "+ usn);
```

```
		System.out.println("Semester: "+ sem);
	}



}



package SEE;
import java.util.*;
import CIE.*;
public class externals extends student
{
	public double see[];

	public void get()
	{
		see= new double[5];
		Scanner in = new Scanner(System.in);
		for(int i=0;i<5;i++)
		{
			System.out.println("SEE mark for subject "+(i+1)+" : ");
			see[i]= in.nextDouble();
		}
	}



}



package CIE;
import java.util.*;
```

```
public class internals
{
	public double cie[];

	public void accept()
	{
		cie= new double[5];
		Scanner ss = new Scanner(System.in);
		for(int i=0;i<5;i++)
		{
			System.out.println("CIE mark for subject "+(i+1)+" : ");
			cie[i]= ss.nextDouble();
		}
	}

}
```

DATE: PAGE:

OOJ - LAB6

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```
package CIE;
import java.util.*;
public class student
{
    public String name;
    public int sem;
    public String usn;

    public void getDetails()
    {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter the name:");
        name = in.nextLine();
        System.out.println("Enter the semester:");
        int = in.nextInt();
        System.out.println("Enter USN no:");
        usn = in.nextLine();
    }

public void display()
{
    System.out.println("The Student Details:");
    System.out.println("Name:" + name);
    System.out.println("USN:" + usn);
    System.out.println("Semester:" + sem);
}
}
```

DATE: PAGE:

```
package CIE;
import java.util.*;

{
  public double cie[];

  public void accept()
  {
    cie = new double[5];
    Scanner in = new Scanner(System.in);
    for(int i = 0; i<5; i++)
    {
      System.out.println("CIE mark scored for subject: "+(i+1)+":");
      cie[i] = in.nextDouble();
    }
}
```

```
package SEE;
import java.util.*;
import CIE.*;
public class externals extends student
{
  public double see[];

  public void get()
  {
    see = new double[5];
    Scanner in = new Scanner(System.in);
```

```
for (int i=0; i<5; i++);
{
    System.out.println("SEE marks for subject : "+(i+1)+" : ");
    see[i] = in.nextDouble();
    }.
}.

import CIE.*;
import SEE.*;
import java.util.*;

class Main
{
  public static void main (String[] args)
  {
    Scanner in = new Scanner (System.in);
    System.out.println("Enter the number of students : ");
    int n = in.nextInt();
    CIE.internals in[] = new CIE.internals[n];
    SEE.internals in[] = new SEE.externals[n];

    int i, j;
    for (i=0; i<n; i++)
    {
        System.out.println("Student "+(i+1));
        in[i] = new CIE.internals();
        in[i] = new SEE.externals();
        in[i].getDetails();
```

DATE: PAGE:

```
System.out.println("CIE Marks: ");
in[i].accept();
System.out.println("see Marks: ");
en[i].get();
System.out.println();
in[i].display();
for(j=0; j<5; j++)
{
  System.out.println("Total marks: "+(j+1)+": "+
                     (in[i].cie[j]+(en[i].see[j]/2));
}
}
}
```

LAB7_GENERICS

```
import java.util.*;
import java.lang.*;

class gen<A, B>{
	A ob1;
	B ob2;
	gen(A x, B y){
		ob1 = x;
		ob2 = y;
	}

	void showTypes(){
		System.out.println("Type of A is::>" + ob1.getClass().getName());
		System.out.println("Type of B is::>" + ob2.getClass().getName());
	}
	A getob1(){
		return ob1;
	}
	B getob2(){
		return ob2;
	}
}

class Generics{
	public static void main(String[]args){

		gen<Integer, String>obtObj =
		new gen<Integer, String>(45, "Generics");

		obtObj.showTypes();
```

```
                int a = obtObj.getob1();
                System.out.println("value::>" + a);
                String b = obtObj.getob2();
                System.out.println("value::>" + b);

        }
}
```

DATE: PAGE:

OOJ LAB-7

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Ans

```
import java.util.*;
import java.lang.*;

class gen <A, B, C>{
        A ob1;
        B ob2;
        C ob3;

        gen (A x, B y, C z){
                ob1 = x;
                ob2 = y;
                ob3 = z;
        }

        void showTypes(){
                System.out.println("Type of A is: " + ob1.getClass().getName
                System.out.println("Type of B is: " + ob2.getClass().getName());
                System.out.println("Type of C is: " + ob3.getClass().getName());
        }

        A getob1(){
                return ob1;
        }
        B getob2(){
                return ob2;
        }
        C getob3(){
                return ob3;
        }
}
```

DATE: PAGE:

