College of Engineering Attingal

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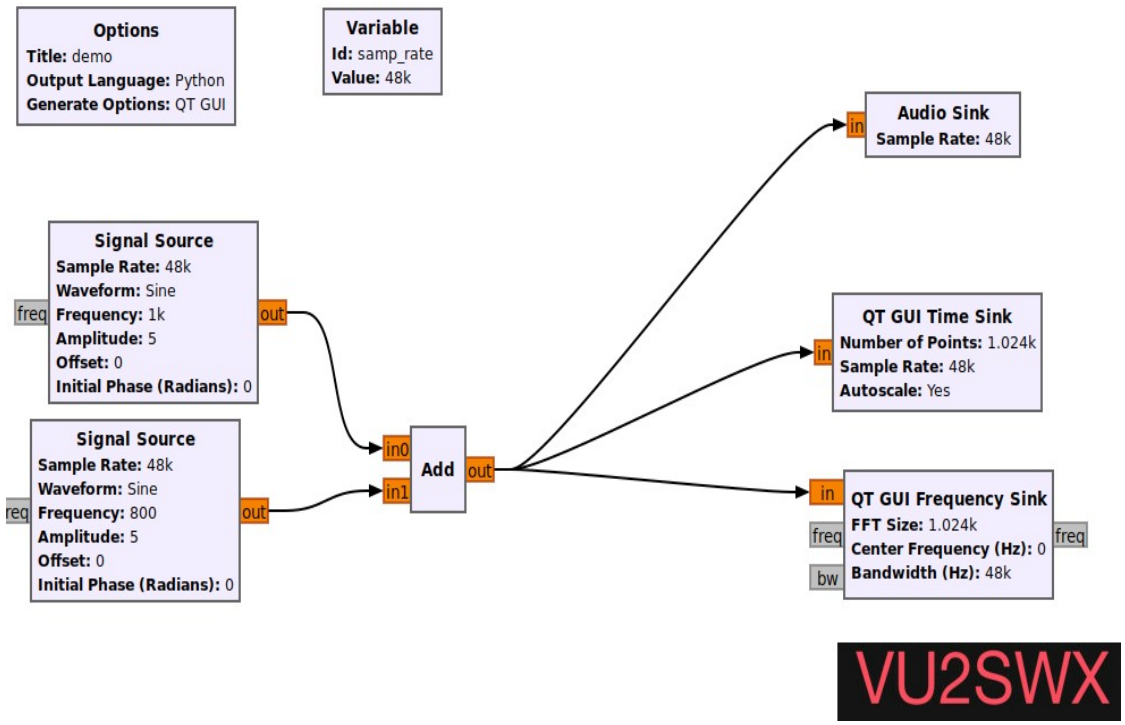
Lesson 2

