**Installing Ubuntu 19.04 Virtual Machine**

Follow the instructions below step by step to install Ubuntu 19.04 on a virtual machine:

1. Download and install VirtualBox from:

[**https://www.virtualbox.org/**](http://www.virtualbox.org/)

2. Download the following ISO file (You can use higher versions also)

<http://old-releases.ubuntu.com/releases/19.04/>

3. Start VirtualBox

We will use VMs extensively throughout the projects of this course. This will give an uniform grading platform.

**Notes**:

1. You can use either the VirtualBox in the instructional labs and install it on your own computer (it is free). You can store it on a USB drive to make it portable.
2. We will work on 32bit kernel in our projects, so make your VM *32bit* too.
3. If your computer has more than one core, give your VM more than one too so it can be faster when compiling a new kernel.
4. Give you VM more than 20GB of virtual disk because building a new kernel requires a lot of space. But use dynamic allocation so that its actual storage usage grows as needed.

**Reference**: “VirtualBox End-user Documentation”, URL: https://www.virtualbox.org/wiki/End-user\_documentation

4. Install ubuntu in your virtual box

5. go into a terminal in Ubuntu and install g++ 4.9 by doing

sudo apt-get install g++