Functions You've to Know

Programming is nothing but another name for problem solving. Solving problems using programs implies designing algorithms and implementing such algorithms via functions,. Therefore, you're expected to know how to *declare* a function in a header file, *define* the function in a source file, how to *include* the relevant header file and *call* such a function in a different source file. You should know the meaning of *pass-by-value* semantics. You should also know how to pass pointers, arrays, and structures.

To be an efficient problem-solver, a C programmer must know the key functions available in the C standard library. The purpose and behavior of functions that you must know are listed below. For these functions, you must know the number of parameters, the type of each parameter, and the function's return type. Generally, you do not need to remember specifically whether `ftell` returns `long` [which it does], `unsigned long`, or `size_t` - it is sufficient if you remember that it is some integral type. Unless the return type of a function matters. For instance, you need to know why `fgetc` doesn't return a value of `char` and instead returns a value of type `int`.

All listed functions have an icon informing you about the degree of familiarity required:

✏️ - You must know how to write [possibly simplified version of] the function.
💬 - You must be able to describe in detail the function's behavior, parameters, and return type. A ❤️‍🔥 icon means the function is particularly important and you must be well-versed in using it.
👁️ - You must have general knowledge about the purpose of the function, but to use it you may need to check the documentation for the order of parameters or the error codes.
ⓘ - You must know about the function's existence, even if there wasn't much focus on it during the semester.

Header file `<stdio.h>`
❤️‍🔥 `printf`, `fprintf`, `sprintf`
❤️‍🔥 `scanf`, `fscanf`, `sscanf`
💬 `fopen`
💬 `fclose`
💬 `feof`
💬 `fread`
💬 `fwrite`
💬 `fgetc`
💬 `fgets`
💬 `fputc`
💬 `fputs`
💬 `puts`
💬 `getchar`
💬 `putchar`
👁️ `ftell`
👁️ `fseek`
ⓘ `fflush`

Header file `<stdlib.h>`

- 🗯️ `malloc`, `calloc`, `free`
- 🗯️ `realloc`
- 👁️ `exit`
- ⓘ `atexit`
- ⓘ `getenv`
- ⓘ `system`
- 👁️ `srand`
- 👁️ `rand`

Header file `<ctype.h>`

- ✏️ `islower`, `isupper`
- ✏️ `tolower`, `toupper`
- ✏️ `isdigit`
- ✏️ `isspace`
- ✏️ `isalpha`

Header file `<string.h>`

- ✏️ `strlen`
- ✏️ `strcpy`
- ✏️ `strcat`
- ✏️ `strcmp`
- ✏️ `atoi`, `atol`, `atoll`
- ⓘ `atof`
- ✏️ `memcpy`
- ✏️ `memset`

Header file `<time.h>`

- ⓘ `time`