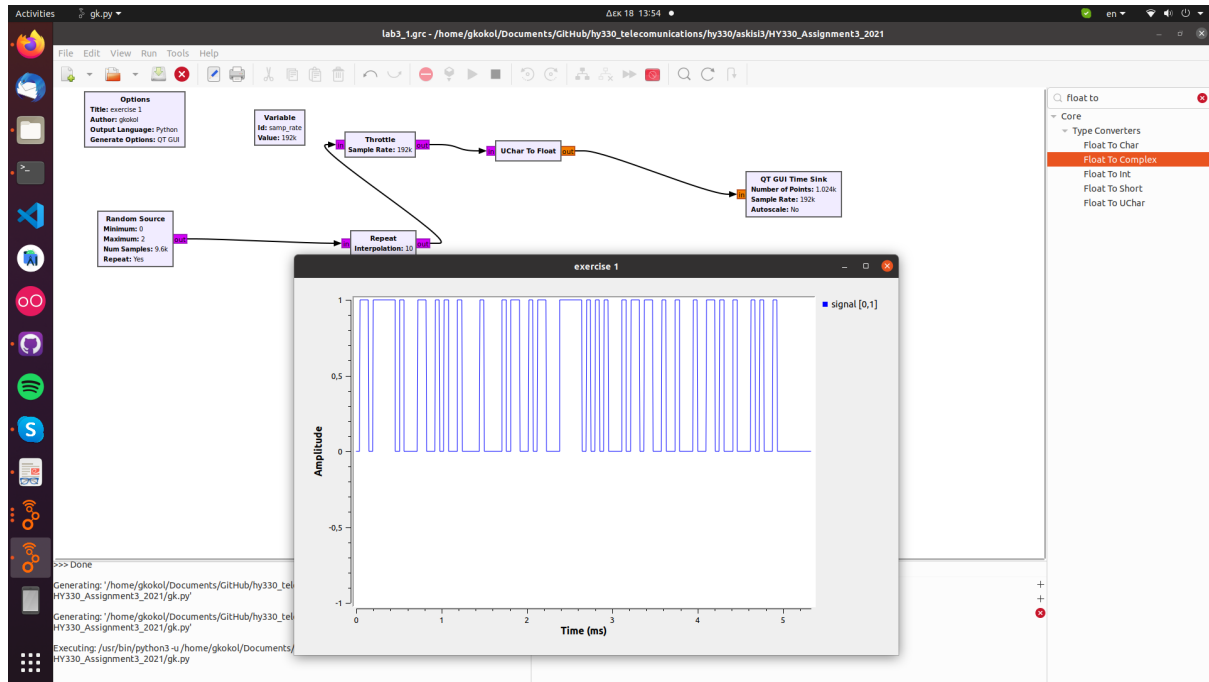


George Kokolakis csd4254

