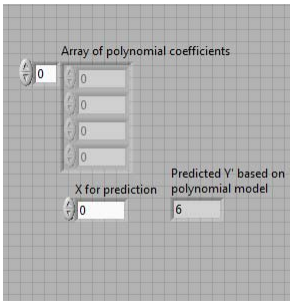
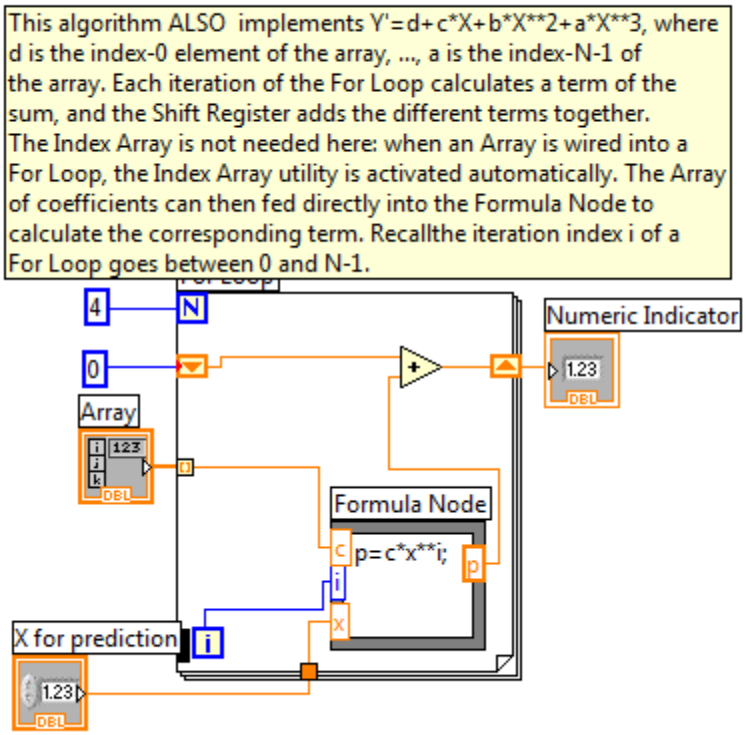
Engin 103 April 28, 2009 back to e-syllabus	Topics: LabVIEW topics: Shift register; spectrum detection Project 3 Topic Assignment Logbook questions

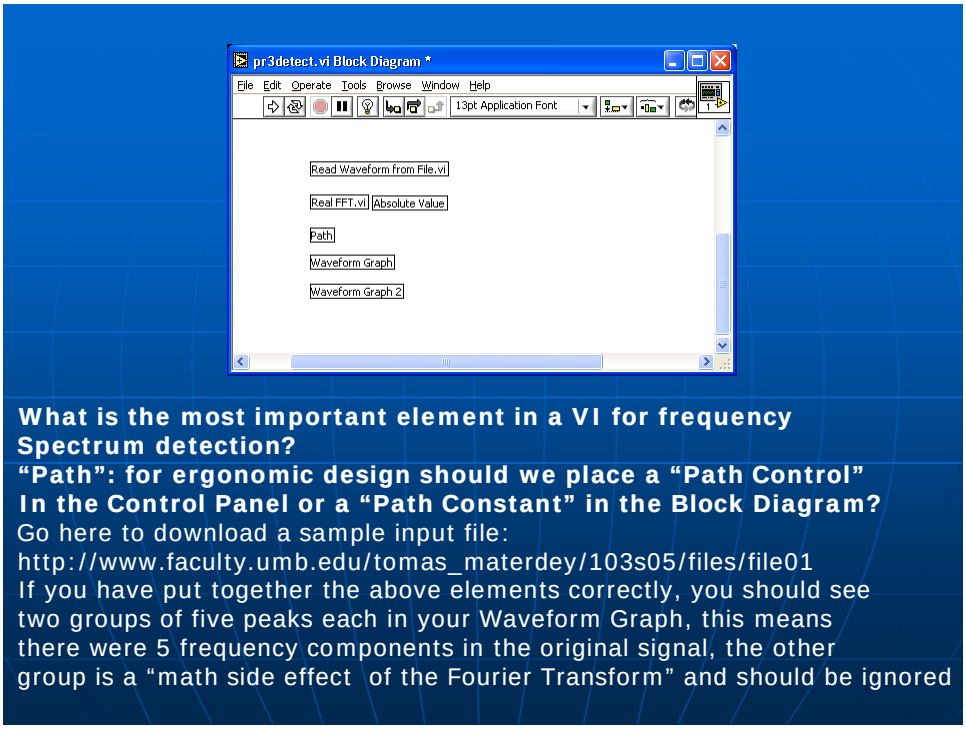
Shift register –To obtain a prediction Y' using a polynomial model





Spectrum detection

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

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Project 3

Project	Description	Team
A	Predict the max. temp. for the next day using previous days' temperatures, using polynomial and other models	**6**
B	Predict the oil price for next week using previous weeks' prices, using polynomial and other models	**10**
C	Detect the frequency spectrum of a given signal using Fourier Transforms	**4**
D	Say the decimal number for a four-digit binary number	**5**

E	Make a 8 keys piano	**2**
F	Solve the quadratic equation with distinction of cases for the discriminant	**8**
G	A VI that can calculate the areas and volumes of 5 different 3D geometrical shapes	**3**
H	A VI that produces interesting sounds from the combination of 2 or more sine waves with different frequencies	**9**
I	A VI that produces a chirp sound, that is a sound whose frequency is changing with time	**7**
J	Make a "sound recording utility" that can record voice from a microphone, display it and its FFT, then save it into a file. When a 'playback button' is pressed it will play the recorded sound.	**1**

	Front Panel (suggested)	Block Diagram (suggested)
Project A Predict Max Temp for next day: polynomial and other models	Numeric Arrays XY Graph Boolean Switches	Case Structure Curve fitting/Data Modeling sub-VI's Bundle for graphing Build Array
Project B Predict gas prices: polynomial and other models	Similar to Project A	Similar to Project A
Project C: Predict the Spectrum of a given Signal using FFT.vi	-Path to File containing given signal in wav format -Waveform Graph for the Spectrum	FFT.vi Absolute Value
Project D: Say the decimal number for a four-digit binary number	-Numeric Control to enter the binary number -Guide for entering correct data	-Case Structure -Play correct wav file according to the binary input
Project E: 8 keys piano	-Push buttons	-Related to Project D
Project F: Solve quadratic equation	-Ways to enter the equation -Ways to output the two solutions; and text to classify the discriminant	-Case Structure -Arithmetic operations -String constants
Project G: Calculate 4 different geometrical shapes	-Boolean switches -Graphics to explain the geometries, dimensions, etc. -Numeric controls for sizes...	-Case structure -Sub-VI
Project H: Sound from two or more sinusoids and their sum	-Ways to enter frequencies or periods -Waveform graphs	-For Loop -Eval Single-Var. Array -Bundle; Build Array -Sound utilities
Project I:	Related to H	

Chirp sound		

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LOGBOOK: example of a logbook page

-Use a quadrille notebook; number all pages; date all entries
-Write your notes for all activities, thoughts, problems and solutions, and learning conclusions related to Engin 103. You should write down progress, outcomes, and conclusions on projects and teamwork; conclusions from class work (including LabVIEW) and homework.
-In addition you should answer in the logbook all questions listed in these notes in blue, as shown below:

No logbook questions for this meeting

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