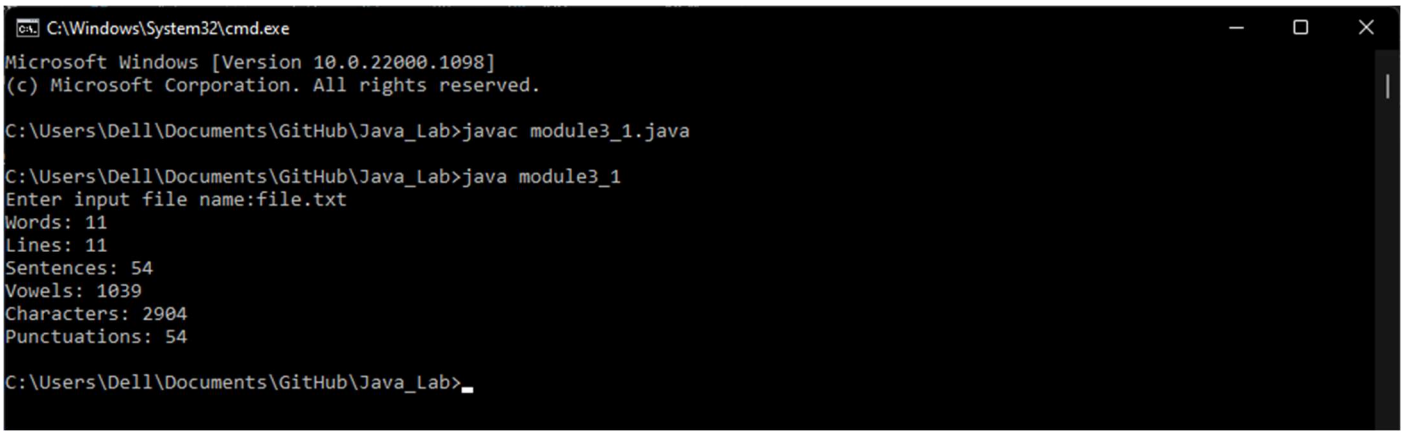
MODULE 3 – Q1

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==punct[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



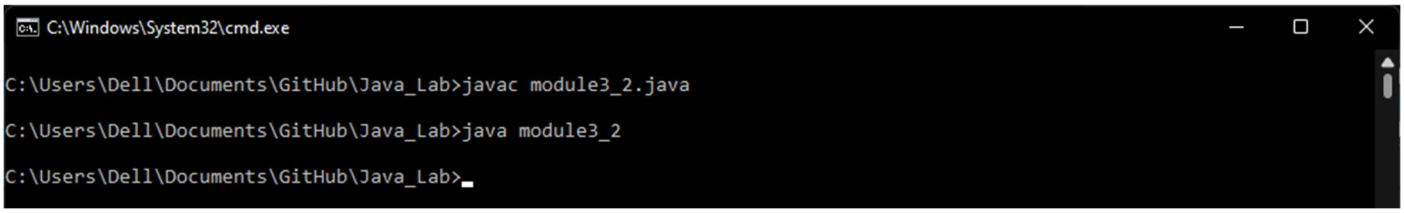
MODULE 3 – Q2

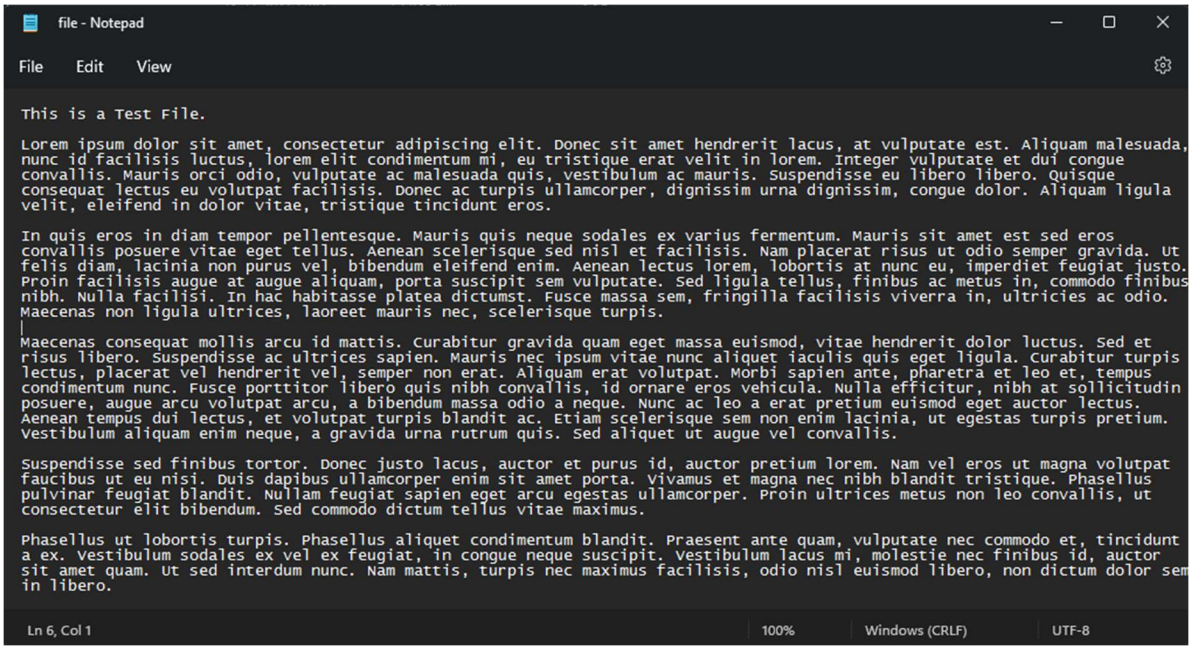
CODE

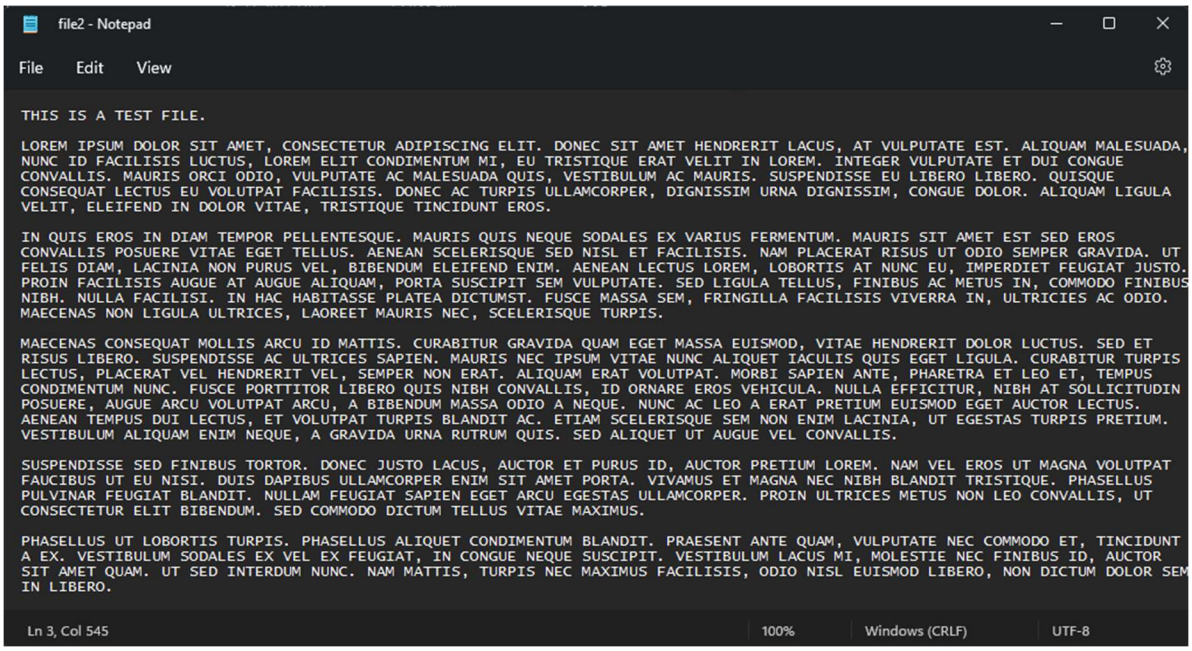
