

Judah Ben-Eliezer

112352727

10/13/2020

Prelab 6:

Hardware Switch Debouncing and Conditional I/O

```
1
2 AVRASM ver. 2.2.7 E:\ESE_280\MyDocuments$\Atmel Studio\7.0\lab_6
  \pb_bounce_count_bin2\pb_bounce_count_bin2\main.asm Tue Oct 13 19:27:36 2020
3
4 E:\ESE_280\MyDocuments$\Atmel Studio\7.0\lab_6\pb_bounce_count_bin2
  \pb_bounce_count_bin2\main.asm(9): Including file 'C:/Program Files (x86)
  \Atmel\Studio\7.0\Packs\atmel\ATmega_DFP\1.3.300\avrasm\inc\m4809def.inc'
5 E:\ESE_280\MyDocuments$\Atmel Studio\7.0\lab_6\pb_bounce_count_bin2
  \pb_bounce_count_bin2\main.asm(9): Including file 'C:/Program Files (x86)
  \Atmel\Studio\7.0\Packs\atmel\ATmega_DFP\1.3.300\avrasm\inc\m4809def.inc'
6
7
8 ; pb_bounce_count_bin2.asm
9 ;
10 ; Created: 10/6/2020 5:50:12 PM
11 ; Author : hp
12 ;
13
14 .list
15
16
17 ; Replace with your application code
18 start:
19 000000 ef0f ldi r16, $FF
20 000001 b90c out VPORTD_DIR, r16
21 000002 9880 cbi VPORTE_DIR, 0
22 000003 b90d out VPORTD_OUT, r16
23 000004 e010 ldi r17, $00
24
25 zero_loop:
26 000005 9990 sbic VPORTE_IN, 0
27 000006 c004 rjmp increment
28 000007 cffd rjmp zero_loop
29
30 one_loop:
31 000008 9b90 sbis VPORTE_IN, 0
32 000009 cffb rjmp zero_loop
33 00000a cffd rjmp one_loop
34
35 increment:
36 00000b 9513 inc r17
37 00000c c000 rjmp output
38
39 output:
40 00000d 9510 com r17
41 00000e b91d out VPORTD_OUT, r17
42 00000f 9510 com r17
43
44
```

```

45 RESOURCE USE INFORMATION
46 -----
47
48 Notice:
49 The register and instruction counts are symbol table hit counts,
50 and hence implicitly used resources are not counted, eg, the
51 'lpm' instruction without operands implicitly uses r0 and z,
52 none of which are counted.
53
54 x,y,z are separate entities in the symbol table and are
55 counted separately from r26..r31 here.
56
57 .dseg memory usage only counts static data declared with .byte
58
59 "ATmega4809" register use summary:
60 x : 0 y : 0 z : 0 r0 : 0 r1 : 0 r2 : 0 r3 : 0 r4 : 0
61 r5 : 0 r6 : 0 r7 : 0 r8 : 0 r9 : 0 r10: 0 r11: 0 r12: 0
62 r13: 0 r14: 0 r15: 0 r16: 3 r17: 5 r18: 0 r19: 0 r20: 0
63 r21: 0 r22: 0 r23: 0 r24: 0 r25: 0 r26: 0 r27: 0 r28: 0
64 r29: 0 r30: 0 r31: 0
65 Registers used: 2 out of 35 (5.7%)
66
67 "ATmega4809" instruction use summary:
68 .lds : 0 .sts : 0 adc : 0 add : 0 adiw : 0 and : 0
69 andi : 0 asr : 0 bclr : 0 bld : 0 brbc : 0 brbs : 0
70 brcc : 0 brcs : 0 break : 0 breq : 0 brge : 0 brhc : 0
71 brhs : 0 brid : 0 brie : 0 brlo : 0 brlt : 0 brmi : 0
72 brne : 0 brpl : 0 brsh : 0 brtc : 0 brts : 0 brvc : 0
73 brvs : 0 bset : 0 bst : 0 call : 0 cbi : 1 cbr : 0
74 clc : 0 clh : 0 cli : 0 cln : 0 clr : 0 cls : 0
75 clt : 0 clv : 0 clz : 0 com : 2 cp : 0 cpc : 0
76 cpi : 0 cpse : 0 dec : 0 des : 0 eor : 0 fmul : 0
77 fmul : 0 fmul : 0 icall : 0 ijmp : 0 in : 0 inc : 1
78 jmp : 0 ld : 0 ldd : 0 ldi : 2 lds : 0 lpm : 0
79 lsl : 0 lsr : 0 mov : 0 movw : 0 mul : 0 muls : 0
80 mul : 0 neg : 0 nop : 0 or : 0 ori : 0 out : 3
81 pop : 0 push : 0 rcall : 0 ret : 0 reti : 0 rjmp : 6
82 rol : 0 ror : 0 sbc : 0 sbci : 0 sbi : 0 sbic : 1
83 sbis : 1 sbiw : 0 sbr : 0 sbrc : 0 sbrs : 0 sec : 0
84 seh : 0 sei : 0 sen : 0 ser : 0 ses : 0 set : 0
85 sev : 0 sez : 0 sleep : 0 spm : 0 st : 0 std : 0
86 sts : 0 sub : 0 subi : 0 swap : 0 tst : 0 wdr : 0
87
88 Instructions used: 8 out of 114 (7.0%)
89
90 "ATmega4809" memory use summary [bytes]:
91 Segment Begin End Code Data Used Size Use%
92 -----
93 [.cseg] 0x000000 0x000022 34 0 34 49152 0.1%

