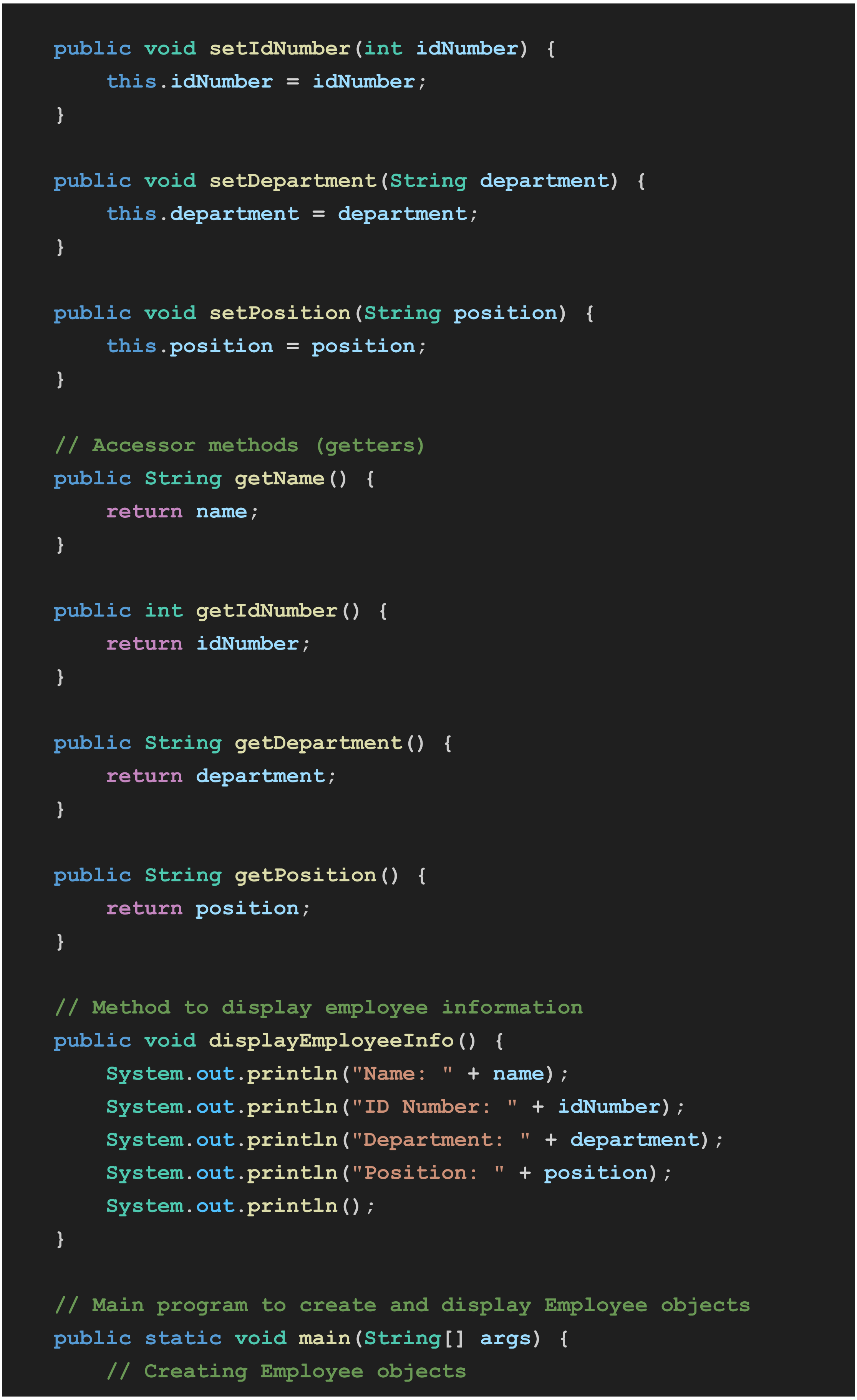
ASSIGNMENT 3

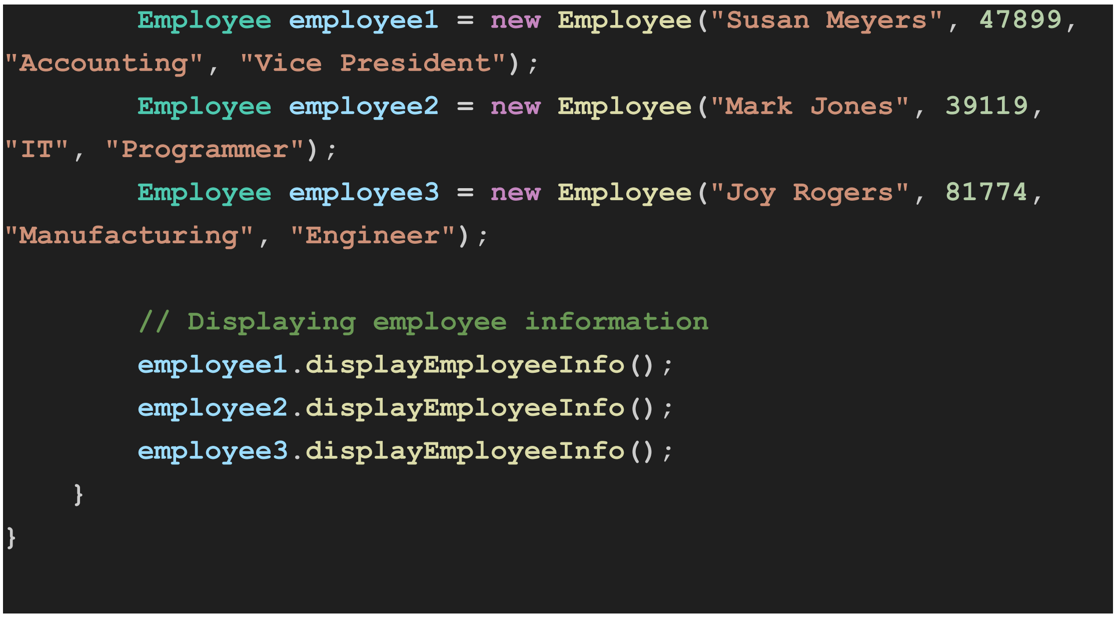
Name: Anushka Prajapati
Registration no.: 20233074