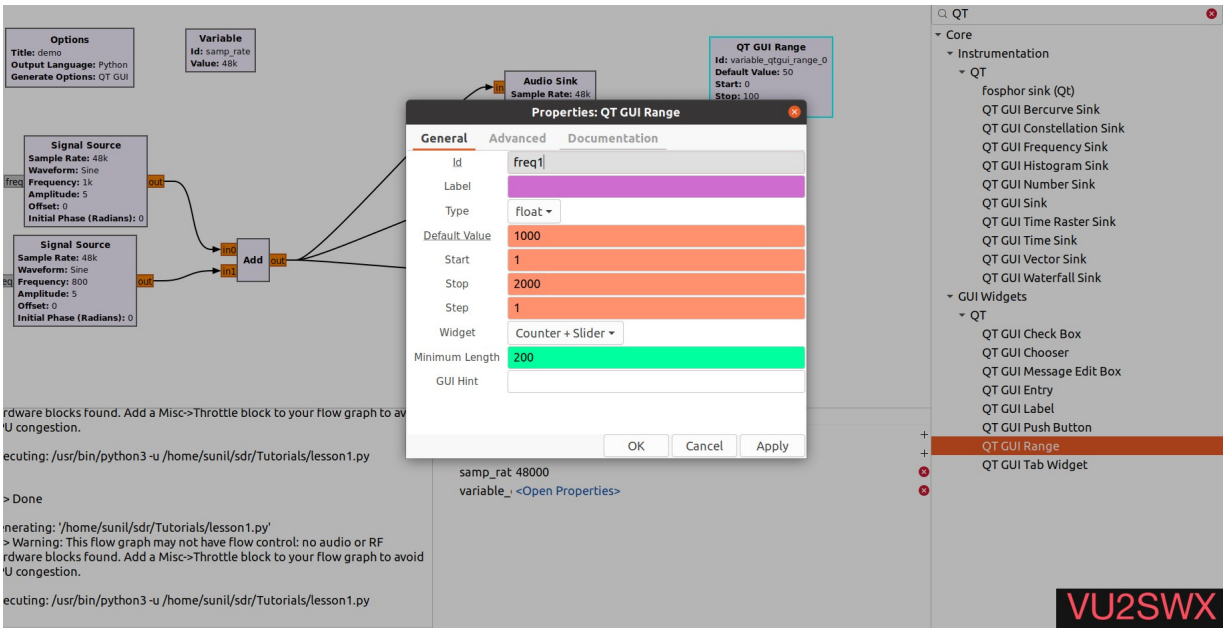
Using GNU Radio Companion

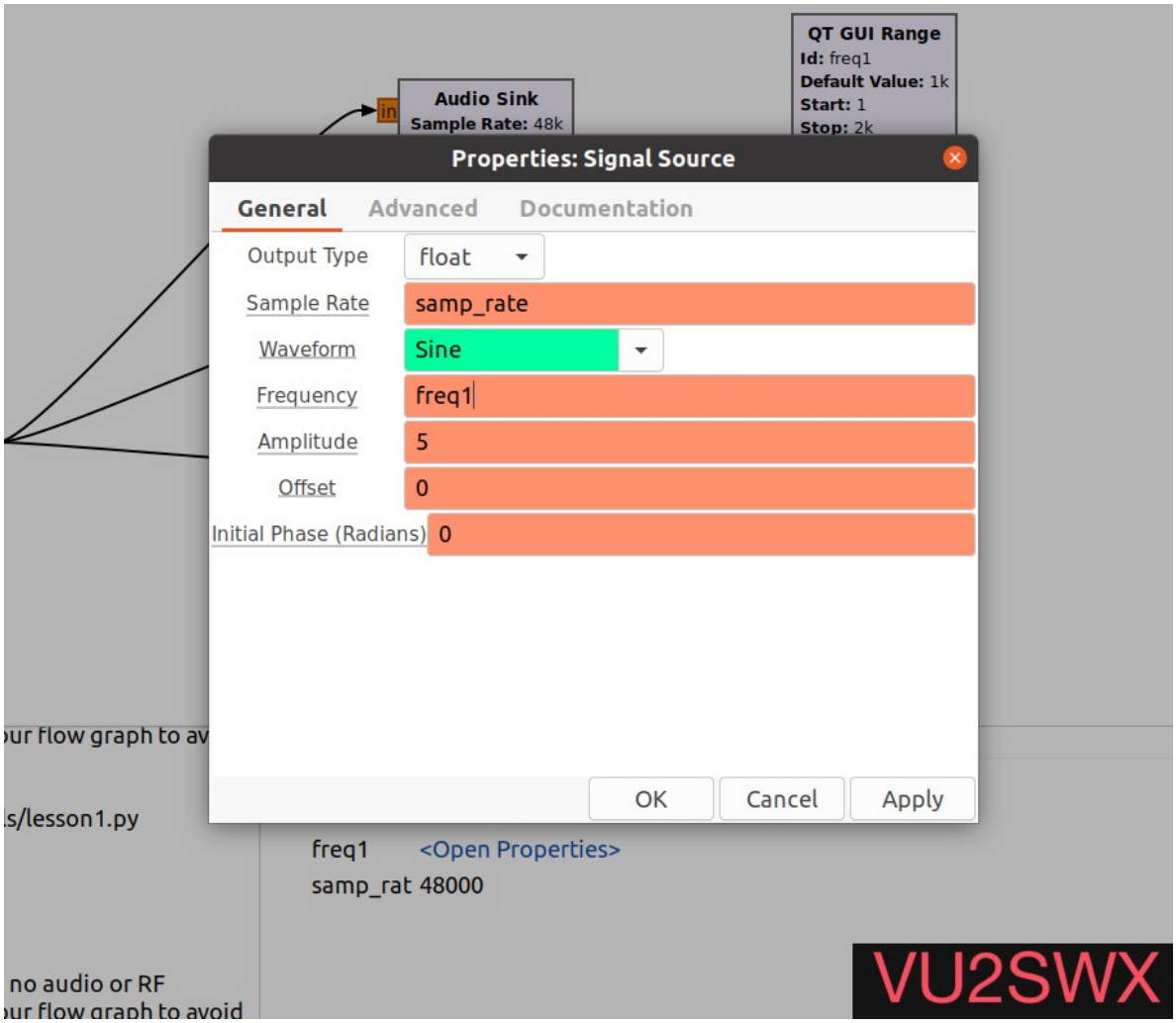
This lesson explores some of the features available in GNU Radio Companion such as sliders and other variable input options.

