Introduction to C (part 2)

BU Summer Challenge

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Continuation of Our Previous Lecture

- Today we will focus on **POINTERS!**
Memory Basics

- Memory Organization.
- Addresses and variables.
- Bytes and data types.
What are Pointers

- Definition of a pointer.
- Purposes and uses of a pointer.
- Declaration syntax.
- Address of operator (&).
- Dereference operator (*).
Pointer Basics

- Declaring and initializing pointers.
- Assigning addresses to pointers.
- Dereferencing pointers.
- Pointer arithmetic.
Pointers and Arrays

- Relationship between the two.
- Array decay: how arrays become pointers.
- Pass by reference/pass by value.
- Traversing via pointers.
Pointers and Functions

- Passing pointers to functions.
  - Call by reference via pointers.
  - Modifying variables via pointers.
- Returning pointers from functions.
  - Cautions when returning pointers to local variables.
- Introduction to function pointers
  - Syntax and usage.
Pointer Pitfalls

- Uninitialized pointers.
- Dangling pointers.
- Memory leaks.
- Best practice:
  - Always initialize.
  - Check for NULL before dereference.
  - Free memory.