Question 1

```
public class Employee {
    // Fields
    private String name;
    private int idNumber;
    private String department;
    private String position;

    // Constructor that accepts all fields
    public Employee(String name, int idNumber, String department,
String position) {
        this.name = name;
        this.idNumber = idNumber;
        this.department = department;
        this.position = position;
    }

    // Constructor that accepts name and idNumber, with default
values for department and position
    public Employee(String name, int idNumber) {
        this(name, idNumber, "", ""); // Calls the full
constructor with empty strings for department and position
    }

    // No-arg constructor that sets default values
    public Employee() {
        this("", 0, "", ""); // Calls the full constructor with
default values
    }

    // Mutator methods (setters)
    public void setName(String name) {
        this.name = name;
    }
```

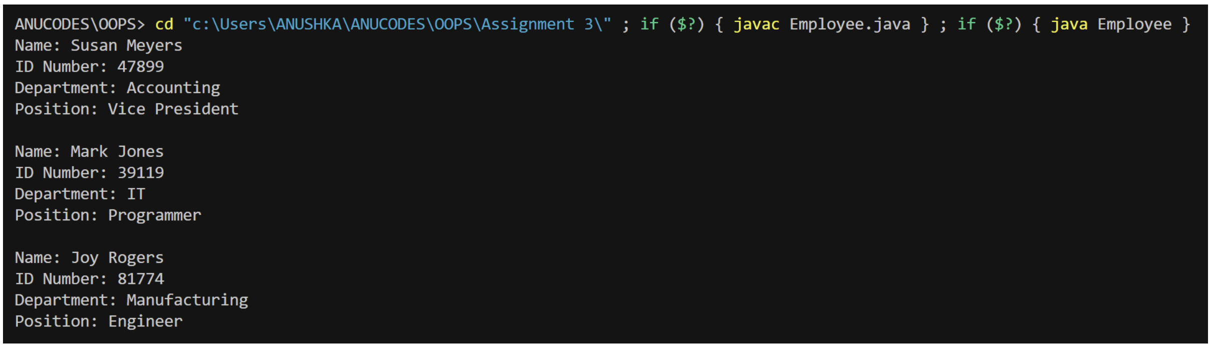


```
public void setIdNumber(int idNumber) {
    this.idNumber = idNumber;
}

public void setDepartment(String department) {
    this.department = department;
}

public void setPosition(String position) {
    this.position = position;
}

// Accessor methods (getters)
public String getName() {
    return name;
}

public int getIdNumber() {
    return idNumber;
}

public String getDepartment() {
    return department;
}

public String getPosition() {
    return position;
}

// Method to display employee information
public void displayEmployeeInfo() {
    System.out.println("Name: " + name);
    System.out.println("ID Number: " + idNumber);
    System.out.println("Department: " + department);
    System.out.println("Position: " + position);
    System.out.println();
}

// Main program to create and display Employee objects
public static void main(String[] args) {
    // Creating Employee objects
```



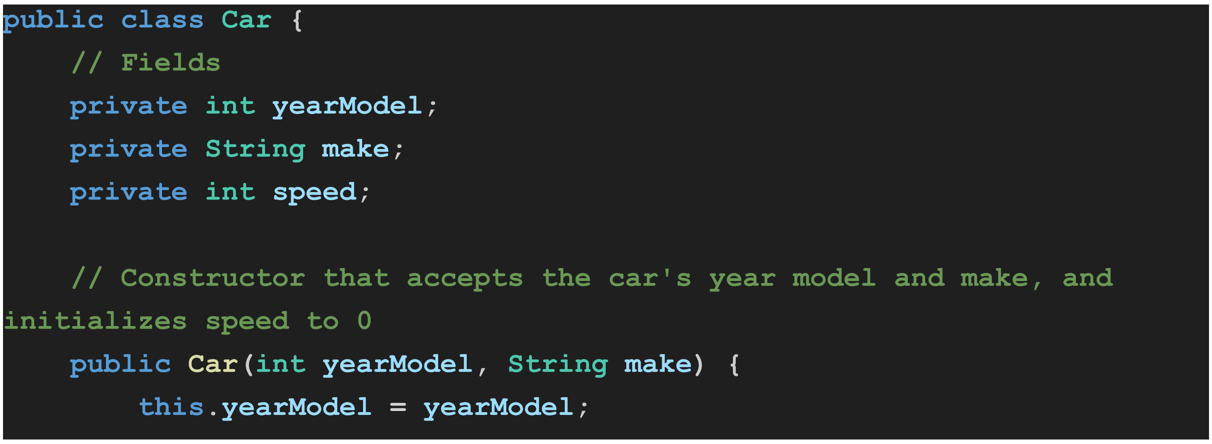
```
        Employee employee1 = new Employee("Susan Meyers", 47899,
"Accounting", "Vice President");
        Employee employee2 = new Employee("Mark Jones", 39119,
"IT", "Programmer");
        Employee employee3 = new Employee("Joy Rogers", 81774,
"Manufacturing", "Engineer");

        // Displaying employee information
        employee1.displayEmployeeInfo();
        employee2.displayEmployeeInfo();
        employee3.displayEmployeeInfo();
    }
}
```

