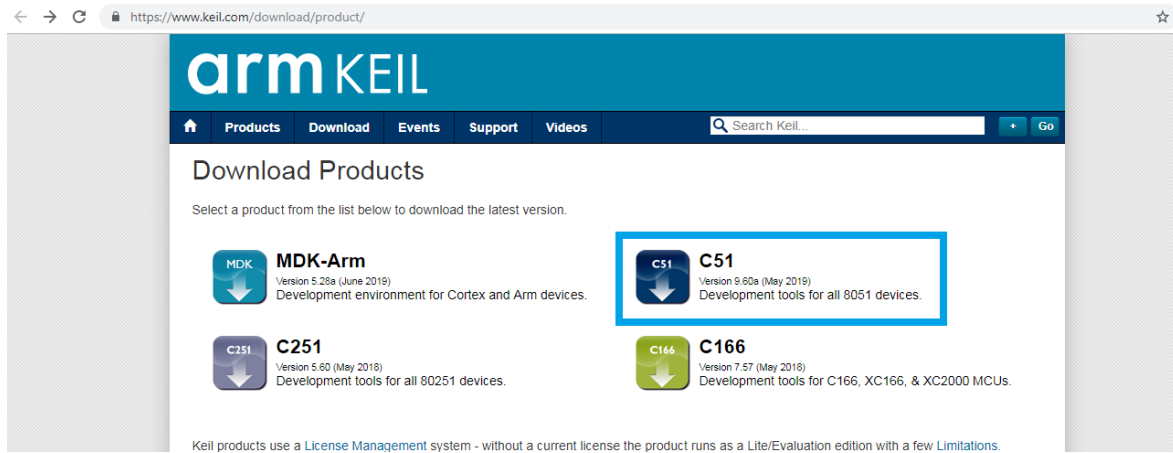# 8051/52 Programming Using Keil µVision IDE

Step 1: Downloading Keil µVision IDE

Keil provides a code limited (2K bytes) evaluation version for 8051 architecture (C51) which is sufficient for learning purposes.

The main limitations of the evaluation version are the following.

- 8051 compiler, assembler, linker, and debugger are limited to 2 Kbytes of object code
- Programs that generate more than 2 Kbytes of object code will not compile
- The debugger supports programs that are 2 Kbytes or smaller
- No hardware support for multiple DPTR registers is provided

  Keil uVision IDE (Evaluation Version) can be downloaded using this link.

  On Clicking the above link you will be redirected to Keil Website Download section.

Please click on the **C51** icon to download 8051 development tools (above Figure) .
and download your Windows Executable.

