

Basic Tutorial for Keil Software

Written by
www.MicroDigitalEd.com



Introduction

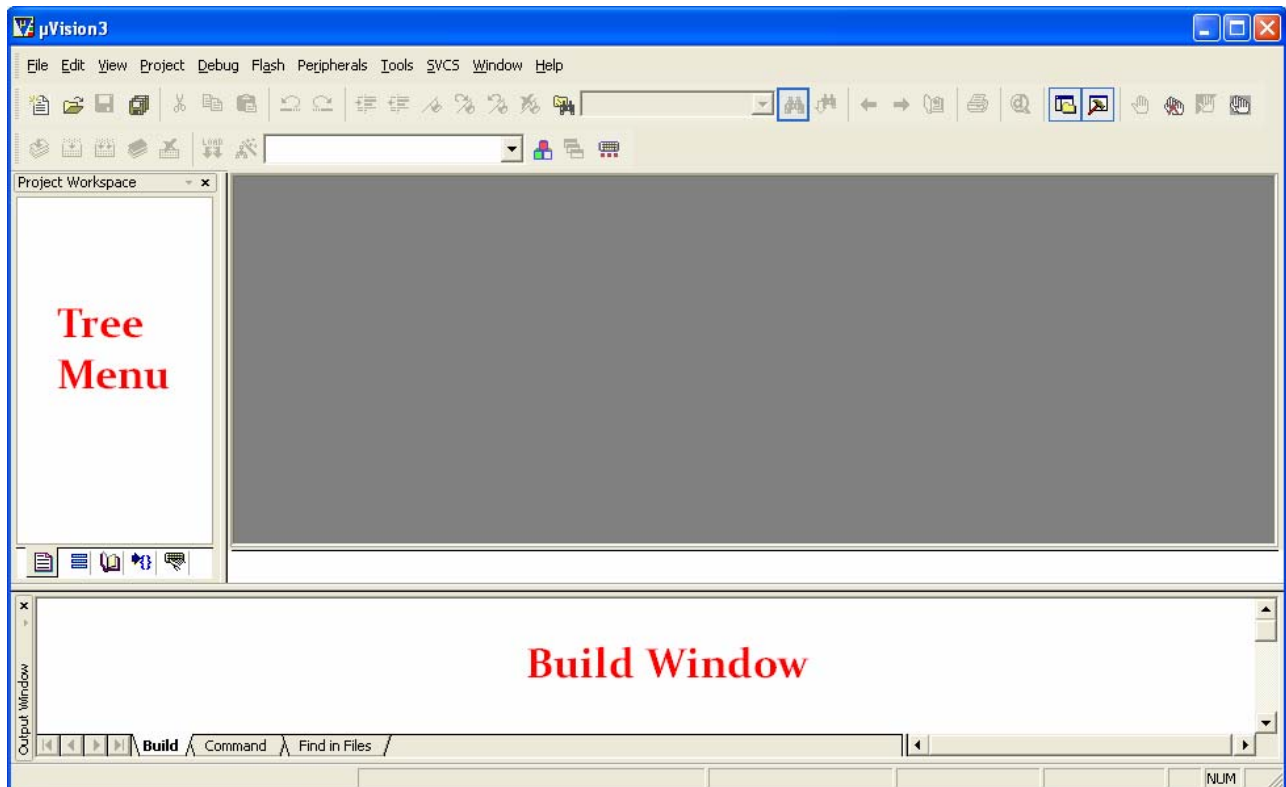
This tutorial will assist you in writing your first 8051 Assembly language program using the popular Keil Compiler. Keil offers an evaluation package that will allow the assembly and debugging of files 2K or less. This package is freely available at their web site. Keil's website address is www.keil.com.

The sample program included in the tutorial toggles Ports 1 and 2 on the 8051. The compiled program has been tested using the 8051 board from MicroDigitalEd.com. The program also works with other systems that have Port 1 and 2 available.

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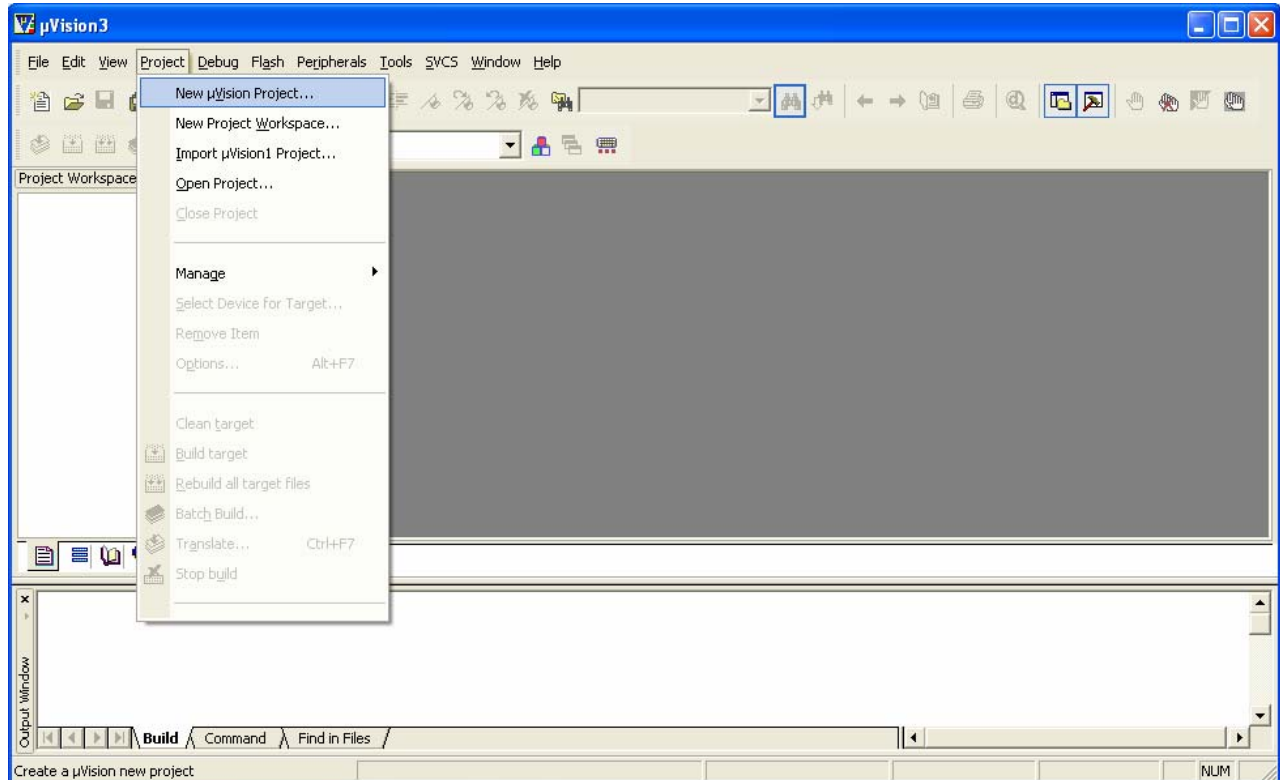
Basic Keil Tutorial

