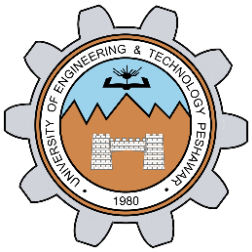
MICROPROCESSOR BASED SYSTEM DESIGN LAB

Lab #01



Spring 2021

CSE307L MBSD Lab

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Registration No.: **18PWCSE1658**

Class Section: **B**

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Student Signature: _____

Submitted to:

Engr. Amaad Khalil

Thursday, May 13, 2021

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

Task:

Write a detailed lab report on Introduction to 8051 Microcontroller & Installation of Software (Proteus and Keil).

Objectives of the lab

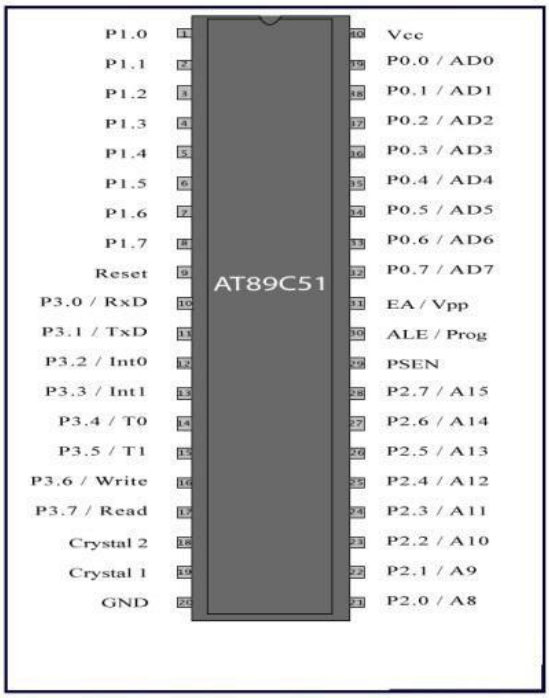
- To get familiar with Keil µVision Integrated Development Environment(IDE).
- Familiarization with 8051 Microcontroller.
- Designing an 8051 Starter Kit
- Toggling I/O Port.

Hardware & software requirement

- Breadboard
- 8051 Microcontroller (AT89C51)
- Crystal Oscillator, Capacitors, Resistors and LEDs
- 8051 Assembler (Keil µVision).
- 8051 Programmer.

