

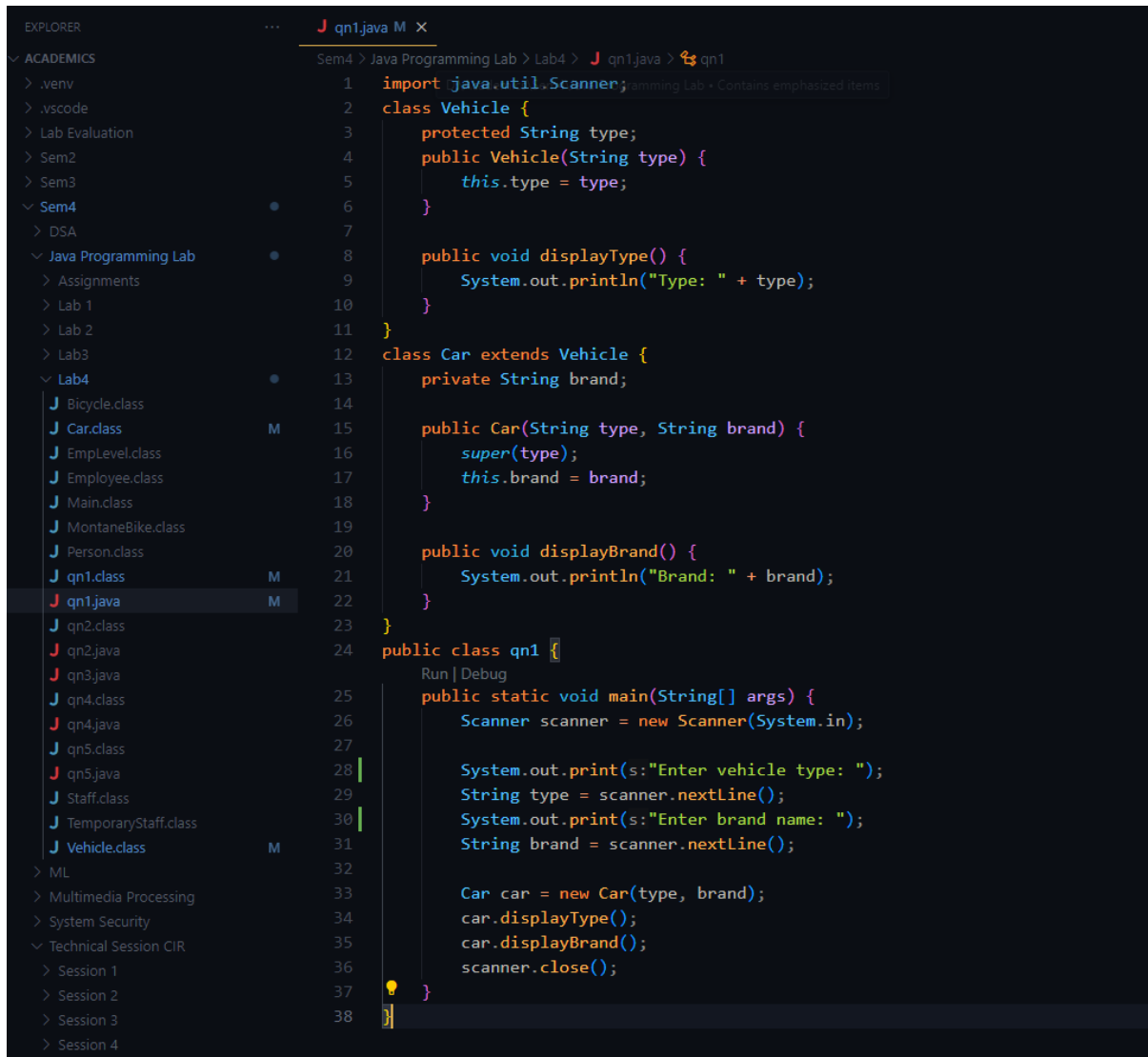
## Java Lab – 4

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CB.SC.U4CYS23036

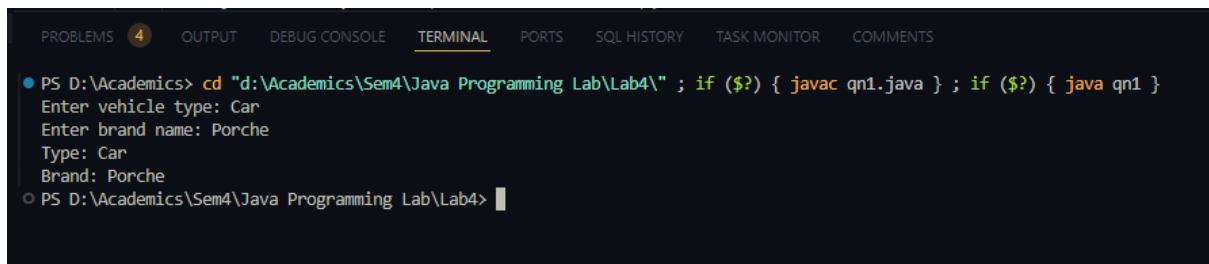
Qn1,

Code:



```
1  import java.util.Scanner;
2  class Vehicle {
3      protected String type;
4      public Vehicle(String type) {
5          this.type = type;
6      }
7
8      public void displayType() {
9          System.out.println("Type: " + type);
10     }
11 }
12 class Car extends Vehicle {
13     private String brand;
14
15     public Car(String type, String brand) {
16         super(type);
17         this.brand = brand;
18     }
19
20     public void displayBrand() {
21         System.out.println("Brand: " + brand);
22     }
23 }
24 public class qn1 {
25     Run | Debug
26     public static void main(String[] args) {
27         Scanner scanner = new Scanner(System.in);
28
29         System.out.print(s:"Enter vehicle type: ");
30         String type = scanner.nextLine();
31         System.out.print(s:"Enter brand name: ");
32         String brand = scanner.nextLine();
33
34         Car car = new Car(type, brand);
35         car.displayType();
36         car.displayBrand();
37         scanner.close();
38     }
39 }
```

## Output:



```
PROBLEMS 4 OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL HISTORY TASK MONITOR COMMENTS
● PS D:\Academics> cd "d:\Academics\Sem4\Java Programming Lab\Lab4\" ; if ($?) { javac qn1.java } ; if ($?) { java qn1 }
Enter vehicle type: Car
Enter brand name: Porche
Type: Car
Brand: Porche
○ PS D:\Academics\Sem4\Java Programming Lab\Lab4> |
```

Qn2,

Code:

