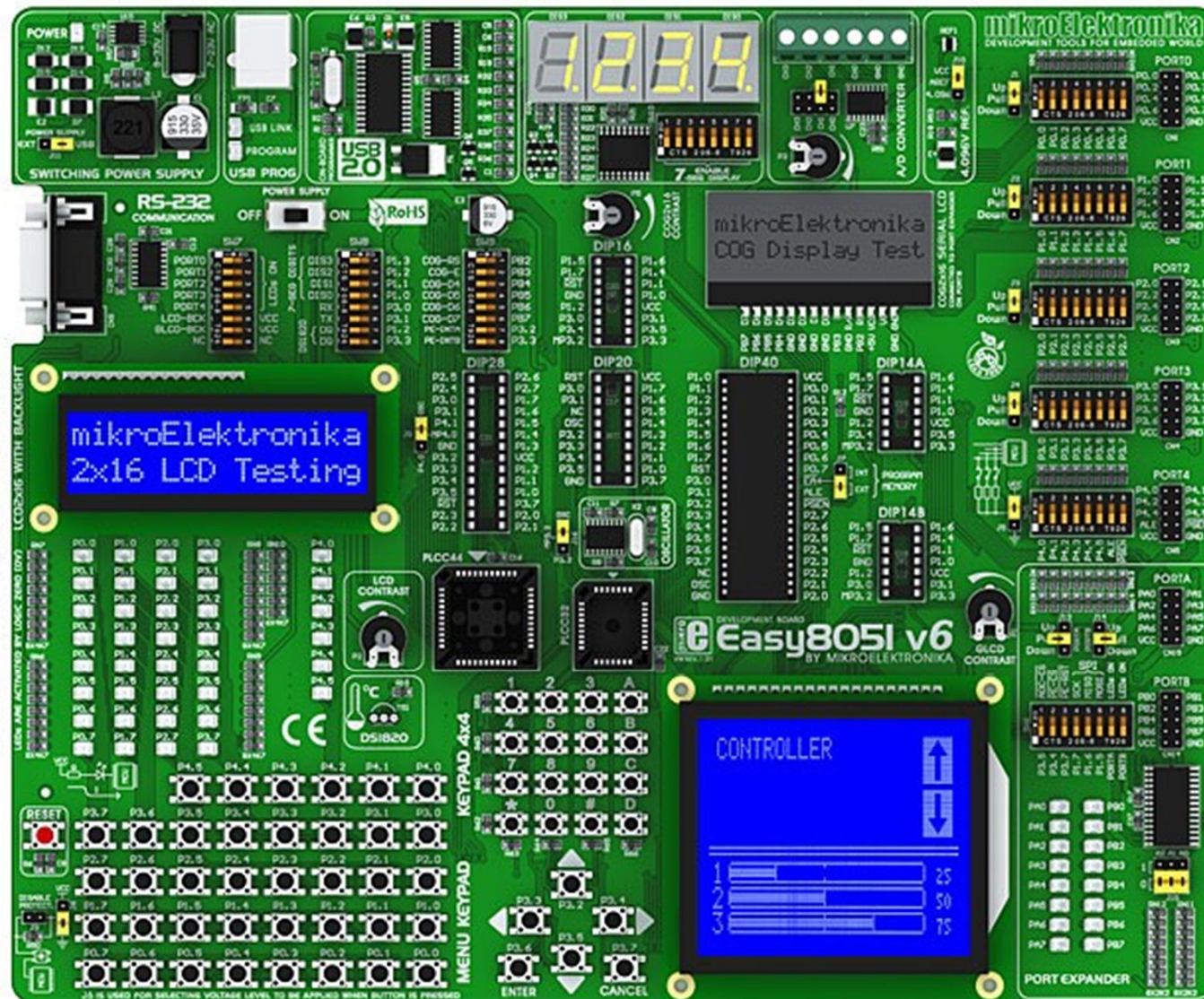# Microprocessors and Microcontrollers (EE-231)
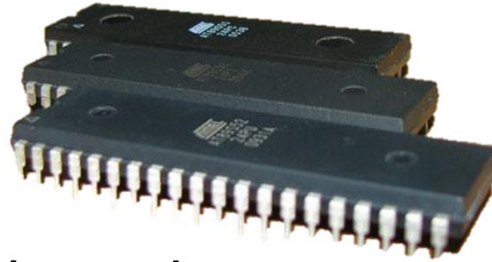
Lab-1

Main Objectives

- Introduction to 8051 Microcontroller Development Boards.

