CMPE 252
C PROGRAMMING

SPRING 2021

WEEK 4-5

POINTERS AND MODULAR PROGRAMMING

CHAPTER 6

Problem Solving & Program Design in C

Eighth Edition
Global Edition

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Pointers

- pointer (pointer variable)
  - **a memory cell that stores the address of a data item**
  - syntax: _type *variable_

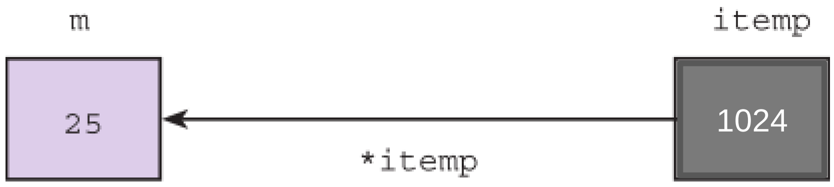
```
int  m  =  25;
int  *itemp;            /* a pointer to an integer */
```

  - How can we store the memory address of m in pointer itemp?
  - Using unary address-of operator &
    - itemp = &m;

Indirection

- indirect reference
  - accessing the contents of a memory cell through a pointer variable that stores its address

***** is unary indirection operator



Assume that variable m is associated with memory cell 1024

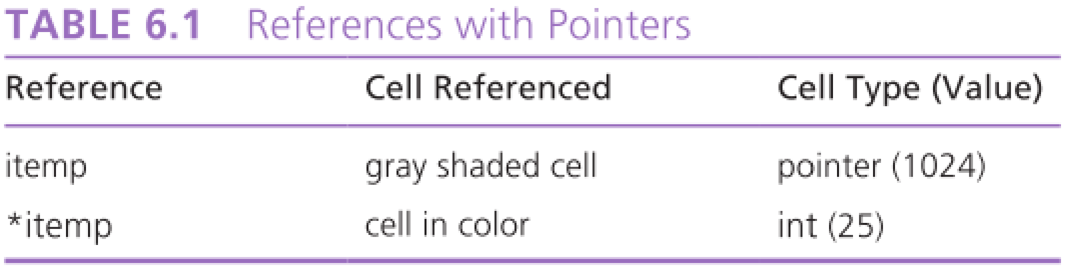


TABLE 6.1 References with Pointers

Reference	Cell Referenced	Cell Type (Value)
itemp	gray shaded cell	pointer (1024)
*itemp	cell in color	int (25)

NULL Pointer

- Pointers should be initialized when they’re defined or they can be assigned a value.
- A pointer may be initialized to NULL, 0 or an address.

```
int * pInt = NULL;
```

- A pointer with the value NULL points to nothing.
- NULL is a symbolic constant defined in the <stddef.h> header (and several other headers, such as <stdio.h>).

NULL Pointer

- Initializing a pointer to 0 is equivalent to initializing a pointer to NULL, but NULL is preferred.
- When 0 is assigned, it’s first converted to a pointer of the appropriate type.
- The value 0 is the only integer value that can be assigned directly to a pointer variable.