Practice Question

Challenge 1: This challenge focuses on void methods that change an object's state.

Task:

Create a LightSwitch class that can be turned on and off.

1. Class Name: LightSwitch

2. Field (Instance Variable): boolean isOn; (to track if the light is on or off)

3. Methods:

- turnOn(): A void method that sets isOn to true and prints a message like "The light is now ON."

- turnOff(): A void method that sets isOn to false and prints a message like "The light is now OFF."

- printStatus(): A void method that prints the current status, e.g., "Is the light on? true".

4. In your main method: Create a LightSwitch object, turn it on, print its status, turn it off, and print its status again

Challenge 2: The Rectangle

This challenge focuses on methods that return a value.

Task: Create a Rectangle class to calculate its area and perimeter.

1. Class Name: Rectangle

2. Fields:

- double width;

- double height;

3. Methods:

- getArea(): This method should return the area of the rectangle (width * height). The return type should be double.

- getPerimeter(): This method should return the perimeter of the rectangle (2 * (width + height)). The return type should be double.

4. In your main method: Create a Rectangle object (e.g., with width 5.0 and height 8.0) and print out the results from calling the getArea() and getPerimeter() methods.

Challenge 3: The BankAccount 🏦

This challenge combines void methods, methods with return values, and basic logic.

Task:

1. Create a simple BankAccount class.

Class Name: BankAccount

2. Fields:

1. String accountHolderName;

2. double balance;

3. Methods:

- deposit(double amount): A void method that adds the amount to the balance. Print a confirmation message. (Bonus: Add a check to prevent depositing a negative amount).

- withdraw(double amount): A void method that subtracts the amount from the balance. Print a confirmation. (Bonus: Add a check to prevent withdrawing more money than is in the account).

- getBalance(): This method should return the current balance.

- printAccountDetails(): A void method that prints the account holder's name and their final balance.

4. In your main method: Create a BankAccount, deposit some money, try to withdraw money, and finally, print the account details.

Challenge 4: The Student Roster

This challenge involves managing a collection of data (an array) inside an object.

Task:

1. Create a Student class that can store grades and calculate an average.

- Class Name: Student

- Fields:

String name;

int[] grades; (An array to hold the student's grades)

3. Methods:

- setGrade(int subjectIndex, int grade): A void method that sets the grade for a subject at a specific index in the grades array. Include a check to make sure the index is valid.

- getAverageGrade(): This method should calculate and return the average of all the grades in the grades array. You will need to use a loop to sum the grades.

- printSummary(): A void method that prints the student's name and their calculated average grade.

4. In your main method: Create a Student object for 3 subjects, set their grades using setGrade(), and then call printSummary().