

LAB 1

BANK ACCOUNT

```
import java.util.Scanner;

class BankAccount {
    String ownerName;
    Long accountNumber;
    int balance = 0;

    Scanner scan = new Scanner(System.in);

    void initialization() {
        System.out.println("Enter your name : ");
        ownerName = scan.nextLine();
        System.out.println("Enter your account number : ");
        accountNumber = scan.nextLong();
        scan.nextLine();
        System.out.println("Enter the balance in bank : ");
        balance = scan.nextInt();
        scan.nextLine();
    }

    void deposit() {
        // Scanner scan = new Scanner(System.in);
        System.out.println("Enter the amount to deposit : ");
        int deposit = scan.nextInt();
        balance += deposit;
    }

    void withdraw() {
        // Scanner scan = new Scanner(System.in);
        System.out.println("Enter the amount to withdraw : ");
        int withdraw = scan.nextInt();
        balance -= withdraw;
    }
}
```

```

void display() {
    System.out.println("....Your Details.... ");
    System.out.println("Your Name : " + ownerName);
    System.out.println("Your Balance in Bank : " + balance);
}

public static void main(String[] args) {
    BankAccount user1 = new BankAccount();
    user1.initialization();
    user1.deposit();
    user1.withdraw();
    user1.display();
}
}

```

The screenshot shows the Visual Studio Code editor with the `BankAccount.java` file open. The code is as follows:

```

10
11 import java.util.Scanner;
12
13 class BankAccount {
14     String ownerName;
15     Long accountNumber;
16     int balance = 0;
17
18     Scanner scan = new Scanner(System.in);
19
20     void initialization() {
21         System.out.println("Enter your name : ");
22         ownerName = scan.nextLine();
23         System.out.println("Enter your account number : ");
24         accountNumber = scan.nextLong();
25         scan.nextLine();
26         System.out.println("Enter the balance in bank : ");
27         balance = scan.nextInt();
28         scan.nextLine();
29     }
30
31     void deposit() {
32         // Scanner scan = new Scanner(System.in);
33         System.out.println("Enter the amount to deposit : ");
34         int deposit = scan.nextInt();
35         balance += deposit;
36     }
37
38     void withdraw() {
39         // Scanner scan = new Scanner(System.in);
40         System.out.println("Enter the amount to withdraw : ");
41         int withdraw = scan.nextInt();
42         balance -= withdraw;

```

The terminal output shows the execution of the program:

```

lab1 (main) -> cd "/f/class/4th/JAVA/JAVA/lab files/lab1/" && javac BankAccount.java && java BankAccount
Enter your name :
Jay
Enter your account number :
1254
Enter the balance in bank :
200
Enter the amount to deposit :
23
Enter the amount to withdraw :
14
....Your Details....
Your Name : Jay
Your Balance in Bank : 209
lab1 (main) ->

```

STUDENT.JAVA

```
import java.util.Scanner;

class Student {
    int stuId, totalMark = 0;
    String stuName;
    int[] marks = new int[3];

    void setData() {
        System.out.println("Enter your details");
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter your student id");
        stuId = scan.nextInt();
        scan.nextLine();
        System.out.println("Enter your name");
        stuName = scan.nextLine();
        System.out.println("Enter your marks in any three subject\n");
        for (int i = 0; i < 3; i++) {
            System.out.println("Enter your marks in subject " + (i + 1));
            marks[i] = scan.nextInt();
        }
        scan.close();
    };

    void getData() {
        System.out.println("\nYour Details");
        System.out.println("Your student ID is : " + stuId);
        System.out.println("Your name is : " + stuName);
        System.out.println("Your marks are :\n");
        for (int i = 0; i < 3; i++) {
            System.out.println("Mark in Subject " + (i + 1) + " : " +
marks[i]);
            totalMark += marks[i];
        }
        System.out.println("\nThe average of your marks is : " +
(totalMark / 3));
    };
}
```

```

public static void main(String[] args) {
    Student s1 = new Student();
    s1.setData();
    s1.getData();
}
}

```

The screenshot shows the Visual Studio Code interface with a Java file named 'Student.java'. The code defines a 'Student' class with attributes for student ID, name, and marks in three subjects. It includes methods for setting and getting this data. The 'main' method creates a 'Student' object, sets its data, and then displays it.

```

import java.util.Scanner;

class Student {
    int stuId, totalMark = 0;
    String stuName;
    int[] marks = new int[3];

    void setData() {
        System.out.println("Enter your details");
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter your student id");
        stuId = scan.nextInt();
        scan.nextLine();
        System.out.println("Enter your name");
        stuName = scan.nextLine();
        System.out.println("Enter your marks in any three subject");
        for (int i = 0; i < 3; i++) {
            System.out.println("Enter your marks in subject " + (i + 1));
            marks[i] = scan.nextInt();
        }
        scan.close();
    }

    void getData() {
        System.out.println("\nYour Details");
        System.out.println("Your student ID is : " + stuId);
        System.out.println("Your name is : " + stuName);
        System.out.println("Your marks are :\n");
    }
}

public static void main(String[] args) {
    Student s1 = new Student();
    s1.setData();
    s1.getData();
}

```

The terminal output shows the program's execution:

```

Lab1 (main) -> cd "/f/Class/4th/JAVA/JAVA/lab files/Lab1/" && javac Student.java && java Student
Enter your details
Enter your student id
1524
Enter your name
Jay
Enter your marks in any three subject
Enter your marks in subject 1
88
Enter your marks in subject 2
89
Enter your marks in subject 3
95

Your Details
Your student ID is : 1524
Your name is : Jay
Your marks are :

Mark in Subject 1 : 88
Mark in Subject 2 : 89
Mark in Subject 3 : 95

The average of your marks is : 90
Lab1 (main) ->

```

LAB 2

CAR.JAVA

```

public class Car {
    int model;
    String make;
    int speed = 0;

    Car(int a, String m, int s) {
        model = a;
        make = m;
    }
}

