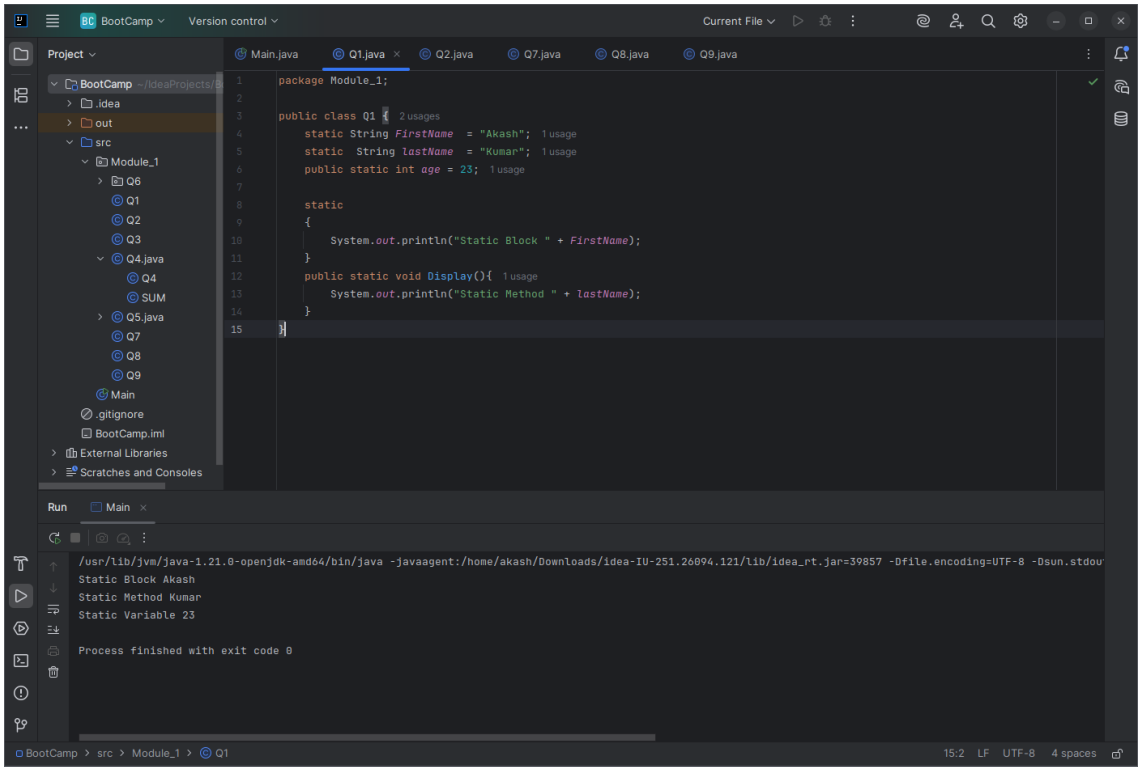
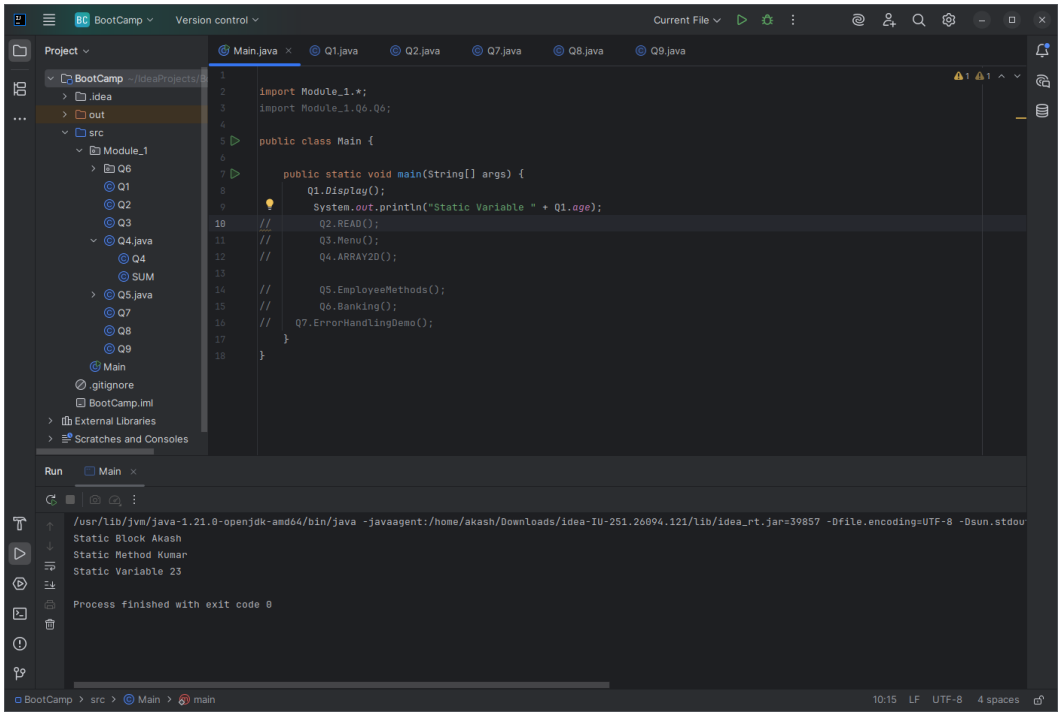
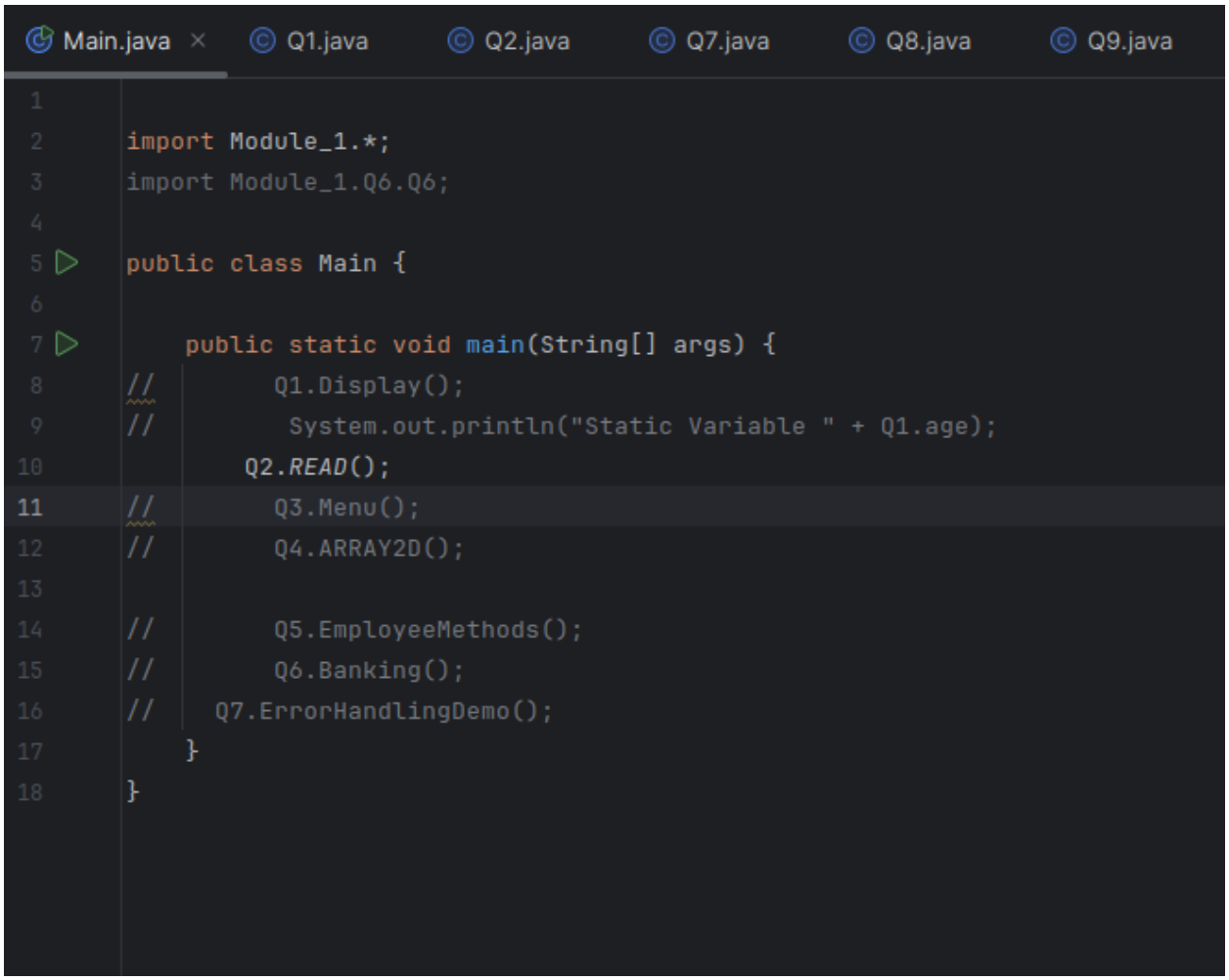
Assignment - Introduction to Java - 1