- Introduction to KEIL μ vision 4

- Project Development in KEIL, and its hardware simulation on Boards

Easy 8051 Development Board

Easy 8051 Development Board

- **Easy8051 v6** development system supports a wide range of **Atmel 8051** microcontrollers.

- Very fast, on-board USB 2.0 programmer

On-Board Devices

- RS-232 Serial Port

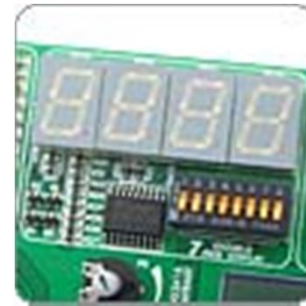- LEDs for each port

- LCD Display

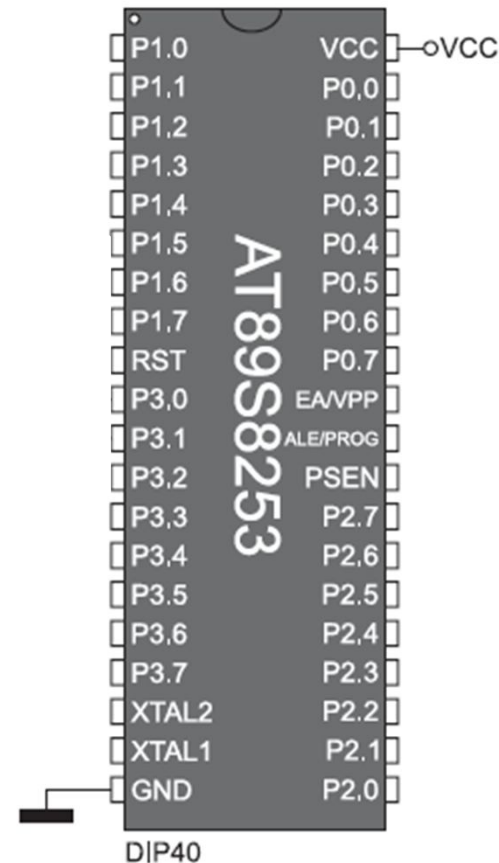# On-Board Devices

- Push Buttons

- Seven Segment Display

- A/D Converter

Microcontroller

- 40-pin IC AT89S8253 Comes with the board
- It has
- Flash (Kbytes): 12 Kbytes
- EEPROM (Bytes): 2048
- Max. Operating Frequency: 24
- Max I/O Pins:32
- SPI:1
- UART:1
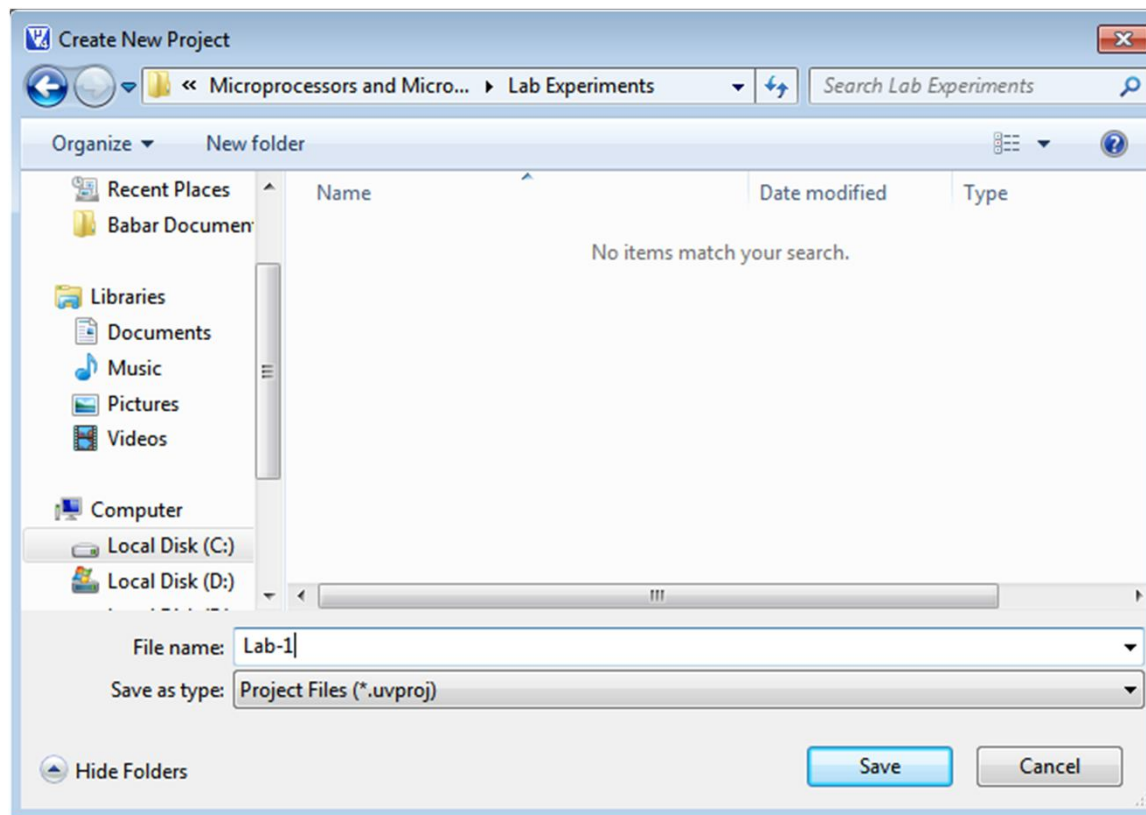- SRAM (Kbytes): 0.25
- Timers: 3