```

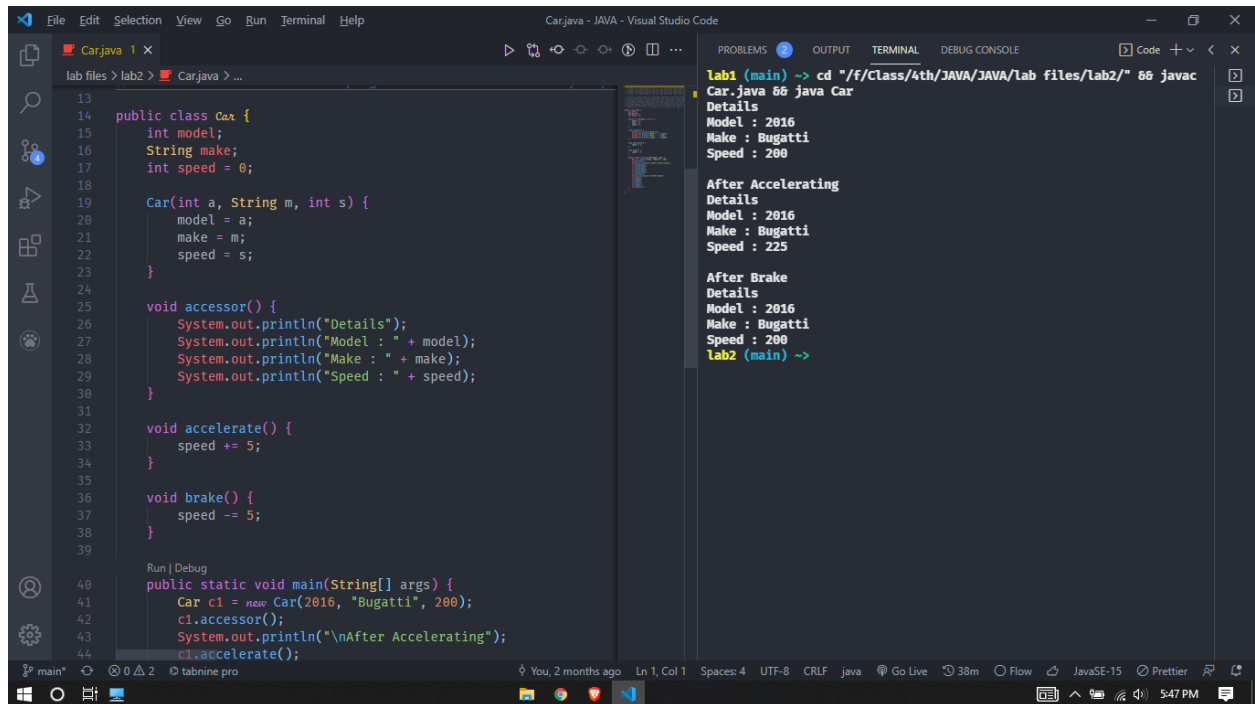
```
        speed = s;
    }

    void accessor() {
        System.out.println("Details");
        System.out.println("Model : " + model);
        System.out.println("Make : " + make);
        System.out.println("Speed : " + speed);
    }

    void accelerate() {
        speed += 5;
    }

    void brake() {
        speed -= 5;
    }

    public static void main(String[] args) {
        Car c1 = new Car(2016, "Bugatti", 200);
        c1.accessor();
        System.out.println("\nAfter Accelerating");
        c1.accelerate();
        c1.accelerate();
        c1.accelerate();
        c1.accelerate();
        c1.accelerate();
        c1.accessor();
        System.out.println("\nAfter Brake");
        c1.brake();
        c1.brake();
        c1.brake();
        c1.brake();
        c1.brake();
        c1.accessor();
    }
}
```



```
File Edit Selection View Go Run Terminal Help
Carjava - JAVA - Visual Studio Code
lab files > lab2 > Carjava > ...

13
14 public class Car {
15     int model;
16     String make;
17     int speed = 0;
18
19     Car(int a, String m, int s) {
20         model = a;
21         make = m;
22         speed = s;
23     }
24
25     void accessor() {
26         System.out.println("Details");
27         System.out.println("Model : " + model);
28         System.out.println("Make : " + make);
29         System.out.println("Speed : " + speed);
30     }
31
32     void accelerate() {
33         speed += 5;
34     }
35
36     void brake() {
37         speed -= 5;
38     }
39
40     Run | Debug
41     public static void main(String[] args) {
42         Car c1 = new Car(2016, "Bugatti", 200);
43         c1.accessor();
44         System.out.println("\nAfter Accelerating");
45         c1.accelerate();
46     }
47 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
Lab1 (main) ~> cd "/f/class/4th/JAVA/JAVA/lab files/lab2/" && javac Car.java && java Car
Details
Model : 2016
Make : Bugatti
Speed : 200
After Accelerating
Details
Model : 2016
Make : Bugatti
Speed : 225
After Brake
Details
Model : 2016
Make : Bugatti
Speed : 200
Lab2 (main) ~>
```

RETAIL.JAVA

```
import java.util.Scanner;

public class RetailItem {
    String description;
    int units;
    double price;

    RetailItem(String d, int u, double p) {
        description = d;
        units = u;
        price = p;
    }

    RetailItem() {
    };

    Scanner scan = new Scanner(System.in);

    void mutator() {
        System.out.println("\nEnter the details");
    }
}
```

```

        System.out.println("Description of Item");
        description = scan.nextLine();
        System.out.println("Number of items");
        units = scan.nextInt();
        scan.nextLine();
        System.out.println("Price of item");
        price = scan.nextDouble();
        scan.nextLine();
    }

    void accessor() {
        System.out.println("\nDescription : " + description);
        System.out.println("Number of Items : " + units);
        System.out.println("Retail Price of Item : " + price);
    }

    public static void main(String[] args) {
        RetailItem r1 = new RetailItem("This is first description from the
constructor", 20, 523.65);
        RetailItem r2 = new RetailItem("This is second description from
the constructor", 40, 70.65);
        r1.accessor();
        r2.accessor();
        RetailItem r3 = new RetailItem();
        r3.mutator();
        r3.accessor();
    }
}

```

The screenshot shows a Visual Studio Code editor with a Java file named `RetailItem.java`. The code defines a `RetailItem` class with attributes `description`, `units`, and `price`. It includes a constructor, a `mutator` method for input, and an `accessor` method for output. The terminal on the right shows the execution of the program, demonstrating the constructor's output and the interactive mutator method.

```
import java.util.Scanner;

public class RetailItem {
    String description;
    int units;
    double price;

    RetailItem(String d, int u, double p) {
        description = d;
        units = u;
        price = p;
    }

    RetailItem() {
    };

    Scanner scan = new Scanner(System.in);

    void mutator() {
        System.out.println("\nEnter the details");
        System.out.println("Description of Item");
        description = scan.nextLine();
        System.out.println("Number of items");
        units = scan.nextInt();
        scan.nextLine();
        System.out.println("Price of item");
        price = scan.nextDouble();
        scan.nextLine();
    }

    void accessor() {
        System.out.println("\nDescription : " + description);
    }
}
```

Lab2 (main) -> cd "/f/Class/4th/JAVA/JAVA/lab files/lab2/" 66 javac RetailItem.java 88 java RetailItem

Description : This is first description from the constructor
Number of Items : 20
Retail Price of Item : 523.65

Description : This is second description from the constructor
Number of Items : 40
Retail Price of Item : 70.65

Enter the details
Description of Item
Item Description
Number of items
512
Price of item
8560

Description : Item Description
Number of Items : 512
Retail Price of Item : 8560.0
Lab2 (main) ->

LAB 3

INHERITENCE.JAVA

```
class A {
    private int a, b;
    protected float c, d;
    public int e, f;

    A() {
        a = 1;
        b = 2;
        c = 3;
        d = 4;
        e = 5;
        f = 6;
    }

    A(int g, int h, float i, float j, int k, int l) {
        a = g;
        b = h;
        c = i;
        d = j;
        e = k;
    }
}
```



```

        f = 1;
    }

    void display() {
        System.out.println("A : " + a);
        System.out.println("B : " + b);
        System.out.println("C : " + c);
        System.out.println("D : " + d);
        System.out.println("E : " + e);
        System.out.println("F : " + f);
    }

    void notOverriden() {
        System.out.println("This method will not be overridden after B");
    }
}

class B extends A {
    B(float i, float j, int k, int l) {
        c = i;
        d = j;
        e = k;
        f = 1;
    }

    B() {
        super();
        e = 9;
        f = 10;
    };

    @Override
    void display() {
        System.out.println("From B");
        // System.out.println("C : " + a);
        System.out.println("C : " + c);
        System.out.println("D : " + d);
        System.out.println("E : " + e);
        System.out.println("F : " + f);
    }

    @Override
    final void notOverriden() {
        System.out.println("This method will not be overridden after B");
    }
}

class C extends B {
    C(float i, float j, int k, int l) {
        c = i;
        d = j;
        e = k;
        f = 1;
    }

    C() {
        c = 25;
    }
}

```

```

        e = 15;
        f = 10;
    }

    @Override
    void display() {
        System.out.println("From C");
        System.out.println("C : " + c);
        System.out.println("D : " + d);
        System.out.println("E : " + e);
        System.out.println("F : " + f);
    }

    // void notOverriden() {
    //     System.out.println("This method is not overridden");
    // }
}

class D extends B {
    D(float i, float j, int k, int l) {
        c = i;
        d = j;
        e = k;
        f = l;
    }

    D() {
        super();
    }

    @Override
    void display() {
        System.out.println("From D");
        System.out.println("C : " + c);
        System.out.println("D : " + d);
        System.out.println("E : " + e);
        System.out.println("F : " + f);
    }
}

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

        System.out.println("\nparameterized Constructor");
        A a2 = new A(1, 2, 3, 2, 7, 8);
        a2.display();
        B b2 = new B(3, 2, 7, 8);
        b2.display();
        C c2 = new C(1, 5, 3, 9);
        c2.display();
        D d2 = new D(1, 2, 3, 8);
        d2.display();
    }
}

