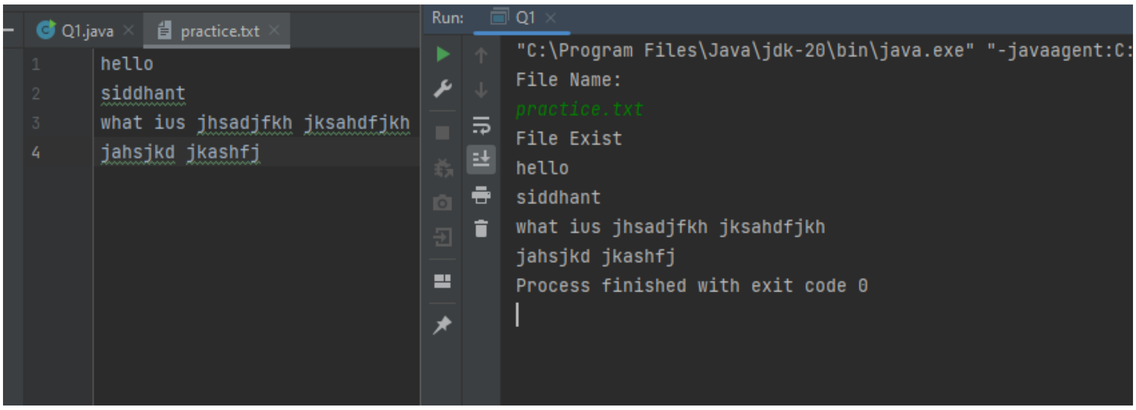
### 1.Reading input from a file and displaying it in the console

```
import java.io.File;
import java.io.FileReader;
import java.io.IOException;
import java.util.Scanner;

public class Q1 {
    public static void main(String[] args) throws IOException {
        //test file existence
        Scanner scan=new Scanner(System.in);
        System.out.println("File Name: ");
        String inFile= scan.next();
        File f = new File(inFile);
        if (f.exists()) {
            //Create file add some text inside
            System.out.println("File Exist");
            FileReader fr=new FileReader(f);
            int i=fr.read();
            while(i!= -1){
                System.out.print((char) i);
                i=fr.read();
            }
        }
        else{
            f.createNewFile();
            System.out.println("File Created");
        }
    }
}
```

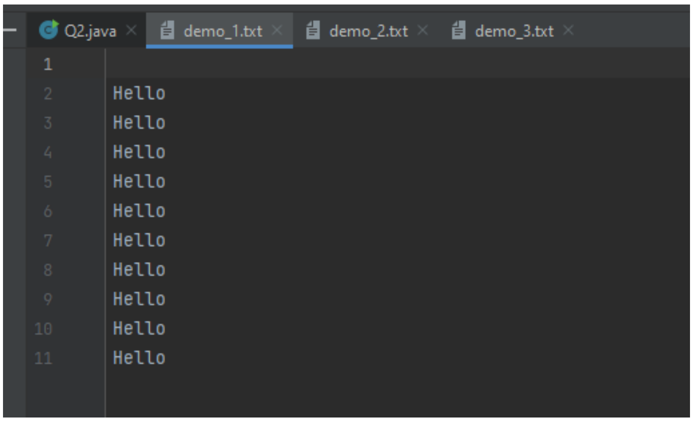


```
hello
siddhant
what ius jhsadjfkh jksahdfjkh
jahsjkd jkashfj
```

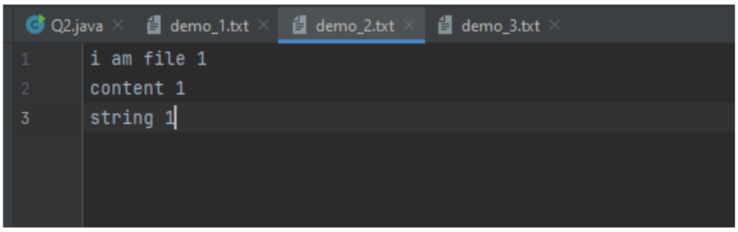
```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:
File Name:
practice.txt
File Exist
hello
siddhant
what ius jhsadjfkh jksahdfjkh
jahsjkd jkashfj
Process finished with exit code 0
```

### 2.Reading input from two files and storing it in a third file

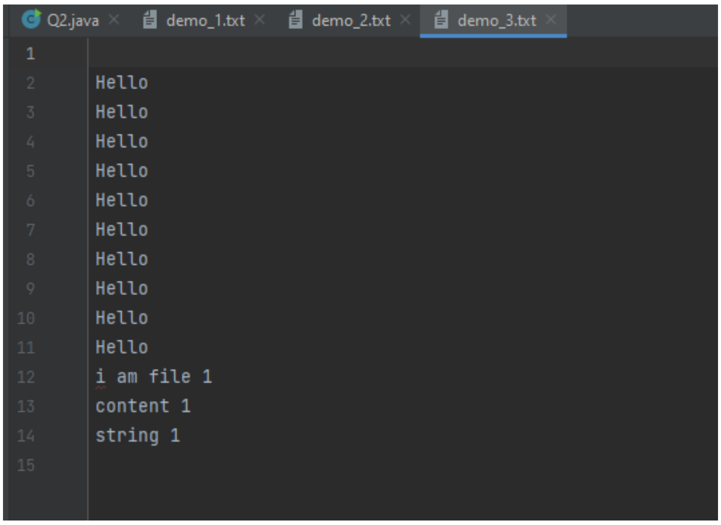
```
import java.io.*;

public class Q2 {
    //Reading input from file1 to store to file3
    public static void main(String[] args) throws IOException {
        //two file as bufferreader
        BufferedReader br1=new BufferedReader(new FileReader("demo_1.txt"));
        BufferedReader br2=new BufferedReader(new FileReader("demo_2.txt"));
        //Write to third file
        File f=new File("demo_3.txt");
        BufferedWriter bw=new BufferedWriter(new FileWriter(f,true));
        String br1Line=br1.readLine();
        String br2Line=br2.readLine();
        while (br1Line != null){
            bw.write(br1Line);
            bw.newLine();
            br1Line=br1.readLine();
        }
        while (br2Line != null){
            bw.write(br2Line);
            bw.newLine();
            br2Line=br2.readLine();
        }
        bw.flush();
        bw.close();
        br1.close();
        br2.close();
    }
}
```



```

Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
```



```
i am file 1
content 1
string 1
```



```

Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
i am file 1
content 1
string 1

```

3.Write a program to define a class employee having fields like empno ,name ,age,dept ,salary .

