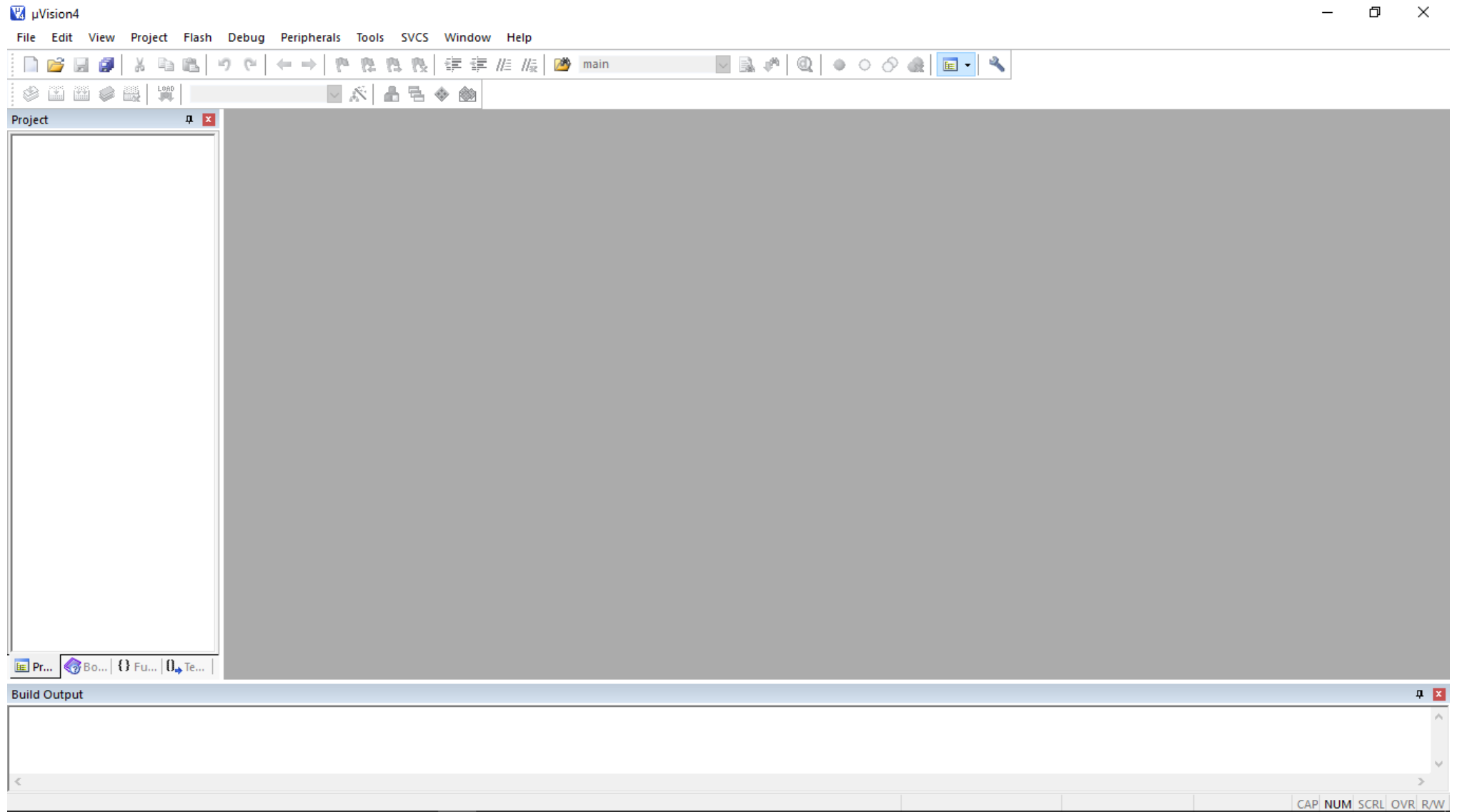


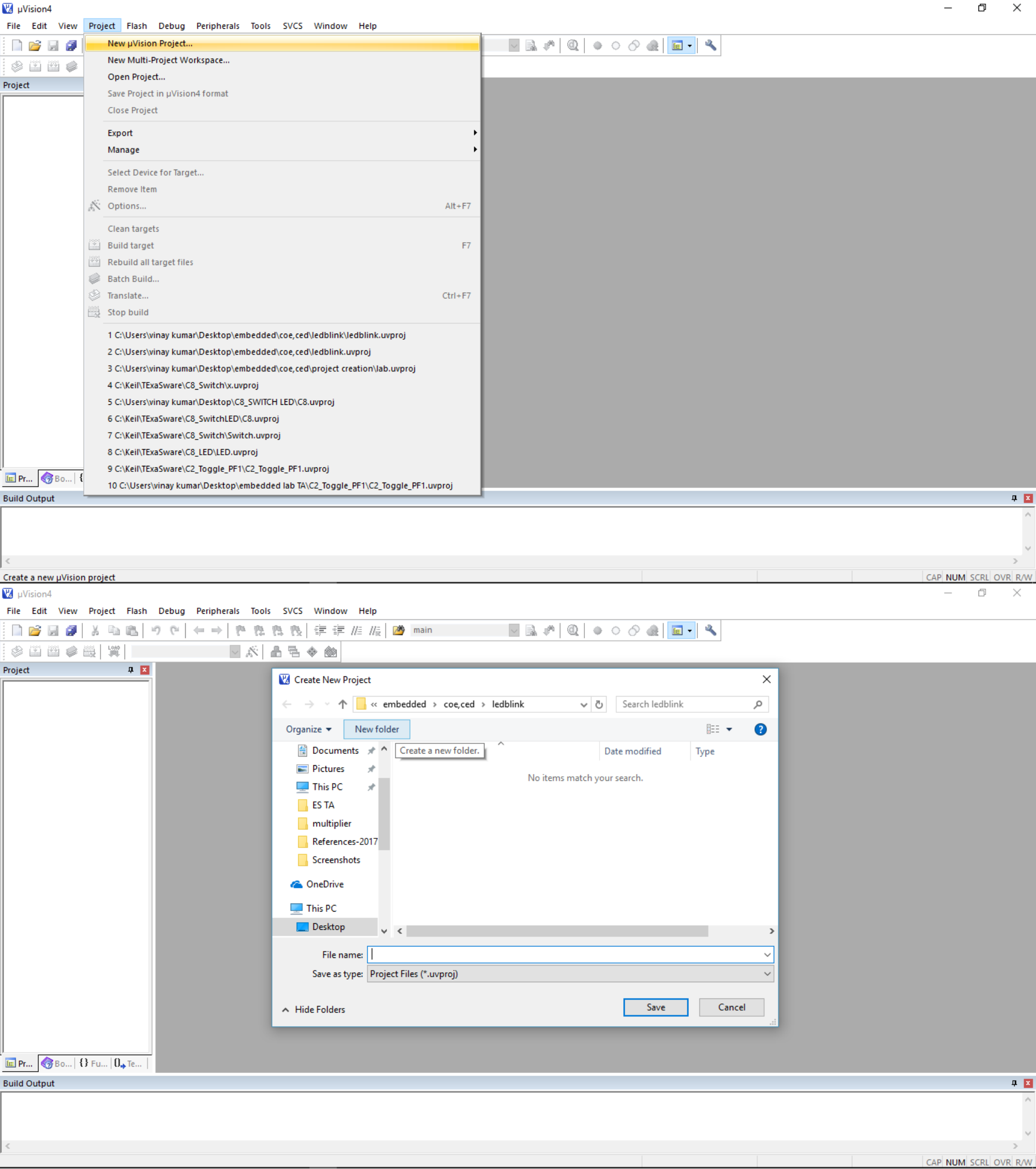
## Getting started with Tiva C Series using Keil IDE