```
import java.io.*;
import java.util.*;
public class module3_2{
    public static void main(String [] args){
        try{
            FileReader fr = new FileReader("file.txt");
            BufferedReader br = new BufferedReader(fr);
            FileWriter fw = new FileWriter("file2.txt");
            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





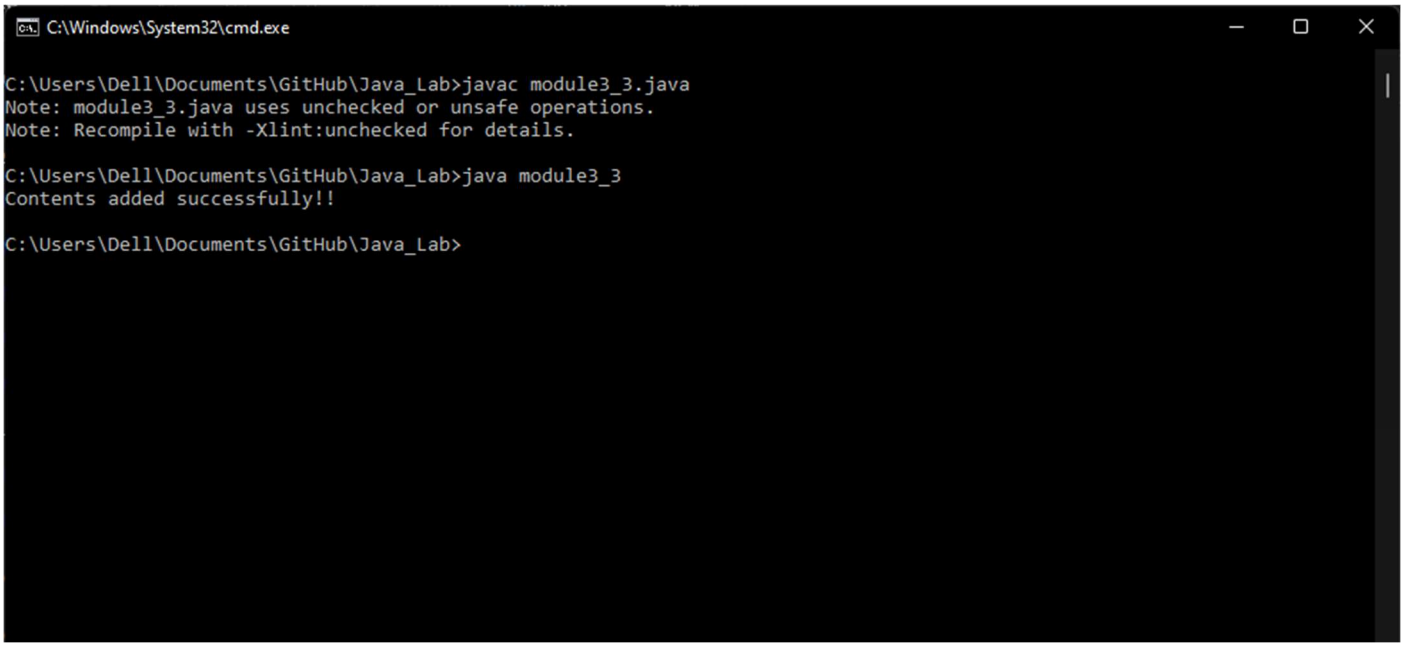


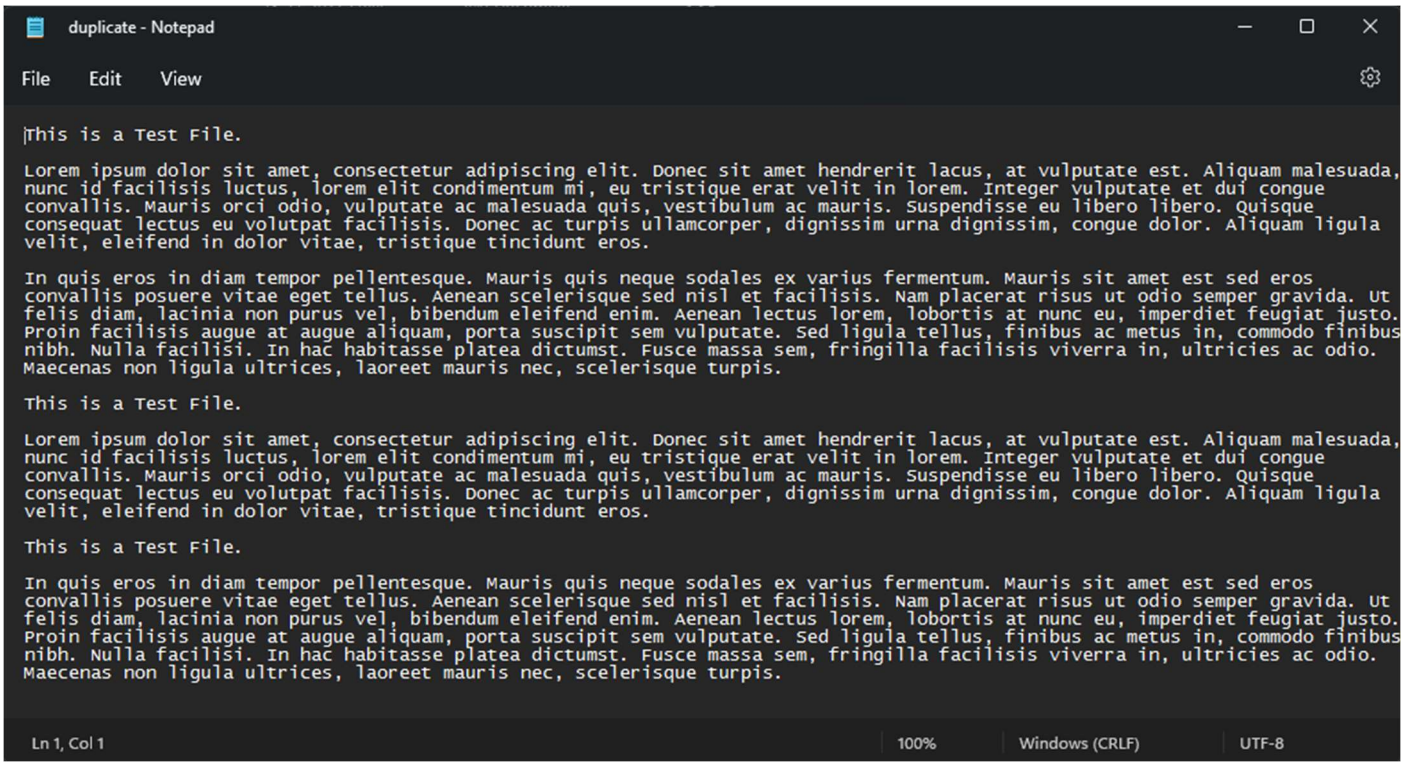
MODULE 3 – Q3

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





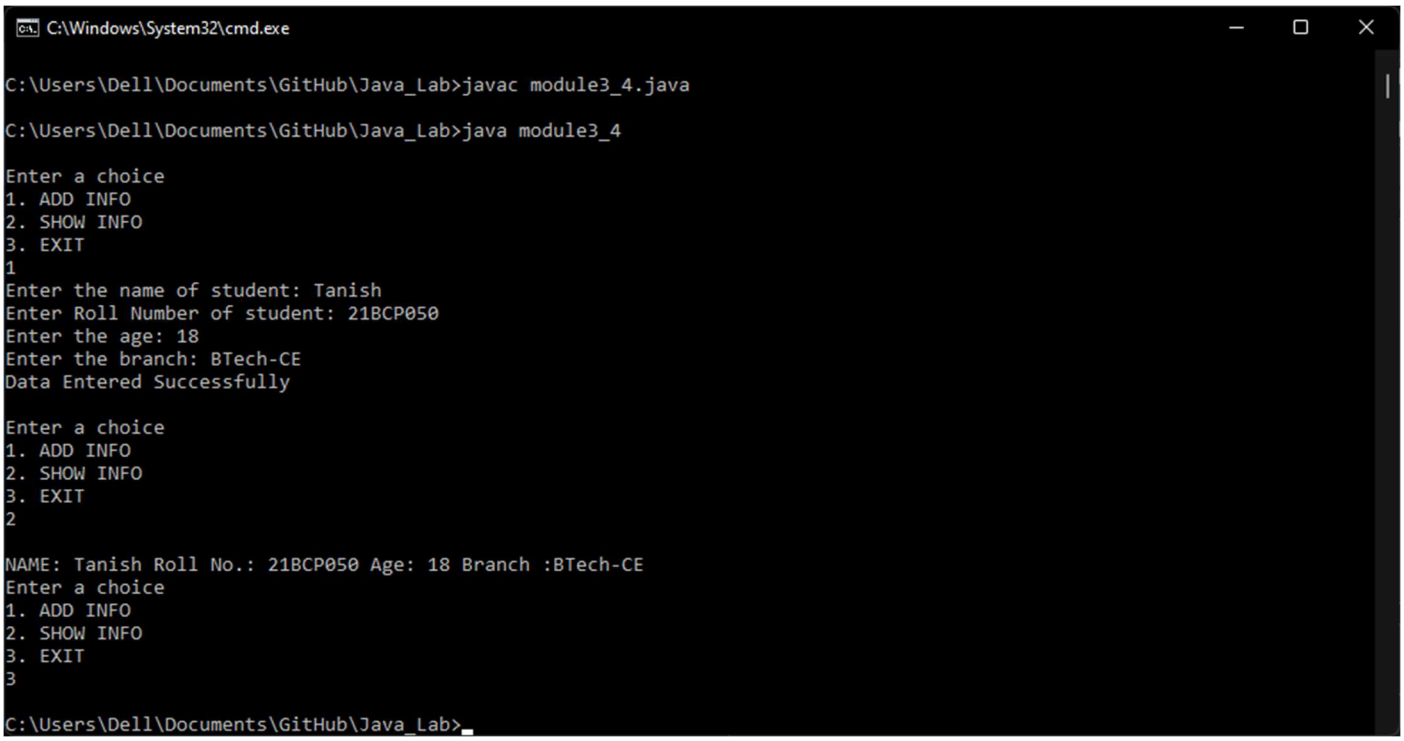
MODULE 3 – Q4