The screenshot shows the Visual Studio Code interface. On the left, the Explorer pane displays a project structure under 'ACADEMICS'. The 'Sem4' folder is expanded, showing 'Java Programming Lab' which contains 'Lab4'. 'Lab4' contains several class files, with 'qn2.java' selected. The main editor displays the code for 'qn2.java'. The code defines an 'Employee' class with protected attributes 'empId' and 'salary', and a constructor. It also defines an 'EmpLevel' class that extends 'Employee', adding a 'level' attribute and a constructor that sets the level based on the salary. A 'display()' method is shown for 'EmpLevel'. Finally, a 'qn2' class with a 'main' method is defined, which uses a 'Scanner' to take user input for an employee ID and salary, creates an 'EmpLevel' object, and calls its 'display()' method.

```
1  import java.util.Scanner;
2  class Employee {
3      protected int empId;
4      protected float salary;
5
6      Employee(int id, float sal) {
7          empId = id;
8          salary = sal;
9      }
10 }
11 class EmpLevel extends Employee {
12     private int level;
13
14     EmpLevel(int id, float sal) {
15         super(id, sal);
16         if(salary > 100)
17             level = 1;
18         else
19             level = 2;
20     }
21
22     void display() {
23         System.out.println(empId);
24         System.out.println(salary);
25         System.out.println(level);
26     }
27 }
28 public class qn2 {
29     Run | Debug
30     public static void main(String[] args) {
31         Scanner sc = new Scanner(System.in);
32         System.out.println(x:"Enter employee ID:");
33         int id = sc.nextInt();
34         System.out.println(x:"Enter salary:");
35         float salary = sc.nextFloat();
36
37         EmpLevel emp = new EmpLevel(id, salary);
38         emp.display();
39
40         sc.close();
41     }
42 }
```

