

# EXPERIMENT 7

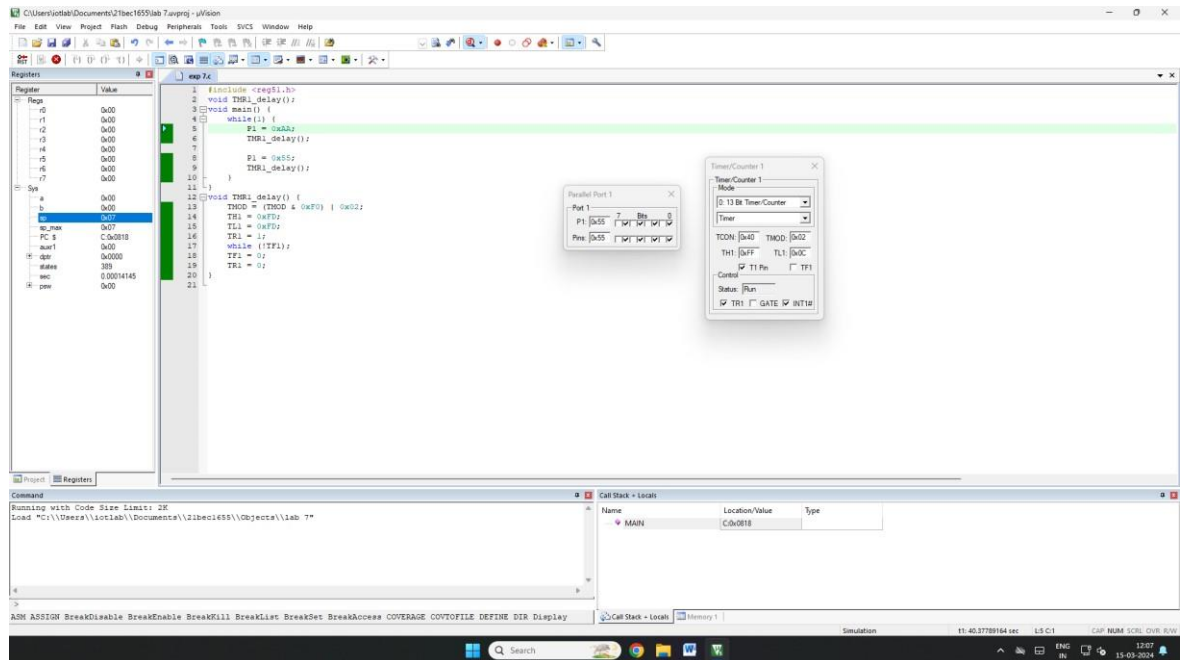
## PROGRAMS ON TIMER AND COUNTER

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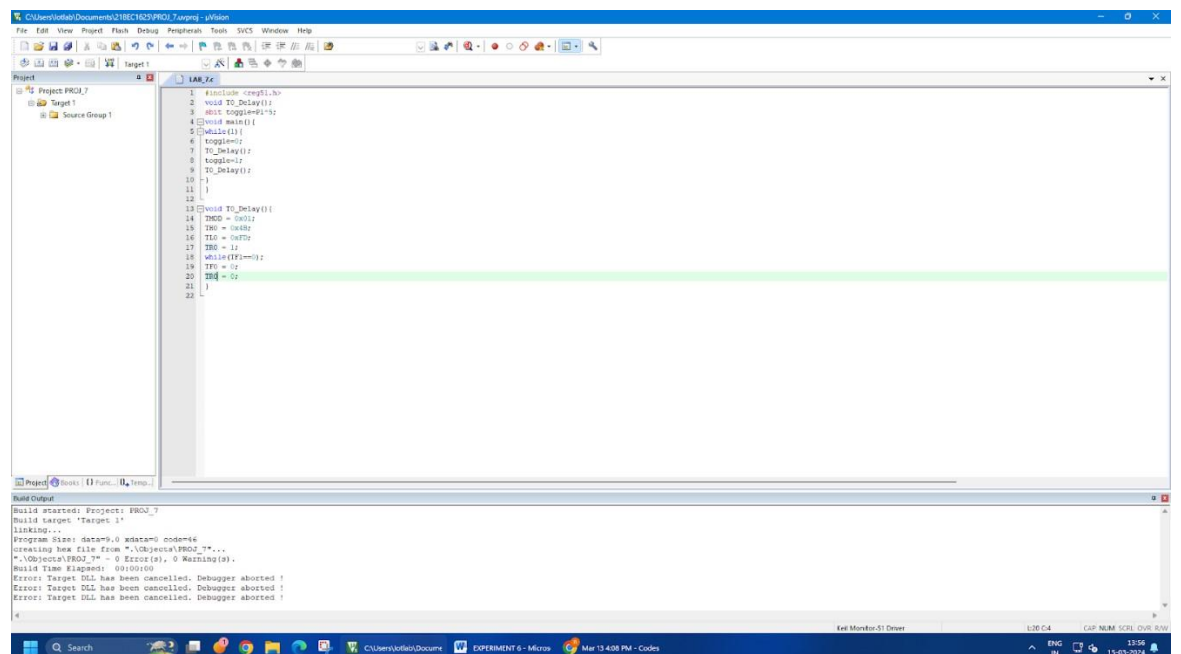
Reg No: 21BEC1277

