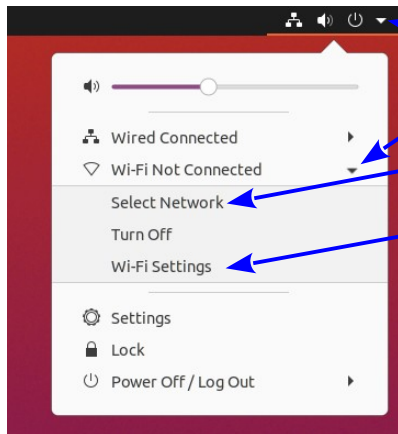


Ubuntu 20.04 Post-Installation Configuration Instructions

After installing the 64-bit version of Ubuntu Linux 20.04 on your laptop, you will need to further configure your laptop to enable you to create and compile C++ programs, and also to customize it for ease of use. These configurations instructions are given below. Some of these steps should not be executed if you have installed Ubuntu as a guest OS within VirtualBox; these steps are clearly marked

Essential Configuration

1. Wireless Network **(DO NOT perform this step if you are running Ubuntu in VirtualBox)**



On the notification bar (top right portion of your screen), left-click on the drop down menu icon.

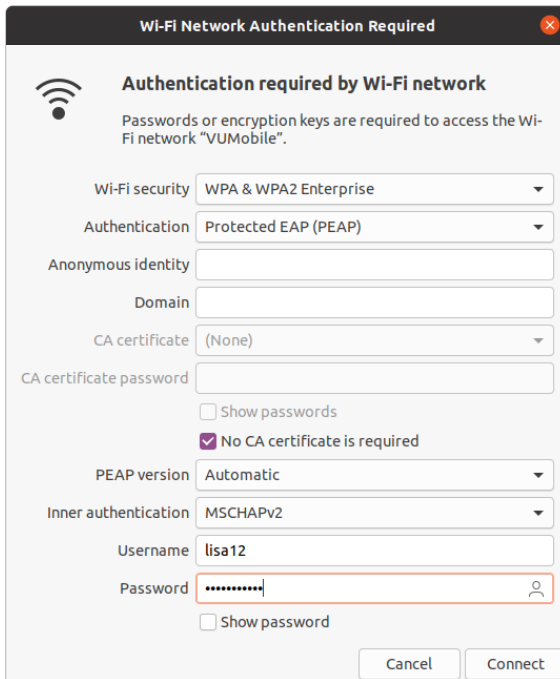
Then, click on this drop down menu arrow and click on ..

Select Network option.

If you do not see any mention of Wi-Fi, click on Wi-Fi settings and turn the Wi-Fi on.

From the visible networks list, select [VUMobile](#).

When the wireless network authentication dialog box pops up, select the following options *exactly* as shown:



« Select PEAP.

« Check the box.

« Select MSCHAPv2

« Your LDAP username & password (VU email credentials)