Q1)Write a class with FirstName, LastName & age field. Print Firstname, LastName & age using static block, static method & static variable respectively.




BootCamp
Version control
Current File
Project
Main.java
Q1.java
Q2.java
Q7.java
Q8.java
Q9.java
BootCamp
.idea
out
src
Module_1
Q6
Q1
Q2
Q3
Q4.java
Q4
SUM
Q5.java
Q7
Q8
Q9
Main
.gitignore
BootCamp.iml
External Libraries
Scratches and Consoles
import Module_1.*;
import Module_1.Q6.Q6;
public class Main {
public static void main(String[] args) {
Q1.Display();
System.out.println("Static Variable " + Q1.age);
// Q2.READ();
// Q3.Menu();
// Q4.ARRAY2D();
// Q5.EmployeeMethods();
// Q6.Banking();
// Q7.ErrorHandlingDemo();
}
}
Run
Main
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib/idea_rt.jar=39857 -Dfile.encoding=UTF-8 -Dsun.stdou
Static Block Akash
Static Method Kumar
Static Variable 23
Process finished with exit code 0
BootCamp
src
Main
main
10:15
LF
UTF-8
4 spaces

Q2)Write a program to read user input until user writes XDONE and then show the entered text by the user on co



mmand line

Main.java | Q1.java | Q2.java | Q7.java | Q8.java | Q9.java

```java
package Module_1;

import java.util.Scanner;

public class Q2{  1 usage
    public static void READ(){  1 usage

        Scanner sc = new Scanner(System.in);
        StringBuilder result = new StringBuilder();

        System.out.println("Enter text (type 'XDONE' anywhere to finish):");

        while (true) {
            String line = sc.nextLine();

            if (line.contains("XDONE")) {
                // Capture only the part before XDONE
                int index = line.indexOf("XDONE");
                result.append(line.substring(0, index));
                break;
            }

            result.append(line).append("\n");
        }

        System.out.println("\nYou entered:");
        System.out.print(result.toString());

        sc.close();
    }

}
```

```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
Enter text (type 'XDONE' anywhere to finish):
 hi i am XDONE

You entered:
 hi i am
Process finished with exit code 0
```

Q3)Write a java program to show following menu to the user:

*******Menu*******

1. Calculate Area of Circle

2. Calculate Circumference of a Circle

3. Exit. Choose an option (1-3): Take radius as user input.

Hint: Use Switch statement to act on the menu. Also area and circumference methods should be static

```java
package Module_1;
import java.util.Scanner;
public class Q3 {  no usages
    public static void Display(){  1 usage
        System.out.println("\t".repeat( count: 4)+"********Menu********");
        System.out.println("\t".repeat( count: 5)+"1. Calculate Area of a Circle.");
        System.out.println("\t".repeat( count: 5)+"2. Calculate Circumference of a Circle.");
        System.out.println("\t".repeat( count: 5)+"3. Exit.");
        System.out.println("\t".repeat( count: 5)+"Choose option (1-3)");

    }
    public static float INPUT() {  2 usages
        Scanner input = new Scanner(System.in);
        float radius = 0;
        System.out.println("\nEnter the radius of a Circle :  ");
        radius = input.nextInt();

        return radius;
    }

    public static float Area() {  1 usage
        float radius = INPUT();
        return (float) (Math.PI * radius * radius);
    }

    public static float Circumference() {  1 usage
        float radius = INPUT();
        return (float) (2 * Math.PI * radius);
    }
    public static void Menu() {  no usages
          Display();
          Scanner input = new Scanner(System.in);
          int choice = 0;
```

```
3     public class Q3 {  no usages
30        public static void Menu() {  no usages
34
35            choice = input.nextInt();
36
37
38            switch(choice){
39                case 1:{
40
41                    float area = Area();
42                    System.out.println("Area of circle is " + area);
43                    break;
44                }
45                case 2:{
46                    float circumference = Circumference();
47                    System.out.println("Circumference of circle is " + circumference);
48                    break;
49                }
50                case 3:{
51                    break;
52                }
53                default:{
54                    System.out.println("Invalid choice");
55                }
56            }
57
58            input.close();
59        }
60    }
```

```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
        ********Menu********
            1. Calculate Area of a Circle.
            2. Calculate Circumference of a Circle.
            3. Exit.
            Choose option (1-3)
1

Enter the radius of a Circle :
1
Area of circle is 3.1415927

Process finished with exit code 0
```

