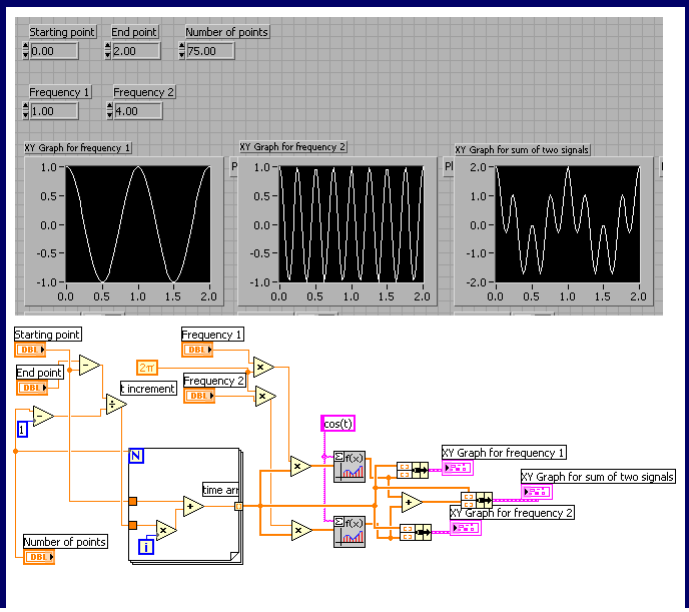
Engin 103
Fall ‘06
Meeting #23: Nov 21, 2006

Today we did CW#12:

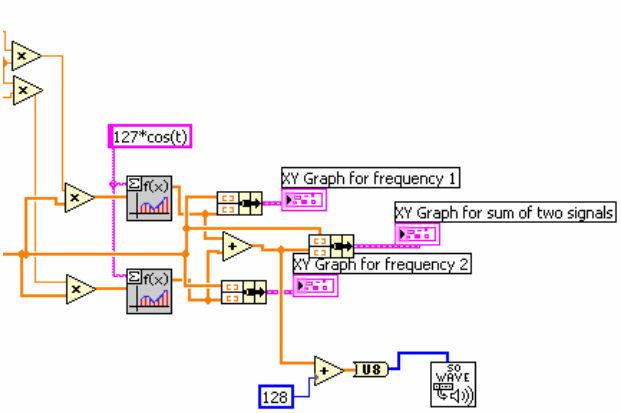
Notice the implementation of cos(2πft) for different frequencies, see Block Diagram below



Possible LabVIEW applications for project 3:

1) Your own ideas
2) Circuit analysis with LabVIEW (different circuits ->ask me for equations)
3) An application that makes use of the Case Structure to make decisions (build upon CW#8)
4) An application that makes use of the For Loop (building upon CW#10) and the waveform graphs.
5) Adding sound to the applications that plot a function

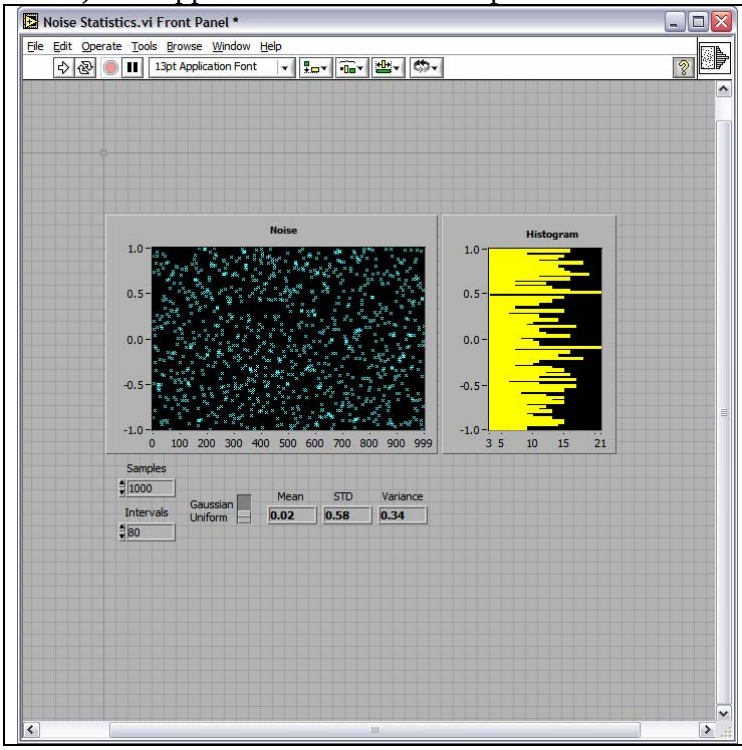
Use of *To Unsign Byte Integer (under All Functions/ Numeric/Conversion), and Snd Write Waveform (under Graphics&Sound/Sound).*