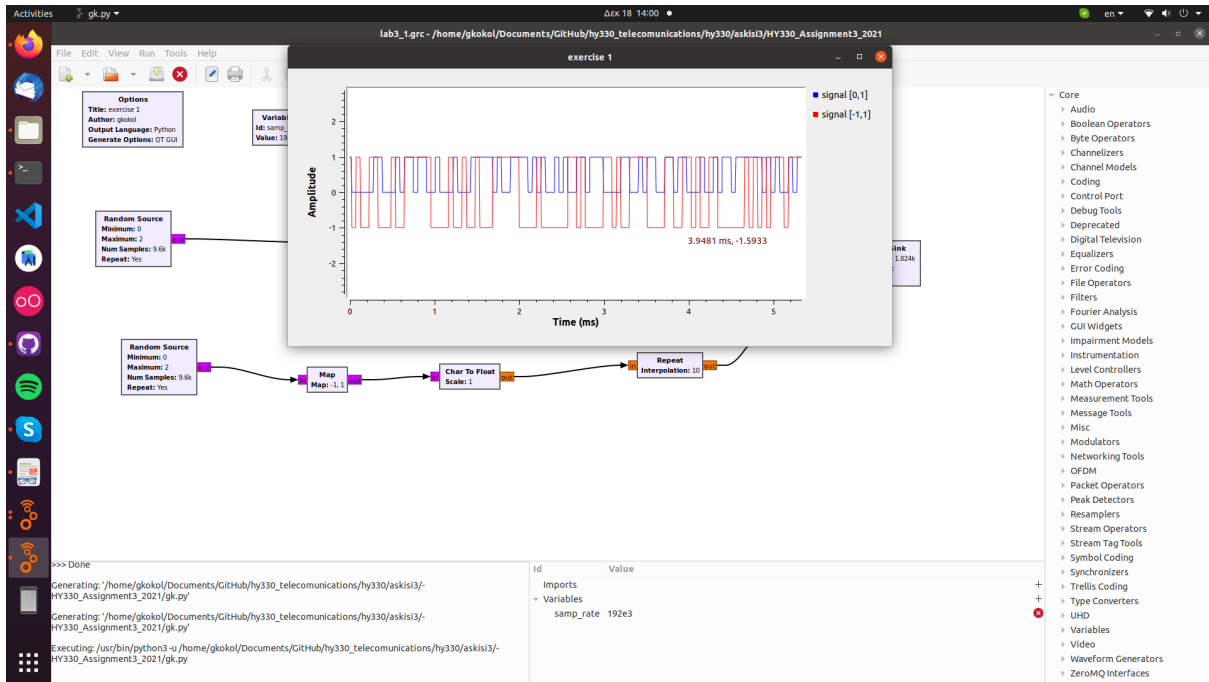
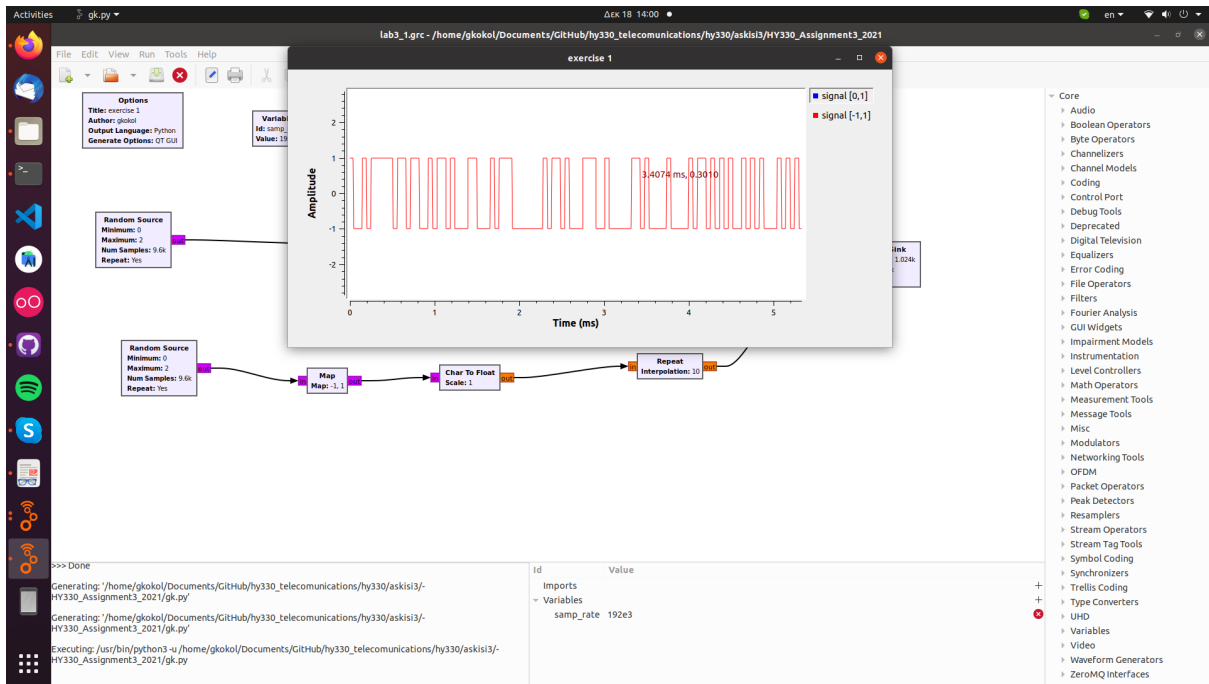
Assignment 3