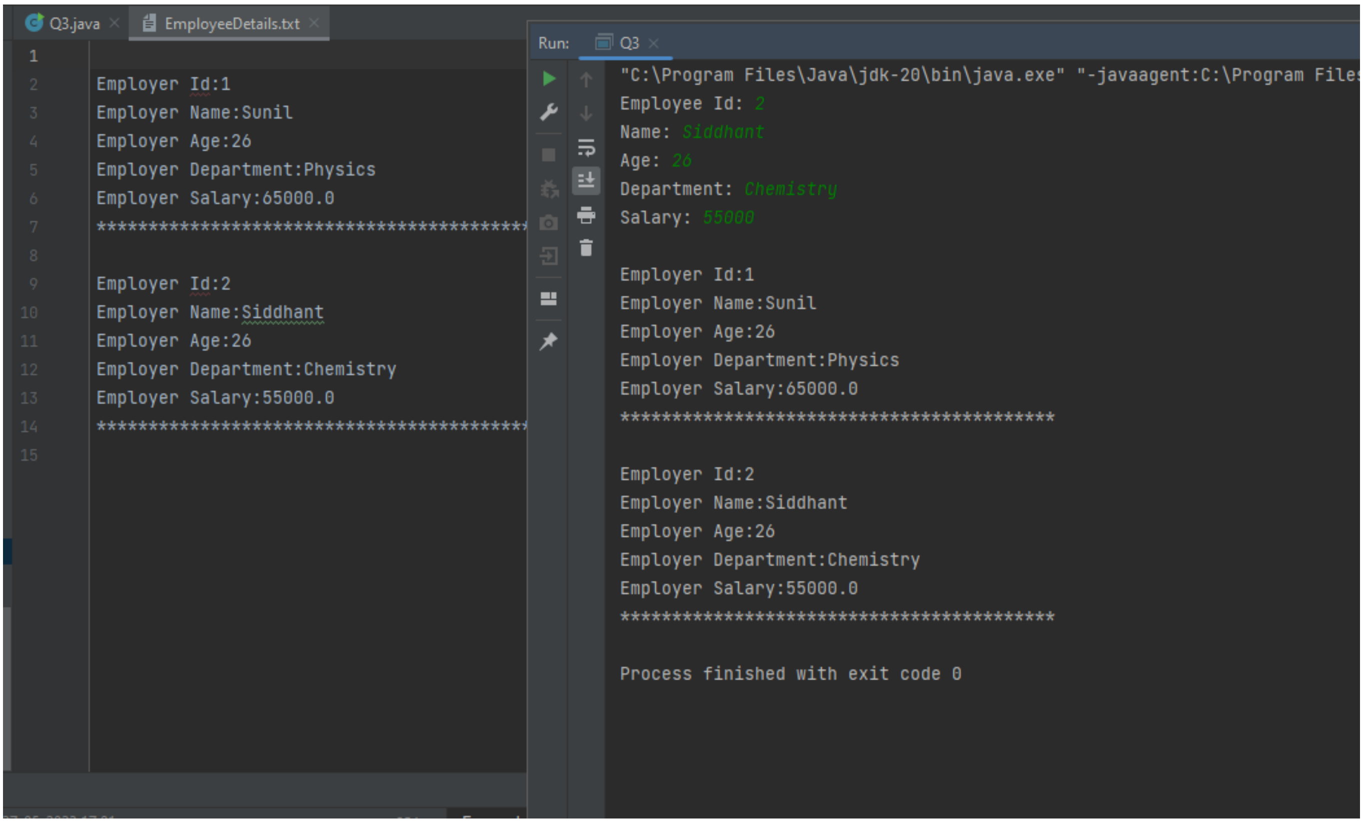
a)Define constructors and destructors.

b)Define get method to invoke values from user

c)Store the complete record of employee into file

d)Read all records of employee from file and display them on screen ***

```
import java.io.*;
import java.util.Scanner;

public class Q3 {
    public static void main(String[] args) throws IOException {
        employee em=new employee();
        File f=new File("EmployeeDetails.txt");
        f.createNewFile();
        FileWriter fw=new FileWriter(f,true);
        BufferedWriter bw=new BufferedWriter(fw);
        em.getData();
        bw.newLine();
        bw.write("Employer Id:"+em.getEmpNo());
        bw.newLine();
        bw.write("Employer Name:"+em.getEmpName());
        bw.newLine();
        bw.write("Employer Age:"+em.getAge());
        bw.newLine();
        bw.write("Employer Department:"+em.getDepartment());
        bw.newLine();
        bw.write("Employer Salary:"+em.getSalary());
        bw.newLine();
        bw.write("*******************************************");
        bw.newLine();
        bw.flush();
        bw.close();
        //read Data from File
        BufferedReader br=new BufferedReader(new FileReader(f));
        String line=br.readLine();
        while (line!=null){
            System.out.println(line);
            line= br.readLine();
        }
        br.close();
    }
}


class employee{
    int empNo;
    String empName;
    int age;
    String department;
    double Salary;

    public int getEmpNo() {
        return empNo;
    }

    public void setEmpNo(int empNo) {
        this.empNo = empNo;
    }

    public String getEmpName() {
        return empName;
    }

    public void setEmpName(String empName) {
        this.empName = empName;
    }

    public int getAge() {
        return age;
    }

    public void setAge(int age) {
        this.age = age;
    }

    public String getDepartment() {
        return department;
    }

    public void setDepartment(String department) {
        this.department = department;
    }

    public double getSalary() {
        return Salary;
    }

    public void setSalary(double salary) {
        Salary = salary;
    }
    public void getData(){
        Scanner scan=new Scanner(System.in);
        System.out.print("Employee Id: ");
        setEmpNo(scan.nextInt());
        System.out.print("Name: ");
        setEmpName(scan.next());
        System.out.print("Age: ");
        setAge(scan.nextInt());
        System.out.print("Department: ");
        setDepartment(scan.next());
        System.out.print("Salary: ");
        setSalary(scan.nextDouble());
    }
}
```



```

Employer Id:1
Employer Name:Sunil
Employer Age:26
Employer Department:Physics
Employer Salary:65000.0
******************************************

Employer Id:2
Employer Name:Siddhant
Employer Age:26
Employer Department:Chemistry
Employer Salary:55000.0
******************************************