Q4)Create a two dimensional array of integers and display:

1. sum of all elements of each column

2. sum of all elements of each row

Main.java Q4.java Q3.java Q1.java Q2.java Q7.java Q8.java Q9.java

```java
package Module_1;

import java.util.Scanner;

class SUM{  2 usages
    public void Sum(int [][]arr ,int n,int m,int x){  2 usages
        for(int i=0;i<n;i++){
            int sum=0;
            for(int j=0;j<m;j++){
                if(x==0)
                sum+=arr[i][j];
                else
                    sum+=arr[j][i];
            }
            if(x==1)
            System.out.print(sum + " ");
            else
            System.out.println(sum);
        }
    }
}
```

```java
public class Q4 {  1 usage
    public static void ARRAY2D() {  1 usage
        int n,m ;
        Scanner input = new Scanner(System.in);
        System.out.print("Enter number of rows : ");
        n=input.nextInt();
        System.out.print("Enter number of columns : ");
        m=input.nextInt();
        int [][] arr = new int[n][m];

        System.out.print("Enter elements : \n");
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                arr[i][j]=input.nextInt();
            }
        }
        SUM S = new SUM();
        System.out.print("Sum of all elements of each row : \n");
        S.Sum(arr,n,m, x: 0);
        System.out.print("\nSum of all elements of each column : \n");
        S.Sum(arr,m,n, x: 1);
    }
}
```

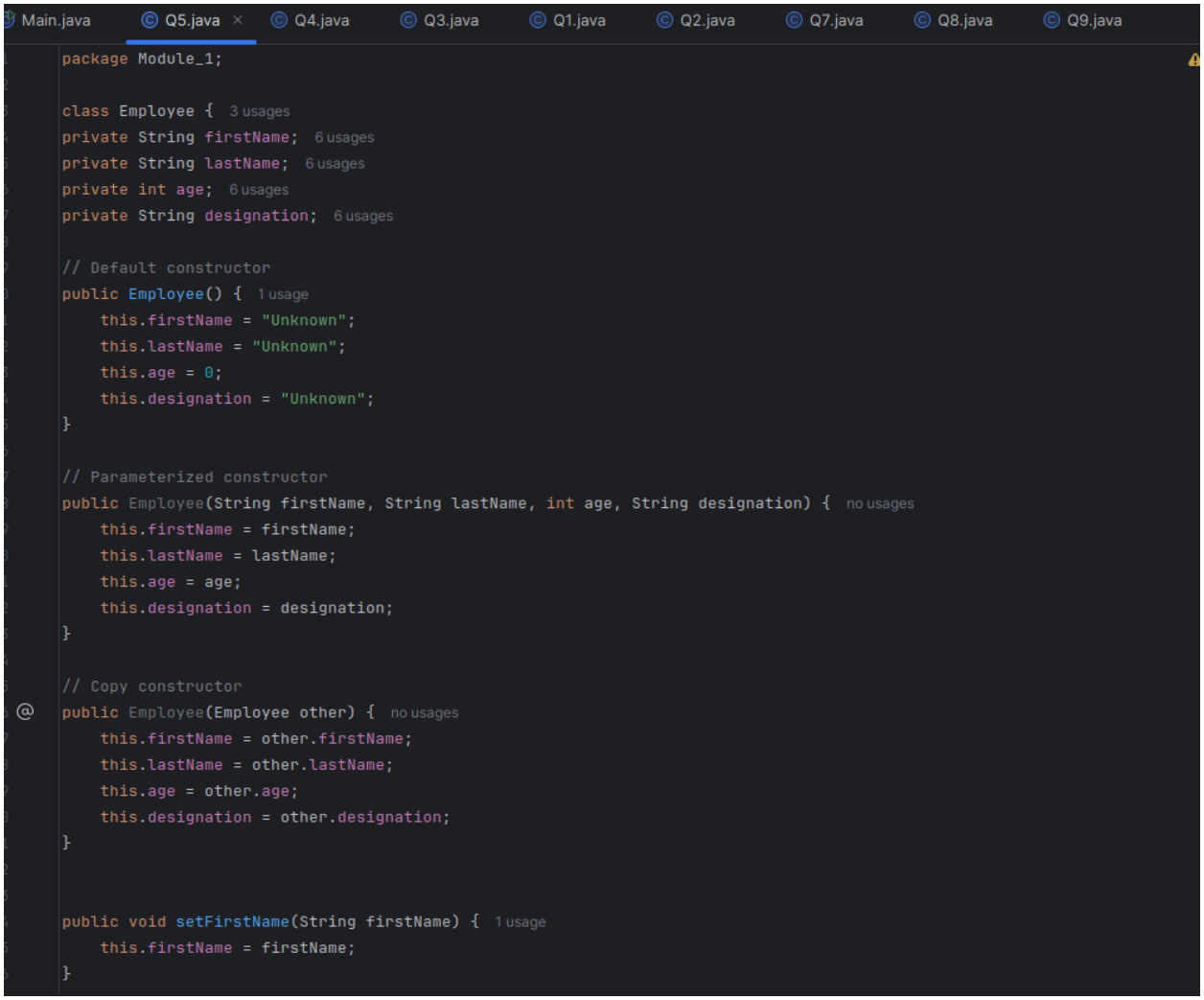
```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
Enter number of rows : 2
Enter number of columns : 2
Enter elements :
1 2 3 4
Sum of all elements of each row :
3
7

Sum of all elements of each column :
4 6
Process finished with exit code 0
```

Q5)Create a class named Employee with fields firstname,lastname,age and designation. The class should:

1. have all types of constructors to initialize the object

2. class should also have setter methods to update a particular field

3. Override its toString method to display a meaningful message using all these fields.



Main.java | Q5.java | Q4.java | Q3.java | Q1.java | Q2.java | Q7.java | Q8.java | Q9.java

