

# Characters, Strings, and the `cstring` library

- Recall that a C-style string is a character array that ends with the null character
- Character literals in single quotes
  - `'a'`, `'\n'`, `'$'`
- string literals in double quotes
  - `"Hello World\n"`
  - Remember that the null-character is implicitly a part of any string *literal*
- The name of an array acts as a pointer to the first element of an array (i.e. it stores the address of where the array starts)
  - Recall that this means when an array is passed into a function, the function has access to the original array contents

## Recap: the `cctype` library

Recall that this C library contains useful character testing functions, as well as the two conversion functions `toupper` and `tolower`

- **Conversion functions:** These return the ascii value of a character
  - `int toupper(int c)` - returns the uppercase version of `c` if it's a lowercase letter, otherwise returns `c` as is
  - `int tolower(int c)` - returns the lowercase version of `c` if it's an uppercase letter, otherwise returns `c` as is
- **Query Functions:** These all return true (non-zero) or false (0), in answer to the question posed by the function's name. They all take in the ascii value of a character as a parameter.
  - `int isdigit(int c)` - decides whether the parameter is a digit (0-9)
  - `int isalpha(int c)` - decides whether the character is a letter (a-z, A-Z)
  - `int isalnum(int c)` - digit or a letter?
  - `int islower(int c)` - lowercase digit? (a-z)
  - `int isupper(int c)` - uppercase digit? (A-Z)
  - `int isxdigit(int c)` - hex digit character? (0-9, a-f)
  - `int isspace(int c)` - white space character?
  - `int iscntrl(int c)` - control character?
  - `int ispunct(int c)` - printing character other than space, letter, digit?
  - `int isprint(int c)` - printing character (including ' ')?
  - `int isgraph(int c)` - printing character other than ' ' (space)?