KEIL U Vision

- Before running the KEIL right click on its Icon and go to its properties.

- Go to **Compatibility** Tab.

- Then in '**Privilege Level**' section check the box stating '**Run this program as an administrator**'
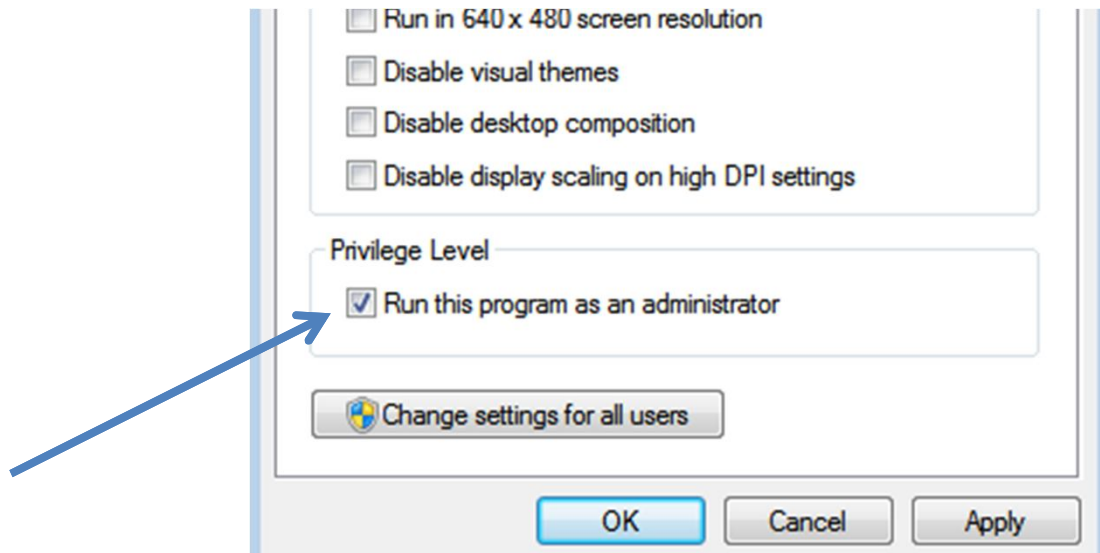
Creating New Project