1. Open a terminal window using: Applications > Accessories > Terminal. At the prompt type:
   `gnuradio-companion`
   Construct the flow graph shown below. Note that the sample rate is set to 48000 in this example. This sample rate is used by all the blocks. The signal being processed is sampled at this rate.

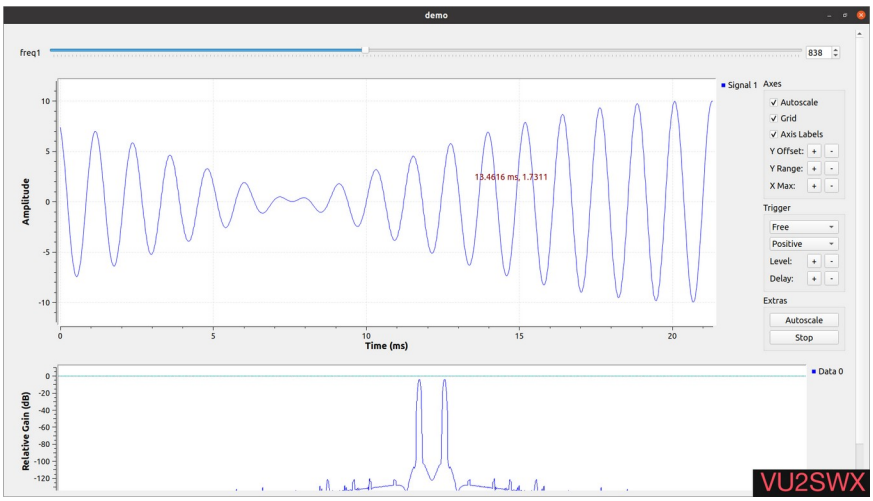


2. Execute the flow graph. You should hear the composite tone and see the FFT sink display of the spectrum. Experiment with the FFT size in the QT GUI Frequency sink. It must always be a multiple of two. Note that as you increase the FFT size the resolution of the display increases. Reset the FFT size to 1024 when you are done.
3. Add a QT GUI range widget to the flow graph. Double click on the block and set the parameters as shown below.