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



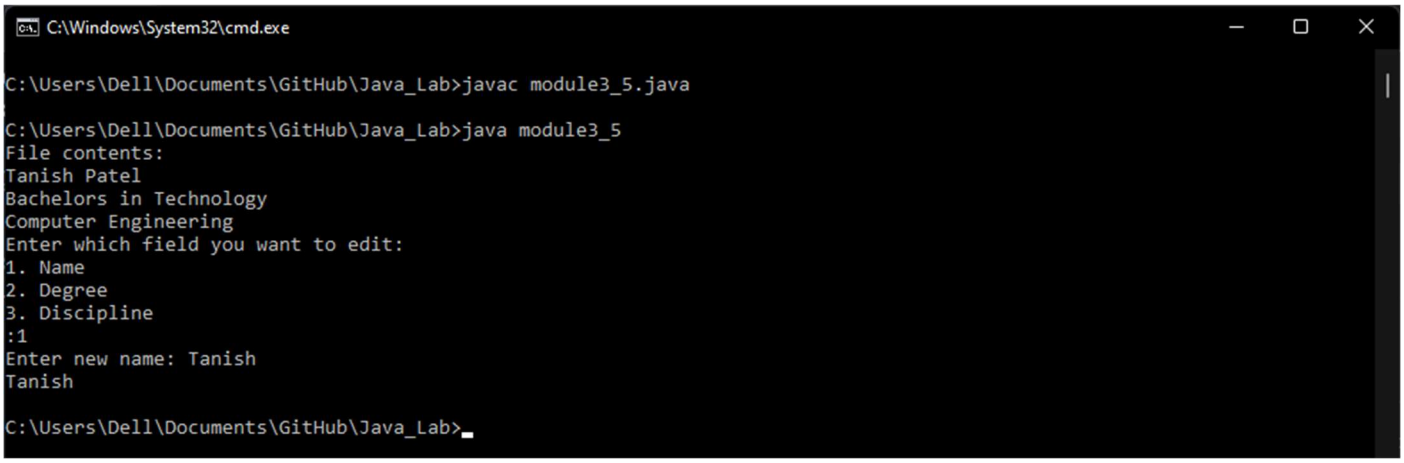
MODULE 3 – Q5

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

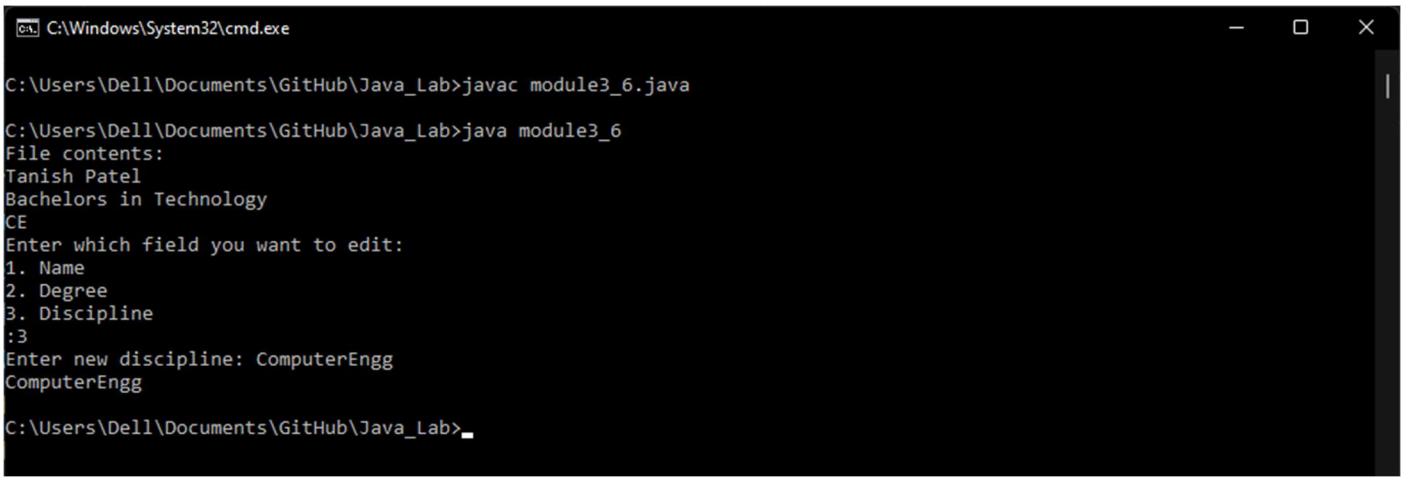


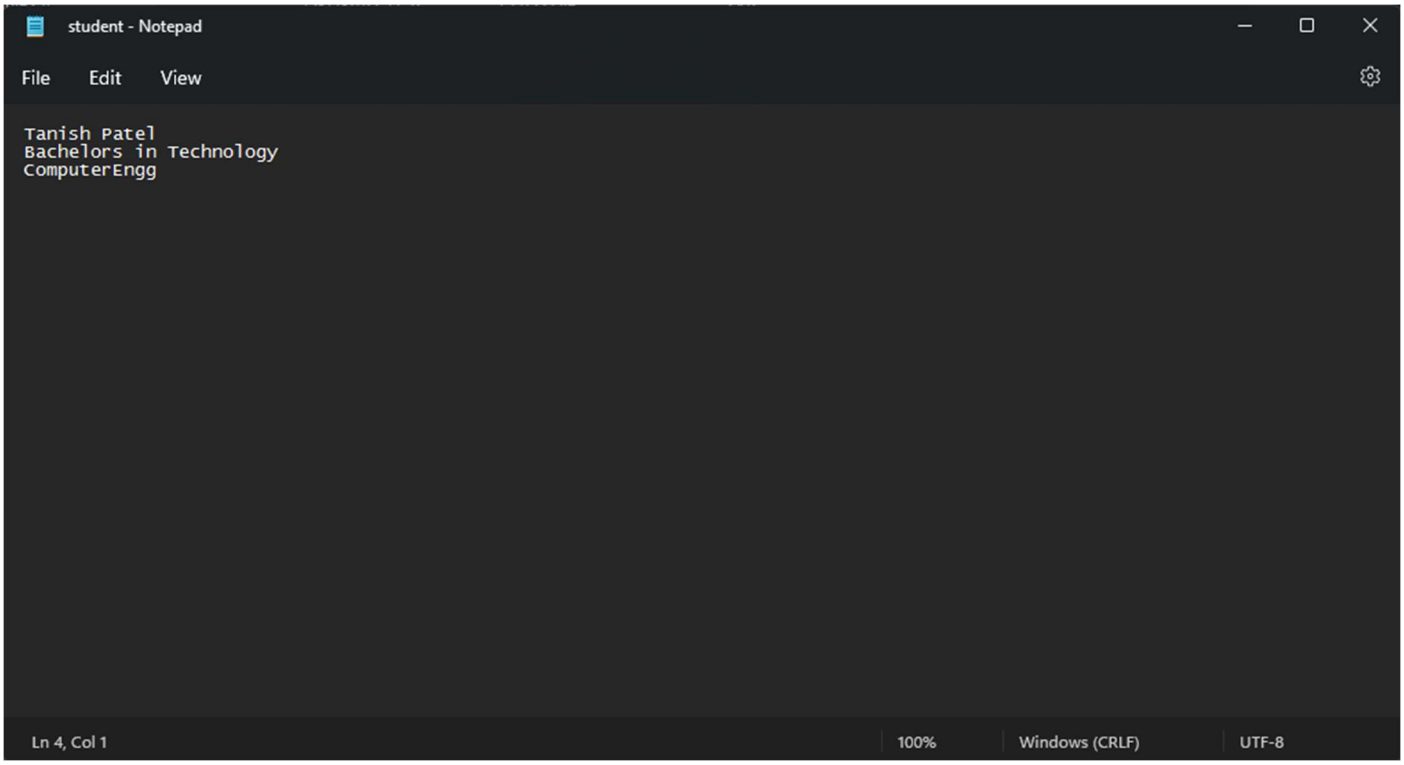
MODULE 3 – Q6

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