1. Open Keil from the Start menu
2. The Figure below shows the basic names of the windows referred in this document

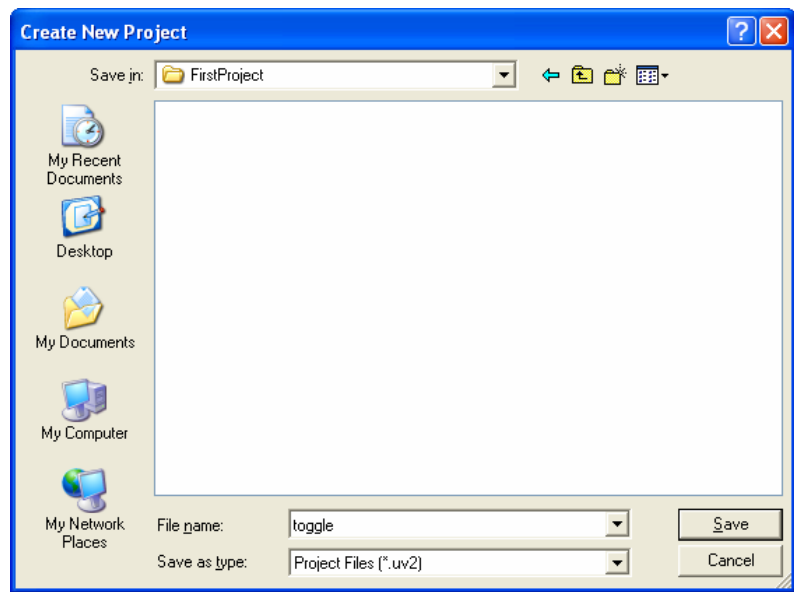


Starting a new Assembler Project

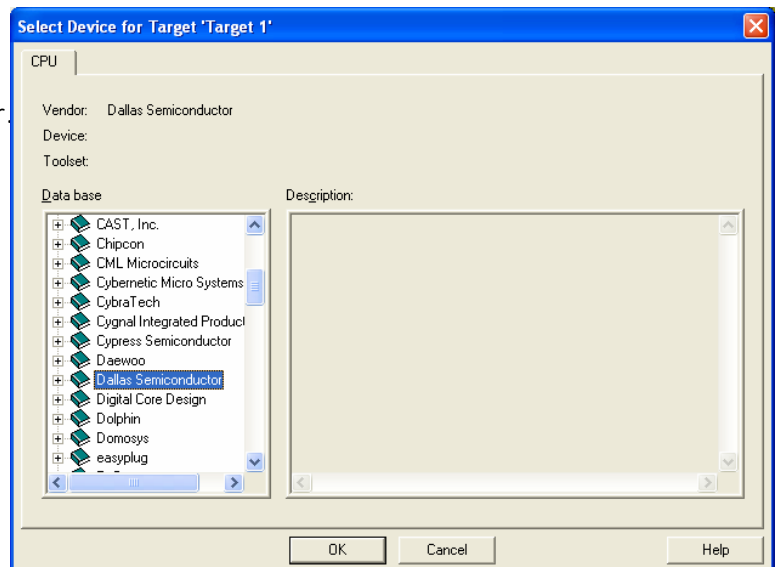
3. Select New μ Vision Project from the Project Menu.



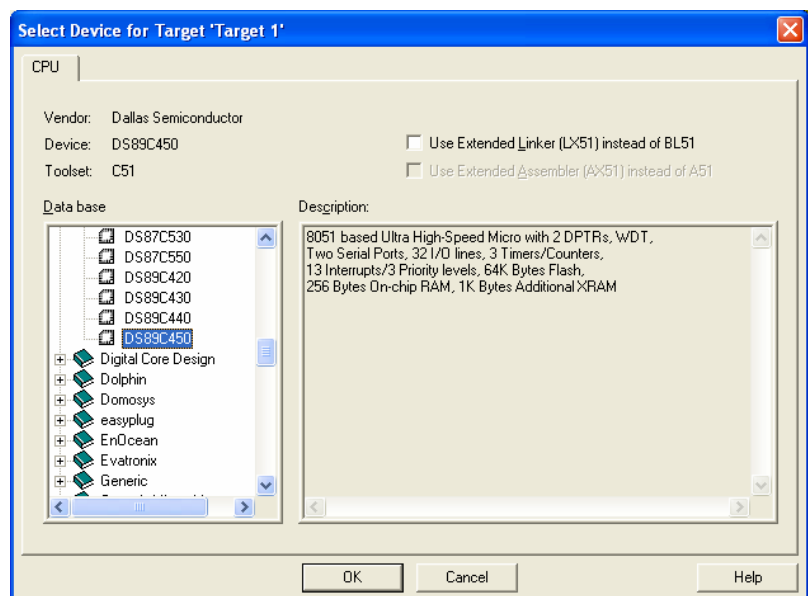
4. Name the project 'Toggle'
5. Click on the Save Button.