Output 1



```
ANUCODES\OOPS> cd "c:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3\" ; if ($?) { javac Employee.java } ; if ($?) { java Employee }
Name: Susan Meyers
ID Number: 47899
Department: Accounting
Position: Vice President

Name: Mark Jones
ID Number: 39119
Department: IT
Position: Programmer

Name: Joy Rogers
ID Number: 81774
Department: Manufacturing
Position: Engineer
```

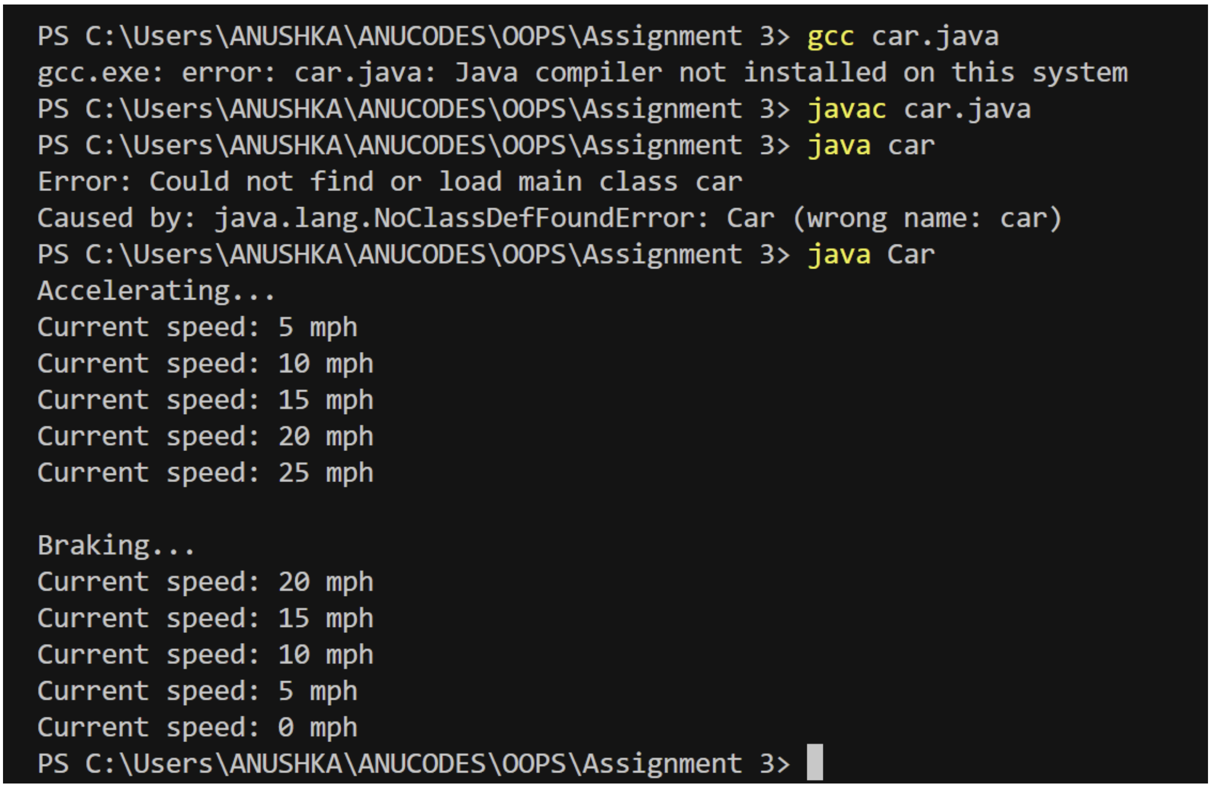
Question 2



```
public class Car {
    // Fields
    private int yearModel;
    private String make;
    private int speed;

    // Constructor that accepts the car's year model and make, and
initializes speed to 0
    public Car(int yearModel, String make) {
        this.yearModel = yearModel;
```

```java
        this.make = make;
        this.speed = 0; // Speed is initially set to 0
    }

    // Accessor methods (getters)
    public int getYearModel() {
        return yearModel;
    }

    public String getMake() {
        return make;
    }

    public int getSpeed() {
        return speed;
    }

    // Method to increase the speed by 5
    public void accelerate() {
        speed += 5;
    }

    // Method to decrease the speed by 5
    public void brake() {
        speed -= 5;
    }

    // Main program to demonstrate the Car class
    public static void main(String[] args) {
        // Create a Car object
        Car myCar = new Car(2024, "Toyota");

        // Accelerate the car five times and display the speed
        System.out.println("Accelerating...");
        for (int i = 0; i < 5; i++) {
            myCar.accelerate();
            System.out.println("Current speed: " + myCar.getSpeed() + "
mph");
        }

        // Brake the car five times and display the speed
        System.out.println("\nBraking...");
        for (int i = 0; i < 5; i++) {
            myCar.brake();
            System.out.println("Current speed: " + myCar.getSpeed() + " mph");
        }
    }
}
```