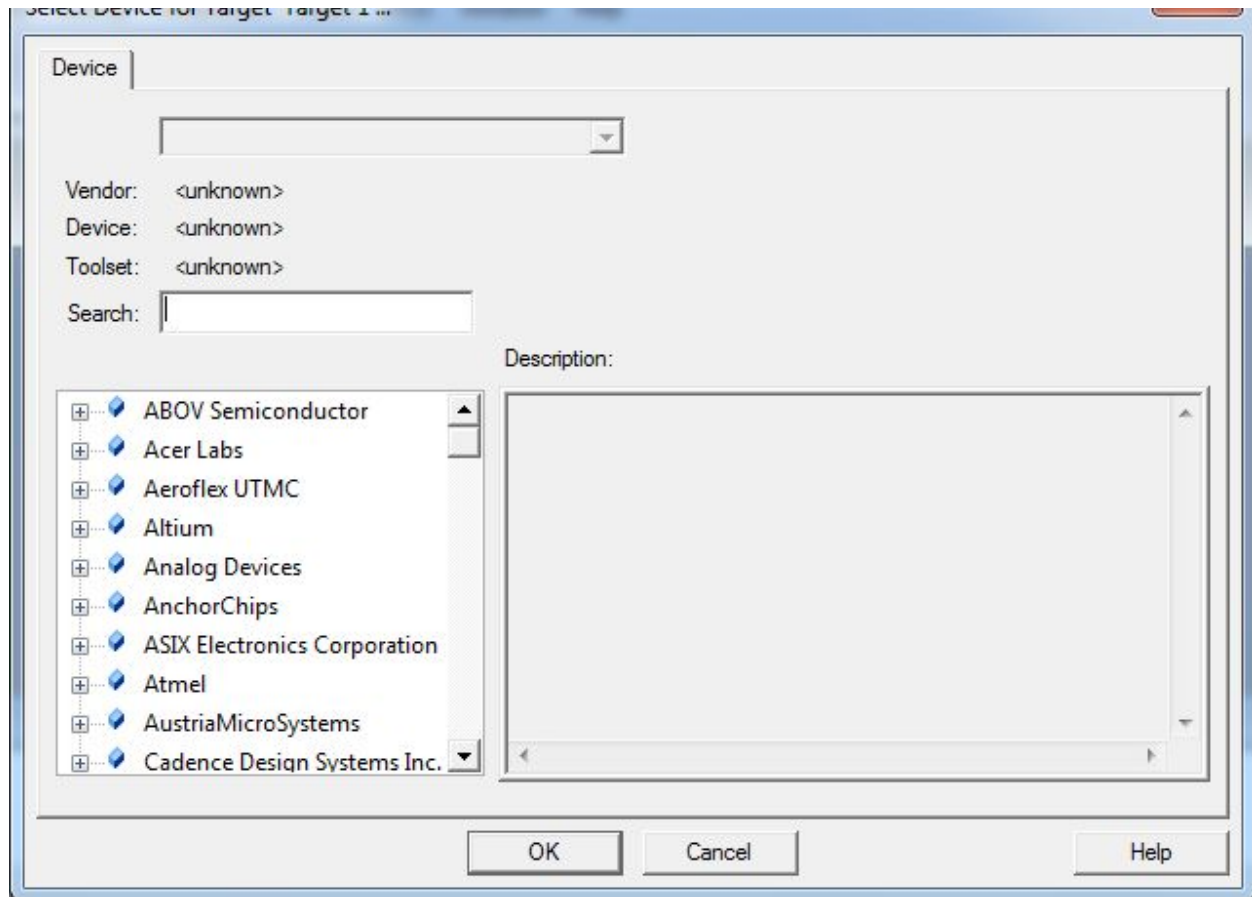## Step 2: Creating a 8051/8052 Project Using Keil Uvision IDE
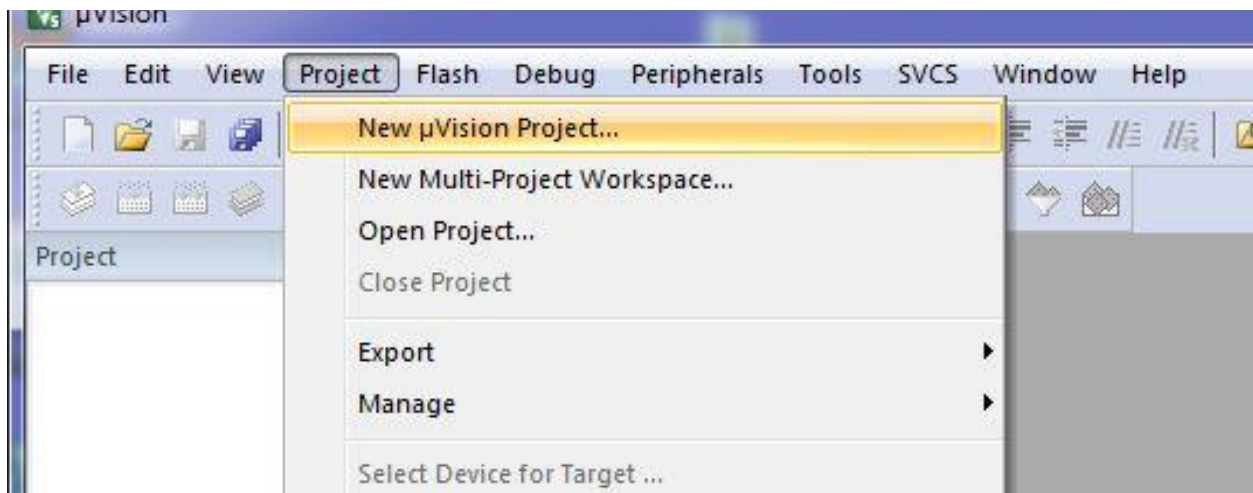
After you have installed the Keil uVision tools for 8051, Double click on the Keil icon on your Windows Desktop to launch the IDE.