## Output:

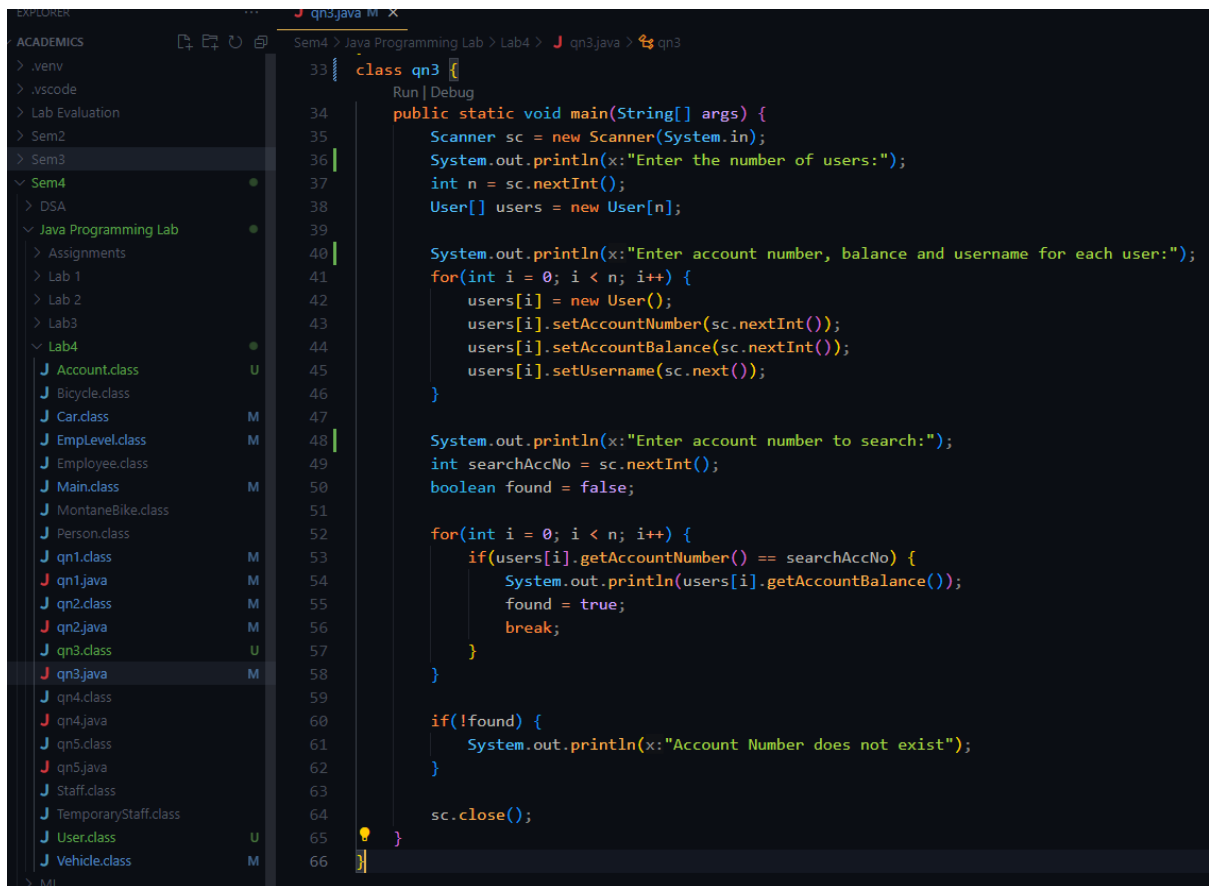
The screenshot shows the VS Code terminal with the 'TERMINAL' tab selected. It displays the command prompt output for running the Java program. The command executed is 'cd "d:\Academics\Sem4\Java Programming Lab\Lab4" ; if (\$?) { javac qn2.java } ; if (\$?) { java qn2 }'. The program prompts for 'Enter employee ID:' and 'Enter salary:'. The user inputs '23036' for the ID and '200000' for the salary. The program then outputs '1'. The terminal prompt returns to 'PS D:\Academics\Sem4\Java Programming Lab\Lab4>'.

```
PS D:\Academics> cd "d:\Academics\Sem4\Java Programming Lab\Lab4" ; if ($?) { javac qn2.java } ; if ($?) { java qn2 }
Enter employee ID:
23036
Enter salary:
200000
23036
200000.0
1
PS D:\Academics\Sem4\Java Programming Lab\Lab4>
```

