

CS121 - Lab#1

Install C++ Compiler in Ubuntu and First Program.

thangdn - January 8, 2018

Name: _____

1 How to install C++ compiler in Ubuntu

Follow these steps to install it:

1. Enter the following commands from a command prompt:

```
sudo apt-get update
sudo apt-get install g++
```

2. Enter the following command from a command prompt: `g++ -version`.

2 Testing C++ programs

You can use `nano` command or `gedit` or `subl` command to write the codes. Here I will use `subl`

2.1 C++ programs

`g++` is the compiler used to compile C++ codes.

Example:

Hello World Program

```
#include <iostream>
using namespace std;

int main()
{
    cout<<"Hello_world"<<endl;
    return 0;
}
```

Create the file (HelloWorld.cpp) using **subl** command; write the code shown below, then compile and run using commands.

Table 1: commands line is used to compile c++ codes

Command line	Explain
\$ g++ HelloWorld.cpp	This command is used to compile the code.
\$ g++ HelloWorld.cpp -o Hello	This command is used to create the executable file.
\$./Hello	This command is used to run the executable file.

As described earlier, the process of creating a C++ program involves creating a source-code file using an editor of some sort, and then converting the source-code file into an executable program using the C++ compiler. The compiler will create an executable file named a.out that the computer can run.

To compile the HelloWorld.cpp program you created earlier, make sure you are in the lab1 directory and type the following on the Ubuntu command line to run the g++ compiler on HelloWorld.cpp.

```
g++ HelloWorld.cpp [ENTER]
```

If you entered the HelloWorld.cpp program correctly, then g++ should compile it without any error messages and produce an executable program file named a.out. Type:

```
ls [ENTER]
```

and make sure both HelloWorld.cpp and a.out are in the directory listing.

If the compiler produced one or more error messages, then you probably made a typing or copying error. Check the provided program again and make sure your program is identical to it. If you find a place where they differ, correct your program, resave it, and recompile it (g++ HelloWorld.cpp).

Once the program compiles, run it by typing the executable file name preceded by ./ :

```
./a.out [ENTER]
```

2.2 The C++ compilation process

Computer cant directly understand the program that we write in C++ language. Compiler converts the program into machine language that is understand by the computer.

As we already know C++ is a compiled language. This means that every source file needs to be converted into an intermediate code called the object code with the help of a

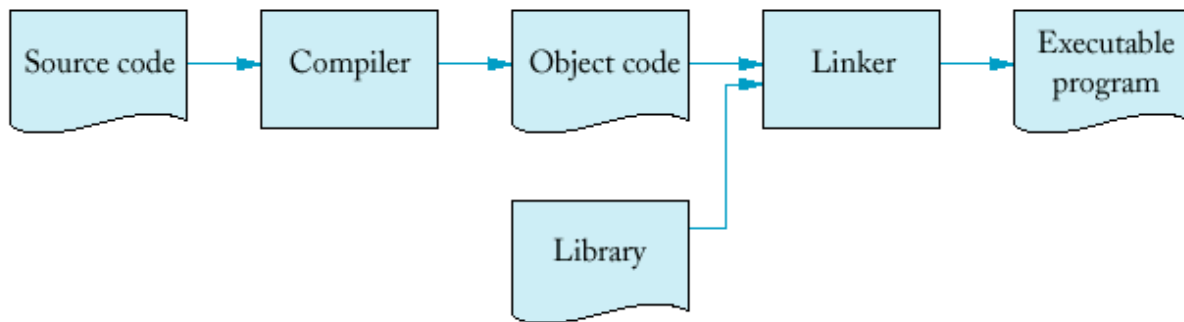


Figure 1: The C++ compilation process

proper compiler and then linked with the other required object files to make an executable. You can see this below, to know how the source is processed to produce the output.

The compilation of a C++ program involves three steps:

1. **Preprocessing:** the preprocessor takes a C++ source code file and deals with the `#includes` and other preprocessor directives. The output of this step is a "pure" C++ file without preprocessor directives.
2. **Compilation:** the compiler takes the pre-processor's output and produces an object file from it.
3. **Linking:** the linker takes the object files produced by the compiler and produces either a library or an executable file.

3 Exercises

3.1 Warm-Up

Write a C++ program that prints out what is shown in the example below (note the double-space gap between the sentences).

Example:

```
I am done with the warmup
```

```
Check me off!
```

3.2 Stretch

Start a `main()` with the following code:

```
int main()  
{  
    int x=2;  
}
```

Without using any numbers other than the 2 provided above, print the value 5. (You may use other variables as long as you do not initialize them to a number)

Output:

5

3.3 Workout

Download **kittyCode.cpp** on the e-learning. When you run the program you will be able to enter a number. The program is supposed to convert from Fahrenheit to Celsius. Fix the code to do the conversion correctly. Please do not write the program from scratch, though this would probably be easier than fixing the code. (You do not need to keep it in the shape of a cat.) (Also, please never write code like this...)

Output1:

0
0F=- 17 .7778C

Output2:

4 0
4 0 F =4 .440 C