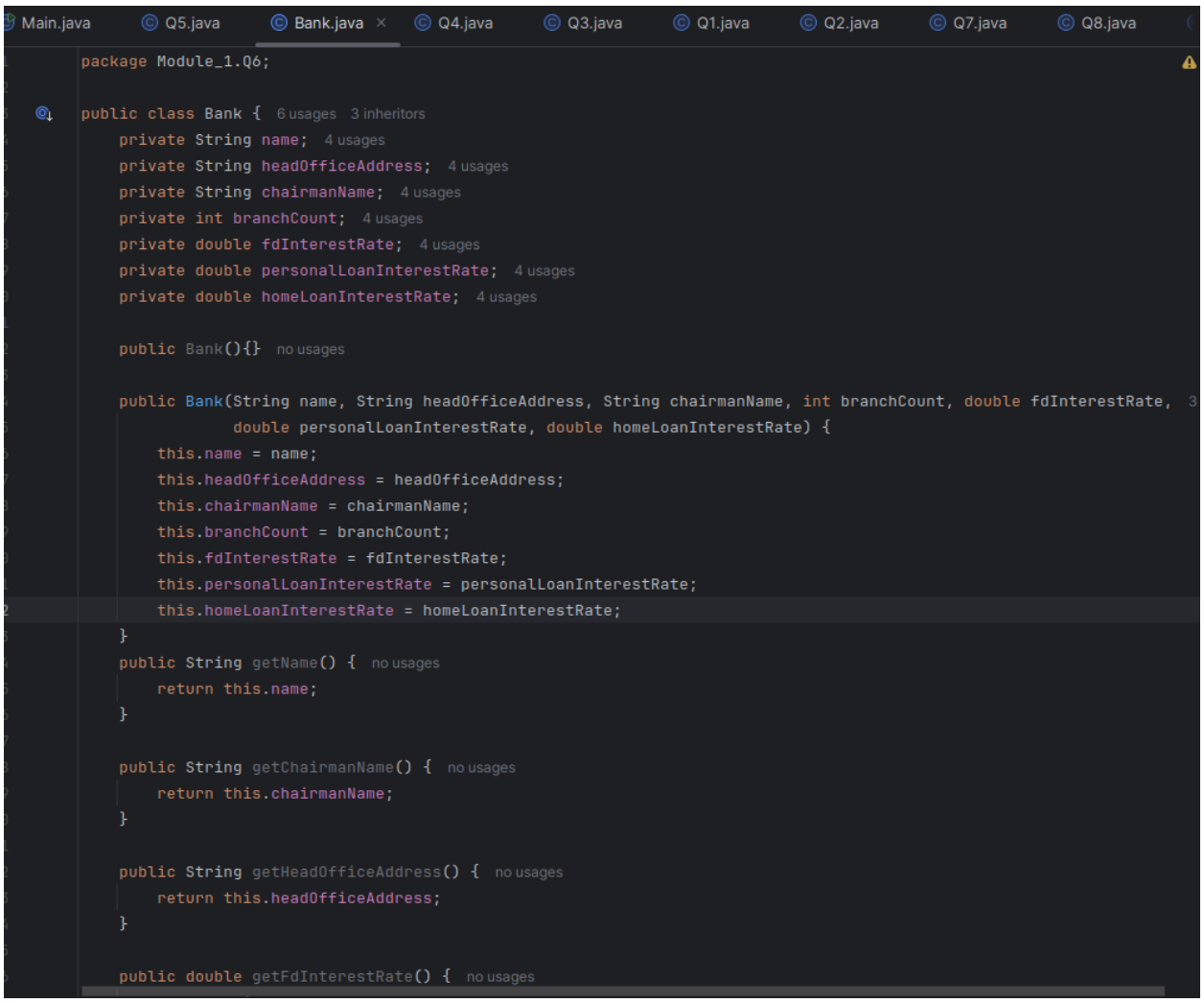
```java
class Employee {  3 usages
public void setFirstName(String firstName) {  1 usage
    this.firstName = firstName;
}

public void setLastName(String lastName) {  1 usage
    this.lastName = lastName;
}

public void setAge(int age) {  1 usage
    this.age = age;
}

public void setDesignation(String designation) {  1 usage
    this.designation = designation;
}

@Override  12 usages
public String toString() {
    return "Employee Details:\n" +
            "Full Name: " + firstName + " " + lastName + "\n" +
            "Age: " + age + "\n" +
            "Designation: " + designation;
}
}
public class Q5 {  1 usage
    public static void EmployeeMethods() {  1 usage
        Employee emp = new Employee();
        emp.setFirstName("Akash");
        emp.setLastName("Kumar");
        emp.setAge(23);
        emp.setDesignation("Trainee");

        System.out.println(emp);

    }
```

