Computer Organization and Assembly Language – Lab

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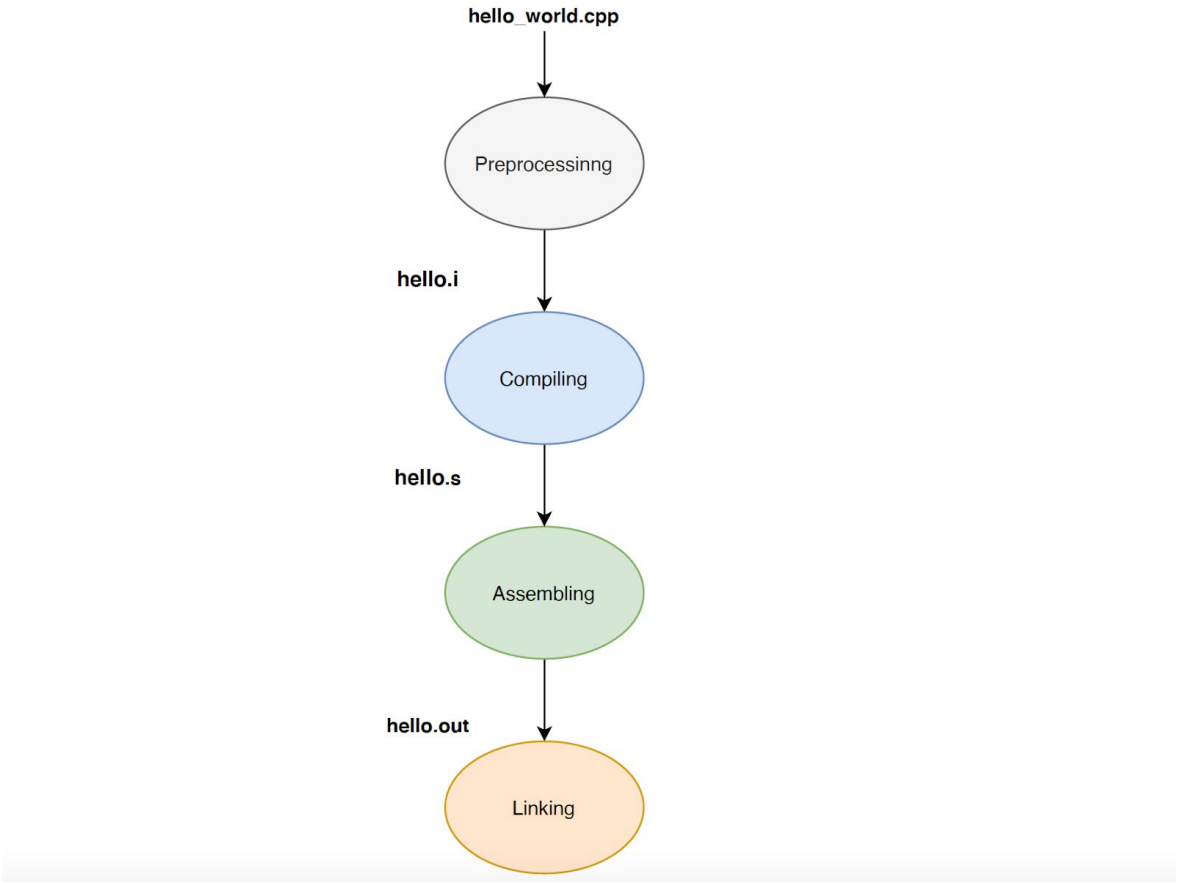
DOSBOX Setup

What is Assembly language?

Assembly language is a low level programming language which uses symbols instead of machine code. Later these programs are converted into machine code by the assembler.

What is the need to study Assembly language?

You will be familiar with the below diagram which you came across in introduction to computing or programming fundamentals course.



We will be writing a simple “hello world” program to understand this whole concept.

