

TECH 3230
Lab #2
Scope and Volatile
Ver 1.0

Purpose: To familiarize students with variable scope and the issues with not using the keyword Volatile in interrupt coding.

Procedure:

Testing the key word Volatile:

1. Download Lab2 from the class website. Unzip the file and open the project by opening Lab2.atstn (project file)
2. Open main.c if it is not already opened. To do this look on the right side of the window in “Solution Explorer” and click on main.c
3. Make sure line numbers are turned on. If they are not go to Tools | Options | Text Editor | All Languages | and check Line Numbers.
4. Compile and run the program as is (no edits). You should see the LED near pin 13 blinking about every second.
5. Now remove the key word ‘volatile’ from line 4. Compile and Run the program again. Is the Light Blinking? Obviously, this is because the word volatile is missing. Write your theory about happening in the system to make it stop working in the space below?
6. Just to make it even more interesting....remove // from line 30 (adding in the print for the counter). Compile and run the program (and open PuTTY to see the output). Theorize why the LED is blinking again (in the space provided).

Scope of a variable:

1. Download Lab2b from the class website. Unzip the file and open the project by opening Lab2b.atsln (project file)
2. A common debugging tool programmers use is to add printf's into their programs to see what values are at a particular point in code. Add printf's to the code to show the scope of each variable called "test". [there should be enough space, do not add extra lines to the program....since we will be using line numbers to answer questions – there should be a total of 99 lines in this program...the last line being blank]. For the functions, call the function from main to execute each (you can call the function directly from the printf statement instead of creating a variable to store the value then print).
3. Now fill in the table for each variable test:

test variable created at line #	test variable no longer exists after line # (or comment)
11	
27	
39	
49	
55	
77	

4. What type of variable is created in line 4? When is the only time the value established in line 4 is used? Why?

5. Describe what happens to test in the loop from lines 79 – 87? Why does it occur?

6. What would happen if you took out the {} on lines 76 and 90? Why?

Turn in this sheet and a zip file of the modified code for Lab2b