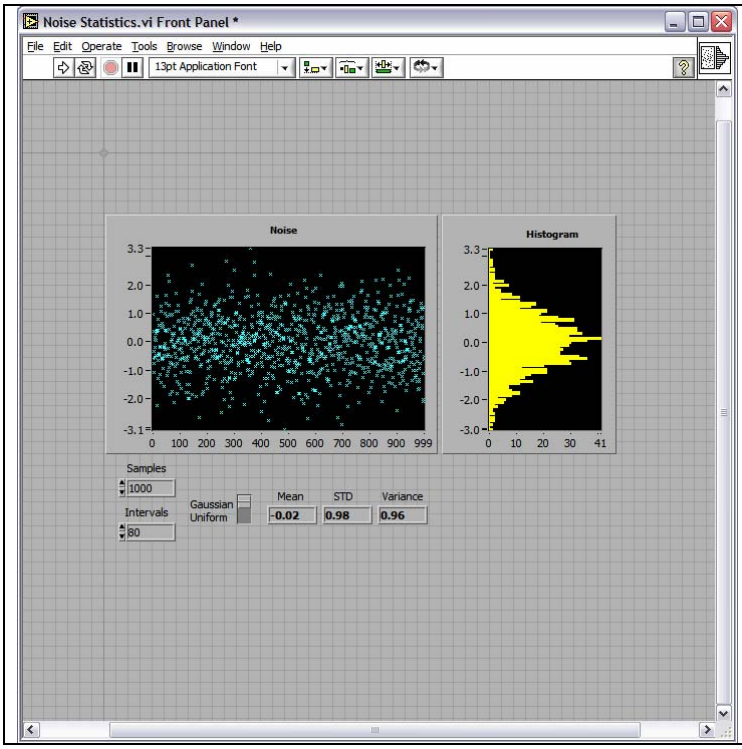


Sample Block Diagram for Sound Generation: modifications needed on CW13

Demonstration of the Beat Phenomena requires selecting the right number of points
given an interval and frequencies (this is an trial-error approach to signal Processing that we can do at the introduction to engineering level).

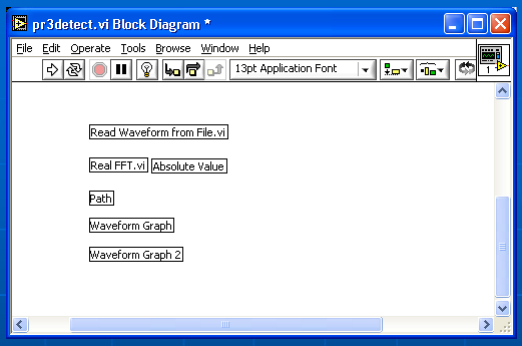
6) Plotting three or more cosine functions with different frequencies (build upon CW #12)
7) An application that can say the alphabet letters
8) An application that does data modeling (CW#13)
9) An application that can do experiments on noise

	Uniform random variable case

	Gaussian random variable case or “white noise”

10) Application that can detect the frequency spectrum of a signal

Frequency Spectrum Detection: Here are the original labels of the Items we need to make a Spectrum Detection VI, not in any particular Order – elements on a same line are related,



What is the most important element in a VI for frequency Spectrum detection?

"Path": for ergonomic design should we place a "Path Control" In the Control Panel or a "Path Constant" in the Block Diagram?

Go here to download a sample input file:
http://www.faculty.umb.edu/tomas_materdey/103s05/files/file01
If you have put together the above elements correctly, you should see two groups of five peaks each in your Waveform Graph, this means there were 5 frequency components in the original signal, the other group is a "math side effect of the Fourier Transform" and should be ignored

Suggested items to write in the Engin 103 logbook:

1) What did you need to do to specify the frequency of a cosine? What is the difference with respect to CW#10? Indicate what are the three inputs for each of the three bundles in CW#12. What type of graph did you use?

2) How did you produce the increment for the x-series using the initial ("between") and final ("and") values? What is the difference between the graphs for f=2Hz and f=4Hz? What are the time separations between consecutive peaks (or periods) as shown in the graphs for a frequency of 2 Hz and 4 Hz.? Can you tell a formula relating the period to the frequency? Explain what do you see in the graph showing the sum of both signals: can you tell the difference with respect to a signal containing only one frequency?