

ECE 322 EMBEDDED SYSTEM

Lab :- 2

Name :- ARVIND KUMAR

Roll N:-2021BEC0035

DATE : 16/01/2024

Submitted By- ARVIND KUMAR

Code:

```

;The semicolon is used to lead an inline documentation
;Please fill the following before exam
;;;Your Name: KARTHIK.B ; ARVIND KUMAR ; AADITI.C ; KARTHIK. YT ; HARSH.G;
;;;Student Number: 2021BEC0034, 2021BEC0035, 2021BEC0036, 2021BEC0037, 2021BEC0043
;;;Program question:
;;;
;;; Directives
        PRESERVE8
        THUMB
; Vector Table Mapped to Address 0 at Reset
; Linker requires __Vectors to be exported
        AREA     RESET, DATA, READONLY
        EXPORT   Vectors
__Vectors
        DCD      0x20001000      ; stack pointer value when stack is empty
        DCD      Reset_Handler  ; reset vector
        ALIGN

;Your Data section
;AREA DATA

; The program
; Linker requires Reset_Handler
        AREA     MYCODE, CODE, READONLY
        ENTRY
        EXPORT   Reset_Handler
Reset_Handler

;;;;;;;;;;User Code Start from the next line;;;;;;;;;;

        MOV R2, #0x01 ;R2= 0X00000001
        MOV R3, #0x02 ;R3 = 0X00000002
        MOV R5, #0x3210 ;R5 = 0X00003210

```

```

MOVT R5, #0x7654 ;R5 = 0X76543210
MOV32 R6, #0x87654321 ;R6 = 0X87654321

LDR R7, = 0x87654321 ;R7 = 0X87654321

ADD R1,R2,R3 ;R1 = 0X00000003
MOV32 R3, #0xFFFFFFFF ;R3 = 0xFFFFFFFF
ADDS R1,R2,R3 ;R1 = 0X0
SUBS R1, R2, R3 ;R1 = 0X02
MOV R4, #0xFFFFFFFF ;R4 = 0xFFFFFFFF
ADD R1, R2, R4 ;R1 = 0X00
ADDS R1,R2, R4 ;R1 = 0X00
MOV R2, #0x00000002 ;R2 = 0X00000002
ADDS R1, R2, R4 ;R1 = 0X00000001

MOV R2, #0x00000001 ;R2 = 0X00000001
MOV R3, #0x00000002 ;R3 = 0X00000002
ADDS R1,R2,R3 ;R1 = 0X00000003

MOV R2, #0x7FFFFFFF ;R2 = 0x7FFFFFFF
MOV R3, #0x7FFFFFFF ;R3 = 0x7FFFFFFF
ADDS R1,R2,R3 ;R1 = 0X00000003
END

```

Output (Debug Screenshots)

C:\Users\IITK LAB2\Desktop\MCB1760\ISP_JTAG\ISP_JTAG\ELEVATOR\team10code2.uvprojx - µVision

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help

Registers

Register	Value
Core	
R0	0x00000000
R1	0x00000003
R2	0x7FFFFFFF
R3	0x7FFFFFFF
R4	0xFFFFFFFF
R5	0x76543210
R6	0x87654321
R7	0x87654321
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x20001000
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x00000054
xPSR	0x01000000
Banked	
System	
Internal	
Mode	Thread
Privilege	Privileged
Stack	MSP
States	23
Sec	0.00000192

Yo.s*

```

27 ; Linker requires Reset_Handler
28
29     AREA    MYCODE, CODE, READONLY
30
31     ENTRY
32     EXPORT Reset_Handler
33
34
35 Reset_Handler
36
37 ;;;;;;;;;;User Code Start from the next line;;;;;;;;;;
38
39     MOV R2, #0x01 ;R2= 0X00000001
40     MOV R3, #0x02 ;R3 = 0X00000002
41     MOV R5, #0x3210 ;R5 = 0X00003210
42
43     MOVT R5, #0x7654 ;R5 = 0X76543210
44     MOV32 R6, #0x87654321 ;R6 = 0X87654321
45
46     LDR R7, = 0x87654321 ;R7 = 0X87654321
47
48     ADD R1,R2,R3 ;R1 = 0X00000003
49     MOV32 R3, #0xFFFFFFFF ;R3 = 0xFFFFFFFF
50     ADDS R1,R2,R3 ;R1 = 0X0
51     SUBS R1, R2, R3 ;R1 = 0X02
52     MOV R4, #0xFFFFFFFF ;R4 = 0xFFFFFFFF
53     ADD R1, R2, R4 ;R1 = 0X00
54     ADDS R1,R2, R4 ;R1 = 0X00
55     MOV R2, #0x00000002 ;R2 = 0X00000002
56     ADDS R1, R2, R4 ;R1 = 0X00000001
57
58     MOV R2, #0x00000001 ;R2 = 0X00000001
59     MOV R3, #0x00000002 ;R3 = 0X00000002
60     ADDS R1,R2,R3 ;R1 = 0X00000003
61
62     MOV R2, #0x7FFFFFFF ;R2 = 0x7FFFFFFF
63     MOV R3, #0x7FFFFFFF ;R3 = 0x7FFFFFFF
64     ADDS R1,R2,R3 ;R1 = 0X00000003
65     END