### TIMER

1. Write an 8051 C program to toggle port P1 continuously with some delay. Use timer 1 and Mode 2 for delay.

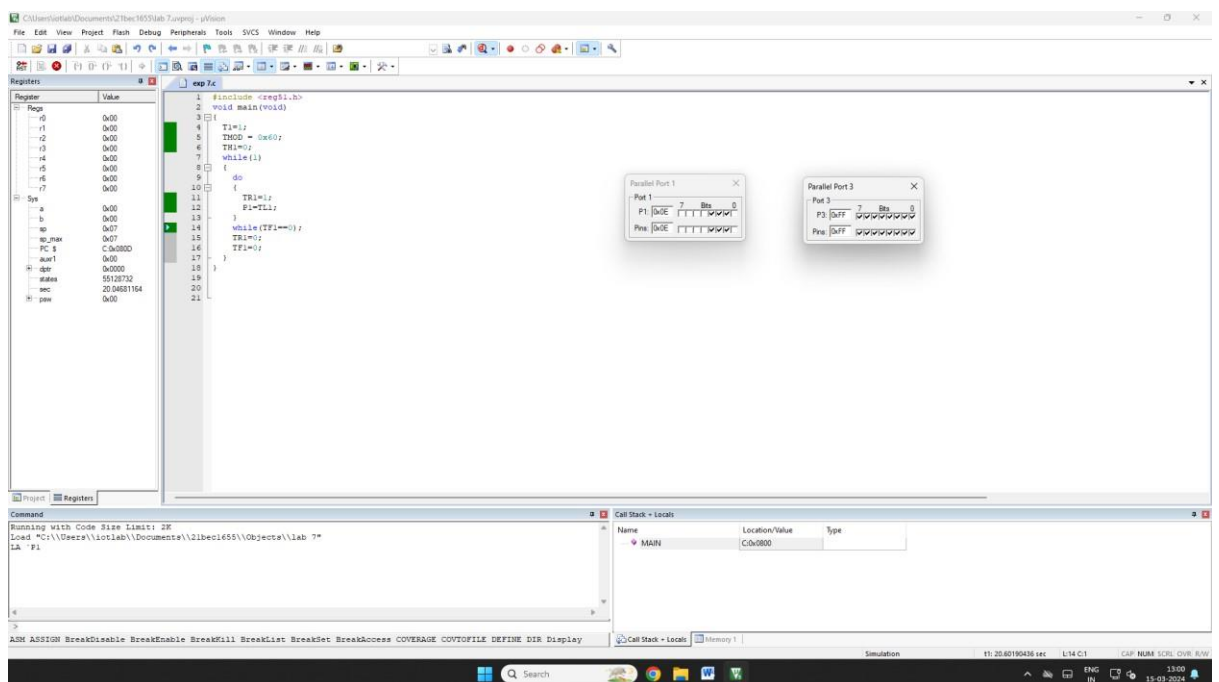
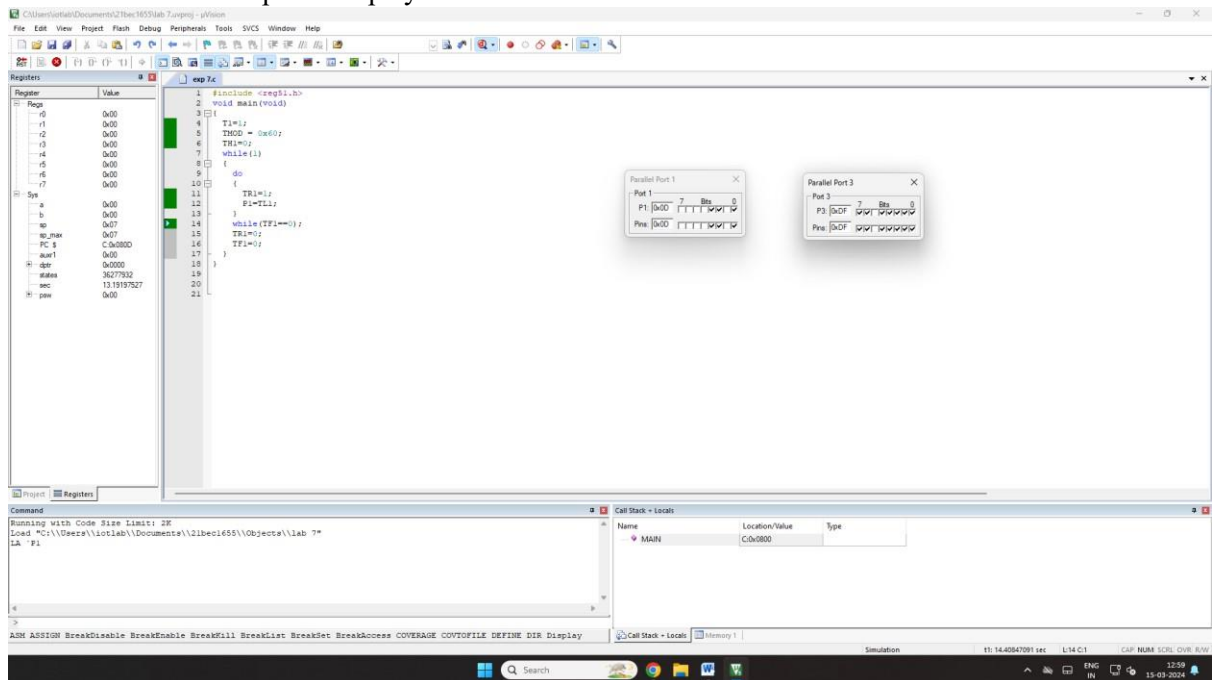