```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files
Employee Id: 2
Name: Siddhant
Age: 26
Department: Chemistry
Salary: 55000

Employer Id:1
Employer Name:Sunil
Employer Age:26
Employer Department:Physics
Employer Salary:65000.0
******************************************

Employer Id:2
Employer Name:Siddhant
Employer Age:26
Employer Department:Chemistry
Employer Salary:55000.0
******************************************

Process finished with exit code 0
```

**4.Write a java program to throw a exception (checked) for a student details

a. If name is a number, an exception must be thrown.

b. If an roll number is greater than 50, an age exception must be thrown.

c. Or else an object must be created for the entered employee details

```

import java.util.Scanner;

public class Q4 {
    static void ValidateName(String name) throws ExceptionNumber{
        for (int i=0;i<name.length();i++){
            if (((name.charAt(i)>='a')&&(name.charAt(i)<='z'))||((name.charAt(i)>='A')&&(name.charAt(i)<='Z')))   {
                continue;
            }
            else{
                throw new ExceptionNumber("NumberNotValid");
            }
        }
    }
    static void ValidateAge(int age) throws ExceptionAge{
        if (age>50){
            throw new ExceptionAge("AgeNotValid");
        }
    }
    public static void main(String[] args) {
        student s1=new student();
        Scanner scan=new Scanner(System.in);
        try{
            System.out.print("Enter Name: ");
            String n=scan.next();     //Take student name Input
            ValidateName(n);           //Validate Name
            s1.setStudentName(n);
            try{                             //Age block of try
                System.out.print("Enter Age: ");
                int a=scan.nextInt();
                ValidateAge(a);
                s1.setAge(a);
                //object is ready to print
                System.out.println("Student Name From Object: "+s1.studentName);
                System.out.println("Student Age From Object: "+s1.age);
            }catch (ExceptionAge ex){
                System.out.println(ex);
            }
        }catch (ExceptionNumber e){
            System.out.println(e);
        }
    }
}

class ExceptionNumber extends Exception{
    ExceptionNumber(String err){
        super(err);
    }
}
class ExceptionAge extends Exception{
    ExceptionAge(String ageErr){
        super(ageErr);
    }
}
class student{
    String studentName;
    int age;

    public void setStudentName(String studentName) {
        this.studentName = studentName;
    }

    public void setAge(int age) {
        this.age = age;
    }
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56171:
Enter Name: 35Siddhant
Assignment_5.ExceptionNumber: NumberNotValid

Enter Name: Siddhant
Enter Age: 51
Assignment_5.ExceptionAge: AgeNotValid


"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56199:
Enter Name: Siddhant
Enter Age: 26
Student Name From Object: Siddhant
Student Age From Object: 26
```

5.Write a java program to perform the following operations based upon the choice entered by the user.

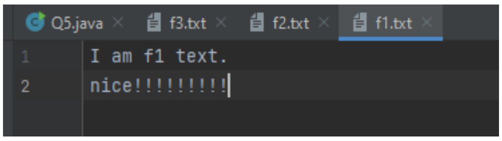
1.Reading input from a file(f1) and displaying it in the console

2.Read the input from the program itself and write to the file(f2)

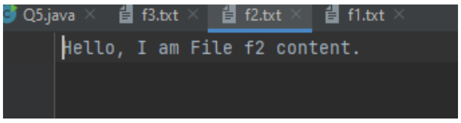
3.Concatenation of fi les (f1 and f2) TO f3 FILE Appending information to file f3.

```
import java.io.*;
import java.util.Scanner;

class fileOperations{
    void FileRead(String filename) throws IOException {
        //1. Reading input from a file(f1) and displaying it in the console
        File f=new File(filename);
        BufferedReader br=new BufferedReader(new FileReader(f));
        String line= br.readLine();
        //loop to read till null
        while (line!=null){
            System.out.println(line);
            line=br.readLine(); //Read again
        }
        br.close();
        System.out.println("**********************************************");
    }
    void FileWrite(String filename) throws IOException{
        //Read from console and append to new file
        File f=new File(filename);
        f.createNewFile();
        Scanner scan=new Scanner(System.in);
        BufferedWriter bw=new BufferedWriter(new FileWriter(f,true)); //Append true
        bw.write(scan.nextLine());
        bw.newLine();
        System.out.println("Do you want to stop Write. Enter exit");
        bw.flush();
        bw.close();
    }
    void FileConcate(String filename) throws IOException{
        //Concanate 2 files
        BufferedReader br1=new BufferedReader(new FileReader("f1.txt"));
        BufferedReader br2=new BufferedReader(new FileReader("f2.txt"));
        //Write to third file
        File f=new File(filename);
        BufferedWriter bw=new BufferedWriter(new FileWriter(f,true));
        String br1Line=br1.readLine();
        String br2Line=br2.readLine();
        while (br1Line != null){
            bw.write(br1Line);
            bw.newLine();
            br1Line=br1.readLine();
        }
        while (br2Line != null){
            bw.write(br2Line);
            bw.newLine();
            br2Line=br2.readLine();
        }
        bw.flush();
        bw.close();
        br1.close();
        br2.close();

