

CODE

```

import java.util.*;
import java.io.*;
public class module3_1{
    public static void main (String [] args) throws FileNotFoundException{
        String filename, input;
        int lcount = 0, vcount = 0, pcount = 0, ccount = 0, wcount = 0, scount = 0;
        int i,j; char ch;
        char vowel[] = {'A','a','E','e','I','i','O','o','U','u'};
        char punct[]={'.','?','!',' ',':',',';'};
        char white[]={'\n','\t',' '};
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter input file name:");
        filename=sc.next();
        try{
            Scanner finput = new Scanner(new FileReader(filename));
            if(!finput.hasNext()){
                System.out.println(filename + " The File is empty. Aborting the
Program");
                System.exit(1);
            }
            while(finput.hasNextLine()){
                input = finput.nextLine();
                wcount++;
                for(i=0; i<input.length(); i++){
                    ch = input.charAt(i);
                    ccount++;
                    for(j=0; j<white.length; j++)
                        if(ch==white[j]){
                            pcount++;
                            if(j<3)
                                scount++;
                        }
                    for(j=0; j<vowel.length; j++)
                        if(ch==vowel[j])
                            vcount++;
                }
                lcount++;
            }
            System.out.println("Words: " + wcount);
            System.out.println("Lines: " + lcount);
            System.out.println("Sentences: " + scount);

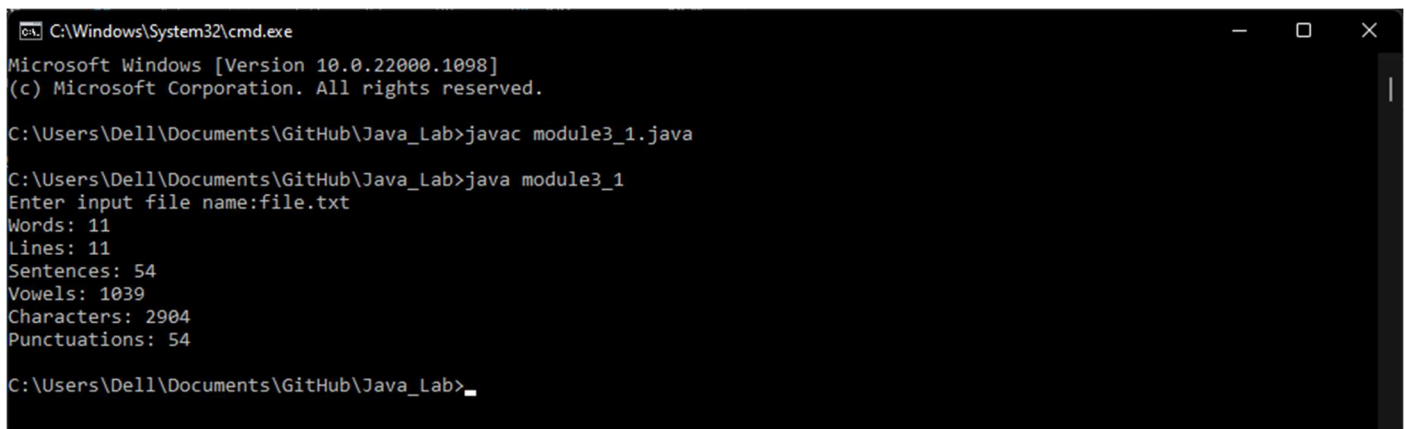
```

```

        System.out.println("Vowels: " + vcount);
        System.out.println("Characters: " + ccount);
        System.out.println("Punctuations: " + pcount);
        finput.close();
        System.exit(0);
    }
    catch(FileNotFoundException e){
        System.out.println("Error" + e);
        System.exit(2);
    }
}
}
}

```

OUTPUT



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.1098]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_1.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_1
Enter input file name:file.txt
Words: 11
Lines: 11
Sentences: 54
Vowels: 1039
Characters: 2904
Punctuations: 54

C:\Users\Dell\Documents\GitHub\Java_Lab>_

```

MODULE 3 – Q2

CODE

```

import java.io.*;
import java.util.*;
public class module3_2{
    public static void main(String [] args){
        try{
            FileReader fr = new FileReader("file.txt");
            BufferedReader br = new BufferedReader(fr);
            FileWriter fw = new FileWriter("file2.txt");
            PrintWriter pw = new PrintWriter(fw);
            Scanner sc = new Scanner(System.in);
            String s1, s2;
            s1 = br.readLine();
            while(s1 != null){
                s2 = s1.toUpperCase();
                pw.println(s2);
                s1 = br.readLine();
            }
            fr.close();

```

```

        br.close();
        pw.flush();
        sc.close();
    } catch (IOException e){
        System.out.println(e);
    }
}
}
}

```

OUTPUT

```

C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_2.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_2

C:\Users\Dell\Documents\GitHub\Java_Lab>_

```

```

file - Notepad

File Edit View

This is a Test File.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec sit amet hendrerit lacus, at vulputate est. Aliquam malesuada, nunc id facilisis luctus, lorem elit condimentum mi, eu tristique erat velit in lorem. Integer vulputate et dui congue convallis. Mauris orci odio, vulputate ac malesuada quis, vestibulum ac mauris. Suspendisse eu libero libero. Quisque consequat lectus eu volutpat facilisis. Donec ac turpis ullamcorper, dignissim urna dignissim, congue dolor. Aliquam ligula velit, eleifend in dolor vitae, tristique tincidunt eros.

In quis eros in diam tempor pellentesque. Mauris quis neque sodales ex varius fermentum. Mauris sit amet est sed eros convallis posuere vitae eget tellus. Aenean scelerisque sed nisl et facilisis. Nam placerat risus ut odio semper gravida. ut felis diam, lacinia non purus vel, bibendum eleifend enim. Aenean lectus lorem, lobortis at nunc eu, imperdiet feugiat justo. Proin facilisis augue at augue aliquam, porta suscipit sem vulputate. Sed ligula tellus, finibus ac metus in, commodo finibus nibh. Nulla facilisi. In hac habitasse platea dictumst. Fusce massa sem, fringilla facilisis viverra in, ultricies ac odio. Maecenas non ligula ultrices, laoreet mauris nec, scelerisque turpis.

Maecenas consequat mollis arcu id mattis. Curabitur gravida quam eget massa euismod, vitae hendrerit dolor luctus. Sed et risus libero. Suspendisse ac ultrices sapien. Mauris nec ipsum vitae nunc aliquet iaculis quis eget ligula. Curabitur turpis lectus, placerat vel hendrerit vel, semper non erat. Aliquam erat volutpat. Morbi sapien ante, pharetra et leo et, tempus condimentum nunc. Fusce porttitor libero quis nibh convallis, id ornare eros vehicula. Nulla efficitur, nibh at sollicitudin posuere, augue arcu volutpat arcu, a bibendum massa odio a neque. Nunc ac leo a erat pretium euismod eget auctor lectus. Aenean tempus dui lectus, et volutpat turpis blandit ac, Etiam scelerisque sem non enim lacinia, ut egestas turpis pretium. Vestibulum aliquam enim neque, a gravida urna rutrum quis. Sed aliquet ut augue vel convallis.

Suspendisse sed finibus tortor. Donec justo lacus, auctor et purus id, auctor pretium lorem. Nam vel eros ut magna volutpat faucibus ut eu nisi. Duis dapibus ullamcorper enim sit amet porta. Vivamus et magna nec nibh blandit tristique. Phasellus pulvinar feugiat blandit. Nullam feugiat sapien eget arcu egestas ullamcorper. Proin ultrices metus non leo convallis, ut consectetur elit bibendum. Sed commodo dictum tellus vitae maximus.

Phasellus ut lobortis turpis. Phasellus aliquet condimentum blandit. Praesent ante quam, vulputate nec commodo et, tincidunt a ex. Vestibulum sodales ex vel ex feugiat, in congue neque suscipit. Vestibulum lacus mi, molestie nec finibus id, auctor sit amet quam. Ut sed interdum nunc. Nam mattis, turpis nec maximus facilisis, odio nisl euismod libero, non dictum dolor sem in libero.