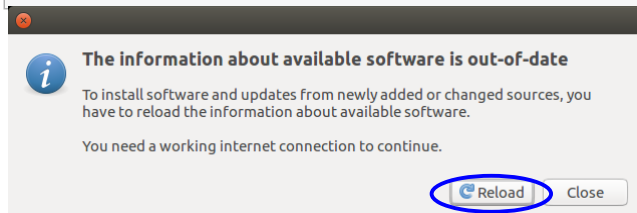
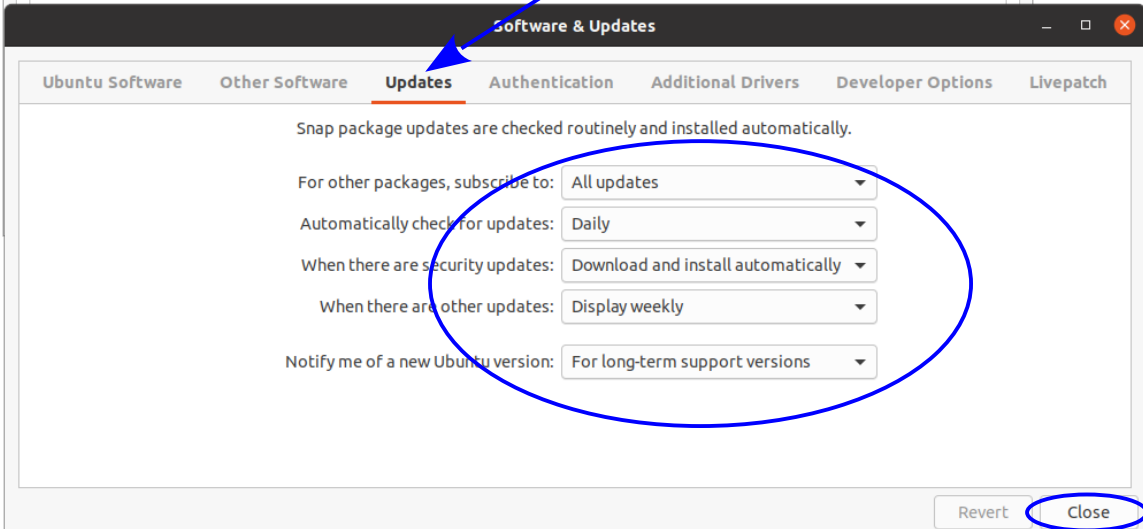
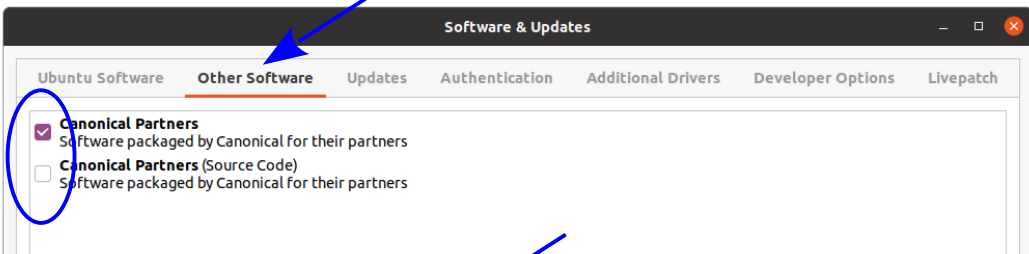
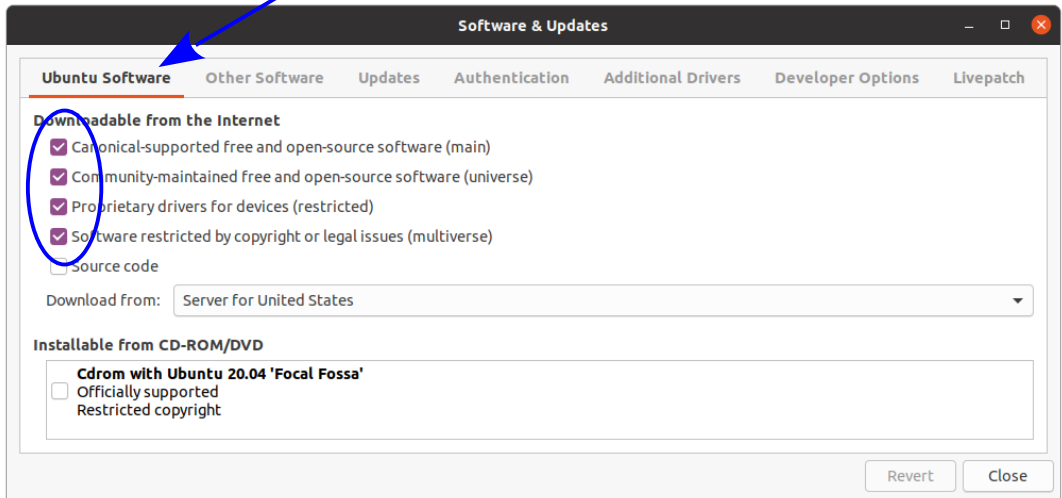
« Click **Connect** when done

If a box pops up warning you that a certificate authority was not chosen, click on "ignore". Your laptop will now connect automatically to VUMobile whenever you are within range of a VUMobile wireless access point.


2. Ubuntu Auto Updates & Access to 3rd Party Software

Click on the "Show Applications" icon  at the bottom left of your screen, on the vertical launch bar.

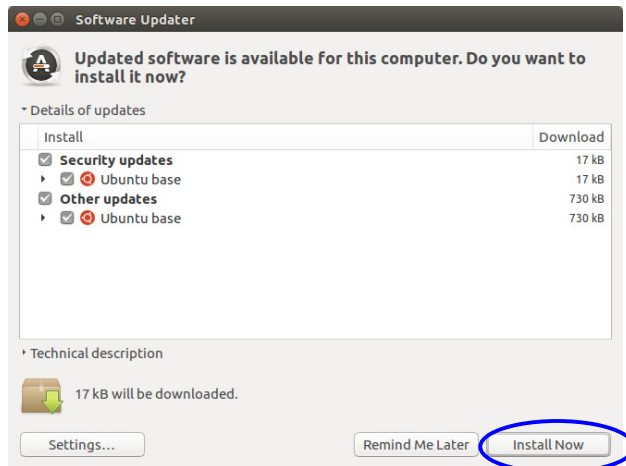
Once the search box pops up, type in "Software & Updates" in the search box, and launch that program by clicking on its icon. Once the dialog box pops up with several tabs; make the following selections in the tabs shown on the next page, leaving the other tabs unchanged. *Note that your screen entries may be slightly different from the ones shown here.*



3. Update your OS and packages NOW! .. You **must** be connected to the Internet!


Click on the "Show Applications" icon  on the bottom left of your screen, on the vertical launch bar.