```

The screenshot shows the Visual Studio Code editor with a Java file named `Data.java` open. The code defines a class `A` with private fields `a` (int), `b` (int), `c` (float), `d` (float), `e` (int), and `f` (int). It includes a no-argument constructor `A()` that initializes these fields to 1, 2, 3.0, 2.0, 7, and 8 respectively. There is also a parameterized constructor `A(int g, int h, float i, float j, int k, int l)` that takes six arguments and assigns them to the fields. A `display()` method is defined to print the values of all fields. The terminal on the right shows the execution of `javac Data.java` and `java Data`, which outputs the values of the fields for both constructors. The status bar at the bottom indicates the file is at line 111, column 6, and the workspace is named 'main'.

```
class A {
    private int a, b;
    protected float c, d;
    public int e, f;

    A() {
        a = 1;
        b = 2;
        c = 3;
        d = 4;
        e = 5;
        f = 6;
    }

    A(int g, int h, float i, float j, int k, int l) {
        a = g;
        b = h;
        c = i;
        d = j;
        e = k;
        f = l;
    }

    void display() {
        System.out.println("A : " + a);
        System.out.println("B : " + b);
        System.out.println("C : " + c);
        System.out.println("D : " + d);
        System.out.println("E : " + e);
        System.out.println("F : " + f);
    }
}
```

Lab2 (main) -> cd "/f/class/4th/JAVA/JAVA/Lab files/Lab3/" && javac Data.java && java Data

parameterized Constructor

A : 1
B : 2
C : 3.0
D : 2.0
E : 7
F : 8

From B
C : 3.0
D : 2.0
E : 7
F : 8

From C
C : 1.0
D : 5.0
E : 3
F : 9

From D
C : 1.0
D : 2.0
E : 3
F : 8

Lab3 (main) ->

VEHICLE.JAVA

```
class Vechicle {
    String name;
    int year;

    void display() {
        System.out.println("The vehicle is " + name + " and is established in year " + year);
    }
}

class Car extends Vechicle {

    Car(String n, int y) {
        name = n;
        year = y;
    }

    @Override
    void display() {
```

```

        System.out.println("...Car Detail...");
        super.display();
    }
}

class Bike extends Vehicle {
    Bike(String n, int y) {
        name = n;
        year = y;
    }

    @Override
    void display() {
        System.out.println("\n...Bike Detail...");
        super.display();
    }
}

public class Veh {
    public static void main(String[] args) {
        Car c1 = new Car("Bugatti", 1989);
        c1.display();
        Bike b1 = new Bike("Honda", 2001);
        b1.display();
    }
}

```

The screenshot shows the Visual Studio Code editor with a Java project named 'Veh.java'. The code defines a base class 'Vehicle' with attributes 'name' and 'year', and a 'display()' method. Two subclasses, 'Car' and 'Bike', extend 'Vehicle' and override the 'display()' method to print their specific details. The 'Veh' class contains a 'main' method that creates instances of 'Car' and 'Bike' and calls their 'display()' methods.

The output window on the right shows the execution results:

```

Lab3 (main) -> cd "/f/Class/4th/JAVA/JAVA/lab files/Lab3/" && javac
Veh.java && java Veh
...Car Detail...
The vehicle is Bugatti and is established in year 1989
...Bike Detail...
The vehicle is Honda and is established in year 2001
Lab3 (main) ->

```

LAB 4

MARK.JAVA

```
class Student {
    String name = "Jay";
    int rollno = 12;
}

class Exam extends Student {
    int marks[] = new int[10];
    int totalMark = 0;

    void getResult() {
        marks[0] = 80;
        marks[1] = 70;
        marks[2] = 70;
        marks[3] = 80;
        marks[4] = 67;
        marks[5] = 94;
        marks[6] = 70;

        for (int i = 0; i < 7; i++) {
            totalMark += marks[i];
        }

        System.out.println("Name : " + name);
        System.out.println("Rollno : " + rollno);
        System.out.println("Total Mark " + totalMark);
    }
}

class Result extends Exam {
    void myResult() {
        System.out.println("....Result....");
        super.getResult();
    }
}

/**
 * Mark
 */
public class Mark {

    public static void main(String[] args) {
        Result r1 = new Result();
        r1.myResult();
    }
}
```

```
Mark.java - JAVA - Visual Studio Code

lab files > lab4 > Mark.java > Mark
You, a month ago | 1 author (You)
1 class Student {
2     String name = "Jay";
3     int rollno = 12;
4 }
5
6 You, a month ago | 1 author (You)
7 class Exam extends Student {
8     int marks[] = new int[10];
9     int totalMark = 0;
10
11     void getResult() {
12         marks[0] = 88;
13         marks[1] = 70;
14         marks[2] = 70;
15         marks[3] = 88;
16         marks[4] = 67;
17         marks[5] = 94;
18         marks[6] = 70;
19
20         for (int i = 0; i < 7; i++) {
21             totalMark += marks[i];
22         }
23         System.out.println("Name : " + name);
24         System.out.println("Rollno : " + rollno);
25         System.out.println("Total Mark " + totalMark);
26     }
27
28 You, a month ago | 1 author (You)
29 class Result extends Exam {
30     void myResult() {
31         System.out.println("....Result....");
32     }
33 }
34
35 You, a month ago | 1 author (You)
36 class MathQues {
37     public static void main(String[] args) {
38         AdvancedMath a1 = new AdvancedMath();
39         a1.myAdd(5, 6);
40     }
41 }
42
43 Lab3 (main) ~> cd "/f/class/4th/JAVA/JAVA/lab files/lab4/" && javac Mark.java && java Mark
....Result....
Name : Jay
Rollno : 12
Total Mark : 531
Lab4 (main) ~>
```