Qn3,

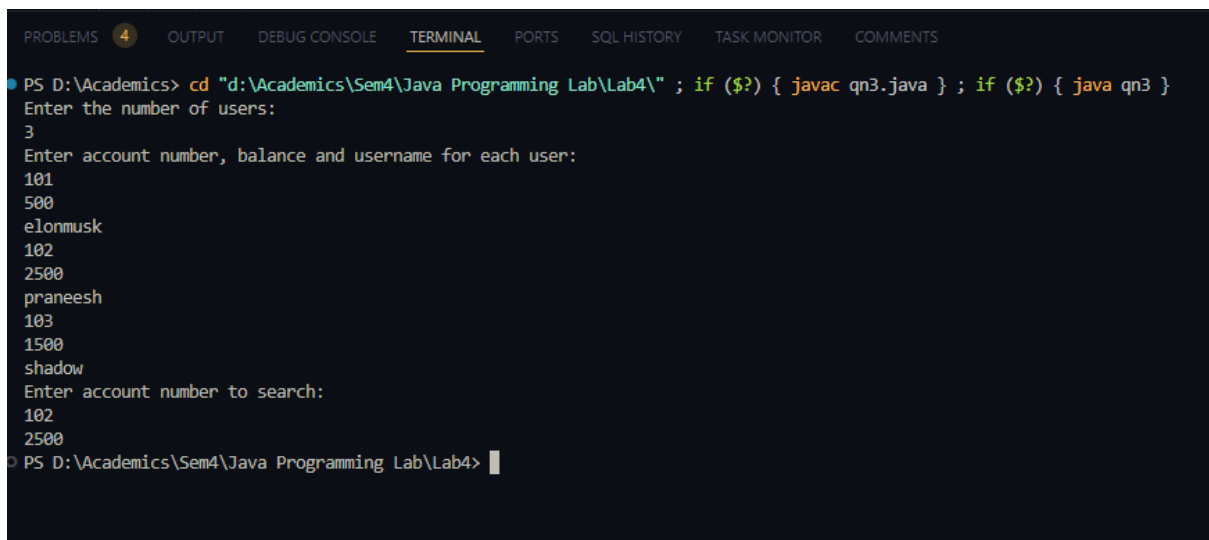
Code:

```
1  import java.util.Scanner;
2  class Account {
3      private int account_number;
4      private int account_balance;
5
6      public void setAccountNumber(int accno) {
7          this.account_number = accno;
8      }
9
10     public void setAccountBalance(int bal) {
11         this.account_balance = bal;
12     }
13
14     public int getAccountNumber() {
15         return account_number;
16     }
17
18     public int getAccountBalance() {
19         return account_balance;
20     }
21 }
22 class User extends Account {
23     private String username;
24
25     public void setUsername(String name) {
26         this.username = name;
27     }
28
29     public String getUsername() {
30         return username;
31     }
32 }
```



```
33 class qn3 {
34     public static void main(String[] args) {
35         Scanner sc = new Scanner(System.in);
36         System.out.println(x:"Enter the number of users:");
37         int n = sc.nextInt();
38         User[] users = new User[n];
39
40         System.out.println(x:"Enter account number, balance and username for each user:");
41         for(int i = 0; i < n; i++) {
42             users[i] = new User();
43             users[i].setAccountNumber(sc.nextInt());
44             users[i].setAccountBalance(sc.nextInt());
45             users[i].setUsername(sc.next());
46         }
47
48         System.out.println(x:"Enter account number to search:");
49         int searchAccNo = sc.nextInt();
50         boolean found = false;
51
52         for(int i = 0; i < n; i++) {
53             if(users[i].getAccountNumber() == searchAccNo) {
54                 System.out.println(users[i].getAccountBalance());
55                 found = true;
56                 break;
57             }
58         }
59
60         if(!found) {
61             System.out.println(x:"Account Number does not exist");
62         }
63
64         sc.close();
65     }
66 }
```