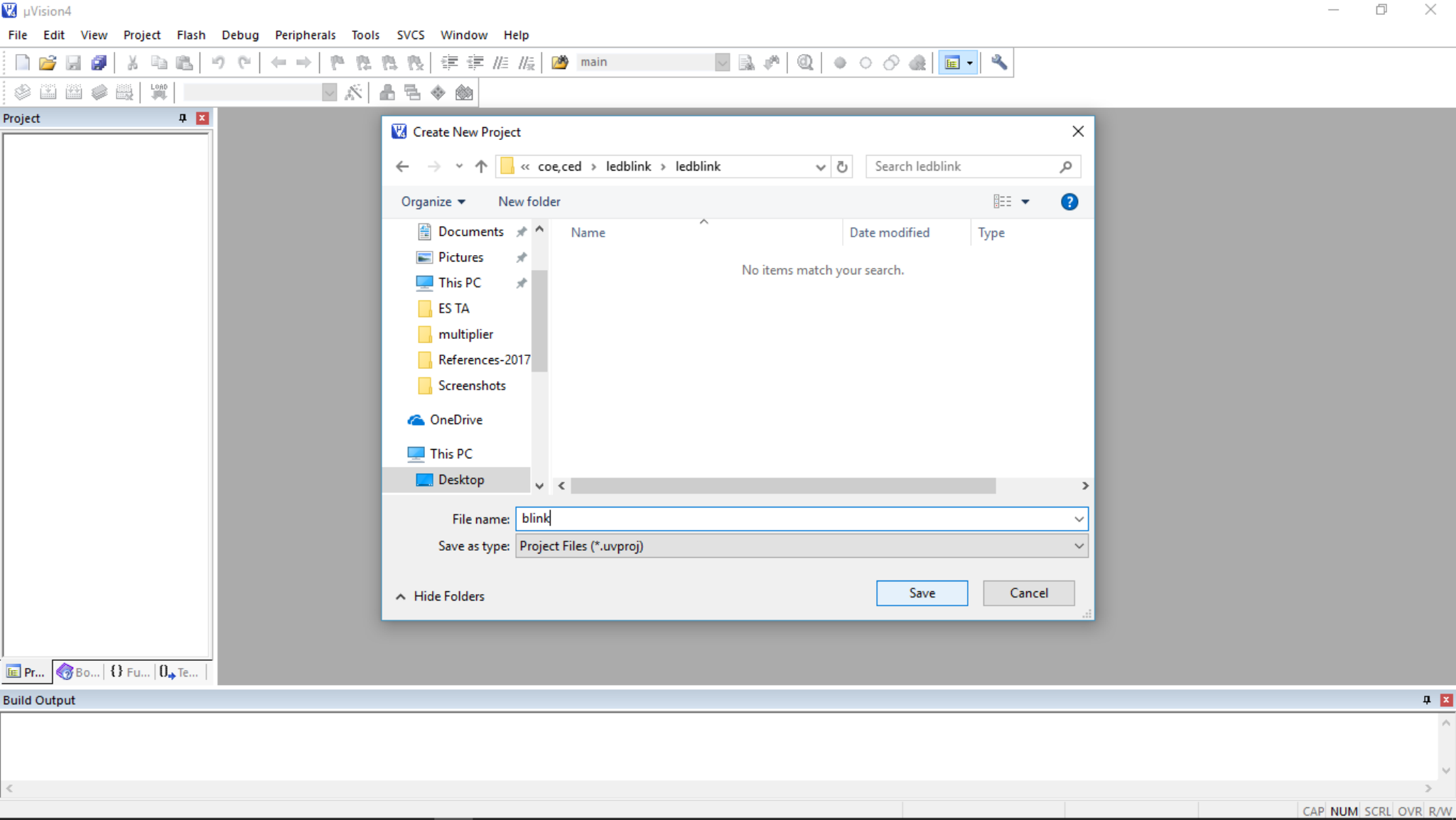
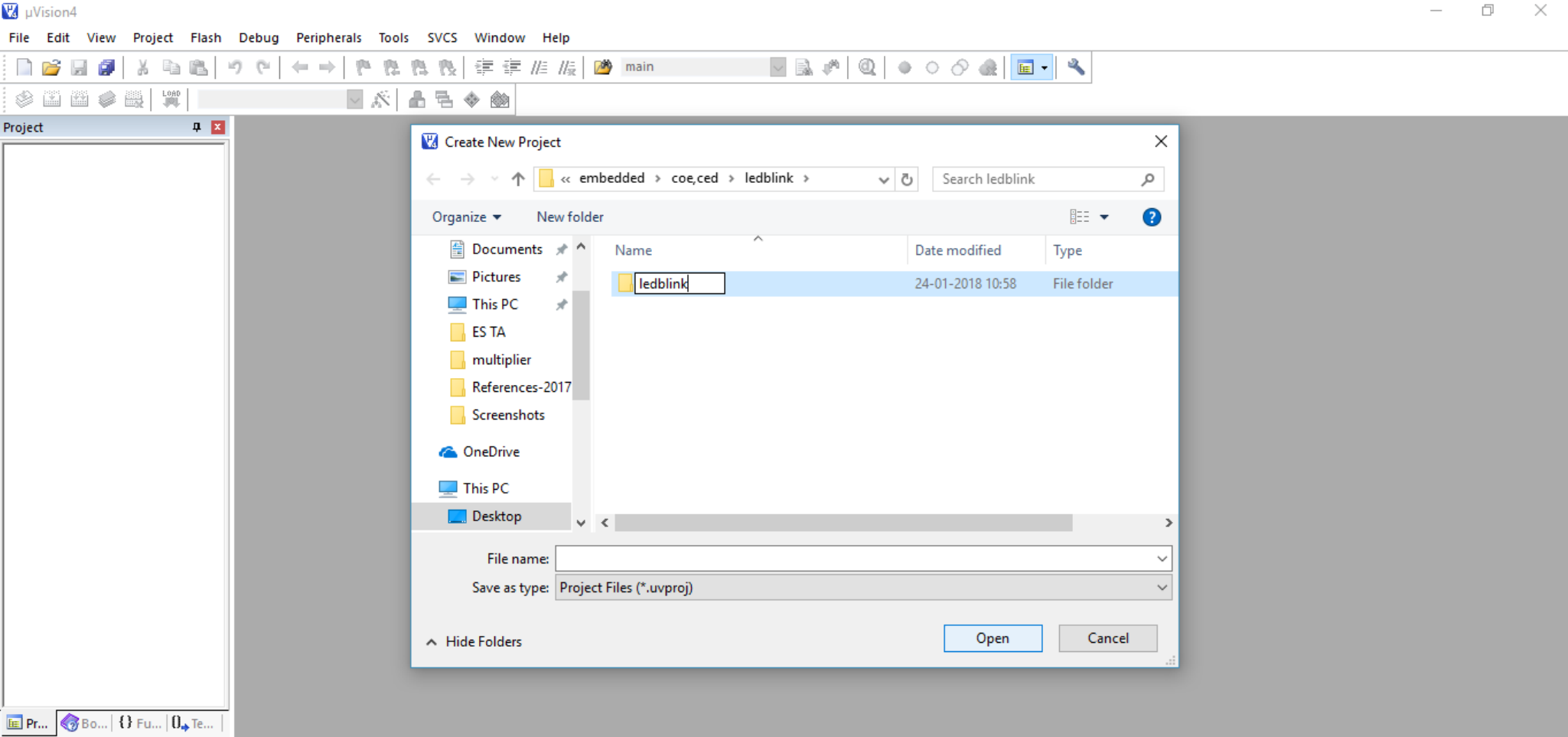
### Embedded Systems Lab

1)open KEIL IDE



2)create new project





C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Select Device for Target 'Target 1'...

CPU

Vendor: Texas Instruments  
Device: TM4C123GH6PM  
Toolset: ARM  
Search: tm4c123gh6pm

Texas Instruments

TM4C123GH6PM

Description:

Old Part Number: LM4F230H5QR  
ARM Cortex-M4F Processor Core  
- 80-MHz operation; 100 DMIPS performance  
- ARM Cortex SysTick Timer  
- Nested Vectored Interrupt Controller (NVIC)  
- Embedded Trace Macro and Trace Port  
- IEEE754-compliant single-precision floating-point unit  
On-Chip Memory  
- 256 KB single-cycle Flash memory up to 40 MHz; a prefetch buffer imp  
- 32 KB single-cycle SRAM  
- Internal ROM loaded with StellarisWare software:  
- 2KB EEPROM  
Advanced Serial Integration