Exercise 1

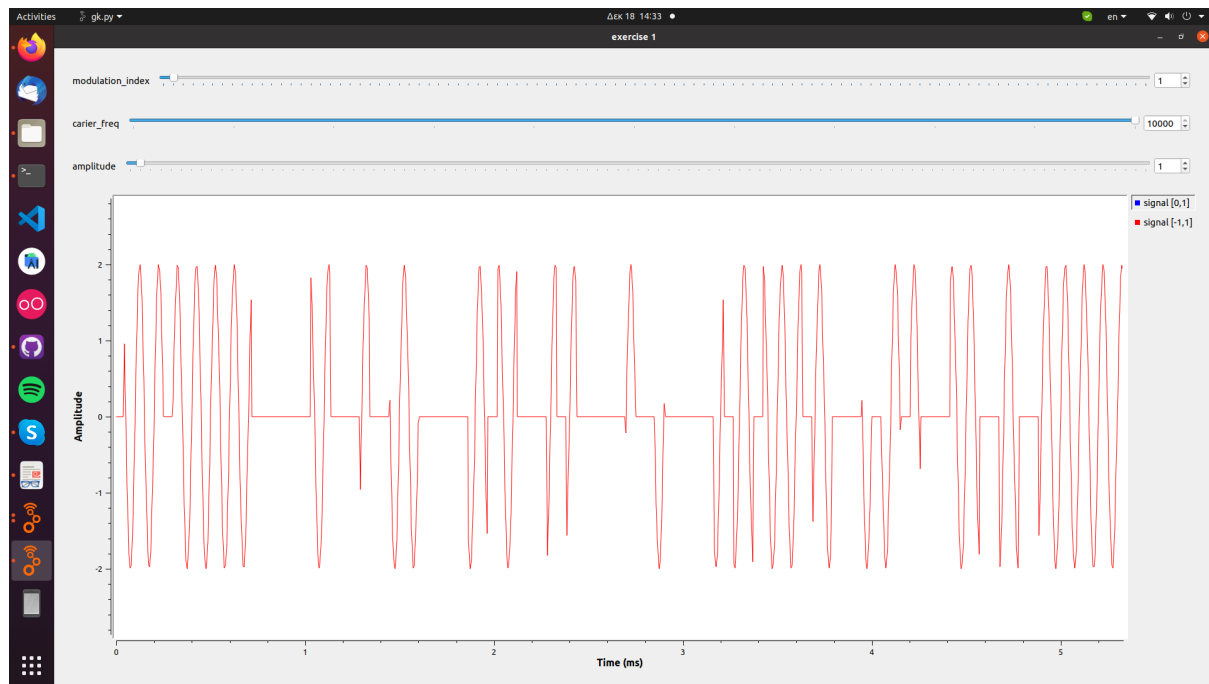
1-4.



5.



6.



7.

The modulation index (or modulation depth) of a modulation scheme describes how much the modulated variable of the carrier signal varies around its unmodulated level. It is defined differently in each modulation scheme. The amplitude modulation index describes the amount by which the modulated carrier envelope varies about the static level. From changing the values of the modulation index, I observe that the amplitude of the signal is changing.

sources:

https://en.wikipedia.org/wiki/Modulation_index

<https://www.electronics-notes.com/articles/radio/modulation/amplitude-modulation-am-index-depth.php>

https://www.tutorialspoint.com/analog_communication/analog_communication_amplitude_modulation.htm

8.

