

**UNC Charlotte, Department of Electrical and Computer Engineering**  
**ECGR 4101/5101, Spring 2012, Homework #3**  
**(20 points)**

**Assignment should be submitted to Moodle.**

1. Write the C code to set port 3, bits 0 through 3 to be output pins, and port 4, bits 4 through 7 to be input pins of our board. (2 points)
2. Write the C code to read the data on port 3, bits 4 through 7 and write the read data to port 3, bits 0 through 3 of our board. (4 points)
3. Write the complete pseudocode for a function to describe how change to toggle the case all of the vowels (not including y) in a string S and convert spaces to the underscore character ( \_ ). Do not use any function calls. (2 points)
4. Write a C function to implement the pseudocode of the previous question. (4 points)  
Assume the *address* of the global variable  
`char S[80]; /* the string */`  
is passed into the function, i.e. the call would be  
`ChangeChar(&S);`
5. Jim Turley wrote the article “The Two Percent Solution” in 2002. Mr. Turley believed processors make up only a small percentage of semiconductor volume yet generate most of the revenue. That was ten years ago. Has anything changed since then? In up to ten lines of correct English, state why you agree or disagree with him, **and cite one current article or website to justify your points.** (8 points)