    }
}

class switchCase{
    Scanner scan=new Scanner(System.in);
    public void switchCaseMethod(int n) throws IOException{
        fileOperations f=new fileOperations();
        switch (n){
            case 1:
                System.out.print("Enter File Want to Read. ");
                String readableFile=scan.next();
                f.FileRead(readableFile);
                break;
            case 2:
                System.out.print("Write File Name: ");
                String writableFile=scan.next();
                f.FileWrite(writableFile);
                break;
            case 3:
                System.out.print("New File Name: ");
                String concateFile=scan.next();
                f.FileConcate(concateFile);
                break;
            default:
                System.out.println("Invalid Choice.");
                break;
        }
    }
}
public class Q5 {
    public static void  main(String[] args) throws IOException{
        Scanner scan=new Scanner(System.in);
        switchCase s=new switchCase();
        System.out.println("Enter Choice: ");
        System.out.println("1.\tRead File.");
        System.out.println("2.\tWrite File.");
        System.out.println("3.\tConcatenate(Merge) two files");
        s.switchCaseMethod(scan.nextInt());
    }
}
```

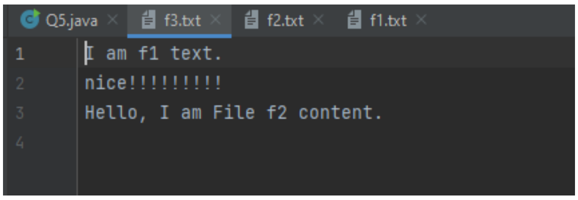
```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56221:
Enter Choice:
1.    Read File.
2.    Write File.
3.    Concatenate(Merge) two files
2
Write File Name: f2.txt
Hello, I am File f2 content.
Do you want to stop Write. Enter exit

Enter Choice:
1.    Read File.
2.    Write File.
3.    Concatenate(Merge) two files
1
Enter File Want to Read. f2.txt
Hello, I am File f2 content.
**********************************************

Enter Choice:
1.    Read File.
2.    Write File.
3.    Concatenate(Merge) two files
3
New File Name: f3.txt
```



```
I am f1 text.
nice!!!!!!!!!
```



```
Hello, I am File f2 content.
```



```
I am f1 text.
nice!!!!!!!!!
Hello, I am File f2 content.
```

6.Perform word count on f3

```
package Assignment_5;

import java.io.File;
import java.util.Scanner;
public class Q8 {
    public static void main(String[] args) throws Exception {
        String filename = "f3.txt";
        File f = new File (filename);
        Scanner scan = new Scanner(f);
        int wordCnt = 1;
        while(scan.hasNextLine()) {
            String text = scan.nextLine();  //Taking Space as input
            for (int i = 0; i < text.length(); i++) {
                if(text.charAt(i) == ' ') {
                    wordCnt++;
                }
            }
        }System.out.println("Word count is " + wordCnt);
    }

}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56401:
Word count is 9

Process finished with exit code 0
```

7.Write a program to ask name of person and display name character by character in each line.

```
import java.util.Scanner;

public class Q6 {
    public static void main(String[] args){
        Scanner scan=new Scanner(System.in);
        System.out.print("Enter Name: ");
        String name= scan.next();
        System.out.println("********************");
        for (int i=0;i<name.length();i++){
            System.out.println(name.charAt(i));
        }
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56487:
Enter Name: Siddhant
********************
S
i
d
d
h
a
n
t
```

8.Write a program to ask two password from user (in string ) and compare them .If both are equal print “access allowed “ otherwise ask string maximum of three times .

```

import java.util.Scanner;

public class Q7 {
    public static void main(String[] args){
        Scanner scan=new Scanner(System.in);
        System.out.println("Enter Password: ");
        String pass=scan.next();
        int trial=3;
        while (trial!=0){
        System.out.println("Repeat Password: ");
        String verify=scan.next();
            if (pass.equals(verify)){
            System.out.println("Password Matched.");
            break;
            }
            System.out.println("Password MisMatched.");
            trial--;
        }
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56505:
Enter Password:
helloWorldNew
Repeat Password:
helloworldnew
Password MisMatched.
Repeat Password:
helloWorldNew
Password Matched.
```

9.write a program to create a class for employee having fields like name , age , salary. Ask 5 employees records from user in an array and display them in ascending order .

```
import java.util.Comparator;
import java.util.Scanner;
import java.util.TreeSet;
public class Q11 {
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        String[] x = new String[5];
        int[] y = new int[5];
        double[] s = new double[5];
        for (int i = 0; i < 5; i++) {
            System.out.println("------------------------------------------");
            System.out.println("Enter The Details of User " + (i+1) + ".");
            System.out.println("------------------------------------------");
            System.out.print("User Name: ");
            x[i] = scan.next();
            System.out.print("User Age: ");
            y[i] = scan.nextInt();
            System.out.print("User Salary: ");
            s[i] = scan.nextDouble();
        }
        employeeData e1 = new employeeData(x[0], y[0], s[0]);
        employeeData e2 = new employeeData(x[1], y[1], s[1]);
        employeeData e3 = new employeeData(x[2], y[2], s[2]);
        employeeData e4 = new employeeData(x[3], y[3], s[3]);
        employeeData e5 = new employeeData(x[4], y[4], s[4]);
        TreeSet t = new TreeSet(new con());
        t.add(e1);
        t.add(e2);
        t.add(e3);
        t.add(e4);
        t.add(e5);
        System.out.println("*Employees Record With Sorting By Age*");
        System.out.println(t);
    }
}
class employeeData{
    String eName;
    int age;
    double salary;

    public employeeData(String eName, int age, double salary) {
        this.eName = eName;
        this.age = age;
        this.salary = salary;
    }
    @Override
    public String toString() {
        return "\n"+eName+"\t\t"+age+"\t\t"+salary+"\n";
    }