To create a new 8051 project using Keil IDE, Click on the ' **Project** ' item on the IDE Menu bar and select **' New uVision Project... '** as shown in the above image.

Now create a Folder to store your project and give a name to your Project files (*.uvproj), for eg Test (Test.uvproj).

Step 3: Selecting an 8051 Device in Keil

Select Device for Target 'Target 1' ...

Device

Vendor: <unknown>
Device: <unknown>
Toolset: <unknown>

Search: |

Description:

- ⊞ ABOV Semiconductor
- ⊞ Acer Labs
- ⊞ Aeroflex UTMC
- ⊞ Altium
- ⊞ Analog Devices
- ⊞ AnchorChips
- ⊞ ASIX Electronics Corporation
- ⊞ Atmel
- ⊞ AustriaMicroSystems
- ⊞ Cadence Design Systems Inc.

OK   Cancel   Help

You will then be taken to the device selection dialog, where you can select the 8051 derivative for which you want to develop software.

Keil has support for a wide variety of 8051 derivatives on its IDE.The 8051 derivatives are organised according to their manufacturer's.

On selecting the particular microcontroller the Keil IDE also displays the features of the selected microcontroller on its left pane .You can Click OK to confirm your choice.
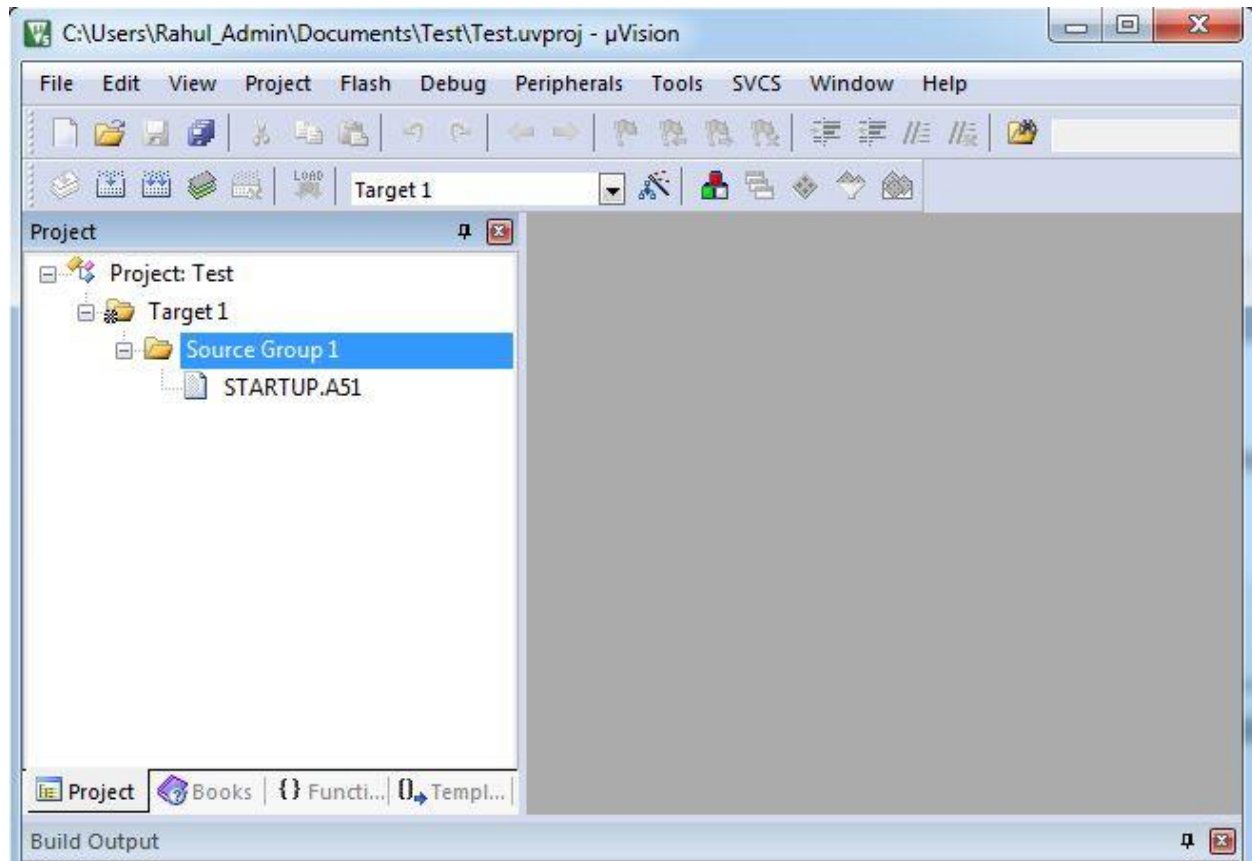
Step 4:
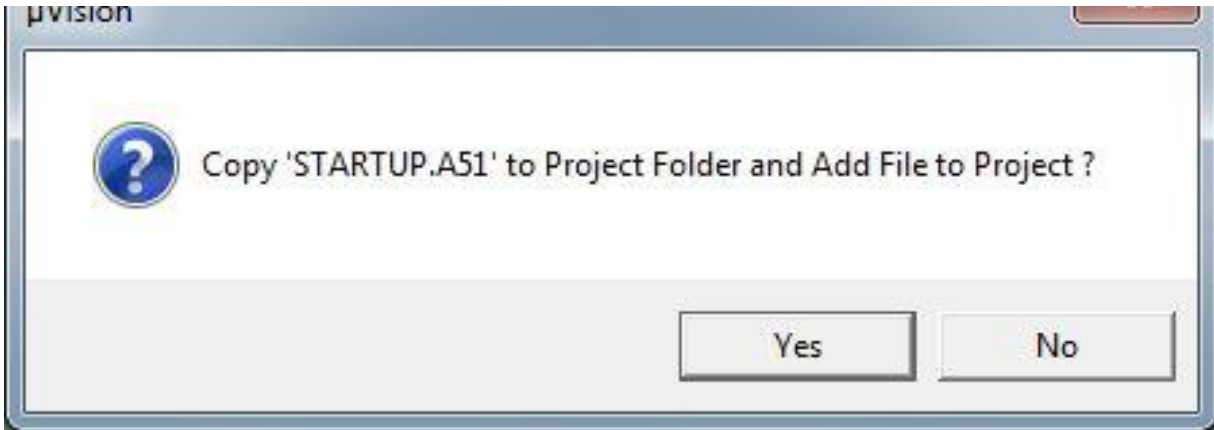
After selecting your 8051 derivative,