OK Cancel Help

Build Output

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

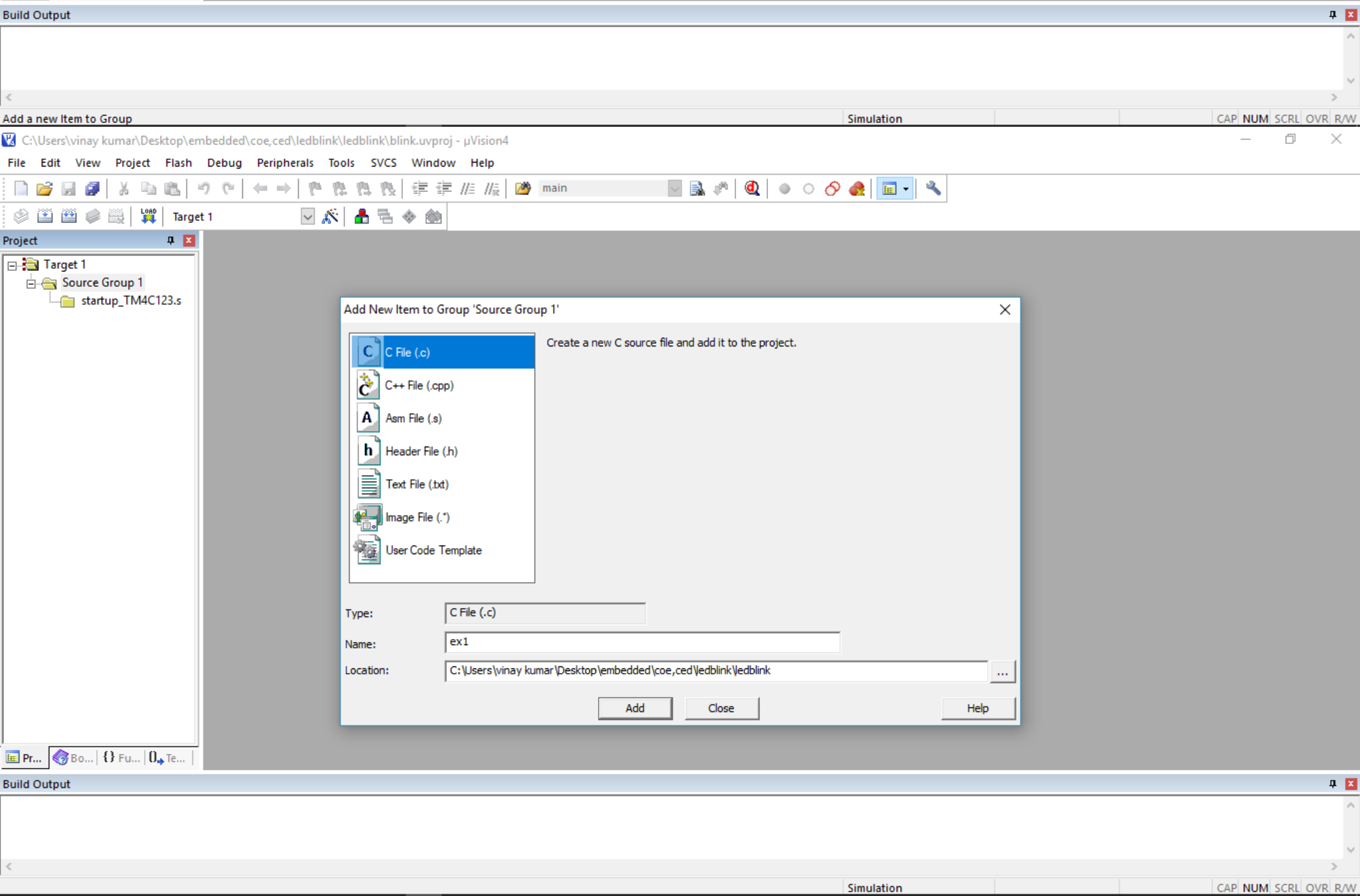
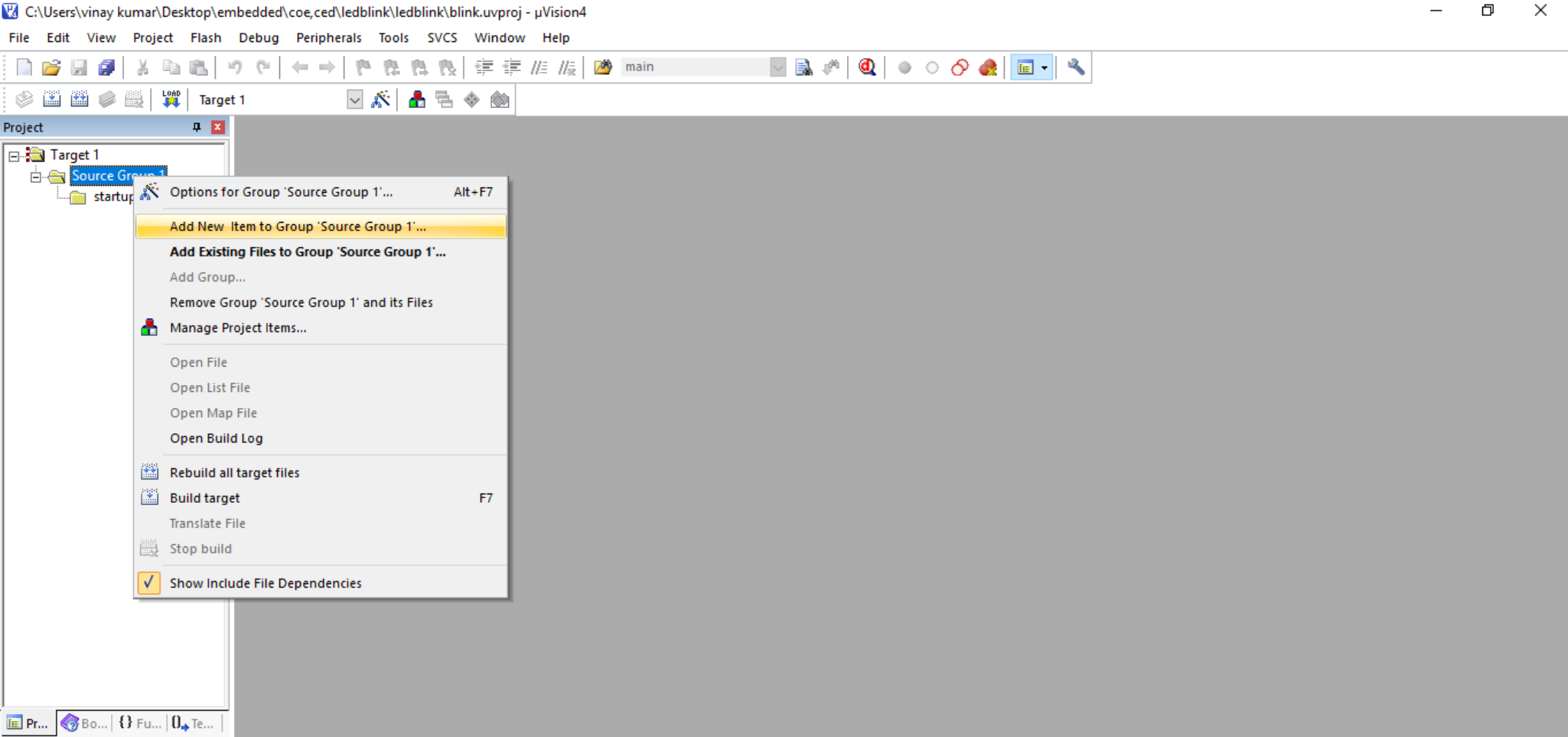
Project

