UNCC, Department of Electrical and Computer Engineering
ECGR4101/5101, Fall 2005, Homework #6, Due: 10/24/05, at the beginning of class (20 points)

You will need to refer to the M16C/20/60 Software Manual, the M16C26 Hardware Manual and M16C C Language Programming Manual to complete this assignment. They are available online through the Documentation contained in the SKP16C26 directories link on the course home page.

0. (1 point) How long did this homework take you?

1. (5 points) Write the lines of C code needed to configure port 6 so the even-numbered bits are outputs and the odd-numbered bits are inputs (no pull-up resistors are needed). Use the symbols defined in sfr62p.h, which are slightly different from the ones in the Hardware Manual. Start with:
   `#include "sfr62p.h"`

2. (5 points) Clean up the following C function (for converting temperature to Celsius from Fahrenheit) to meet coding guidelines of lecture 9. Assume that valid values of i range from -40 to 250. If this value is not valid, return the value TEMP_ERROR.

```
int fc(int i) {
      int r;
      r = (i-32)*5.0/9.0;
      return r;
      }
```

   a. Change(s) needed to meet 1.1:
   b. Change(s) needed to meet 1.2:
   c. Change(s) needed to meet 8.1:
   d. Change(s) needed to meet 5.1:

3. (2 points)What is the output code (in decimal) of a 5-bit ADC with
   V_{in}=6.8V, V_{+ref}=10 V, V_{-ref}=0 V ?
4. (2 points)What is the output code (in decimal) of an 8-bit ADC with
   V_{in}=3.2V, V_{+ref}=5 V, V_{-ref}= 1.5 V ?
5. (2 points)What is the maximum quantization error for an 8 bit ADC with
   V_{+ref}=10 V, V_{-ref}=0 V ?
6. (3 points) Read the Russell Massey article "Introduction to Interrupts." In four lines of correct English, summarize Mr. Massey's article.