

Software Dependencies:

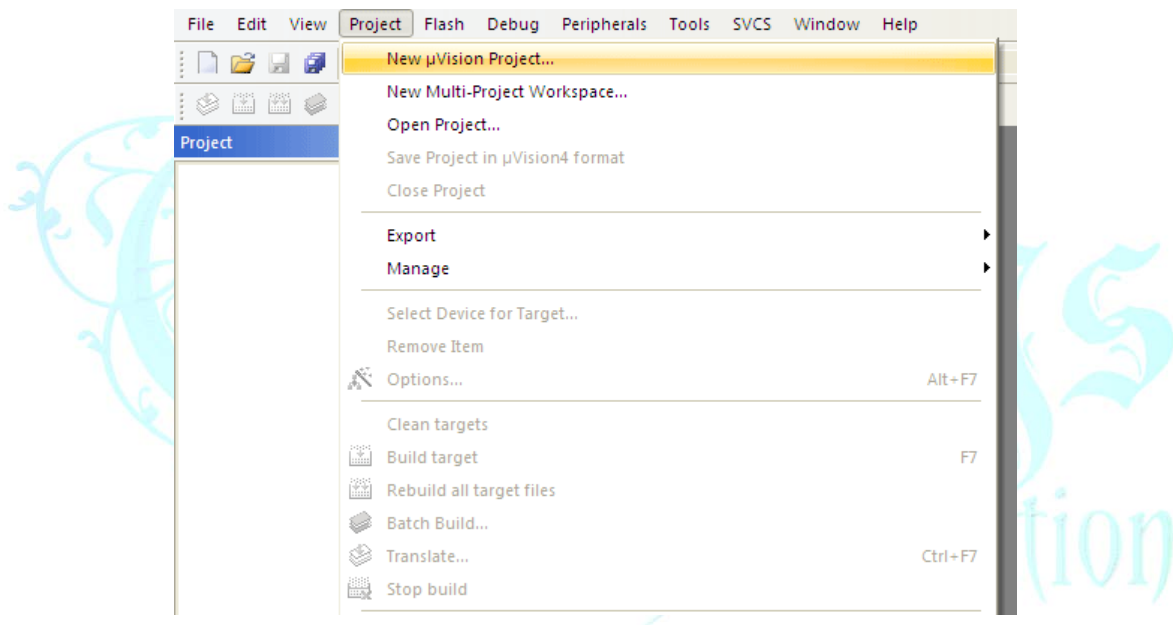
In order to create and load hex files to 8051 Project Board v0.1, following softwares are needed,

- [Keil C51](#) from Tools by ARM
- [Flash Magic](#) form NXP

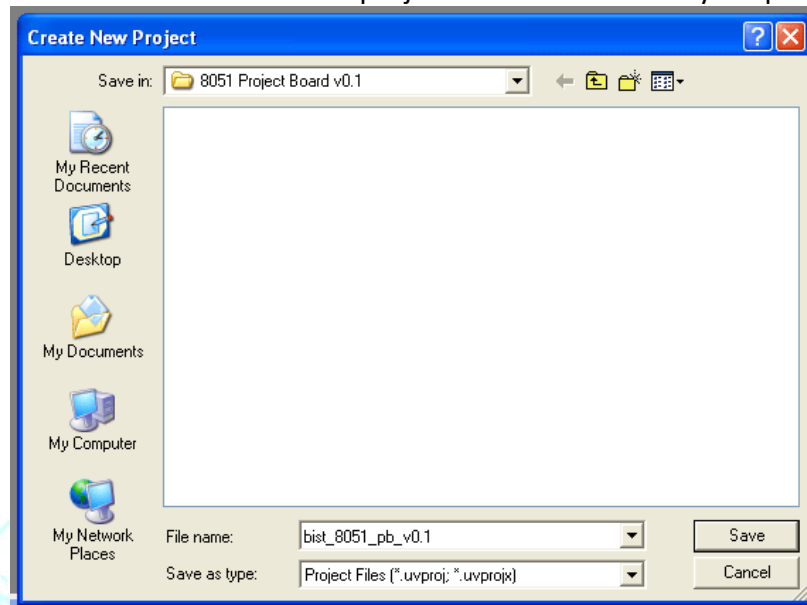
To get these softwares follow the links provided above.

Once installed, follow the below mentioned steps to test your 8051 Project Board v0.1.