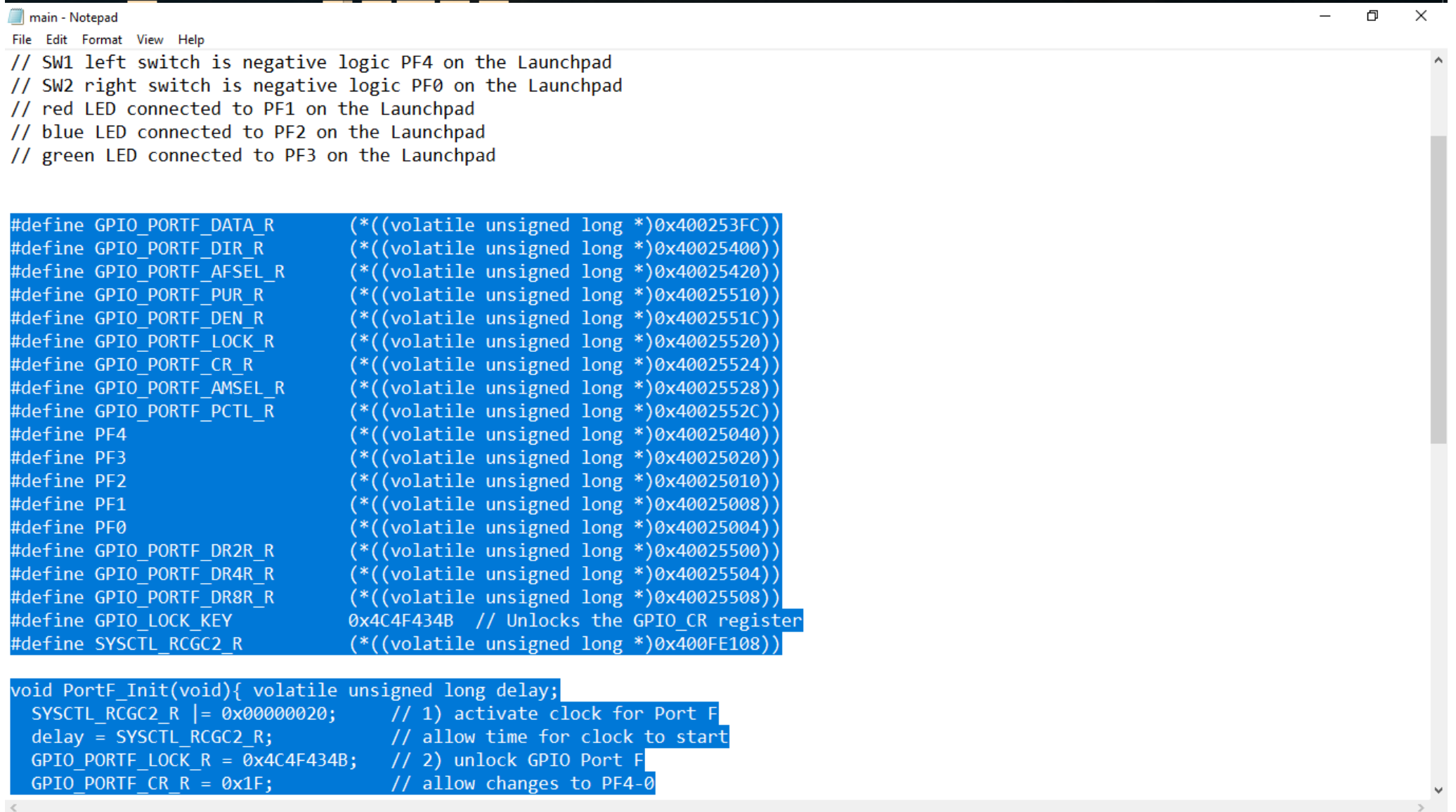
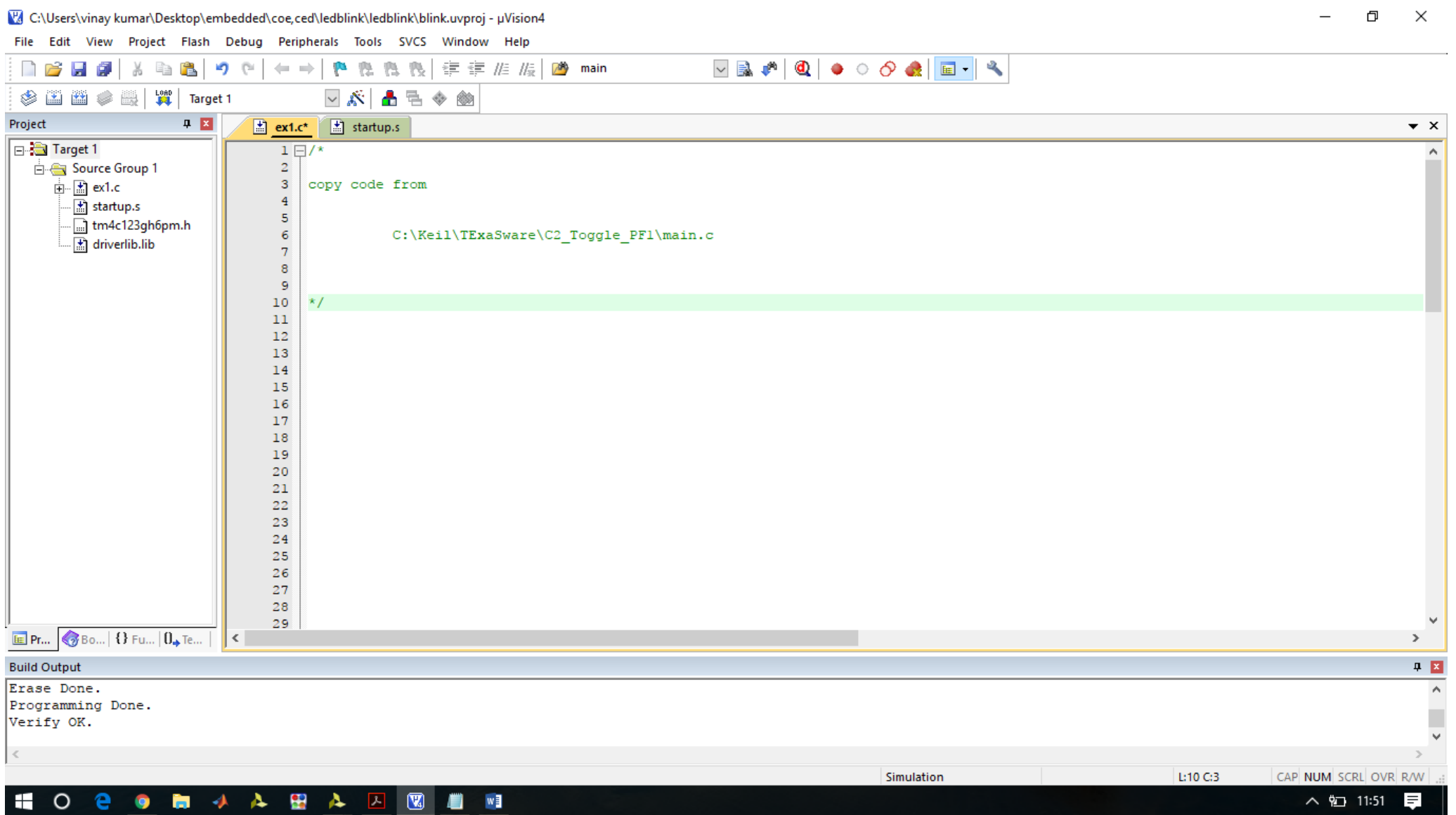
µVision

Copy 'startup\_TM4C123.s' to Project Folder and Add File to Project ?

Yes No

Build Output





### 3) copy these files and paste in your project folder

The screenshot shows a Windows File Explorer window with the address bar set to 'include'. The left sidebar shows the 'Quick access' pane with 'This PC' selected. The main pane displays a list of files in the 'include' folder:

Name	Date modified	Type	Size
driverlib.lib	09-08-2017 13:40	LIB File	3,676 KB
startup.s	21-05-2013 12:39	S File	28 KB
tm4c123gh6pm.h	04-07-2013 07:12	Header File	

A context menu is open over the selected files, showing options like 'Edit with Notepad++', 'Share with', 'Add to archive...', 'Compress and email...', 'Send to', 'Cut', 'Copy', 'Create shortcut', 'Delete', 'Rename', and 'Properties'. The 'Copy' option is highlighted.

The screenshot also shows the IDE interface (uVision4) with the 'Project' window displaying the project structure. The 'Source Group 1' contains the files 'startup\_TM4C123.s' and 'ex1.c'. The 'ex1.c' file is open in the editor, showing C code for GPIO initialization. A dialog box 'Add Files to Group 'Source Group 1'' is open, showing the 'ledblink' folder as the source. The files 'startup\_tm4c123.d', 'startup\_tm4c123.lst', 'startup\_tm4c123.o', 'startup\_TM4C123.s', and 'tm4c123gh6pm.h' are listed. The 'tm4c123gh6pm.h' file is selected, and the 'File name' field is set to 'tm4c123gh6pm'. The 'Files of type' is set to 'All files (\*.\*)'.