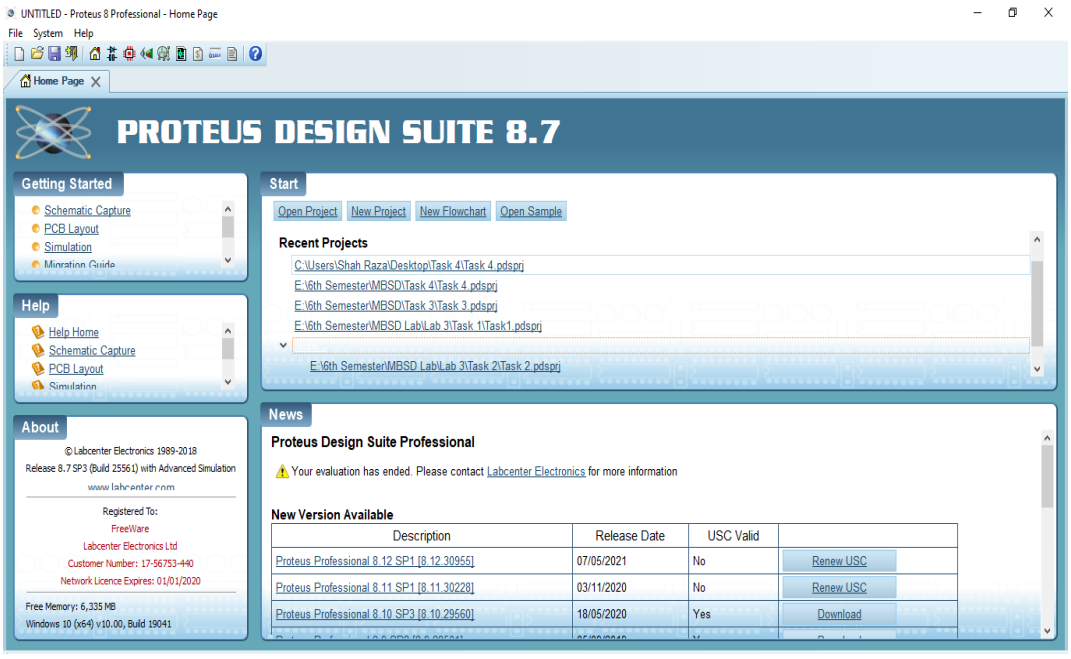
Starter Circuit

- AT89C51 have 40 pins dedicated for various functions such as I/O, -RD, -WR, address, data, and interrupts.
- The 8051 has an on-chip oscillator but requires an external clock to run it. A quartz crystal oscillator is connected to inputs XTAL1 (pin19) and XTAL2 (pin18). The quartz crystal oscillator also needs two capacitors of 30 pF value



