


## OOP Assignments - Week 1

### A. Problem Solving

1. Given an array of integers, print the sum of odd numbers and even numbers, separated by a space.
  - **Input:** [1, 3, 2, 4, 5]
  - **Output:** 9 6
2. Given an integer  $n$  ( $n \geq 0$ ), if the  $n$  is a prime number, print "PRIME", else print "NOT PRIME".

- <b>Input:</b> 6	- <b>Input:</b> 13
- <b>Output:</b> NOT PRIME	- <b>Output:</b> PRIME
3. Given an integer  $n$  ( $n \geq 4$ ), print the glass hour pattern with height and width equal to  $n$ .
  - **Input:** 5
  - **Output:**  

4. Given a matrix of integers with size  $[n, n]$ , print the sum of two diagonal lines.
  - **Input:**

```
[[4, 2, 1, 9],  
[5, 3, 4, 1],  
[0, 2, 3, 3],  
[5, 3, 1, 2]]
```
  - **Output:** 32

## B. Object Oriented Programming

1. Enter 2 points with coordinates (x, y). Print the coordinate information and the distance between them:

- Define a class **Point** with the necessary properties (remember the encapsulation principle).
- Define a constructor that contains 2 parameters to assign the (x, y) coordinate when creating a new point.
- Define a method that prints the coordinate information of a point by the following format (x, y).
- Define a method that calculate a point to another.
- In the Main function, create 2 points, print the information and the distance between them.

2. Create a Rectangle object with given width and height and create a Circle object with a given radius, print the information of 2 shapes including their properties, perimeter and area.

- Defines an abstract class **Shape** with 2 abstract methods for calculating the perimeter and the area of the shape.
- Define two sub-classes **Rectangle** and **Circle** inherited the abstract class **Shape**.
- **Rectangle** contains information about width and height.
- **Circle** contains information about radius.
- Override the method calculate perimeter and area in the sub-classes.

3. Same requirement with exercise B.2, but with a little update:

- **Rectangle** contains information about the top-left **Point** and the right-bottom **Point**.
- **Circle** contains information about the center **Point** and radius.
- **Rectangle** and Circle both contain information about color.

### C. Winform Exercise

Game “Kiểm tra mắt”: <https://s-m.game24h.vn/html5game/kiem-tra-mat/>

1. Go to Folder Files/Assignments/Week1 -> Download the **DemoWinformGame** folder and the record **WinformExerciseRequirement\_Week1.mp4**.
2. Add the DemoWinformGame project to your solution.
3. Modify the logic as requirement in the record.