

Experiment 7

Aim:

To write an ARM Assembly Language to multiply two numbers using repeated addition.

Tool Used:

Keil uVision4

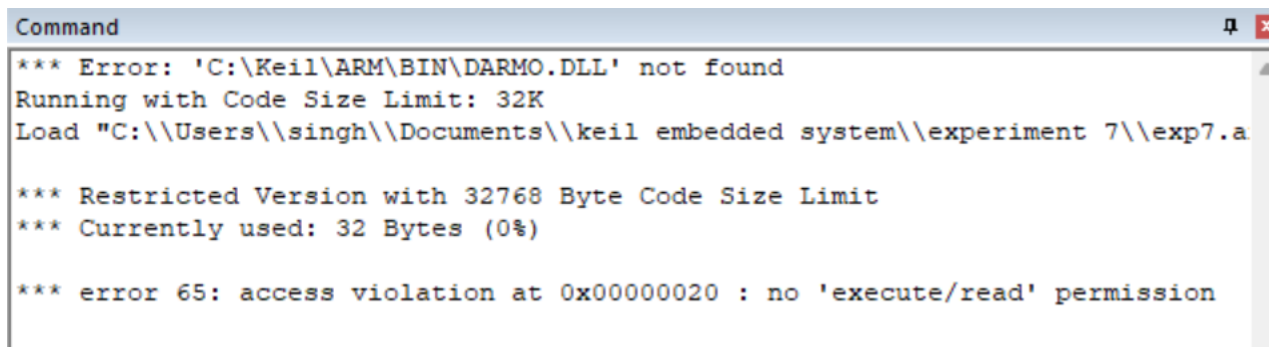
Theory:

LDR loads the register with some value. One number can be used as counter and the other number can be decremented every loop. On every loop the 1 st number is added on to the result.

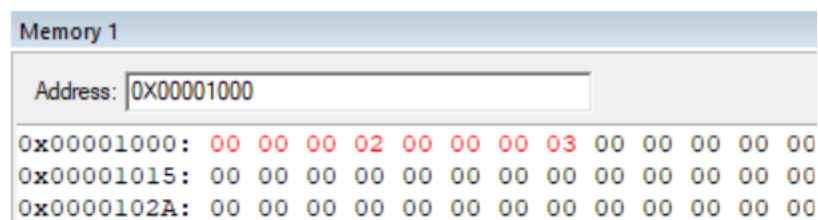
Code:

```
AREA PROGRAM, CODE, READONLY
ENTRY
MAIN
    LDR R0, =0X00001000
    LDR R1, =0X00001004
    LDR R2, [R0]
    LDR R3, [R1]
LOOP
    ADD R4, R4, R2
    SUBS R3, R3, #1
    BNE LOOP
END
```

Output:

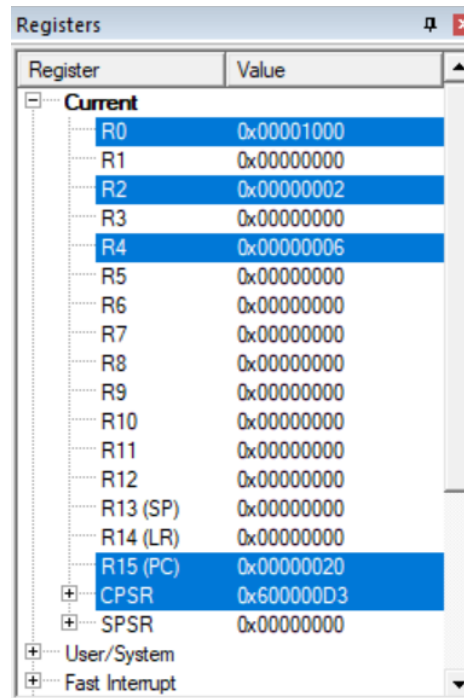


```
Command
*** Error: 'C:\Keil\ARM\BIN\DARMO.DLL' not found
Running with Code Size Limit: 32K
Load "C:\\Users\\singh\\Documents\\keil embedded system\\experiment 7\\exp7.a
*** Restricted Version with 32768 Byte Code Size Limit
*** Currently used: 32 Bytes (0%)
*** error 65: access violation at 0x00000020 : no 'execute/read' permission
```



```
Memory 1
Address: 0X00001000
0x00001000: 00 00 00 02 00 00 00 03 00 00 00 00 00
0x00001015: 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0000102A: 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Register Content



A screenshot of a 'Registers' window from a debugger. The window has a title bar with a pin icon and a close button. It contains a table with two columns: 'Register' and 'Value'. The table lists 16 registers (R0 to R15) and three special registers (CPSR, SPSR). The 'Current' register is expanded, showing a list of registers. R0, R1, R2, R4, R15 (PC), CPSR, and SPSR are highlighted in blue. The values are in hexadecimal. R0 is 0x00001000, R1 is 0x00000000, R2 is 0x00000002, R3 is 0x00000000, R4 is 0x00000006, R5 is 0x00000000, R6 is 0x00000000, R7 is 0x00000000, R8 is 0x00000000, R9 is 0x00000000, R10 is 0x00000000, R11 is 0x00000000, R12 is 0x00000000, R13 (SP) is 0x00000000, R14 (LR) is 0x00000000, R15 (PC) is 0x00000020, CPSR is 0x600000D3, and SPSR is 0x00000000. Below the table, there are expandable sections for 'User/System' and 'Fast Interrupt'.

Register	Value
Current	
R0	0x00001000
R1	0x00000000
R2	0x00000002
R3	0x00000000
R4	0x00000006
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x00000000
R14 (LR)	0x00000000
R15 (PC)	0x00000020
CPSR	0x600000D3
SPSR	0x00000000
User/System	
Fast Interrupt	

Result:

The experiments on multiplication operation have been performed and verified to be correct.