Proteus Professional Introduction

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

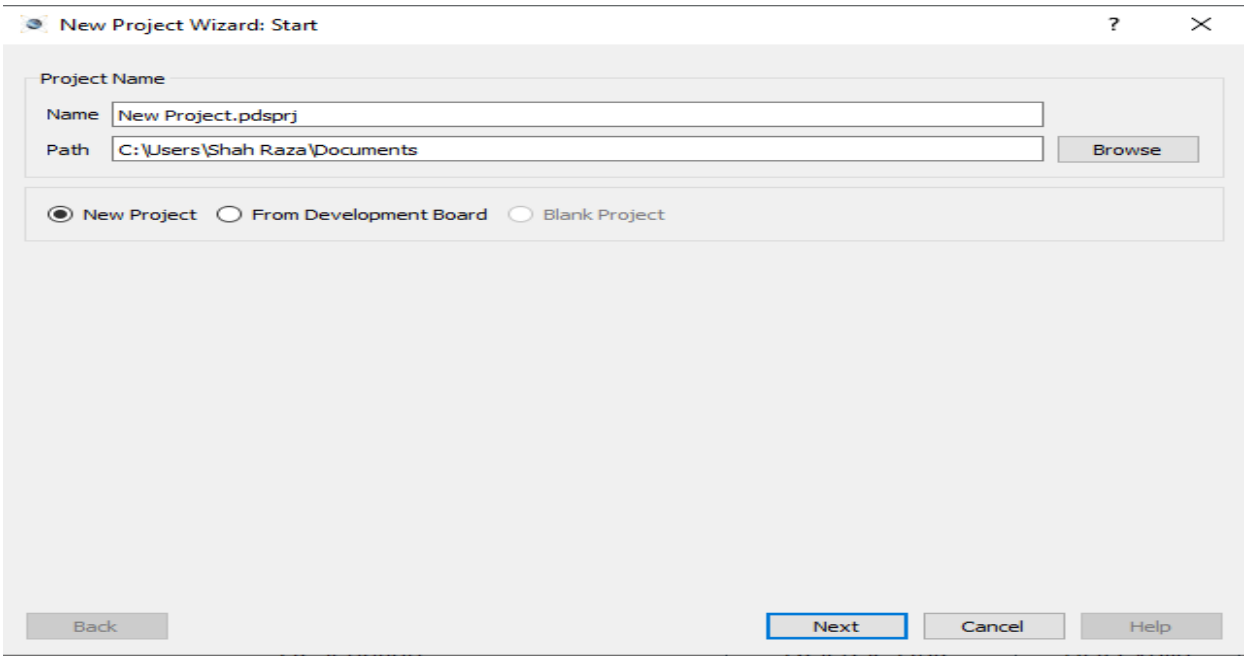


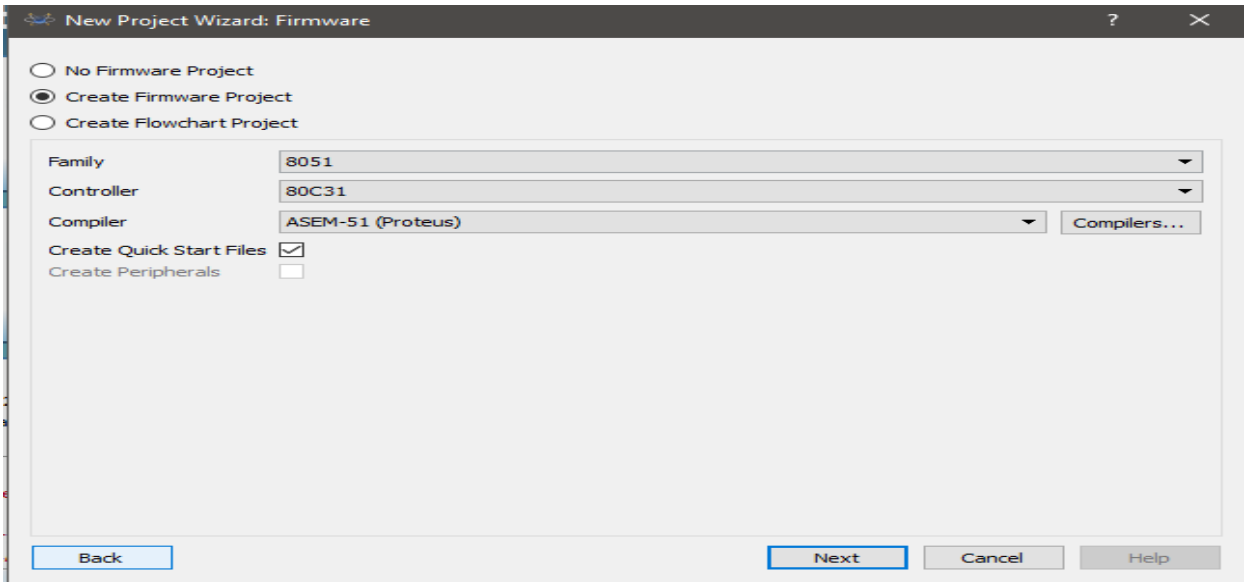
Starting a New Project

3. Select New Project from the Start Menu.
4. Name the project *Toggle*
5. Click on the Next Button

The device window will be displayed.