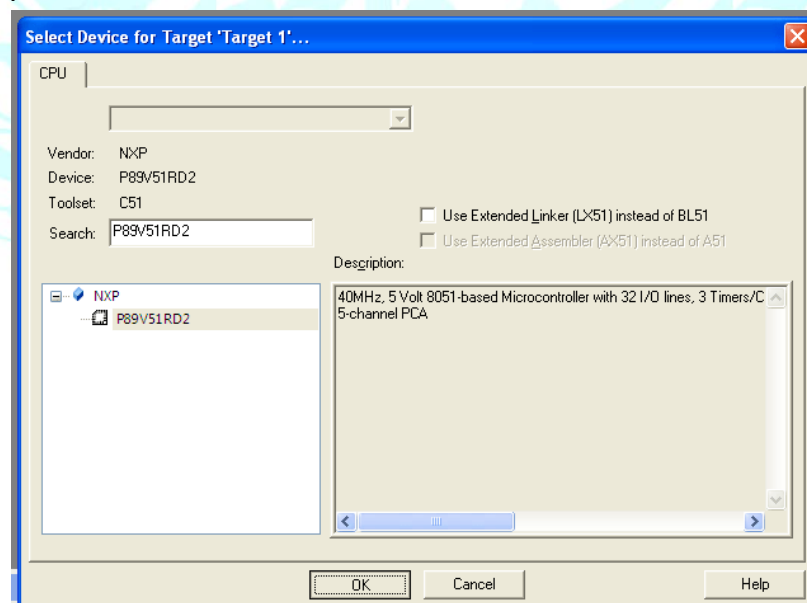
1. Start Keil uVision5.
Navigate to “Project” tab and select “New μ Vision Project”.



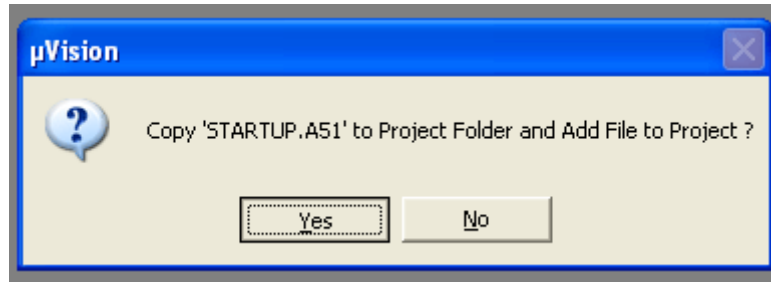
2. Create a new folder and store project files in it and save your project.



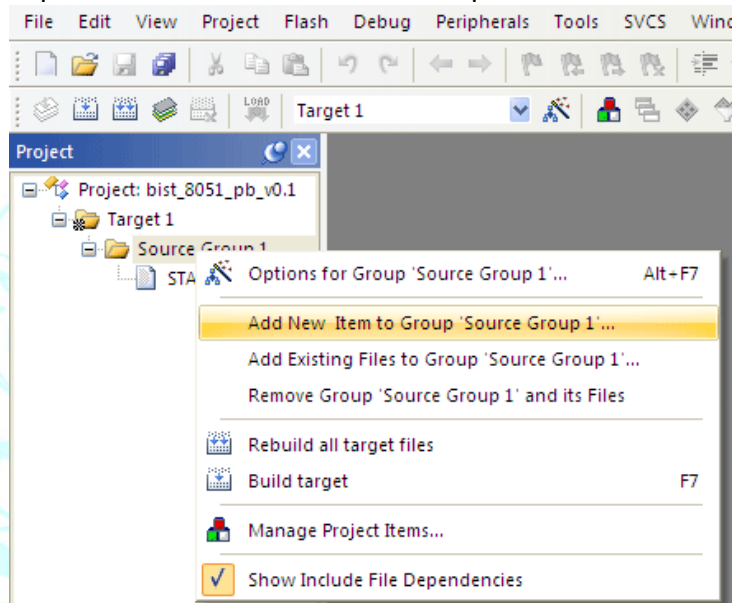
3. Enter P89V51RD2 in the search box, select "P89V51RD2" nested under NXP and select "OK".



