MPCA Lab - Week 6

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Student programs :

Program 1: Sum of all digits in a number

Code:

```
.data
    A:  .WORD 2312
    MAGIC:  .WORD 0xCCCCCCCD

.text
    mov r0,#0
    LDR r1,=A
    LDR r2,[r1]
    ldr r4,=MAGIC
    LDR r5,[r4]

loop:
    CMP r2,#10
    BLT endseq
    MOV r3,r2
    B mod
mod:
```

```
    CMP r3,#10
    BLT found
    SUB r3,r3,#10
    B mod


found:
    ADD r0,r0,r3
    UMULL r6,r2,r2,r5
    MOV r2,r2,LSR #3
    B loop
endseq:
    ADD r0,r0,r2
    .end
```
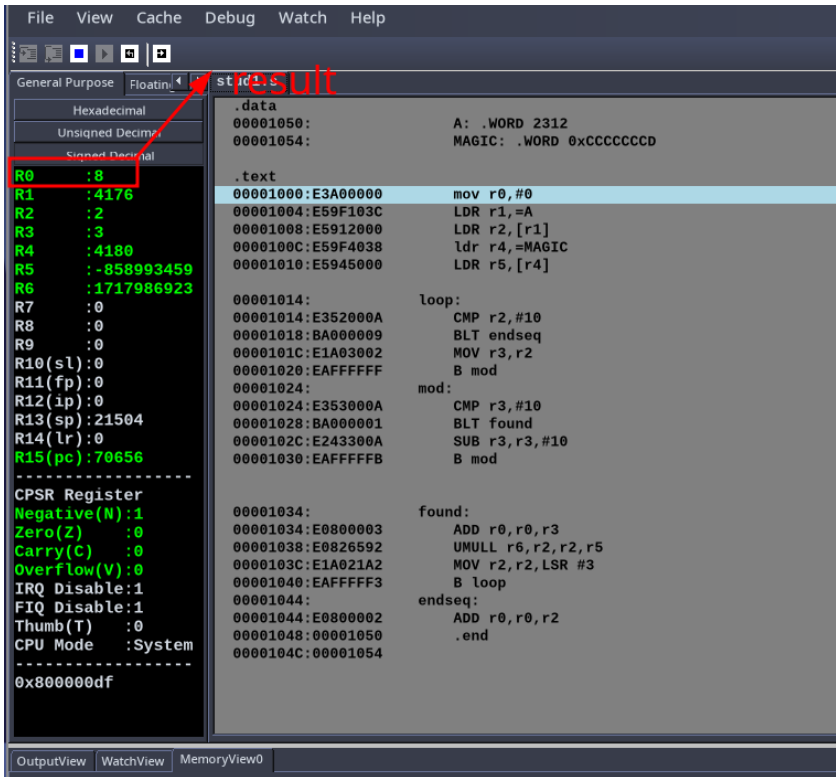
Screenshots:

Program 2: Find # of occurrence of an alphabet in a given string

Code:

```
.data
    string: .ASCIZ "this program is for lab 6 MPC
    char: .ASCIZ "a"

.text

LDR r0,=string
LDR r1,=char
```

```
 MOV r5,#0

 loop:
     LDRB r2,[r0],#1
     LDRB r3,[r1]
     CMP r2,r3
     ADDEQ r5,r5,#1
     CMP r2,#0
     BEQ end
     B loop

 end: .end
```
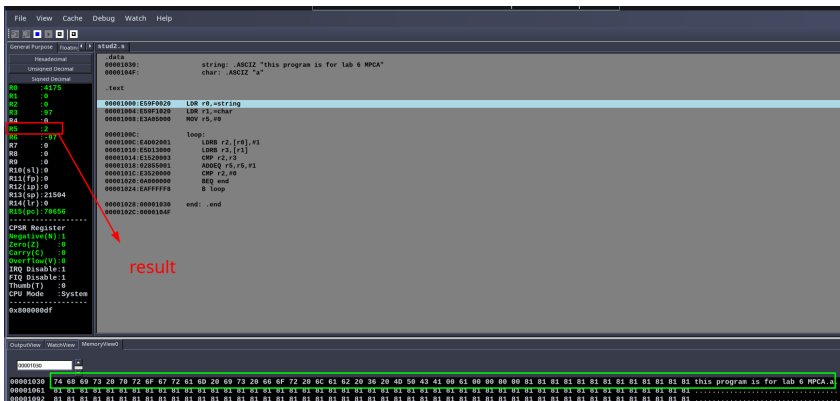
Screenshots:

| Hexadecimal |
| Unsigned Decimal |
| Signed Decimal |

```
R0      :4175
R1      :0
R2      :0
R3      :97
R4      :0
R5      :2
R6      :-97
R7      :0
R8      :0
R9      :0
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):21504
R14(lr):0
R15(pc):70656
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CPSR Register
Negative(N):1
Zero(Z)    :0
Carry(C)   :0
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T)   :0
CPU Mode   :System
-------------------
0x800000df
```

result

```
        .data
00001030:                    string: .ASCIZ "this program is for lab 6 MPCA"
0000104F:                    char: .ASCIZ "a"

        .text

00001000:E59F0020    LDR r0,=string
00001004:E59F1020    LDR r1,=char
00001008:E3A05000    MOV r5,#0

0000100C:            loop:
0000100C:E4D02001        LDRB r2,[r0],#1
00001010:E5D13000        LDRB r3,[r1]
00001014:E1520003        CMP r2,r3
00001018:02855001        ADDEQ r5,r5,#1
0000101C:E3520000        CMP r2,#0
00001020:0A000000        BEQ end
00001024:EAFFFFF8        B loop

00001028:00001030    end: .end
0000102C:0000104F
```