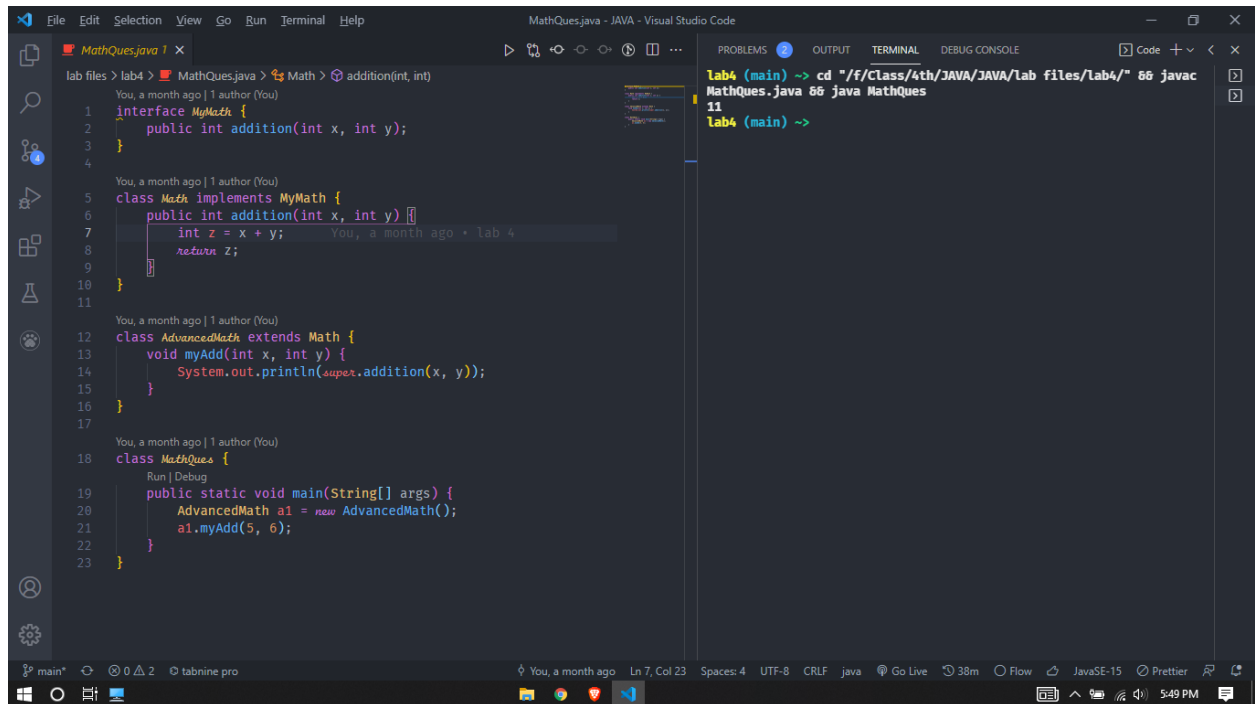
MATH.JAVA

```
interface MyMath {
    public int addition(int x, int y);
}

class Math implements MyMath {
    public int addition(int x, int y) {
        int z = x + y;
        return z;
    }
}

class AdvancedMath extends Math {
    void myAdd(int x, int y) {
        System.out.println(super.addition(x, y));
    }
}

class MathQues {
    public static void main(String[] args) {
        AdvancedMath a1 = new AdvancedMath();
        a1.myAdd(5, 6);
    }
}
```



```
File Edit Selection View Go Run Terminal Help
MathQues.java - JAVA - Visual Studio Code

lab files > lab4 > MathQues.java > Math > addition(int, int)
You, a month ago | 1 author (You)
1 interface MyMath {
2     public int addition(int x, int y);
3 }
4
You, a month ago | 1 author (You)
5 class Math implements MyMath {
6     public int addition(int x, int y) {
7         int z = x + y;
8         return z;
9     }
10 }
11
You, a month ago | 1 author (You)
12 class AdvancedMath extends Math {
13     void myAdd(int x, int y) {
14         System.out.println(super.addition(x, y));
15     }
16 }
17
You, a month ago | 1 author (You)
18 class MathQues {
19     public static void main(String[] args) {
20         AdvancedMath a1 = new AdvancedMath();
21         a1.myAdd(5, 6);
22     }
23 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
Lab4 (main) ~> cd "/f/class/4th/JAVA/JAVA/lab files/lab4/" && javac MathQues.java && java MathQues
11
Lab4 (main) ~>
```

SHAPE.JAVA

```
abstract class Shape {
    abstract void display();
}

interface IPoint {
    public void displayPoint();
}

class Triangle extends Shape implements IPoint {
    void display() {
        System.out.println("I am triangle shape");
    }

    public void displayPoint() {
        System.out.println("Triangle with point = 3");
    }
}
```

```

    }
}

class Hexagon extends Shape implements IPoint {
    void display() {
        System.out.println("I am hexagon shape");
    }

    public void displayPoint() {
        System.out.println("Hexagon with point = 6");
    }
}

class Circle extends Shape {
    void display() {
        System.out.println("I am circle shape");
    }
}

class ThreeDCircle extends Circle {
    void display() {
        super.display();
        System.out.println("I am a 3d Circle");
    }
}

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

        Triangle t1 = new Triangle();
        t1.display();
        t1.displayPoint();

        Hexagon h1 = new Hexagon();
        h1.display();
        h1.displayPoint();

        Circle c1 = new Circle();
        c1.display();
    }
}

```



```

ThreeDCircle cc1 = new ThreeDCircle();
cc1.display();
}
}

```

```

TwoC.java
1 You, a month ago | 1 author (You)
2 abstract class Shape {
3     abstract void display();
4 }
5 You, a month ago | lab 4
6 interface IPoint {
7     public void displayPoint();
8 }
9
10 class Triangle extends Shape implements IPoint {
11     void display() {
12         System.out.println("I am triangle shape");
13     }
14
15     public void displayPoint() {
16         System.out.println("Triangle with point = 3");
17     }
18 }
19
20 class Hexagon extends Shape implements IPoint {
21     void display() {
22         System.out.println("I am hexagon shape");
23     }
24
25     public void displayPoint() {
26         System.out.println("Hexagon with point = 6");
27     }
28 }

```

```

Lab4 (main) -> cd "/f/class/4th/JAVA/JAVA/lab files/lab4/" && javac TwoC.java && java TwoC
I am triangle shape
Triangle with point = 3
I am hexagon shape
Hexagon with point = 6
I am circle shape
I am circle shape
I am a 3d Circle
Lab4 (main) ->

```

LAB 5

PACKAGE.JAVA

```

package dpack;

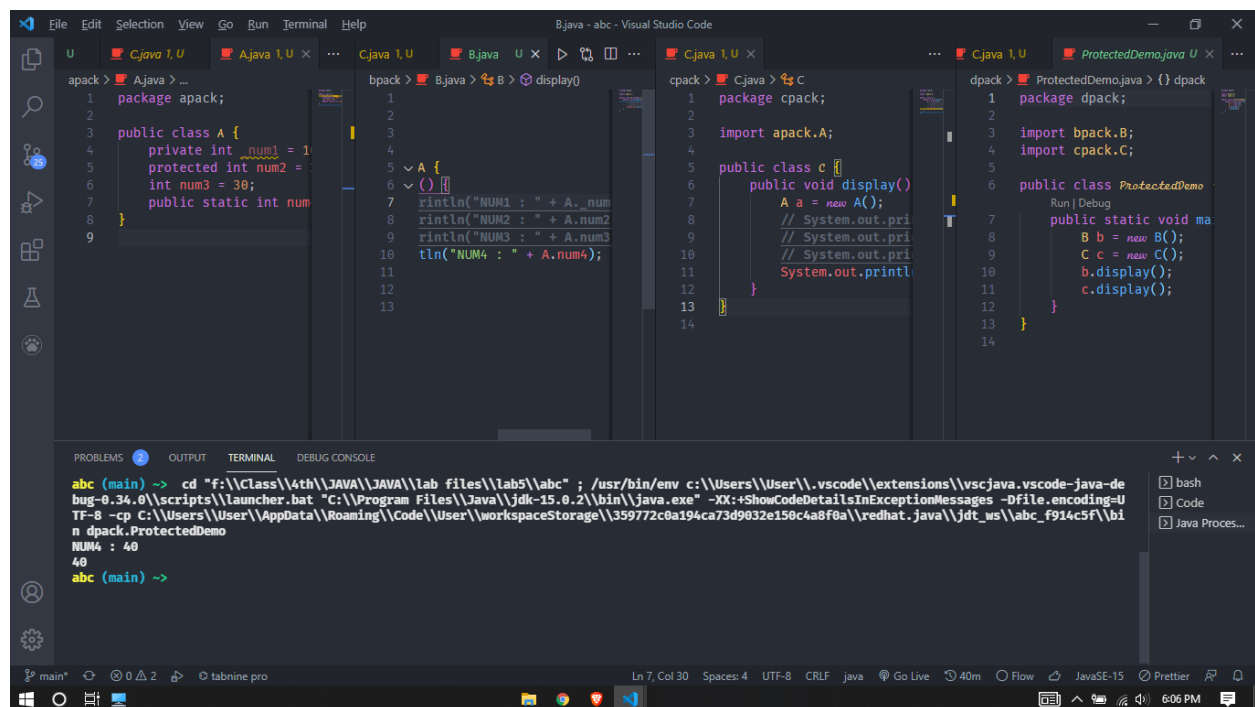
import bpack.B;
import cpack.C;

```

```

public class ProtectedDemo {
    public static void main(String[] args) {
        B b = new B();
        C c = new C();
        b.display();
        c.display();
    }
}

```



STUDENT.JAVA

```

public class Student {
    String name;
    int[] marks = new int[100];
    int totalMark = 0;
    int average = 0;

    void showResult() {
        try {
            for (int i : marks) {
                if (marks[i] < 0) {