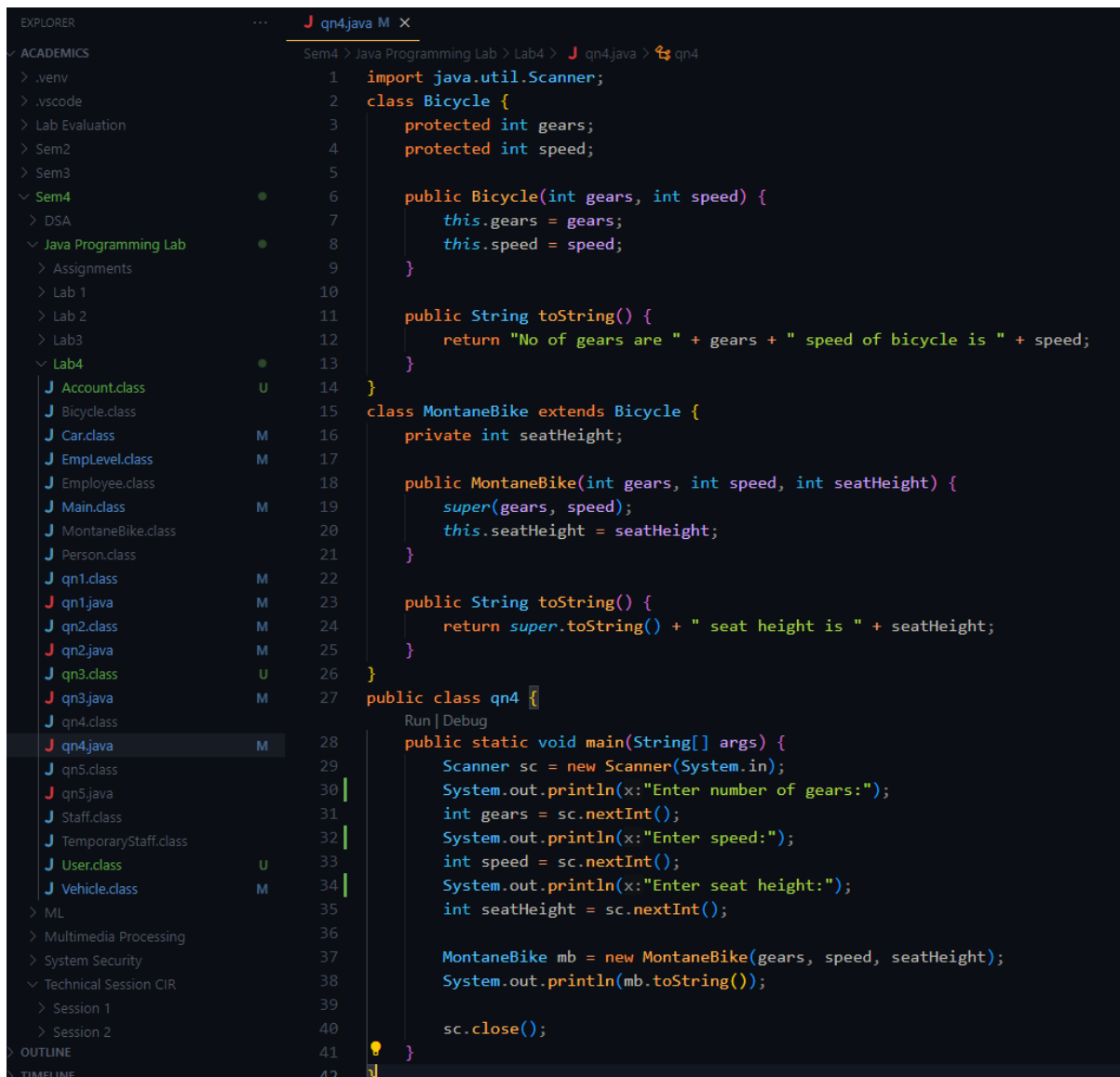
Output:



```
PS D:\Academics> cd "d:\Academics\Sem4\Java Programming Lab\Lab4\" ; if ($?) { javac qn3.java } ; if ($?) { java qn3 }
Enter the number of users:
3
Enter account number, balance and username for each user:
101
500
elonmusk
102
2500
praneesh
103
1500
shadow
Enter account number to search:
102
2500
PS D:\Academics\Sem4\Java Programming Lab\Lab4>
```

