LAB3

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SOLVED EXAMPLE

```
        AREA RESET, DATA, READONLY
        EXPORT __Vectors

__Vectors

        DCD 0x1001000
        DCD Reset_Handler
        ALIGN
        AREA mycode, CODE, READONLY
        ENTRY
        EXPORT Reset_Handler

Reset_Handler

        LDR R1,=VALUE1
        LDR R2,=VALUE2
        UMULL R3,R4,R2,R1
        LDR R2,=RESULT
        STR R4,[R2]
        ADD R2, #4
        STR R3,[R2]
STOP
        B STOP
```

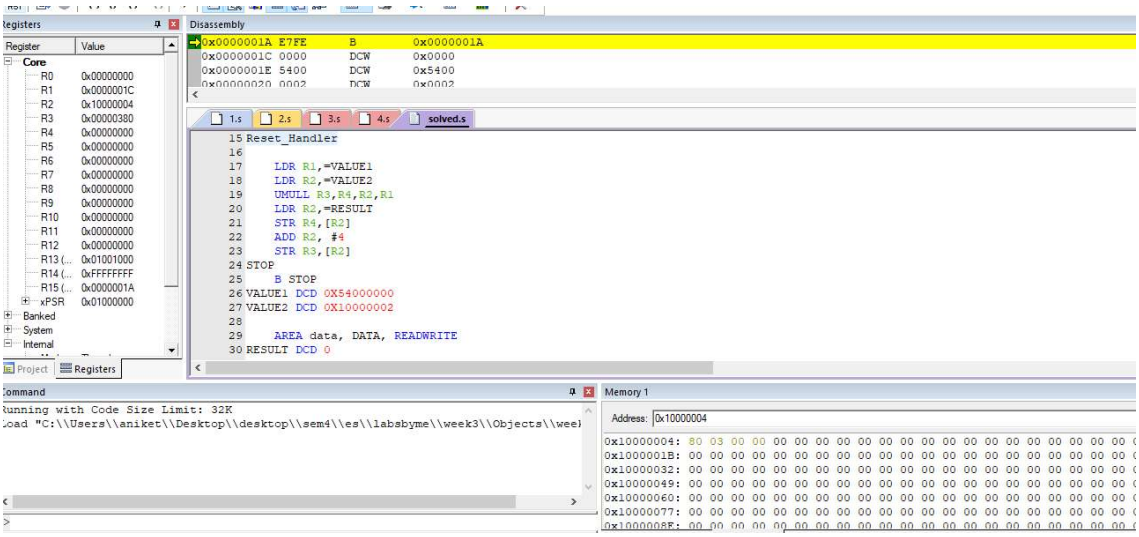
VALUE1 DCD 0X54000000

VALUE2 DCD 0X10000002

AREA data, DATA, READWRITE

RESULT DCD 0

END



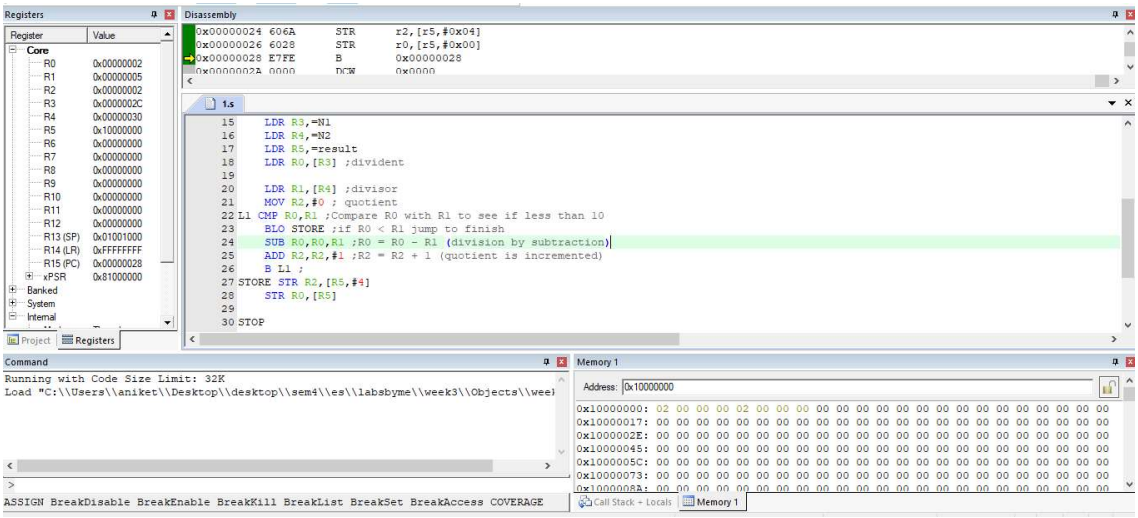
Excercises

1. AREA RESET, DATA, READONLY

   EXPORT __Vectors

```
__Vectors

        DCD 0x1001000
        DCD Reset_Handler
        ALIGN
        AREA mycode, CODE, READONLY
        ENTRY
        EXPORT Reset_Handler

Reset_Handler
        LDR R3,=N1
        LDR R4,=N2
        LDR R5,=result
        LDR R0,[R3] ;divident