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

int main(){

   string str = "hello word";
   cout<<str;
}
```

Preprocessing:

g++ -E hello_world.cpp 1> hello.i

Compiling:

g++ -S hello.i

Assembling:

g++ -c hello.s

Linking:

g++ hello.o -o hello.out

(A detailed description of each step will be discussed in the lab)

Let's get into DOSBOX!

How to setup dosbox on your Ubuntu machine (16.04/18.04):

1. Go to https://github.com/lanrekkeeg/Nasm-Setup and follow the steps in README.md

README.md

How to setup Nasm with AFD debugger

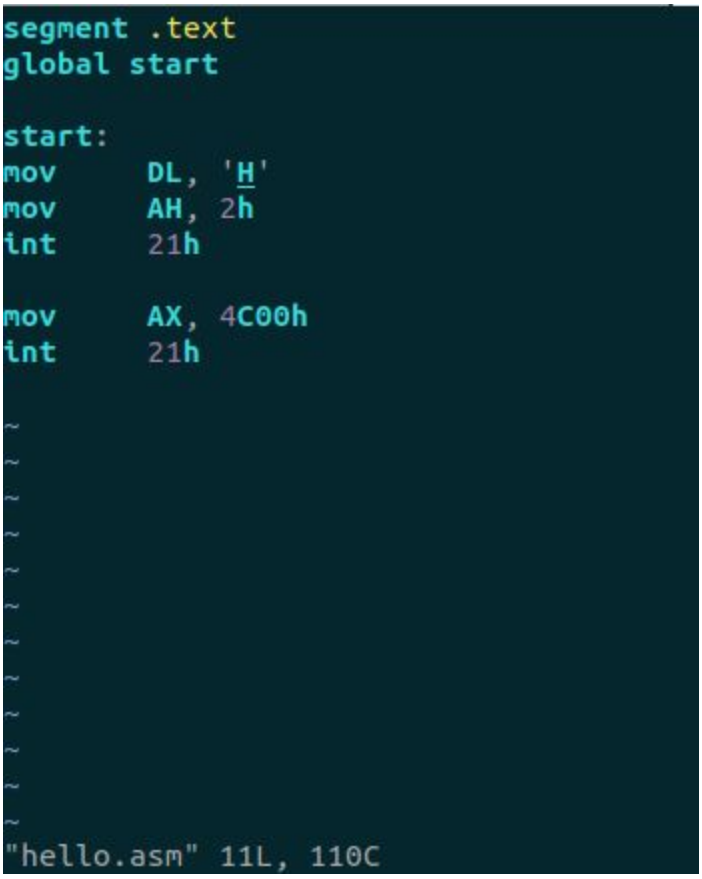
1. `git clone https://github.com/lanrekkeeg/Nasm-Setup.git`
2. `cd Nasm-Setup`
3. `sudo chmod +x setup.sh`
4. `./setup.sh`

2. Run ‘dosbox’ (command) on your terminal and dosbox will open up.

How to use dosbox and execute a sample file:

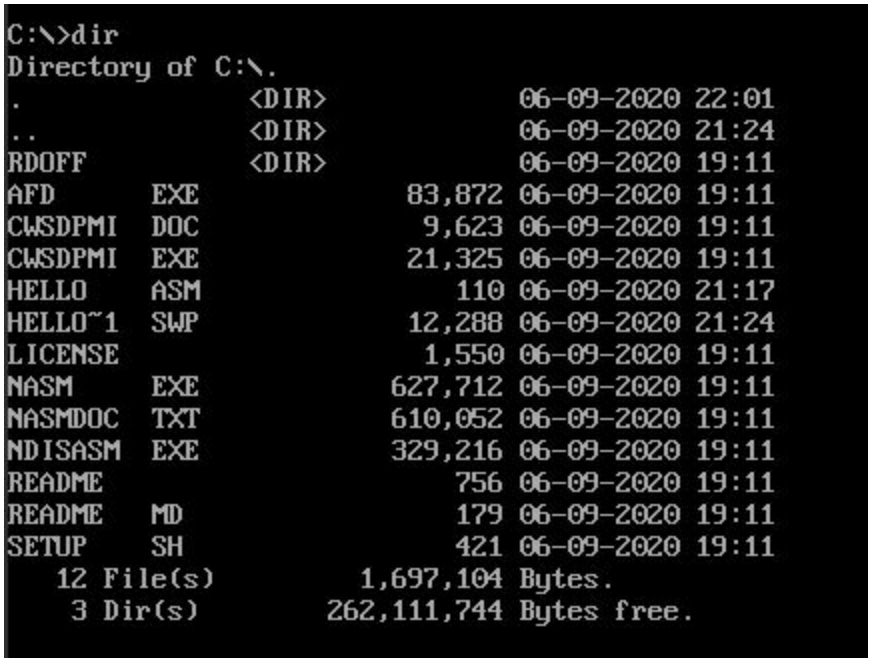
1. First, using ‘touch’ command create a file in your /home/[your name]/nasm-lab directory with ‘.asm’ extension.

2. You can easily edit your file like in the screenshot below using nano or vim editor. If you’re not familiar with them, simply open a file from GUI and write in it like you normally do.



3. Restart dosbox. (because if you don't you won't be able to see the changes made in directory i.e. your new file)

4. Execute 'dir' command. Now you should see your filename.asm file.



5. Now execute command:
   nasm filename.asm -o filename.com

6. Execute command 'dir' to check if 'filename.com' is created or not. If it's created then you are good to go. In case you have some error in your .asm file, you'll see the error on the dosbox screen.

7. Now execute command:
   filename.com

You will see the output on your screen.

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