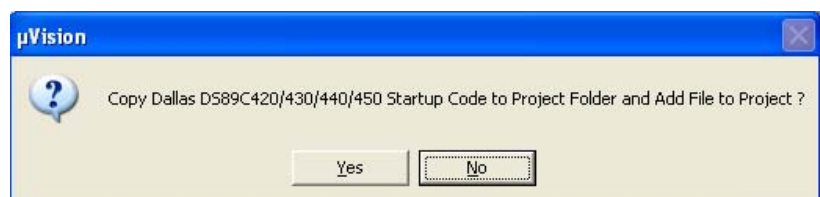
6. The device window will be displayed.
7. Select the part you will be using to test with. For now we will use the Dallas Semiconductor part DS89C450.
8. Double Click on the Dallas Semiconductor.



9. Scroll down and select the DS89C450 Part
10. Click OK

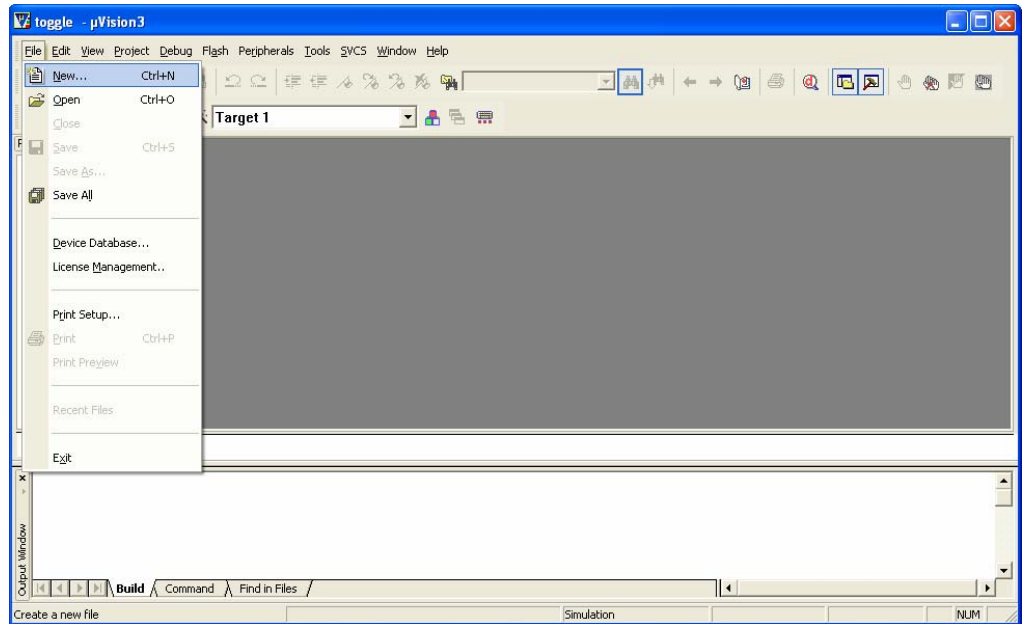


11. Choose *No*.

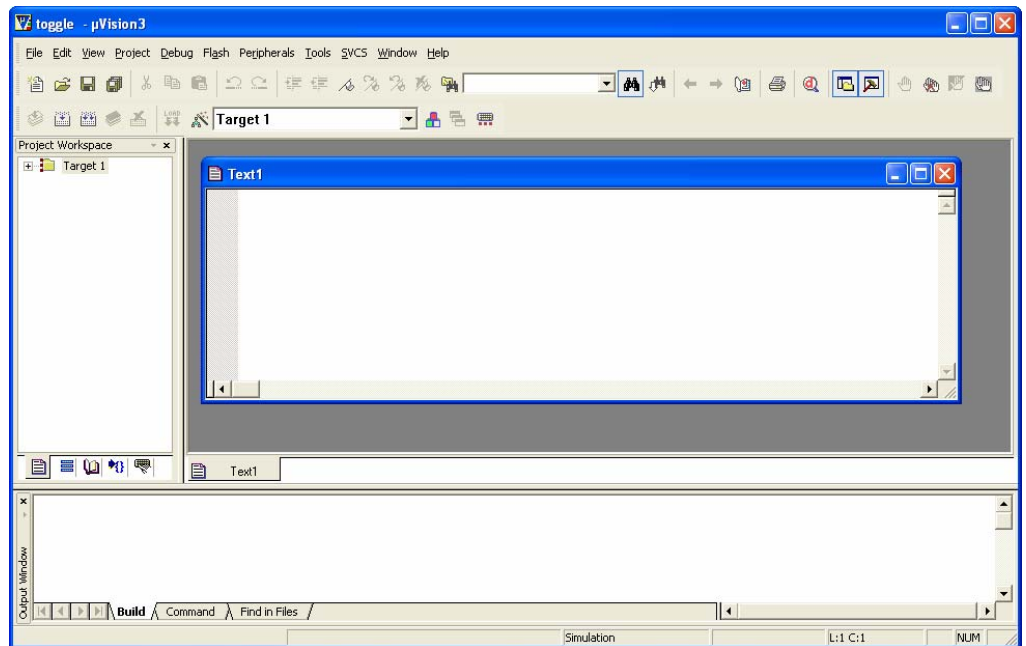


Creating Source File

1. Click File Menu and select New.