Output 2



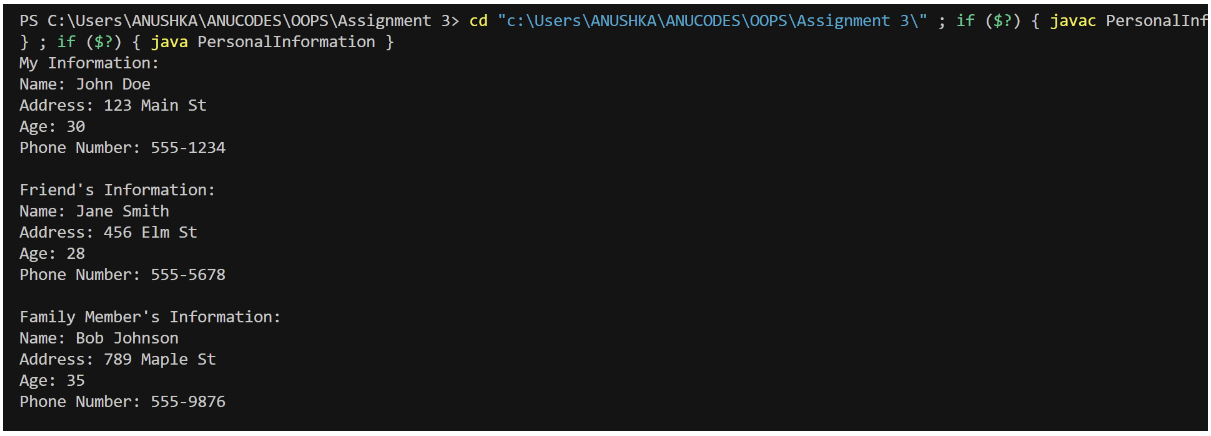
```
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> gcc car.java
gcc.exe: error: car.java: Java compiler not installed on this system
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> javac car.java
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> java car
Error: Could not find or load main class car
Caused by: java.lang.NoClassDefFoundError: Car (wrong name: car)
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> java Car
Accelerating...
Current speed: 5 mph
Current speed: 10 mph
Current speed: 15 mph
Current speed: 20 mph
Current speed: 25 mph

Braking...
Current speed: 20 mph
Current speed: 15 mph
Current speed: 10 mph
Current speed: 5 mph
Current speed: 0 mph
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3>
```

Question 3

```
public class PersonalInformation {
    // Fields
    private String name;
    private String address;
    private int age;
    private String phoneNumber;

    // Constructor that accepts all fields
    public PersonalInformation(String name, String address, int age, String phoneNumber) {
        this.name = name;
```

```java
        this.address = address;
        this.age = age;
        this.phoneNumber = phoneNumber;
    }

    // Mutator methods (setters)
    public void setName(String name) {
        this.name = name;
    }

    public void setAddress(String address) {
        this.address = address;
    }

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

    public void setPhoneNumber(String phoneNumber) {
        this.phoneNumber = phoneNumber;
    }

    // Accessor methods (getters)
    public String getName() {
        return name;
    }

    public String getAddress() {
        return address;
    }

    public int getAge() {
        return age;
    }

    public String getPhoneNumber() {
        return phoneNumber;
    }

    // Method to display personal information
    public void displayInfo() {
        System.out.println("Name: " + name);
        System.out.println("Address: " + address);
        System.out.println("Age: " + age);
        System.out.println("Phone Number: " + phoneNumber);
        System.out.println();
    }

    // Main program to demonstrate the PersonalInformation class
    public static void main(String[] args) {
        // Creating three instances of PersonalInformation
        PersonalInformation myInfo = new PersonalInformation("John
Doe", "123 Main St", 30, "555-1234");
        PersonalInformation friendInfo = new PersonalInformation("Jane
Smith", "456 Elm St", 28, "555-5678");
        PersonalInformation familyInfo = new PersonalInformation("Bob
Johnson", "789 Maple St", 35, "555-9876");

        // Displaying information for each instance
        System.out.println("My Information:");
        myInfo.displayInfo();

        System.out.println("Friend's Information:");
        friendInfo.displayInfo();

        System.out.println("Family Member's Information:");
        familyInfo.displayInfo();
    }
}
```

Output 3

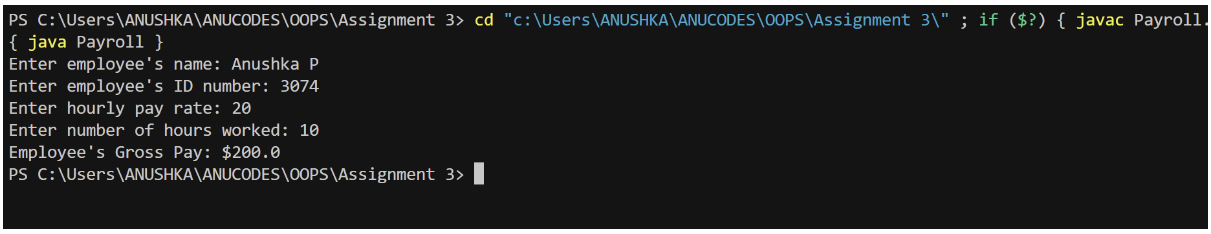


```
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> cd "c:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3\" ; if ($?) { javac PersonalInf
} ; if ($?) { java PersonalInformation }
My Information:
Name: John Doe
Address: 123 Main St
Age: 30
Phone Number: 555-1234

Friend's Information:
Name: Jane Smith
Address: 456 Elm St
Age: 28
Phone Number: 555-5678

Family Member's Information:
Name: Bob Johnson
Address: 789 Maple St
Age: 35
Phone Number: 555-9876
```