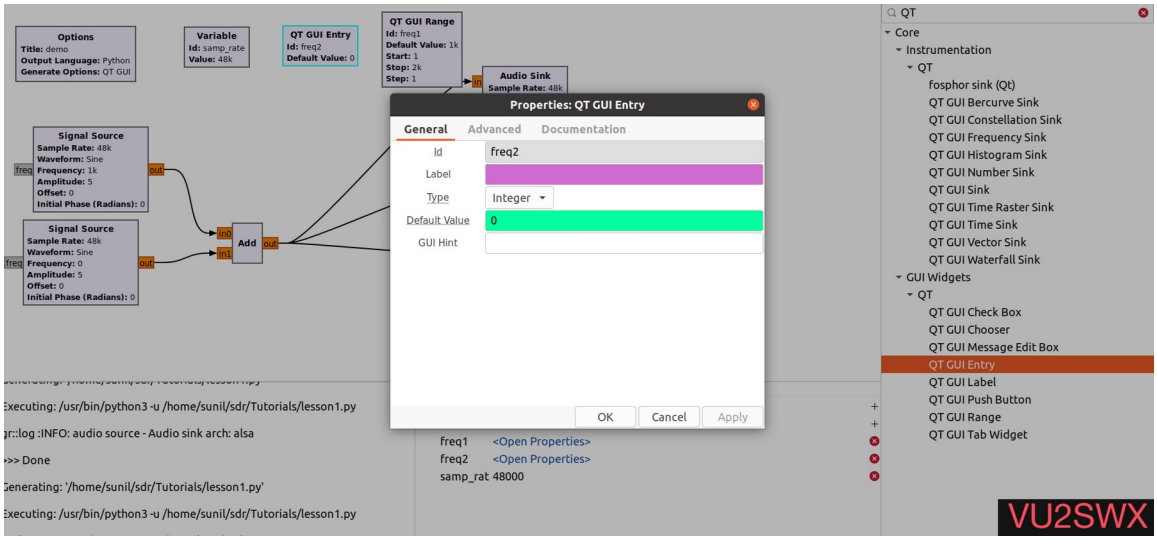


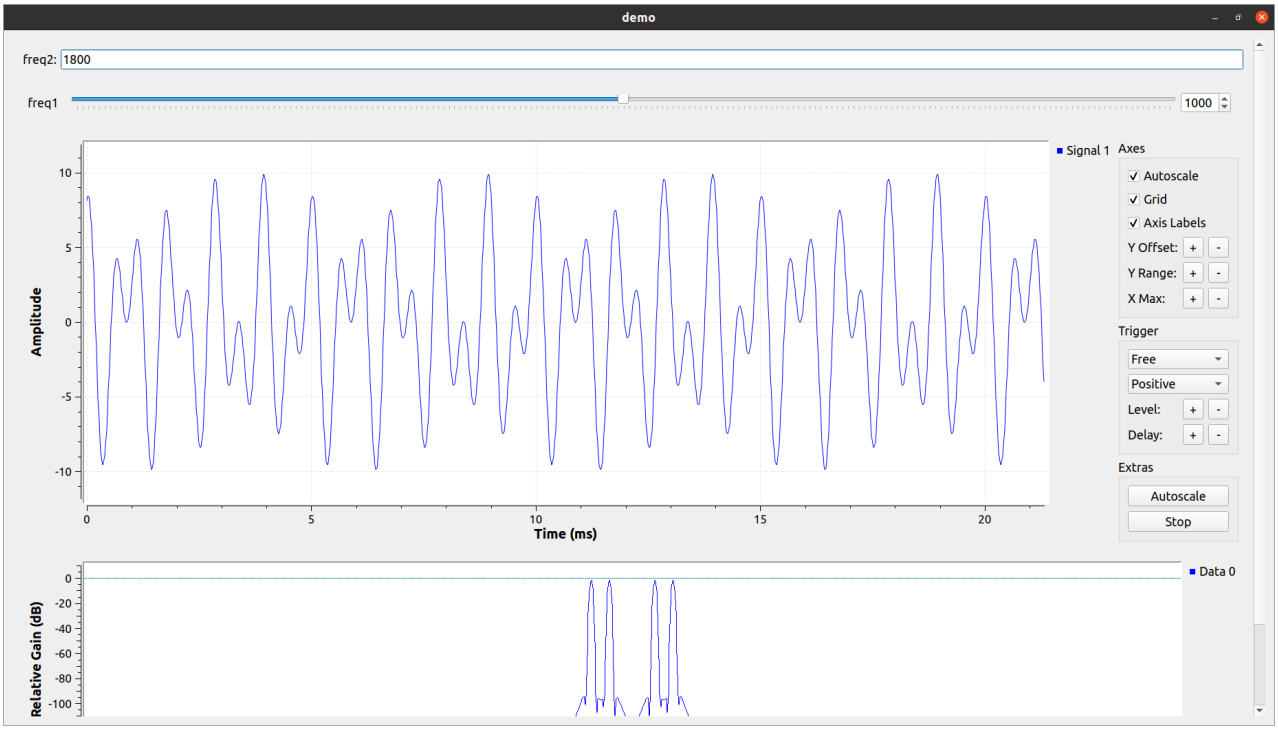


4. Double click on the bottom Signal Source Replace the frequency (800) with the variable freq1. Execute the flow graph. You should now observe that both the spectrum and the sound change as you vary the frequency of the Signal Source using the slider.



