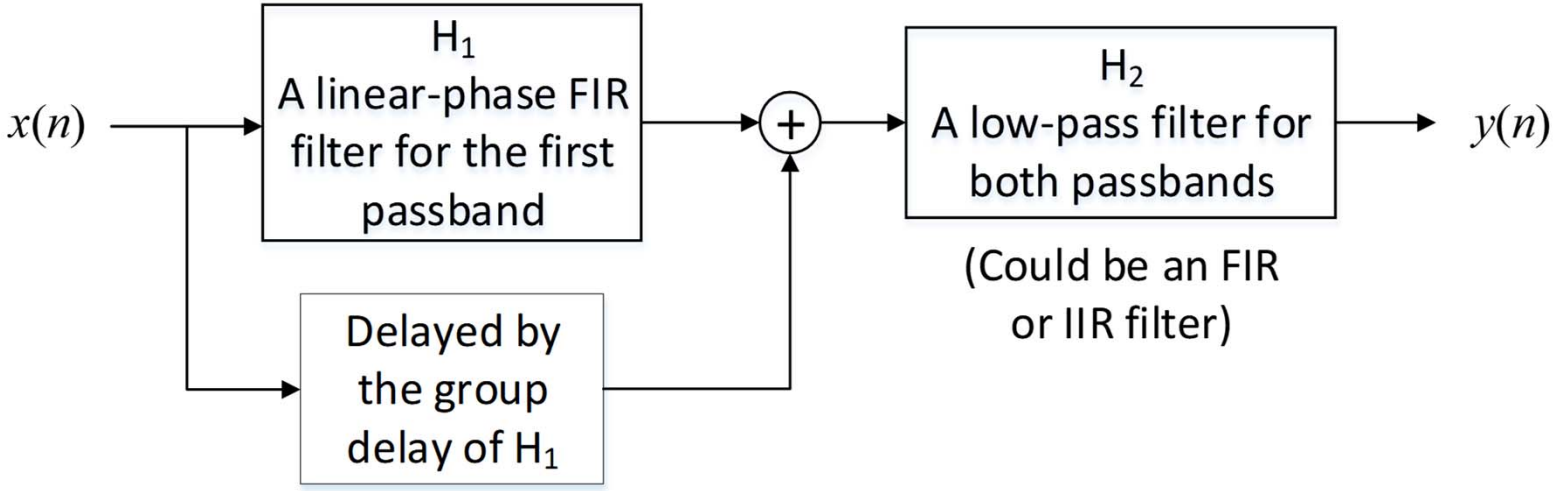
Course Project

- Turn in your assignment electronically. Use your student id as your filename.
- Filename: 學號_project.doc
- Turn in your report in Moodle!
- Due date: 06/28/2021

- Design a low-pass filter with the following specifications.
  - Sampling frequency: 250 kHz.
  - First passband edge frequency: 20 kHz.
  - First passband gain: 2.
  - Second passband range: from 40 kHz to 60 kHz
  - Second passband gain: 1.
  - Stopband edge frequency: 80 kHz.
  - Passband ripple size (peak to peak): 0.4 dB.
  - Stopband attenuation: 80 dB.

Course Project

– Hint: An architecture for your information:



- Show your design architecture and all your design coefficients with 12-bit resolution.
- Plot the magnitude response of your design using Matlab.

Course Project

- Convert your design into a Verilog code.
  - The input is in the 2's complement 8-bit fixed point format. Using the random number generator to generate a random signal of variance 1 as the input. Store the output signal in a text file.
  - In Matlab, read in the text file that stores the output signal created by the Verilog simulator. Convert them into real numbers if necessary. Plot the magnitude spectrum of the output signal and compare it with the magnitude response obtained in the previous step.