

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.

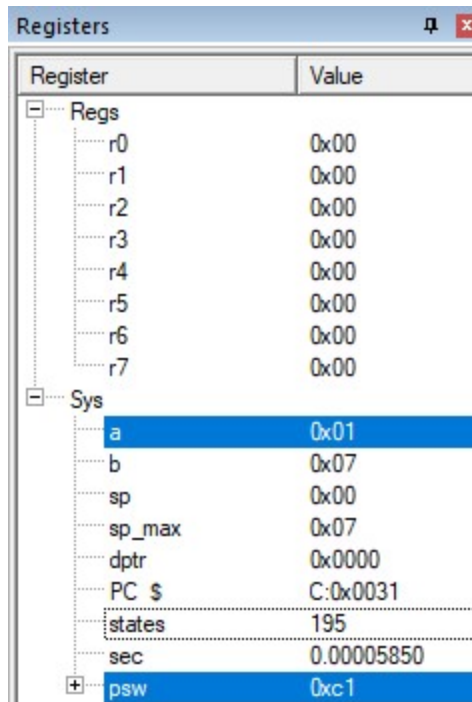
Execution Time? 17.6323784722 us

Calculations can be seen in Fig 1.5.2

1	$f = 11.0592 \cdot 10^6$	= 11 059 200
2	$t_{operation} = \frac{1}{f}$	= $9.0422453704 \times 10^{-8}$
3	$n_{steps} = 195$	-10 195
4	$t_{operation} \cdot n_{steps} \cdot 10^6$	= 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



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), 'dptra' (0x0000), 'PC \$' (C:0x0031), 'states' (195), 'sec' (0.00005850), and 'psw' (0xc1). The 'a' and 'psw' entries 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
dptra	0x0000
PC \$	C:0x0031
states	195
sec	0.00005850
psw	0xc1

Fig 1.5.3: Register display after running code to ENDLOOP