6. Select the part you will be using to test with. For now, we will use the 80C51.

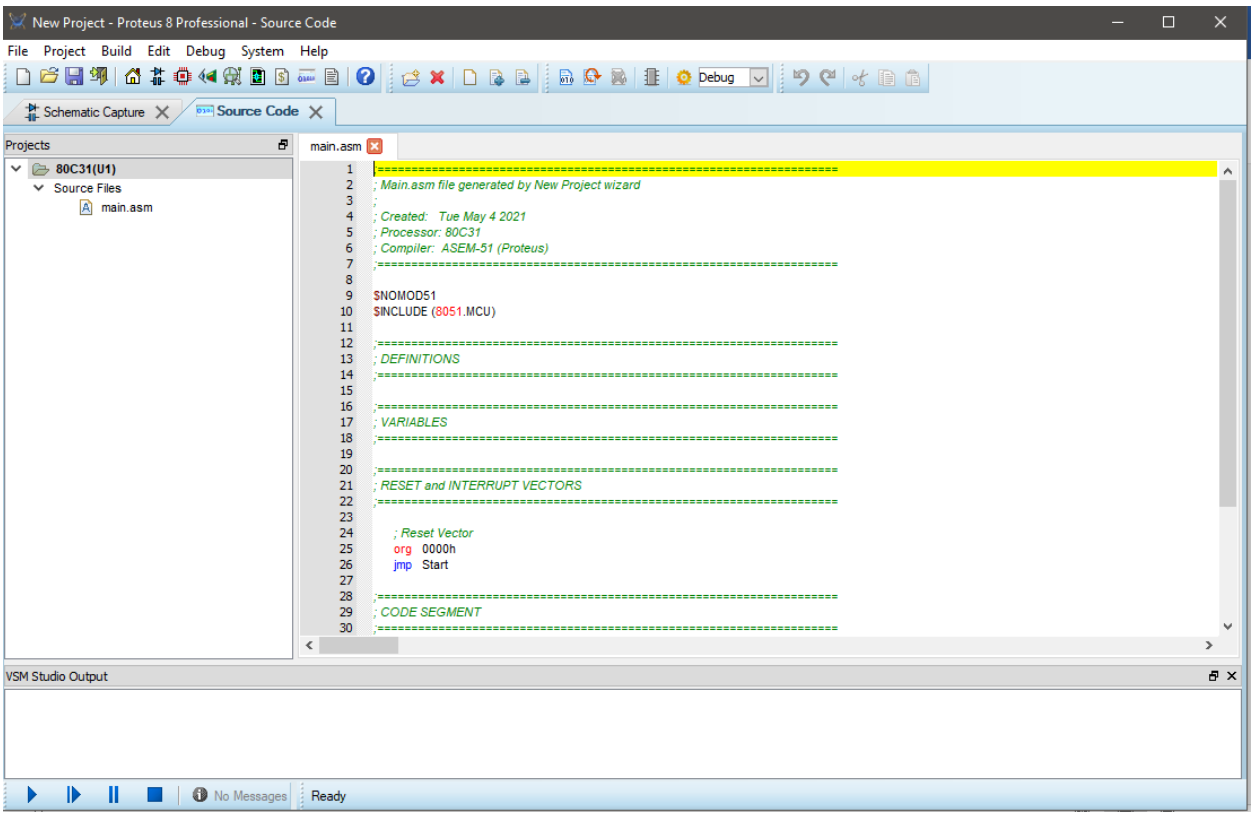




Creating Source File

7.It opens automatically a source file for you according to the selected the compiler.

8. It's a .asm file or .c for using c language.



Testing Program in Debugger

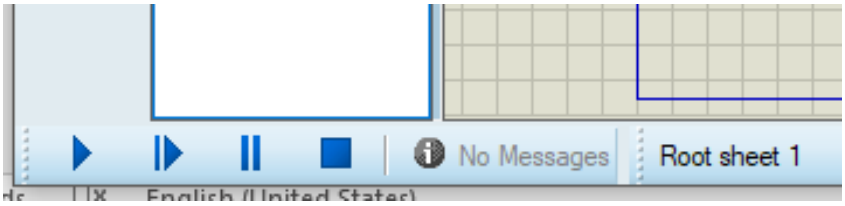
9.Click on the Project menu and select Build all Target Files.

10.In the build window it should report '0 Error(s) and 0 Warnings'

11.Click on Debug menu and select 'Start/Stop Debug Session'.

12.To exit out, click on Debug menu and select 'Start/Stop Debug Session'.