Once the search box pops up, type in "Software Updater" in the search box, and launch that program by clicking on its icon.. Install updates by clicking the circled button (If your system is up-to-date, then this window does not pop up)



4. Installation of Program Development Environment ..You **must** be connected to the Internet!

4.1 First we install the **Synaptic** package manager as follows:

Click on the "Show Applications" icon  on the bottom left of your screen to open the search box again. Type "Terminal" in the search box and launch (i.e. start) the terminal application; you will see a blank box pop up, with a command prompt in it. From the command line in this terminal, type the following command exactly as shown:

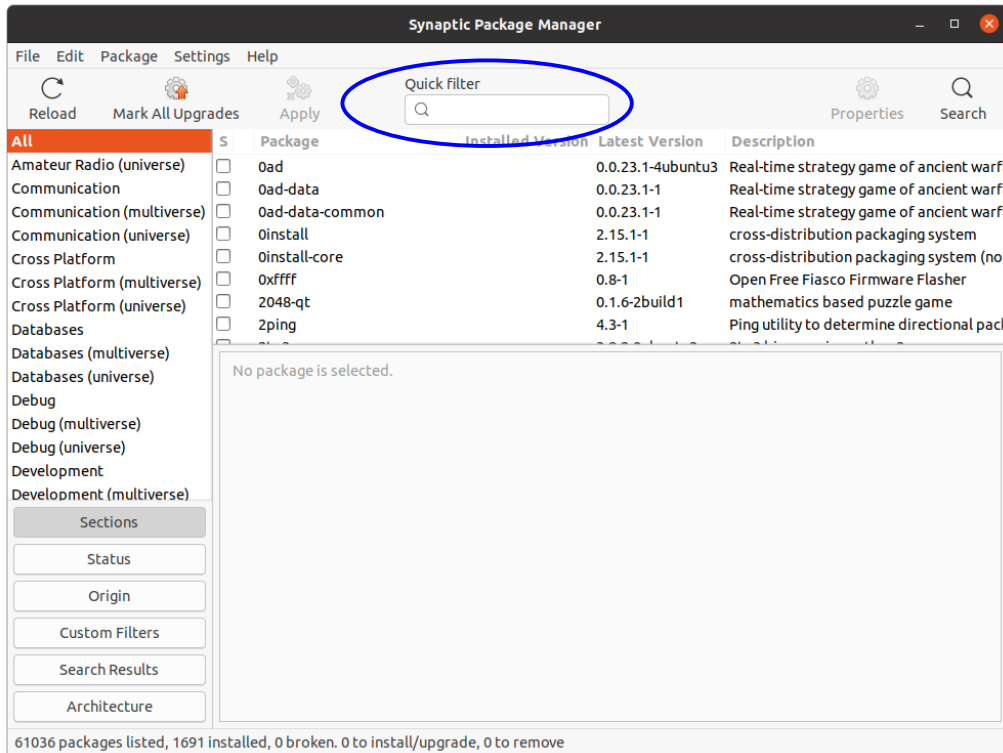
```
sudo apt-get install synaptic
```

Enter your password when prompted, and select 'y' if you are asked permission to continue. At this point, your system will download and install the **synaptic** package manager. If you get any errors, check to make sure that you have an active Internet connection.

4.2 Next, we use **Synaptic** to download and install other required packages:

In Ubuntu (and other Linux distributions), the package manager manages the downloading, installation and updating of all applications and supporting system libraries; it is the master application that interfaces with Ubuntu's app store. Almost every software package (app) that you need should be downloaded through the package manager. Although it is possible to install packages by directly downloading and installing them (i.e. side-loaded without involving the package manager), this method is strongly discouraged since security patches and updates are not automatically applied to such apps. In addition, you could inadvertently install malware on your system. Therefore, if you wish to side-load apps, at the very least, please make doubly sure that the download site is trustworthy.

Open the search box, search for **Synaptic**, and launch it; enter your password when prompted. Glance through the "Quick Introduction" pop up box and dismiss it. Once **Synaptic** is active, type in "g++" in its Quick Filter box (top center). If the Quick Filter text entry box is missing, then go to **step 4.Optional**. Otherwise continue ...



When the "g++" package is displayed, click on the selection box next to it, and select "Mark for installation". If a dialog box pops up asking you to approve additional required changes, select the "Mark" button to proceed.