The 'Build Output' window at the bottom shows the following messages:

```
Finished: 1 information, 0 warning and 1 error messages.
".\blink.axf" - 1 Error(s), 0 Warning(s).
Target not created
```



#### 4) Add startup.s and tm4c123gh6pm.h files to source group

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Target 1

Source Group 1

startup\_TM4C123.s

ex1.c

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11 #define GPIO\_PORTF\_DATA\_R (\*(volatile unsigned long \*)0x400253FC)

12 #define GPIO\_PORTF\_DIR\_R (\*(volatile unsigned long \*)0x40025400)

13 #define GPIO\_PORTF\_AFSEL\_R (\*(volatile unsigned long \*)0x40025404)

14 #define GPIO\_PORTF\_PURSEL\_R (\*(volatile unsigned long \*)0x40025408)

15 #define GPIO\_PORTF\_DEN\_R (\*(volatile unsigned long \*)0x4002540C)

16 #define GPIO\_PORTF\_LOCK\_R (\*(volatile unsigned long \*)0x40025410)

17 #define GPIO\_PORTF\_CR\_R (\*(volatile unsigned long \*)0x40025414)

18 #define GPIO\_PORTF\_AMSEL\_R (\*(volatile unsigned long \*)0x40025418)

19 #define GPIO\_PORTF\_PCTL\_R (\*(volatile unsigned long \*)0x4002541C)

20 #define PF4

21 #define PF3

22 #define PF2

23 #define PF1

24 #define PF0

25 #define GPIO\_PORTF\_DR2R (\*(volatile unsigned long \*)0x40025420)

26 #define GPIO\_PORTF\_DR4R (\*(volatile unsigned long \*)0x40025424)

27 #define GPIO\_PORTF\_DR8R (\*(volatile unsigned long \*)0x40025428)

28 #define GPIO\_LOCK\_KEY 0x4C4F434B

29 #define SYSCTL\_RCGC2\_R (\*(volatile unsigned long \*)0x400FE108)

30

31 void PortF\_Init(void) {

32 SYSCTL\_RCGC2\_R |= 0x00000020; // 1) activate clock for Port F

33 delay = SYSCTL\_RCGC2\_R; // allow time for clock to start

34 GPIO\_PORTF\_LOCK\_R = 0x4C4F434B; // 2) unlock GPIO Port F

35 GPIO\_PORTF\_CR\_R = 0x1F; // allow changes to PF4-0

36 // only PF0 needs to be unlocked, other bits can't be locked

37 GPIO\_PORTF\_AMSEL\_R = 0x00; // 3) disable analog on PF

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## 5)build target

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Build (F7)

Build target files

Source Group 1

- ex1.c
- startup.s
- tm4c123gh6pm.h
- driverlib.lib

```
28 #define GPIO_LOCK_KEY      0x4C4F434B // Unlocks the GPIO_CR register
29 #define SYSCTL_RCGC2_R      (*((volatile unsigned long *)0x400FE108))
30
31 void PortF_Init(void){ volatile unsigned long delay;
32     SYSCTL_RCGC2_R |= 0x00000020; // 1) activate clock for Port F
33     delay = SYSCTL_RCGC2_R; // allow time for clock to start
34     GPIO_PORTF_LOCK_R = 0x4C4F434B; // 2) unlock GPIO Port F
35     GPIO_PORTF_CR_R = 0x1F; // allow changes to PF4-0
36     // only PF0 needs to be unlocked, other bits can't be locked
37     GPIO_PORTF_AMSEL_R = 0x00; // 3) disable analog on PF
38     GPIO_PORTF_PCTL_R = 0x00000000; // 4) PCTL GPIO on PF4-0
39     GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
40     GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
41     GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
42     GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
43 }
44 unsigned long Led;
45 void Delay(void){unsigned long volatile time;
46     time = 145448; // 0.1sec
47     while(time){
48         time--;
49     }
50 }
51 int main(void){
52     PortF_Init(); // make PF1 out (PF1 built-in LED)
53     while(1){
54         Led = GPIO_PORTF_DATA_R; // read previous
55         Led = Led^0x02; // toggle red LED, PF1
56         GPIO_PORTF_DATA_R = Led; // output
57         Delay();
58     }
```

Build Output

Build target files

Simulation

L:42 C:54

CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Target 1

Source Group 1

- ex1.c
- startup.s
- tm4c123gh6pm.h
- driverlib.lib

```
28 #define GPIO_LOCK_KEY      0x4C4F434B // Unlocks the GPIO_CR register
29 #define SYSCTL_RCGC2_R      (*((volatile unsigned long *)0x400FE108))
30
31 void PortF_Init(void){ volatile unsigned long delay;
32     SYSCTL_RCGC2_R |= 0x00000020; // 1) activate clock for Port F
33     delay = SYSCTL_RCGC2_R; // allow time for clock to start
34     GPIO_PORTF_LOCK_R = 0x4C4F434B; // 2) unlock GPIO Port F
35     GPIO_PORTF_CR_R = 0x1F; // allow changes to PF4-0
36     // only PF0 needs to be unlocked, other bits can't be locked
37     GPIO_PORTF_AMSEL_R = 0x00; // 3) disable analog on PF
38     GPIO_PORTF_PCTL_R = 0x00000000; // 4) PCTL GPIO on PF4-0
39     GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
40     GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
41     GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
42     GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
43 }
44 unsigned long Led;
45 void Delay(void){unsigned long volatile time;
46     time = 145448; // 0.1sec
47     while(time){
48         time--;
49     }
50 }
51 int main(void){
52     PortF_Init(); // make PF1 out (PF1 built-in LED)
53     while(1){
54         Led = GPIO_PORTF_DATA_R; // read previous
55         Led = Led^0x02; // toggle red LED, PF1
56         GPIO_PORTF_DATA_R = Led; // output
57         Delay();
58     }
```

Build Output

linking...

