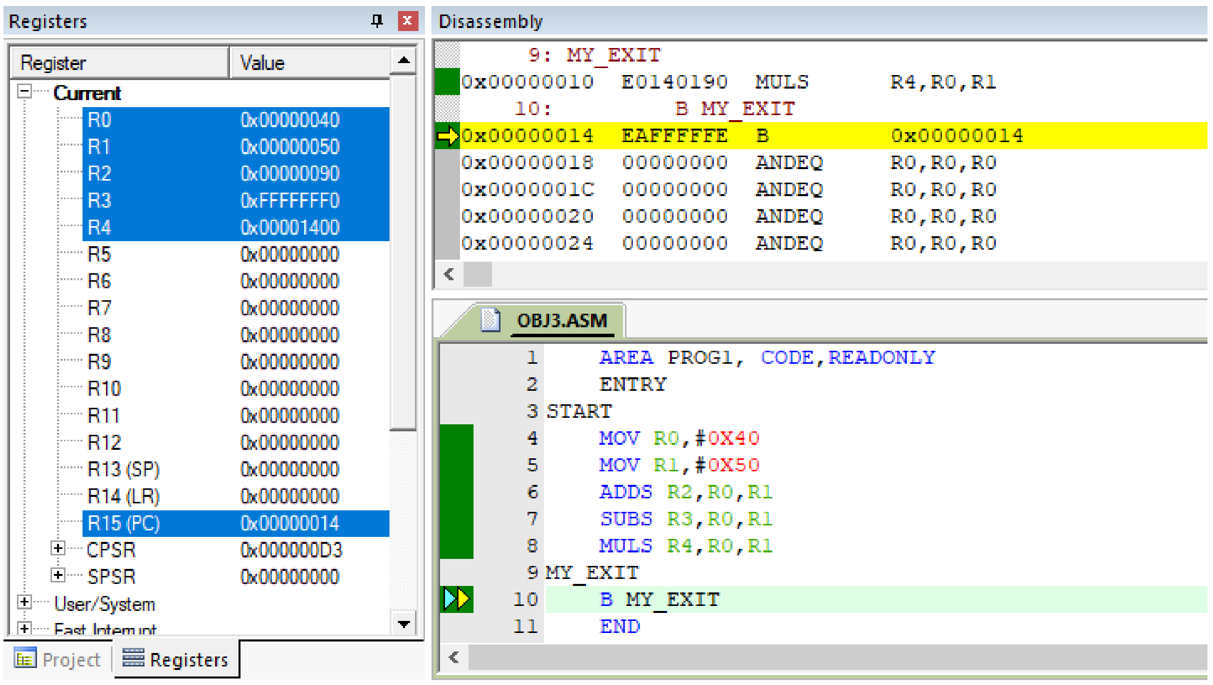
Lab-4

Obj-1: Perform Addition and Subtraction of two 32-bit numbers using data processing addressing mode (with immediate data).

Program:

```
        AREA PROG1, CODE,READONLY
        ENTRY
START
        MOV R0,#0X40
        MOV R1,#0X50
        ADDS R2,R0,R1
        SUBS R3,R0,R1
        MULS R4,R0,R1
MY_EXIT
        B MY_EXIT
        END
```

Result :



Registers

Register	Value
Current	
R0	0x00000040
R1	0x00000050
R2	0x00000090
R3	0xFFFFFFF0
R4	0x00001400
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x00000000
R14 (LR)	0x00000000
R15 (PC)	0x00000014
CPSR	0x000000D3
SPSR	0x00000000
User/System	
Fast Interrupt	

Disassembly

```
     9: MY_EXIT
0x00000010  E0140190  MULS      R4,R0,R1
    10:          B MY_EXIT
0x00000014  EAFFFFFE  B         0x00000014
0x00000018  00000000  ANDEQ     R0,R0,R0
0x0000001C  00000000  ANDEQ     R0,R0,R0
0x00000020  00000000  ANDEQ     R0,R0,R0
0x00000024  00000000  ANDEQ     R0,R0,R0
```

OBJ3.ASM

```
    AREA PROG1, CODE,READONLY
    ENTRY
START
    MOV R0,#0X40
    MOV R1,#0X50
    ADDS R2,R0,R1
    SUBS R3,R0,R1
    MULS R4,R0,R1
MY_EXIT
    B MY_EXIT
    END
```