Now, type in "anjuta" in the same Quick Filter box. When the "anjuta" package is displayed, click on the selection box next to it and select "Mark for installation". Again, if a dialog box pops up asking you to approve additional required changes, select the "Mark" button to proceed.

Next, in the Quick Filter box, search for, and select "libtool-bin" for installation.

Recommended: If you would like to use the fonts that are most commonly used in MS Word, install MS-style fonts (such as Times New Roman, etc.) by searching for and selecting the MS font package "ttf-mscorefonts-installer".

NOW, click on the "Apply" button on the top and confirm by clicking "apply" in the dialog box when asked. If you have opted to install the "ttf-mscorefonts-installer" package, an End User License Agreement (EULA) box may pop up that asks you to agree to the license. Give your assent and continue. Wait for the files to be downloaded and installed (approx. 1 minute).

4.Optional If the Quick Filter text entry box is missing in Synaptic:

Note: If you can see the Quick Filter text entry box at the top of Synaptic's main window, you **do not** need to perform these operations. Otherwise, proceed ..

First close synaptic. Open the search box, find the "Terminal" application and start it. From the command line in the terminal, type the following command in exactly as shown:

```
sudo apt-get install apt-xapian-index
```



Enter your password and answer 'y' to the installation prompt. After the command finishes execution, enter the next command:

```
sudo update-apt-xapian-index -vf
```

Now, go back to **step 4.2**.

The following steps are specific only to ECE 2620 (C++, Algorithms & Data Structures).

5. Creating a Programming Project in Anjuta Integrated Development Environment (IDE)

Click on the "Show Applications"  icon, and in the search box that appears, type in "anjuta". Drag the icon  and drop it on the left-side vertical launch bar on your screen. To launch [anjuta](#), click on this icon.

Once anjuta launches, select "Create a new project" in the window that pops up. A new window will then pop up; select "C++ project type → Generic C++ → Next". Fill in your project name (e.g. lab1) and other details, then select "Next".

On the Project Options screen, the destination is: `/home/<your-username>/ece2620/labs/lab1`. For other assignments, change the destination directory suitably.

For example, the destination for lab 2 is `/home/<your-username>/ece2620/labs/lab2` and for hw1, select `/home/<your-username>/ece2620/hw/hw1`.

If a directory does not exist, you will have to create it either using the "Open" button, and the "Create Folder" button in the next window, or by using the file browser from the left-side vertical menu bar. **Do not use spaces** in naming directories or files. Anjuta does not like spaces in file names or directory names!

Leave the other Project Options unchanged, then select "Continue". Check the Summary page; if all looks as it should then click "Apply".

IMPORTANT NOTE: *You must use a different directory for each project, otherwise be prepared to waste several hours of your life in cleaning up the mixed-up files! :(*

Next, from Anjuta's Build menu, select "Configuration → Default". Again, from the Build menu: "Configure Project". Make sure that the "Regenerate Project" box is checked, then click "Execute". At this point, Anjuta will set up all the configuration files needed for your project. If this step is successful, you should see a `main.cc` file in the `/home/<username>/labs/lab1/src` directory. You can check by clicking on the "Files" button at the bottom of the top-left pane. Double-click on the "`main.cc`" filename to open up the file in the top-right pane. By default, this file has a "Hello World" program pre-written in it. At this point, from Anjuta's Build menu, select "Build Project" (or simply, use the "Build whole project" button on the IDE and check the compiler's messages carefully to assure yourself that the project compiles without errors. Now, go ahead and use the "Run" button (it looks like it has gears on it) to check whether the program runs correctly; if it does, you will see the "Hello World" message in the terminal window (bottom pane) of the IDE.

If any errors were displayed during the 'build' or 'run' phase, then it is very likely that your project setup has errors. If you continue without fixing the errors, then you will most likely not be able to compile and execute your own program at all, even if your code is error free. If so, try regenerating the project from scratch again.

On the other hand, if your "Hello World" program worked fine, then you are ready to proceed with your lab assignment as follows: strip out all the comments and code in `main.cc` and insert your own. In order to add more source files (`xyz.cc`) or header files (`xyz.h`) of your own, you can click on the '+' button on the IDE and save the file in the same directory as `main.cc`. Create source code (C++) files from only within the Anjuta IDE; never use Ubuntu's File Manager for this purpose. Otherwise, Anjuta will not be able to set up the compilation process correctly for your source files.

6. Uploading your source code

When you are ready to upload the lab or homework files, use Ubuntu's File Manager to navigate to your project's parent directory. For example, if your project is in the directory `/home/<username>/ece2620/labs/lab1`, then navigate to `/home/<username>/ece2620/labs`. You will see your `lab1` directory here - right-click on it. In the menu that pops up, select "Compress → .zip → Create". Upload the zipped file to the Blackboard site.