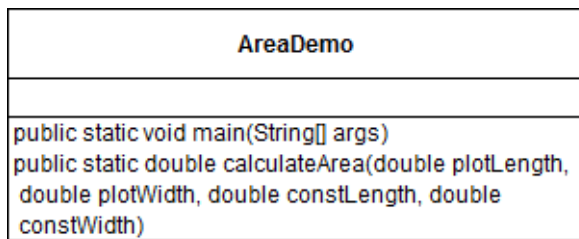Refer below sample problem with solution to solve remaining problems. Ensure same approach is followed. Use exactly same class name and method names as specified in the problem statement. Any mistake on these instructions may result into invalid submission of the assignments even if logic is 100% correct.

1. Write a program which will read length and width of a residential plot, and length and width of construction area. Program should calculate the open area. Assume values are read in meters. Program to be solved in calculateArea method of class – AreaDemo. This class also has main method which will read values, call calculateArea method and displays final result. Class diagram for AreaDemo method is as below:

```
┌─────────────────────────────────────────────────┐
│                   AreaDemo                       │
├─────────────────────────────────────────────────┤
│                                                  │
├─────────────────────────────────────────────────┤
│ public static void main(String[] args)           │
│ public static double calculateArea(double plotLength,│
│  double plotWidth, double constLength, double     │
│  constWidth)                                      │
└─────────────────────────────────────────────────┘
```

Refer below solution **which also shows usage of Scanner class** to read values from user:

```java
import java.util.Scanner;

public class AreaDemo {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        Scanner sc = new Scanner(System.in); //declaring scanner

        System.out.println("Enter plot length:");
        double plotLength = sc.nextDouble(); //sc.nextDouble() will allow to read double value. Explore other such read options
        System.out.println("Enter plot width:");
        double plotWidth = sc.nextDouble();
        System.out.println("Enter construction area length:");
        double constLength = sc.nextDouble();
        System.out.println("Enter construction area width:");
        double constWidth = sc.nextDouble();
        double openArea = calculateArea(plotLength, plotWidth, constLength, constWidth);
        System.out.println("Open area = " + openArea);
    }

    public static double calculateArea(double plotLength, double plotWidth, double constLength, double  constWidth)
    {
        double openArea = 0;

        openArea = plotLength*plotWidth - constLength*constWidth;

        return openArea;
    }
}
```

Sample output:

```
Console ☒
<terminated> AreaDemo [Java Application] C:\Program Files\Jav
Enter plot length:
22
Enter plot width:
33
Enter construction area length:
11
Enter construction area width:
15
Open area = 561.0
```

Each trainee is supposed to write above program and try out even if they are aware about Java language. Along with learning Java numeric computations, below points are very important to practice and applicable throughout this ILP training as well as most important for any software code.

- **Use exactly same Class names as mentioned**
- **Use exactly same method signature (method name, return type, method parameter type, position of each method parameter)**
- **Use main method only for input and output. Logic written in separate method**

As mentioned above, any logic which may be 100% correct is not valid if above points are not taken care. Hence, simply building logic does not certify us as project ready. Building exact and complete solution does.

2. Write a program which will read basic salary, HRA%, DA% , insurance premium amount and PF%. Program should display on hand salary by adding HRA%, DA% to basic salary and deducting insurance premium and PF%. Refer below class diagram and solve this problem exactly how it is solved in first question.

SalaryDemo
public static voidMain(String[] args) public static double calculateGrossSalary(double basic, double hra, double da, double premium double pf)

3. Write a program which will calculate hollow area inside a ball. Program will read outer radius and inner radius. Refer below class diagram and solve this problem exactly how it is solved in first question.

HollowAreaDemo
public static voidMain(String[] args) public static double calculateHollowArea(double outerRadius, double innerRadius)

4. A movie theatre runs daily show. There is fixed cost involved to host the show and variable cost per attendee of the show. Write a program which will read the fixed cost, variable cost per attendee and rate of ticket per attendee and no of attendees. Program should display profit out of that show (can be negative). Refer below class diagram and solve this problem exactly how it is solved in first question.

ShowDemo
public static voidMain(String[] args) public static double calculateProfit(double fixedCost, double variableCost, double ratePerTicket, double noOfAttendees)