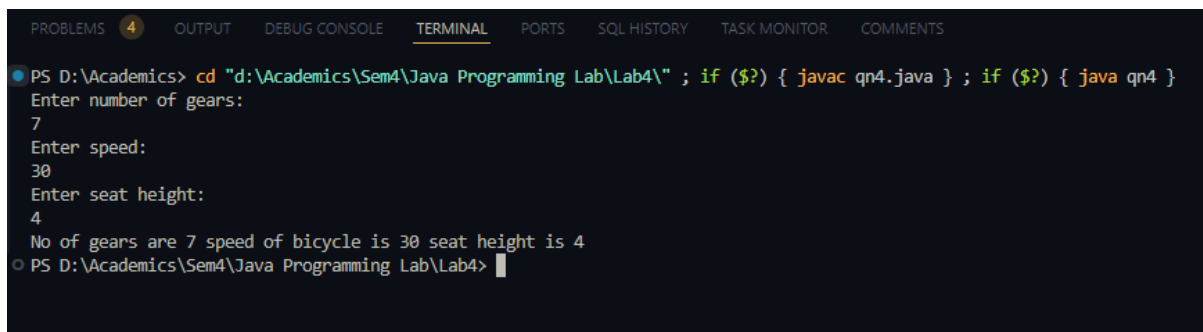
Qn4,

Code:



```
1  import java.util.Scanner;
2  class Bicycle {
3      protected int gears;
4      protected int speed;
5
6      public Bicycle(int gears, int speed) {
7          this.gears = gears;
8          this.speed = speed;
9      }
10
11     public String toString() {
12         return "No of gears are " + gears + " speed of bicycle is " + speed;
13     }
14 }
15 class MontaneBike extends Bicycle {
16     private int seatHeight;
17
18     public MontaneBike(int gears, int speed, int seatHeight) {
19         super(gears, speed);
20         this.seatHeight = seatHeight;
21     }
22
23     public String toString() {
24         return super.toString() + " seat height is " + seatHeight;
25     }
26 }
27 public class qn4 {
28     Run | Debug
29     public static void main(String[] args) {
30         Scanner sc = new Scanner(System.in);
31         System.out.println("Enter number of gears:");
32         int gears = sc.nextInt();
33         System.out.println("Enter speed:");
34         int speed = sc.nextInt();
35         System.out.println("Enter seat height:");
36         int seatHeight = sc.nextInt();
37
38         MontaneBike mb = new MontaneBike(gears, speed, seatHeight);
39         System.out.println(mb.toString());
40
41         sc.close();
42     }
43 }
```