13. At the End of the window compiling options.

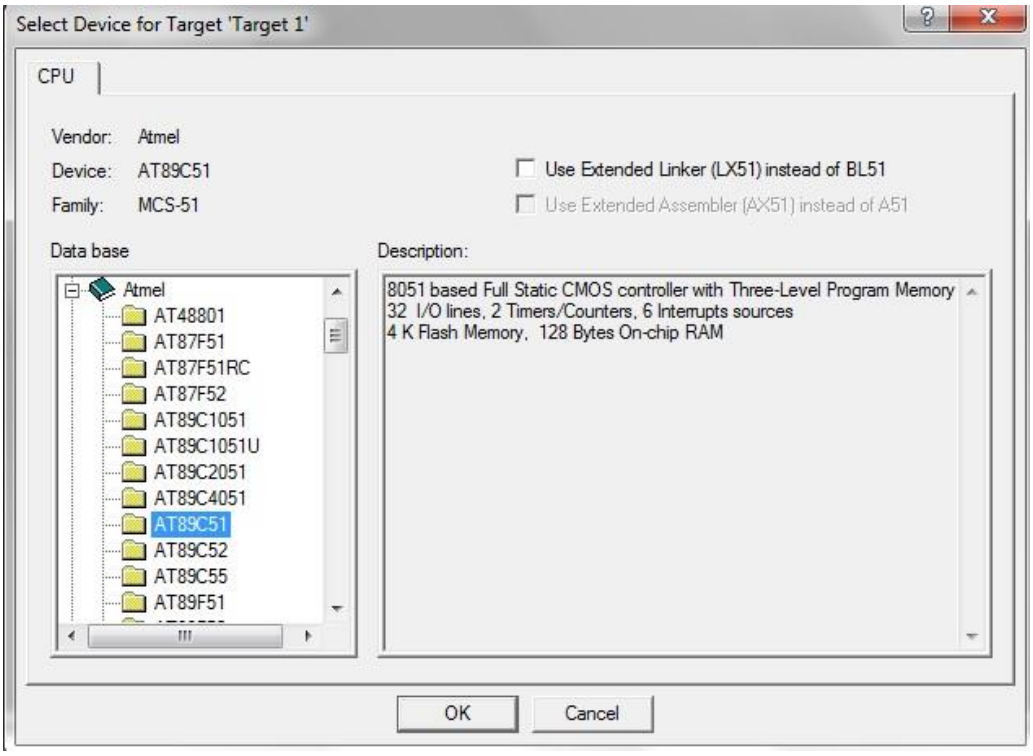


Keil uvision5 Introduction
Starting a New Project

7. Select New Project from the Project Menu.
8. Name the project *Toggle*
9. Click on the Save Button

The device window will be displayed.

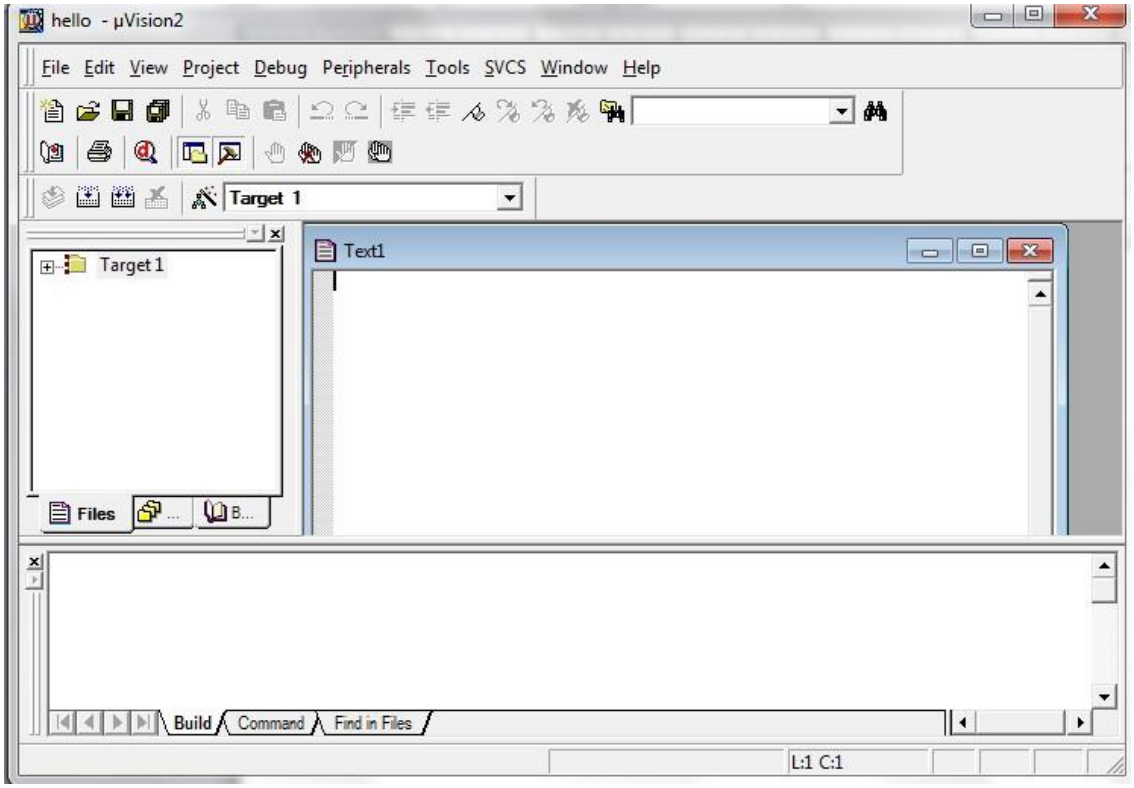
10. Select the part you will be using to test with. For now, we will use the Atmel's AT89C51



Creating Source File

7. Click File Menu and select New.
8. A new window will open up in the KeilIDE.
9. Copy the code given below in assembly language in the new window. This code will toggle Port 1 and Port 2 continuously.

