INSTALLATION OF GNU RADIO

HOW TO INSTALL GNURADIO:

The recommended way to install GNU Radio on most platforms is using already available binary packages. Most distributions contain a package named `gnuradio` or similar in their standard repositories. For most use cases it is enough to install this package and start developing.
For Ubuntu, the latest builds (both released and pulled from master branch) are maintained as PPAs. Be sure to uninstall any previously installed versions of gnuradio first.
Hence, to install the version 3.7 of GNUradio,
Open the terminal and add the gnuradio/gnuradio-releases-3.7 ppa (removing other gnuradio ppas if already configured):

```
$ sudo add-apt-repository ppa:gnuradio/gnuradio-releases-3.7
```

Then use the commands:

```
$ sudo apt-get update
$ sudo apt install gnuradio
```

Note down that: (FOR UBUNTU 18 users)
On released builds for Ubuntu 18 (bionic), there is an issue using gr_modtool after GNU Radio has been installed from the PPA. This is due to byte-compiled code that remains in the modtool templates after installation. To workaround this issue:

```
$ cd /usr/share/gnuradio/modtool/templates/gr-newmod
$ sudo py3clean .
```

INSTALLATION OF OOT MODULE:

WHAT's AN OOT MODULE?

A GNU Radio component that does not reside in the GNU Radio source tree is known as an out-of-tree module. Typically, if you wish to extend GNU Radio with your own functions and blocks, you'll develop a module. This allows you to maintain the code and add functionality to it in addition to the main code.

Before creating any block in gnuradio or using OOT module, we first need to install various packages in order to avoid any package not found error.

1. Go to the main directory terminal and install the following packages:
    - Swig
    - Libboost-all-dev
    - Cmake-data
    - Liblog4cpp5-dev
    - Libitpp-dev
    - Libcppunit-dev
2. Install the above packages by the following commands in the main directory:

```
sudo apt-get install swig
sudo apt-get install libboost-all-dev
sudo apt-get install cmake-data
sudo apt-get install liblog4cpp5-dev
sudo apt-get install libitpp-dev
sudo apt-get install libcppunit-dev
```

Note that the package liblog4cpp5-unit is very important to install.

3. Some necessary packages for GNUradio are developed by ETTUS RESEARCH and NATIONAL INSTRUMENTS .Install the package by downloading it first by:

```
sudo add-apt-repository ppa:ettusresearch/uhd
```

Then run the command:

```
sudo apt-get update
```

Now, final step is installation of packages:

```
sudo apt-get install libuhd-dev libuhd003 uhd-host
```

And now, the installation of packages is complete. We can now proceed further for blocks creation and running the OOT module.

In the project, we used multiple custom blocks from the project "Implementation of a packet encoder/decoder pair in the GNU radio framework". Hence to use those existing blocks, importing of this out-of-order module was necessary. Hence, to install the project:

1. Download the Github repository (As a ZIP file): https://github.com/thomasverelst/gnuradioproject.git
2. Next, extract the ZIP folder into the main directory.
3. After the extraction is completed successfully, go to the gnuradio/gr-packetizer directory
4. Type in the following commands sequentially for successful installation of the OOT module:

```
mkdir build
cd build
cmake../
make
sudo make install
sudo ldconfig
```

REFERENCES:

1. https://www.youtube.com/watch?v=6Cj27eZriRs
2. https://wiki.gnuradio.org/index.php/OutOfTreeModules
3. https://github.com/thomasverelst/gnuradioproject.git
4. https://wiki.gnuradio.org/index.php/InstallingGR