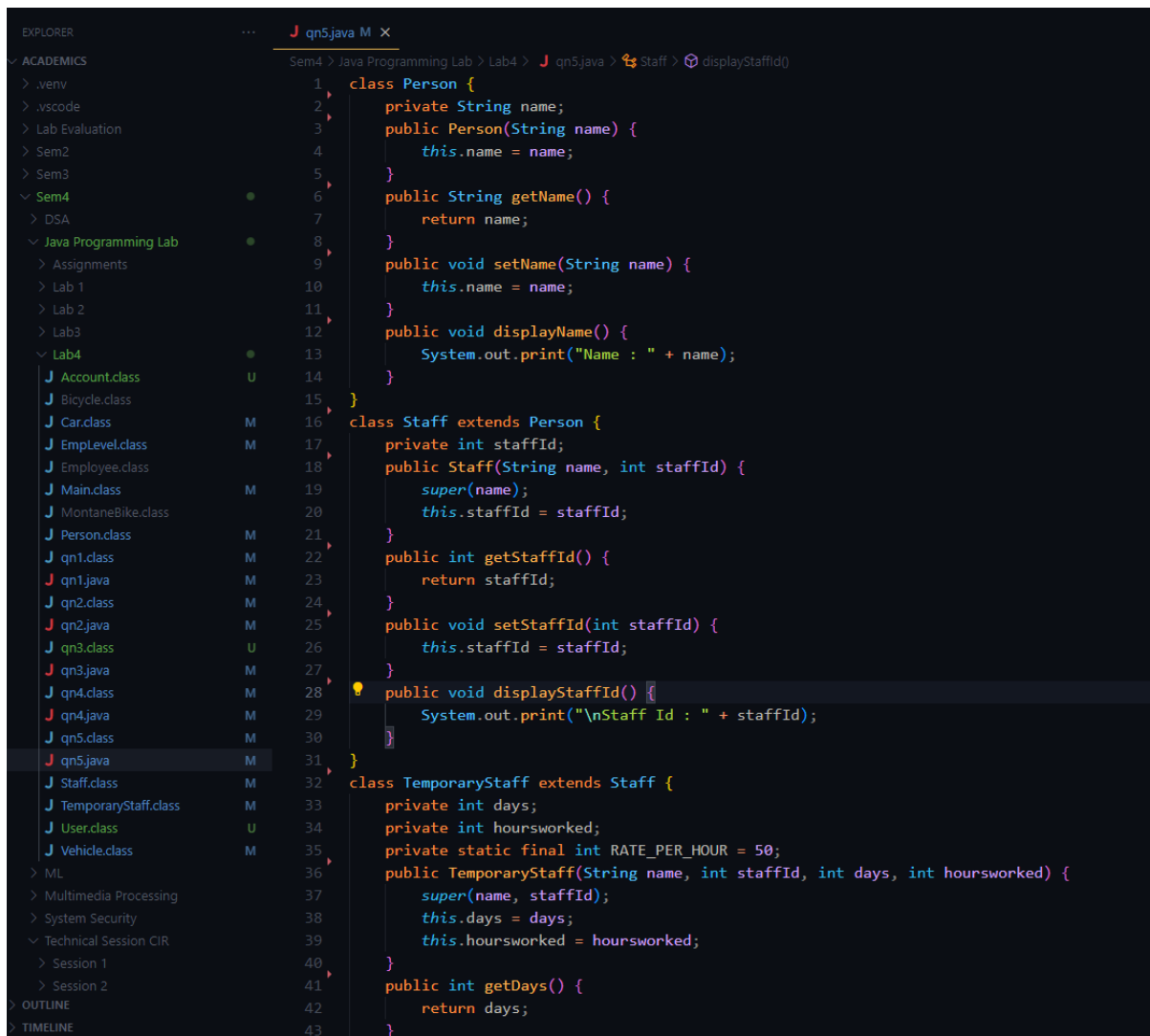
Output:



```
PROBLEMS 4 OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL HISTORY TASK MONITOR COMMENTS
PS D:\Academics> cd "d:\Academics\Sem4\Java Programming Lab\Lab4" ; if ($?) { javac qn4.java } ; if ($?) { java qn4 }
Enter number of gears:
7
Enter speed:
30
Enter seat height:
4
No of gears are 7 speed of bicycle is 30 seat height is 4
PS D:\Academics\Sem4\Java Programming Lab\Lab4>
```