```

Registers

Register	Value
R0	0x00000000
R1	0x00000003
R2	0x7FFFFFFF
R3	0x7FFFFFFF
R4	0xFFFFFFFF
R5	0x76543210
R6	0x76543210
R7	0x76543210
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x20001000
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x00000004
xPSR	0x10000000

Core

Mode: Thread

Privilege: Privileged

Stack: MSP

States: 23

Sec: 0.00001932

```

1 ;The semicolon is used to lead an inline documentation
2 ;Please fill the following before exam
3 ;;;Your Name: KARTHIK.S ; ADDITI.C ; KARTHIK, VT ; HARSH.G
4 ;;;Student Number: 2021BEC0034, 2021BEC0036, 2021BEC0037, 2021BEC0043
5 ;;;Program Question:
6 ;;;
7 ;;; Directives
8 PRESERVE8
9 THUMB
10
11 ; Vector Table Mapped to Address 0 at Reset
12 ; Linker requires __Vectors to be exported
13
14 AREA RESET, DATA, READONLY
15 EXPORT __Vectors
16
17 __Vectors
18 DCD 0x20001000 ; stack pointer value when stack is empty
19 DCD Reset_Handler ; reset vector
20
21 ALIGN
22
23 ;Your Data section
24 AREA DATA
25
26 ; The program
27 ; Linker requires Reset_Handler
28
29 AREA MYCODE, CODE, READONLY
30
31 ENTRY
32 EXPORT Reset_Handler
33
34 Reset_Handler
35
36 ;;;;;;;;;User Code Start from the next line;;;;;;;;;
37
38 MOV R2, #0x01 ;R2= 0X00000001
39 MOV R3, #0x02 ;R3 = 0X00000002
40

```

Command

Load "C:\Users\IITK LAB2\Desktop\MCB1760\ISP_JTAG\ISP_JTAG\ELEVATOR\Objects\team10code2.axf"

Call Stack - Locals

Name	Location/V...	Type
0x00		

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE DEFINE DIR Display Enter EVALuate

Simulation

t1: 0.01402567 sec L5 C23 CAP NUM SCRL OVR R/W

31°C Light rain 3:48 PM 01/16/24

Registers

Register	Value
R0	0x00000000
R1	0x00000003
R2	0x7FFFFFFF
R3	0x7FFFFFFF
R4	0xFFFFFFFF
R5	0x76543210
R6	0x76543210
R7	0x76543210
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x20001000
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x00000004
xPSR	0x10000000

Core

Mode: Thread

Privilege: Privileged

Stack: MSP

States: 23

Sec: 0.00001932

```

27 ; Linker requires Reset_Handler
28
29 AREA MYCODE, CODE, READONLY
30
31 ENTRY
32 EXPORT Reset_Handler
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34 Reset_Handler
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36 ;;;;;;;;;User Code Start from the next line;;;;;;;;;
37
38 MOV R2, #0x01 ;R2= 0X00000001
39 MOV R3, #0x02 ;R3 = 0X00000002
40 MOV R4, #0x3210 ;R4 = 0X00003210
41
42 MOV R5, #0x7654 ;R5 = 0X76543210
43 MOV R6, #0x87654321 ;R6 = 0X87654321
44
45 LDR R7, =0x87654321 ;R7 = 0X87654321
46
47 ADD R1,R2,R3 ;R1 = 0X00000003
48 MOV R3, #0xFFFFFFFF ;R3 = 0xFFFFFFFF
49 ADDS R1,R2,R3 ;R1 = 0X0
50 SUBS R1, R2, R3 ;R1 = 0X02
51 MOV R4, #0xFFFFFFFF ;R4 = 0xFFFFFFFF
52 ADD R1, R2, R4 ;R1 = 0X00
53 ADDS R1,R2,R4 ;R1 = 0X00
54 MOV R2, #0x00000002 ;R2 = 0X00000002
55 ADDS R1, R2, R4 ;R1 = 0X00000001
56
57 MOV R2, #0x00000001 ;R2 = 0X00000001
58 MOV R3, #0x00000002 ;R3 = 0X00000002
59 ADDS R1,R2,R3 ;R1 = 0X00000003
60
61 MOV R2, #0xFFFFFFFF ;R2 = 0xFFFFFFFF
62 MOV R3, #0xFFFFFFFF ;R3 = 0xFFFFFFFF
63 ADDS R1,R2,R3 ;R1 = 0X00000003
64
65 END

```

Command

Load "C:\Users\IITK LAB2\Desktop\MCB1760\ISP_JTAG\ISP_JTAG\ELEVATOR\Objects\team10code2.axf"

Call Stack - Locals

Name	Location/V...	Type
0x00		

ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE DEFINE DIR Display Enter EVALuate

Simulation

t1: 0.01615525 sec L5 C23 CAP NUM SCRL OVR R/W

31°C Light rain 3:49 PM 01/16/24

Thankyou..