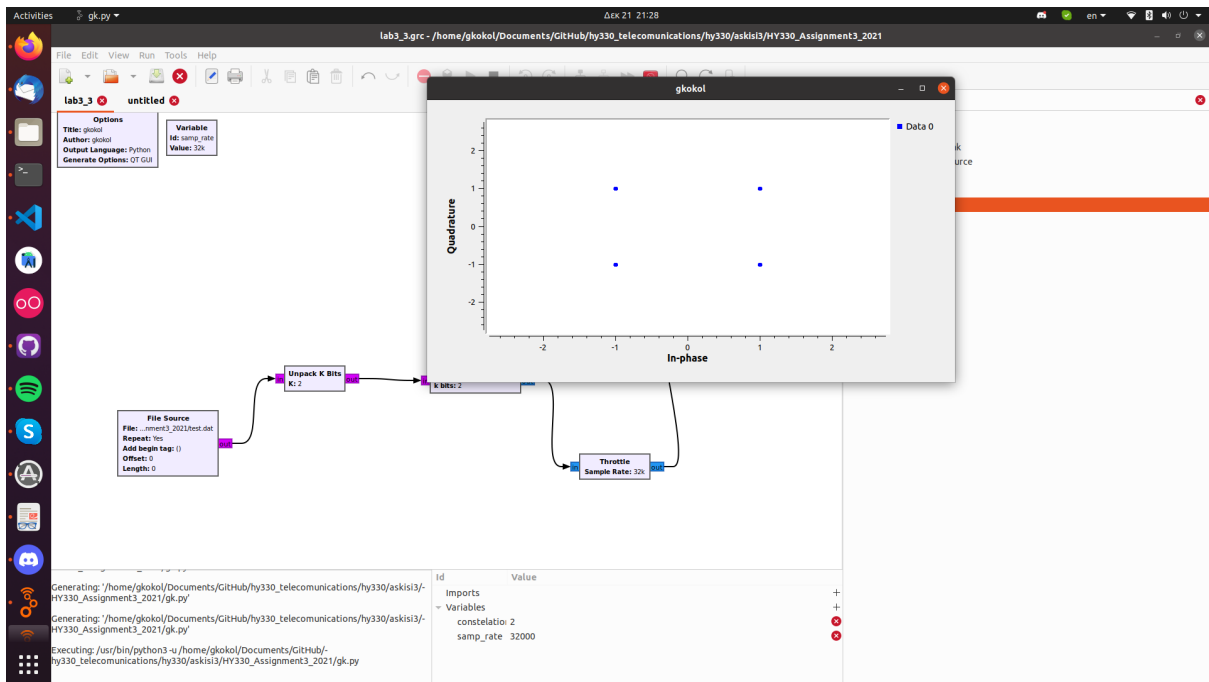
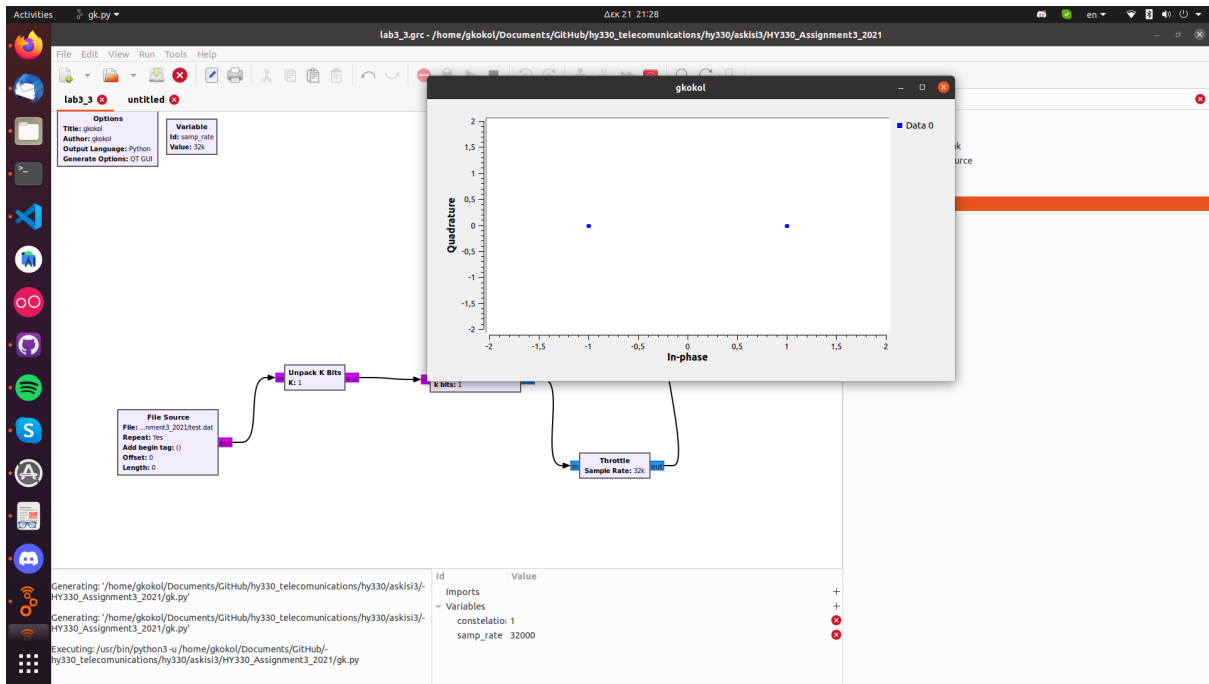
One of the possible reasons is the abrupt digital change of bits between -1 and 1 into the analog field. Also, another reason that those spurious emissions generally appear is the multipath, which is when the same signal from the transmitter reaches the transmitter from different paths and in different time periods.

