Good afternoon, Welcome to this crash course on C++! I am Kgen.

After completing this one hour class, I expect that you will understand the general concept of c++ programming, and how it is different and better than python and vice versa. I do not think that this one lecture is enough to confidently add c++ to your resume, but you can always learn more outside the class too.  
  
As, I go through the course, you are encouraged to take a note if you are serious about c++.

I will assume that you have already programmed before and know python or any language and understand basic programming concepts. So i can focus on c++ theme Instead of discussing programming concepts from scratch.

if you want to know history of c++(which is c with class, c++ 98, 11, 17, 20) feel free to check on wikipedia but is not on wikipedia is my history on programming, I started it almost 7 years ago.

Raise your hand if python is your first programming language and only know u know,, i feel sorry for all of you, its never too late to learn a actual programming language, instead of scripting language. I m joking, python is #2 most used language right now and I am using it on my machine learning project.

**USES**

Almost every software that you know or exists uses c++ in some form or at some point, so, absolute zero need to read from the slide.

every program that needs optimization uses c++ and almost all the software that you know uses c++ at their core.

**Advantage**  
C++ compilers fast, work more closer with hardware, and it is better than python

python is too abstract, more than needed, a python programmer may not understand all the fundamental aspects of programming, or how computer actually does the thing. yes python code writing takes less time because of the library but it is very hard to optimize the code execution time

**Disadvantate**  
I do not think there is actual disadvantage, but some guy on online think it is   
**Read from the point on slide**

Ok, this is the hello world program in c++. Take a deep breath, this might looks difficult to your eyes.

0, success, 1 for failure, 2 invalid argument

It is telling the compiler this is the way to go.

**Raise your hand if you think c++ is a compiled language?**

**Yes, it is. The reason we all need this structure is because of compiler.**

**Compiler is expecting that we write a program in this structure.**

**So that it does lexical analysis, syntax analysis and it keep the token in syntax tree so, int main will be at the top.**

reserved word that has a predefined meaning and purpose in the language. These keywords cannot be used as identifiers (such as variable names

## Primitive Data type

Primitive data types in C++ are some inbuilt data types that can be used by the user directly for the declaration of the variable.

## Derived Data type

The derived data type in C++ is derived from the primitive data type.

## User-defined or Abstract Data Type

Abstract data type in C++ language is defined by the users themselves. It is like defining a class in structure or C++.

## What are Variables in C++?

A variable is a named storage location of data in memory.

1. Local Variable in C++

Local variables are declared and initialized at the start of a function or block and allocated memory inside that execution scope.

1. Instance Variable in C++

Instance variables are non-static variables declared in a class outside [constructors](https://www.scholarhat.com/tutorial/cpp/constructor-and-destructor-in-cpp), methods, and other blocks. Generally, it is an object variable.

1. Static Variable in C++

These are similar to instance variables but common to every object of the class.

1. Automatic Variable in C++

All the local variables are automatic variables by default. They are also known as auto variables.  
  
5. External Variable in C++

External or global variables are declared using the extern keyword.

## Mutability and Immutability in Python

Unlike C++, where every object is mutable by default, Python objects’ immutability is determined by their type

Every int, string are instance variable in python

Conditional statements: If a condition is true inside the if statement, the body of the statement executes.

For loop   
While loop is like while some condition is true then do  
Do While is like do it then check condition and repeat if condition is meet

These are few operators in C++ used for mathematics but we will see it in use while we do the code.

In c++ we need to specify what kind of data we are using else, it is going to do the integer division.

Pow comes from the cmath library.

Look at how brackets are used to specify the scope and && used instead of and..

Switch is one more way to control the structure of your program.

Arrays is a group of variable of same data type.

Vector are dynamic array, it stores the value in contiguous memory. So we can access it easily.

Pointer is one of the scariest thing in c++ for beginner.

So, i mentioned earlier that string is not primitive data type in c++. String is a library which means we need to import it before we used them.

I am skipping hash tables and unordered set because you guys are very good with dictionary in python.

Thank you everyone, I am Kgen. I am open to collaborate on any project if you have unique product idea. Or, if you want to learn more about programming in c++ or other languages, you can book me from caldwell insight.