Experiment 4

Aim:

To write an ARM Assembly Language to

a) Add two 64 bit numbers.

b) Add ten 32 bit numbers.

Tool Used:

Keil uVision4

Theory:

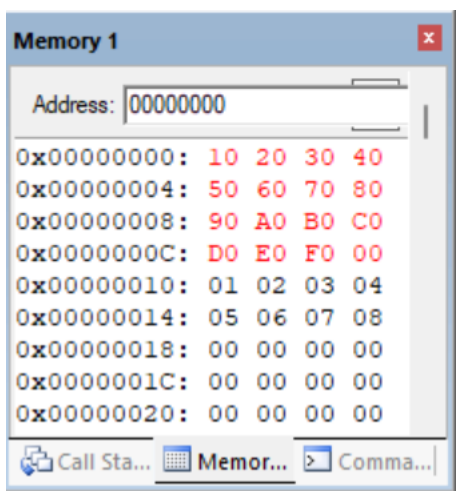
LDM load multiple register locations with starting address mentioned. ! is used in LDM for updating pointer, else same value will be updated in all registers. STM load the value into consecutive memory locations with starting address mentioned. ADDCS adds the value if the carry flag is set.

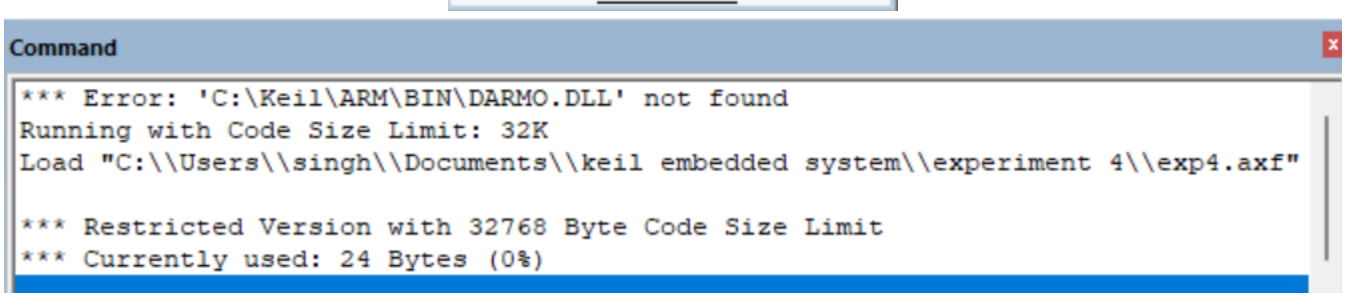
a) Add two 64 bit numbers.

Code:

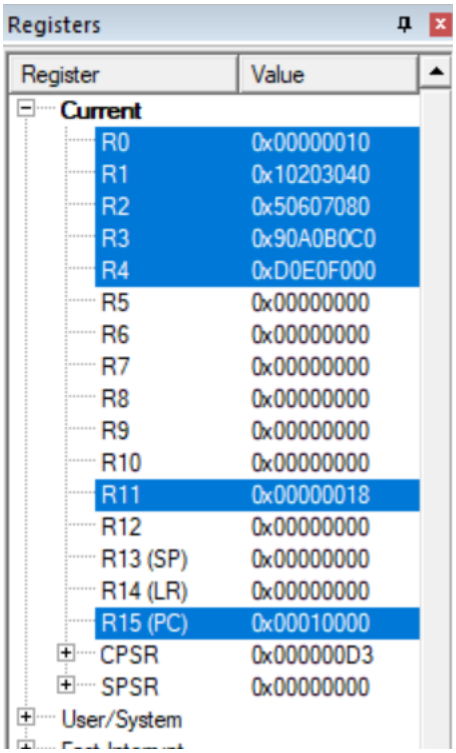
```
 AREA PROGRAM,CODE, READONLY
 ENTRY
MAIN
 LDR R0, =0X00000000
 LDM R0!, {R1-R4}
 ADDS R6,R2,R4
 ADCS R5,R1,R3
 LDR R7, =0X00000010
 STM R7!, {R5-R6}
 END
```

Output:





Register Contents



Registers

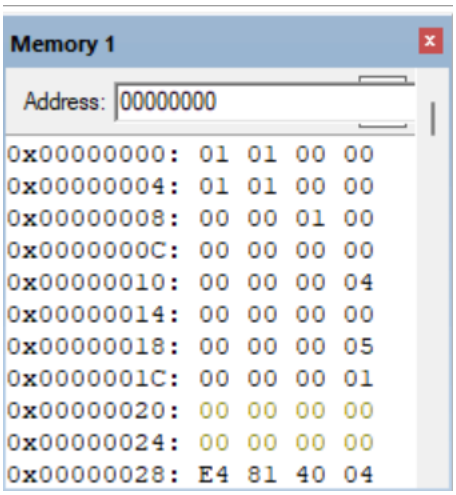
Register	Value
Current	
R0	0x00000010
R1	0x10203040
R2	0x50607080
R3	0x90A0B0C0
R4	0xD0E0F000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000018
R12	0x00000000
R13 (SP)	0x00000000
R14 (LR)	0x00000000
R15 (PC)	0x00010000
CPSR	0x000000D3
SPSR	0x00000000
User/System	

b) Add Ten 32 bit numbers.

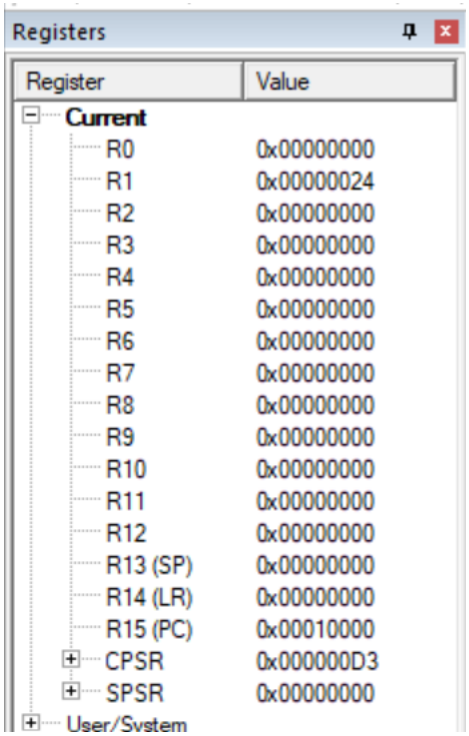
Code:

```
 AREA PROGRAM,CODE, READONLY
 ENTRY
MAIN
    LDR R0, =0x00000000
    LDR R1, =0x00000020
    MOV R3, #9
    LDR R4, [R0]

LOOP ADD R0, R0, #4
    LDR R5, [R0]
    ADDS R4,R4,R5
    ADCS R7,R7,#1
    SUBS R3,R3,#1
    BNE LOOP

    STR R4, [R1], #4
    STR R7, [R1]
    END
```

Output:



Register Contents



Result:

The experiments on add operations have been performed and verified to be correct.