INPUT		**OUTPUT**	
ML	**DATA**	**ML**	**DATA**
-	**0X40 (R0)**	**-**	**0X90 (R2)**
-	**0X50 (R1)**	**-**	**0Xfffffff0 (R3)**
		-	**0X1400 (R4)**

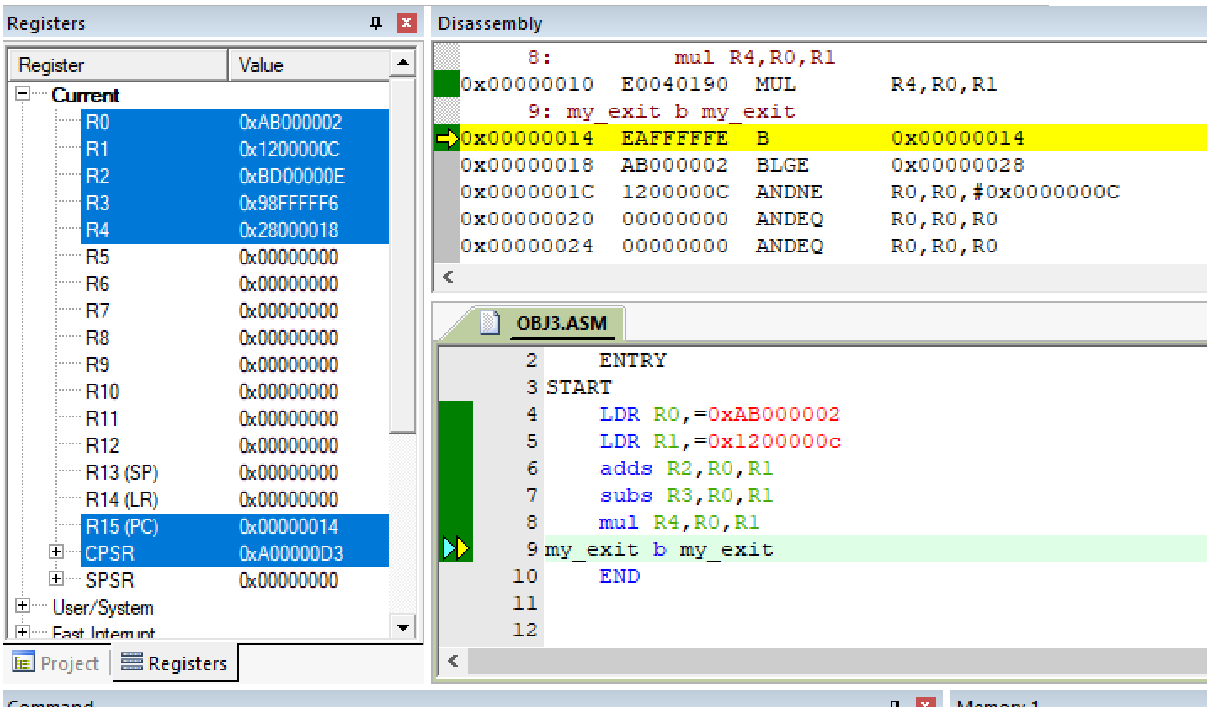
OR

Objective-1

Program:

```
        AREA prg1, CODE, READONLY
        ENTRY
START
        LDR R0,=0xAB000002
        LDR R1,=0x1200000c
        adds R2,R0,R1
        subs R3,R0,R1
        mul R4,R0,R1
my_exit b my_exit
        END
```

RESULT:



Registers

Register	Value
Current	
R0	0xAB000002
R1	0x1200000C
R2	0xBD00000E
R3	0x98FFFFF6
R4	0x28000018
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x00000000
R14 (LR)	0x00000000
R15 (PC)	0x00000014
CPSR	0xA00000D3
SPSR	0x00000000
User/System	
Fast Interrupt	

Disassembly

```
     8:           mul  R4,R0,R1
0x00000010  E0040190  MUL       R4,R0,R1
     9: my_exit b my_exit
0x00000014  EAFFFFFE  B         0x00000014
0x00000018  AB000002  BLGE      0x00000028
0x0000001C  1200000C  ANDNE     R0,R0,#0x0000000C
0x00000020  00000000  ANDEQ     R0,R0,R0
0x00000024  00000000  ANDEQ     R0,R0,R0
```

OBJ3.ASM

```
    ENTRY
START
    LDR R0,=0xAB000002
    LDR R1,=0x1200000c
    adds R2,R0,R1
    subs R3,R0,R1
    mul R4,R0,R1
my_exit b my_exit
    END
```

