C++ Basics

A Language with Some Class

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1. Getting Started

C++ is a general pupose programming language, created at 1985 by Bjarne Stroustrup as at first an extension of the Grandpa language, C. C++ or also called `"C with Classes"`, was first developed for system and embedded programming, however over the years it has made itself seen in game development, desktop application development, and has overall been a very good language to have in your portfolio.

Little known fact, the first Command Line program written in MKProjects were first written in C++ before being written in Rust. For C++ there is a well known compilers you can use g++.

1.1 Installing G++

```
# Mac OS
$ g++

# Debain Linux
$ sudo apt-get install g++
```

Usage:

```
$ g++ file.cpp # to compile C++ program
$ ./a.out # to execute program binary
```

2. Introduction

2.1 Program Structure

Consider the following hello world program, `hello.cpp`:

```
#include<iostream>

int main(){
    std::cout << "Hello World" << std::endl;
    return 0;
}
```

The program runs from top to bottom, line by line:

- The first line instructs the compiler to locate the file that contains a library called `iostream`.
- This library contains code that allows for I/O (input & output).
- The `main()` function houses all the instructions for the program.

2.2 Basic Output

Now let's talk more about the `std::cout` in our program above. This is used to display output to the user's command line or terminal. To use `std::cout`, you must use it following << and a string or variable you wish to output.

```
std::cout << "The answer of the test is: " << answer << std::endl;
```

Note: `std::endl` is used to end the line of the output.

2.3 Comments

Comments are useful to document code, temporary debugging and in C++, it supports two different type of comments, single line `//` and multi-line `/* */`. Comments are ignored by the compiler at compiler time, making them a very good way to organize your code.

```
// This single line will be ignored

/*
The first C++ program written by MKProjects
was only available for Linux on Sanp!
All of this will be ignored !!!
*/
```

Compile & Run

Since we have our program, `hello.cpp`, we may as well compile and run it.

```
# First compile the program with g++
$ g++ hello.cpp

# Now run the binary to execute the program
$ ls
a.out hello.cpp

$ ./a.out
Hello World
```