        LDR R1,[R4] ;divisor
        MOV R2,#0 ; quotient
L1 CMP R0,R1 ;Compare R0 with R1 to see if less than 10
        BLO STORE ;if R0 < R1 jump to finish
        SUB R0,R0,R1 ;R0 = R0 - R1 (division by subtraction)
        ADD R2,R2,#1 ;R2 = R2 + 1 (quotient is incremented)
        B L1 ;
STORE STR R2,[R5,#4]
        STR R0,[R5]
```

```
STOP
        B STOP
N1 DCD 12
N2 DCD 5

        AREA mydata, DATA, READWRITE
result DCD 0,0

        END
```



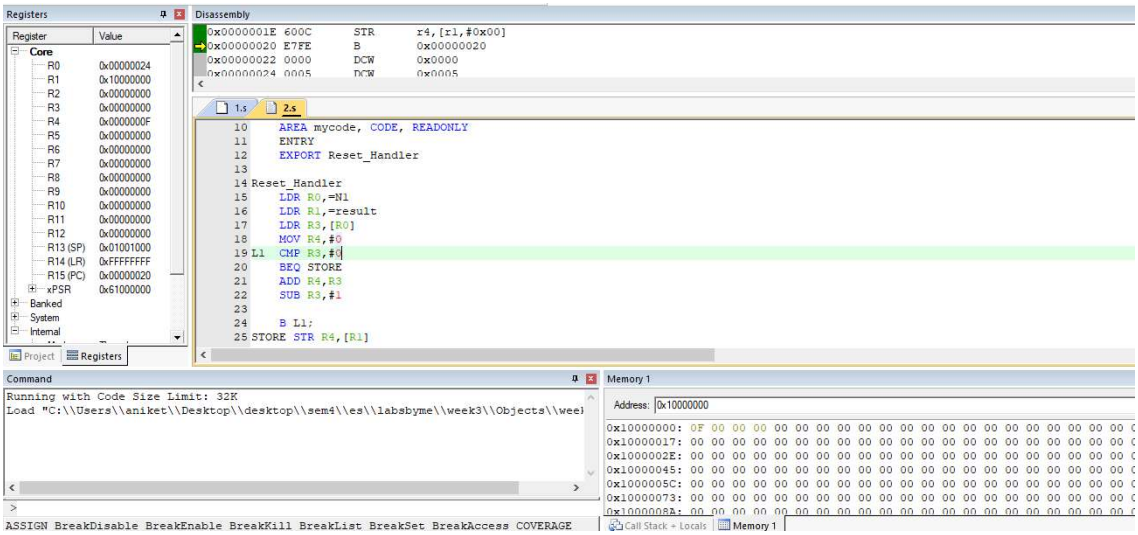
2.

```
        AREA RESET, DATA, READONLY
        EXPORT __Vectors

__Vectors

        DCD 0x1001000
        DCD Reset_Handler
        ALIGN
        AREA mycode, CODE, READONLY
        ENTRY
        EXPORT Reset_Handler

Reset_Handler
        LDR R0,=N1
        LDR R1,=result
        LDR R3,[R0]
        MOV R4,#0
L1      CMP R3,#0
        BEQ     STORE
        ADD     R4,R3
        SUB R3,#1

        B L1;
STORE STR R4,[R1]


STOP
        B STOP
N1 DCD 5
```

