No	Programs	
Week p.6	**Student exercises:** 1. Write a program in ARM7TDMI-ISA to find the sum of all the digits in an 32bit number.	

```
week7 - Notepad
File  Edit  Format  View  Help
;sum of 32 bit .....

.DATA
        A:.WORD 0X12345678
        B:.WORD 0
.TEXT
        LDR R0,=A
        LDR R6,=B
        MOV R1,#15
        LDR R2,[R0]
        MOV R3,#8
        MOV R5,#0
L1:
        ANDS R4,R1,R2
        ADDS R5,R5,R4
        MOV R2,R2,LSR #4
        SUB R3,R3,#1
        CMP R3,#0
        BNE L1
        STR R5,[R6]
        SWI 0X011
```

```
ARMSim - The ARM Simulator Dept. of Computer Science                          —  □  ×
File  View  Cache  Debug  Watch  Help

RegistersView        ┨ ×    week7.s
General Purpose  F ◄ ►                      ;sum of 32 bit .....
    Hexadecimal                      .DATA
  Unsigned Decimal       00001040:            A:.WORD 0X12345678
                         00001044:            B:.WORD 0
  Signed Decimal                             .TEXT
R0      :4160         00001000:E3A00D41       LDR R0,=A
R1      :15          00001004:E59F602C       LDR R6,=B
R2      :0           00001008:E3A0100F       MOV R1,#15
R3      :0           0000100C:E5902000       LDR R2,[R0]
R4      :1           00001010:E3A03008       MOV R3,#8
R5      :36          00001014:E3A05000       MOV R5,#0
R6      :4164        00001018:        L1:
R7      :0           00001018:E0114002       ANDS R4,R1,R2
R8      :0           0000101C:E0955004       ADDS R5,R5,R4
R9      :0           00001020:E1A02222       MOV R2,R2,LSR #4
R10(sl):0            00001024:E2433001       SUB R3,R3,#1
R11(fp):0            00001028:E3530000       CMP R3,#0
R12(ip):0            0000102C:1AFFFFF9       BNE L1
R13(sp):21504        00001030:E5865000       STR R5,[R6]
R14(lr):0            00001034:EF000011       SWI 0X011
R15(pc):4148                                 /*
---------------                              ;charecter ....
CPSR Register                                .DATA
Negative(N):0                                    A:.ASCII "HELLO WORLD"
Zero(Z)    :1                                    B:.ASCII "L"
Carry(C)   :1                                .TEXT
Overflow(V):0                                    LDR R0,=A
IRQ Disable:1                                    LDR R1,=B
FIQ Disable:1                                    MOV R4,#0      ;HOLDS THE COUNT VALUE
Thumb(T)   :0                                    MOV R9,#0
CPU Mode   :Sy                              L:
---------------                                  LDRB R2,[R0],#1
0x600000df                                       LDRB R3,[R1]
                                                 CMP R2,R3

OutputView                                                          ┨ ×
Console  Stdin/Stdout/Stderr

 Execution ending, Instruction Count:56 Elasped Time:00:00:00.0264637
 Instructions per second:2116

OutputView   WatchView
```

2. Write a program in ARM7TDMI-ISA to find the number of occurrences of a given character in a string.

   Example: Given string : My name is Bond.
                    Character : 'n'.
                    Expected Output : Display 2 in a register.

```
;charecter ....

.DATA
        A:.ASCII "HELLO WORLD"
        B:.ASCII "L"
.TEXT
        LDR R0,=A
        LDR R1,=B
        MOV R4,#0        ;HOLDS THE COUNT VALUE
        MOV R9,#0
L:
        LDRB R2,[R0],#1
        LDRB R3,[R1]
        CMP R2,R3
        BEQ L1
        ADD R9,R9,#1
        CMP R9,#11
        BNE L
        SWI 0X011
L1:
        ADD R4,R4,#1
        ADD R9,R9,#1
        CMP R9,#11
        BNE L
        SWI 0X011
```