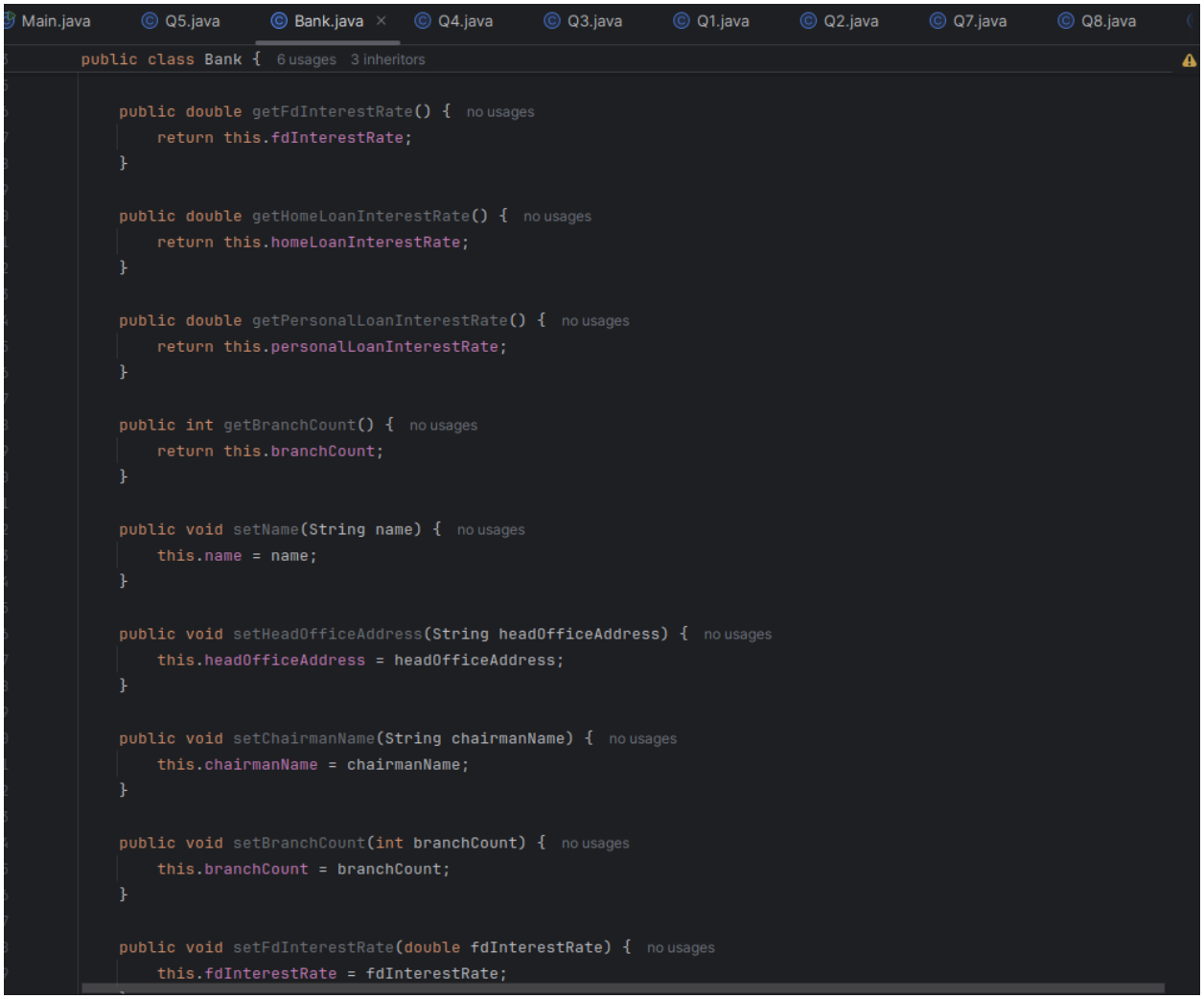
```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
Employee Details:
Full Name: Akash Kumar
Age: 23
Designation: Trainee

Process finished with exit code 0
```

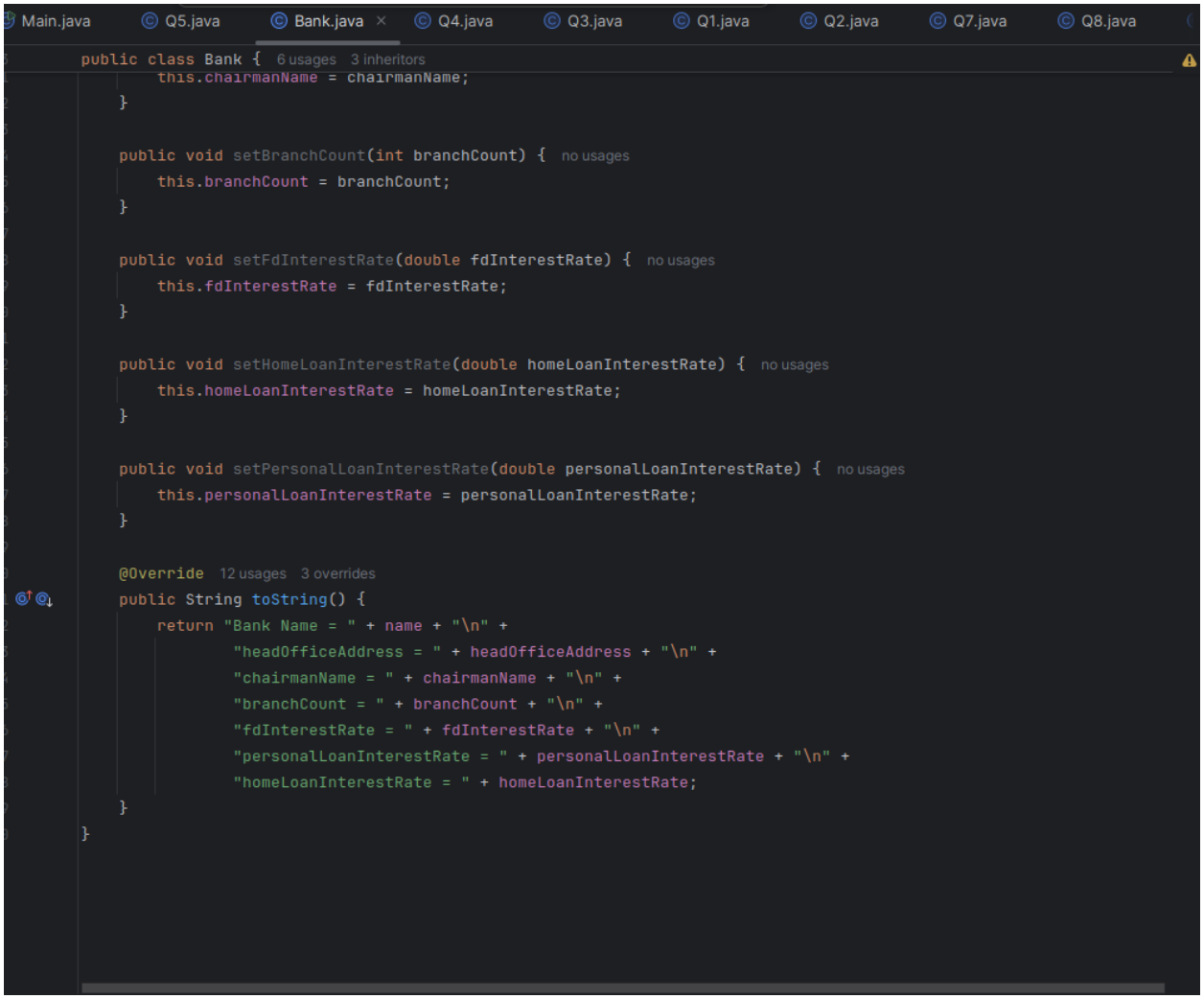
Q6)Implement a banking system using java. Create 3 sub class of Bank : SBI, BOI, ICICI Classes should have attributes like Name, headofficeAddress, chairmanName, branchCount, fdInterestRate, personalLoanInterestRate, homeLoanInterestRate. All 3 should have following methods:

1. add getters and setters for the fields

2. print details of every bank (override toString)




Main.java
Q5.java
Bank.java
Q4.java
Q3.java
Q1.java
Q2.java
Q7.java
Q8.java
public class Bank { 6 usages 3 inheritors
public double getFdInterestRate() { no usages
return this.fdInterestRate;
}
public double getHomeLoanInterestRate() { no usages
return this.homeLoanInterestRate;
}
public double getPersonalLoanInterestRate() { no usages
return this.personalLoanInterestRate;
}
public int getBranchCount() { no usages
return this.branchCount;
}
public void setName(String name) { no usages
this.name = name;
}
public void setHeadOfficeAddress(String headOfficeAddress) { no usages
this.headOfficeAddress = headOfficeAddress;
}
public void setChairmanName(String chairmanName) { no usages
this.chairmanName = chairmanName;
}
public void setBranchCount(int branchCount) { no usages
this.branchCount = branchCount;
}
public void setFdInterestRate(double fdInterestRate) { no usages
this.fdInterestRate = fdInterestRate;


Main.java
Q5.java
Bank.java
Q4.java
Q3.java
Q1.java
Q2.java
Q7.java
Q8.java
public class Bank { 6 usages 3 inheritors
this.chairmanName = chairmanName;
}
public void setBranchCount(int branchCount) { no usages
this.branchCount = branchCount;
}
public void setFdInterestRate(double fdInterestRate) { no usages
this.fdInterestRate = fdInterestRate;
}
public void setHomeLoanInterestRate(double homeLoanInterestRate) { no usages
this.homeLoanInterestRate = homeLoanInterestRate;
}
public void setPersonalLoanInterestRate(double personalLoanInterestRate) { no usages
this.personalLoanInterestRate = personalLoanInterestRate;
}
@Override 12 usages 3 overrides
public String toString() {
return "Bank Name = " + name + "\n" +
"headOfficeAddress = " + headOfficeAddress + "\n" +
"chairmanName = " + chairmanName + "\n" +
"branchCount = " + branchCount + "\n" +
"fdInterestRate = " + fdInterestRate + "\n" +
"personalLoanInterestRate = " + personalLoanInterestRate + "\n" +
"homeLoanInterestRate = " + homeLoanInterestRate;
}
}

Main.java | Q5.java | Bank.java | BOI.java | Q4.java | Q3.java | Q1.java | Q2.java | Q7.java

```java
package Module_1.Q6;

public class BOI extends Bank {  1 usage
    public BOI() {  1 usage
        super( name: "BOI",  headOfficeAddress: "Mumbai, Maharashtra",  chairmanName: "Rajneesh Karnatak",
                branchCount: 5000,  fdInterestRate: 5.7,  personalLoanInterestRate: 11.0,  homeLoanInterestRate: 7.3);
    }

    @Override  12 usages
    public String toString() {
        return "Bank of India Details:\n" + super.toString();
    }
}
```

Main.java | Q5.java | Bank.java | BOI.java | ICICI.java | Q4.java | Q3.java | Q1.java | Q2.java

```java
package Module_1.Q6;

public class ICICI extends Bank {  1 usage
    public ICICI() {  1 usage
        super( name: "ICICI",  headOfficeAddress: "Mumbai, Maharashtra",  chairmanName: "Sandeep Bakhshi",
                branchCount: 5300,  fdInterestRate: 6.0,  personalLoanInterestRate: 11.5,  homeLoanInterestRate: 8.2);
    }

    @Override  12 usages
    public String toString() {
        return "ICICI Bank Details:\n" + super.toString();
    }
}
```

Main.java | Q5.java | Bank.java | BOI.java | ICICI.java | SBI.java | Q4.java | Q3.java | Q1.java

```java
package Module_1.Q6;

public class SBI extends Bank{  1 usage
    public SBI() {  1 usage
        super( name: "SBI",  headOfficeAddress: "Mumbai, Maharashtra",  chairmanName: "Dinesh Kumar Khara",
                branchCount: 22000,  fdInterestRate: 5.5,  personalLoanInterestRate: 10.5,  homeLoanInterestRate: 7.0);
    }

    @Override  12 usages
    public String toString() {
        return "SBI Bank Details:\n" + super.toString();
    }
}
```

Main.java | Q5.java | Bank.java | BOI.java | ICICI.java | SBI.java | Q6.java | Q4.java | Q3.java

```java
package Module_1.Q6;

public class Q6 {  2 usages
    public static void Banking() {  1 usage
        Bank sbi = new SBI();
        Bank boi = new BOI();
        Bank icici = new ICICI();

        System.out.println(sbi);

//        System.out.println(boi);
//        System.out.println(icici);

    }
}
```

```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
SBI Bank Details:
Bank Name = SBI
headOfficeAddress = Mumbai, Maharashtra
chairmanName = Dinesh Kumar Khara
branchCount = 22000
fdInterestRate = 5.5
personalLoanInterestRate = 10.5
homeLoanInterestRate = 7.0

Process finished with exit code 0
```

Q7)WAP showing try, multi-catch and finally blocks.