- Go to 'Project' then select 'Create new Project'.
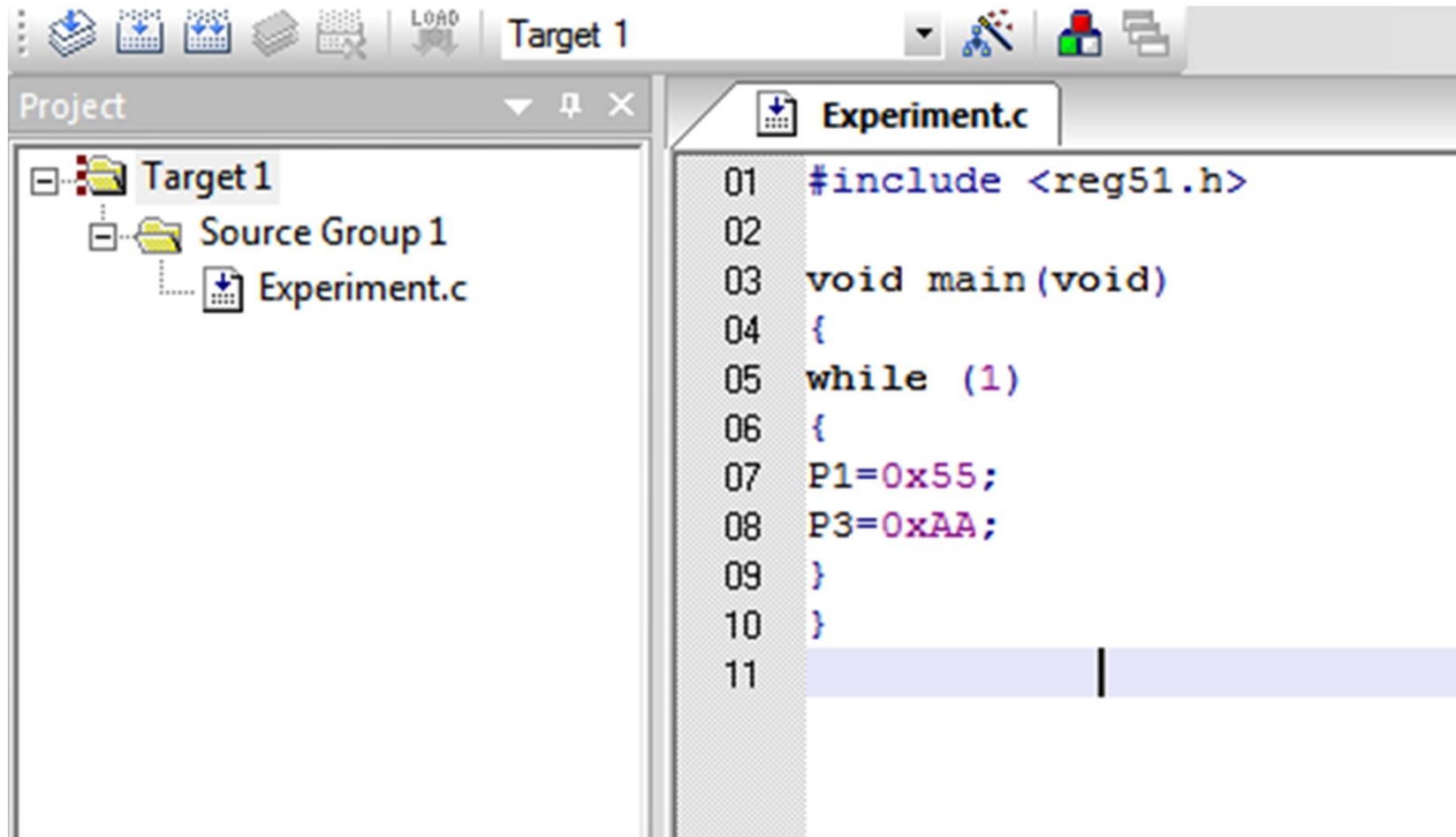- Now, create your project in a folder of your choice.

Creating New Project

- Then choose your IC from the list by expanding the name of the IC manufacturer, which in our case is **Atmel.**