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```
class Generics {
    public static void main (String [] args) {
        gen <Integer, String, Double> gobObj =
        new gen <Integer, String, Double> (45, "Generics", 420.48);

        obtObj.showTypes();

        int a = obtObj.getob1();
        System.out.println("Value: " + a);
        String b = obtObj.getob2();
        System.out.println("Value: " + b);
        double c = obtObj.getob3();
        System.out.println("value: " + c);
    }
}
```

LAB8_EXCEPTIONHANDLING

```
import java.util.*;
import java.lang.*;


class Father {
	int age;
	Scanner ss = new Scanner(System.in);
	Father() throws WrongAge {
		System.out.print("Enter the Father's age::> ");
		age = ss.nextInt();
		if(age < 0){
			throw new WrongAge(age);
		}
	}
}


class Son extends Father {
	int age;
	Son() throws WrongAge {
		super();
		System.out.print("Enter the Son's age::> ");
		age = ss.nextInt();
		if(age < 0){
			throw new WrongAge(age);
		}
		if(age > super.age || age == super.age){
			throw new WrongAge(age);
		}
		System.out.println("Nothing wrong here..");
	}
}
```

```
class LAB8 {
	public static void main(String args[]) {
		try{
			Son so = new Son();
		}
		catch(WrongAge e){
			System.out.println(e);
		}
	}
}
```

```
import java.util.*;
import java.lang.*;

public class WrongAge extends Exception {
	int x;
	WrongAge(int x){
		this.x = x;
	}
	public String toString(){
		return "Error..Son's age cannot be greater than the father's age.. ";
	}
}
```

DATE: PAGE:

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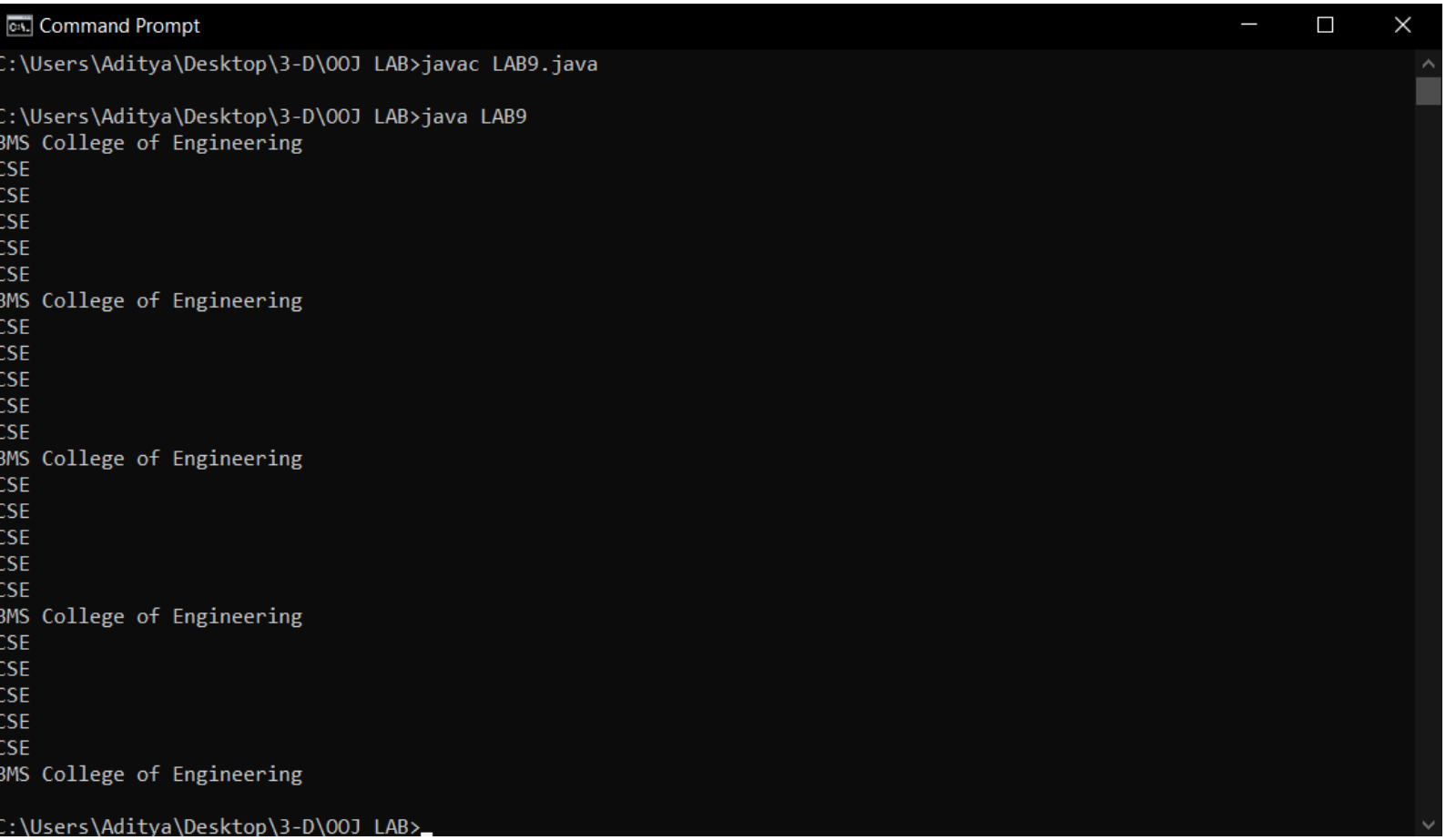
```
import java.util.*;
import java.util.lang.*;

