

main.asm

```

1 ;-----
2 ; MSP430 Assembler Code Template for use with TI Code Composer Studio
3 ;
4 ;
5 ;-----
6     .cdecls C,LIST,"msp430.h"      ; Include device header file
7
8 ;-----
9     .def      RESET                ; Export program entry-point to
10                                ; make it known to linker.
11 ;-----
12     .data                          ; Assemble into program memory.
13     .retain                          ; Override ELF conditional linking
14                                ; and retain current section.
15     .retainrefs                      ; And retain any sections that have
16                                ; references to current section.
17
18 Sum:    .space 2
19 Diff:   .space 2
20 ;-----
21     .text                          ; Assemble into program memory.
22     .retain                          ; Override ELF conditional linking
23                                ; and retain current section.
24     .retainrefs                      ; And retain any sections that have
25                                ; references to current section.
26
27 ;-----
28 RESET    mov.w    #__STACK_END,SP    ; Initialize stackpointer
29 StopWDT  mov.w    #WDTPW|WDTHOLD,&WDTCTL ; Stop watchdog timer
30
31 ;-----
32 ; Main loop here
33 ;-----
34     sub.w    #4, SP                ; space for for two outputs from subroutine
35     push.w   #12                    ; input Num2 for subroutine
36     push.w   #25                    ; input Num1 for subroutine
37
38     call    #SumDiff
39     add.w   #4, SP                ; reclaim stack mem for the two inputs
40     pop.w   &Diff                  ; pop result Num2 - Num1 into variable Diff
41     pop.w   &Sum                    ; pop result Num2 + Num1 into variable Sum
42
43
44 ;-----
45 ;                               Subroutine: SumDiff
46 ;                               Adds and Subtracts Num1 and Num2
47 ;
48 ;   SP -> Return Address
49 ;   Word Length Input, Num1
50 ;   Word Length Input, Num2
51 ;   Word Length Output, Num2 - Num1
52 ;   Word Length Output, Num2 + Num1
53
54 ;-----
55 SumDiff:
56                                ; 0(SP) is PC (return address)
57                                ; 2(SP) is input, Num1

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58             ; 4(SP) is input, Num2
59             ; 6(SP) is where output Num2 - Num1 goes
60             ; 8(SP) is where output Num2 + Num1 goes
61
62
63     mov.w    2(SP), 8(SP) ; move Num1 into output 8(SP)
64     add.w    4(SP), 8(SP) ; output 8(SP) now contains Num1 + Num2
65
66     mov.w    4(SP), 6(SP) ; move Num2 into output 6(SP)
67     sub.w    2(SP), 6(SP) ; output 6(SP) now contains Num2 - Num1
68
69     ret
70
71 ;-----
72 ; Stack Pointer definition
73 ;-----
74     .global __STACK_END
75     .sect   .stack
76
77 ;-----
78 ; Interrupt Vectors
79 ;-----
80     .sect   ".reset"           ; MSP430 RESET Vector
81     .short  RESET
82
83
```