

Part01

Problem: Add both single-line and multi-line comments in the following code segment explaining its purpose:

```
int x = 10;  
int y = 20;  
int sum = x + y;  
Console.WriteLine(sum);
```

Question: What is the shortcut to comment and uncomment a selected block of code in Visual Studio?

Problem: Identify and fix the errors in this code snippet:

```
int x = "10";  
console.WriteLine(x + y);
```

Question: Explain the difference between a runtime error and a logical error [with examples](#).

Problem: Declare variables using proper naming conventions to store:

- Your full name.
- Your age.
- Your monthly salary.
- Whether you are a student.

Question: Why is it important to follow naming conventions such as PascalCase in C#?

Problem: Write a program to demonstrate that changing the value of a reference type affects all references pointing to that object.

Question: Explain the difference between value types and reference types in terms of memory allocation.

Problem: Create a program that calculates the following using variables $x = 15$ and $y = 4$:

- Sum
- Difference
- Product
- Division result
- Remainder

Question: What will be the output of the following code? Explain why:

```
int a = 2, b = 7;  
Console.WriteLine(a % b);
```

Problem: Write a program that checks if a given number is both:

- Greater than 10.
- Even.

Question: How does the `&&` (logical AND) operator differ from the `&` (bitwise AND) operator?

Problem: Implement a program that takes a `double` input from the user and casts it to an `int`. Use both implicit and explicit casting, then print the results.

Question: Why is explicit casting required when converting a `double` to an `int`?

Problem: Write a program that: (G01 Bonus, G02 mandatory)

- Prompts the user for their age as a string.
- Converts the string to an integer using `Parse`
- Checks if the age is valid (e.g., greater than 0).

Question: What exception might occur if the input is invalid and how can you handle it

Problem: Write a program that demonstrates the difference between prefix and postfix increment operators using a variable `x`.

Question: Given the code below, what is the value of `x` after execution? Explain why

```
int x = 5;  
int y = ++x + x++;
```

Part02

- 1- LinkedIn article about variables allocation in stack and heap for both value and ref types
- 2- what's the difference between compiled and interpreted languages and in this way what about Csharp?

3- Compare between implicit, explicit, Convert and parse casting

Part03 Bonus

4- self study report

5- what meant by Csharp is managed code

6- what meant by struct is considered like class before