- Then pick the IC that you are going to use from the list of that manufacturer. We will pick **AT89S8253**
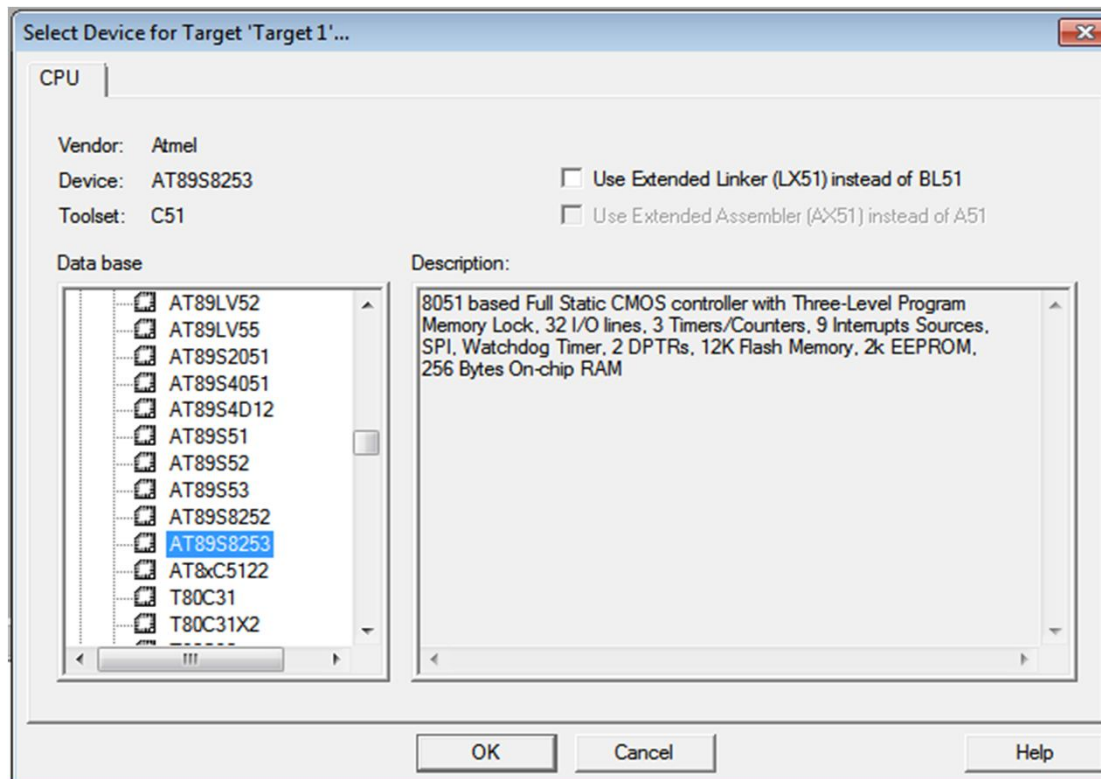
Creating New Project

- Choose 'No' for a startup code option.

- Then Click '**File**' and click '**new**'. A window with the name text1 will appear. Go to '**File**' again and Click '**Save**' to save this file to the project folder created in the 1st first. Use the **.c** extension. [e.g. *experiment.c*]

- Then in **project** window, expand '**target1**' and right-click on '**Source Group 1**' and choose the file which was saved in last step.

- Now the file is added to your project and you can write your code in this file.
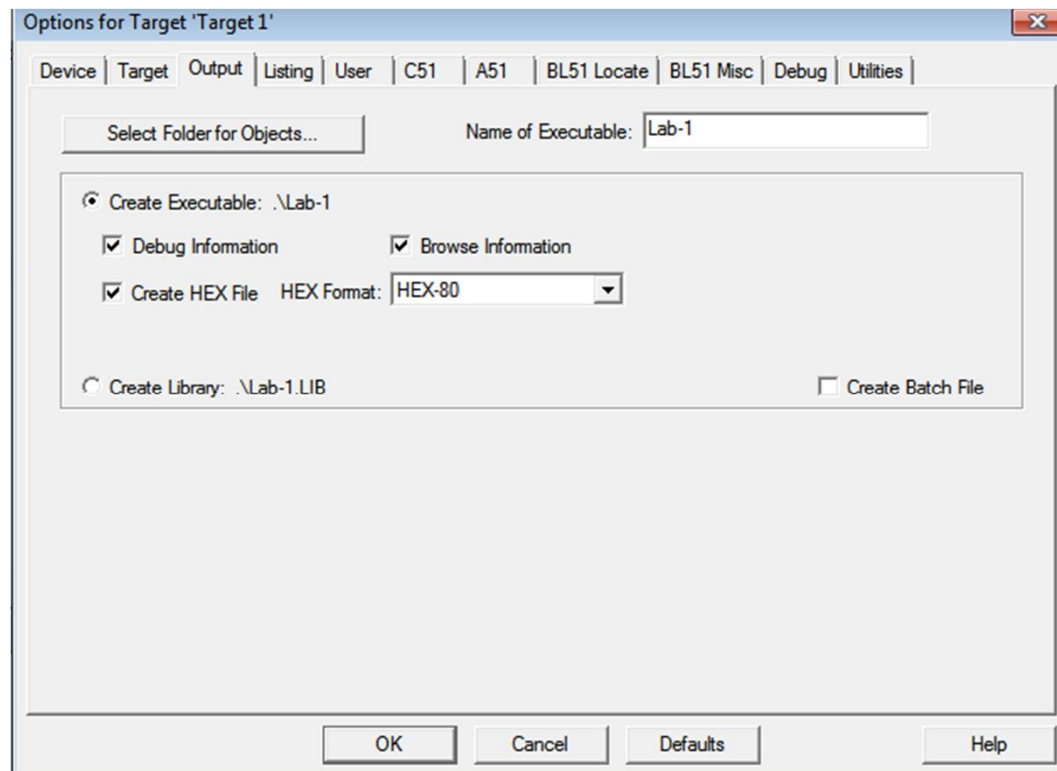
Writing Code

```c
#include <reg51.h>

void main(void)
{
while (1)
{
P1=0x55;
P3=0xAA;
}
}
```
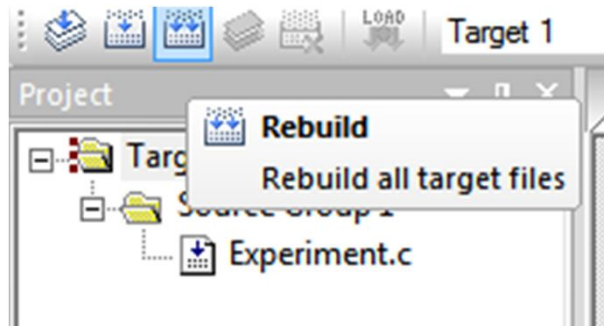
Compiling & Building Hex File