2. A new window will open up in the Keil IDE.



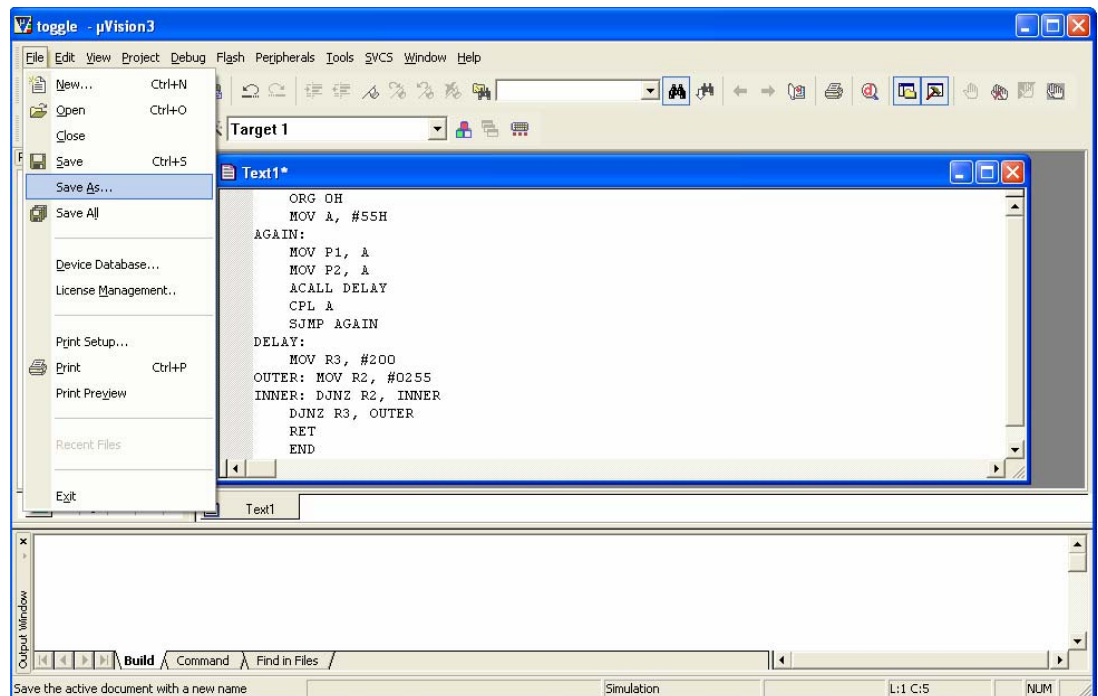
- Copy the example to the Right into the new window. This file will toggle Ports 1 and 2 with a delay.

```
ORG 0H
    MOV A, #55H
AGAIN:
    MOV P1, A
    MOV P2, A
    ACALL DELAY
    CPL A
    SJMP AGAIN

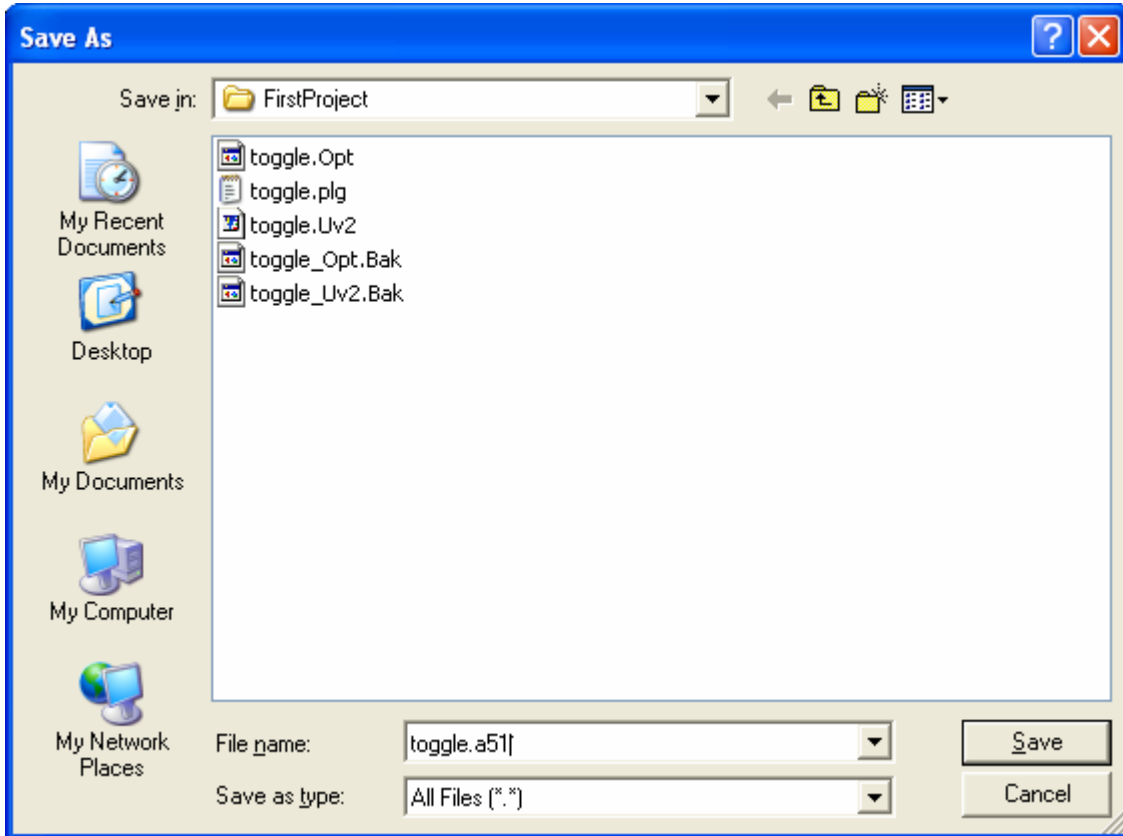
DELAY:
    MOV R3, #200
OUTER: MOV R2, #0255
INNER: DJNZ R2, INNER
        DJNZ R3, OUTER
        RET

END
```