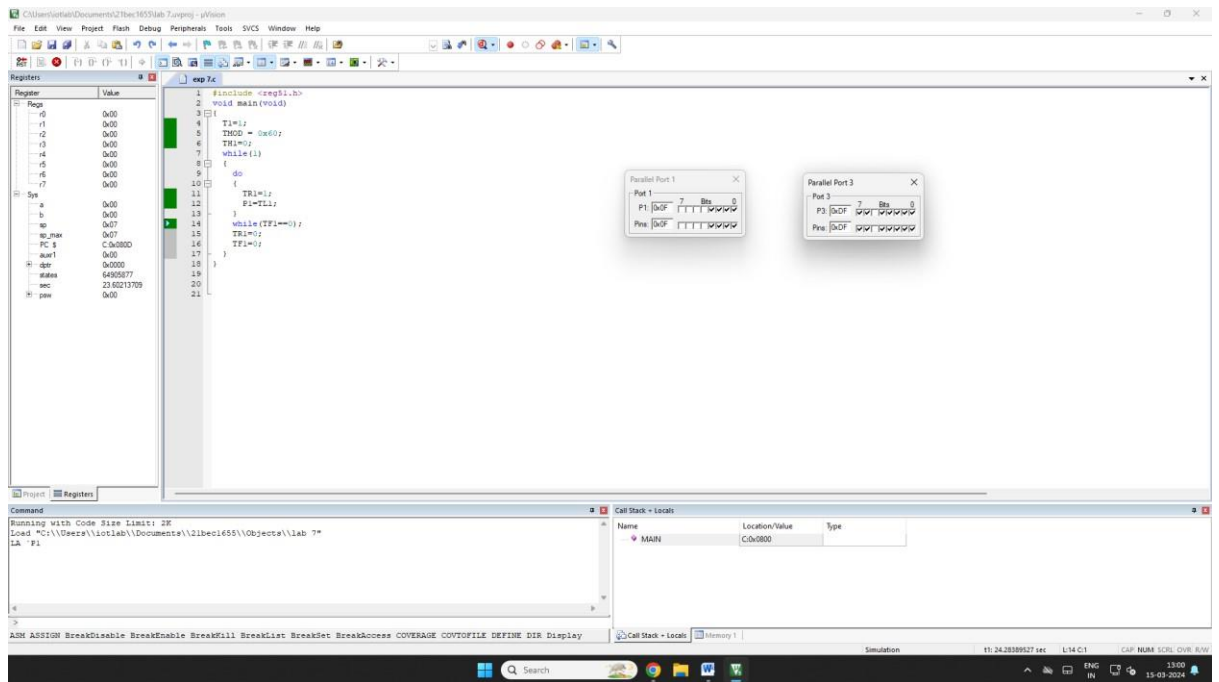
2. Write an 8051 C program to toggle port only bit p1.5 continuously every 50ms.