Question 4

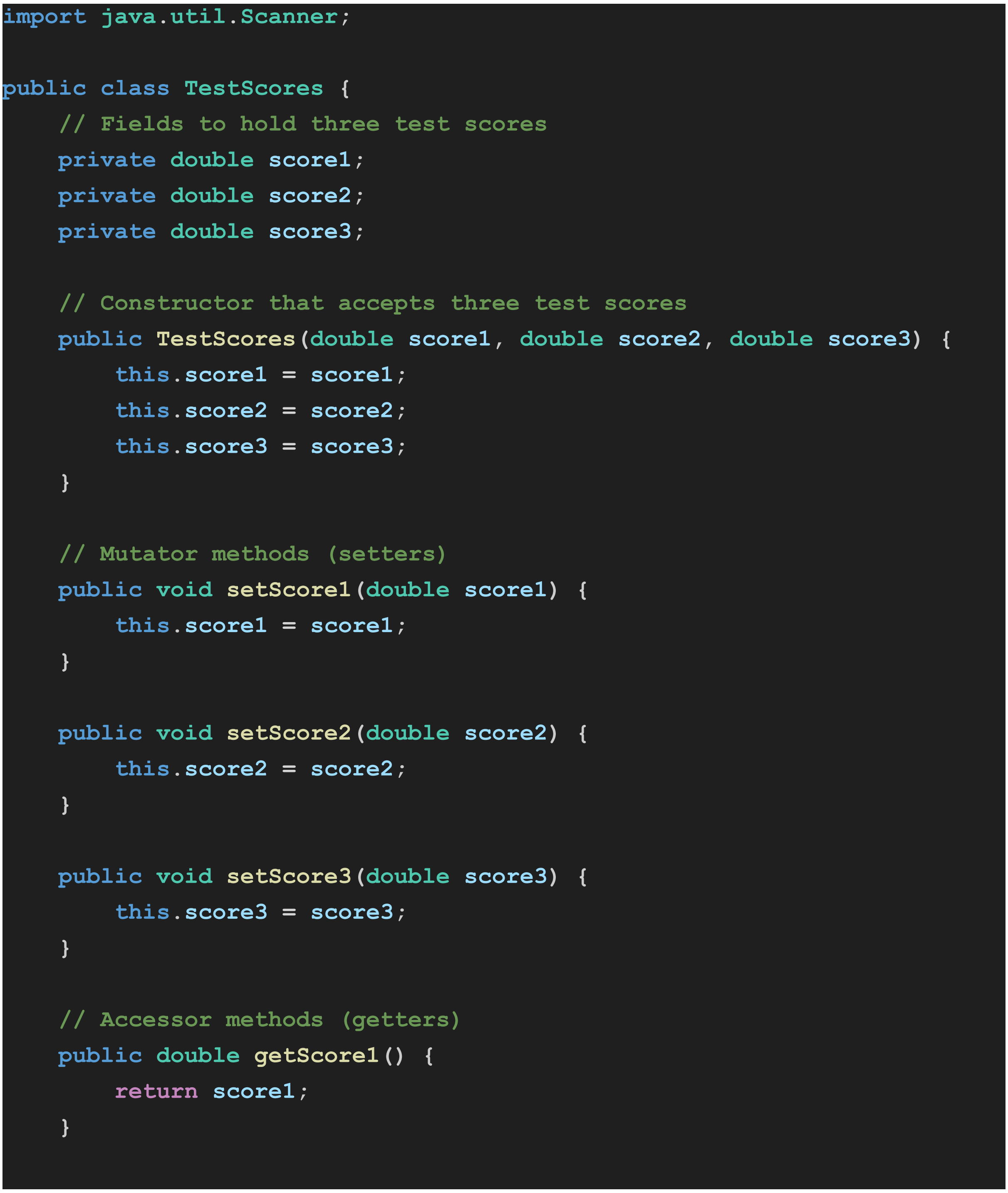
```java
import java.util.Scanner;

public class Payroll {
    // Fields
    private String employeeName;
    private int idNumber;
    private double hourlyPayRate;
    private double hoursWorked;

    // Constructor that accepts employee's name and ID number
    public Payroll(String employeeName, int idNumber) {
        this.employeeName = employeeName;
        this.idNumber = idNumber;
        this.hourlyPayRate = 0.0;
        this.hoursWorked = 0.0;
    }

    // Mutator methods (setters)
    public void setHourlyPayRate(double hourlyPayRate) {
        this.hourlyPayRate = hourlyPayRate;
    }

    public void setHoursWorked(double hoursWorked) {
        this.hoursWorked = hoursWorked;
    }

    // Accessor methods (getters)
    public String getEmployeeName() {
        return employeeName;
    }

    public int getIdNumber() {
        return idNumber;
    }

    public double getHourlyPayRate() {
        return hourlyPayRate;
    }

    public double getHoursWorked() {
        return hoursWorked;
    }
    // Method to calculate and return gross pay
    public double getGrossPay() {
        return hoursWorked * hourlyPayRate;
    }

    // Main program to demonstrate the Payroll class
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input employee's name and ID number
        System.out.print("Enter employee's name: ");
        String name = scanner.nextLine();
        System.out.print("Enter employee's ID number: ");
        int id = scanner.nextInt();

        // Create a Payroll object
        Payroll payroll = new Payroll(name, id);

        // Input hourly pay rate and hours worked
        System.out.print("Enter hourly pay rate: ");
        double hourlyRate = scanner.nextDouble();
        System.out.print("Enter number of hours worked: ");
        double hours = scanner.nextDouble();

        // Set hourly pay rate and hours worked in the Payroll object
        payroll.setHourlyPayRate(hourlyRate);
        payroll.setHoursWorked(hours);

        // Display the gross pay
        System.out.println("Employee's Gross Pay: $" +
payroll.getGrossPay());
    }
}
```