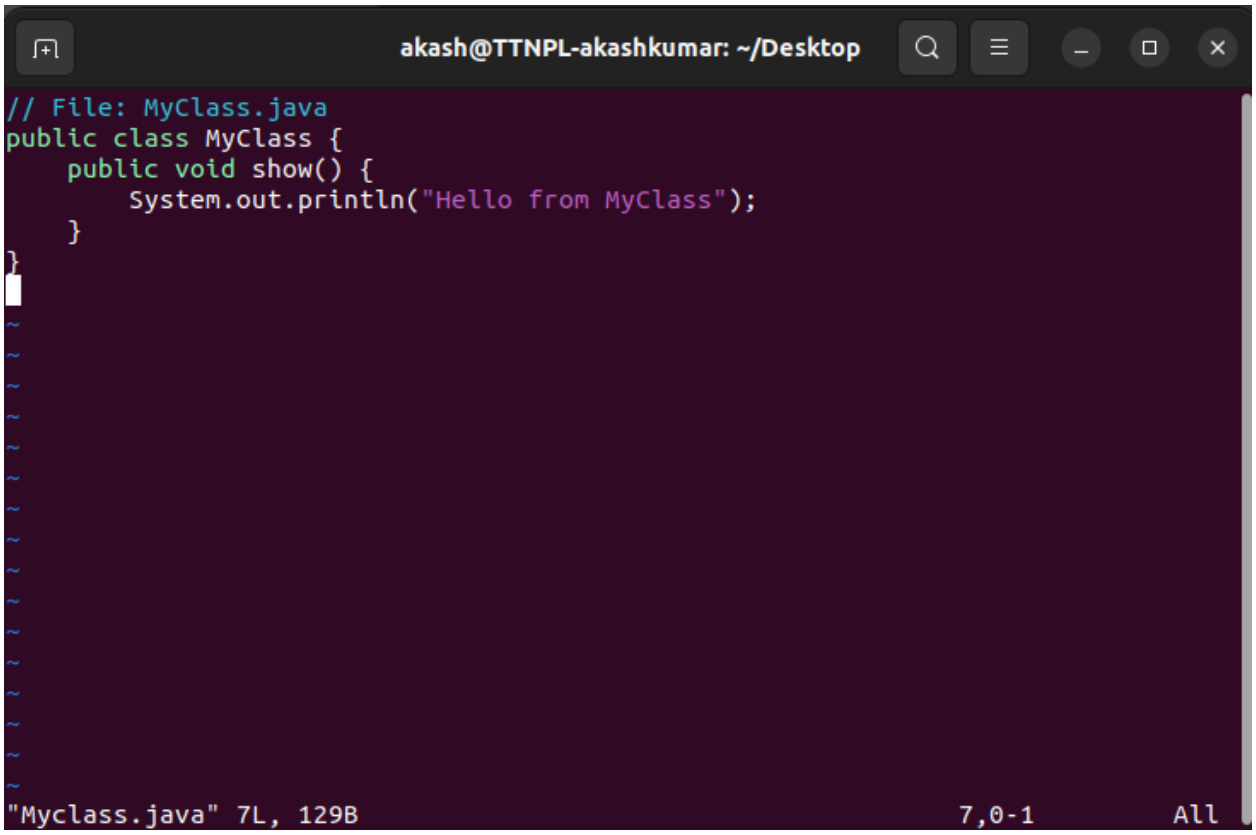
Main.java | Q7.java | Q8.java | Q9.java

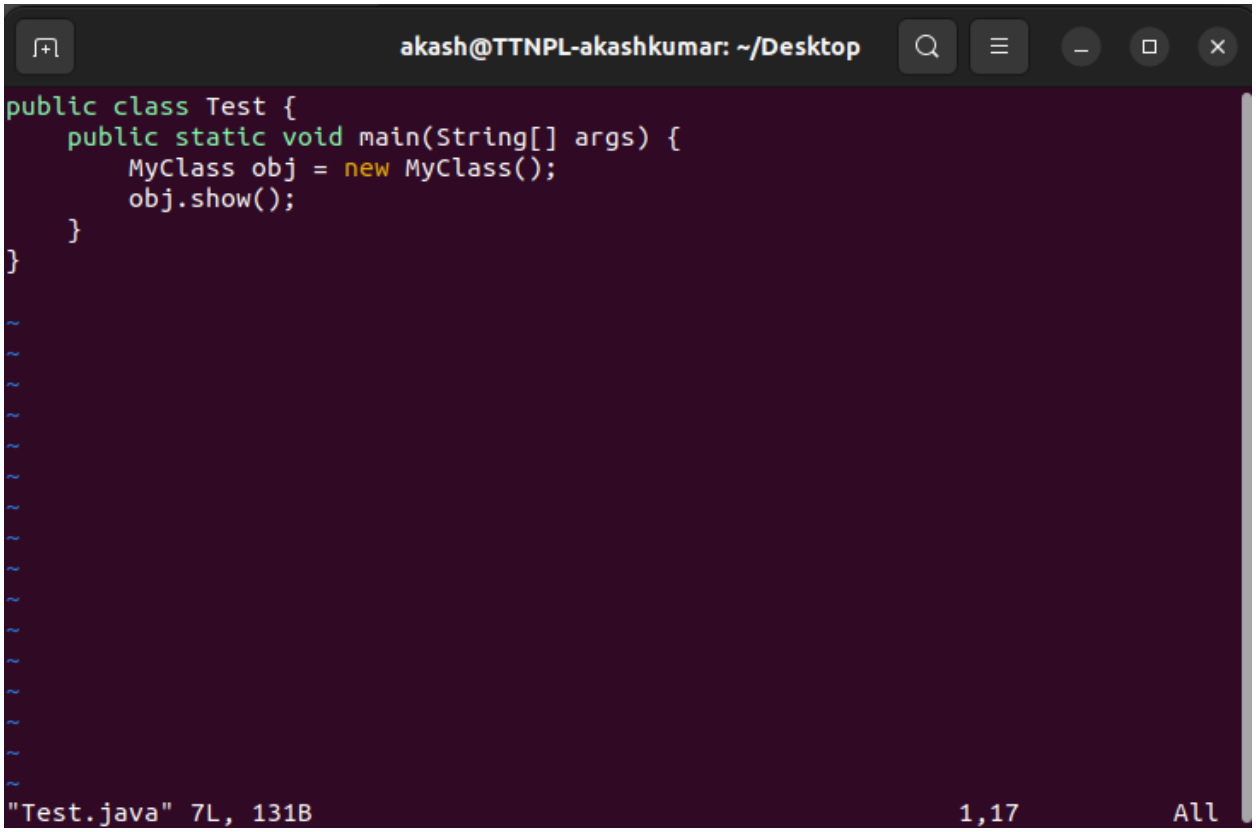
```java
package Module_1;
import java.util.Scanner;

public class Q7 {  1 usage
    public static void ErrorHandlingDemo(){  1 usage
  Scanner input = new Scanner(System.in);
  int []arr = new int[3];
  String temp ;
  int idx;
  int val ;
        try{

            System.out.print("Enter an index to be accessed: ");
             idx = input.nextInt();

             System.out.println(arr[idx]);
             System.out.print("Enter a name : ");
             temp = input.nextLine();
             System.out.println(temp);
             System.out.println("Enter a value to divide 10 ");
             val = input.nextInt();
             System.out.println(100/val);

        }catch (ArrayIndexOutOfBoundsException e) {
            System.out.println( e.getMessage());
        }
        catch (NullPointerException | ArithmeticException e) {
        System.out.println( e.getClass().getSimpleName() + " - " + e.getMessage());

        } finally {
        System.out.println("Finally block executed.");
    }

        System.out.println("After Try - Catch Block");
    }
}
```

