What is C?

Let us start with a brief history of C and discover how to write the Hello World program in C.

We'll cover the following

C is a high-level programming language that was first developed by Dennis Ritchie at Bell Labs in the early 1970s. Unix was one of the first operating systems to be written in C. Microsoft Windows, Mac OS X, and GNU/Linux are also written in C. Lots of other high-level languages like Perl, PHP, Python, R, Matlab, Mathematica, etc., are written in C.

Currently (as of July 2012) C is #1 in popularity according to the TIOBE index.

Example Code

```
#include <stdio.h>

int main(int argc, char *argv[]) {
  printf("hello world\n");
  return 0;
}
```

The above is a bare-bones C program that simply writes the string “hello world” to the screen. As you can see, it’s not scary looking code. The code that “does the work” here is line 4. All the other stuff you can think of as standard “boilerplate” C code that you need for any C program.

Line 1 imports one of the standard C libraries, `stdio.h`, (standard input/output). Line 3 defines a function called `main()`, which is needed for the program to run. The stuff inside the brackets in `main()` (the `int argc, char *argv[]`) is optional. You could leave it out, and your program would still run. Same for line 5, `return 0;`. I included them here for completeness.

We'll examine this code in the later lessons. You do not need to worry about understanding the logic for now.

As a comparison here is a similar program in Python:

```
print "hello world"
```

Here it is in R:

```
cat("hello world\n")
```

and Matlab / Octave:

```
disp('hello world')
```

As you can see, what differentiates C code from the code in other languages is that in C we have to import the `stdio.h` library and define the `main()` function explicitly in C. Not such a big deal. The other difference is that the name of the standard function to write stuff to the screen is different in each language. In C it is `printf()`, in Python it is `print`, in R it is `cat()`, and in Matlab/Octave it is `disp()`. Again, no big deal.

One of the things I want you to take away from this boot camp is that with few exceptions, all (procedural) programming languages are essentially the same, but:

1. names of standard functions are different
2. rules of syntax are different
3. functionality included in standard libraries is different
4. APIs are different and use different names for things

That's it. Once you know how to program in one language, all you have to do is learn some different syntactic rules, and learn the names of the various functions that you will be using, and learn what APIs provide the needed functionality. No big deal.

To see hello world in a bunch of other languages, go here: hello-world.

Next, we'll look at some of the pros and cons of using C.