- Select '**Project**' and Choose '**options for target 1**'.
- Select the Tab '**Output**'.
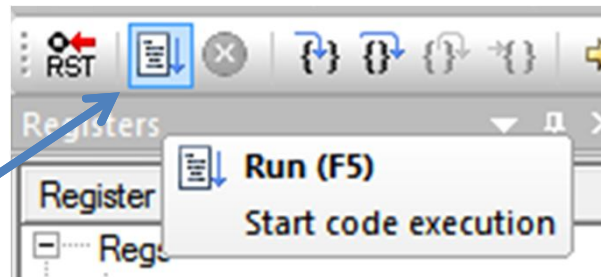- Check '**Create Hex File**'

Compiling & Building Hex File

- Select '**Project**' and Choose '**Rebuild all target Files**'.

  Or

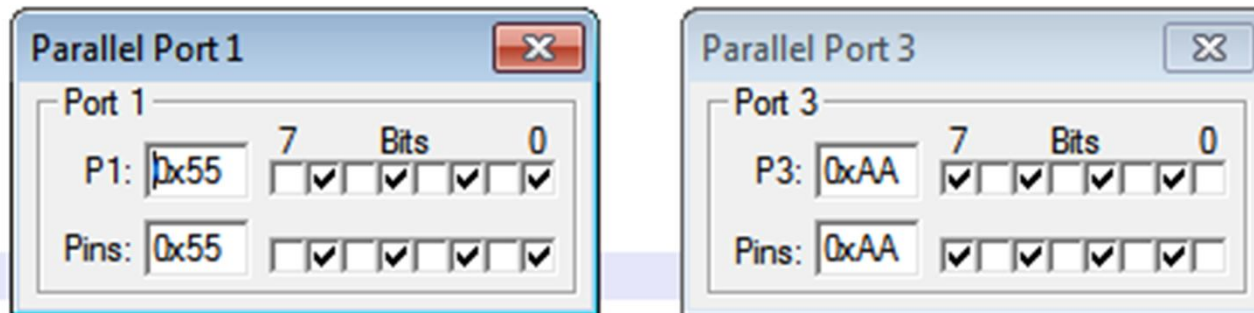- Click on the toolbar click on button

Debug

- Click '**Debug**' and choose '**Start/Stop Debug Session**' or use the debug toolbar button

- Then in '**Peripherals'** choose relevant '**I/O- Ports'** in our code those would be **'P1 & P3'**

- Then select **'Run'** button from the toolbar. Or Press **F5**

- Verify the code by viewing data on peripherals

Debug

- The data is correct i.e. 55 and AA. Now stop the debug session by clicking on the same button.

Parallel Port 1

Port 1

P1: 0x55   7   Bits   0

Pins: 0x55

Parallel Port 3

Port 3

P3: 0xAA   7   Bits   0

Pins: 0xAA

- Now prepare for Burning.

Burning

- Run 8051 Flash Programmer.
- Load the Hex file from the project folder.
- Press the Write button to burn the code in Development board.

Burning