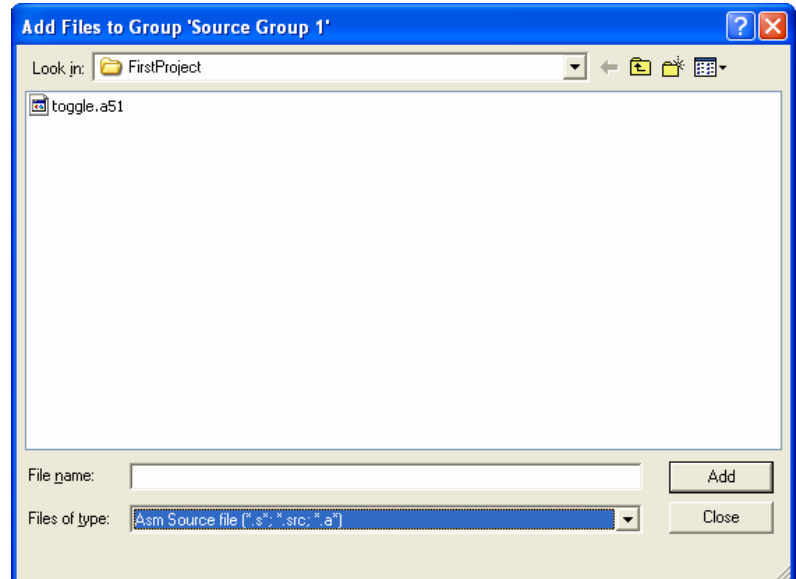
- Click on File menu and select Save As...



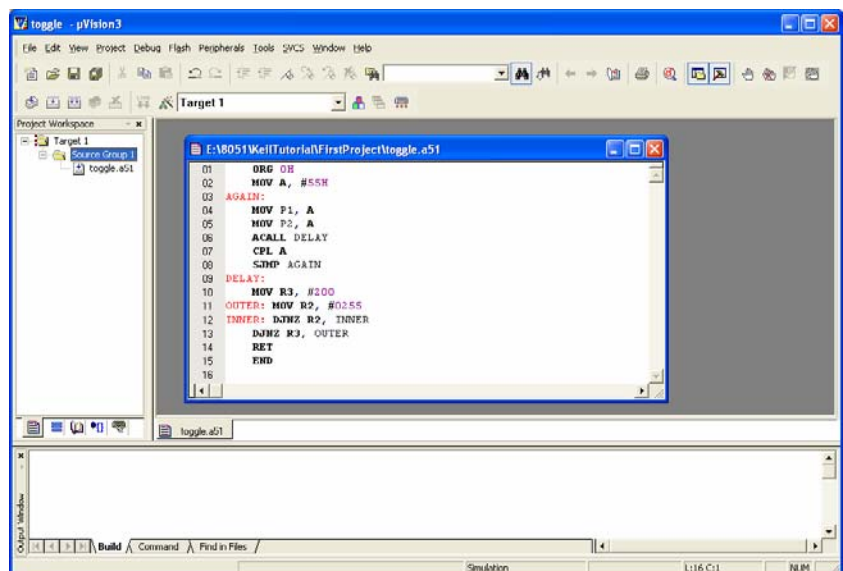
5. Name the file Toggle.a51
6. Click the Save Button



4. Change file type to *Asm Source File (*.a; *.src)*.
5. Select *toggle.a51*
6. Click *Add* button
7. Click Close button.