Ln 6, Col 1
100% Windows (CRLF) UTF-8

```

```

file2 - Notepad

File Edit View

THIS IS A TEST FILE.

LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT. DONEC SIT AMET HENDRERIT LACUS, AT VULPUTATE EST. ALIQUAM MALESUADA, NUNC ID FACILISIS LUCTUS, LOREM ELIT CONDIMENTUM MI, EU TRISTIQUE ERAT VELIT IN LOREM. INTEGER VULPUTATE ET DUI CONGUE CONVALLIS. MAURIS ORCI ODIO, VULPUTATE AC MALESUADA QUIS, VESTIBULUM AC MAURIS. SUSPENDISSE EU LIBERO LIBERO. QUISQUE CONSEQUAT LECTUS EU VOLUTPAT FACILISIS. DONEC AC TURPIS ULLAMCORPER, DIGNISSIM URNA DIGNISSIM, CONGUE DOLOR. ALIQUAM LIGULA VELIT, ELEIFEND IN DOLOR VITAE, TRISTIQUE TINCIDUNT EROS.

IN QUIS EROS IN DIAM TEMPOR PELLENTESQUE. MAURIS QUIS NEQUE SODALES EX VARIUS FERMENTUM. MAURIS SIT AMET EST SED EROS CONVALLIS POSUERE VITAE EGEG TELLUS. AENEAN SCALERISQUE SED NISL ET FACILISIS. NAM PLACERAT RISUS UT ODIO SEMPER GRAVIDA. UT FELIS DIAM, LACINIA NON PURUS VEL, BIBENDUM ELEIFEND ENIM. AENEAN LECTUS LOREM, LOBORTIS AT NUNC EU, IMPERDIET FEUGIAT JUSTO. PROIN FACILISIS AUGUE AT AUGUE ALIQUAM, PORTA SUSCIPIT SEM VULPUTATE. SED LIGULA TELLUS, FINIBUS AC METUS IN, COMMODO FINIBUS NIBH. NULLA FACILISI. IN HAC HABITASSE PLATEA DICTUMST. FUSCE MASSA SEM, FRINGILLA FACILISIS VIVERRA IN, ULTRICIES AC ODIO. MAECENAS NON LIGULA ULTRICES, LAOREET MAURIS NEC, SCALERISQUE TURPIS.

MAECENAS CONSEQUAT MOLLIS ARCU ID MATTIS. CURABITUR GRAVIDA QUAM EGEG MASSA EUISMOD, VITAE HENDRERIT DOLOR LUCTUS. SED ET RISUS LIBERO. SUSPENDISSE AC ULTRICES SAPIEN. MAURIS NEC IPSUM VITAE NUNC ALIQUET IACULIS QUIS EGEG LIGULA. CURABITUR TURPIS LECTUS, PLACERAT VEL HENDRERIT VEL, SEMPER NON ERAT. ALIQUAM ERAT VOLUTPAT. MORBI SAPIEN ANTE, PHARETRA ET LEO ET, TEMPUS CONDIMENTUM NUNC. FUSCE PORTTITOR LIBERO QUIS NIBH CONVALLIS, ID ORNARE EROS VEHICULA. NULLA EFFICITUR, NIBH AT SOLLICITUDIN POSUERE, AUGUE ARCU VOLUTPAT ARCU, A BIBENDUM MASSA ODIO A NEQUE, NUNC AC LEO A ERAT PRETIUM EUISMOD EGEG AUCTOR LECTUS. AENEAN TEMPUS DUI LECTUS, ET VOLUTPAT TURPIS BLANDIT AC, ETIAM SCALERISQUE SEM NON ENIM LACINIA, UT EGESTAS TURPIS PRETIUM. VESTIBULUM ALIQUAM ENIM NEQUE, A GRAVIDA URNA RUTRUM QUIS. SED ALIQUET UT AUGUE VEL CONVALLIS.

SUSPENDISSE SED FINIBUS TORTOR. DONEC JUSTO LACUS, AUCTOR ET PURUS ID, AUCTOR PRETIUM LOREM. NAM VEL EROS UT MAGNA VOLUTPAT FAUCIBUS UT EU NISI. DUIS DAPIBUS ULLAMCORPER ENIM SIT AMET PORTA. VIVAMUS ET MAGNA NEC NIBH BLANDIT TRISTIQUE. PHASELLUS PULVINAR FEUGIAT BLANDIT. NULLAM FEUGIAT SAPIEN EGEG ARCU EGESTAS ULLAMCORPER. PROIN ULTRICES METUS NON LEO CONVALLIS, UT CONSECETUR ELIT BIBENDUM. SED COMMODO DICTUM TELLUS VITAE MAXIMUS.

PHASELLUS UT LOBORTIS TURPIS. PHASELLUS ALIQUET CONDIMENTUM BLANDIT. PRAESENT ANTE QUAM, VULPUTATE NEC COMMODO ET, TINCIDUNT A EX. VESTIBULUM SODALES EX VEL EX FEUGIAT, IN CONGUE NEQUE SUSCIPIT. VESTIBULUM LACUS MI, MOLESTIE NEC FINIBUS ID, AUCTOR SIT AMET QUAM. UT SED INTERDUM NUNC. NAM MATTIS, TURPIS NEC MAXIMUS FACILISIS, ODIO NISL EUISMOD LIBERO, NON DICTUM DOLOR SEM IN LIBERO.

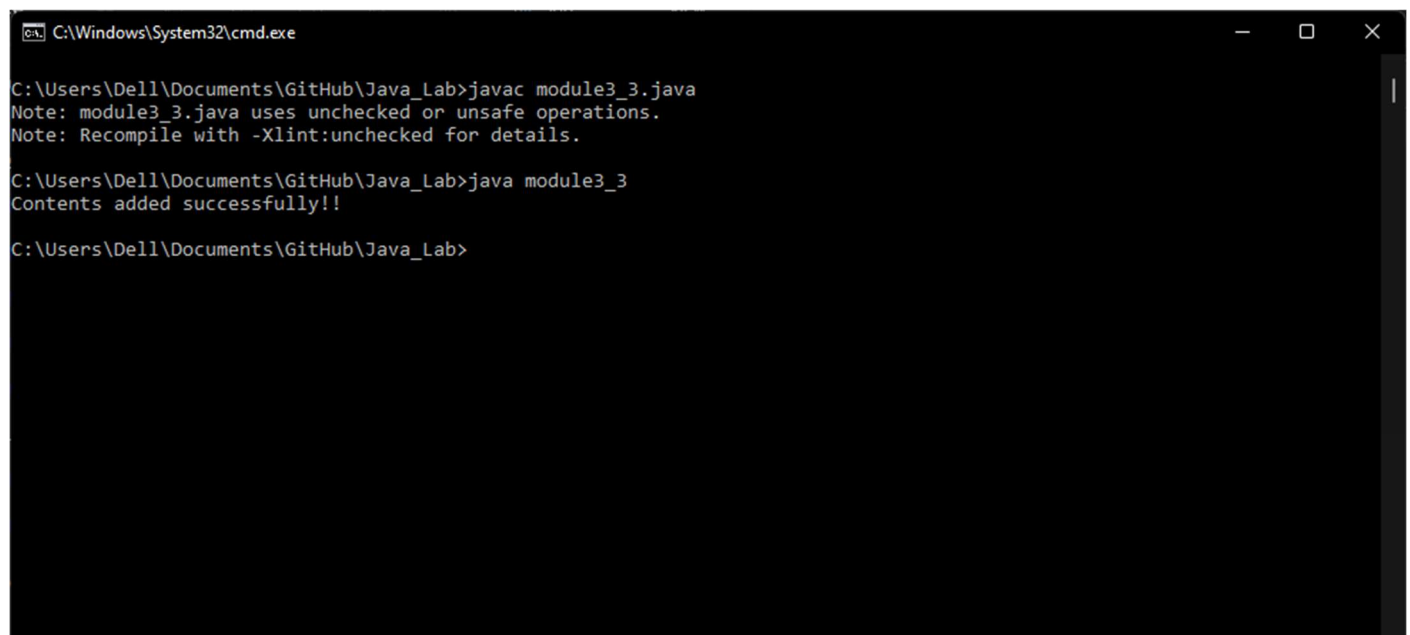
Ln 3, Col 545
100% Windows (CRLF) UTF-8

```

CODE

