Microprocessor and Computer Architecture

UE23CS251B

4th Semester, Academic Year 2024-25

Date: 16-03-2025

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Week#____5_____ Program Number: ____1___

Title of the Program

1. Write an ALP using ARM7TDMI to multiply 2 matrices.

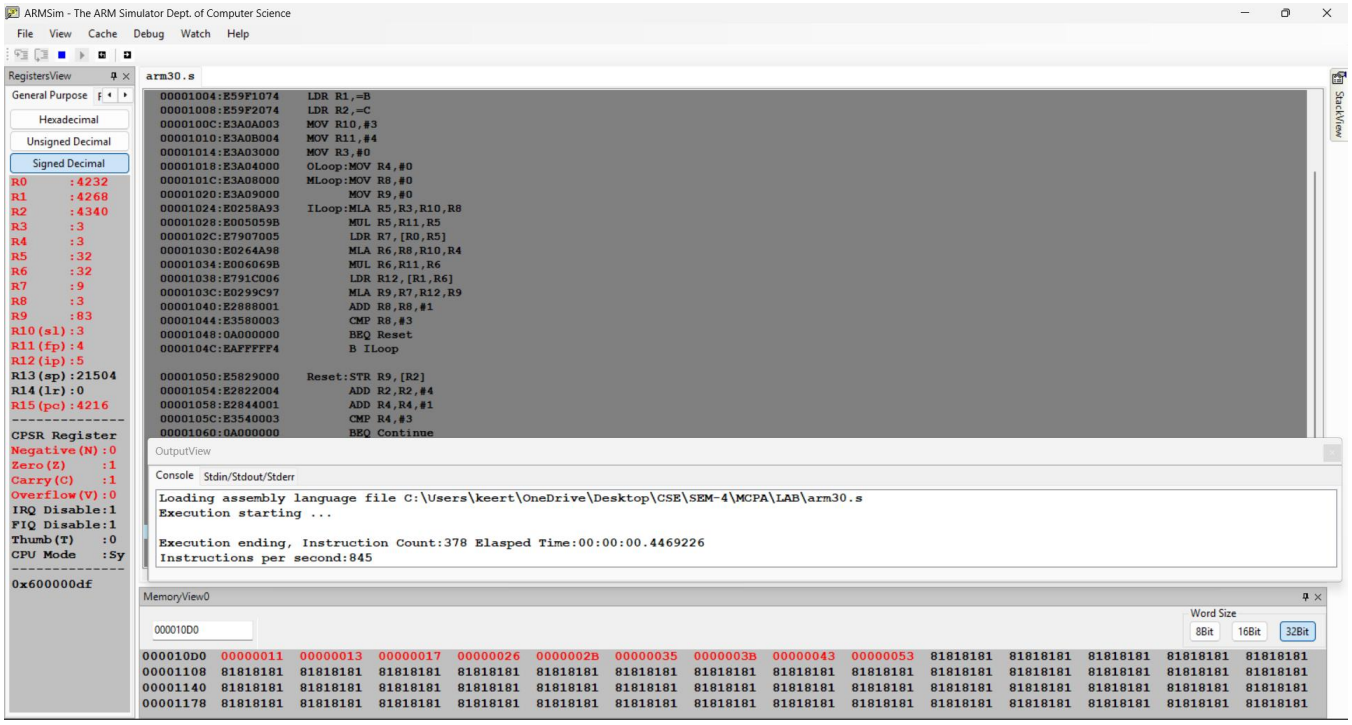
I. ARM Assembly Code(1)

```
.data
A:.word 1,2,3,4,5,6,7,8,9
B:.word 1,1,2,2,3,3,4,4,5
C:.word 0,0,0,0,0,0,0,0,0
.text
LDR R0,=A
LDR R1,=B
LDR R2,=C
MOV R10,#3
MOV R11,#4
MOV R3,#0
```

```
OLoop:MOV R4,#0
MLoop:MOV R8,#0
      MOV R9,#0
ILoop:MLA R5,R3,R10,R8
      MUL R5,R11,R5
      LDR R7,[R0,R5]
      MLA R6,R8,R10,R4
      MUL R6,R11,R6
      LDR R12,[R1,R6]
      MLA R9,R7,R12,R9
      ADD R8,R8,#1
      CMP R8,#3
      BEQ Reset
      B ILoop

Reset:STR R9,[R2]
      ADD R2,R2,#4
      ADD R4,R4,#1
      CMP R4,#3
      BEQ Continue
      B MLoop

Continue:ADD R3,R3,#1
        CMP R3,#3
```

```
        BEQ Exit
        B OLoop
Exit:SWI 0x11

.end
```