Output 4



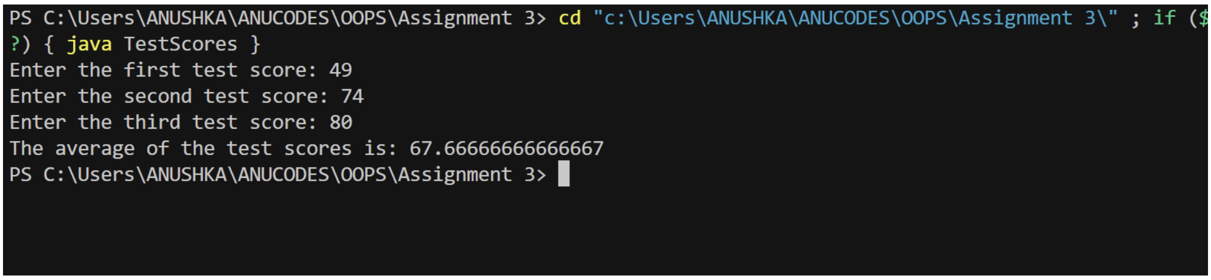
```
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> cd "c:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3\" ; if ($?) { javac Payroll.
{ java Payroll }
Enter employee's name: Anushka P
Enter employee's ID number: 3074
Enter hourly pay rate: 20
Enter number of hours worked: 10
Employee's Gross Pay: $200.0
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> 
```

Question 5



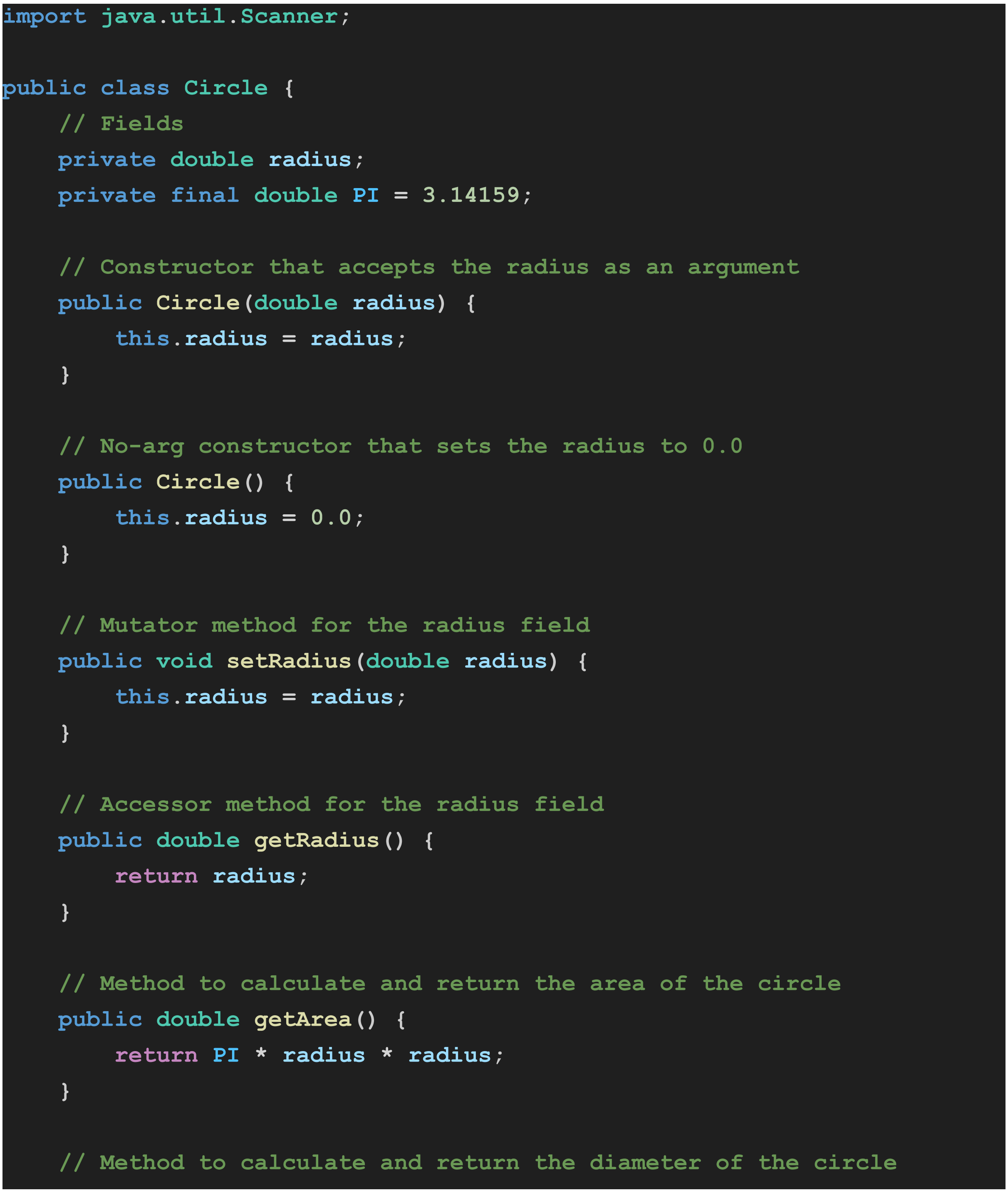
```java
import java.util.Scanner;

public class TestScores {
    // Fields to hold three test scores
    private double score1;
    private double score2;
    private double score3;

    // Constructor that accepts three test scores
    public TestScores(double score1, double score2, double score3) {
        this.score1 = score1;
        this.score2 = score2;
        this.score3 = score3;
    }

    // Mutator methods (setters)
    public void setScore1(double score1) {
        this.score1 = score1;
    }

    public void setScore2(double score2) {
        this.score2 = score2;
    }

    public void setScore3(double score3) {
        this.score3 = score3;
    }

    // Accessor methods (getters)
    public double getScore1() {
        return score1;
    }
    public double getScore2() {
        return score2;
    }

    public double getScore3() {
        return score3;
    }

    // Method to calculate and return the average of the three scores
    public double getAverage() {
        return (score1 + score2 + score3) / 3;
    }

    // Main program to demonstrate the TestScores class
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Input three test scores from the user
        System.out.print("Enter the first test score: ");
        double score1 = scanner.nextDouble();
        System.out.print("Enter the second test score: ");
        double score2 = scanner.nextDouble();
        System.out.print("Enter the third test score: ");
        double score3 = scanner.nextDouble();

        // Create a TestScores object
        TestScores testScores = new TestScores(score1, score2, score3);

        // Display the average of the scores
        System.out.println("The average of the test scores is: " +
testScores.getAverage());
    }
}
```