10. Click on the file menu and select Save.
11. Name the file Toggle.asm

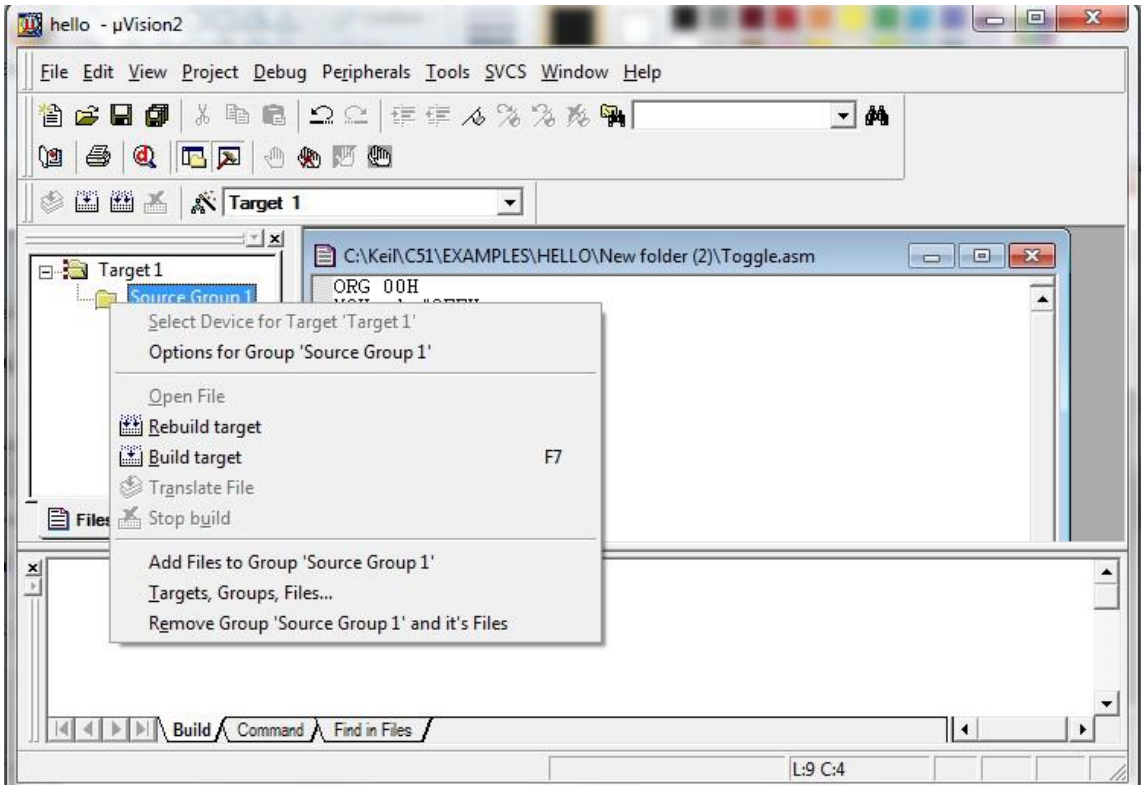


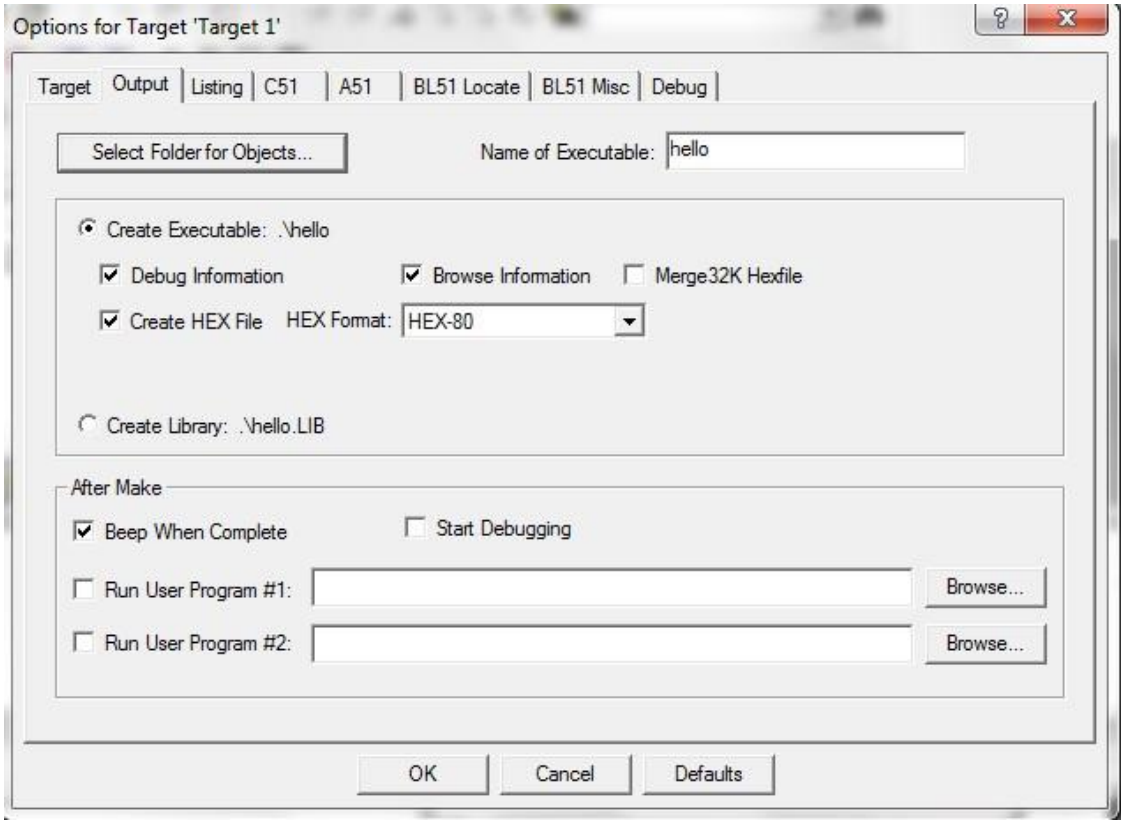
Adding File to the Project

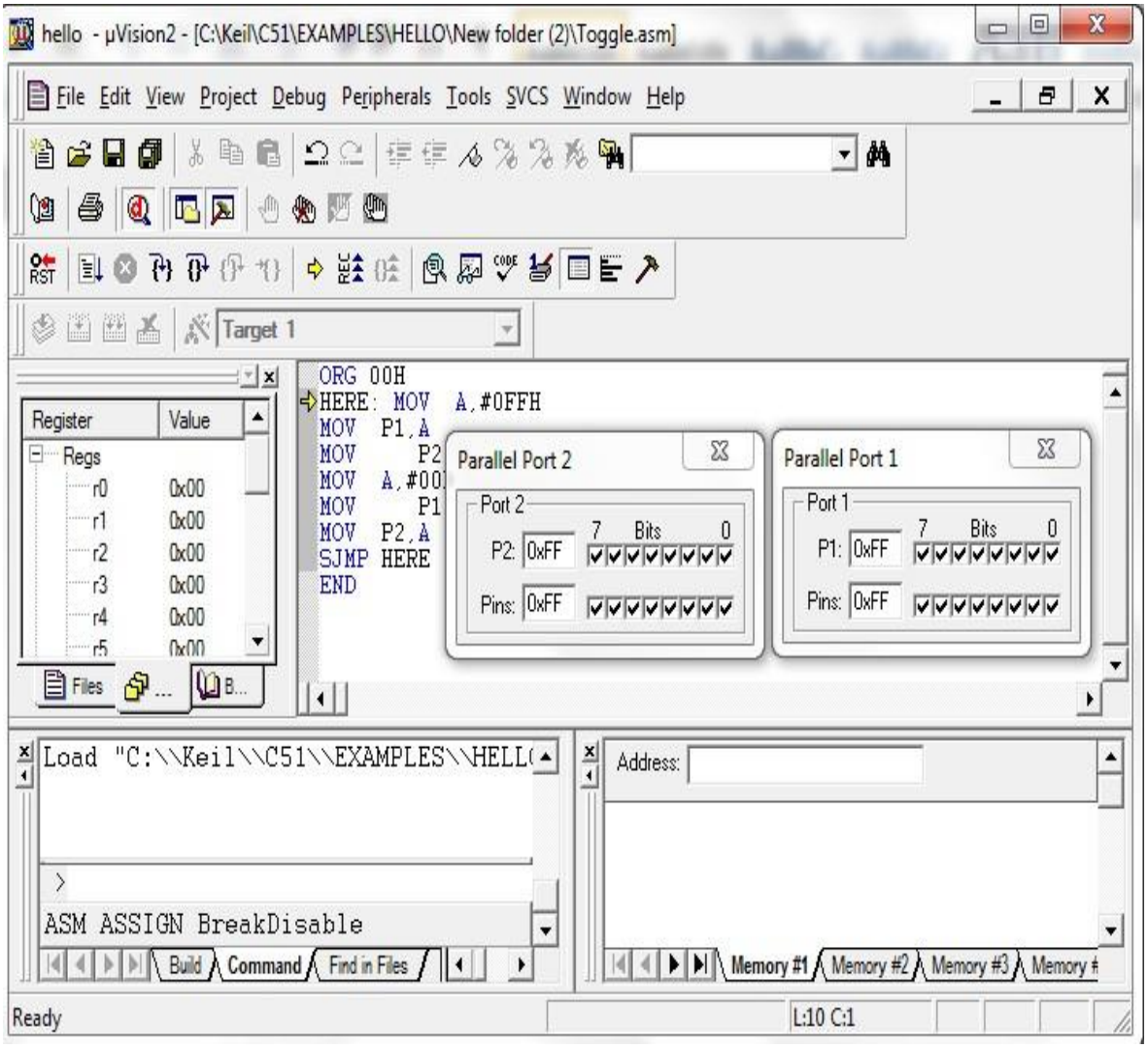
12. Expend Target1 in the tree menu.
13. Click on Source Group1 and select Add file to Group 'Source Group1'.
14. Change file type to Asm Source File (*.a, *.src, *.asm).
15. Click on Toggle.asm and select Add button.
16. Click Close button.
17. Expend the Source Group 1 to ensure that the file was added.

Creating HEX file

18. Select on Target 1 in tree menu.
19. Click on Project menu and select Options for Target 1.
20. Select Output tab and then select Create Hex File check box.