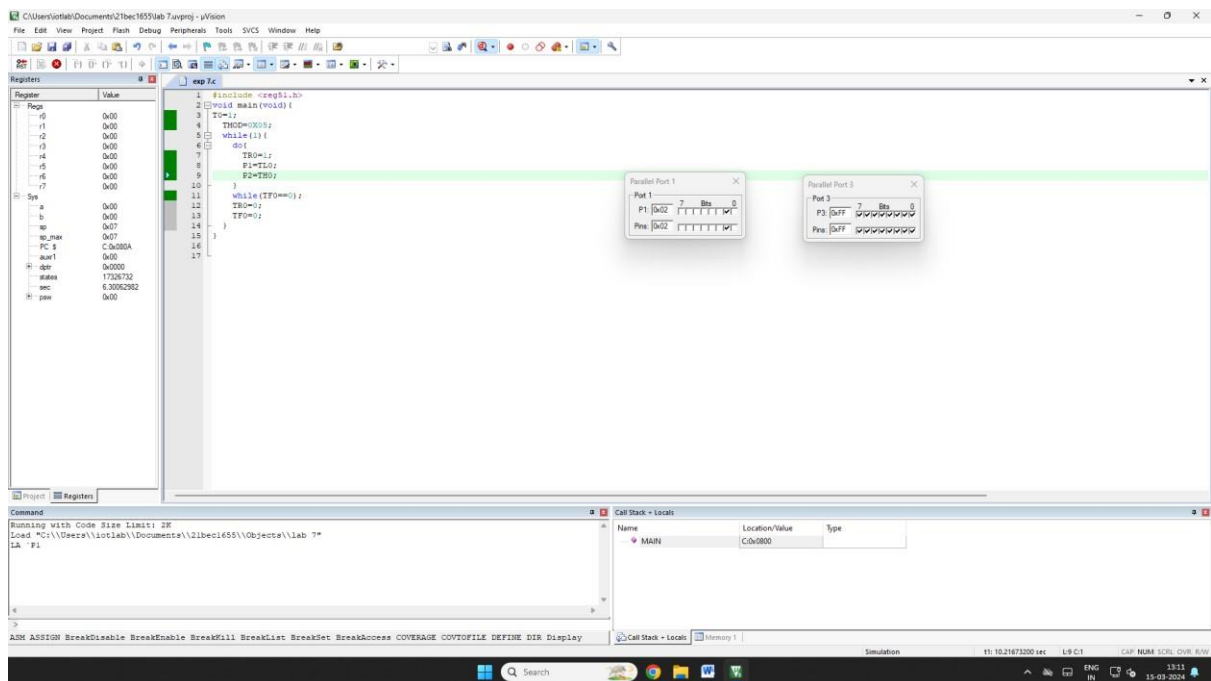
## COUNTER

1. Assume that a 1-Hz external clock is being fed into pin T1(P3.5). Write a C program for counter 1 in mode 2 to count up and display the state of the TL1 count on P1. Start the count at 0H.





- Assume that a 1-Hz external clock is being fed into pin T0(P3.4). Write a C program for counter 0 in mode 1 to count up and display the state of the TL0 and TH0 registers on P1 and P2, respectively.



