Mini-Project 07: Swiss Army Knife

You have gotten to the point in your studies that you can understand DSP papers that appear in IEEE publications. The purpose of this project is to read one such paper and reproduce some of its results in LabVIEW.

The paper

"The Swiss Army Knife of Digital Networks" by Richard Lyons and Amy Bell starts on page 90 of the May 2004 issue of the IEEE Signal Processing Magazine (Vol. 21 No. 3). When you get to the Signal Processing Magazine May 2004 page, if you have never see this publication before, click on "Table of Contents" (left column) and read the paragraph near the bottom that gives the scope of the magazine.

The memo

Give the article a quick read through from beginning to end (it's only 8 pages, and 4 of those have large figures). No need to remember all the details; just try to get a sense of all the things this one filter can do. Write a memo about the article. Your memo should contain the following:

1. A complete reference to the article.
2. An introduction telling what you are doing. (One or two sentences should be enough.)
3. A brief summary of the article. No more that half a page or so.
4. Further investigate the **«Filter_Name»** on page *«Page_Number»*. For this filter please:
   a. Give the name of your filter,
   b. Write the difference equation,
   c. Write the system function,
   d. Write the impulse response, and
   e. Reproduce the four plots in LabVIEW, in a row, inline in your memo. You may use `zplane`, `freqz`, etc. to do this. Note the Magnitude of the frequency response plot is in dB. Full credit for those who plot it in dB. Only one point off if you do a linear plot. Hint: the last homework showed how to find the frequency response without using `freqz`. Pick which method you like best.
5. Your judgment of the effectiveness of the article as a tutorial. Justify your opinion. No more that half a page or so.
6. A brief conclusion. (A sentence or two should be plenty.)
7. Use a memo format, and don't forget to initial it.

The memo is due at the beginning of class Monday February 13th.