```
import java.io.*;
import java.util.*;
public class module3_2{
    public static void main(String [] args){
        try{
            FileReader fr = new FileReader("file.txt");
            BufferedReader br = new BufferedReader(fr);
            FileWriter fw = new FileWriter("file2.txt");
            PrintWriter pw = new PrintWriter(fw);
            Scanner sc = new Scanner(System.in);
            String s1, s2;
            s1 = br.readLine();
            while(s1 != null){
                s2 = s1.toUpperCase();
                pw.println(s2);
                s1 = br.readLine();
            }
            fr.close();
            br.close();
            pw.flush();
            sc.close();
        } catch (IOException e){
            System.out.println(e);
        }
    }
}
```

OUTPUT

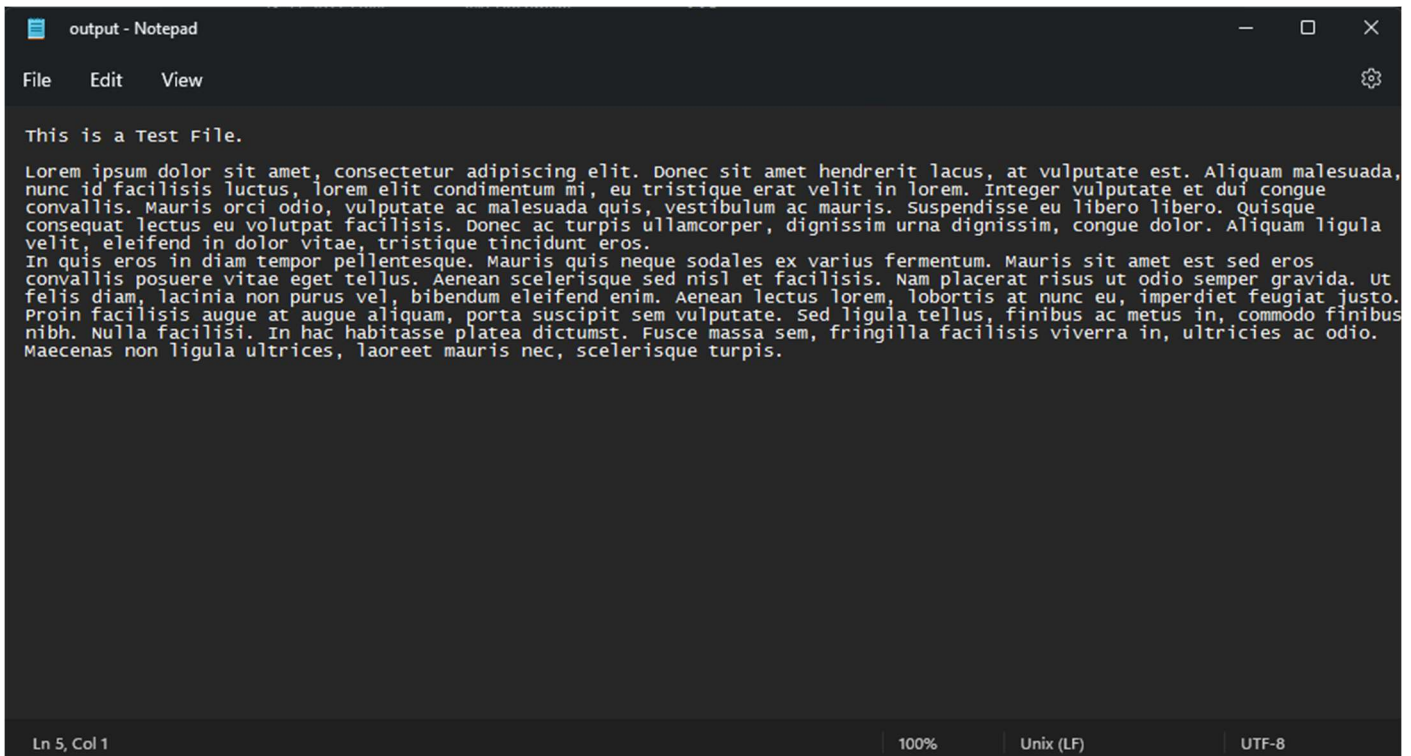


```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_3.java
Note: module3_3.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_3
Contents added successfully!!

C:\Users\Dell\Documents\GitHub\Java_Lab>
```

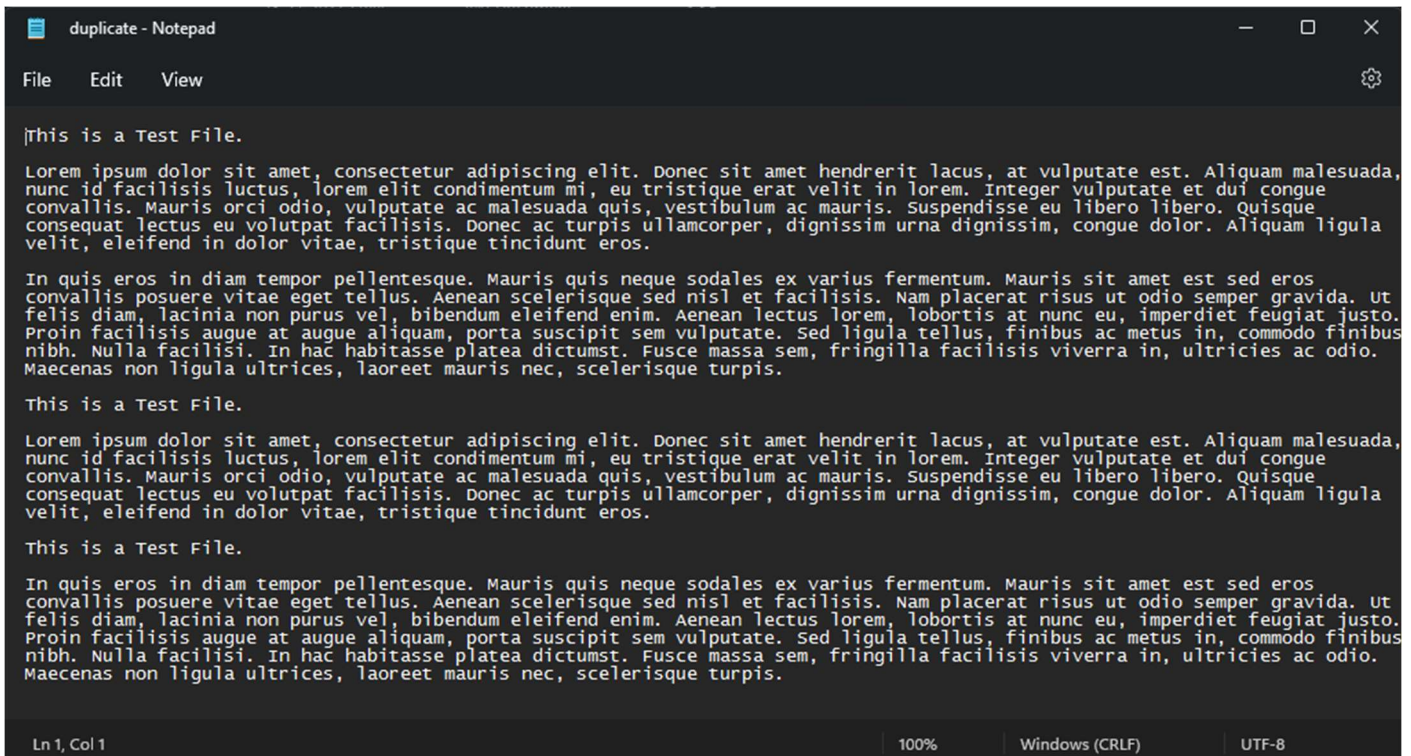



```
output - Notepad
File Edit View

This is a Test File.