```

```

        throw new ArrayIndexOutOfBoundsException("Mark greater than
0 is expected");
    } else if (marks[i] > 50) {
        throw new ArithmeticException("Mark cant be more than 50");
    }
}

for (int i = 0; i < 6; i++) {
    totalMark += marks[i];
}
average = totalMark / 6;
System.out.println("Total mark is " + totalMark);
System.out.println("Average mark is " + average);
} catch (ArithmeticException e) {
    System.out.println("Mark is more than 50");
} catch (ArrayIndexOutOfBoundsException e) {
    System.out.println("Mark is less than 0");
}
}

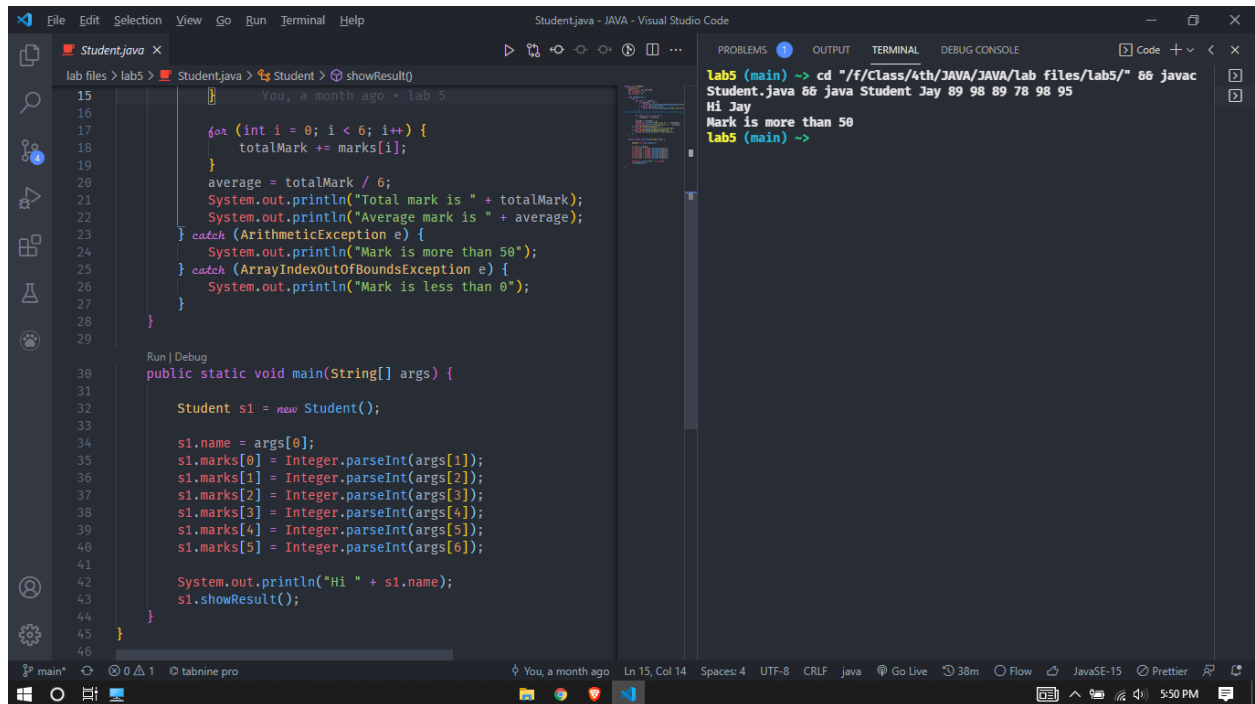
public static void main(String[] args) {

    Student s1 = new Student();

    s1.name = args[0];
    s1.marks[0] = Integer.parseInt(args[1]);
    s1.marks[1] = Integer.parseInt(args[2]);
    s1.marks[2] = Integer.parseInt(args[3]);
    s1.marks[3] = Integer.parseInt(args[4]);
    s1.marks[4] = Integer.parseInt(args[5]);
    s1.marks[5] = Integer.parseInt(args[6]);

    System.out.println("Hi " + s1.name);
    s1.showResult();
}
}

```



```
Student.java - JAVA - Visual Studio Code

15      You, a month ago * lab 5
16
17      for (int i = 0; i < 6; i++) {
18          totalMark += marks[i];
19      }
20      average = totalMark / 6;
21      System.out.println("Total mark is " + totalMark);
22      System.out.println("Average mark is " + average);
23  } catch (ArithmeticException e) {
24      System.out.println("Mark is more than 50");
25  } catch (ArrayIndexOutOfBoundsException e) {
26      System.out.println("Mark is less than 0");
27  }
28  }
29
30  Run | Debug
31  public static void main(String[] args) {
32
33      Student s1 = new Student();
34
35      s1.name = args[0];
36      s1.marks[0] = Integer.parseInt(args[1]);
37      s1.marks[1] = Integer.parseInt(args[2]);
38      s1.marks[2] = Integer.parseInt(args[3]);
39      s1.marks[3] = Integer.parseInt(args[4]);
40      s1.marks[4] = Integer.parseInt(args[5]);
41      s1.marks[5] = Integer.parseInt(args[6]);
42
43      System.out.println("Hi " + s1.name);
44      s1.showResult();
45  }
46  }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Lab5 (main) ~> cd "/f/class/4th/JAVA/JAVA/lab files/lab5/" && javac Student.java && java Student Jay 89 98 89 78 98 95
Hi Jay
Mark is more than 50
Lab5 (main) ~>
```

LAB 6

BUSRES.JAVA

```
public class BusRes {
    public static void main(String[] args) {
        TicketBooking tkt = new TicketBooking();
        Thread thread1 = new Thread(tkt, "Taylor");
        Thread thread2 = new Thread(tkt, "Katy");
        thread1.start();
        thread2.start();
    }
}

class TicketBooking implements Runnable {
    int availableTicket = 1;

    public void run() {
        System.out.println("Customer in queue : " +
Thread.currentThread().getName());
        synchronized (this) {
            if (availableTicket > 0) {
                System.out.println("\nAvailable Ticket = " + availableTicket);
```

```

        System.out.println("Booking ticket for " +
Thread.currentThread().getName());
        availableTicket--;
        System.out.println("Ticket is booked for " +
Thread.currentThread().getName());
        System.out.println("\nAvailable Ticket = " + availableTicket);
    } else {
        System.out.println("Ticket is not booked for " +
Thread.currentThread().getName());
    }
}

}

}

```

```

File Edit Selection View Go Run Terminal Help
BusRes.java - JAVA - Visual Studio Code

lab files > lab6 > BusRes.java > ...
You, 3 weeks ago | 1 author (You)
1 // 4 a. Consider a Bus reservation system that allows online rese
2
3 public class BusRes {
4     Run | Debug
5     public static void main(String[] args) {
6         TicketBooking tkt = new TicketBooking();
7         Thread thread1 = new Thread(tkt, "Taylor");
8         Thread thread2 = new Thread(tkt, "Katy");
9         thread1.start();
10        thread2.start();
11    }
12 }
13 You, 3 weeks ago | 1 author (You)
14 class TicketBooking implements Runnable {
15     int availableTicket = 1;
16
17     public void run() {
18         System.out.println("Customer in queue : " + Thread.current
19         synchronized (this) {
20             if (availableTicket > 0) {
21                 System.out.println("\nAvailable Ticket = " + avail
22                 System.out.println("Booking ticket for " + Thread
23                 availableTicket--;
24                 System.out.println("Ticket is booked for " + Thre
25                 System.out.println("\nAvailable Ticket = " + avail
26             } else {
27                 System.out.println("Ticket is not booked for " +
28             }
29         }
30     }
31 }
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```

```

class Temperature {
    int temp;

    Scanner scan = new Scanner(System.in);

    void getTemp() {
        System.out.println("Enter the temperature");
        temp = scan.nextInt();
        // scan.nextLine();
    }

