1.

```
// Book.java
public class Book {
    private String title;
    private String author;
    private int yearPublished;

    // Constructor to initialize attributes
    public Book(String title, String author, int yearPublished) {
        this.title = title;
        this.author = author;
        this.yearPublished = yearPublished;
    }

    // Main method to create and display Book objects
    public static void main(String[] args) {
        Book book1 = new Book("To Kill a Mockingbird", "Harper Lee", 1960);
        Book book2 = new Book("1984", "George Orwell", 1949);

        System.out.println("Book 1: " + book1.title + " by " + book1.author + " (" +
book1.yearPublished + ")");
        System.out.println("Book 2: " + book2.title + " by " + book2.author + " (" +
book2.yearPublished + ")");
    }
}
```

2.

```
// Student.java
public class Student {
    private String name;
    private int age;
    private String major;

    // Constructor to initialize all fields
    public Student(String name, int age, String major) {
        this.name = name;
        this.age = age;
        this.major = major;
    }

    // Method to print student information
    public void printStudentInfo() {
        System.out.println("Student Name: " + name);
        System.out.println("Age: " + age);
        System.out.println("Major: " + major);
```

```
    }

    // Main method to create and display Student object
    public static void main(String[] args) {
        Student student = new Student("Alice", 21, "Computer Science");
        student.printStudentInfo();
    }
}

3. // Shape.java
abstract class Shape {
    protected String name;

    // Constructor to initialize name
    public Shape(String name) {
        this.name = name;
    }

    // Abstract method to calculate area
    public abstract double calculateArea();
}

// Circle.java
class Circle extends Shape {
    private double radius;

    // Constructor to initialize name and radius
    public Circle(String name, double radius) {
        super(name);
        this.radius = radius;
    }

    // Implement calculateArea() for Circle
    @Override
    public double calculateArea() {
        return Math.PI * radius * radius;
    }
}

// Rectangle.java
class Rectangle extends Shape {
    private double length;
    private double width;
```

```
    // Constructor to initialize name, length, and width
    public Rectangle(String name, double length, double width) {
        super(name);
        this.length = length;
        this.width = width;
    }

    // Implement calculateArea() for Rectangle
    @Override
    public double calculateArea() {
        return length * width;
    }
}

// Main method to create instances of Circle and Rectangle
public class Main {
    public static void main(String[] args) {
        Shape circle = new Circle("Circle", 5.0);
        Shape rectangle = new Rectangle("Rectangle", 4.0, 6.0);

        System.out.println(circle.name + " Area: " + circle.calculateArea());
        System.out.println(rectangle.name + " Area: " + rectangle.calculateArea());
    }
}
```

4.
```
// Car.java
public class Car {
    private String brand;
    private String model;
    private int year;

    // Default constructor
    public Car() {
        this.brand = "Unknown";
        this.model = "Unknown";
        this.year = 2000;
    }

    // Constructor with brand and model, year set to 2024 by default
    public Car(String brand, String model) {
        this.brand = brand;
        this.model = model;
        this.year = 2024;
```

```
    }

    // Constructor with brand, model, and year
    public Car(String brand, String model, int year) {
        this.brand = brand;
        this.model = model;
        this.year = year;
    }

    // Main method to create and display Car objects
    public static void main(String[] args) {
        Car car1 = new Car();
        Car car2 = new Car("Tesla", "Model S");
        Car car3 = new Car("Ford", "Mustang", 2023);

        System.out.println("Car 1: " + car1.brand + " " + car1.model + " (" + car1.year + ")");
        System.out.println("Car 2: " + car2.brand + " " + car2.model + " (" + car2.year + ")");
        System.out.println("Car 3: " + car3.brand + " " + car3.model + " (" + car3.year + ")");
    }
}
```