II. Output Screen Shots (1)



Week#____5_____ Program Number: ____2___

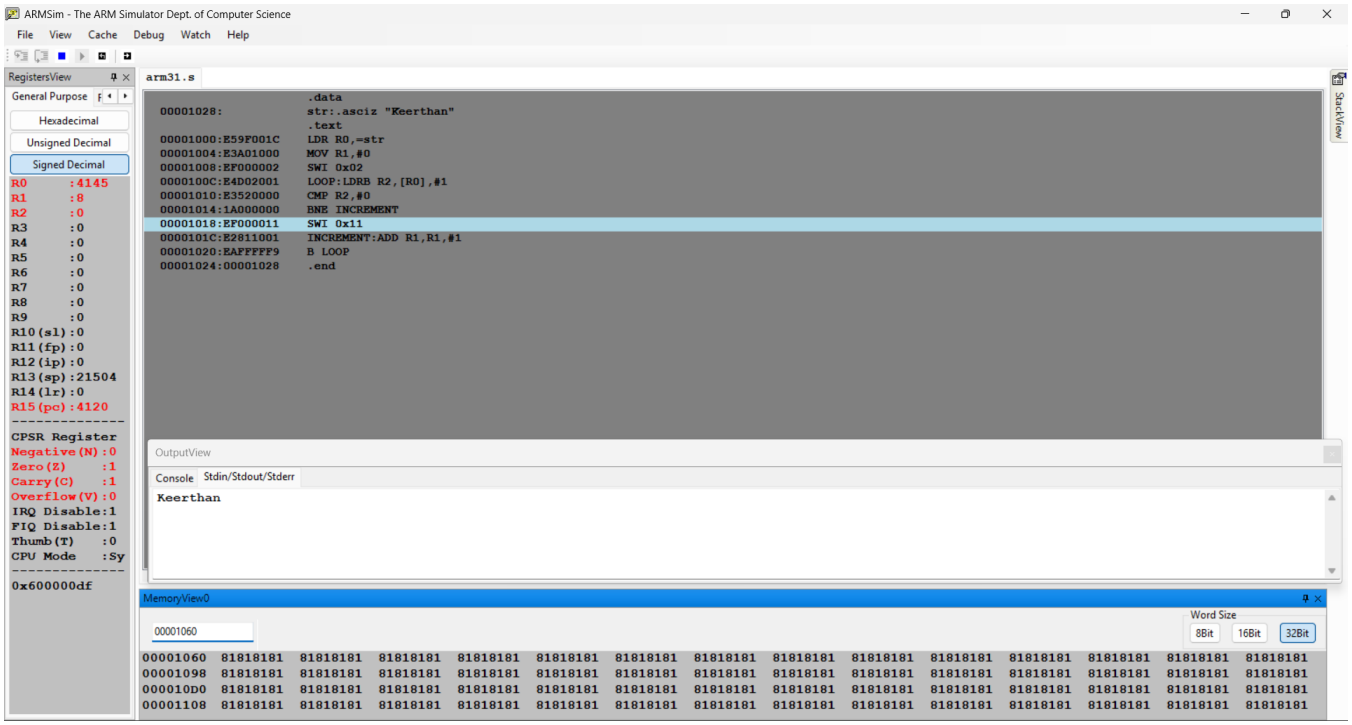
Title of the Program

2. Write an ALP using ARM7TDMI to find the length of a given string

I. ARM Assembly Code(1)

```
.data
str:.asciz "Keerthan"
.text
LDR R0,=str
MOV R1,#0
SWI 0x02
LOOP:LDRB R2,[R0],#1
CMP R2,#0
BNE INCREMENT
SWI 0x11
INCREMENT:ADD R1,R1,#1
B LOOP
.end
```

II. Output Screen Shots (1)


ARMSim - The ARM Simulator Dept. of Computer Science
File View Cache Debug Watch Help
RegistersView
General Purpose
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :4145
R1 :8
R2 :0
R3 :0
R4 :0
R5 :0
R6 :0
R7 :0
R8 :0
R9 :0
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):21504
R14(lr):0
R15(pc):4120
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
arm31.s
.data
00001028: str:.asciz "Keerthan"
.text
00001000:E59F001C LDR R0,=str
00001004:E3A01000 MOV R1,#0
00001008:EF000002 SWI 0x02
0000100C:E4D02001 LOOP:LDRB R2,[R0],#1
00001010:E3520000 CMP R2,#0
00001014:1A000000 BNE INCREMENT
00001018:EF000011 SWI 0x11
0000101C:E2811001 INCREMENT:ADD R1,R1,#1
00001020:EAFFFFF9 B LOOP
00001024:00001028 .end
StackView
OutputView
Console Stdin/Stdout/Stderr
Keerthan
MemoryView0
00001060
Word Size
8Bit 16Bit 32Bit
00001060 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
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- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

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