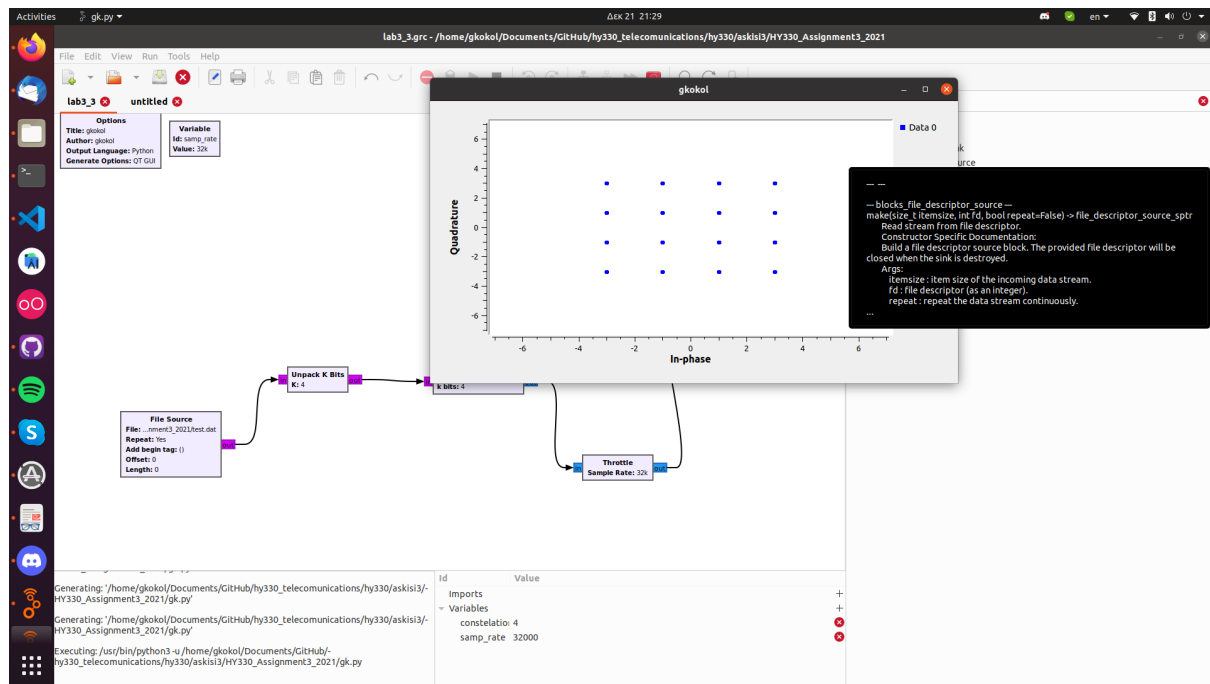
Exercise 2

1. we change the sample rate to 192k and we put the repeat block to 160 to get a bitrate of 1200. $192k/160 = 1200$
2. For removing the spurious i used a root cosine filter.
3. The observation that I make is that the two signals have different fmax, our modulator has fmax 2 and the gnu's 2.

