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1 ; Harsh Savla & TJ Wiegman
2 ; ME 58600
3 ; 2022-09-26
4 ; lab4main.s
5
6 EXTI_PR          EQU 0x40010414
7
8 ; allocate some RAM for clicks and outclicks
9     AREA MyData, DATA, READWRITE
10 clicks          SPACE 2
11 outclicks       SPACE 2
12
13 ; program code
14     AREA ARMex, CODE, READONLY
15     ENTRY
16 __main PROC
17     EXPORT __main
18     IMPORT initcom
19     IMPORT initint
20     IMPORT inittime
21     IMPORT shownum
22     IMPORT checkcom
23     IMPORT getchar
24
25     ; Initialize serial communications
26     bl initcom
27
28     ; Initialize clicks and outclicks to zero
29     mov R0, #0
30     ldr R3, =clicks
31     strh R0, [R3]
32     ldr R3, =outclicks
33     strh R0, [R3]
34
35     ; Set up external clock interrupt
36     bl initint
37
38     ; Set up 100ms timer
39     bl inittime
40
41     ; Main loop
42 chloop ldr R3, =outclicks
43     ldrh R1, [R3]
44     cmp R1, #0x0000
45     bne shclick
46
47     ; Check if received serial comm
48     bl checkcom
49     cmp R0, #0xFF
50     bne chloop
51
52     ; Check if received character is ESC
53     bl getchar
54     cmp R0, #0x1B ; ASCII value for ESCAPE

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55         beq done
56         b chloop
57
58 shclick mov R0, R1 ; copy outclicks from R1 to R0
59         mov R1, #0
60         strh R1, [R3] ; reset outclicks to zero
61         bl shownum ; R0 still holds old outclicks value
62         b chloop
63
64 done     b done
65         ENDP
66
67 EXTI1_IRQHandler PROC
68         EXPORT EXTI1_IRQHandler
69         ; push LR to stack
70         push {LR}
71
72         ; Clear interrupt flag
73         ldr R3, =EXTI_PR
74         mov R1, #0x02
75         str R1, [R3]
76
77         ; Increase clicks value
78         ldr R3, =clicks
79         ldrh R1, [R3]
80         add R1, #1
81         strh R1, [R3]
82
83         ; End subroutine and go back to caller
84         pop {LR}
85         bx LR
86         ENDP
87
88 SysTick_Handler PROC
89         EXPORT SysTick_Handler
90         ; push LR to stack
91         push {LR}
92
93         ; Get clicks, then reset
94         ldr R3, =clicks
95         ldrh R1, [R3]
96         mov R2, #0
97         strh R2, [R3]
98
99         ; Move clicks to outclicks
100        ldr R3, =outclicks
101        strh R1, [R3]
102
103        ; End subroutine and go back to caller
104        pop {LR}
105        bx LR
106        ENDP
107    END

```