class Father {
    int age;
    Scanner in = new Scanner(System.in);
    Father() throws WrongAge {
        System.out.print("Enter the Father's age: ");
        age = in.nextInt();
        if (age<0) {
            throw new WrongAge(age);
        }
    }

class Son extends Father {
    int age;
    Son() throws WrongAge {
        super();
        System.out.println("Enter the age of the son: ");
        age = in.nextInt();
        if(age<0) {
            throw new WrongAge(age);
        }
        if (age>0) {
        if (age > super.age || age == super.age) {
            throw new WrongAge(age);
        }
    }
```

```
class LAB8 {
    public static void main (String [] args) {
        try {
            Son s = new Son();
        }
        catch (WrongAge e){
            System.out.println(e);
        }
    }
}

import java.util.*;
import java.lang.*;

public class WrongAge extends Exception {
        int x;
        WrongAge (int x) {
            this.x = x;
        }
        public String toString() {
            return "Error";
        }
}
```

```
C:\Users\Aditya\Desktop\3-D\OOJ LAB>cd LAB8

C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>javac LAB8.java

C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>javac WrongAge.java

C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>java LAB8
Enter the Father's age::> 45
Enter the Son's age::> 18
Nothing wrong here..

C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>java LAB8
Enter the Father's age::> 45
Enter the Son's age::> 77
Error..Son's age cannot be greater than the father's age..

C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>_
```

LAB9_MULTITHREADING

```
import java.util.*;
import java.lang.*;

class NewThread implements Runnable {
	String name;
	int interval;
	int repeat;
	Thread t;
	NewThread(String name,int interval,int repeat){
	  this.name = name;
	  this.repeat = repeat;
	  this.interval = interval;
	  t = new Thread(this,name);
	  t.start();
	}
	public void run(){
	  try{
		for(int i=repeat;i>0;i--){
			System.out.println(""+name);
			Thread.sleep(interval);
		}
	  }catch(InterruptedException e){
		System.out.println("Child Interrupted "+name);
	  }
	}
}

class LAB9 {
	public static void main(String args[]){
	  new NewThread("BMS College of Engineering",10000,5);
	  new NewThread("CSE",2000,20);
	  try{
		for(int i=5;i>0;i--){
			Thread.sleep(10000);
		}
	  }
	  catch(InterruptedException e){
		System.out.println("Main Thread Interrupted");
	  }
	}
}
```


Command Prompt
C:\Users\Aditya\Desktop\3-D\OOJ LAB>javac LAB9.java
C:\Users\Aditya\Desktop\3-D\OOJ LAB>java LAB9
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
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BMS College of Engineering
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CSE
BMS College of Engineering
C:\Users\Aditya\Desktop\3-D\OOJ LAB>

DATE: PAGE:

LAB 9

```
import java.util.*;
import java.lang.*;

class NewThread implements Runnable {
    String name;
    int repeat;
    int interval;
    Thread t;
    NewThread(String name, int interval, int repeat){
        this.name = name;
        this.repeat = repeat;
        this.interval = interval;
        t = new Thread(this, name);
        t.start();
    }
    public void run() {
        try {
            for(int i = repeat; i > 0; i--) {
                System.out.println("" + name);
                Thread.sleep(interval);
            }
        }
        catch (InterruptedException e) {
            System.out.println("Child Interrupted " + name);
        }
    }
}
```

DATE: PAGE:

```
class LAB9 {
    public static void main (String args[]) {
        System.out.println ("BMS College of Engineering",
                                                    10000,5);
        new Thread ("BMS college of Engineering", 10000, 5);
        new Thread ("CSE", 2000, 20);
        try {
            for (int i=5; i>0; i--) {
                Thread.sleep (10000);
            }
        }
        catch (InterruptedException e) {
            System.out.println ("Main Thread Interrupted");
        }
    }
}
```