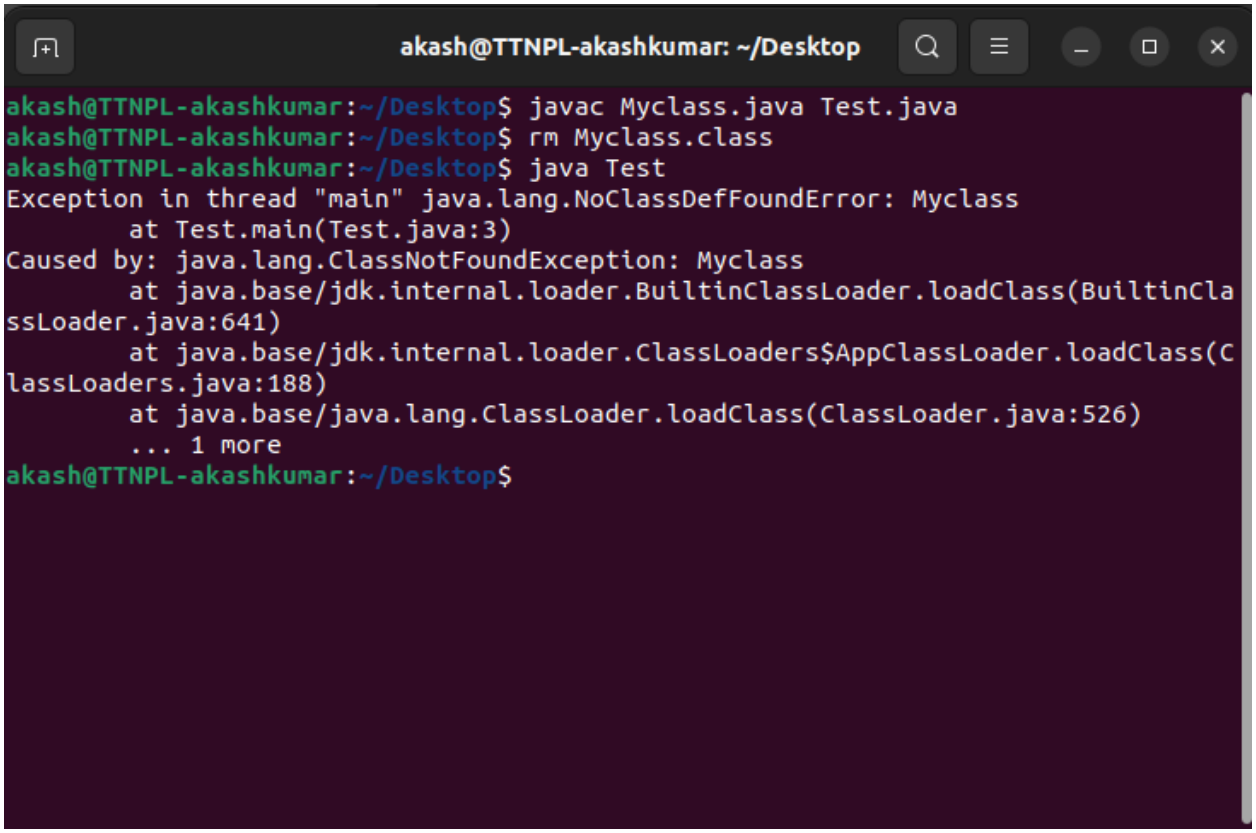
```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
Enter an index to be accessed: 6
Index 6 out of bounds for length 3
Finally block executed.
After Try - Catch Block

Process finished with exit code 0
```

Q8)WAP to produce NoClassDefFoundError and ClassNotFoundException exception.

1)NoClassDefFoundError




akash@TTNPL-akashkumar: ~/Desktop
public class Test {
public static void main(String[] args) {
MyClass obj = new MyClass();
obj.show();
}
}
"Test.java" 7L, 131B
1,17
All


akash@TTNPL-akashkumar: ~/Desktop
akash@TTNPL-akashkumar:~/Desktop$ javac Myclass.java Test.java
akash@TTNPL-akashkumar:~/Desktop$ rm Myclass.class
akash@TTNPL-akashkumar:~/Desktop$ java Test
Exception in thread "main" java.lang.NoClassDefFoundError: Myclass
at Test.main(Test.java:3)
Caused by: java.lang.ClassNotFoundException: Myclass
at java.base/jdk.internal.loader.BuiltinClassLoader.loadClass(BuiltinClassLoader.java:641)
at java.base/jdk.internal.loader.ClassLoaders$AppClassLoader.loadClass(ClassLoaders.java:188)
at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:526)
... 1 more
akash@TTNPL-akashkumar:~/Desktop$

2)ClassNotFoundException exception.

```
akash@TTNPL-akashkumar:~/Desktop$ touch ClassNotFoundDemo.java
akash@TTNPL-akashkumar:~/Desktop$ vim ClassNotFoundDemo.java
akash@TTNPL-akashkumar:~/Desktop$ javac ClassNotFoundDemo.java
akash@TTNPL-akashkumar:~/Desktop$ java ClassNotFoundDemo
Caught ClassNotFoundException: com.fake.NonExistentClass
akash@TTNPL-akashkumar:~/Desktop$
```

```
// ClassNotFoundDemo.java
public class ClassNotFoundDemo {
    public static void main(String[] args) {
        try {
            Class.forName("com.fake.NonExistentClass");
        } catch (ClassNotFoundException e) {
            System.out.println("Caught ClassNotFoundException: " + e.getMessage(
));
        }
    }
}
~
~
~
~
~
~
~
~
~
~
"ClassNotFoundDemo.java" 11L, 322B                    11,0-1        All
```

Q9)Create a custom exception that do not have any stack trace.

```
/usr/lib/jvm/java-1.21.0-openjdk-amd64/bin/java -javaagent:/home/akash/Downloads/idea-IU-251.26094.121/lib
Caught custom exception: Something went wrong!
Module_1.NoStackTraceException: Something went wrong!

Process finished with exit code 0
```

```java
package Module_1;

class NoStackTraceException extends RuntimeException {  2 usages
    public NoStackTraceException(String message) {  1 usage
        super(message);
    }

    @Override  no usages
    public synchronized Throwable fillInStackTrace() {
        return null;
    }
}

public class Q9 {  1 usage
    public static void NoTrace() {  1 usage
        try {
            throw new NoStackTraceException("Something went wrong!");
        } catch (NoStackTraceException e) {
            System.out.println("Caught custom exception: " + e.getMessage());
            // Stack trace won't print anything if called
            e.printStackTrace();
        }
    }
}
```