```

94 [.dseg] 0x002800 0x002800 0 0 0 6144 0.0%
95 [.eseg] 0x000000 0x000000 0 0 0 256 0.0%
96
97 Assembly complete, 0 errors, 0 warnings
98


```
1
2 AVRASM ver. 2.2.7 E:\ESE_280\MyDocuments$\Atmel Studio\7.0\lab_6
   \conditional_input_hdwe\conditional_input_hdwe\main.asm Tue Oct 13 20:14:54
   2020
3
4 E:\ESE_280\MyDocuments$\Atmel Studio\7.0\lab_6\conditional_input_hdwe
   \conditional_input_hdwe\main.asm(9): Including file 'C:/Program Files (x86)
   \Atmel\Studio\7.0\Packs\atmel\ATmega_DFP\1.3.300\avrasm\inc\m4809def.inc'
5 E:\ESE_280\MyDocuments$\Atmel Studio\7.0\lab_6\conditional_input_hdwe
   \conditional_input_hdwe\main.asm(9): Including file 'C:/Program Files (x86)
   \Atmel\Studio\7.0\Packs\atmel\ATmega_DFP\1.3.300\avrasm\inc\m4809def.inc'
6
7
8 ; conditional_input_hdwe.asm
9 ;
10 ; Created: 10/6/2020 6:38:10 PM
11 ; Author : hp
12 ;
13
14 .list
15
16
17 ; Replace with your application code
18 start:
19 000000 e000 ldi r16, $00
20 000001 ef1f ldi r17, $FF
21 000002 b900 out VPORTA_DIR, r16
22 000003 b91c out VPORTD_DIR, r17
23 000004 b90d out VPORTD_OUT, r16
24 000005 9880 cbi VPORTE_DIR, 0
25 000006 9a81 sbi VPORTE_DIR, 1
26
27 check_flag:
28 000007 9a89 sbi VPORTE_OUT, 1
29 000008 9990 sbic VPORTE_IN, 0
30 000009 cffd rjmp check_flag
31
32 sw_led_io:
33 00000a b102 in r16, VPORTA_IN
34 00000b 9500 com r16
35 00000c b90d out VPORTD_OUT, r16
36 00000d 9889 cbi VPORTE_OUT, 1
37
38
39 RESOURCE USE INFORMATION
40 -----
41
42 Notice:
43 The register and instruction counts are symbol table hit counts,
```

```

44 and hence implicitly used resources are not counted, eg, the
45 'lpm' instruction without operands implicitly uses r0 and z,
46 none of which are counted.
47
48 x,y,z are separate entities in the symbol table and are
49 counted separately from r26..r31 here.
50
51 .dseg memory usage only counts static data declared with .byte
52
53 "ATmega4809" register use summary:
54 x : 0 y : 0 z : 0 r0 : 0 r1 : 0 r2 : 0 r3 : 0 r4 : 0
55 r5 : 0 r6 : 0 r7 : 0 r8 : 0 r9 : 0 r10: 0 r11: 0 r12: 0
56 r13: 0 r14: 0 r15: 0 r16: 6 r17: 2 r18: 0 r19: 0 r20: 0
57 r21: 0 r22: 0 r23: 0 r24: 0 r25: 0 r26: 0 r27: 0 r28: 0
58 r29: 0 r30: 0 r31: 0
59 Registers used: 2 out of 35 (5.7%)
60
61 "ATmega4809" instruction use summary:
62 .lds : 0 .sts : 0 adc : 0 add : 0 adiw : 0 and : 0
63 andi : 0 asr : 0 bclr : 0 bld : 0 brbc : 0 brbs : 0
64 brcc : 0 brcs : 0 break : 0 breq : 0 brge : 0 brhc : 0
65 brhs : 0 brid : 0 brie : 0 brlo : 0 brlt : 0 brmi : 0
66 brne : 0 brpl : 0 brsh : 0 brtc : 0 brts : 0 brvc : 0
67 brvs : 0 bset : 0 bst : 0 call : 0 cbi : 2 cbr : 0
68 clc : 0 clh : 0 cli : 0 cln : 0 clr : 0 cls : 0
69 clt : 0 clv : 0 clz : 0 com : 1 cp : 0 cpc : 0
70 cpi : 0 cpse : 0 dec : 0 des : 0 eor : 0 fmul : 0
71 fmul : 0 fmul : 0 icall : 0 ijmp : 0 in : 1 inc : 0
72 jmp : 0 ld : 0 ldd : 0 ldi : 2 lds : 0 lpm : 0
73 lsl : 0 lsr : 0 mov : 0 movw : 0 mul : 0 muls : 0
74 mul : 0 neg : 0 nop : 0 or : 0 ori : 0 out : 4
75 pop : 0 push : 0 rcall : 0 ret : 0 reti : 0 rjmp : 2
76 rol : 0 ror : 0 sbc : 0 sbci : 0 sbi : 2 sbic : 1
77 sbis : 0 sbiw : 0 sbr : 0 sbrc : 0 sbrs : 0 sec : 0
78 seh : 0 sei : 0 sen : 0 ser : 0 ses : 0 set : 0
79 sev : 0 sez : 0 sleep : 0 spm : 0 st : 0 std : 0
80 sts : 0 sub : 0 subi : 0 swap : 0 tst : 0 wdr : 0
81
82 Instructions used: 8 out of 114 (7.0%)
83
84 "ATmega4809" memory use summary [bytes]:
85 Segment Begin End Code Data Used Size Use%
86 -----
87 [.cseg] 0x000000 0x00001e 30 0 30 49152 0.1%
88 [.dseg] 0x002800 0x002800 0 0 0 6144 0.0%
89 [.eseg] 0x000000 0x000000 0 0 0 256 0.0%
90
91 Assembly complete, 0 errors, 0 warnings
92

```

