C-Strings and the string Class

Chapter 12

C-String

- What is a string?

C-String

- What is a string?
  - A set, sequence, array, or string, of characters

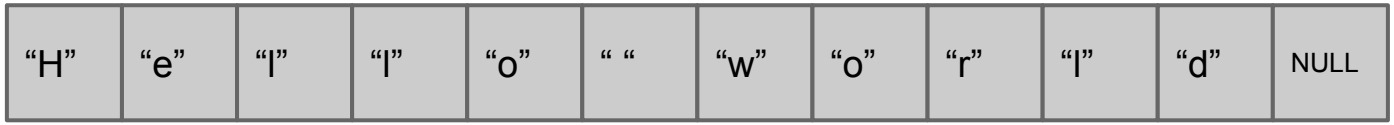
- Up until now, the string Class has been used for most character arrays

C-String

- A C-String is a sequence of characters in memory that are NULL terminated

C-String

The string “Hello world” would look like this in memory



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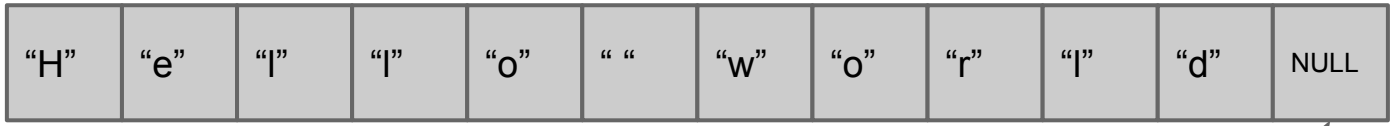

Notice the NULL terminator. It is very important

C-String

- In a C-String, why is the NULL terminator so important?

C-String

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  - How would we know when or where the string ended?

C-String

- C-Strings come in different forms
  - String literals
  - Programmer defined arrays of characters
  - Pointers to character

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  - Hence, “bob” would be 4 bytes long

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- We can create strings on the fly

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```
char myString[6];
myString[0] = ‘H’;
myString[1] = ‘e’;
myString[2] = ‘l’;
myString[3] = ‘l’;
myString[4] = ‘o’;
myString[5] = NULL;
```

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- How would we pass a character array into a function?
- What about a dynamically allocated C-String?

Command Line Arguments

- Now that we know C-Strings, we can look at passing command line arguments into our program

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int main(int argc, char** pArgv)

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  - Each C-String represents a command line argument

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- The argument ‘pArgv’ is an array of C-Strings
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- The argument ‘argc’ is the number of arguments in ‘pArgv’

- Note: pArgv[0] will be the name of your executable
  - If your command was “MyProgram.exe firstArg”
    - pArgv[0] = “MyProgram.exe”

C-String Helper Functions

- Functions
  - strlen
  - strcat
  - strcpy
  - strcmp
  - strstr

C-String Helper Functions

- What are some common tasks we would want to do with a C-String?

C-String Helper Functions

- What are some common tasks we would want to do with a C-String?
  - Convert a string into a value

String Conversions

- Functions
  - atoi
  - atol
  - atof
  - itoa

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std::string myString;
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http://www.cplusplus.com/reference/string/string/

The C++ string Class

- Constructors
  - string()
  - string(const char* s)
  - string(const string &s)
  - string(const char*, int n)
  - string(int n, char ch)
  - string(const string &s, int p, int n)

The C++ string Class

- Overloaded Operators
  - >>
  - <<
  - =
  - +=
  - +
  - [ ]
  - Relational Operators
    - <, >, <=, ...

The C++ string Class

- Member functions
  - append
  - at
  - c_str
  - compare
  - copy
  - find
  - empty
  - insert
  - length
  - replace
  - substr