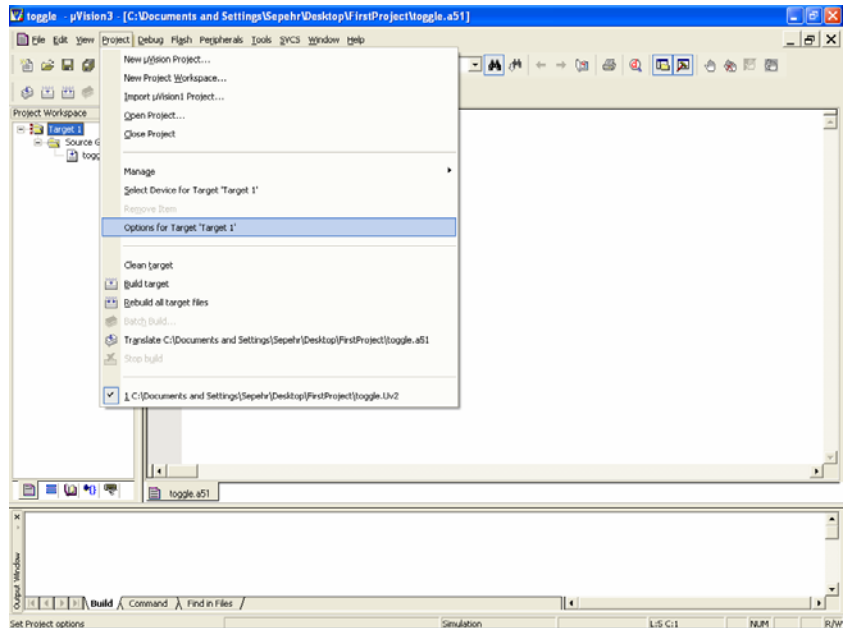


8. Expand the *Source Group 1* in the Tree menu to ensure that the file was added to the project

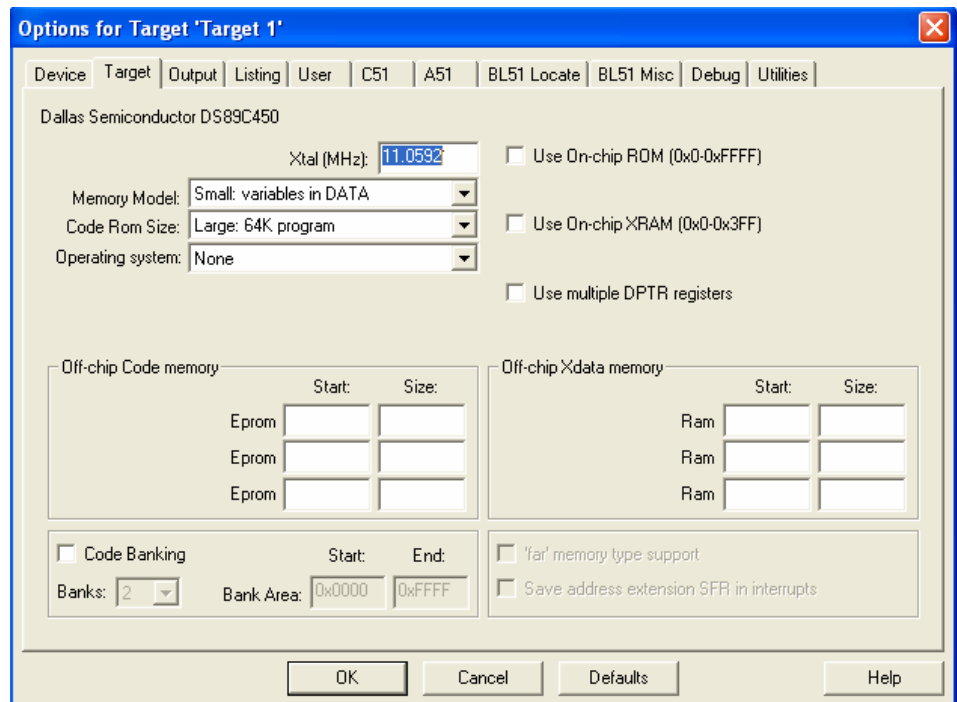


Creating HEX for the Part

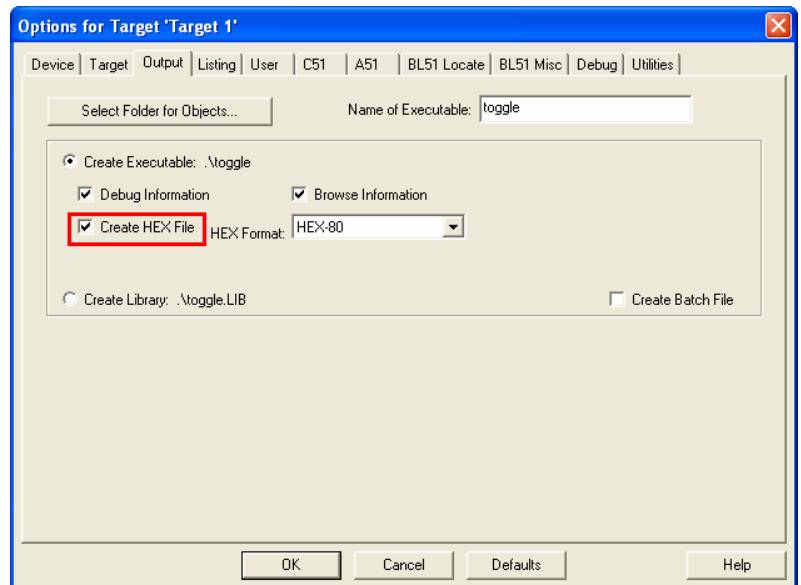
1. Click on Target 1 in Tree menu
2. Click on Project Menu and select Options for Target 1



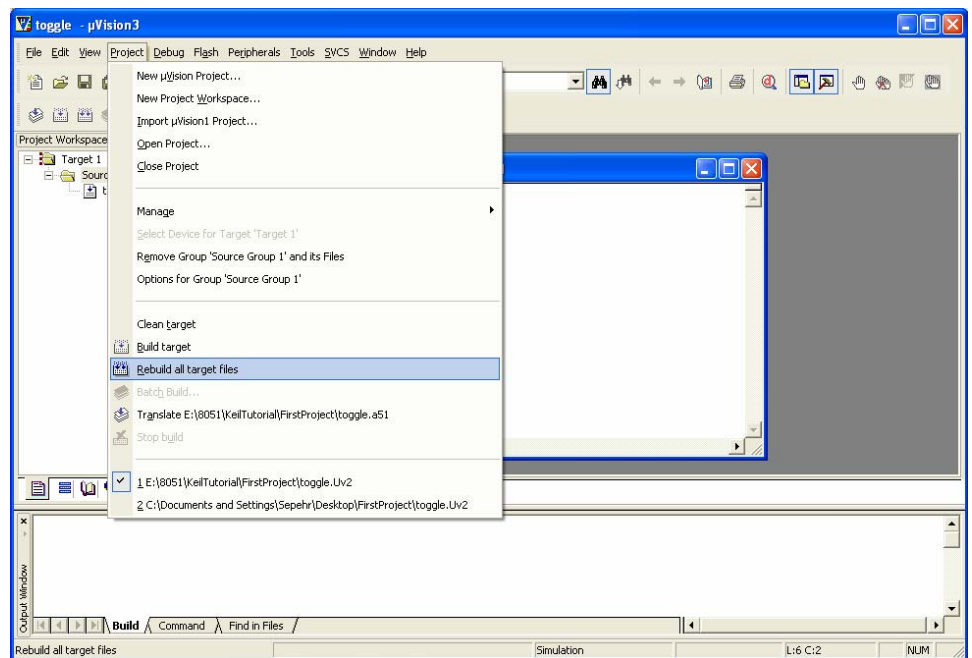
3. Select Target Tab
4. Change Xtal (Mhz) from 33.0 to 11.0592