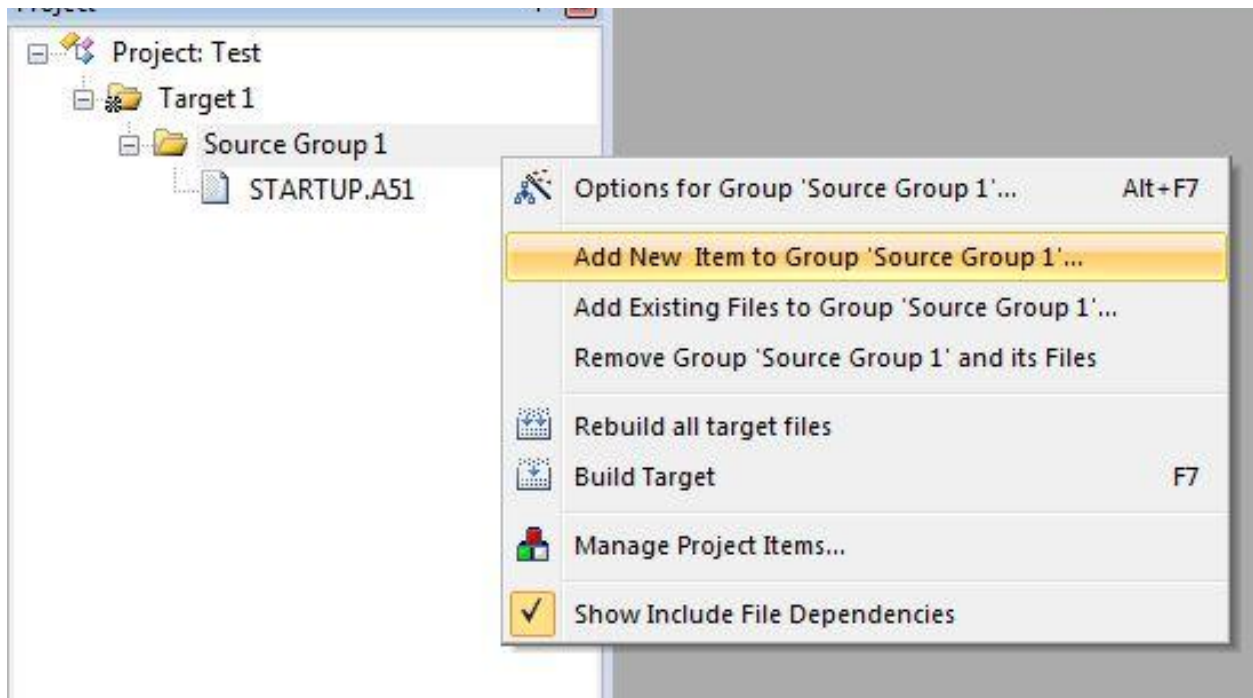You will get another dialog as shown Above.Asking to copy STARTUP.A51

Click ' Yes '

Step 5:

Now your Project pane on the Kiel IDE would look something like this (above image)

Step 6: Adding C Files to Keil Project

Now you can add C files to you Project.

Right Click on the **Source Group 1** folder on your Project pane and
select **Add New Item to Group 'Source Group1'...**

Step 7:

Now you can select the type of file you want to add to your project using
Select C File(.c) and give it a name (here main.c) and Click **Add**.Now you can
type a small program into the main.c to blink the LED's connected to Port 1 of
8051 .You can find the source code below.

***********************************START*************************************

```c
#include<reg52.h>          // special function register declarations
                           // for the intended 8051 derivative
P3 = 0x00;                 //output port used for leds
sbit LED = P3^5;           // Defining LED pin
void Delay(void);          // Function prototype declaration
void main (void)
{
   while(1)               // infinite loop
   {
     LED = 0;             // LED ON
     Delay();
     LED = 1;             // LED OFF
     Delay();
   }
}
void Delay(void)
{
   int j;
   int i;
   for(i=0;i<10;i++)
   {
     for(j=0;j<10000;j++)
     {
     }
   }
}
```
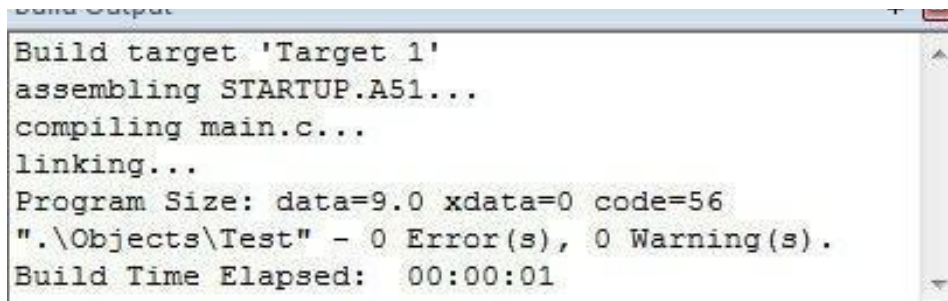
***********************************STOP********************************