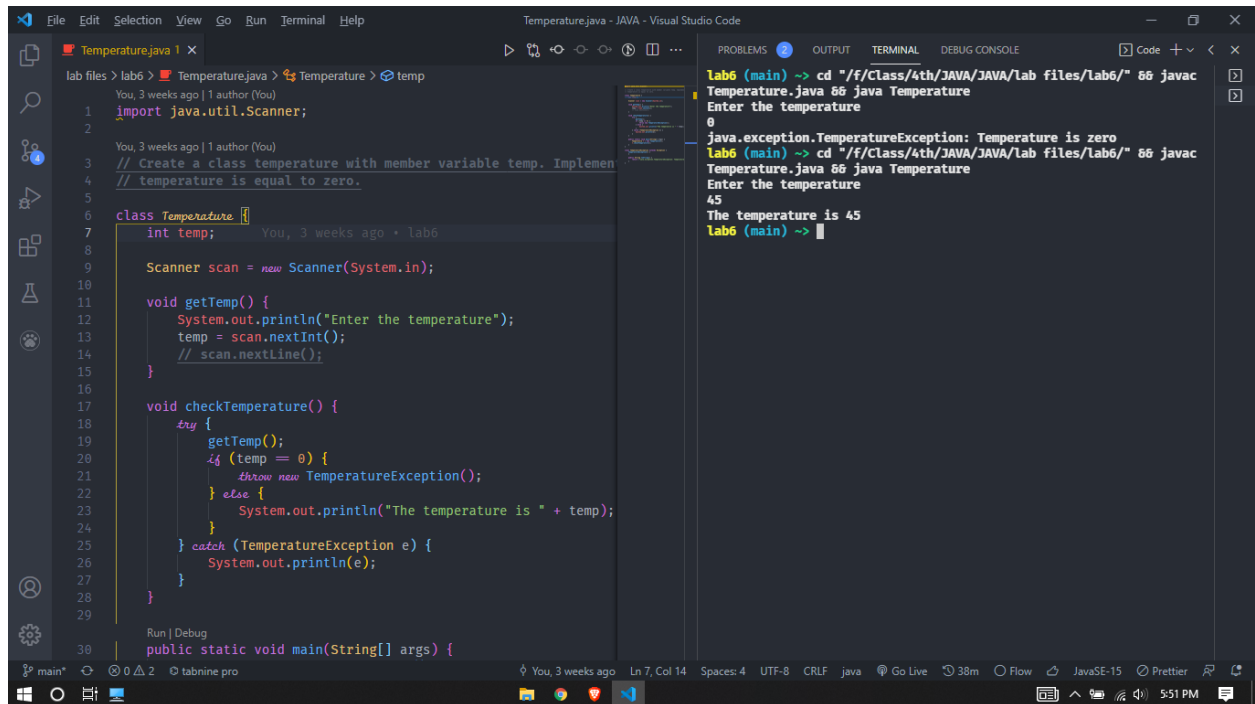
    void checkTemperature() {
        try {
            getTemp();
            if (temp == 0) {
                throw new TemperatureException();
            } else {
                System.out.println("The temperature is " + temp);
            }
        } catch (TemperatureException e) {
            System.out.println(e);
        }
    }

    public static void main(String[] args) {
        Temperature t = new Temperature();
        t.checkTemperature();
    }
}

class TemperatureException extends Exception {
    TemperatureException() {
    }

    public String toString() {
        return ("java.exception.TemperatureException: Temperature is zero");
    }
}

```



The screenshot shows the Visual Studio Code interface with a Java file named `Temperature.java` open. The code defines a `Temperature` class with a `temp` variable, a `Scanner` for input, and methods `getTemp()` and `checkTemperature()`. The `checkTemperature()` method throws a `TemperatureException` if the temperature is zero. The `main` method calls `checkTemperature()`. The terminal on the right shows the execution of the program, which prompts the user to enter a temperature. The user enters 0, which results in a `java.exception.TemperatureException: Temperature is zero`. The user then enters 45, and the program outputs "The temperature is 45".

```
Temperature.java - JAVA - Visual Studio Code

lab files > lab6 > Temperature.java > Temperature > temp

1 import java.util.Scanner;
2
3 You, 3 weeks ago | 1 author (You)
4 // Create a class temperature with member variable temp. Implement
5 // temperature is equal to zero.
6
7 class Temperature {
8     int temp;
9
10    Scanner scan = new Scanner(System.in);
11
12    void getTemp() {
13        System.out.println("Enter the temperature");
14        temp = scan.nextInt();
15        // scan.nextLine();
16    }
17
18    void checkTemperature() {
19        try {
20            getTemp();
21            if (temp == 0) {
22                throw new TemperatureException();
23            } else {
24                System.out.println("The temperature is " + temp);
25            }
26        } catch (TemperatureException e) {
27            System.out.println(e);
28        }
29    }
30
31    public static void main(String[] args) {
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```

```

    }

}

void display() {
    if (!this.empty()) {
        System.out.println(Q);
    }
}

boolean empty() {
    if (front == -1 && rear == -1)
        return true;
    return false;
}

}

class QueueQues {
    public static void main(String[] args) {
        QueueTest q1 = new QueueTest();
        q1.enqueue(1);
        q1.display();
        q1.enqueue(5.17);
        q1.enqueue("Jay");
        q1.display();
        q1.dequeue();
        q1.display();
    }
}

```



```
QueueQues.java 1, M x
lab files > lab7 > QueueQues.java > QueueTest<T> > dequeue()
1  import java.util.*;
2
3  You, seconds ago | 1 author (You)
4  class QueueTest<T> {
5      LinkedList<T> Q = new LinkedList<>();
6      int front = -1, rear = -1;
7
8      void enqueue(T X) {
9          front++;
10         Q.add(X);
11     }
12
13     void dequeue() {
14         if (this.empty())
15             return;
16         else if (front == rear) {
17             front = rear = -1;
18         } else {
19             Q.removeFirst();
20         }
21     }
22
23     void display() {
24         if (this.empty()) {
25             System.out.println(Q);
26         }
27     }
28
29     boolean empty() {
30         if (front == -1 && rear == -1)
31             return true;
32     }
33 }
```

```
Lab7 (main) ~> cd "/f/Class/4th/JAVA/JAVA/lab files/lab7/" && javac
QueueQues.java && java QueueQues
Note: QueueQues.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
[1]
[1, 5.17, Jay]
[5.17, Jay]
Lab7 (main) ~>
```

STACK.JAVA

```
// Program to create a stack to store integer, double and student objects
using generics.
import java.util.Stack;

class StackTest<T> {
    Stack<T> stk = new Stack<>();
    String student = "Student";

    void add(T a) {
        stk.push(a);
    }
}
```

```

    void display() {
        System.out.println(stk);
    }

    void delete() {
        stk.pop();
    }
}

class StackQues {
    public static void main(String[] args) {
        StackTest stk = new StackTest();
        stk.add(5);
        stk.add("15");
        stk.add(stk.student);
        stk.display();
        stk.delete();
        stk.display();
    }
}

```

The screenshot shows the Visual Studio Code editor with the file `StackQues.java` open. The code in the editor matches the code block above. The terminal on the right shows the output of running the program:

```

Lab7 (main) -> cd "/f/class/4th/JAVA/JAVA/lab files/Lab7/" 66 javac StackQues.java 66 java StackQues
Note: StackQues.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
[5, 15, Student]
[5, 15]
Lab7 (main) ->

```

The status bar at the bottom indicates the file is at line 17, column 20, with 4 spaces, UTF-8 encoding, and CRLF line endings. The system tray shows the time as 5:52 PM.