AREA mydata, DATA, READWRITE

result DCD 0

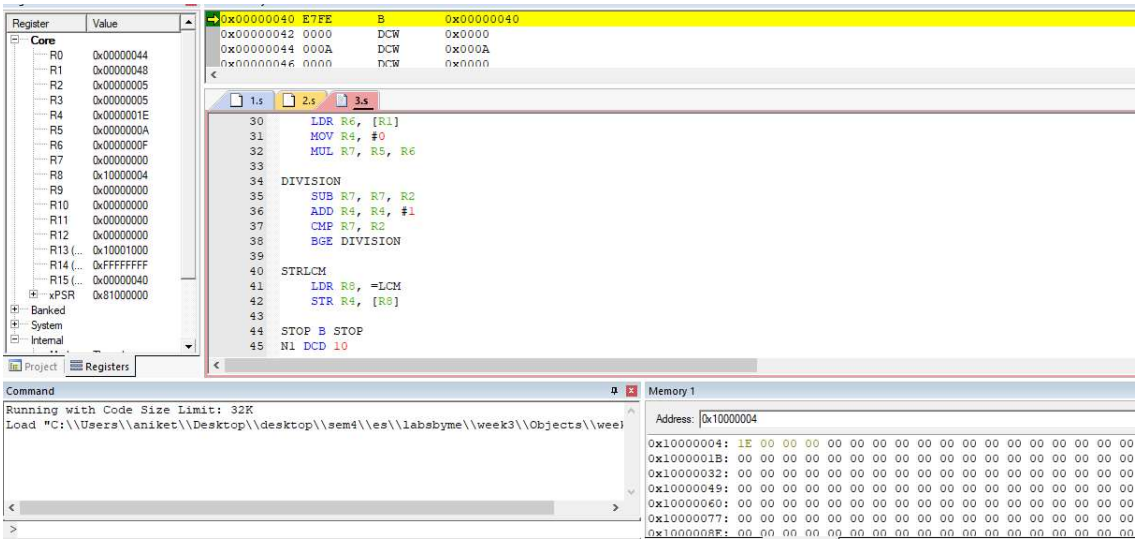
END



3.

```
        AREA RESET,DATA,READONLY
        EXPORT __Vectors

__Vectors

        DCD 0X10001000
        DCD Reset_Handler
        AREA mycode,CODE,READONLY
        ENTRY
        EXPORT Reset_Handler

Reset_Handler
        LDR R0, =N1
        LDR R1, =N2
        LDR R2, [R0]
        LDR R3, [R1]

GCDT
        CMP R2, R3;three cases greater ,lower,equal
        SUBLT R3, R3, R2  ;lower
        SUBGT R2, R2, R3;greater
        BNE GCDT;equal

STRGCD
        LDR R4, =GCD
        STR R2, [R4]

LCMT
        LDR R5, [R0]
```

```
        LDR R6, [R1]
        MOV R4, #0
        MUL R7, R5, R6

DIVISION
        SUB R7, R7, R2
        ADD R4, R4, #1
        CMP R7, R2
        BGE DIVISION

STRLCM
        LDR R8, =LCM
        STR R4, [R8]

STOP B STOP
N1 DCD 10
N2 DCD 15
        AREA mydata,DATA,READWRITE
GCD DCD 0
LCM DCD 0
        END
```