Step 8: Building a C Project Using Keil UVision IDE
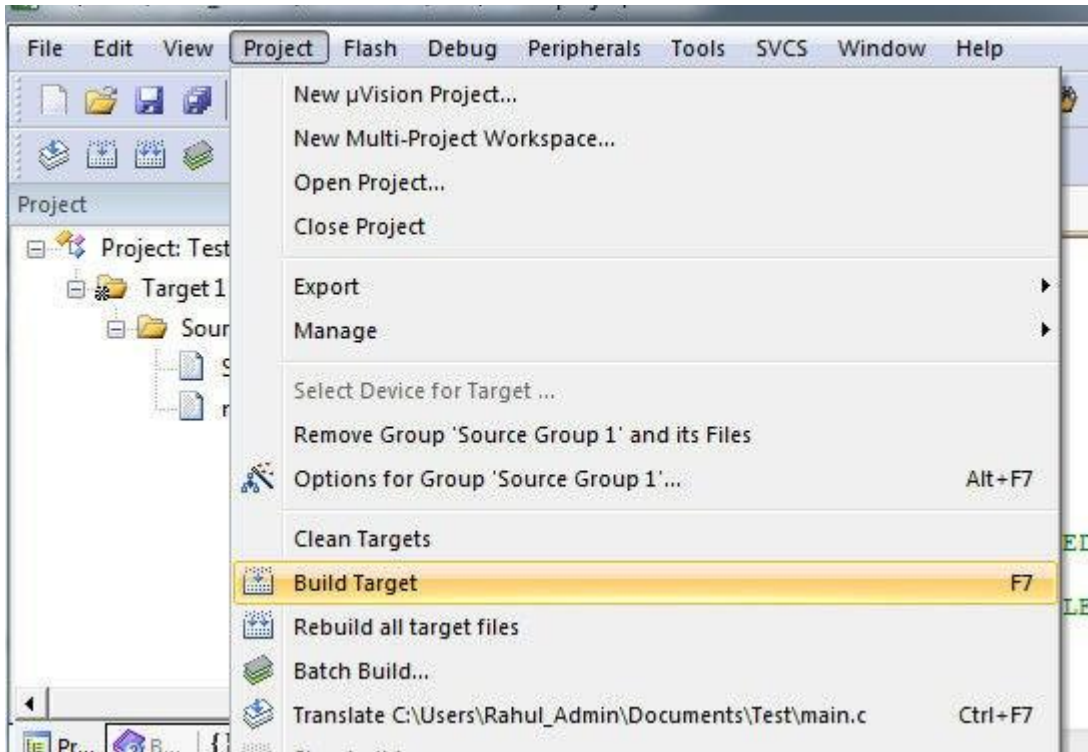
After you have typed out the above c program to your main.c file,You can compile the C file by pressing **F7 key** or by going to ' **Project -> Build Target** ' on the IDE menu bar.
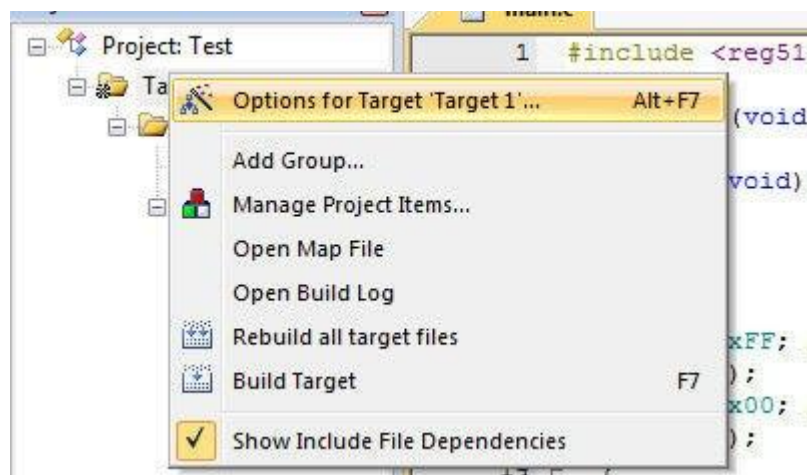
Step 9:

```
Build Output                                          + ☐
Build target 'Target 1'
assembling STARTUP.A51...
compiling main.c...
linking...
Program Size: data=9.0 xdata=0 code=56
".\Objects\Test" - 0 Error(s), 0 Warning(s).
Build Time Elapsed:   00:00:01
```

If there are no errors the code will compile and you can view the output on
the Build Output panel.