Output 5



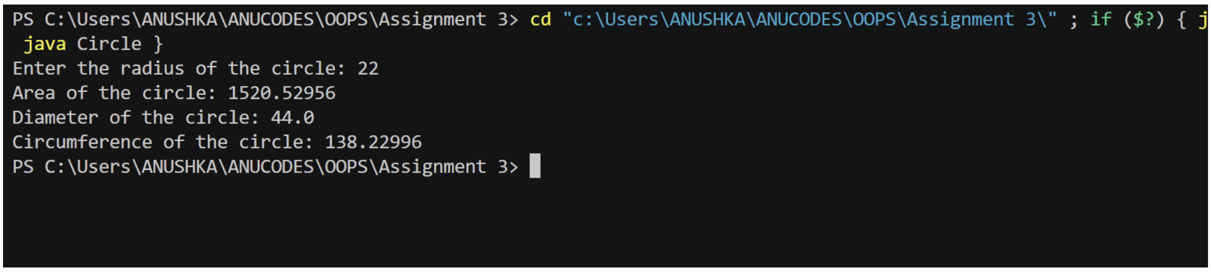
```
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> cd "c:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3\" ; if ($
?) { java TestScores }
Enter the first test score: 49
Enter the second test score: 74
Enter the third test score: 80
The average of the test scores is: 67.66666666666667
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> 
```

Question 6



```java
import java.util.Scanner;

public class Circle {
    // Fields
    private double radius;
    private final double PI = 3.14159;

    // Constructor that accepts the radius as an argument
    public Circle(double radius) {
        this.radius = radius;
    }

    // No-arg constructor that sets the radius to 0.0
    public Circle() {
        this.radius = 0.0;
    }

    // Mutator method for the radius field
    public void setRadius(double radius) {
        this.radius = radius;
    }

    // Accessor method for the radius field
    public double getRadius() {
        return radius;
    }

    // Method to calculate and return the area of the circle
    public double getArea() {
        return PI * radius * radius;
    }

    // Method to calculate and return the diameter of the circle
    public double getDiameter() {
        return radius * 2;
    }

    // Method to calculate and return the circumference of the circle
    public double getCircumference() {
        return 2 * PI * radius;
    }

    // Main program to demonstrate the Circle class
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Ask the user for the circle's radius
        System.out.print("Enter the radius of the circle: ");
        double radius = scanner.nextDouble();

        // Create a Circle object with the given radius
        Circle circle = new Circle(radius);

        // Display the area, diameter, and circumference of the circle
        System.out.println("Area of the circle: " + circle.getArea());
        System.out.println("Diameter of the circle: " +
circle.getDiameter());
        System.out.println("Circumference of the circle: " +
circle.getCircumference());
    }
}
```