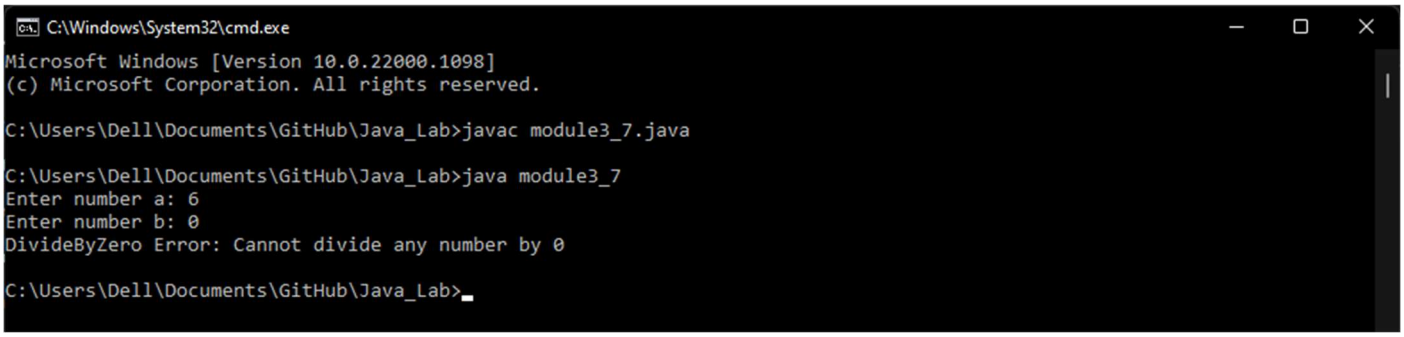
MODULE 3 – Q7

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

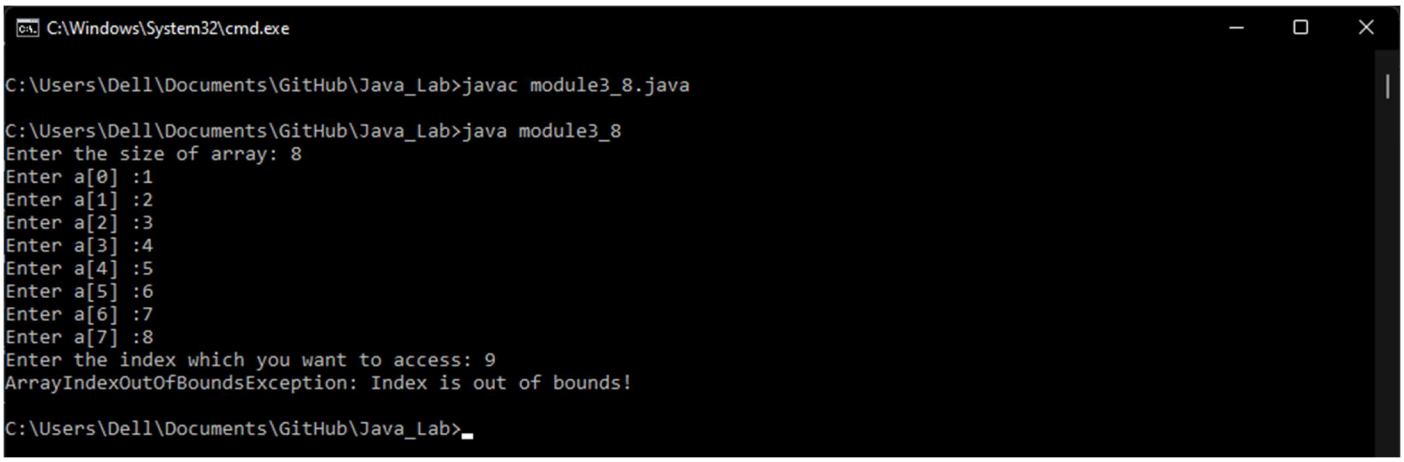


MODULE 3 – Q8

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

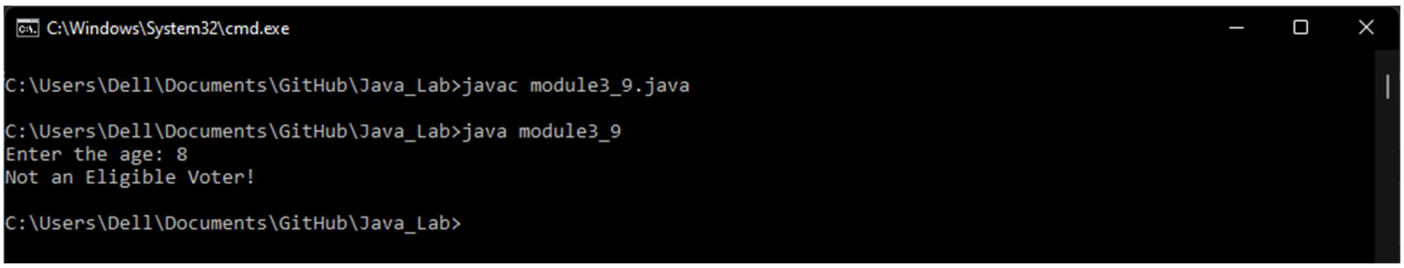


MODULE 3 – Q9