}
class con implements Comparator {
    @Override
    public int compare(Object o1, Object o2) {
        employeeData ed1 = (employeeData) o1;
        employeeData ed2 = (employeeData) o2;
        return ed1.eName.compareTo(ed2.eName);
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56615:
-----------------------------------------
Enter The Details of User 1.
-----------------------------------------
User Name: Siddhant
User Age: 26
User Salary: 56000
-----------------------------------------
Enter The Details of User 2.
-----------------------------------------
User Name: Poonam
User Age: 28
User Salary: 45000
-----------------------------------------
Enter The Details of User 3.
-----------------------------------------
User Name: Neelam
User Age: 17
User Salary: 45000
-----------------------------------------
Enter The Details of User 4.
-----------------------------------------
User Name: Desai
User Age: 56
User Salary: 987000
-----------------------------------------
Enter The Details of User 5.
-----------------------------------------
User Name: Sunil
User Age: 34
User Salary: 654000
*Employees Record With Sorting By Age*
[
Desai        56        987000.0
,
Neelam       17        45000.0
,
 Poonam        28        45000.0
,
 Siddhant     26        56000.0
,
 Sunil        34        654000.0
]
```

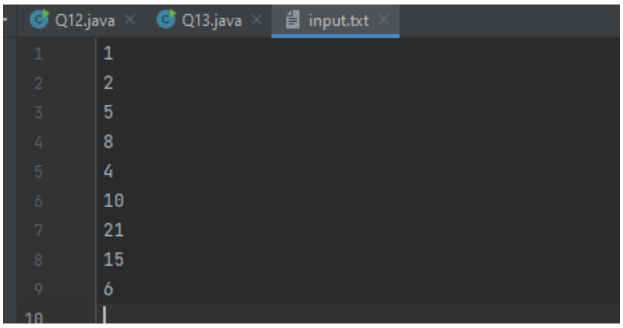
10.Write a program to arrange a set of integer numbers in a ascending order where input will be taken through command line argument.

```
import java.util.ArrayList;
import java.util.Collections;

/*
12.Write a program to arrange a set of integer numbers in a ascending order
where input will be taken through command line argument
 */
public class Q12 {
    public static void main(String[] args){
        ArrayList<Integer> a=new ArrayList<>();
        for (int i=0;i< args.length;i++) {
            //Converting String to int and Using generic Interger
            a.add(Integer.parseInt(args[i]));
        }
        Collections.sort(a);        //Simply sort with Collection.
        System.out.println(a);
    }
}
```

```
PS E:\Java\IBrainIDEA\JavaDBDA\src\Assignment_5> java  Q12.java 1 55 80 10 2 4 60
[1, 2, 4, 10, 55, 60, 80]
```

11.Write a program to calculate the cube & Square using pameterised constructor using BufferedReader class object.

```
import java.util.ArrayList;
import java.util.Collections;

public class Q12 {
    public static void main(String[] args){
        ArrayList<Integer> a=new ArrayList<>();
        for (int i=0;i< args.length;i++) {
            //Converting String to int and Using generic Interger
            a.add(Integer.parseInt(args[i]));
        }
        Collections.sort(a);        //Simply sort with Collection.
        System.out.println(a);
    }
}
```



```
1
2
5
8
4
10
21
15
6
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56743:
Num: 1.0 Square: 1.0    Cube: 1.0
Num: 2.0 Square: 4.0    Cube: 8.0
Num: 5.0 Square: 25.0    Cube: 125.0
Num: 8.0 Square: 64.0    Cube: 512.0
Num: 4.0 Square: 16.0    Cube: 64.0
Num: 10.0 Square: 100.0    Cube: 1000.0
Num: 21.0 Square: 441.0    Cube: 9261.0
Num: 15.0 Square: 225.0    Cube: 3375.0
Num: 6.0 Square: 36.0    Cube: 216.0
```

12.Write a java class which consists of 5 integer data array .Overload constructor ( Default & normal) to initialize those integer data members.Provide a method which sorts those integer data members using bubble sort

```
public class Q14 {

    public static void main(String[] args) {
        int[] x = {10,60,0,5,90};
        dataSet d = new dataSet(x);
        System.out.println("Array Before Bubble Sort");
        for (int i = 0; i < x.length; i++) {
            System.out.print(x[i] + " ");
        }
        System.out.println();
        d.bubbleSort(x);//sorting array elements using bubble sort
        System.out.println("Array After Bubble Sort");
        for (int i = 0; i < x.length; i++) {
            System.out.print(x[i] + " ");
        }
    }
}
class dataSet{
    int[] arr;
    dataSet(int[] arr){
        this.arr= arr;
    }
    void bubbleSort(int[] arr) {
        int n = arr.length;
        int k = 0;
        for (int i = 0; i < n; i++) {
            for (int j = 1; j < (n - i); j++) {
                if (arr[j - 1] > arr[j]) {
                    //swap elements
                    k = arr[j - 1];
                    arr[j - 1] = arr[j];
                    arr[j] = k;
                }

            }
        }
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=58694:
Array Before Bubble Sort
10 60 0 5 90
Array After Bubble Sort
0 5 10 60 90
Process finished with exit code 0
```

13..Write a program to maintain the office database using hierarchical inheritance. Superclassis Employee that contain the information as follows- Emp_code, Emp_name,Address, Ph_no, Da-10%, Hra-20%.

Create three subclass of Manager, Typist, officer each class having their own basic pay & da,hra remain same.

Create a menu driven application in main and depending on choice ask details and printy them on screen

```

import java.util.ArrayList;
import java.util.Scanner;

public class Q15 {
    public static void main(String[] args){
    ArrayList<Typist> t=new ArrayList<>();
    ArrayList<Officer> o= new ArrayList<>();
    ArrayList<Manager> m=new ArrayList<>();
    m.add(new Manager(1,"Shirish",987654,36000));
    m.add(new Manager(2,"Ramesh",98765544,360000));
    t.add(new Typist(1,"Suresh",9876524,24000));
    t.add(new Typist(2,"Shinu",9456524,240000));
    o.add(new Officer(1,"Pavan",9076524,214000));
    o.add(new Officer(2,"Siddhant",9046524,23000));
    System.out.println("View Data: ");
    System.out.println("1.Typist\n2.Officer.\n3.Manager");
    Scanner scan=new Scanner(System.in);
    System.out.print("Select choice: ");int i= scan.nextInt();
    switch (i){
        case 1:
            System.out.println("Typist Data");
            System.out.println("---------------------------------------------------------");
            System.out.println(t);
            break;
        case 2:
            System.out.println("Officer Data");
            System.out.println("---------------------------------------------------------");
            System.out.println(o);
            break;
        case 3:
            System.out.println("Manager Data");
            System.out.println("---------------------------------------------------------");
            System.out.println(m);
            break;
        default:
            System.out.println("Invalid Choice*");
            break;
        }
    }
}
 class superClassEmp{
     int empId;
     String eName;
     long ePhone;
     float da=10f;
     float hra=20f;
    public superClassEmp(int empId, String eName, long ePhone) {
        this.empId = empId;
        this.eName = eName;
        this.ePhone = ePhone;
    }

