```java
public class BankAccount {
    static String bankName;
    static int totalAccounts = 0;
    static double interestRate;

    String accountNumber;
    String accountHolder;
    double balance;

    public BankAccount(String accountNumber, String accountHolder, double
balance) {
        this.accountNumber = accountNumber;
        this.accountHolder = accountHolder;
        this.balance = balance;
        totalAccounts++;
    }

    public static void setBankName(String name) {
        bankName = name;
    }

    public static void setInterestRate(double rate) {
        interestRate = rate;
    }

    public static int getTotalAccounts() {
        return totalAccounts;
    }

    public static void displayBankInfo() {
        System.out.println("Bank: " + bankName + ", Total Accounts: " +
totalAccounts);
    }

    public void deposit(double amount) {
        balance += amount;
    }

    public void withdraw(double amount) {
        if (amount <= balance) balance -= amount;
```

```
    }

    public double calculateInterest() {
        return balance * interestRate / 100;
    }

    public void displayAccountInfo() {
        System.out.println("Account: " + accountNumber + ", Holder: " +
accountHolder +
                           ", Balance: " + balance + ", Interest: " +
calculateInterest());
    }

    public static void main(String[] args) {
        setBankName("CodeBank");
        setInterestRate(5.0);

        BankAccount acc1 = new BankAccount("A001", "Alice", 1000);
        BankAccount acc2 = new BankAccount("A002", "Bob", 2000);

        acc1.deposit(500);
        acc2.withdraw(300);

        acc1.displayAccountInfo();
        acc2.displayAccountInfo();

        displayBankInfo(); // Static method called without object
        acc1.displayBankInfo(); // Static method called with object
    }
}
```

```
PS E:\JAVA PROGRAMS\steparyansingh\year2\strings\week3\practice> run BankAccount
Compiling BankAccount.java...
Compilation successful. Running program...

Account: A001, Holder: Alice, Balance: 1500.0, Interest: 75.0
Account: A002, Holder: Bob, Balance: 1700.0, Interest: 85.0
Bank: CodeBank, Total Accounts: 2
Bank: CodeBank, Total Accounts: 2

Program finished. Cleaning up...
BankAccount.class file deleted successfully.
Press any key to continue . . .
```

```
public class Car {
    String brand;
    String model;
    int year;
    String color;
    boolean isRunning;

    public Car(String brand, String model, int
year, String color) {
        this.brand = brand;
        this.model = model;
        this.year = year;
        this.color = color;
        this.isRunning = false;
    }

    public void startEngine() {
        isRunning = true;
        System.out.println(brand + " " + model +
" engine started.");
    }

    public void stopEngine() {
        isRunning = false;
        System.out.println(brand + " " + model +
" engine stopped.");
    }
```

```
    public void displayInfo() {
        System.out.println("Brand: " + brand + ",
Model: " + model + ", Year: " + year +
                           ", Color: " + color +
", Running: " + isRunning);
    }

    public int getAge() {
        return 2025 - year;
    }

    public static void main(String[] args) {
        Car car1 = new Car("Toyota", "Camry",
2018, "Red");
        Car car2 = new Car("Honda", "Civic",
2020, "Blue");
        Car car3 = new Car("Ford", "Mustang",
2015, "Black");

        car1.startEngine();
        car2.stopEngine();
        car3.displayInfo();

        System.out.println("Age of car1: " +
car1.getAge());
```

```
        // Each car object maintains its own
state, just like real cars do.
    }
}
```

```
PS E:\JAVA PROGRAMS\steparyansingh\year2\strings\week3\practice> run Car
Compiling Car.java...
Compilation successful. Running program...

Toyota Camry engine started.
Honda Civic engine stopped.
Brand: Ford, Model: Mustang, Year: 2015, Color: Black, Running: false
Age of car1: 7

Program finished. Cleaning up...
Car.class file deleted successfully.
Press any key to continue . . .