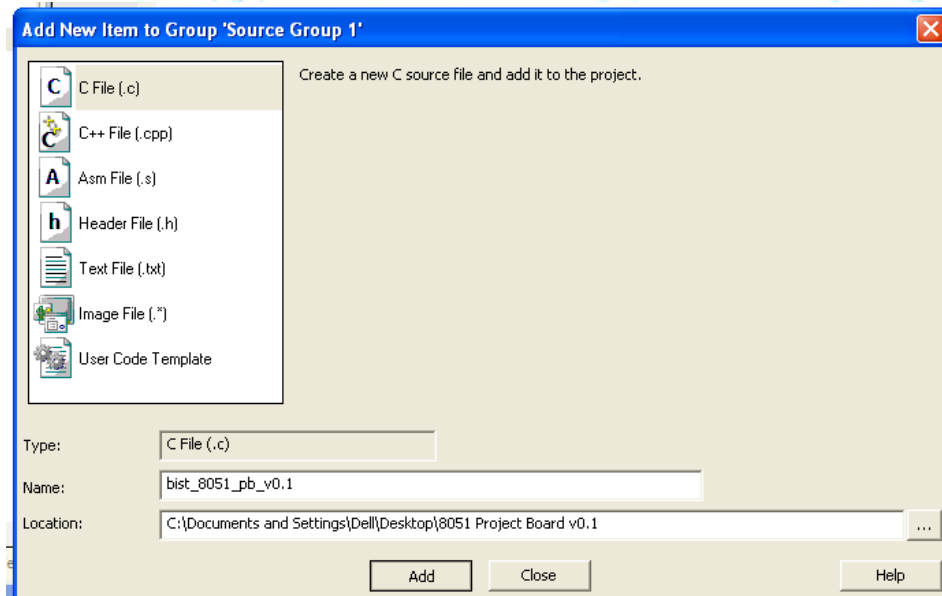
4. Select yes to copy the mentioned files to your project.



5. To create a new file with ".c" extension and add it to your project, right click on "Source Group 1" select "Add New Item to Group".



6. Select "C File (.c)" from the list and provide it a name to add.



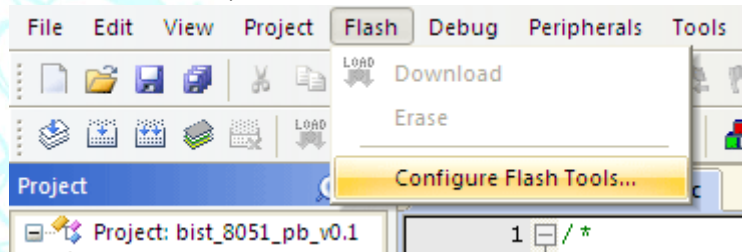
7. Use the code provided below in the C file just created.

```

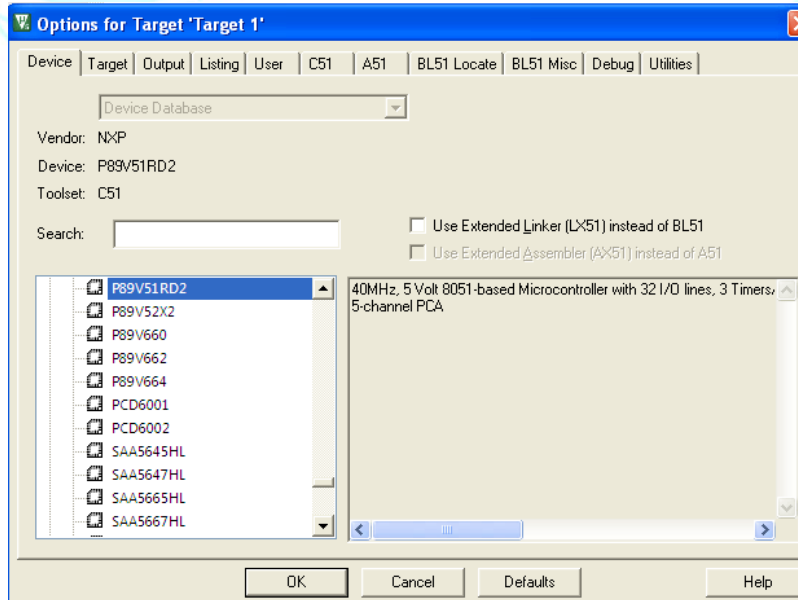
bist_8051_pb_v0.1.c
1  /*
2  Program to blink interface led connected to port 1.0
3  */
4  #include <reg51.h>
5
6  sbit LED = P1^0; //define port 1.0 as LED
7
8  //function to generate delay
9  void delay(void){
10     TMOD = 0x01; //initialize timer to mode 1
11     TLO = 0x00; //initialize lower byte of timer 0
12     TH0 = 0x00; //initialize higher byte of timer 0
13     TRO = 1; //turn on timer 0
14     while(TFO == 0); //wait for timer flag to set
15     TRO = 0; //turn off timer 0
16     TFO = 0; //clear timer flag
17 }
18
19 void main(){
20     while(1){
21         LED = ~LED; //toggle led
22         delay(); //provide delay
23     }
24 }
25