     public superClassEmp() {

     }
 }

//Priority set AS Typist>Officer>Manager
class Typist extends superClassEmp {
    public double BasicPay;
    public Typist(int empId, String eName, long ePhone, double basicPay) {
        super(empId, eName, ePhone);
        BasicPay = basicPay;
    }
    public double getBasicPay() {
        return BasicPay;
    }
    public void setBasicPay(double basicPay) {
        BasicPay = basicPay;
    }
    @Override
    public String toString() {
        return " "+"empId="+ empId +
                ", eName='" + eName + '\'' +
                ", ePhone=" + ePhone +
                ", da=" + da +
                ", hra=" + hra +
                ", BasicPay=" + BasicPay+
                '\n';
    }
}

class Officer extends superClassEmp {
    public double BasicPay;
    public Officer(int empId, String eName, long ePhone, double basicPay) {
        super(empId, eName, ePhone);
        this.BasicPay = basicPay;
    }
    public Officer() {
        super();
    }
    @Override
    public String toString() {
        return " "+"empId="+ empId +
                ", eName='" + eName + '\'' +
                ", ePhone=" + ePhone +
                ", da=" + da +
                ", hra=" + hra +
                ", BasicPay=" + BasicPay+
                '\n';
    }
}

class Manager extends superClassEmp {
    public double BasicPay;
    public Manager(int empId, String eName, long ePhone, double basicPay) {
        super(empId, eName, ePhone);
        this.BasicPay = basicPay;
    }

    @Override
    public String toString() {
        return " "+"empId="+ empId +
                ", eName='" + eName + '\'' +
                ", ePhone=" + ePhone +
                ", da=" + da +
                ", hra=" + hra +
                ", BasicPay=" + BasicPay+
                '\n';
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56869:
View Data:
1.Typist
2.Officer.
3.Manager
Select choice: 2
Officer Data
--------------------------------------------------------
[ empId=1, eName='Pavan', ePhone=9076524, da=10.0, hra=20.0, BasicPay=214000.0
,  empId=2, eName='Siddhant', ePhone=9046524, da=10.0, hra=20.0, BasicPay=23000.0
]```
```

14.Define an Exception NoMatchFoundException that is thrown when Kolkata isnot found from the following set of strings.city name ={ Kolkata, Chennai, Mumbai, Delhi, Bangalore, Amedabad}

```

import java.util.ArrayList;
import java.util.Scanner;

class ExceptionNotFound extends Exception{
    ExceptionNotFound(String a){
        super(a);
    }
}
public class Q16 {
    static void Validatekolkata(ArrayList list) throws ExceptionNotFound{
        int i=0;
        int flag=0;
        while (i!= list.size()){
            if (list.get(i).equals("Kolkata")){
                i++;
                flag=1;
            }else{i++;}
        }
        if (flag==1){
            System.out.println("Kolkata City Found");
```

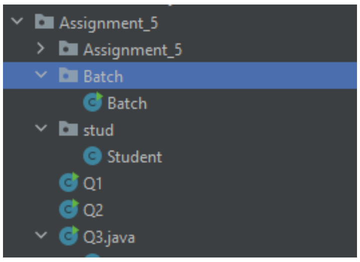
```
        }else {
            throw new ExceptionNotFound("NoMatchFoundException") ;
        }
    }
    public static void main(String[] args){
        ArrayList<String> CityNames=new ArrayList<String>();
        Scanner scan=new Scanner(System.in);
        System.out.println("Enter Cities Names");
        for (int i=1;i<=5;i++){
            System.out.print("City "+i+": ");
            CityNames.add(scan.next());
        }
        try{
            Validatekolkata(CityNames);
            System.out.println("Cities List: "+CityNames);
        }catch (ExceptionNotFound e){
            System.out.println(e);
        }
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56897:
Enter Cities Names
City 1: Mumbai
City 2: Delhi
City 3: Nanded
City 4: Nanded
City 5: Ahmedabad
Assignment_5.ExceptionNotFound: NoMatchFoundException

"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56909:
Enter Cities Names
City 1: Mumbai
City 2: Kolkata
City 3: Delhi
City 4: Nanded
City 5: Pawai
Kolkata City Found
Cities List: [Mumbai, Kolkata, Delhi, Nanded, Pawai]
```

15.Write a class Student, store it in package stud.

Write a class Batch with information about subject, faculty, and timing. Store it in package bat. Use the class Batch to set informationin the Student class

```
import  Assignment_5.stud.Student;

import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.Scanner;

public class Batch {
    static String subject;
    static String faculty;
    static long timing;

    public static void main(String[] args){
        Date d=new Date();
        SimpleDateFormat sdf = new SimpleDateFormat("MM/dd/yyyy h:mm:ss a");
        String formattedDate;
        formattedDate = sdf.format(new Date());
        Student s=new Student();
        Scanner scan =new Scanner(System.in);
        System.out.println("Enter Student Details.");
        System.out.print("Roll No. ");s.setsRollNo(scan.nextInt());
        System.out.print("Name: ");s.setsName(scan.next());
        System.out.print("Age: ");s.setAge(scan.nextInt());
        System.out.print("Subject: ");subject=scan.next();
        System.out.print("Faculty: ");faculty= scan.next();
        System.out.println(s);
        System.out.println(" Subject: "+subject);
        System.out.println(" Faculty: "+faculty);
        System.out.println(" Timing: "+formattedDate);
    }
}

//For Student Package Code

package Assignment_5.stud;

public class Student {
    private int sRollNo;
    private String sName;
    private int age;

    public Student(int sRollNo, String sName, int age) {
        this.sRollNo = sRollNo;
        this.sName = sName;
        this.age = age;
    }
    public Student(){}

    public int getsRollNo() {
        return sRollNo;
    }

    public void setsRollNo(int sRollNo) {
        this.sRollNo = sRollNo;
    }

    public String getsName() {
        return sName;
    }

    public void setsName(String sName) {
        this.sName = sName;
    }

    public int getAge() {
        return age;
    }

    public void setAge(int age) {
        this.age = age;
    }

    @Override
    public String toString() {
        return "Student info\n---------------------\n RollNo: "+getsRollNo()
        +"\n Name: "+getsName()+"\n Age: "+getAge()+"";
    }
}
```