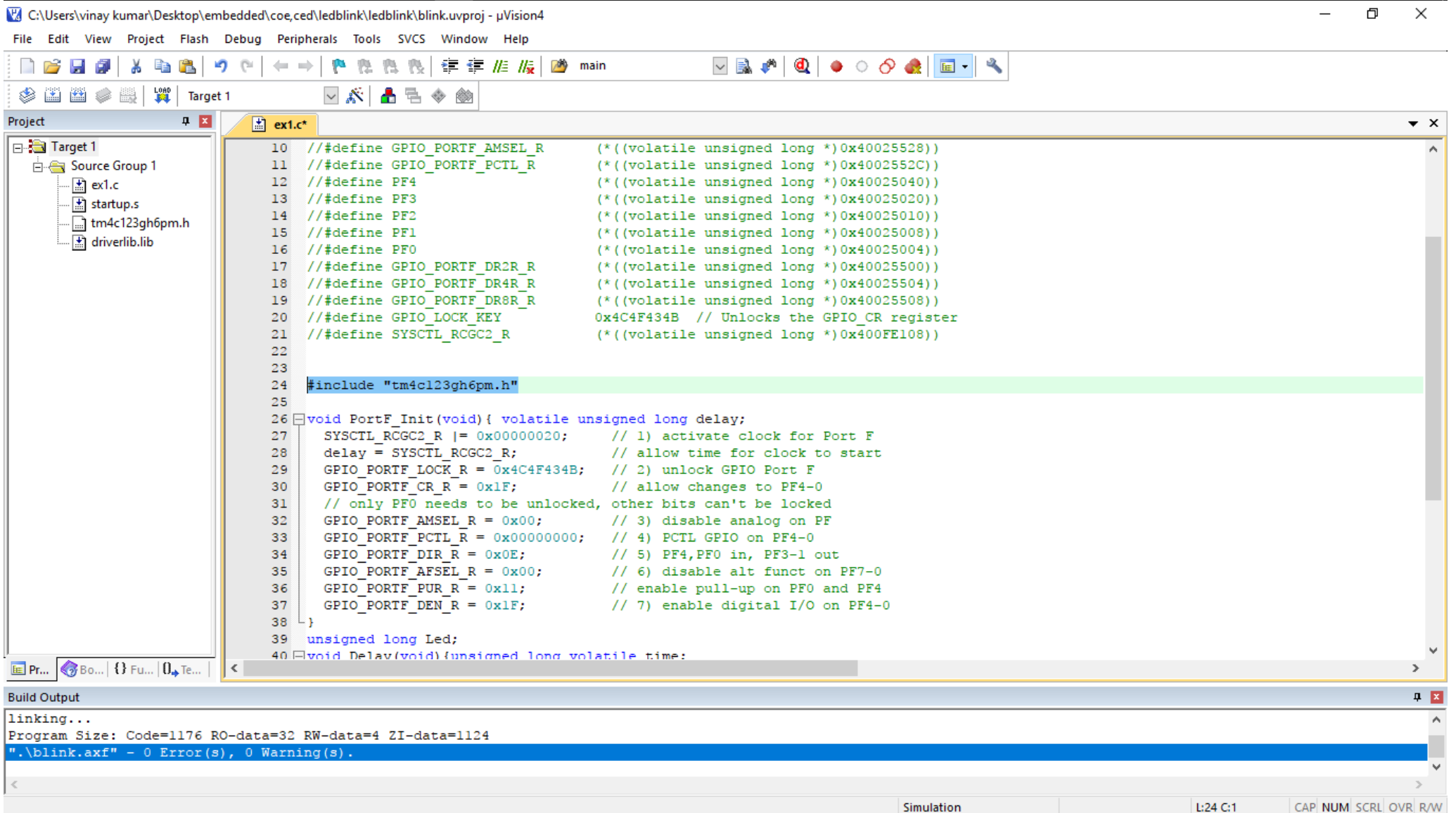
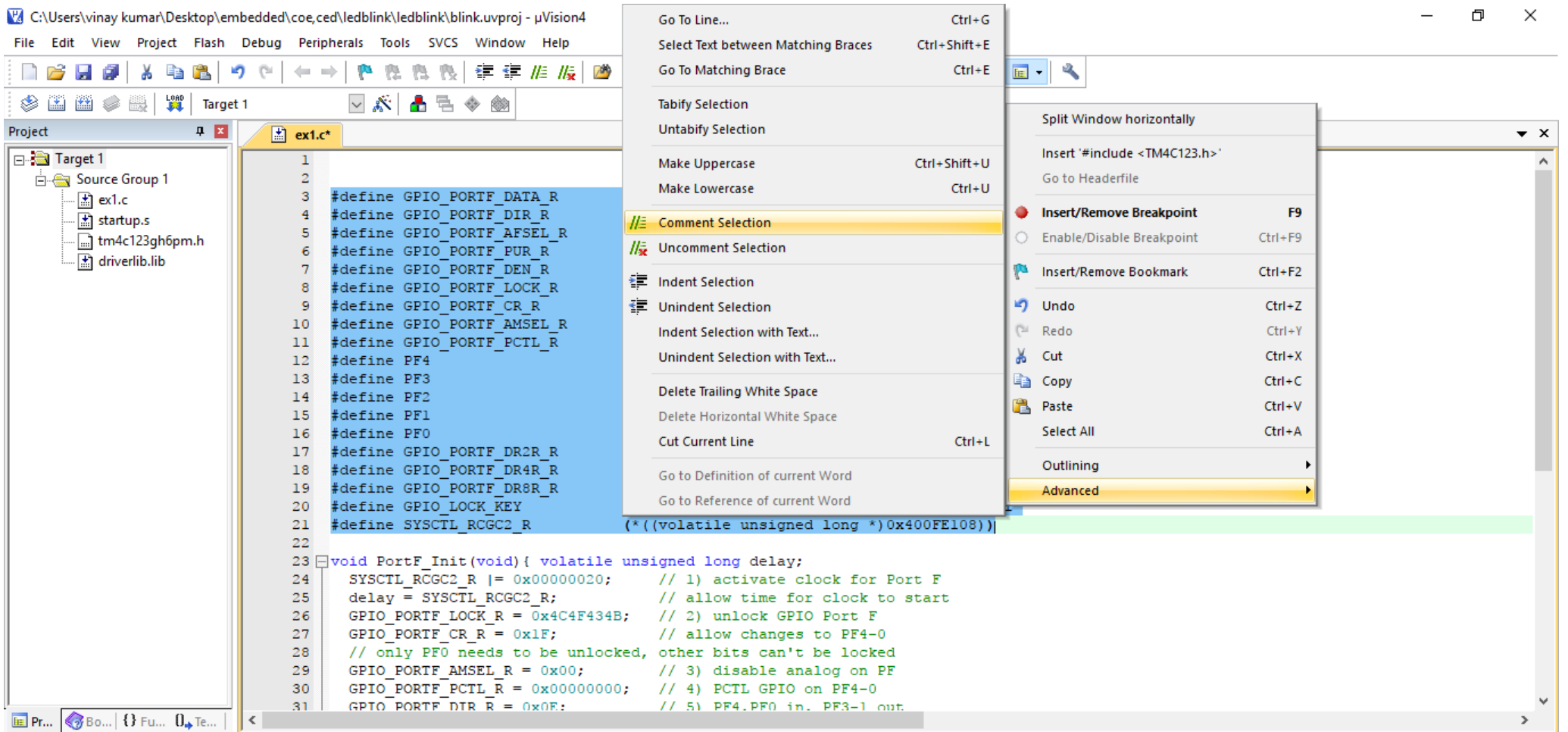
Program Size: Code=1176 RO-data=32 RW-data=4 ZI-data=1124

".\blink.axf" - 0 Error(s), 0 Warning(s).

Simulation

L:42 C:54

CAP NUM SCRL OVR R/W



C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - uVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Source Group 1

- ex1.c
- startup.s
- tm4c123gh6pm.h
- driverlib.lib

Options for Target...  
Configure target options

```
10 // #define GPIO_PORTF_AMSEL_R (*(volatile unsigned long *)0x40025528))
11 // #define GPIO_PORTF_PCTL_R (*(volatile unsigned long *)0x4002552C))
12 // #define PF4 (*(volatile unsigned long *)0x40025040))
13 // #define PF3 (*(volatile unsigned long *)0x40025020))
14 // #define PF2 (*(volatile unsigned long *)0x40025010))
15 // #define PF1 (*(volatile unsigned long *)0x40025008))
16 // #define PF0 (*(volatile unsigned long *)0x40025004))
17 // #define GPIO_PORTF_DR2R_R (*(volatile unsigned long *)0x40025500))
18 // #define GPIO_PORTF_DR4R_R (*(volatile unsigned long *)0x40025504))
19 // #define GPIO_PORTF_DR8R_R (*(volatile unsigned long *)0x40025508))
20 // #define GPIO_LOCK_KEY 0x4C4F434B // Unlocks the GPIO_CR register
21 // #define SYSCTL_RCGC2_R (*(volatile unsigned long *)0x400FE108))
22
23
24 #include "tm4c123gh6pm.h"
25
26 void PortF_Init(void) { volatile unsigned long delay;
27     SYSCTL_RCGC2_R |= 0x00000020; // 1) activate clock for Port F
28     delay = SYSCTL_RCGC2_R; // allow time for clock to start
29     GPIO_PORTF_LOCK_R = 0x4C4F434B; // 2) unlock GPIO Port F
30     GPIO_PORTF_CR_R = 0x1F; // allow changes to PF4-0
31     // only PF0 needs to be unlocked, other bits can't be locked
32     GPIO_PORTF_AMSEL_R = 0x00; // 3) disable analog on PF
33     GPIO_PORTF_PCTL_R = 0x00000000; // 4) PCTL GPIO on PF4-0
34     GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
35     GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
36     GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
37     GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
38 }
39 unsigned long Led;
40 void Delay(void) { unsigned long volatile time;
```

Build Output

linking...

Program Size: Code=1176 RO-data=32 RW-data=4 ZI-data=1124

".\blink.axf" - 0 Error(s), 0 Warning(s).

Simulation L:24 C:26 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - uVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Source Group 1

- ex1.c
- startup.s
- tm4c123gh6pm.h
- driverlib.lib

Options for Target 'Target 1'

Device Target Output Listing User C/C++ Asm Linker Debug Utilities

Texas Instruments TM4C123GH6PM

Xtal (MHz): 16.0

Operating system: None

System-Viewer File (.Sfr): TM4C123GH6PM.SFR

☐ Use Custom SVD File

Code Generation

☐ Use Cross-Module Optimization

☐ Use MicroLIB ☐ Big Endian

Floating Point Hardware: Use FPU Not Used Use FPU

Read/Only Memory Areas

	default	off-chip	Start	Size	Startup
<input type="checkbox"/> ROM1:					<input type="radio"/>
<input type="checkbox"/> ROM2:					<input type="radio"/>
<input type="checkbox"/> ROM3:					<input type="radio"/>
on-chip					
<input checked="" type="checkbox"/> IROM1:	0x0		0x40000		<input checked="" type="radio"/>
<input type="checkbox"/> IROM2:					<input type="radio"/>

Read/Write Memory Areas

	default	off-chip	Start	Size	NoInit
<input type="checkbox"/> RAM1:					<input type="checkbox"/>
<input type="checkbox"/> RAM2:					<input type="checkbox"/>
<input type="checkbox"/> RAM3:					<input type="checkbox"/>
on-chip					
<input checked="" type="checkbox"/> IRAM1:	0x20000000		0x8000		<input type="checkbox"/>
<input type="checkbox"/> IRAM2:					<input type="checkbox"/>

Build Output

linking...

Program Size: Code=1176 RO-data=32 RW-data=4 ZI-data=1124

".\blink.axf" - 0 Error(s), 0 Warning(s).