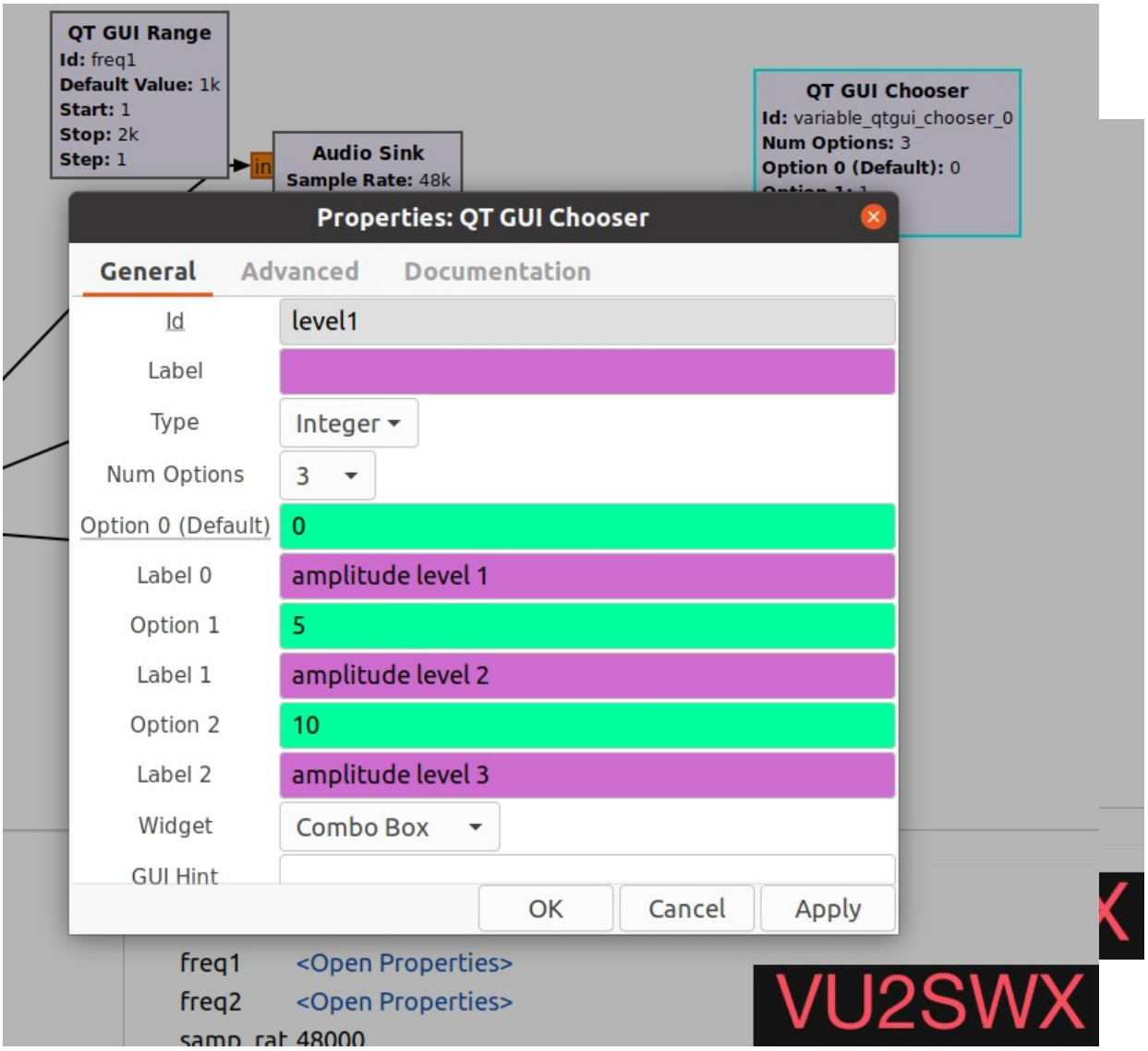
5. Add a Variable QT GUI entry block to the flow graph. Set the parameters as shown in the figure below. Modify signal source frequency to freq2. Execute the graph and try to enter some value to freq2 and observe the output