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In quis eros in diam tempor pellentesque. Mauris quis neque sodales ex varius fermentum. Mauris sit amet est sed eros convallis posuere vitae eget tellus. Aenean scelerisque sed nisl et facilisis. Nam placerat risus ut odio semper gravida. Ut felis diam, lacinia non purus vel, bibendum eleifend enim. Aenean lectus lorem, lobortis at nunc eu, imperdiet feugiat justo. Proin facilisis augue at augue aliquam, porta suscipit sem vulputate. Sed ligula tellus, finibus ac metus in, commodo finibus nibh. Nulla facilisi. In hac habitasse platea dictumst. Fusce massa sem, fringilla facilisis viverra in, ultricies ac odio. Maecenas non ligula ultrices, laoreet mauris nec, scelerisque turpis.

Ln 5, Col 1 | 100% | Unix (LF) | UTF-8
```



```
duplicate - Notepad
File Edit View

This is a Test File.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec sit amet hendrerit lacus, at vulputate est. Aliquam malesuada, nunc id facilisis luctus, lorem elit condimentum mi, eu tristique erat velit in lorem. Integer vulputate et dui congue convallis. Mauris orci odio, vulputate ac malesuada quis, vestibulum ac mauris. Suspendisse eu libero libero. Quisque consequat lectus eu volutpat facilisis. Donec ac turpis ullamcorper, dignissim urna dignissim, congue dolor. Aliquam ligula velit, eleifend in dolor vitae, tristique tincidunt eros.

In quis eros in diam tempor pellentesque. Mauris quis neque sodales ex varius fermentum. Mauris sit amet est sed eros convallis posuere vitae eget tellus. Aenean scelerisque sed nisl et facilisis. Nam placerat risus ut odio semper gravida. Ut felis diam, lacinia non purus vel, bibendum eleifend enim. Aenean lectus lorem, lobortis at nunc eu, imperdiet feugiat justo. Proin facilisis augue at augue aliquam, porta suscipit sem vulputate. Sed ligula tellus, finibus ac metus in, commodo finibus nibh. Nulla facilisi. In hac habitasse platea dictumst. Fusce massa sem, fringilla facilisis viverra in, ultricies ac odio. Maecenas non ligula ultrices, laoreet mauris nec, scelerisque turpis.

This is a Test File.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec sit amet hendrerit lacus, at vulputate est. Aliquam malesuada, nunc id facilisis luctus, lorem elit condimentum mi, eu tristique erat velit in lorem. Integer vulputate et dui congue convallis. Mauris orci odio, vulputate ac malesuada quis, vestibulum ac mauris. Suspendisse eu libero libero. Quisque consequat lectus eu volutpat facilisis. Donec ac turpis ullamcorper, dignissim urna dignissim, congue dolor. Aliquam ligula velit, eleifend in dolor vitae, tristique tincidunt eros.

This is a Test File.

In quis eros in diam tempor pellentesque. Mauris quis neque sodales ex varius fermentum. Mauris sit amet est sed eros convallis posuere vitae eget tellus. Aenean scelerisque sed nisl et facilisis. Nam placerat risus ut odio semper gravida. Ut felis diam, lacinia non purus vel, bibendum eleifend enim. Aenean lectus lorem, lobortis at nunc eu, imperdiet feugiat justo. Proin facilisis augue at augue aliquam, porta suscipit sem vulputate. Sed ligula tellus, finibus ac metus in, commodo finibus nibh. Nulla facilisi. In hac habitasse platea dictumst. Fusce massa sem, fringilla facilisis viverra in, ultricies ac odio. Maecenas non ligula ultrices, laoreet mauris nec, scelerisque turpis.

Ln 1, Col 1 | 100% | Windows (CRLF) | UTF-8
```

MODULE 3 – Q4

CODE

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

public class module3_4{

    public static void getInfo() throws IOException{
        FileInputStream inp = new FileInputStream("new.txt");
        int i = 0;
        while((i=inp.read()) != -1){
```

```

        System.out.print((char)i);
    }
    inp.close();
}

public static void addInfo() throws IOException{
    FileOutputStream out = new FileOutputStream("new.txt", true);
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the name of student: ");
    String name = sc.nextLine();
    System.out.print("Enter Roll Number of student: ");
    String roll = sc.nextLine();
    System.out.print("Enter the age: ");
    String age = sc.nextLine();
    System.out.print("Enter the branch: ");
    String branch = sc.nextLine();
    String str = "\nNAME: " + name + " Roll No.: " + roll + " Age: " + age + " Branch
:" + branch;
    byte b[] = str.getBytes();
    out.write(b); out.close();
    System.out.println("Data Entered Successfully");
}

public static void main(String [] args) throws IOException{
    int select;
    boolean check = true;
    do {
        Scanner sc = new Scanner(System.in);
        System.out.println("\nEnter a choice \n1. ADD INFO \n2. SHOW INFO \n3.
EXIT");
        select = sc.nextInt();
        switch(select){
            case 1: {
                addInfo(); break;
            }
            case 2: {
                getInfo(); break;
            }
            case 3: {
                check = false; break;
            }
            default: {
                System.out.println("Enter a valid choice");
            }
        }
    } while(check);
}
}

```

OUTPUT

```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_4.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_4

Enter a choice
1. ADD INFO
2. SHOW INFO
3. EXIT
1
Enter the name of student: Tanish
Enter Roll Number of student: 21BCP050
Enter the age: 18
Enter the branch: BTech-CE
Data Entered Successfully

Enter a choice
1. ADD INFO
2. SHOW INFO
3. EXIT
2
NAME: Tanish Roll No.: 21BCP050 Age: 18 Branch :BTech-CE
Enter a choice
1. ADD INFO
2. SHOW INFO
3. EXIT
3
C:\Users\Dell\Documents\GitHub\Java_Lab>
```