5. Select Output Tab
6. Click on Create Hex File check box
7. Click OK Button




8. Click on Project Menu and select Rebuild all Target Files
9. In the Build Window it should report '0 Errors (s), 0 Warnings'
10. You are now ready to Program your Part



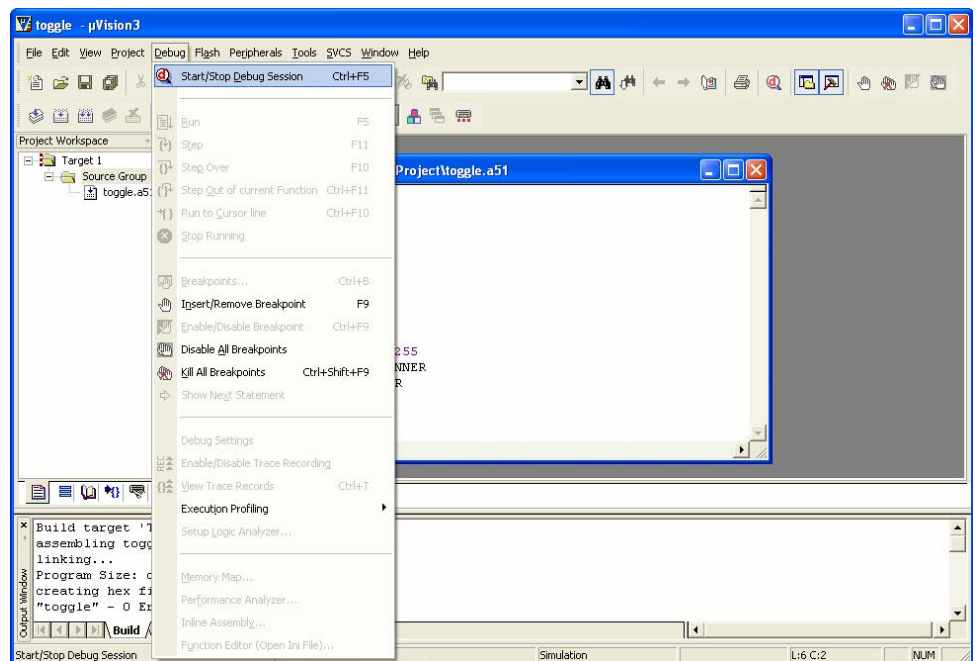
Testing Program in Debugger

1. Comment out line ACALL DELAY by placing a Semicolon at the beginning. This will allow you to see the port change immediately.
2. Click on the File Menu and select Save

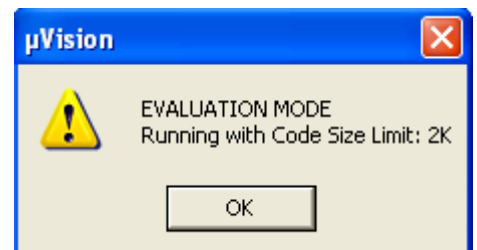


```
E:\8051\KeilTutorial\FirstProject\toggle.a51*
01      ORG 0H
02      MOV A, #55H
03      AGAIN:
04      MOV P1, A
05      MOV P2, A
06      ; ACALL DELAY
07      CPL A
08      SJMP AGAIN
09      DELAY:
10      MOV R3, #200
11      OUTER: MOV R2, #0255
12      INNER: DJNZ R2, INNER
13      DJNZ R3, OUTER
14      RET
15      END
16
```

3. Click on Project Menu and select Rebuild all Target Files
4. In the Build Window it should report '0 Errors (s), 0 Warnings'
5. Click on Debug Menu and Select Start/Stop Debug Session.

