

Lab 4

Compare and Installation of GCC with different supported versions and Install a C compiler in the virtual machine and execute a sample program

Ubuntu is a widely used **Linux-based** operating system for running Linux-based programs. We need the GCC compiler to compile a C program and run it on Ubuntu operating system. GCC Compiler is a component of the build-essential package that we must install from the Ubuntu repository.

We can install the build-essential package by using the following command in the Ubuntu terminal:

1. `$ sudo apt update`
2. `$ sudo apt install build-essential`

After installing the build-essential package, we have to write our C program in an **Integrated Development Environment** (IDE) like Visual Studio Code, or a simple Text editor and then compile and run our C program on the terminal. We can use the following commands to compile and run our C Program.

1. Use the following command to compile the sample.c C program file in the same directory where the sample.c is present:

```
$ gcc sample.c -o sample
```

This command generates an executable file sample that we can run directly on the terminal using the below command.

2. To run the sample file, execute the following command in the same directory as where the sample executable file is present:

```
$ ./sample
```

Steps to Run a C Program in Ubuntu

Follow the given steps to run a C program on the Ubuntu operating system:

1. First, make sure that the **GCC** compiler is installed on your Ubuntu operating system, we can check the **GCC** compiler installation status using the following command :

```
$ gcc --version
```

C Programming on Linux

1. Type “ls” on Terminal to see all files under current folder
2. Confirm that “helloworld.c” is in the current directory. If not, type cd DIRECTORY_PATH to go to the directory that has “helloworld.c”
3. Type “gcc helloworld.c” to compile, and type “ls” to confirm that a new executable file “a.out” is created

A screenshot of a terminal window titled "yoonji@yoonji-VirtualBox: ~". The window shows the following command-line session:

```
File Edit View Search Terminal Help
yoonji@yoonji-VirtualBox:~$ ls
Desktop Downloads helloworld.c Pictures Templates
Documents examples.desktop Music Public Videos
yoonji@yoonji-VirtualBox:~$ gcc helloworld.c
yoonji@yoonji-VirtualBox:~$ ls
a.out Documents examples.desktop Music Public Videos
Desktop Downloads helloworld.c Pictures Templates
yoonji@yoonji-VirtualBox:~$
```

The command "ls" is highlighted with a red box. The output of "ls" after compilation ("a.out") is also highlighted with a red box.

C Programming on Linux

1. Type “./a.out” on Terminal to run the program
2. If you see “Hello World? on the next line,
3. you just successfully ran your first C program!
4. Try other codes from “A Shotgun Introduction to C”. You can also find many C programming guides online.
5. (Just google it!) Enjoy :)

A screenshot of a terminal window titled "yoonji@yoonji-VirtualBox: ~". The window shows the following command-line session:

```
File Edit View Search Terminal Help
yoonji@yoonji-VirtualBox:~$ ls
Desktop Downloads helloworld.c Pictures Templates
Documents examples.desktop Music Public Videos
yoonji@yoonji-VirtualBox:~$ gcc helloworld.c
yoonji@yoonji-VirtualBox:~$ ls
a.out Documents examples.desktop Music Public Videos
Desktop Downloads helloworld.c Pictures Templates
yoonji@yoonji-VirtualBox:~$ ./a.out
Hello World
yoonji@yoonji-VirtualBox:~$
```

The command "./a.out" is highlighted with a red box. The output "Hello World" is also highlighted with a red box.