21. Click Ok button.


hello - µVision2
File Edit View Project Debug Peripherals Tools SVCS Window Help
Target 1
Target 1
Source Group 1
C:\Keil\C51\EXAMPLES\HELLO\New folder (2)\Toggle.asm
ORG 00H
Select Device for Target 'Target 1'
Options for Group 'Source Group 1'
Open File
Rebuild target
Build target F7
Translate File
Stop build
Add Files to Group 'Source Group 1'
Targets, Groups, Files...
Remove Group 'Source Group 1' and it's Files
Build
Command
Find in Files
L:9 C:4


Options for Target 'Target 1'
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Select Folder for Objects...
Name of Executable: hello
Create Executable: .\hello
Debug Information
Browse Information
Merge32K Hexfile
Create HEX File
HEX Format: HEX-80
Create Library: .\hello.LIB
After Make
Beep When Complete
Start Debugging
Run User Program #1:
Browse...
Run User Program #2:
Browse...
OK
Cancel
Defaults

Testing Program in Debugger

22. Click on the Project menu and select Build all Target Files.
23. In the build window it should report '0 Error(s) and 0 Warnings'
24. Click on Debug menu and select 'Start/Stop Debug Session'.
25. Click on Peripherals and select I/O Ports.
26. Select Port 1 and Port 2.
27. Step through the code by pressing F11 on the keyboard. The Port Boxes change with passing instructions.
28. To exit out, click on Debug menu and select 'Start/Stop Debug Session'.