MODULE 3 – Q5

CODE

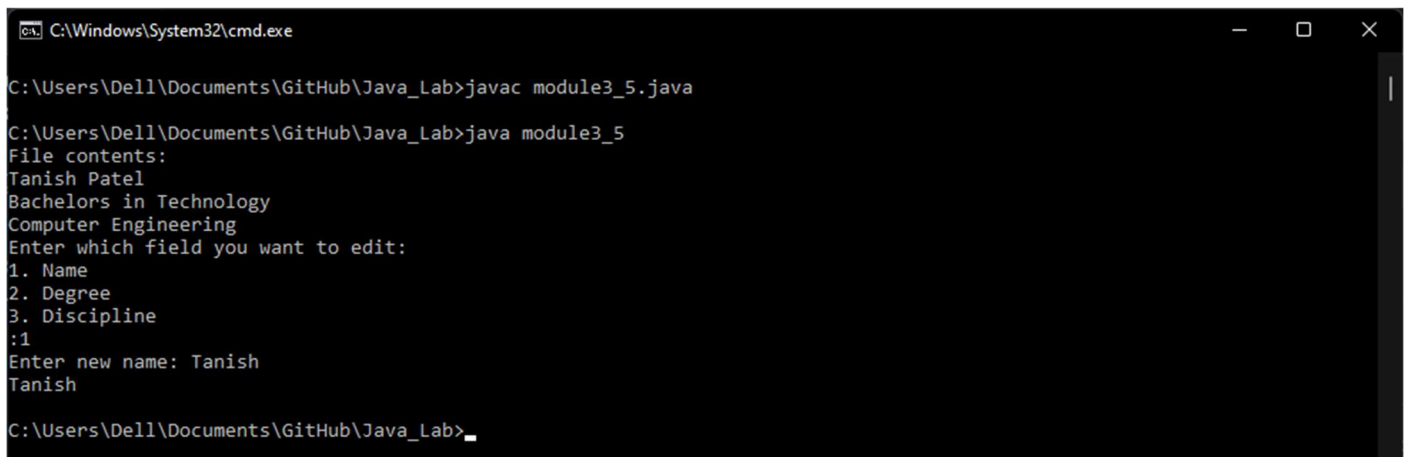
```
import java.io.*;
import java.util.*;
class Student {
    public static void main(String[] args) throws IOException{
        Scanner sc = new Scanner(System.in);
        BufferedReader fin = new BufferedReader(new FileReader("student.txt"));
        System.out.println("File contents:");
        String s = "";
        ArrayList<String> arr = new ArrayList<String>();
        for(s = fin.readLine(); s != null; s=fin.readLine()) {
            System.out.println(s);
            arr.add(s);
        }
        fin.close();
        System.out.println("Enter which field you want to edit: ");
        System.out.print("1. Name\n2. Degree\n3. Discipline\n");
        int id_ = -1, choice = sc.nextInt();
        if(choice == 1) {
            System.out.print("Enter new name: ");
            id_ = 0;
        }
        if(choice == 2) {
            System.out.print("Enter new degree: ");
            id_ = 1;
        }
    }
}
```

```

    }
    if(choice == 3) {
        System.out.print("Enter new discipline: ");
        id_ = 2;
    }
    sc.nextLine();
    String s_ = sc.nextLine();
    System.out.println(s_);
    if(id_ >= 1 && id_ <= 3)
        arr.set(id_, s_);
    PrintWriter fout = new PrintWriter(new FileWriter("student.txt"));
    for(int i = 0; i < arr.size(); i++)
        fout.println(arr.get(i));
    fout.close();
}
}

```

OUTPUT



```

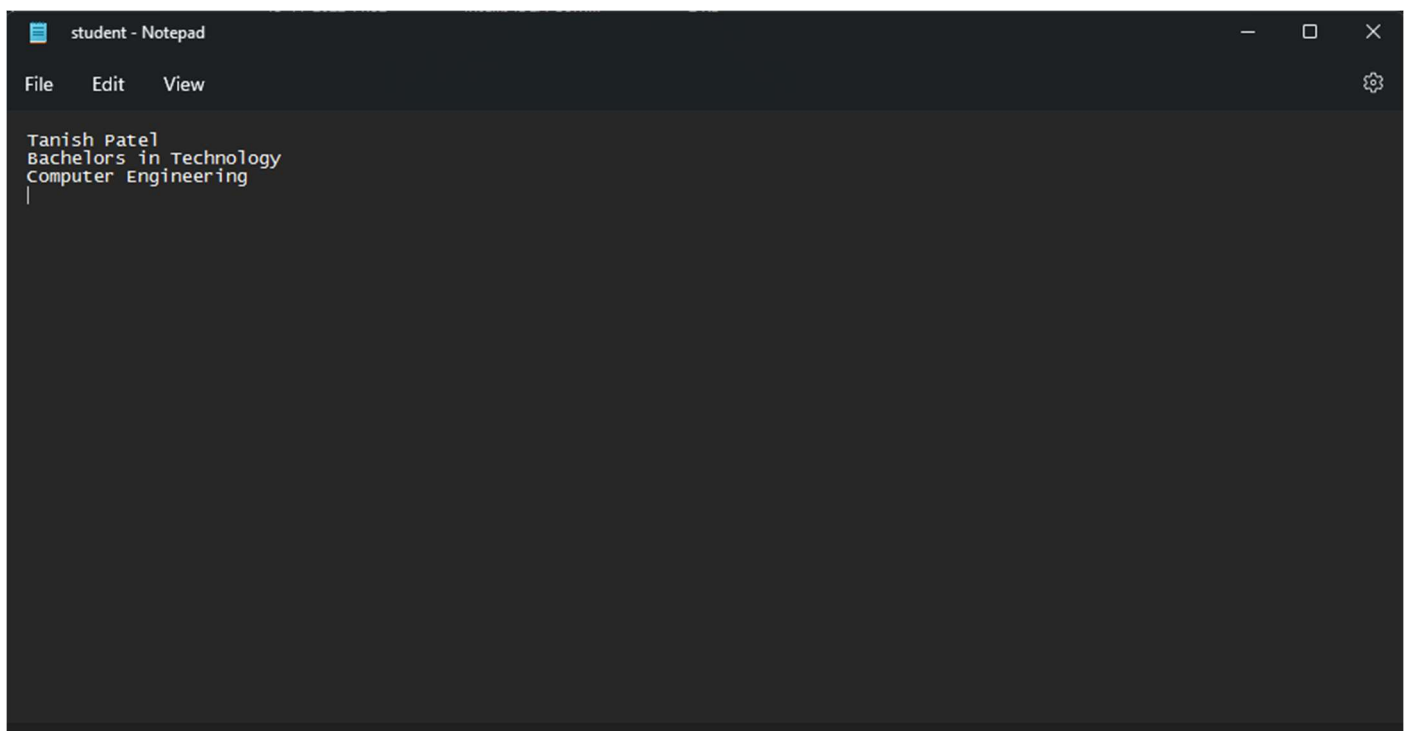
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_5.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_5
File contents:
Tanish Patel
Bachelors in Technology
Computer Engineering
Enter which field you want to edit:
1. Name
2. Degree
3. Discipline
:1
Enter new name: Tanish
Tanish

C:\Users\Dell\Documents\GitHub\Java_Lab>_

```



```

student - Notepad

File Edit View

Tanish Patel
Bachelors in Technology
Computer Engineering
|

```


CODE

```
import java.io.*;
import java.util.*;
class module3_6{
    public static void main(String[] args) throws IOException{
        Scanner sc = new Scanner(System.in);
        BufferedReader fin = new BufferedReader(new FileReader("student.txt"));
        System.out.println("File contents:");
        String s = "";
        ArrayList<String> arr = new ArrayList<String>();
        for(s = fin.readLine(); s != null; s=fin.readLine()) {
            System.out.println(s);
            arr.add(s);
        }
        fin.close();
        System.out.println("Enter which field you want to edit: ");
        System.out.print("1. Name\n2. Degree\n3. Discipline\n");
        int id_ = -1, choice = sc.nextInt();
        if(choice == 1) {
            System.out.print("Enter new name: ");
            id_ = 0;
        }
        if(choice == 2) {
            System.out.print("Enter new degree: ");
            id_ = 1;
        }
        if(choice == 3) {
            System.out.print("Enter new discipline: ");
            id_ = 2;
        }
        sc.nextLine();
        String s_ = sc.nextLine();
        System.out.println(s_);
        if(id_ >= 1 && id_ <= 3)
            arr.set(id_, s_);
        PrintWriter fout = new PrintWriter(new FileWriter("student.txt"));
        for(int i = 0; i < arr.size(); i++)
            fout.println(arr.get(i));
        fout.close();
    }
}
```

OUTPUT

```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_6.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_6
File contents:
Tanish Patel
Bachelors in Technology
CE
Enter which field you want to edit:
1. Name
2. Degree
3. Discipline
:3
Enter new discipline: ComputerEngg
ComputerEngg

C:\Users\Dell\Documents\GitHub\Java_Lab>
```

```
student - Notepad

File Edit View

Tanish Patel
Bachelors in Technology
ComputerEngg

Ln 4, Col 1 100% Windows (CRLF) UTF-8
```

