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Part01

الأسئلة الغير مجابة موجودة في الكود

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.

runtime error: happens while the program is running because of unexpected behave

ex: int x=9/0

logical error: the program runs but it gives wrong output because of incorrect logic

ex: int sum =x-y

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#?

Because of readability and clean code

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.

Value type: is stored directly in stack

Reference type: the pointer stored in stack, but the actual data is in the heap.

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

* + Sum
  + Difference o Product o Division result o 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. o Even.

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

&&: used for logical expressions (Boolean)

&: used for bitwise operations like binary sum

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?   
Because double is stored at 8 bytes and int is stored at 4 so you must add a check at explicit casting because the double my be grater than the int space, so it flows.

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 o 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

System format exception, add a condition to check the validation.

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++; //7

Part02

1. A screenshot of a computer

   AI-generated content may be incorrect.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?

Compiled: The source code is translated into machine code by a compiler before the program runs.

Interpreted: The source code is read and executed line by line by an interpreter at runtime.

Csharp Is hybrid compiled (CIL) , interpreted (JIT).

1. Compare between implicit, explicit, Convert and parse casting

Implicit: without casting operator, safe, no data loss.

Explicit: with casting operator, not safe, data loss, overflow.

Convert: converts any data type to any datatype, may through exception.

Parse: converts string to the called data type, may through exception.

# Part03 Bonus

1. self study report
2. what meant by Csharp is managed code

C# code runs under the control of the .NET Common Language Runtime (CLR), which manages many aspects of execution:

* Safety
* Security
* JIT

1. what meant by struct is considered like class before

That struct in C# is similar to class in syntax and behave.