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| **Feature** | **Variable** | **Pointer** |
| Basic Definition | Named memory location that stores data | Variable that stores memory address |
| What it Stores | Actual value (data) | Memory address of another variable |
| Declaration | type variable\_name; | type \*pointer\_name; |
|  | int num; | int \*ptr; |
| Memory Allocation | Allocates memory for the value | Allocates memory to hold an address |
| Size | sizeof(type) sizeof(int) = 4 bytes | sizeof(pointer) Usually 4 or 8 bytes (system dependent) |
| Key Operators | Direct name access | & (address-of), \* (dereference) |
| Initialization | int num = 10; | int \*ptr = &num; |
| Access Method | Direct access | Indirect access through dereferencing |
| NULL Assignment | Not applicable | Can be assigned NULL: ptr = NULL; |
| Arithmetic | Normal arithmetic: num + 1 (adds 1 to value) | Pointer arithmetic: ptr + 1 (moves to next memory location) |
| Primary Purpose | Store and manipulate data | Reference other variables, dynamic memory |
| Risk Level | Lower risk of memory errors | Higher risk (segmentation faults memory leaks) |