Comments on CPH3

For problem 3, remember that

By definition

$$\Delta f = \frac{F_S}{N}$$

and

$$f_o = k \cdot \Delta f$$

so to avoid frequency leakage

$$k = \frac{f_o}{\Delta f}$$ where k must be an integer

Also, (as demo'd in class, and can be derived from the above formulas)
Frequency leakage is avoided if there are an integer number of cycles, C, of f_o
Where C is defined as

$$C = \frac{f_o}{F_S} N$$

Note: This can be checked using dimensional analyses

$$C = \frac{cycles / \sec ond}{samples / \sec ond} samples = cycles$$

So, in your program you could either limit *k* or *C* to an integer number, which inturn sets the value for N. I choose to make *C* an integer value, by rounding the the value given by the user of function up to the next integer.

One last note: If you see F_T and wonder what it is, it is the same thing as F_S. The book last year used F_T instead of F_S