```

8. To configure the flash tools, select "Flash" tab.

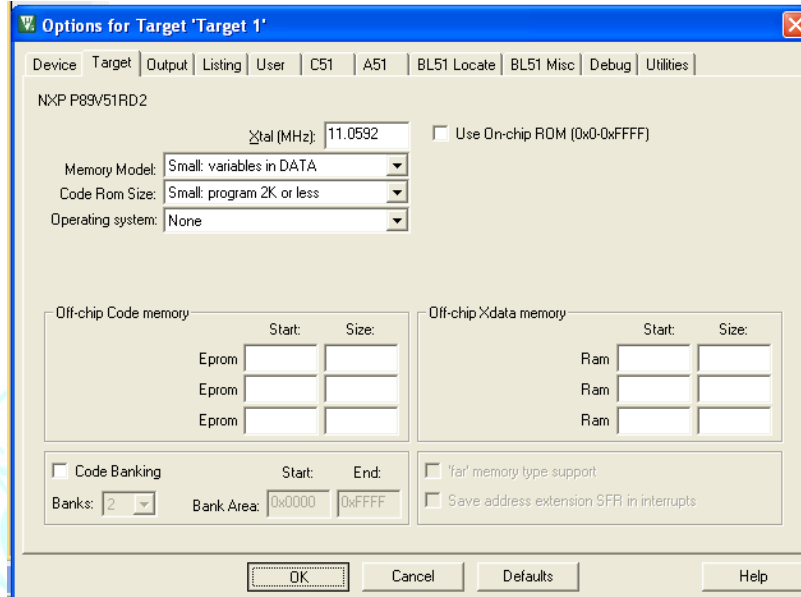


9. Check whether the device you are using is selected.



10. Navigate to “Target” tab and ensure these settings,

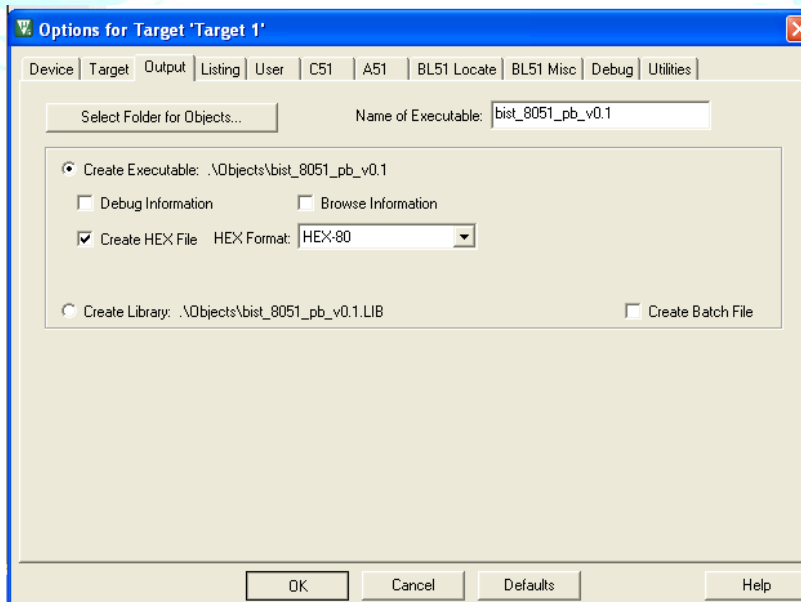
- Xtal (MHz): 11.0592
- Memory Model : Small variables in DATA
- Code Rom Size : Small : program 2K or less
- Operating System : None