Register
Value
Core
R0 0x00000044
R1 0x00000048
R2 0x00000005
R3 0x00000005
R4 0x0000001E
R5 0x0000000A
R6 0x0000000F
R7 0x00000000
R8 0x10000004
R9 0x00000000
R10 0x00000000
R11 0x00000000
R12 0x00000000
R13 (... 0x10001000
R14 (... 0xFFFFFFFF
R15 (... 0x00000040
xPSR 0x81000000
Banked
System
Internal
Project
Registers
0x00000040 E7FE B 0x00000040
0x00000042 0000 DCW 0x0000
0x00000044 000A DCW 0x000A
1.s
2.s
3.s
30 LDR R6, [R1]
31 MOV R4, #0
32 MUL R7, R5, R6
33
34 DIVISION
35 SUB R7, R7, R2
36 ADD R4, R4, #1
37 CMP R7, R2
38 BGE DIVISION
39
40 STRLCM
41 LDR R8, =LCM
42 STR R4, [R8]
43
44 STOP B STOP
45 N1 DCD 10
Command
Running with Code Size Limit: 32K
Load "C:\\Users\\aniket\\Desktop\\desktop\\sem4\\es\\labsbyme\\week3\\Objects\\weel
Memory 1
Address: 0x10000004
0x10000004: 1E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1000001B: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10000032: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10000049: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10000060: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10000077: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

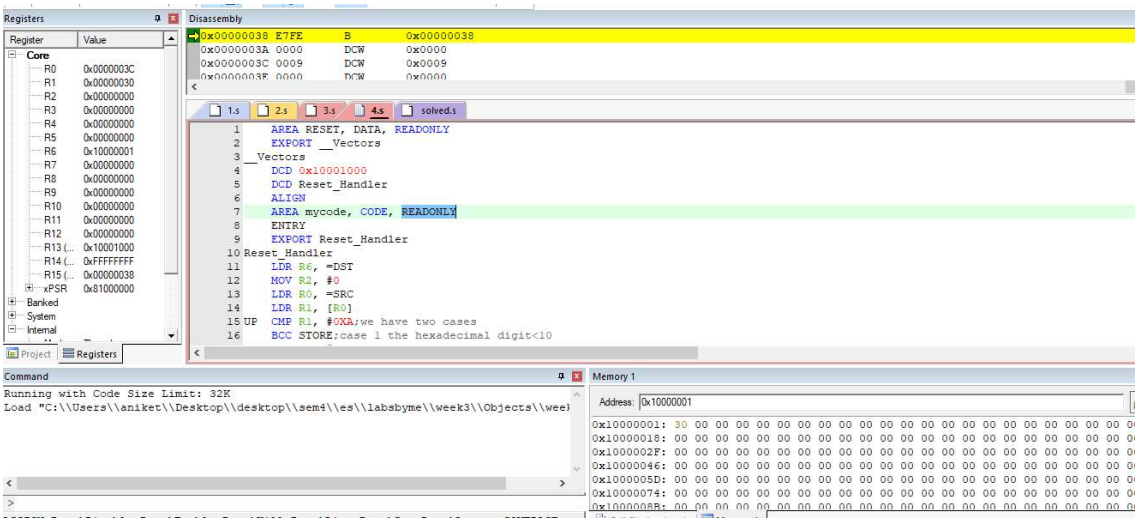
4.

```
        AREA RESET, DATA, READONLY
        EXPORT __Vectors
__Vectors
        DCD 0x10001000
        DCD Reset_Handler
        ALIGN
        AREA mycode, CODE, READONLY
        ENTRY
        EXPORT Reset_Handler
Reset_Handler
        LDR R6, =DST
        MOV R2, #0
        LDR R0, =SRC
        LDR R1, [R0]
UP      CMP R1, #0XA;we have two cases
        BCC STORE;case 1 the hexadecimal digit<10
        SUB R1, #0XA;case 2 hexadecimal digit>10 so we find the ones digit and the tens digit
        ADD R2, #01
        B UP
STORE
        ADD R1, #0X30
        STRB R1, [R6], #1
        MOV R1, R2
        MOV R2, #0
        CMP R1, #0XA
        BCS UP
        ADD R1, #0X30
        STRB R1, [R6]
STOP B STOP
SRC DCD 0X9
```