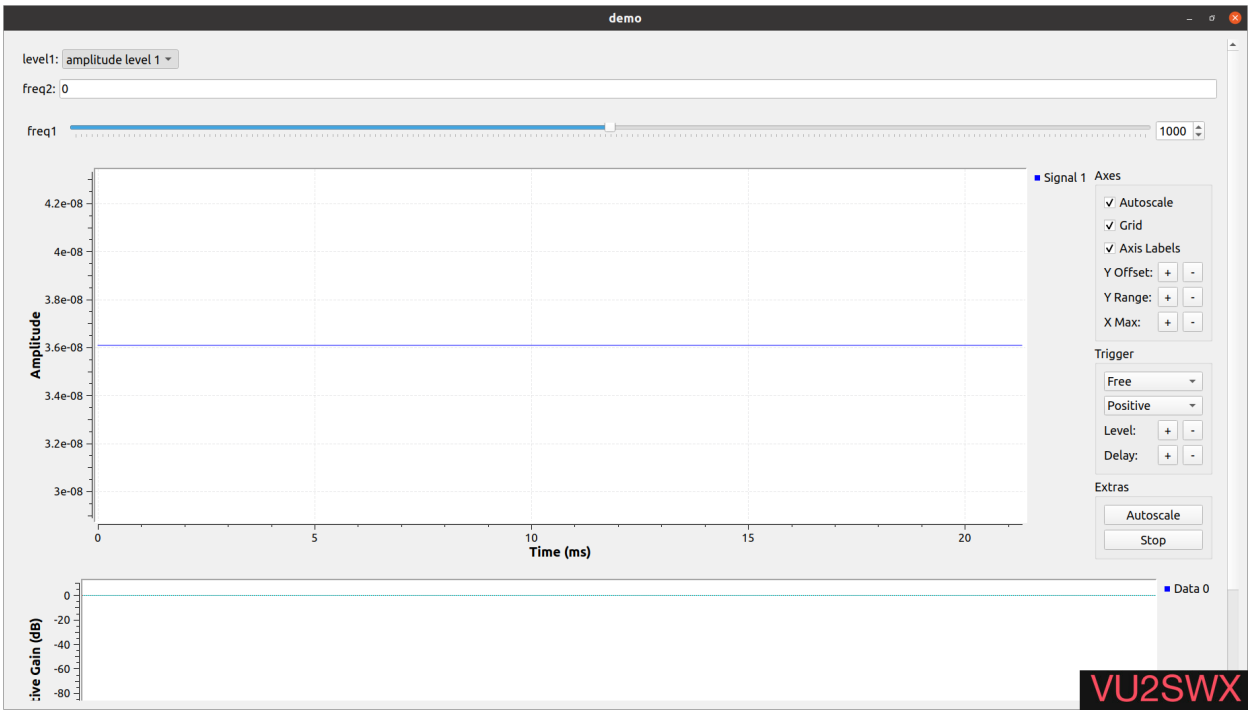


6. Double click on the bottom Signal Source and replace the Amplitude with another text entry variable level2. Execute the flow graph. Change the value to 0.1 followed by Enter. The volume of the tone will decrease and this will be reflected on the spectrum plot.

7. Add a QT Chooser block to the flow graph. This block will add either a drop down menu, radio buttons or a button. Input the parameters as shown in the figure below.



8. Change the amplitude of the top signal source to level1. Execute the flow graph and change the amplitude of the top Signal Source using drop down menu Experiment with the Drop Down menu and the Button to see how they work.



9. Explore the remaining widgets in QT GUI