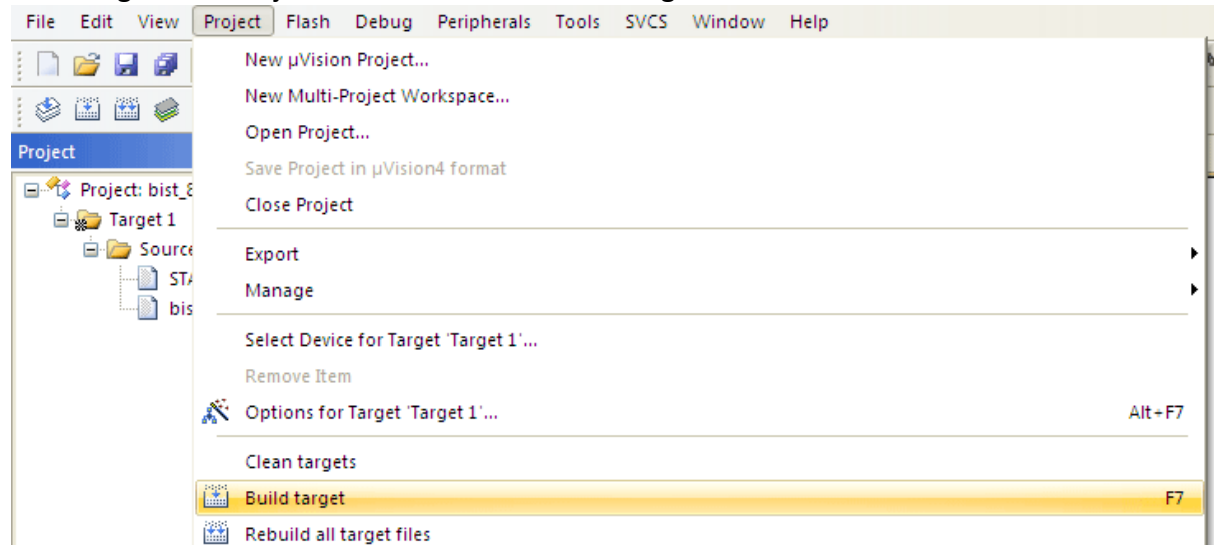
11. Navigate to “Output” tab and ensure these settings,

- Select “Create Executable”
- Check “Create HEX File”

and select “OK”

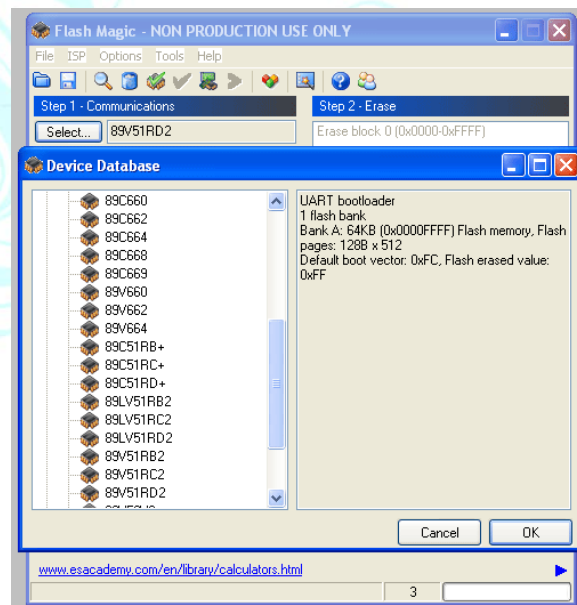


12. Navigate to “Project” tab and select “Build Target”.



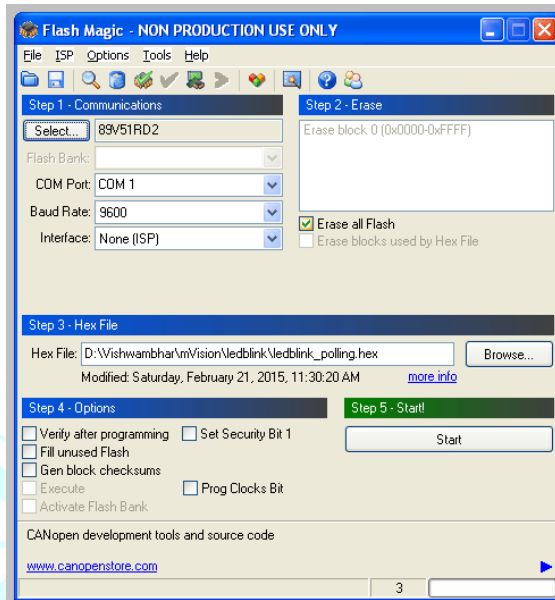
13. Open Flash Magic and ensure these settings,

