120 points total.

Your total score (e.g., 118) will be included in the final calculation of your course grade.

Part 1: 100 points total – 20 points each

Include code and explanations where appropriate.

Question 1: Extern Keyword

What does the `extern` keyword do in C?
Explain with a code example involving **two files** demonstrating how `extern` allows variable sharing across files.

Question 2: Octal Integer Literals

What is the decimal value of the octal literal `023` in C?
Write a short C program using `printf` to show the output.
Explain how octal numbers work in C.

Question 3: Storage Class – `static`

Write a C function that uses a `static` variable.
Call the function **two times** from `main()` and explain the output behavior.

Question 4: Title Case Checker

Write a function `int isTitleCase(char* sentence)` that returns 1 if the sentence is in title case. Use these test cases:

- `"This Is A Title"` → should return 1
- `"this is Not"` → should return 0

Question 5: Pointer Arithmetic

Suppose `double* p` points to memory address `0x1000` on a **64-bit system**.
What is the address after `p++`? Explain how pointer arithmetic works for `double*` types.

Part 2: Bonus Question (20 points)

Floating-Point Vulnerability and Unexpected Output

The following C function may print `"Unexpected"` under certain inputs:

```c
void check_sum(double x) {
    int integral = (int)x;
    double decimal = x - integral; // fractional part

    double sum = 0;
    for (int i = 1; i <= integral; i++) {
        sum += i;
    }

    if (sum + decimal == 11) printf("Unexpected");
}
```

Your task:

- Find a value of `x` such that the program prints `"Unexpected"`. You can think of this situation as either discovering a vulnerability or unintentionally opening a security backdoor in the software.
- Explain why this occurs in terms of **floating-point precision and comparison**.

Answer format: A possible `x` is _____ Explain why this value triggers the output.