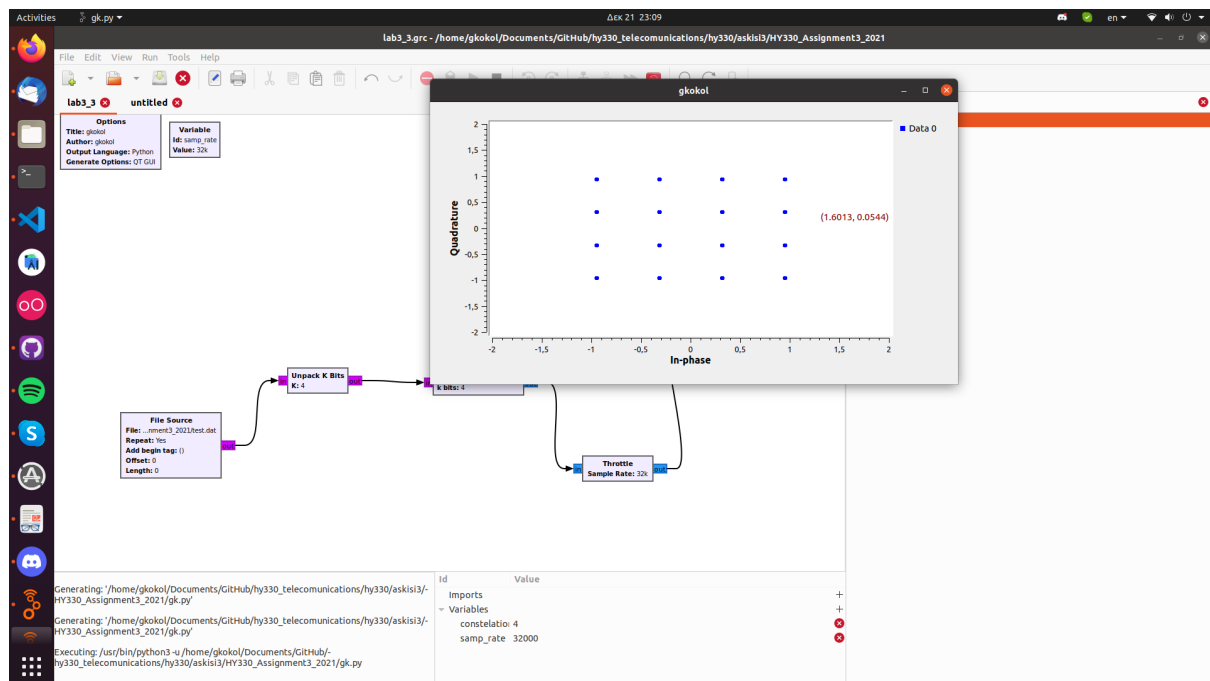
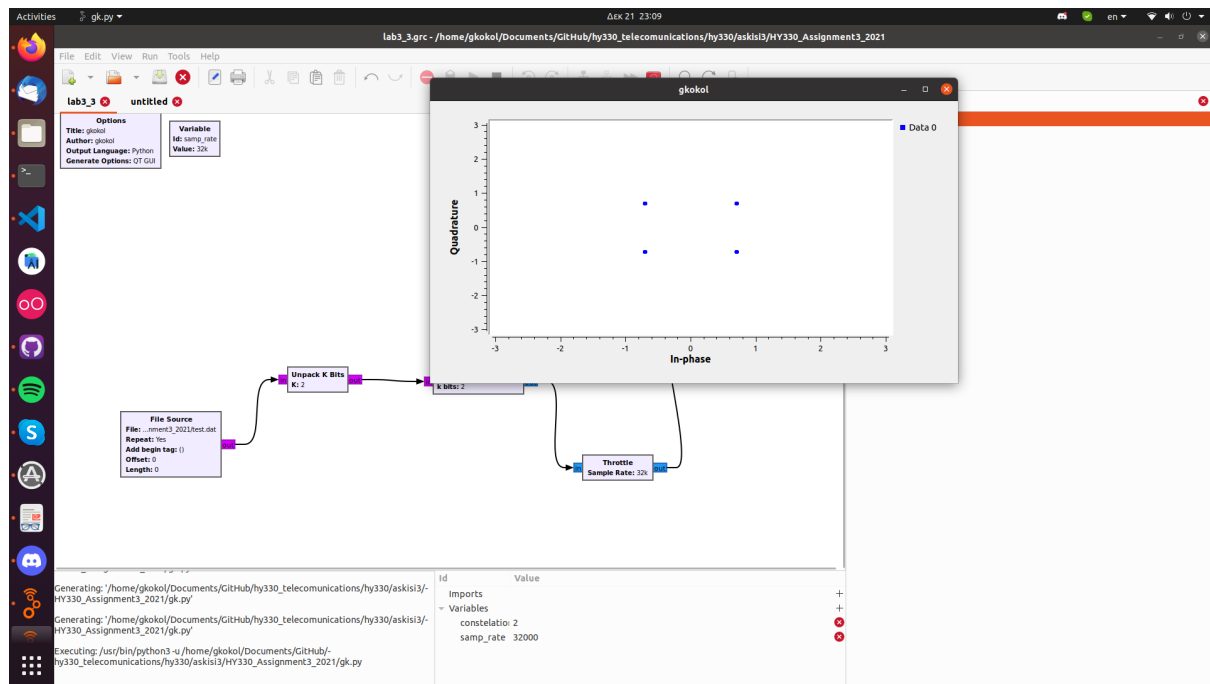
Exercise 3

2.





3.



If the energy is high, then the transmitted signal will also have high amplitude. Having mean energy for all modulations, will make a system simpler and with less cost as the signal will need to have less energy.