```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=56944:
Enter Student Details.
Roll No. 1
Name: Siddhant
Age: 26
Subject: Physics
```

```
Faculty: Physics
Student info
---------------------
 RollNo: 1
 Name: Siddhant
 Age: 26
 Subject: Physics
 Faculty: Physics
 Timing: 05/27/2023 5:54:40 pm
```

16.Write a program that defines an array of 5 elements. This array is later initialized tocontain 10 elements.

The program should throw a customized exception when the arrayoverflows

```java
import java.util.*;

public class Q18 {
    public static void ValidateArraySize(int size) throws arrayWithFixSizeException{
        if (size>10){
            throw new arrayWithFixSizeException("ArrayOverFlowsException");
        }
    }
    public  static void main(String[] args) throws Exception {
        //Defined an Array with Capacity 5
        ArrayList<Integer> a=new ArrayList<>(5);
        Scanner scan=new Scanner(System.in);
        System.out.println("Array Max Size is 10.");
        while (true) {
            try {
                a.ensureCapacity(10);
                a.add(scan.nextInt());
                ValidateArraySize(a.size());
                System.out.println("Array Elements: "+a);
            } catch (arrayWithFixSizeException e) {
                System.out.println(e);
                break;
            }
        }
    }
}
class arrayWithFixSizeException extends Exception{
    arrayWithFixSizeException(String Excep){
        super(Excep);
    }

}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=57027:
Array Max Size is 10.
10
Array Elements: [10]
20
Array Elements: [10, 20]
30
Array Elements: [10, 20, 30]
40
Array Elements: [10, 20, 30, 40]
50
Array Elements: [10, 20, 30, 40, 50]
60
Array Elements: [10, 20, 30, 40, 50, 60]
70
Array Elements: [10, 20, 30, 40, 50, 60, 70]
80
Array Elements: [10, 20, 30, 40, 50, 60, 70, 80]
90
Array Elements: [10, 20, 30, 40, 50, 60, 70, 80, 90]
100
```

```
Array Elements: [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
1
Assignment_5.arrayWithFixSizeException: ArrayOverFlowsException
```

17.Write a program to display two strings moving in the opposite direction.

```
import java.util.ArrayList;
import java.util.Scanner;

public class Q19 {
    public static void main(String[] args){
        Scanner scan=new Scanner(System.in);
        System.out.print("Enter String: ");
        String s=scan.next();
        System.out.print("Rotation to LEFT Steps: ");
        int n=scan.nextInt();
        //For rotation purpose
        ArrayList xLeft=new ArrayList<>();
        for (int i=0;i<s.length();i++){
            xLeft.add(s.charAt(i));
        }
        ArrayList xRight=new ArrayList();
        for (int i=0;i<s.length();i++){
            xRight.add(s.charAt(i));
        }
        for (int i=0;i<n;i++){
            char dummy= (char) xLeft.get(0);
            xLeft.remove(0);
            xLeft.add(dummy);
        }
        for (int i=0;i<n;i++){
            char dummy= (char) xRight.get(xRight.size()-1);
            xRight.remove(xRight.size()-1);
            xRight.add(0,dummy);
        }
        System.out.println(s);
        System.out.print("LeftShift: ");
        System.out.println(xLeft);
        System.out.print("RightShift: ");
        System.out.println(xRight);
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=57060:
Enter String: ABCDEFGHIJK
Rotation to LEFT Steps: 3
ABCDEFGHIJK
LeftShift: [D, E, F, G, H, I, J, K, A, B, C]
RightShift: [I, J, K, A, B, C, D, E, F, G, H]
```

18.List all '.java' files present in a directory.

```
import java.io.File;
import java.io.IOException;

public class Q20 {
    public static void main(String[] args) throws IOException {
        File f = new File("E:\\Java\\IBrainIDEA\\JavaDBDA\\src\\Assignment_5");
        String[] files=f.list();
        for (String s:files){
            System.out.println(s);
        }
    }
}
```

```
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=57083:
Assignment_5
Batch
Q1.java
Q11.java
Q12.java
Q13.java
Q14.java
Q15.java
Q16.java
Q18.java
Q19.java
Q2.java
Q20.java
Q21.java
Q22.java
Q3.java
Q4.java
Q5.java
Q6.java
Q7.java
Q8.java
stud
```

19.Create three classes message1 ,message2 and message3 and call their methods one after another and display message .In above case set priority level of all object and run them according to priority. Create another class message4 and make sure it should not be called before previously define class. Hint use join

```
import java.lang.Thread;    //Thread Package
import java.lang.Runnable;  //Implementation of Thread Package

//Because extend Not Allow to give access to create more than 1 Thread
class message1 implements Runnable{
    @Override
    public void run() {
        try {
            Thread.sleep(2000);
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }
        System.out.println("Message 1");
    }
}
class message2 implements Runnable{
    @Override
    public void run() {
        try {
            Thread.sleep(2000);
            System.out.println("Message 2");
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }}
}
```

```
class message3 implements Runnable{
    @Override
    public void run() {
        try {
            Thread.sleep(2000);
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }
        System.out.println("Message 3");
    }
}
class message4 implements Runnable{
    @Override
    public void run() {
        System.out.println("I will Not Call Before 3 classes");
    }

}

public class Q21 {
    public static void main(String[] args) throws InterruptedException {
        //Calling Threads 1,2,3
        message1 m1=new message1();//Bullet creation
        Thread t1=new Thread(m1);
        message2 m2=new message2();
        Thread t2=new Thread(m2);
        message3 m3=new message3();
        Thread t3=new Thread(m3);
        message4 m4=new message4();
        Thread t4=new Thread(m4);
        //Set priorities to thread
        t1.setPriority(Thread.MAX_PRIORITY);
        t2.setPriority(Thread.NORM_PRIORITY);
        t3.setPriority(Thread.MIN_PRIORITY);
        t1.start();
        t1.join(2000);  //t2 will not execute until t1 finished with highest priority also t2 will waiting for 1s finish
        t2.start();
        t2.join(2000);
        t3.start();
        t3.join(2000);
        t4.start();
        //Message 1,2,3 always wait for completionof work, tested in the method with sleep method.
    }
}
```

```
**
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=57103:
Message 1
Message 2
Message 3
I will Not Call Before 3 classes
**
```

20.Write a program that contains method even and another method odd , call both of the methods in main and print their values after 2000 millisecond and make sure that another method should not be called before the task of one is complete .