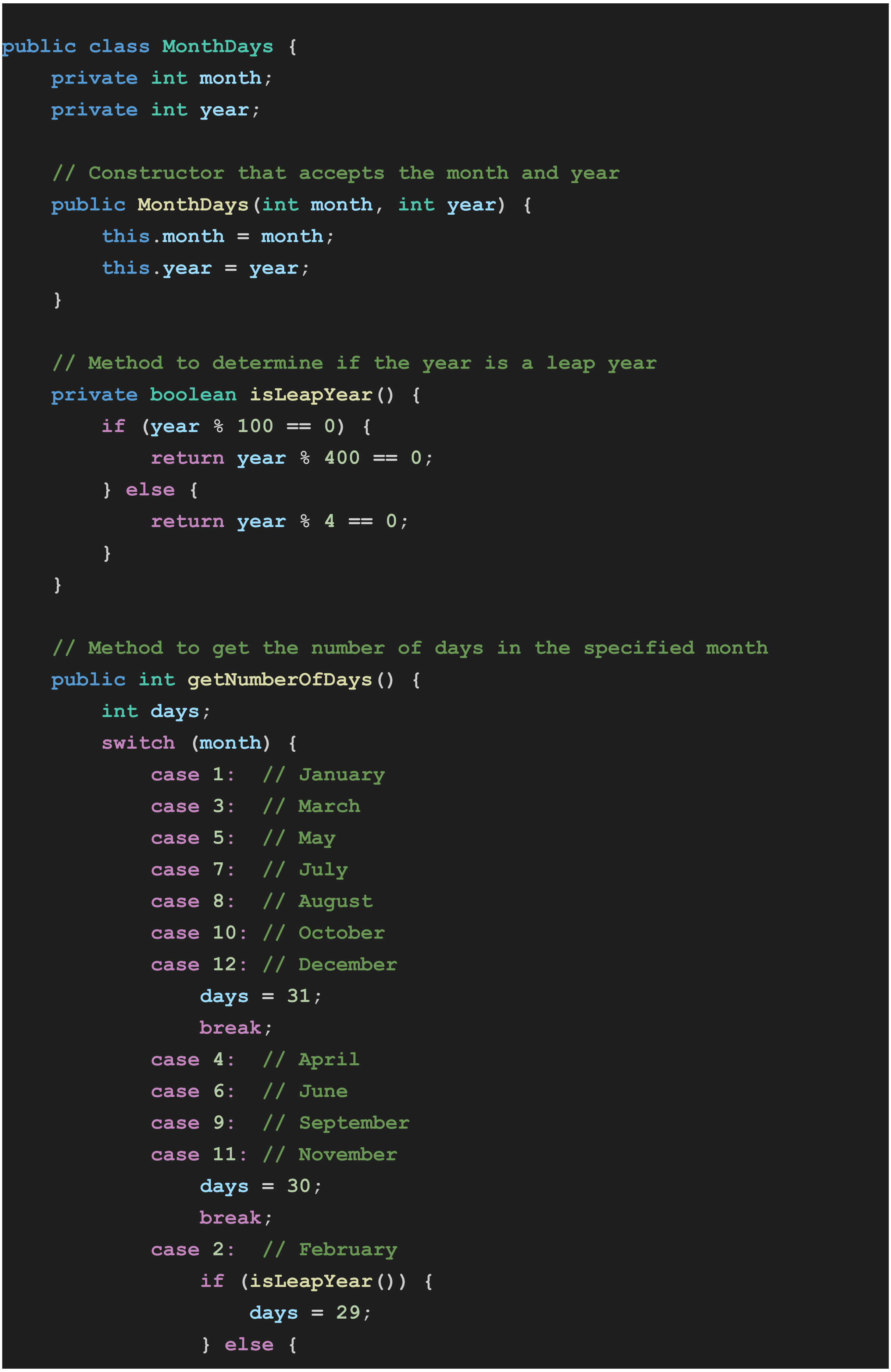
Output 6



```
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> cd "c:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3\" ; if ($?) { j
 java Circle }
Enter the radius of the circle: 22
Area of the circle: 1520.52956
Diameter of the circle: 44.0
Circumference of the circle: 138.22996
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> 
```

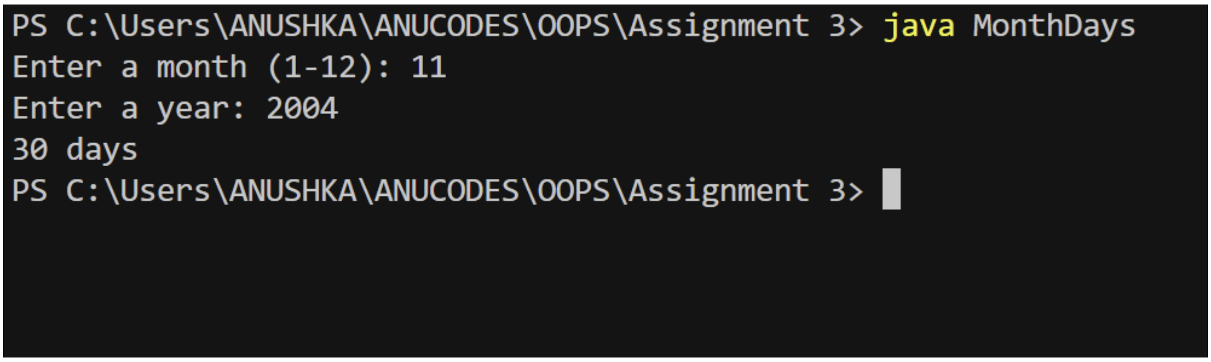
Question 7

```
import java.util.Scanner;
```



```java
public class MonthDays {
    private int month;
    private int year;

    // Constructor that accepts the month and year
    public MonthDays(int month, int year) {
        this.month = month;
        this.year = year;
    }

    // Method to determine if the year is a leap year
    private boolean isLeapYear() {
        if (year % 100 == 0) {
            return year % 400 == 0;
        } else {
            return year % 4 == 0;
        }
    }

    // Method to get the number of days in the specified month
    public int getNumberOfDays() {
        int days;
        switch (month) {
            case 1:  // January
            case 3:  // March
            case 5:  // May
            case 7:  // July
            case 8:  // August
            case 10: // October
            case 12: // December
                days = 31;
                break;
            case 4:  // April
            case 6:  // June
            case 9:  // September
            case 11: // November
                days = 30;
                break;
            case 2:  // February
                if (isLeapYear()) {
                    days = 29;
                } else {
                    days = 28;
                }
                break;
            default:
                days = 0; // Invalid month, should not happen if input
is validated correctly
                break;
        }
        return days;
    }

    // Main program to demonstrate the MonthDays class
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Ask the user for the month (1-12)
        System.out.print("Enter a month (1-12): ");
        int month = scanner.nextInt();

        // Ask the user for the year
        System.out.print("Enter a year: ");
        int year = scanner.nextInt();

        // Create a MonthDays object
        MonthDays monthDays = new MonthDays(month, year);

        // Get and display the number of days in the specified month
and year
        int days = monthDays.getNumberOfDays();
        System.out.println(days + " days");
    }
}
```

Output 7



```
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> java MonthDays
Enter a month (1-12): 11
Enter a year: 2004
30 days
PS C:\Users\ANUSHKA\ANUCODES\OOPS\Assignment 3> 
```