MODULE 3 – Q7

CODE

```
import java.util.*;

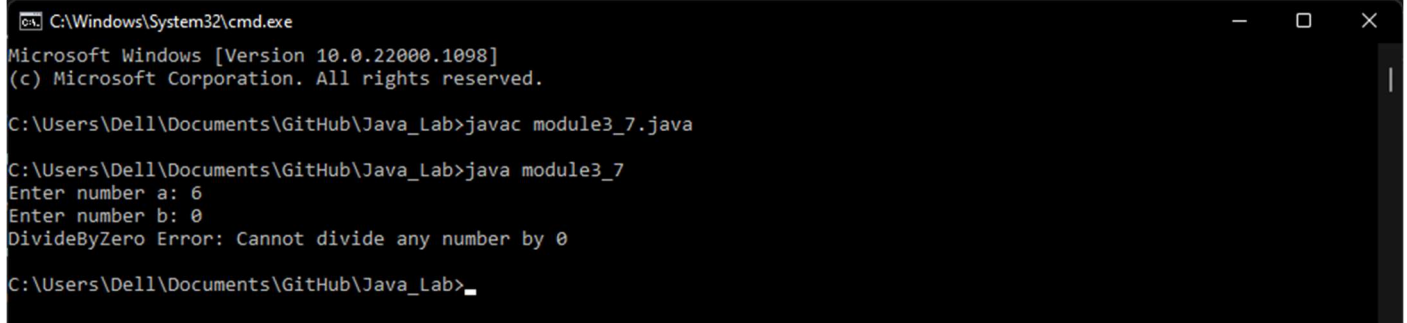
public class module3_7{
    public static void main(String [] args){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter number a: ");
        int a = sc.nextInt();
        System.out.print("Enter number b: ");
        int b = sc.nextInt();
        try{
            System.out.println("The division of the numbers (a/b) is: " + a/b);
        } catch (ArithmeticException e){
            System.out.println("DivideByZero Error: Cannot divide any number by 0");
        }
    }
}
```

```

    }
}
}

```

OUTPUT



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.1098]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_7.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_7
Enter number a: 6
Enter number b: 0
DivideByZero Error: Cannot divide any number by 0

C:\Users\Dell\Documents\GitHub\Java_Lab>_

```

MODULE 3 – Q8

CODE

```

import java.util.*;

public class module3_8{
    public static void main(String [] args){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of array: ");
        int size = sc.nextInt();
        int a[] = new int[size];
        for(int i=0; i<size; i++){
            System.out.print("Enter a["+i+"] :");
            a[i] = sc.nextInt();
        }
        try{
            System.out.print("Enter the index which you want to access: ");
            int index_tst = sc.nextInt();
            int divisonval = a[index_tst];
            System.out.print("Enter the number which you want to divide to: ");
            int in_val = sc.nextInt();
            try{
                System.out.println("The division:" + divisonval + "/" + in_val + "=" +
divisonval/in_val);
            }
            catch(ArithmeticException e){
                System.out.println("DivisionByZero Error: Cannot divide by zero!");
            }
        }
        catch(ArrayIndexOutOfBoundsException e1){
            System.out.println("ArrayIndexOutOfBoundsException: Index is out of bounds!");
        }
    }
}

```

OUTPUT

```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_8.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_8
Enter the size of array: 8
Enter a[0] :1
Enter a[1] :2
Enter a[2] :3
Enter a[3] :4
Enter a[4] :5
Enter a[5] :6
Enter a[6] :7
Enter a[7] :8
Enter the index which you want to access: 9
ArrayIndexOutOfBoundsException: Index is out of bounds!

C:\Users\Dell\Documents\GitHub\Java_Lab>_
```

MODULE 3 – Q9

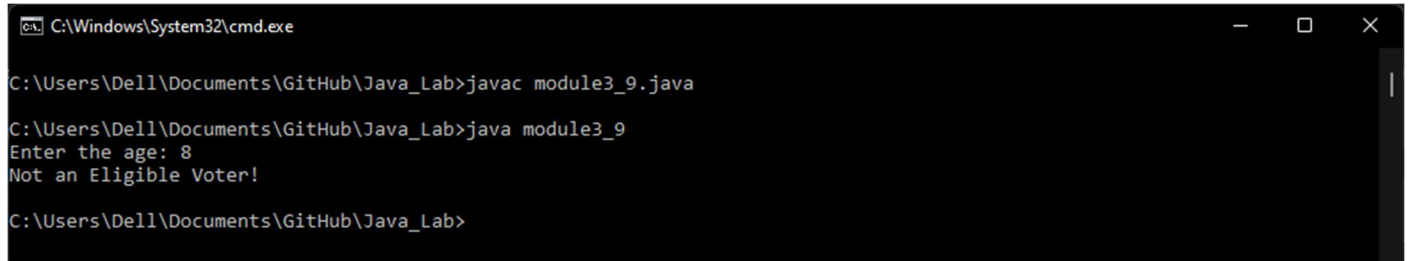
CODE

```
import java.util.*;

public class module3_9{
    public static void main(String [] args){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the age: ");
        int age = sc.nextInt();
        try{
            if(age<=0)
                throw new ABC();
            else
                if(age>=18)
                    System.out.println("Eligible Voter!");
                else
                    System.out.println("Not an Eligible Voter!");
        }
        catch(ABC o){
            System.out.println(o);
        }
    }
}

class ABC extends Exception{
    public String errMsg;
    public ABC(){
        this.errMsg = "AgeLessThanZero: Age cannot be less than zero!";
    }
    public String toString(){
        return errMsg;
    }
}
```

OUTPUT



```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_9.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_9
Enter the age: 8
Not an Eligible Voter!

C:\Users\Dell\Documents\GitHub\Java_Lab>
```

MODULE 3 – Q10

CODE

```
import java.util.*;

class bankac{
    int bankacno, acbal;
    public bankac(){
    }
    public bankac(int bankacno, int acbal){
        this.bankacno = bankacno;
        this.acbal = acbal;
    }
    //Defining a withdraw method
    public void withdrawfunds(int witamt){
        try{
            if(witamt>acbal)
                throw new Exception();
            acbal = acbal-witamt;
            System.out.println("Successfully withdrawn: " + witamt);
            System.out.println("Current balance: " + acbal);
        }
        catch (Exception e){
            System.out.println("Insufficient Funds!");
        }
    }
    //Defining a deposit method
    public void depositfunds(int depamt){
        acbal = acbal+depamt;
        System.out.println("Amount deposited: " + depamt);
        System.out.println("Current balance: " + acbal);
    }
}

public class module3_10{
    public static void main(String [] args){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter bank account number: ");
        int b1 = sc.nextInt();
        System.out.print("Enter bank balance: ");
```



```

        int b2 = sc.nextInt();
        bankac a1 = new bankac(b1,b2);
        int flag = 1;
        while(flag==1){
            System.out.print("Enter 1 for Withdraw, 2 for Deposit: ");
            int opt = sc.nextInt();
            if(opt==1){
                System.out.print("Enter amount to be withdrawn: ");
                int amtwit = sc.nextInt();
                a1.withdrawfunds(amtwit);
            }else if(opt==2){
                System.out.println("Enter amount to be deposited: ");
                int depamt = sc.nextInt();
                a1.depositfunds(depamt);
            }else if(opt==3){
                System.out.println("Goodbye");
                flag++;
            }
        }
        sc.close();
    }
}

```

OUTPUT

```

C:\Windows\System32\cmd.exe
C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_10.java
C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_10
Enter bank account number: 122032
Enter bank balance: 90000
Enter 1 for Withdraw, 2 for Deposit: 1
Enter amount to be withdrawn: 1000
Successfully withdrawn: 1000
Current balance: 89000
Enter 1 for Withdraw, 2 for Deposit: 2
Enter amount to be deposited:
1000
Amount deposited: 1000
Current balance: 90000
Enter 1 for Withdraw, 2 for Deposit: 1
Enter amount to be withdrawn: 1000000
Insufficient Funds!
Enter 1 for Withdraw, 2 for Deposit: 3
Goodbye
C:\Users\Dell\Documents\GitHub\Java_Lab>

```

MODULE 3 – Q11

CODE