Qn5,

Code:



```
1 class Person {
2     private String name;
3     public Person(String name) {
4         this.name = name;
5     }
6     public String getName() {
7         return name;
8     }
9     public void setName(String name) {
10        this.name = name;
11    }
12    public void displayName() {
13        System.out.print("Name : " + name);
14    }
15 }
16 class Staff extends Person {
17     private int staffId;
18     public Staff(String name, int staffId) {
19         super(name);
20         this.staffId = staffId;
21     }
22     public int getStaffId() {
23         return staffId;
24     }
25     public void setStaffId(int staffId) {
26         this.staffId = staffId;
27     }
28     public void displayStaffId() {
29         System.out.print("\nStaff Id : " + staffId);
30     }
31 }
32 class TemporaryStaff extends Staff {
33     private int days;
34     private int hoursworked;
35     private static final int RATE_PER_HOUR = 50;
36     public TemporaryStaff(String name, int staffId, int days, int hoursworked) {
37         super(name, staffId);
38         this.days = days;
39         this.hoursworked = hoursworked;
40     }
41     public int getDays() {
42         return days;
43     }
44 }
```

The screenshot shows an IDE with a file explorer on the left and a code editor on the right. The file explorer shows a project structure with folders like .venv, .vscode, Lab Evaluation, Sem2, Sem3, Sem4, DSA, Java Programming Lab, Assignments, Lab 1, Lab 2, Lab3, Lab4, and ML. Under Lab4, there are several .class files and .java files. The code editor shows the following Java code:

```
class TemporaryStaff extends Staff {  
    public int getDays() {  
        return days;  
    }  
    public void setDays(int days) {  
        this.days = days;  
    }  
    public int getHoursworked() {  
        return hoursworked;  
    }  
    public void setHoursworked(int hoursworked) {  
        this.hoursworked = hoursworked;  
    }  
    public int calculateSalary() {  
        return days * hoursworked * RATE_PER_HOUR;  
    }  
    public void displayDetails() {  
        displayName();  
        displayStaffId();  
        System.out.println("\nNo. of Days : " + days);  
        System.out.println("No. of Hours Worked : " + hoursworked);  
        System.out.println("Total Salary : " + calculateSalary());  
    }  
}  
  
class qn5 {  
    public static void main(String[] args) {  
        java.util.Scanner scanner = new java.util.Scanner(System.in);  
        System.out.print(s:"Enter name: ");  
        String name = scanner.nextLine();  
        System.out.print(s:"Enter staff ID: ");  
        int staffId = scanner.nextInt();  
        System.out.print(s:"Enter number of days: ");  
        int days = scanner.nextInt();  
        System.out.print(s:"Enter hours worked: ");  
        int hours = scanner.nextInt();  
        TemporaryStaff staff = new TemporaryStaff(name, staffId, days, hours);  
        staff.displayDetails();  
        scanner.close();  
    }  
}
```

Output:

The screenshot shows a terminal window with the following output:

```
PS D:\Academics> cd "d:\Academics\Sem4\Java Programming Lab\Lab4\" ; if ($?) { javac qn5.java } ; if ($?) { java qn5 }  
Enter name: Praneesh  
Enter staff ID: 420  
Enter number of days: 29  
Enter hours worked: 225  
Name : Praneesh  
Staff Id : 420  
No. of Days : 29  
No. of Hours Worked : 225  
Total Salary : 326250  
PS D:\Academics\Sem4\Java Programming Lab\Lab4>
```