

How many bytes of code space does your program require?

Code Size? 51 bytes.

I found this by removing the preconditions (with them it would be 56 bytes) and building the project. Then I checked the build window for the byte size as seen in Fig 1.5.1:

```
Build Output
Build started: Project: Lab1Pat1.1
Build target 'Target_1'
assembling lab1Pat1_1.asm...
linking...
Program Size: data=8.0 xdata=0 code=51
".\Objects\Lab1Pat1.1" - 0 Error(s), 0 Warning(s).
Build Time Elapsed: 00:00:00
```

Fig 1.5.1: Build file output (without preconditions)

How long did your program take to execute for $X=0x33$ and $Y=0x07$? Assume an 11.0592 MHz clock and include the instructions executed from the beginning until you reach the ENDLOOP label.

Execution Time? 17.6323784722 us

Calculations can be seen in Fig 1.5.2

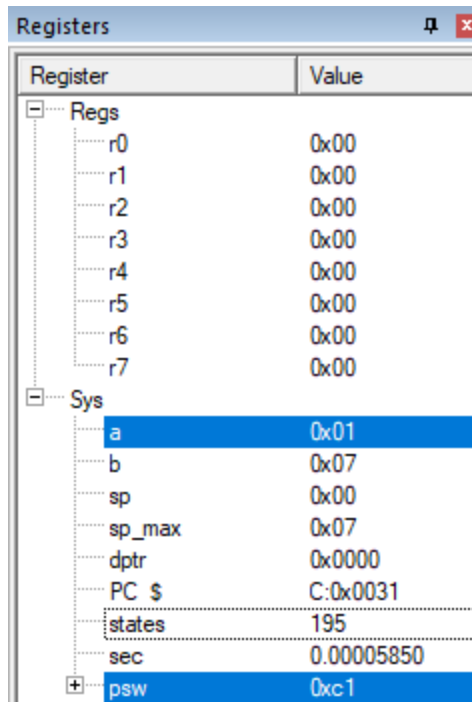
The figure shows a four-step calculation process:

- $f = 11.0592 \cdot 10^6$ = 11 059 200
- $t_{operation} = \frac{1}{f}$ = $9.0422453704 \times 10^{-8}$
- $n_{steps} = 195$ (with a slider set to 195)
- $t_{operation} \cdot n_{steps} \cdot 10^6$ = 17.6323784722

Fig 1.5.2: Detailed Calculation

The way n_{steps} was found was by running the code with a breakpoint at ENDLOOP and checking the machine states after reaching said loop, which was 195, as seen in Fig 1.5.3

wrong, each machine step is 12 oscillations



The image shows a 'Registers' window with a tree view on the left and a table of values on the right. The tree view has two main categories: 'Regs' and 'Sys'. 'Regs' contains registers r0 through r7, all with a value of 0x00. 'Sys' contains system variables: 'a' (0x01), 'b' (0x07), 'sp' (0x00), 'sp_max' (0x07), 'dptr' (0x0000), 'PC \$' (C:0x0031), 'states' (195), 'sec' (0.00005850), and 'psw' (0xc1). The 'a' and 'psw' rows are highlighted in blue.

| Register | Value |
|----------|------------|
| Regs | |
| r0 | 0x00 |
| r1 | 0x00 |
| r2 | 0x00 |
| r3 | 0x00 |
| r4 | 0x00 |
| r5 | 0x00 |
| r6 | 0x00 |
| r7 | 0x00 |
| Sys | |
| a | 0x01 |
| b | 0x07 |
| sp | 0x00 |
| sp_max | 0x07 |
| dptr | 0x0000 |
| PC \$ | C:0x0031 |
| states | 195 |
| sec | 0.00005850 |
| psw | 0xc1 |

Fig 1.5.3: Register display after running code to ENDLOOP