Simulation L:24 C:26 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - uVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Source Group 1

- ex1.c
- startup.s
- tm4c123gh6pm.h
- driverlib.lib

ex1.c

```
10 // #define GPIO_PORTF_AMSEL_R (*(volatile unsigned long *)0x40025528))
11 // #define GPIO_PORTF_AMSEL_R (*(volatile unsigned long *)0x40025528))
12 // #define
13 // #define
14 // #define
15 // #define
16 // #define
17 // #define
18 // #define
19 // #define
20 // #define
21 // #define
22
23
24 #include "
25
26 void PortF
27 SYSCTL_R
28 delay =
29 GPIO_PORT
30 GPIO_PORT
31 // only
32 GPIO_PORT
33 GPIO_PORT
34 GPIO_PORT
35 GPIO_PORT
36 GPIO_PORT
37 GPIO_PORT
38 }
39 unsigned l
40 void Delay
```

Options for Target 'Target 1'

Device | Target | Output | Listing | User | C/C++ | Asm | Linker | Debug | Utilities

☒ Use Simulator ☐ Use: Stellaris ICDI

☐ Limit Speed to Real-Time

☒ Load Application at Startup ☒ Run to main()

Initialization File:  ... Edit...

Restore Debug Session Settings

☒ Breakpoints ☒ Toolbox

☒ Watch Windows & Performance Analyzer

☒ Memory Display ☒ System Viewer

CPU DLL: Parameter: SARMCM3.DLL -MPU

Driver DLL: Parameter: SARMCM3.DLL -MPU

Dialog DLL: Parameter: DCM.DLL pCM4 -dLaunchPadDLL

TCM.DLL pCM4

OK Cancel Defaults Help

Build Output

linking...

Program Size: Code=1176 RO-data=32 RW-data=4 ZI-data=1124

".\blink.axf" - 0 Error(s), 0 Warning(s).

Simulation L:24 C:26 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - uVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Source Group 1

- ex1.c
- startup.s
- tm4c123gh6pm.h
- driverlib.lib

ex1.c

```
10 // #define GPIO_PORTF_AMSEL_R (*(volatile unsigned long *)0x40025528))
11 // #define GPIO_PORTF_AMSEL_R (*(volatile unsigned long *)0x40025528))
12 // #define
13 // #define
14 // #define
15 // #define
16 // #define
17 // #define
18 // #define
19 // #define
20 // #define
21 // #define
22
23
24 #include "
25
26 void PortF
27 SYSCTL_R
28 delay =
29 GPIO_PORT
30 GPIO_PORT
31 // only
32 GPIO_PORT
33 GPIO_PORT
34 GPIO_PORT
35 GPIO_PORT
36 GPIO_PORT
37 GPIO_PORT
38 }
39 unsigned l
40 void Delay
```

Options for Target 'Target 1'

Device | Target | Output | Listing | User | C/C++ | Asm | Linker | Debug | Utilities

☒ Use Target Driver for Flash Programming ☐ Use Debug Driver

Stellaris ICDI ☒ Update Target before Debugging

Init File:  ... Edit...

☐ Use External Tool for Flash Programming

Command:  ...

Arguments:

☐ Run Independent

Configure Image File Processing (FCARM):

Output File:  Add Output File to Group: Source Group 1

Image Files Root Folder:  ☐ Generate Listing

OK Cancel Defaults Help

Build Output

linking...

Program Size: Code=1176 RO-data=32 RW-data=4 ZI-data=1124

".\blink.axf" - 0 Error(s), 0 Warning(s).

Simulation L:24 C:26 CAP NUM SCRL OVR R/W



C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Start/Stop Debug Session (Ctrl+F5)  
Enter or leave a debug session

Project

Target 1

Source Group 1

ex1.c

startup.s

tm4c123gh6pm.h

driverlib.lib

```
10 // #define GPIO_PORTF_AMSEL_R ((volatile unsigned long *)0x40025528))
11 // #define GPIO_PORTF_PCTL_R ((volatile unsigned long *)0x4002552C))
12 // #define PF4 ((volatile unsigned long *)0x40025040))
13 // #define PF3 ((volatile unsigned long *)0x40025020))
14 // #define PF2 ((volatile unsigned long *)0x40025010))
15 // #define PF1 ((volatile unsigned long *)0x40025008))
16 // #define PF0 ((volatile unsigned long *)0x40025004))
17 // #define GPIO_PORTF_DR2R_R ((volatile unsigned long *)0x40025500))
18 // #define GPIO_PORTF_DR4R_R ((volatile unsigned long *)0x40025504))
19 // #define GPIO_PORTF_DR8R_R ((volatile unsigned long *)0x40025508))
20 // #define GPIO_LOCK_KEY 0x4C4F434B // Unlocks the GPIO_CR register
21 // #define SYSCTL_RCGC2_R ((volatile unsigned long *)0x400FE108))
22
23
24 #include "tm4c123gh6pm.h"
25
26 void PortF_Init(void){ volatile unsigned long delay;
27     SYSCTL_RCGC2_R |= 0x00000020; // 1) activate clock for Port F
28     delay = SYSCTL_RCGC2_R; // allow time for clock to start
29     GPIO_PORTF_LOCK_R = 0x4C4F434B; // 2) unlock GPIO Port F
30     GPIO_PORTF_CR_R = 0x1F; // allow changes to PF4-0
31     // only PF0 needs to be unlocked, other bits can't be locked
32     GPIO_PORTF_AMSEL_R = 0x00; // 3) disable analog on PF
33     GPIO_PORTF_PCTL_R = 0x00000000; // 4) PCTL GPIO on PF4-0
34     GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
35     GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
36     GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
37     GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
38 }
39 unsigned long Led;
40 void Delay(void){unsigned long volatile time;
```

Build Output

Erase Done.  
Programming Done.  
Verify OK.

Enter or leave a debug session

Simulation

L:24 C:26

CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

main

Target 1

Project

Target 1

Source Group 1

ex1.c

startup.s

tm4c123gh6pm.h

driverlib.lib

```
10 // #define GPIO_PORTF_AMSEL_R ((volatile unsigned long *)0x40025528))
11 // #define GPIO_PORTF_PCTL_R ((volatile unsigned long *)0x4002552C))
12 // #define PF4 ((volatile unsigned long *)0x40025040))
13 // #define PF3 ((volatile unsigned long *)0x40025020))
14 // #define PF2 ((volatile unsigned long *)0x40025010))
15 // #define PF1 ((volatile unsigned long *)0x40025008))
16 // #define PF0 ((volatile unsigned long *)0x40025004))
17 // #define GPIO_PORTF_DR2R_R ((volatile unsigned long *)0x40025500))
18 // #define GPIO_PORTF_DR4R_R ((volatile unsigned long *)0x40025504))
19 // #define GPIO_PORTF_DR8R_R ((volatile unsigned long *)0x40025508))
20 // #define GPIO_LOCK_KEY 0x4C4F434B // Unlocks the GPIO_CR register
21 // #define SYSCTL_RCGC2_R ((volatile unsigned long *)0x400FE108))
22
23
24 #include "tm4c123gh6pm.h"
25
26 void PortF_Init(void){ volatile
27     SYSCTL_RCGC2_R |= 0x00000020;
28     delay = SYSCTL_RCGC2_R;
29     GPIO_PORTF_LOCK_R = 0x4C4F434B;
30     GPIO_PORTF_CR_R = 0x1F;
31     // only PF0 needs to be unlocked, other bits can't be locked
32     GPIO_PORTF_AMSEL_R = 0x00; // 3) disable analog on PF
33     GPIO_PORTF_PCTL_R = 0x00000000; // 4) PCTL GPIO on PF4-0
34     GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
35     GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
36     GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
37     GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
38 }
39 unsigned long Led;
40 void Delay(void){unsigned long volatile time;
```

µVision

EVALUATION MODE  
Running with Code Size Limit: 32K

OK

Build Output

Erase Done.  
Programming Done.  
Verify OK.