File   View   Cache   Debug   Watch   Help

week7.s

```
                           MOV R5,#0
                 L1:
                           ANDS R4,R1,R2
                           ADDS R5,R5,R4
                           MOV R2,R2,LSR #4
                           SUB R3,R3,#1
                           CMP R3,#0
                           BNE L1
                           STR R5,[R6]
                           SWI 0X011
                 */
                 ;charecter ....

                 .DATA
0000104C:        A:.ASCII "MUMBAI"
00001052:        B:.ASCII "M"
                 .TEXT
00001000:E59F003C  LDR R0,=A
00001004:E59F103C  LDR R1,=B
00001008:E3A04000  MOV R4,#0          ;HOLDS THE COUNT VALUE
0000100C:E3A09000  MOV R9,#0
00001010:        L:
00001010:E4D02001  LDRB R2,[R0],#1
00001014:E5D13000  LDRB R3,[R1]
00001018:E1520003  CMP R2,R3
0000101C:0A000003  BEQ L1
00001020:E2899001  ADD R9,R9,#1
00001024:E359000B  CMP R9,#11
00001028:1AFFFFF8  BNE L
0000102C:EF000011  SWI 0X011
00001030:        L1:
00001030:E2844001  ADD R4,R4,#1
00001034:E2899001  ADD R9,R9,#1
00001038:E359000B  CMP R9,#11
0000103C:1AFFFFF3  BNE L
                   SWI 0X011
```
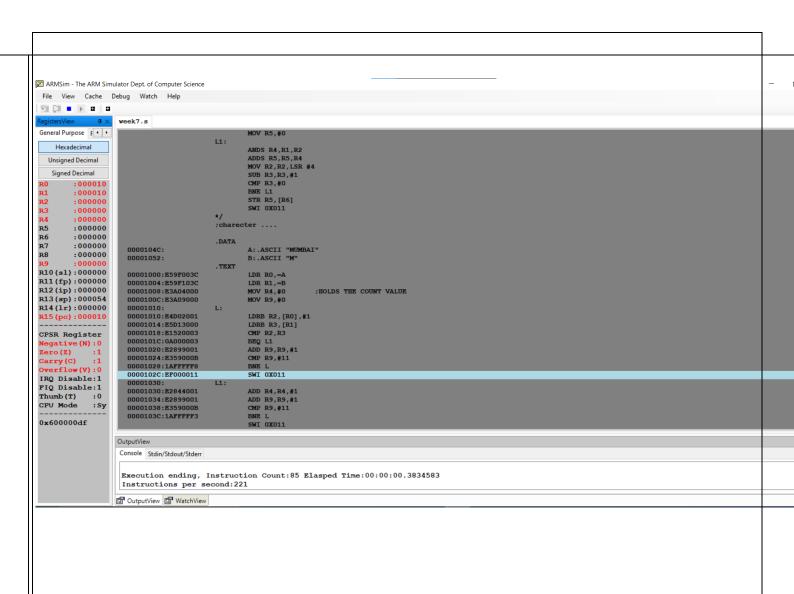
RegistersView

General Purpose

Hexadecimal

Unsigned Decimal

Signed Decimal

```
R0        :000010
R1        :000010
R2        :000000
R3        :000000
R4        :000000
R5        :000000
R6        :000000
R7        :000000
R8        :000000
R9        :000000
R10(sl):000000
R11(fp):000000
R12(ip):000000
R13(sp):000054
R14(lr):000000
R15(pc):000010
---------------
CPSR Register
Negative(N):0
Zero(Z)    :1
Carry(C)   :1
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T)   :0
CPU Mode   :Sy
---------------
0x600000df
```

OutputView

Console   Stdin/Stdout/Stderr

Execution ending, Instruction Count:85 Elasped Time:00:00:00.3834583
Instructions per second:221

OutputView   WatchView

MPCA-Laboratory/Assignment/Hands-on/Project