CUUser\iotlab\Documents\21bec1655\lab 7\proj - uVision

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
r0	0x00
r1	0x00
r2	0x00
r3	0x00
r4	0x00
r5	0x00
r6	0x00
r7	0x00
sys	
a	0x00
b	0x00
sp	0x07
sp_max	0x07
PC	C:0x000A
aux1	0x00
der	0x0000
status	45637195
sec	16.61715995
pos	0x00

```

1 #include <reg51.h>
2 void main(void) {
3     T0=1;
4     TH0D=0x03;
5     while(1) {
6         do {
7             T0=1;
8             P1=T0;
9             P2=T0;
10        }
11        while(TFO==0);
12        T0=0;
13        TFO=1;
14    }
15 }
16
17

```

Parallel Port 1

Port	7	6	5	4	3	2	1	0
P1	0x03	1	1	1	1	1	1	1
Pre	0x03	1	1	1	1	1	1	1

Parallel Port 3

Port	7	6	5	4	3	2	1	0
P3	0x0F	1	1	1	1	1	1	1
Pre	0x0F	1	1	1	1	1	1	1

Command

Running with Code Size Limit: 2K  
Load C:\Users\iotlab\Documents\21bec1655\Objects\lab 7\*  
LA \*P1

Call Stack - Locals

Name	Location/Value	Type
MAIN	C:0x000	

ASH ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE DEFINE DIR Display

Simulation 11:17.35246327 sec L5 C1 CAP NUM SCRL OVR R/W

CUUser\iotlab\Documents\21bec1655\lab 7\proj - uVision

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
r0	0x00
r1	0x00
r2	0x00
r3	0x00
r4	0x00
r5	0x00
r6	0x00
r7	0x00
sys	
a	0x00
b	0x00
sp	0x07
sp_max	0x07
PC	C:0x0007
aux1	0x00
der	0x0000
status	59634996
sec	21.65545309
pos	0x00

```

1 #include <reg51.h>
2 void main(void) {
3     T0=1;
4     TH0D=0x03;
5     while(1) {
6         do {
7             T0=1;
8             P1=T0;
9             P2=T0;
10        }
11        while(TFO==0);
12        T0=0;
13        TFO=1;
14    }
15 }
16
17

```

Parallel Port 1

Port	7	6	5	4	3	2	1	0
P1	0x04	1	1	1	1	1	1	1
Pre	0x04	1	1	1	1	1	1	1

Parallel Port 3

Port	7	6	5	4	3	2	1	0
P3	0x0F	1	1	1	1	1	1	1
Pre	0x0F	1	1	1	1	1	1	1

Command

Running with Code Size Limit: 2K  
Load C:\Users\iotlab\Documents\21bec1655\Objects\lab 7\*  
LA \*P1