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



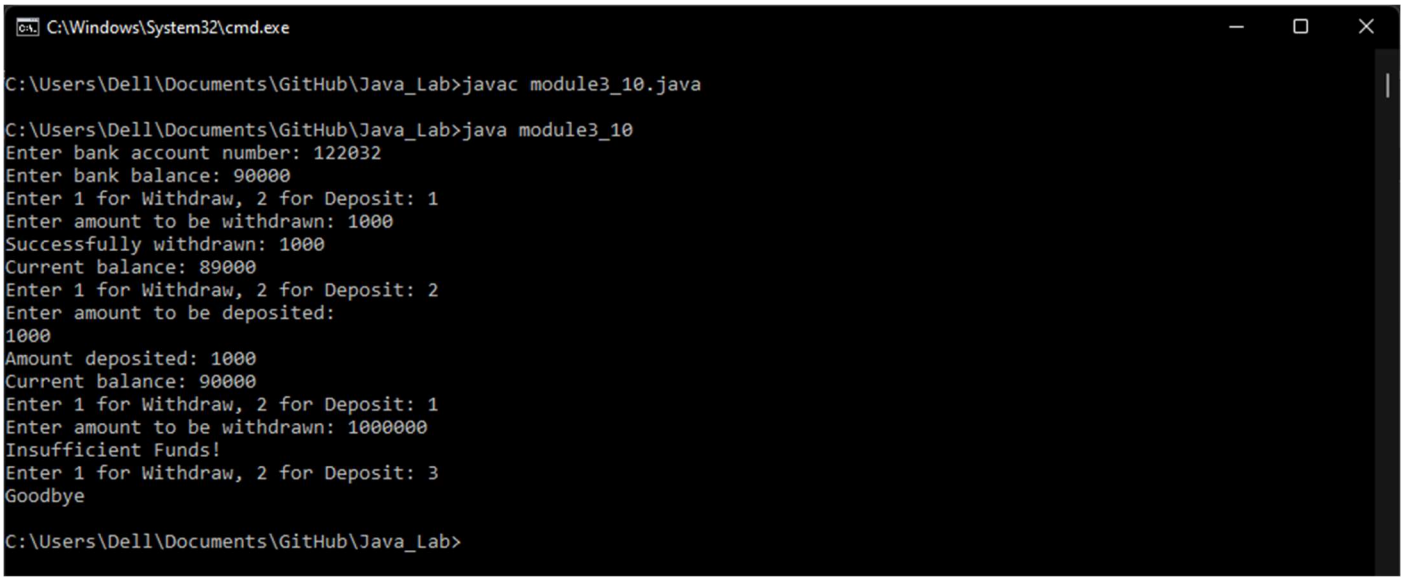
MODULE 3 – Q10

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



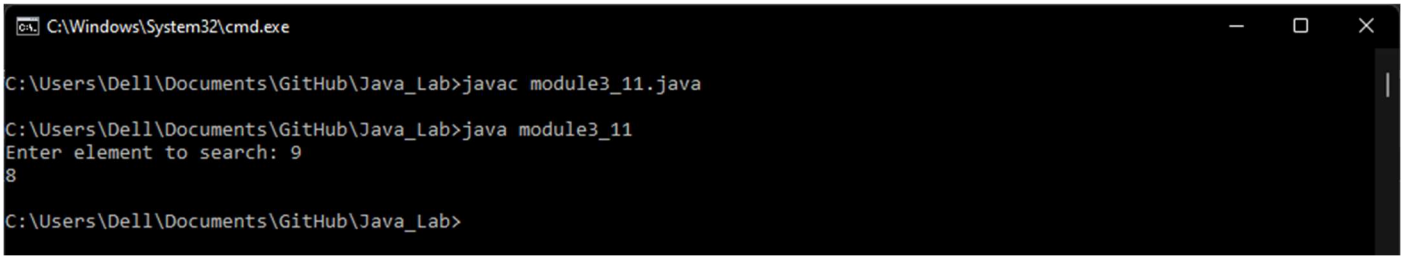
MODULE 3 – Q11

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



