**Installing Ubuntu 19.04 Virtual Machine (Ubuntu 22.04 is the latest version and you can install that for this project). Either version will work but you need to have at least 19.04**

Follow the instructions below step by step to install Ubuntu 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++