```

import java.util.*;

public class module3_11 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    }
}

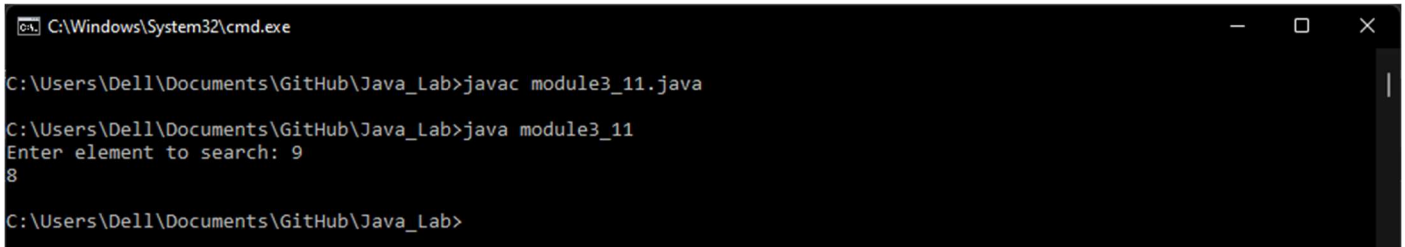
```

```

        System.out.print("Enter element to search: ");
        int key = sc.nextInt();
        int idx = binarySearch(arr, key);
        System.out.println(idx);
    }
    static int binarySearch(int[] arr, int key) {
        int lb = 0, ub = arr.length-1, mid;
        while(lb <= ub) {
            try {
                mid = (lb + ub) / 2;
                if(arr[mid] == key)
                    return mid;
                else if(arr[mid] > key)
                    ub = mid-1;
                else lb = mid+1;
                if(lb > ub) throw new ArrayIndexOutOfBoundsException();
            } catch(ArrayIndexOutOfBoundsException e) {
                System.out.println("Element not found");
                System.exit(0);
            }
        }
        return -1;
    }
}

```

OUTPUT



```

C:\Windows\System32\cmd.exe
C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_11.java
C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_11
Enter element to search: 9
8
C:\Users\Dell\Documents\GitHub\Java_Lab>

```

MODULE 3 – Q12

CODE

```

import java.util.*;
class threading_methods extends Thread{
    String message;
    int a;
    threading_methods(String msg,int num){
        message = msg;
        a = num;
    }
    public void run(){
        for(int i = 0; i<=a; i++){

```

```

        try{
            System.out.println("Message passed into Thread: " + message);
            Thread.sleep(100);
        }
        catch(InterruptedException e){
            System.out.println("Exception: " + e.getMessage());
        }
    }
}

}

public class module3_12{
    public static void main(String [] args){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the message you want to pass in the Thread 1: ");
        String message1 = sc.nextLine();
        System.out.print("Enter how many times you want to pass the message: ");
        int num1 = sc.nextInt();
        threading_methods o1 = new threading_methods(message1,num1);
        System.out.print("Enter the name of the thread 1: ");
        String threadname = sc.next();
        o1.setName(threadname);
        System.out.print("Enter the priority of the thread 1: ");
        int prioritythread = sc.nextInt();
        o1.setPriority(prioritythread);
        System.out.print("Enter the message you want to pass in the Thread 2: ");
        String message2 = sc.next();
        System.out.print("Enter how many times you want to pass the message: ");
        int num2 = sc.nextInt();
        threading_methods o2 = new threading_methods(message2,num2);
        System.out.print("Enter the name of the thread 2: ");
        String threadname1 = sc.next();
        o2.setName(threadname1);
        System.out.print("Enter the priority of the thread 2: ");
        int prioritythread1 = sc.nextInt();
        o2.setPriority(prioritythread1);
        System.out.println("Starting thread 1");
        o1.start();
        System.out.println("Starting thread 2");
        o2.start();
    }
}

```

OUTPUT

```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_12.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_12
Enter the message you want to pass in the Thread 1: Message1
Enter how many times you want to pass the message: 4
Enter the name of the thread 1: Thread1
Enter the priority of the thread 1: 6
Enter the message you want to pass in the Thread 2: Message2
Enter how many times you want to pass the message: 2
Enter the name of the thread 2: Thread2
Enter the priority of the thread 2: 9
Starting thread 1
Starting thread 2
Message passed into Thread: Message1
Message passed into Thread: Message2
Message passed into Thread: Message1
Message passed into Thread: Message2
Message passed into Thread: Message2
Message passed into Thread: Message1
Message passed into Thread: Message1
Message passed into Thread: Message1
Message passed into Thread: Message1

C:\Users\Dell\Documents\GitHub\Java_Lab>
```

MODULE 3 – Q13

CODE

```
class ThreadingDemo implements Runnable {
    public void run() {
        try {
            System.out.println("Thread " + Thread.currentThread().getId() + " is running");
        } catch (Exception e) {System.out.println("Threading exception");}
    }
}

public class module3_13{
    public static void main(String[] args) {
        for(int i = 0; i < 10; i++) {
            ThreadingDemo t0 = new ThreadingDemo();
            Thread t = new Thread(t0);
            t.start();
        }
    }
}
```

OUTPUT

```
C:\Windows\System32\cmd.exe

C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_13.java

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_13
Error: Could not find or load main class module3_13
Caused by: java.lang.ClassNotFoundException: module3_13

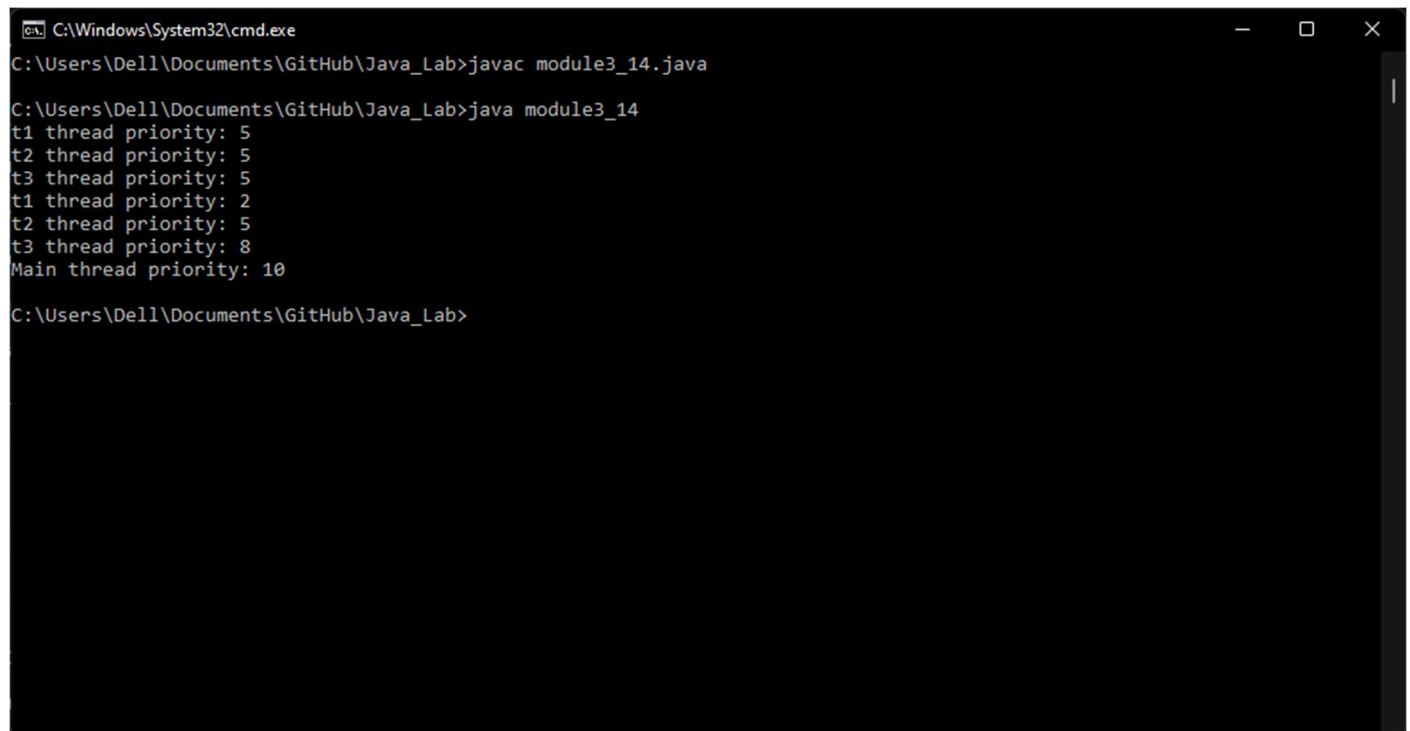
C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_13
Thread 15 is running
Thread 24 is running
Thread 16 is running
Thread 18 is running
Thread 19 is running
Thread 23 is running
Thread 21 is running
Thread 22 is running
Thread 20 is running
Thread 17 is running