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

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

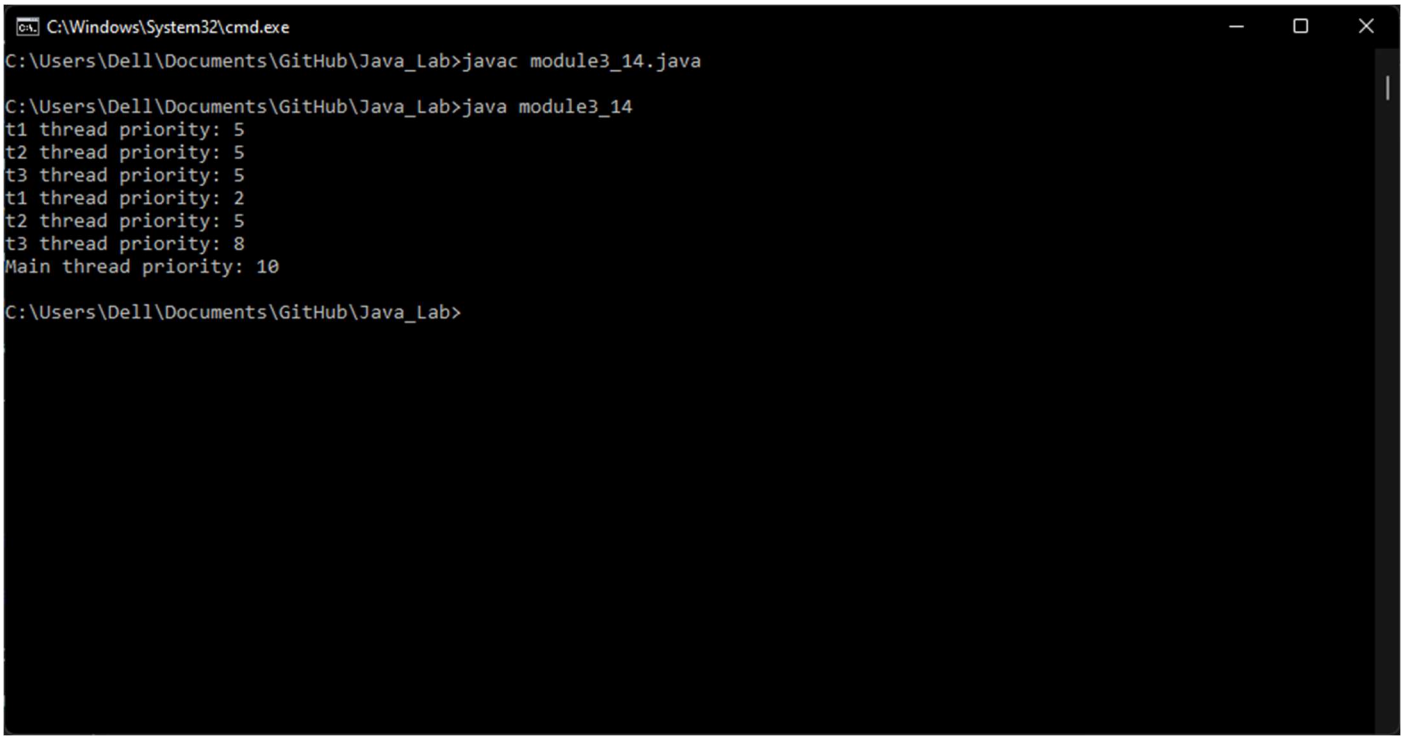
```
C:\Windows\System32\cmd.exe

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

C:\Users\Dell\Documents\GitHub\Java_Lab>java module3_!3
Error: Could not find or load main class module3_!3
Caused by: java.lang.ClassNotFoundException: module3_!3

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>
```

MODULE 3 – Q14

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



MODULE 3 – Q15

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