LAB 8

LIBRARY.JAVA

```
import java.io.FileInputStream;
import java.io.FileOutputStream;

class Library {
    public static void main(String[] args) {
        try {
            FileOutputStream fout = new FileOutputStream("library.txt",
false);

            String title = String.valueOf(args[0]);
            String author = String.valueOf(args[1]);
            String price = String.valueOf(args[2]);
            String edition = String.valueOf(args[3]);

            fout.write(title.getBytes());
            fout.write(' ');
            fout.write(author.getBytes());
            fout.write(' ');
            fout.write(price.getBytes());
            fout.write(' ');
            fout.write(edition.getBytes());
            fout.write('\n');
            fout.close();
            System.out.println("successfully written to file.");
        } catch (Exception e) {
            System.out.println(e);
        }

        // try {
        // FileInputStream fin = new FileInputStream("library.txt");
        // int i = 0;
        // while ((i = fin.read()) != -1) {
```

```

        // System.out.print((char) i);
        // }
        // fin.close();
        // } catch (Exception e) {
        // System.out.println(e);
        // }
    }
}

```

The screenshot shows a Visual Studio Code editor with a Java project named 'Library.java'. The code in 'Library.java' is as follows:

```

1 import java.io.FileInputStream;
2 import java.io.FileOutputStream;
3
4 class Library {
5     public static void main(String[] args) {
6         try {
7             FileOutputStream fout = new FileOutputStream("library
8             String title = String.valueOf(args[0]);
9             String author = String.valueOf(args[1]);
10            String price = String.valueOf(args[2]);
11            String edition = String.valueOf(args[3]);
12
13            fout.write(title.getBytes());
14            fout.write(' ');
15            fout.write(author.getBytes());
16            fout.write(' ');
17            fout.write(price.getBytes());
18            fout.write(' ');
19            fout.write(edition.getBytes());
20            fout.write('\n');
21            fout.close();
22            System.out.println("successfully written to file.");
23        } catch (Exception e) {
24            System.out.println(e);
25        }
26
27        // try {
28        //     FileInputStream fin = new FileInputStream("library.txt
29        //     int i = 0;
30        //     while ((i = fin.read()) != -1) {
31        //         System.out.print((char) i);
32        //     }
33    }
34 }

```

The terminal shows the execution of the program:

```

lab8 (main) -> java Library b
ook added 50 now
successfully written to file.

lab8 (main) -> vim library.tx
t
lab8 (main) ->

```

STRING.JAVA

```

class StringQues {

    // @Override
    public static String toString(int stri) {
        return "Good Morning";
    }
}

```

```

public static void main(String[] args) {
    char[] arr = { 'a', 'b', 'c', 'd', 'e', 'f' };
    String str = new String(arr, 2, 3);
    System.out.println(str);

    String s1 = "Hello World";
    String s2 = "Hello World";
    String str1 = new String("Hello World ");
    String str2 = new String("Bms College");
    String str3 = new String("Hello World ");

    System.out.println(toString(1));

    System.out.println(str1.concat(str2));

    System.out.println(str1 == str2);
    System.out.println(str1.compareTo(str3));
    System.out.println(s1 == s2);

    String ss1 = "good morning";
    String ss2 = "morning is started";

    System.out.println(ss2.contains(ss1));
    System.out.println(ss2.indexOf("morning"));

    System.out.println(s1.replace("Hello", "Greeting"));

    String sss1 = "Hello BMSCE Good Morning";
    System.out.println(sss1.replaceAll(" ", ""));

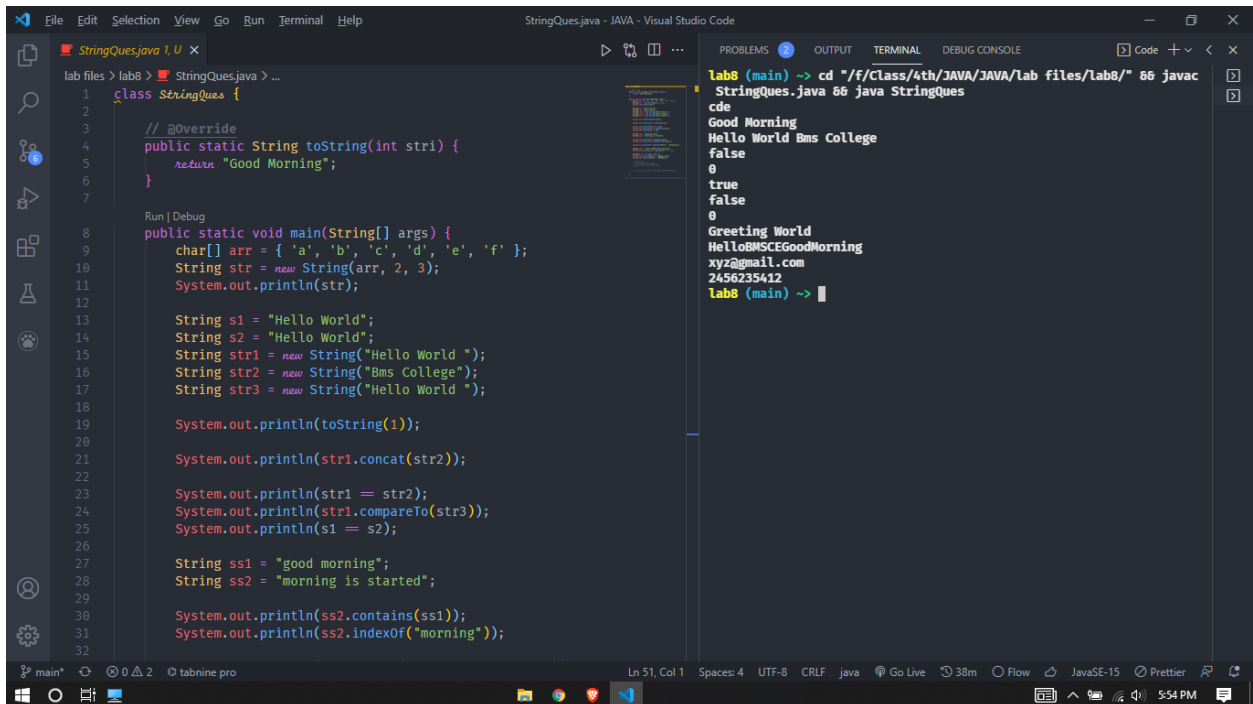
    String[] d1 = { "xyz", "24" };
    System.out.println(d1[0] + "@gmail.com");
    System.out.println(d1[1] + "56235412");

    // @Override
    // void toString(string) {
    // System.out.println(string);
    // }

```

```
// System.out.println(toString("Good Morning"));

}
```



The screenshot shows the Visual Studio Code editor with a Java file named `StringQues.java` open. The code defines a class `StringQues` with a `toString` method and a `main` method. The `main` method performs various string operations and prints the results. The terminal on the right shows the command to compile and run the program, followed by the output of the program.

```
StringQues.java 1,0 X
lab files > lab8 > StringQues.java > ...
1 class StringQues {
2
3 // @Override
4 public static String toString(int stri) {
5     return "Good Morning";
6 }
7
8 Run | Debug
9 public static void main(String[] args) {
10     char[] arr = { 'a', 'b', 'c', 'd', 'e', 'f' };
11     String str = new String(arr, 2, 3);
12     System.out.println(str);
13
14     String s1 = "Hello World";
15     String s2 = "Hello World";
16     String str1 = new String("Hello World ");
17     String str2 = new String("Bms College");
18     String str3 = new String("Hello World ");
19
20     System.out.println(toString(1));
21
22     System.out.println(str1.concat(str2));
23
24     System.out.println(str1 == str2);
25     System.out.println(str1.compareTo(str3));
26     System.out.println(s1 == s2);
27
28     String ss1 = "good morning";
29     String ss2 = "morning is started";
30
31     System.out.println(ss2.contains(ss1));
32     System.out.println(ss2.indexOf("morning"));
33 }
```

```
lab8 (main) -> cd "/f/class/4th/JAVA/JAVA/lab files/lab8/" && javac
StringQues.java && java StringQues
cde
Good Morning
Hello World Bms College
false
0
true
false
0
Greeting World
HelloBMSCEGoodMorning
xyz@gmail.com
2456235412
lab8 (main) ->
```