C:\Users\Dell\Documents\GitHub\Java_Lab>
```

CODE

```
public class module3_14 extends Thread{
    public void run() {
        System.out.println("Inside the run method.");
    }
    public static void main(String[] args) {
        module3_14 t1 = new module3_14();
        module3_14 t2 = new module3_14();
        module3_14 t3 = new module3_14();
        System.out.println("t1 thread priority: " + t1.getPriority());
        System.out.println("t2 thread priority: " + t2.getPriority());
        System.out.println("t3 thread priority: " + t3.getPriority());
        t1.setPriority(2);
        t2.setPriority(5);
        t3.setPriority(8);
        System.out.println("t1 thread priority: " + t1.getPriority());
        System.out.println("t2 thread priority: " + t2.getPriority());
        System.out.println("t3 thread priority: " + t3.getPriority());
        Thread.currentThread().setPriority(MAX_PRIORITY);
        System.out.println("Main thread priority: " + Thread.currentThread().getPriority());
    }
}
```

OUTPUT



```
C:\Windows\System32\cmd.exe
C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_14.java
C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_14
t1 thread priority: 5
t2 thread priority: 5
t3 thread priority: 5
t1 thread priority: 2
t2 thread priority: 5
t3 thread priority: 8
Main thread priority: 10
C:\Users\Dell\Documents\GitHub\Java_Lab>
```

CODE

```
public class module3_15 {
    public static void main(String[] args) {
        Resource res = new Resource();
        Thread p = new Producer("P", res);
        Thread c = new Thread(new Consumer("C", res));
```



```

        p.start();
        // try { Thread.sleep(1000); }
        // catch(Exception e) { System.out.println(e); }
        c.start();
    }
}

class Resource {
    boolean isProduced = false;
    int data;

    synchronized void put(int x) throws Exception {
        if(isProduced)
            wait();
        this.data = x;
        isProduced = true;
        notifyAll();
    }

    synchronized int get() throws Exception {
        if(!isProduced)
            wait();
        isProduced = false;
        notifyAll();

        return data;
    }
}

class Producer extends Thread {
    String name;
    Resource res;

    public Producer(String name, Resource res) {
        this.name = name;
        this.res = res;
    }

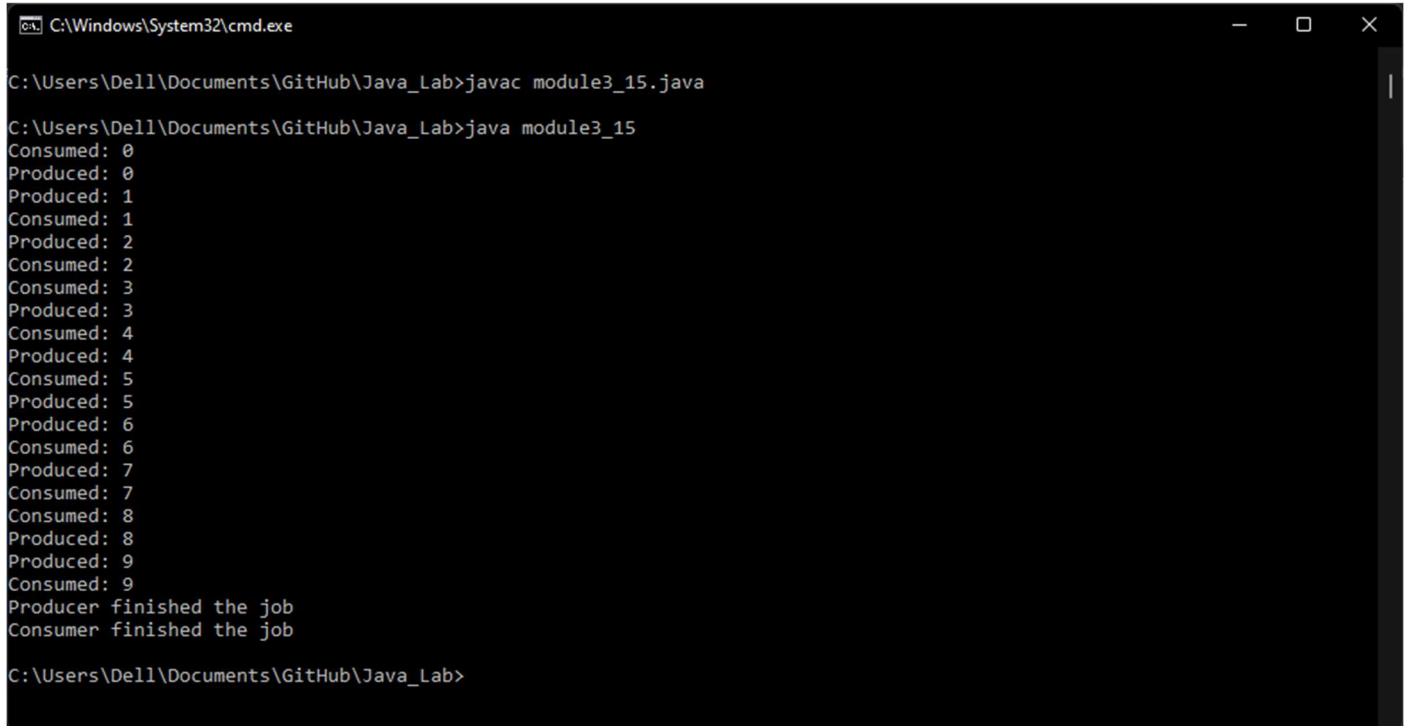
    public void run() {
        try {
            for(int i = 0; i < 10; i++) {
                res.put(i);
                System.out.println("Produced: " + i);
                Thread.sleep(1000);
            }
        } catch(Exception e) {}
        finally { System.out.println("Producer finished the job"); }
    }
}

class Consumer implements Runnable {

```

```
String name;
Resource res;
public Consumer(String name, Resource res) {
    this.name = name;
    this.res = res;
}
public void run() {
    try {
        for (int i = 0; i < 10; i++) {
            System.out.println("Consumed: " + res.get());
            Thread.sleep(1000);
        }
    } catch (Exception e) {}
    finally { System.out.println("Consumer finished the job"); }
}
}
```

OUTPUT



```
C:\Windows\System32\cmd.exe
C:\Users\Dell\Documents\GitHub\Java_Lab>javac module3_15.java
C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_15
Consumed: 0
Produced: 0
Produced: 1
Consumed: 1
Produced: 2
Consumed: 2
Consumed: 3
Produced: 3
Consumed: 4
Produced: 4
Consumed: 5
Produced: 5
Produced: 6
Consumed: 6
Produced: 7
Consumed: 7
Consumed: 8
Produced: 8
Produced: 9
Consumed: 9
Producer finished the job
Consumer finished the job
C:\Users\Dell\Documents\GitHub\Java_Lab>
```