```

```
public class Student {
    private String studentId;
    private String name;
    private double grade;
    private String course;

    public Student() {
        this.studentId = "";
        this.name = "";
        this.grade = 0.0;
        this.course = "";
    }

    public Student(String studentId, String name, double grade, String course) {
        this.studentId = studentId;
        this.name = name;
        this.grade = grade;
        this.course = course;
    }
```

```
    public String getStudentId() { return studentId; }
    public void setStudentId(String studentId) { this.studentId = studentId; }

    public String getName() { return name; }
    public void setName(String name) { this.name = name; }

    public double getGrade() { return grade; }
    public void setGrade(double grade) { this.grade = grade; }

    public String getCourse() { return course; }
    public void setCourse(String course) { this.course = course; }

    public String calculateLetterGrade() {
        if (grade >= 90) return "A";
        else if (grade >= 80) return "B";
        else if (grade >= 70) return "C";
        else if (grade >= 60) return "D";
        else return "F";
    }

    public void displayStudent() {
        System.out.println("ID: " + studentId + ", Name: " + name +
                           ", Grade: " + grade + " (" + calculateLetterGrade()
+ "), Course: " + course);
    }

    public static void main(String[] args) {
        Student s1 = new Student();
        s1.setStudentId("S101");
        s1.setName("Alice");
        s1.setGrade(85.5);
        s1.setCourse("Java");

        Student s2 = new Student("S102", "Bob", 72.0, "Python");

        s1.displayStudent();
        s2.displayStudent();
    }
}
```

```
PS E:\JAVA PROGRAMS\steparyansingh\year2\strings\week3\practice> run Student
Compiling Student.java...
Compilation successful. Running program...

ID: S101, Name: Alice, Grade: 85.5 (B), Course: Java
ID: S102, Name: Bob, Grade: 72.0 (C), Course: Python

Program finished. Cleaning up...
Student.class file deleted successfully.
Press any key to continue . . .
```

```java
public class Vehicle {
    protected String make;
    protected String model;
    protected int year;
    protected double fuelLevel;

    public Vehicle(String make, String model, int year, double fuelLevel) {
        this.make = make;
        this.model = model;
        this.year = year;
        this.fuelLevel = fuelLevel;
    }

    public void startVehicle() {
        System.out.println(make + " " + model + " started.");
    }

    public void stopVehicle() {
        System.out.println(make + " " + model + " stopped.");
    }

    public void refuel(double amount) {
        fuelLevel += amount;
    }

    public void displayVehicleInfo() {
        System.out.println("Make: " + make + ", Model: " + model +
                           ", Year: " + year + ", Fuel Level: " + fuelLevel);
    }
```

```java
    public static void main(String[] args) {
        Vehicle[] vehicles = {
            new Vehicle("Toyota", "Corolla", 2019, 50),
            new Vehicle("Ford", "F-150", 2020, 70),
            new Vehicle("Yamaha", "R15", 2022, 30)
        };

        for (Vehicle v : vehicles) {
            v.startVehicle();
            v.refuel(10);
            v.displayVehicleInfo();
            v.stopVehicle();
        }

        // Reusability: Same Vehicle class used for different types.
        // Extensibility: Can extend Vehicle to create Car, Truck, etc.
        // Benefit: Avoids code duplication, promotes maintainability.
    }
}
```

```
PS E:\JAVA PROGRAMS\steparyansingh\year2\strings\week3\practice> run Vehicle
Compiling Vehicle.java...
Compilation successful. Running program...

Toyota Corolla started.
Make: Toyota, Model: Corolla, Year: 2019, Fuel Level: 60.0
Toyota Corolla stopped.
Ford F-150 started.
Make: Ford, Model: F-150, Year: 2020, Fuel Level: 80.0
Ford F-150 stopped.
Yamaha R15 started.
Make: Yamaha, Model: R15, Year: 2022, Fuel Level: 40.0
Yamaha R15 stopped.

Program finished. Cleaning up...
Vehicle.class file deleted successfully.
Press any key to continue . . .
```