Step 10: Generating 8051 HEX File Using Kiel IDE

```
☐ Project: Test                        1   #include <reg51.
  ☐ Ta  ✕  Options for Target 'Target 1'...   Alt+F7   (void)
    ☐
           Add Group...                              void)
    ☐  ⬜  Manage Project Items...
           Open Map File
           Open Build Log
       ⬚  Rebuild all target files                  xFF;
       ⬚  Build Target                    F7  );
                                              x00;
       ✓  Show Include File Dependencies        );
```

Inorder to download the code into the 8051 microcontroller we have to
generate the corresponding hex code .

In Keil uVision IDE you can generate hex file for your 8051 derivative by, Right Clicking on the ' **Target 1** ' Folder and Selecting **Options for Target 'Target1'....**
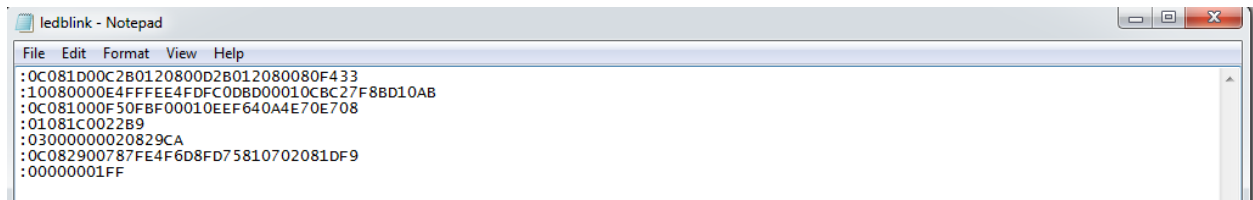
Step 11:
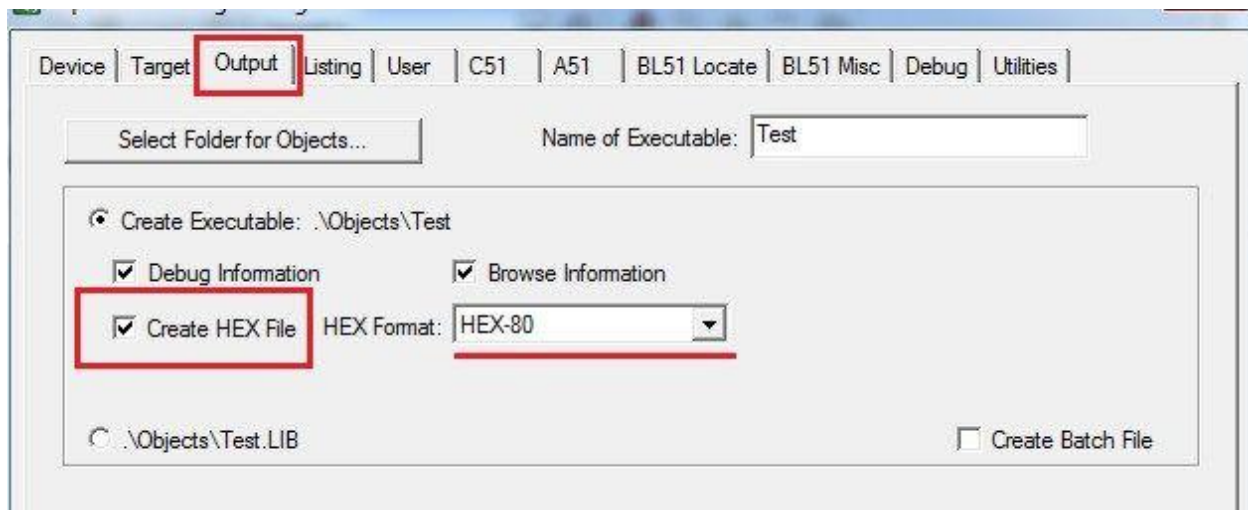
Then on the Options for Target ' **Target 1**' Dialog ,

Select the **Output tab** and check the **Create Hex File** option and Press **OK**.

Now rebuild your project by pressing F7.
Kiel IDE would generate a hex file with same name (here Test.hex) as your project in the Objects folder .

Step 12: Viewing the Generated Hex File

You can open the Test.hex file with notepad to view the contents after creation.