AREA mydata, DATA, READWRITE

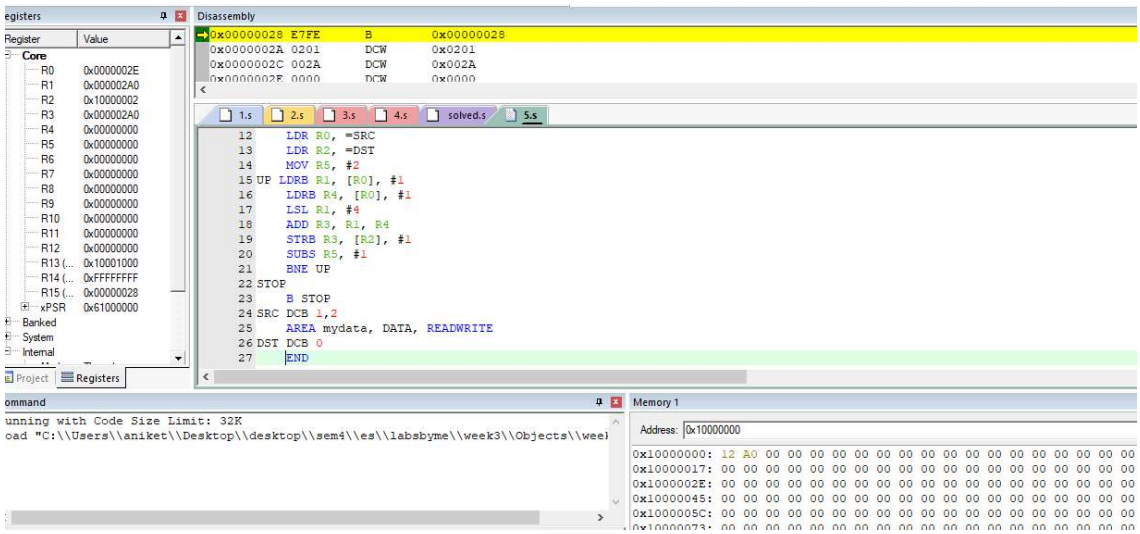
DST DCD 0

END



5.

```
        AREA RESET, DATA, READONLY
        EXPORT __Vectors
__Vectors
    DCD 0x10001000
    DCD Reset_Handler
    ALIGN
    AREA mycode, CODE, READONLY
    ENTRY
    EXPORT Reset_Handler

Reset_Handler
    LDR R0, =SRC
    LDR R2, =DST
    MOV R5, #2
UP LDRB R1, [R0], #1
    LDRB R4, [R0], #1
    LSL R1, #4
    ADD R3, R1, R4
    STRB R3, [R2], #1
    SUBS R5, #1
    BNE UP
STOP
    B STOP
SRC DCB 1,2
    AREA mydata, DATA, READWRITE
DST DCB 0
    END
```


Registers
Register
Value
Core
R0 0x0000002E
R1 0x000002A0
R2 0x10000002
R3 0x000002A0
R4 0x00000000
R5 0x00000000
R6 0x00000000
R7 0x00000000
R8 0x00000000
R9 0x00000000
R10 0x00000000
R11 0x00000000
R12 0x00000000
R13 (... 0x10001000
R14 (... 0xFFFFFFFF
R15 (... 0x00000028
xPSR 0x61000000
Banked
System
Internal
Project
Registers
Disassembly
0x00000028 E7FE B 0x00000028
0x0000002A 0201 DCW 0x0201
0x0000002C 002A DCW 0x002A
0x0000002E 0000 DCW 0x0000
1.s
2.s
3.s
4.s
solved.s
5.s
12 LDR R0, =SRC
13 LDR R2, =DST
14 MOV R5, #2
15 UP LDRB R1, [R0], #1
16 LDRB R4, [R0], #1
17 LSL R1, #4
18 ADD R3, R1, R4
19 STRB R3, [R2], #1
20 SUBS R5, #1
21 BNE UP
22 STOP
23 B STOP
24 SRC DCB 1,2
25 AREA mydata, DATA, READWRITE
26 DST DCB 0
27 END
ommand
unning with Code Size Limit: 32K
oad "C:\\Users\\aniket\\Desktop\\desktop\\sem4\\es\\labsbyme\\week3\\Objects\\wee
Memory 1
Address: 0x10000000
0x10000000: 12 A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10000017: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1000002E: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x10000045: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1000005C: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00