LAB 9

Arraydequeue.JAVA

```
import java.util.ArrayDeque;

class Arraydequeue {

    public static void main(String[] args) {

        ArrayDeque adq = new ArrayDeque();
        adq.add(1);
        adq.add(2);
        adq.add(3);
        System.out.println(adq);
        adq.addFirst(100);
        System.out.println(adq);
        adq.addLast(500);
        System.out.println(adq);
        adq.clear();
        System.out.println(adq);
        // adq.display();
    }
}
```

```
File Edit Selection View Go Run Terminal Help
Arraydequeue.java - JAVA - Visual Studio Code

lab files > lab9 > Arraydequeue.java
You, a week ago | 1 author (You)
1 import java.util.ArrayDeque;
2
3 class Arraydequeue {
4
5     Run | Debug
6     public static void main(String[] args) {
7
8         ArrayDeque adq = new ArrayDeque();
9         adq.add(1);
10        adq.add(2);
11        adq.add(3);
12        System.out.println(adq);
13        adq.addFirst(100);
14        System.out.println(adq);
15        adq.addLast(500);
16        System.out.println(adq);
17        adq.clear();
18        System.out.println(adq);
19        // adq.display();
20
21    }
22 }

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
lab9 (main) -> cd "/f/Class/4th/JAVA/JAVA/Lab files/lab9/" 88
javac Arraydequeue.java 88 java Arraydequeue
Note: Arraydequeue.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
[1, 2, 3]
[100, 1, 2, 3]
[100, 1, 2, 3, 500]
[]
lab9 (main) ->

main* 5 2 tabnine pro You, a week ago Ln 16, Col 21 Spaces: 4 UTF-8 CRLF java Go Live 0m Flow JavaSE-15 Prettier 22°C Light rain 8:11 PM
```

ArrayList.JAVA

```
import java.util.ArrayList;

class ArrayList {
    public static void main(String[] args) {
        // ArrayList<Integer> alist = new ArrayList<Integer>();
        ArrayList alist = new ArrayList();
        alist.add("a");
        alist.add("b");
        alist.add("c");
        alist.add("d");
        alist.add(5);
        // alist.display();
        System.out.println(alist);
        alist.remove("c");
        // alist.display();
        System.out.println(alist);
        alist.remove("b");
    }
}
```



```

        // alist.display();
        System.out.println(alist);
        alist.clear();
        System.out.println(alist);
    }
}

```

The screenshot shows the Visual Studio Code editor with a Java file named `Arraylist.java`. The code defines a `main` method that creates an `ArrayList`, adds elements 'a', 'b', 'c', 'd', and 5, prints the list, removes 'c', prints again, removes 'b', prints again, clears the list, and prints the final state. The terminal on the right shows the execution output, which matches the code's logic: `[a, b, c, d, 5]`, `[a, b, d, 5]`, `[a, d, 5]`, and finally `[]`.

```

lab files > lab9 > Arraylist.java > ArrayList > main(String[])
1  import java.util.ArrayList;
2
3  class ArrayList {
4      public static void main(String[] args) {
5          // ArrayList<Integer> alist = new ArrayList<Integer>();
6          ArrayList alist = new ArrayList();
7          alist.add("a");
8          alist.add("b");
9          alist.add("c");
10         alist.add("d");
11         alist.add(5);
12         // alist.display();
13         System.out.println(alist);
14         alist.remove("c");
15         // alist.display();
16         System.out.println(alist);
17         alist.remove("b");
18         // alist.display();
19         System.out.println(alist);
20         alist.clear();
21         System.out.println(alist);
22     }
23 }
24
lab9 (main) -> cd "/f/class/4th/JAVA/JAVA/lab files/lab9/" 56
javac Arraylist.java 56 java ArrayList
Note: Arraylist.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
[a, b, c, d, 5]
[a, b, d, 5]
[a, d, 5]
[]
lab9 (main) ->

```

HashSet.JAVA

```

import java.util.HashSet;

class Books {

    int id, quantity;
    String name, author;

    public Books(int id, String name, String author, int quantity) {

```

```

        this.id = id;
        this.name = name;
        this.author = author;
        this.quantity = quantity;
    }
}

class Hashset {
    public static void main(String[] args) {
        HashSet<Books> hset = new HashSet<Books>();
        Books b1 = new Books(1, "Book1", "Author 1", 50);
        Books b2 = new Books(2, "Book2", "Author 2", 60);
        Books b3 = new Books(3, "Book3", "Author 3", 70);
        hset.add(b1);
        hset.add(b2);
        hset.add(b3);

        // System.out.println(hset);

        for (Books b : hset) {
            System.out.println(b.id + " " + b.name + " " + b.author + " "
+ b.quantity);
        }

        hset.remove(b3);

        System.out.println("\n");

        for (Books b : hset) {
            System.out.println(b.id + " " + b.name + " " + b.author + " "
+ b.quantity);
        }

        hset.clear();
        for (Books b : hset) {
            System.out.println(b.id + " " + b.name + " " + b.author + " "
+ b.quantity);
        }
    }
}

```

```

}

}

```

```

lab files > lab9 > Hashset.java > Hashset > main(String[] args)
3 class Books {
4
5     int id, quantity;
6     String name, author;
7
8     public Books(int id, String name, String author, int quant
9         this.id = id;
10        this.name = name;
11        this.author = author;
12        this.quantity = quantity;
13    }
14
15 }
16
17 You, a week ago | 1 author (You)
18 class Hashset {
19     public static void main(String[] args) {
20         HashSet<Books> hset = new HashSet<Books>();
21         Books b1 = new Books(1, "Book1", "Author 1", 50);
22         Books b2 = new Books(2, "Book2", "Author 2", 60);
23         Books b3 = new Books(3, "Book3", "Author 3", 70);
24         hset.add(b1);
25         hset.add(b2);
26         hset.add(b3);
27
28         // System.out.println(hset);
29
30         for (Books b : hset) {
31             System.out.println(b.id + " " + b.name + " " + b.a
32         }
33
34         hset.remove(b3);

```

```

lab9 (main) -> cd "/f/Class/4th/JAVA/JAVA/lab files/lab9/" 66
javac Hashset.java 66 java Hashset
3 Book3 Author 3 70
1 Book1 Author 1 50
2 Book2 Author 2 60
lab9 (main) ->
1 Book1 Author 1 50
2 Book2 Author 2 60
lab9 (main) ->

```

Treeset.JAVA

```

import java.util.TreeSet;

class Treeset {
    public static void main(String[] args) {
        TreeSet tset = new TreeSet();
        tset.add(1);
        tset.add(2);
        tset.add(3);
        tset.add(4);
        tset.add(5);
        tset.add(6);

        System.out.println(tset);
    }
}

```

```

        System.out.println("Removed " + tset.pollFirst());
        System.out.println(tset);

        System.out.println("Removed: " + tset.pollLast());
        System.out.println(tset);
    }
}

```

The screenshot shows the Visual Studio Code interface with the following components:

- Editor:** Displays the `Treset.java` file with the following code:


```

import java.util.TreeSet;

class Treset {
    public static void main(String[] args) {
        TreeSet tset = new TreeSet();
        tset.add(1);
        tset.add(2);
        tset.add(3);
        tset.add(4);
        tset.add(5);
        tset.add(6);

        System.out.println(tset);
        System.out.println("Removed " + tset.pollFirst());
        System.out.println(tset);

        System.out.println("Removed: " + tset.pollLast());
        System.out.println(tset);
    }
}

```
- Terminal:** Shows the command `javac Treset.java && java Treset` and its output:


```

lab9 (main) -> cd "/f/Class/4th/JAVA/JAVA/lab files/lab9/" &&
javac Treset.java && java Treset
Note: Treset.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
[1, 2, 3, 4, 5, 6]
Removed 1
[2, 3, 4, 5, 6]
Removed: 6
[2, 3, 4, 5]
lab9 (main) ->

```
- Problems Panel:** Empty.
- Output Panel:** Empty.
- Debug Console:** Empty.
- Bottom Status Bar:** Shows the current file is `Treset.java`, line 14, column 1, with 4 spaces, UTF-8 encoding, CRLF line endings, and the Java language.

THANK YOU