```
import java.util.ArrayList;
public class Q22 {
    public static void main(String[] args) throws InterruptedException {
        callableMethod c=new callableMethod();
        int[] n={1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20};
        EvenThread m=new EvenThread(c,n);
        OddThread o=new OddThread(c,n);
        Thread.sleep(2000);
        m.start();  //Calling both Separate
        m.join(2000);
        //Method are not declare as  Hence it not work well
        o.start();
    }
}
class callableMethod{
    public  void EvenMethod(int[] n){
        System.out.println("-----------------Even Set-----------------------");
        ArrayList<Integer> a=new ArrayList<>();
        int i=0;
        while (i<=n.length){
            if (n[i]%2==0){
                a.add(n[i]);
                i++;
            }i++;
        }System.out.println(a);
        try{
            Thread.sleep(10);   //Just For trial
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }
    }
     public  void OddMethod(int[] n){
        System.out.println("-----------------Odd Set-----------------------");
        ArrayList<Integer> a=new ArrayList<>();
        int i=0;
        while (i<n.length){
            if (n[i]%2==1){
                a.add(n[i]);
                i++;
            }i++;
        }System.out.println(a);
        try{
            Thread.sleep(10);
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }
    }

}
class EvenThread extends Thread{
    callableMethod c; //instance variable for Object Reference in Main
    int[] n;    //List of numbers given to method,for call from Main just create Constructor;
    EvenThread(callableMethod c,int[] n){
        this.c=c;                       //Object reference
        this.n=n;                       //ArraySet Reference
    }
    public  void run(){
        c.EvenMethod(n);
    }
}
class OddThread extends Thread{
    callableMethod c; //instance variable for Object Reference in Main
    int[] n;    //List of numbers given to method,for call from Main just create Constructor;
    OddThread(callableMethod c,int[] n){
        this.c=c;                       //Object reference
        this.n=n;                       //ArraySet Reference
    }
    public  void run(){
        c.OddMethod(n);
    }
}
```

```
**"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=5948
-----------------Even Set-----------------------
[2, 4, 6, 8, 10, 12, 14, 16, 18, 20]
-----------------Odd Set-----------------------
[1, 3, 5, 7, 9, 11, 13, 15, 17, 19]

Process finished with exit code 0
**
```

21.write a program for thread synchronization.

create an account class with required attributes and method as common resource. create first thread to deposit money, second thread to withdraw money and third thread to check balance

```
import java.lang.Runnable;

public class Q23 {
    public static void main(String[] args) throws InterruptedException {
        Account a=new Account();
        a.setAmount(30000);
        depositThread d=new depositThread(a,3000);
        withdrawThread w=new withdrawThread(a,2000);
        checkBalThread cb=new checkBalThread(a);
        System.out.println("Amount Initial: "+a.getAmount());
        Thread.sleep(500);
        Thread Dt=new Thread(d);
        Thread Wt=new Thread(w);
        Thread Ct=new Thread(cb);
        Dt.start();
        //Dt.join();
        Wt.start();
        //Wt.join();
        Ct.start();
    }
}
class Account{
    //Account Attributes
    int uid=1;
    String uname="Sunil";
    int AccountNumber=987654;
    double amount;
    public double getAmount() {
        return amount;
    }

    public void setAmount(double amount) {
        this.amount = amount;
    }
    Account(){}

    //Deposit Method Declare
    synchronized public void Deposit(double value) {
        System.out.println("---------Deposit Receipt -------------------");
        System.out.println("Id:"+uid);
        System.out.println("userName: "+uname);
        System.out.println("accountNumber: "+AccountNumber);
        setAmount(getAmount() + value);
        System.out.println("Amount After Deposit: " + getAmount());
        try {
            Thread.sleep(1000);  //Check Synchronize work or not
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }
    }
    synchronized public void Withdraw(double value) {
        System.out.println("---------WithDraw Receipt -------------------");
        System.out.println("Id:"+uid);
        System.out.println("userName: "+uname);
        System.out.println("accountNumber: "+AccountNumber);
        setAmount(getAmount() - value);
        System.out.println("Amount After Withdraw: " + getAmount());
        try {
            Thread.sleep(1000);  //Check Synchronize work or not
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }
    }
    synchronized public void CheckBalance(){
        System.out.println("---------Balance Receipt -------------------");
        System.out.println("Id:"+uid);
        System.out.println("userName: "+uname);
        System.out.println("accountNumber: "+AccountNumber);
        System.out.println("Your Account Balance is: "+getAmount());
        try {
            Thread.sleep(1000);  //Check Synchronize work or not
        } catch (InterruptedException e) {
            throw new RuntimeException(e);
        }

    }
}
class depositThread implements Runnable{
    Account a;
    double amount;
    depositThread(Account a,double amount){
        this.a=a;
        this.amount=amount;
    }
    @Override
    public void run() {
        a.Deposit(amount);
    }
}
class withdrawThread implements Runnable{
    Account b;
    double amount;
    withdrawThread(Account b,double amount){
        this.b=b;
        this.amount=amount;
    }
    @Override
    public void run() {
        b.Withdraw(amount);
    }
}
class checkBalThread implements Runnable{
    Account c;
    public checkBalThread(Account c) {
        this.c = c;
    }
    @Override
    public void run() {
        c.CheckBalance();
    }
}
```

```
**
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.1\lib\idea_rt.jar=58452:
Amount Initial: 30000.0
---------Deposit Receipt -------------------
Id:1
userName: Sunil
accountNumber: 987654
Amount After Deposit: 33000.0
---------Balance Receipt -------------------
Id:1
userName: Sunil
accountNumber: 987654
Your Account Balance is: 33000.0
---------WithDraw Receipt -------------------
Id:1
userName: Sunil
accountNumber: 987654
Amount After Withdraw: 31000.0

Process finished with exit code 0
**
```