- Device : 89V51RD2

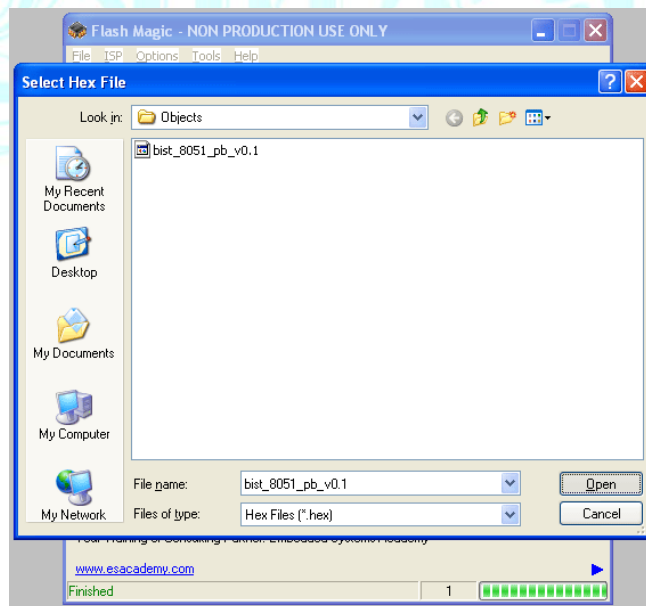


14. Ensure the following settings,

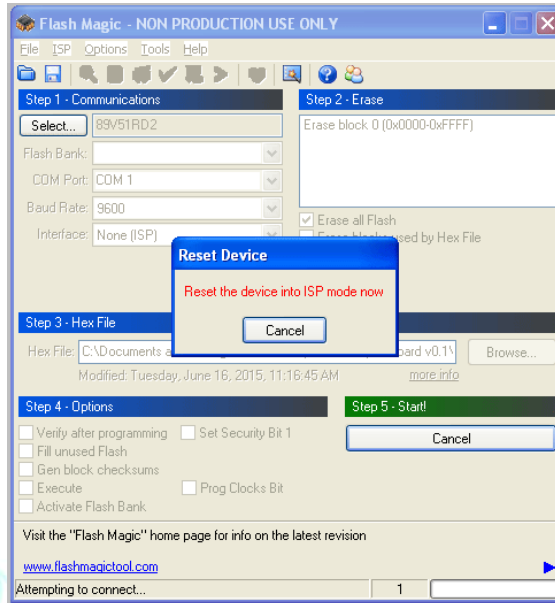
- Select the appropriate COM port from your computer
- Set Baud Rate to 9600
- Interface : None (ISP)
- Check “Erase all Flash”



15. Browse to the location of the HEX file created (by default in the “Objects” folder of your project).

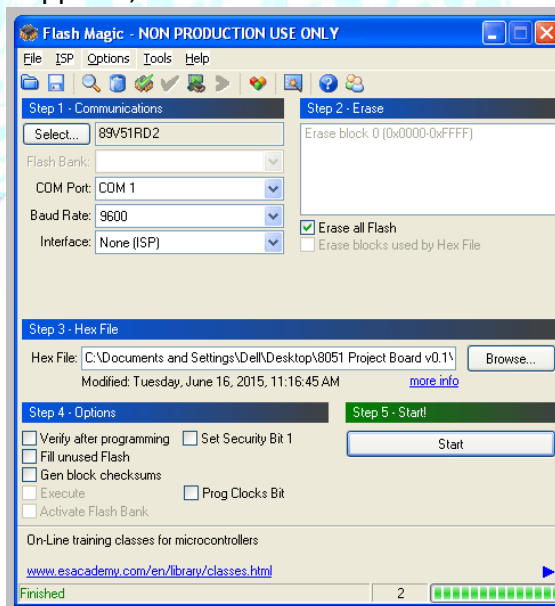


16. Select “Start” and wait for a dialog box to pop up,



Then, press the button labeled “RST” (the only push button on board the 8051 Project Board v0.1).

17. The tool then programs the device on 8051 Project Board v0.1. Once finished the following dialog box appears,



18. Press the “RST” button on 8051 Project Board v0.1 again to execute the program.

BIST Source Code:

```
/*
    Program to blink interface led connected to port 1.0
*/
#include <reg51.h>

sbit LED = P1^0;      //define port 1.0 as LED

//function to generate delay
void delay(void){
    TMOD = 0x01; //initialize timer to mode 1
    TL0 = 0x00;   //initialize lower byte of timer 0
    TH0 = 0x00;   //initialize higher byte of timer 0
    TR0 = 1;      //turn on timer 0
    while(TF0 == 0); //wait for timer flag to set
    TR0 = 0;      //turn off timer 0
    TF0 = 0;      //clear timer flag
}

void main(){
    while(1){
        LED = ~LED; //toggle led
        delay(); //provide delay
    }
}
```