Simulation

L:24 C:26

CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
R0	0x20000068
R1	0x20000068
R2	0x20000068
R3	0x20000068
R4	0x00000000
R5	0x20000004
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x000004AC
R11	0x00000000
R12	0x20000044
R13 (SP)	0x20000468
R14 (LR)	0x0000030F
R15 (PC)	0x0000038E
xPSR	0x21000000

Disassembly

```
47: PortF_Init(); // make PF1 out (PF1 built-in LED)
0x0000038E F7FFFC7 BL.W
48: while(1){
0x00000392 E00F B 0x000003B4
```

Logic Analyzer

Performance Analyzer

Code Coverage

ex1.c startup.s

```
34 GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
35 GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
36 GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
37 GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
38 }
39 unsigned long Led;
40 void Delay(void){unsigned long volatile time;
41 time = 145448; // 0.1sec
42 while(time){
43 time--;
44 }
45 }
46 int main(void){
47 PortF_Init(); // make PF1 out (PF1 built-in LED)
48 while(1){
49 Led = GPIO_PORTF_DATA_R; // read previous
50 Led = Led^0x02; // toggle red LED, PF1
51 GPIO_PORTF_DATA_R = Led; // output
52 Delay();
53 }
54 }
55 }
```

Command

\*\*\* Currently used: 1200 Bytes (3%)

Call Stack + Locals

Name	Location/Value	Type
main	0x0000038E	int f0

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE

Show or hide the Logic Analyzer Window

Simulation t1: 0.00005487 sec L:47 C:1 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
R0	0x20000068
R1	0x20000068
R2	0x20000068
R3	0x20000068
R4	0x00000000
R5	0x20000004
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x000004AC
R11	0x00000000
R12	0x20000044
R13 (SP)	0x20000468
R14 (LR)	0x0000030F
R15 (PC)	0x0000038E
xPSR	0x21000000

Logic Analyzer

Setup... Load... Min Time Max Time Grid Zoom Min/Max Update Screen Transition Jump to Signal Info Amplitude Show Cycles Cursor

0 s 54.875 us 1 ms In Out All Auto Undo Stop Clear Prev Next Code Trace

2.6875 us 4.822687 ms 11.00269 ms 22.00269 ms

Disassembly

ex1.c startup.s

```
34 GPIO_PORTF_DIR_R = 0x0E; // 5) PF4,PF0 in, PF3-1 out
35 GPIO_PORTF_AFSEL_R = 0x00; // 6) disable alt funct on PF7-0
36 GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
37 GPIO_PORTF_DEN_R = 0x1F; // 7) enable digital I/O on PF4-0
38 }
39 unsigned long Led;
40 void Delay(void){unsigned long volatile time;
41 time = 145448; // 0.1sec
42 while(time){
43 time--;
44 }
45 }
46 int main(void){
47 PortF_Init(); // make PF1 out (PF1 built-in LED)
48 while(1){
49 Led = GPIO_PORTF_DATA_R; // read previous
50 Led = Led^0x02; // toggle red LED, PF1
51 GPIO_PORTF_DATA_R = Led; // output
52 Delay();
53 }
54 }
55 }
```

Command

\*\*\* Currently used: 1200 Bytes (3%)

Call Stack + Locals

Name	Location/Value	Type
main	0x0000038E	int f0

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE

Simulation t1: 0.00005487 sec L:47 C:1 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - uVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
R0	0x20000068
R1	0x20000068
R2	0x20000068
R3	0x20000068
R4	0x00000000
R5	0x20000004
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x000004AC
R11	0x00000000
R12	0x20000044
R13 (SP)	0x20000468
R14 (LR)	0x0000030F
R15 (PC)	0x0000038E
xPSR	0x21000000

Logic Analyzer

Setup... Load... Min Time Max Time Grid

Save... 0 s 54.875 us 1 ms

Zoom Min/Max Update Screen Transition Jump to

Signal Info Amplitude Show Cycles Cursor

Current Logic Analyzer Signals:

New (Insert)

Signal Display

Display Type: Analog

Color: [Color Picker]

Display Range

Max: 0.0

Min: 0.0

Display Formula (Signal & Mask) >> Shift

And Mask: 0xFFFFFFFF Shift Right: 0

Export / Import

Export Signal Definitions... Import Signal Definitions...

Kill All Close Help

Command

\*\*\* Currently used: 1200 Bytes (3%)

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE

Call Stack + Locals

Name	Location/Value	Type
main	0x0000038E	int f0

Simulation t1: 0.00005487 sec L:47 C:1 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - uVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
R0	0x20000068
R1	0x20000068
R2	0x20000068
R3	0x20000068
R4	0x00000000
R5	0x20000004
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x000004AC
R11	0x00000000
R12	0x20000044
R13 (SP)	0x20000468
R14 (LR)	0x0000030F
R15 (PC)	0x0000038E
xPSR	0x21000000

Logic Analyzer

Setup... Load... Min Time Max Time Grid

Save... 54.875 us 54.875 us 0 s

Zoom Min/Max Update Screen Transition Jump to

Signal Info Amplitude Show Cycles Cursor

Current Logic Analyzer Signals:

(portf & 0x00000002) >> 1

Signal Display

Display Type: Analog

Color: Analog

Display Range

Max: 0xFFFFFFFF

Min: 0x0

Display Formula (Signal & Mask) >> Shift

And Mask: 0x00000002 Shift Right: 1

Export / Import

Export Signal Definitions... Import Signal Definitions...

Kill All Close Help

Command

LA (portf & 0x00000002) >> 1

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE

Call Stack + Locals

Name	Location/Value	Type
main	0x0000038E	int f0

Simulation t1: 0.00005487 sec L:47 C:1 CAP NUM SCRL OVR R/W



C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers Run (F5) Start code execution

Register Value

Core

R0	0x20000068
R1	0x20000068
R2	0x20000068
R3	0x20000068
R4	0x00000000
R5	0x20000004
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x000004AC
R11	0x00000000
R12	0x20000044
R13 (SP)	0x20000468
R14 (LR)	0x0000030F
R15 (PC)	0x0000038E
xPSR	0x21000000

Banked

System

Internal

Mode Thread

Privilege Privileged

Stack MSP

States 878

Sec 0.00005487

FPU

Project Registers

Logic Analyzer

Setup... Load... Save... Min Time Max Time Grid Zoom Min/Max Update Screen Transition Jump to Signal Info Amplitude Show Cycles Cursor

1

(portf & 0x00000002) >> 1

54.875 us 54.875 us 0 s

54.875 us 54.875 us 54.875 us 54.875 us

Disassembly Logic Analyzer

ex1.c startup.s

```
47 PortF_Init(); // make PF1 out (PF1 built-in LED)
48 while(1){
49     Led = GPIO_PORTF_DATA_R; // read previous
50     Led = Led^0x02; // toggle red LED, PF1
51     GPIO_PORTF_DATA_R = Led; // output
52     Delay();
53 }
54 }
55 }
```

Command

LA (portf & 0x00000002) >> 1

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE

Call Stack + Locals

Name	Location/Value	Type
main	0x0000038E	int f0

Simulation t1: 0.00005487 sec L:47 C:1 CAP NUM SCRL OVR R/W

C:\Users\vinay kumar\Desktop\embedded\coe,ced\ledblink\ledblink\blink.uvproj - µVision4

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register Value

Core

R0	0x20000068
R1	0x20000068
R2	0x20000068
R3	0x20000068
R4	0x00000000
R5	0x20000004
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x000004AC
R11	0x00000000
R12	0x20000044
R13 (SP)	0x20000468
R14 (LR)	0x0000030F
R15 (PC)	0x0000038E
xPSR	0x21000000

Banked

System

Internal

Mode Thread

Privilege Privileged

Stack MSP

States 878

Sec 0.00005487

FPU

Project Registers

Logic Analyzer

Setup... Load... Save... Min Time Max Time Grid Zoom Min/Max Update Screen Transition Jump to Signal Info Amplitude Show Cycles Cursor

1

(portf & 0x00000002) >> 1

54.875 us 10.435 s 50 ms

1->1

0.200057 s

0.400055 s, d: 0.199998 s

1.050055 s

(portf & 0x00000002) >> 1

Time: 0.400055 s Mouse Pos 0.200057 s Reference Point 0.199998 s Delta 0.199998 s = 5.000059 Hz

Value: 1

PC S: 0x3ac

ex1.c startup.s

```
42 while(time){
43     time--;
44 }
45 }
46 int main(void){
47     PortF_Init(); // make PF1 out (PF1 built-in LED)
48     while(1){
49         Led = GPIO_PORTF_DATA_R; // read previous
50         Led = Led^0x02; // toggle red LED, PF1
51         GPIO_PORTF_DATA_R = Led; // output
52         Delay();
53     }
54 }
55 }
```

Command

LA (portf & 0x00000002) >> 1

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE

Call Stack + Locals

Name	Location/Value	Type
main	0x0000038E	int f0

Simulation t1: 36.76300006 sec L:47 C:1 CAP NUM SCRL OVR R/W