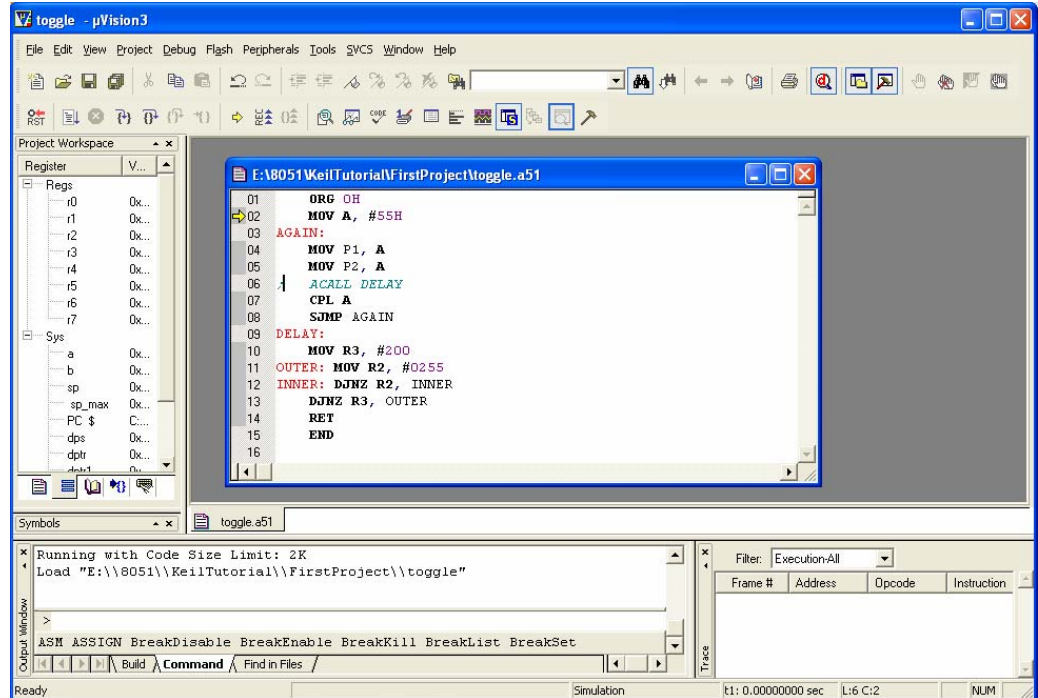


6. If you use a free version of Keil the dialog appears. Click OK.

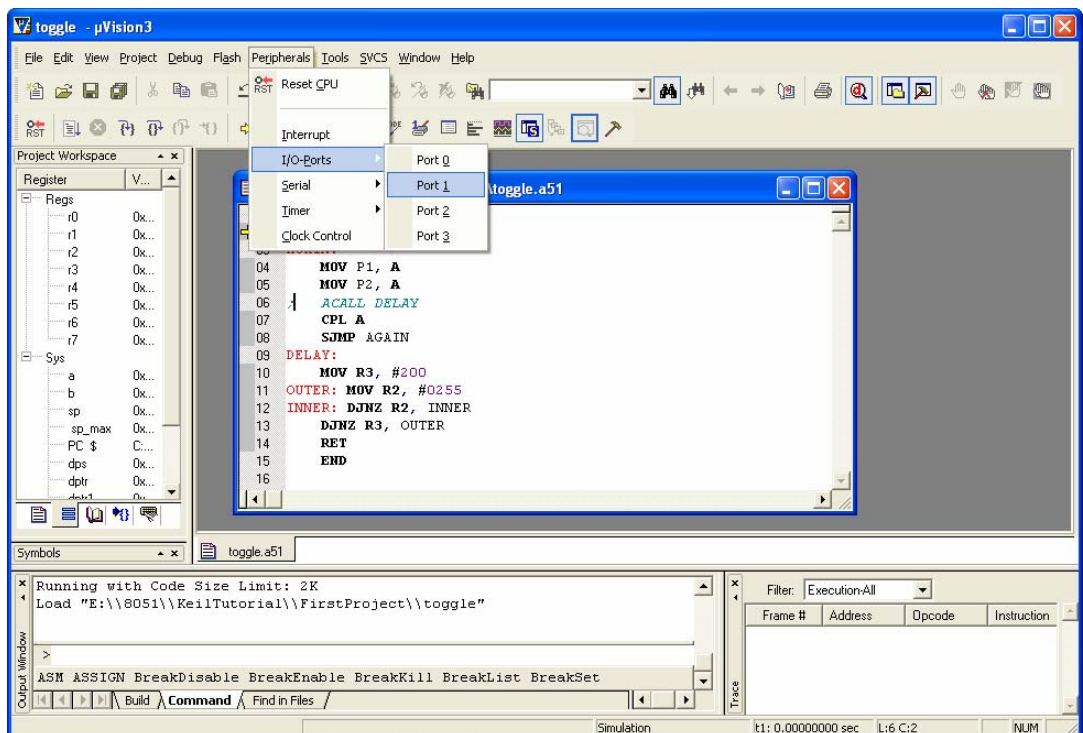


Running the Keil Debugger

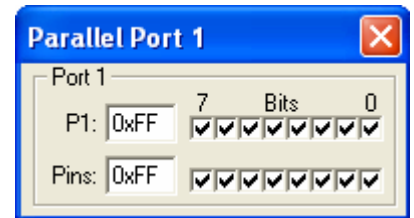
1. The Keil Debugger should be now Running.



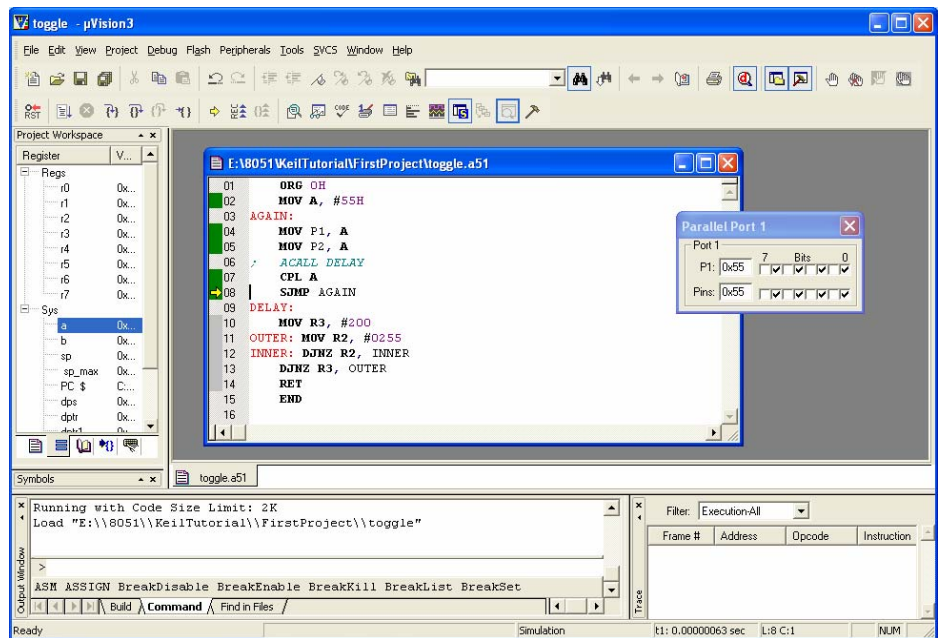
2. Click on Peripherals. Select *I/O Ports*, Select *Port 1*.



3. A new window should pop up. This represent the Port and Pins



4. Step through the code by pressing F11 on the Keyboard. The Parallel Port 1 Box should change as you completely step through the code.



5. To exit out, Click on Debug Menu and Select Start/Stop Debug Session