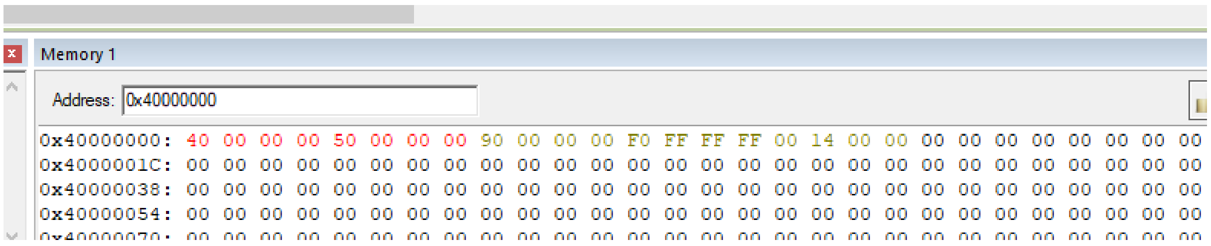
INPUT		OUTPUT	
ML	**DATA**	**ML**	**DATA**
-	**0XAB000002**	-	**0Xbd00000e**
-	**0X1200000C**	-	**0X98fffff6**
		-	**0X28000018**

Objective 2: Perform Addition, Subtraction, and Multiplication of two 32-bit numbers using load/store addressing mode.

Program:

```
        AREA prg1, CODE, READONLY
        ENTRY
START
        LDR R0,=0X40000000
        LDR R1,[R0],#4
        LDR R2,[R0],#4
        ADDS R3,R1,R2
        STR R3,[R0],#4
        SUBS R4,R1,R2
        STR R4,[R0],#4
        MUL R5,R1,R2
        STR R5,[R0]
my_exit
        B my_exit
        END
```

RESULT



Memory 1

Address: 0x40000000

```
0x40000000: 40 00 00 00 50 00 00 00 90 00 00 00 F0 FF FF FF 00 14 00 00 00 00 00 00 00 00 00 00
0x4000001C: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000038: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000054: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000070: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

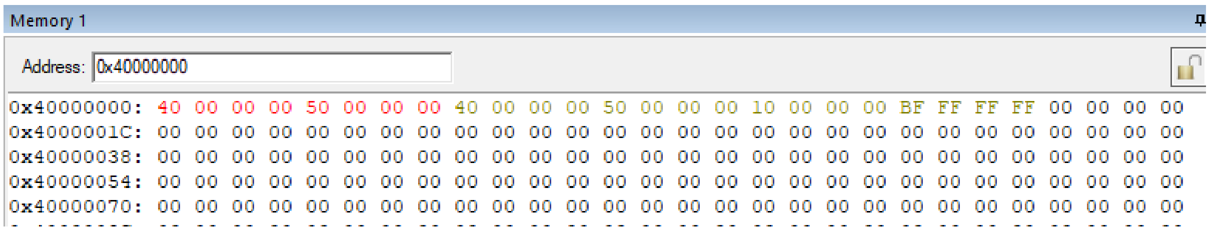
INPUT		**OUTPUT**	
ML	**DATA**	**ML**	**DATA**
0X10100000	**0X40**	**0X10100008**	**0X90**
0X10100004	**0X50**	**0X1010000C**	**0Xfffffff0**
		0X10100010	**0X1400**

Objective-3: Perform the logical operations (AND, OR, XOR, and NOT) on two 32-bit numbers using load/store addressing mode

Program

```
        AREA prg1, CODE, READONLY
        ENTRY
START
        LDR R0,=0X40000000
        LDR R1,[R0],#4
        LDR R2,[R0],#4
        ANDS R3,R2,R1
        STR R3,[R0],#4
        ORR R4,R2,R1
        STR R4,[R0],#4
        EOR R5,R2,R1
        STR R5,[R0],#4
        MVN R6, R1
        STR R6,[R0]
my_exit
        B my_exit
        END
```

RESULT:



Memory 1

Address: 0x40000000

```
0x40000000: 40 00 00 00 50 00 00 00 40 00 00 00 50 00 00 00 10 00 00 00 BF FF FF FF 00 00 00 00
0x4000001C: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000038: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000054: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000070: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

INPUT		**OUTPUT**	
ML	**DATA**	**ML**	**DATA**
0X10100000	**0X40**	**0X10100008**	**0X40**
0X10100004	**0X50**	**0X1010000C**	**0X50**
		0X10100010	**0X10**
		0X10100014	**0Xffffffbf**