Call Stack - Locals

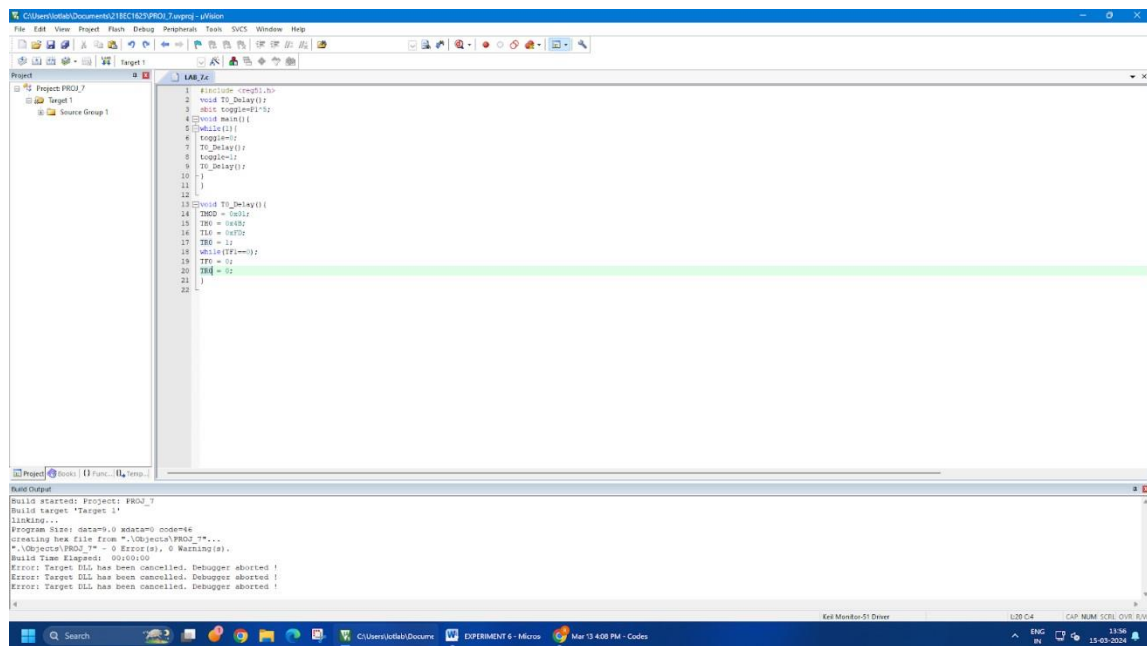
Name	Location/Value	Type
MAIN	C:0x000	

ASH ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE DEFINE DIR Display

Simulation 11:22.25413818 sec L5 C1 CAP NUM SCRL OVR R/W

## HARDWARE:

1. Write an 8051 C program to toggle port only bit p1.5 continuously every 50ms.



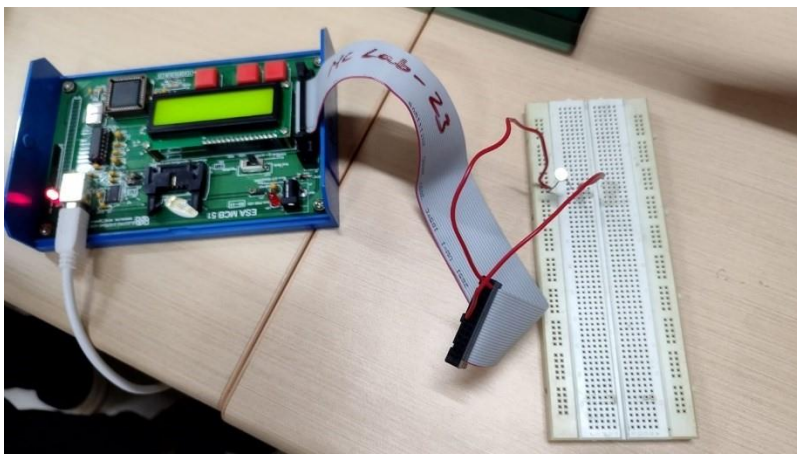
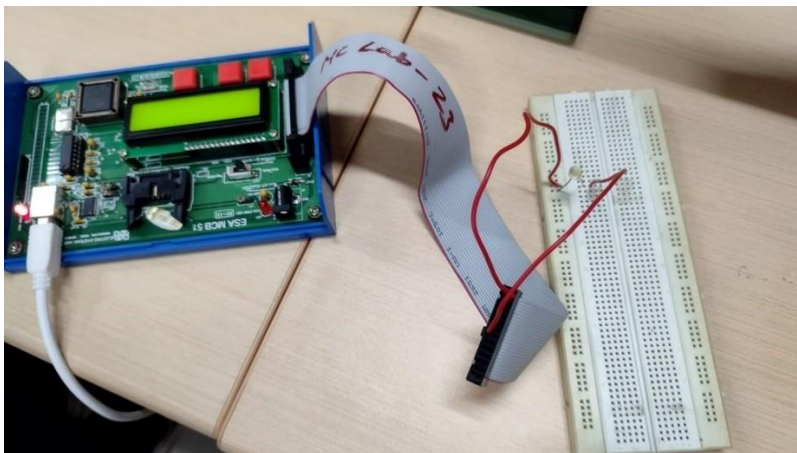
The screenshot shows the uVision IDE with a C program for toggling P1.5 every 50ms. The code is as follows:

```
1 #include <reg51.h>
2 void T0_Delay()
3 {
4     toggle = !toggle;
5     while(1)
6     {
7         T0_Delay();
8         toggle = !toggle;
9         T0_Delay();
10    }
11 }
12
13 void T0_Delay()
14 {
15     TH0 = 0x00;
16     TL0 = 0x00;
17     TR0 = 1;
18     while(TF == 0)
19     {
20         TR0 = 0;
21     }
22 }
```

The build output at the bottom shows the following errors:

```
Build started: Project: P801_7
Build target 'Target 1'
Linking...
Program Size: data=9.0 words code=14
creating hex file from *.Objects\PROJ_7...
*.Objects\PROJ_7 -> Error(s): 0 Warning(s).
Build Time Elapsed: 00:00:00
Error: Target I/O has been cancelled. Debugger aborted !
Error: Target DLL has been cancelled. Debugger aborted !
Error: Target DLL has been cancelled. Debugger aborted !
```

**Output:** The LED toggles.



**RESULT:**

Hence the programs on timer and counter has been done and verified.