PES UNIVERSITY

Department of Computer Science & Engineering

Microprocessor & Computer Architecture

MPCA-Laboratory/Assignment/Hands-on/Project

UE20CS252

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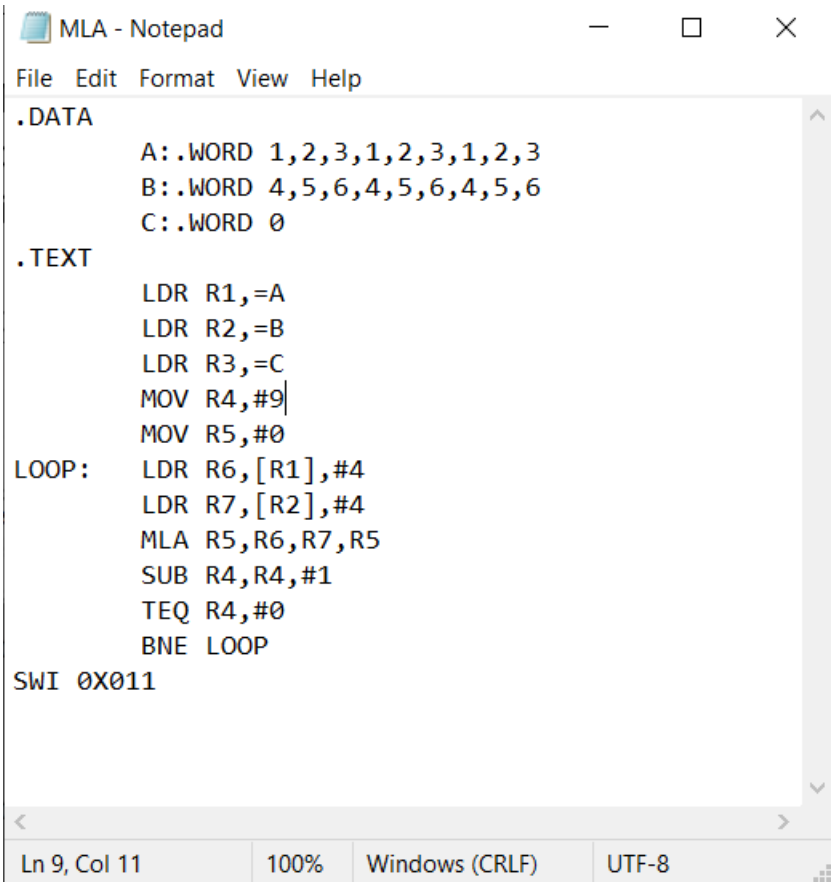
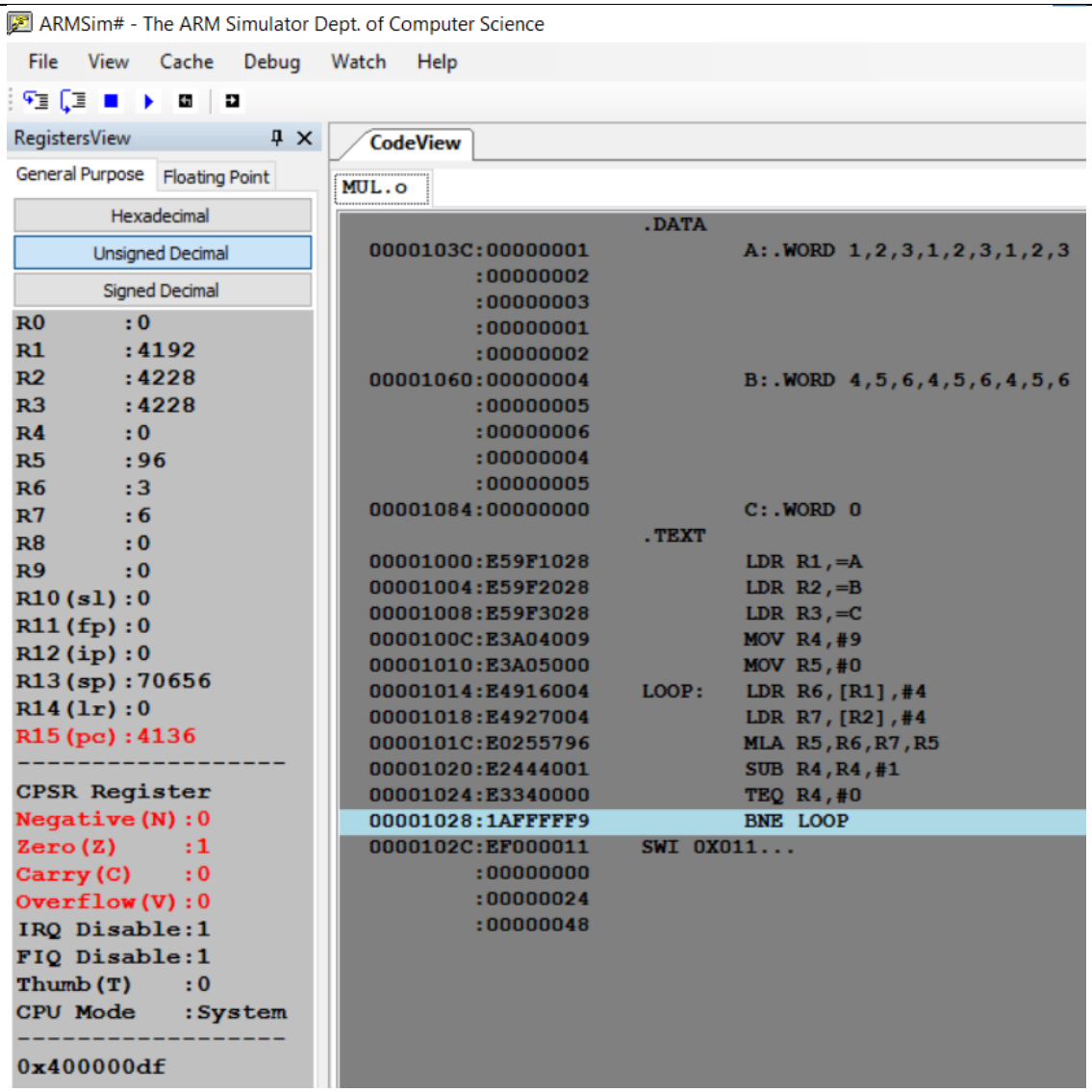
Sl. No	Programs
Week No.5	**Student exercises:** 1. Write a program in ARM7TDMI-ISA to multiply 2 matrices of order3. i.e., implement c[i][j]=c[i][j] + a[i][j] x b[i][j]. a. Use MLA instruction





b. Use MUL instruction

MUL - Notepad

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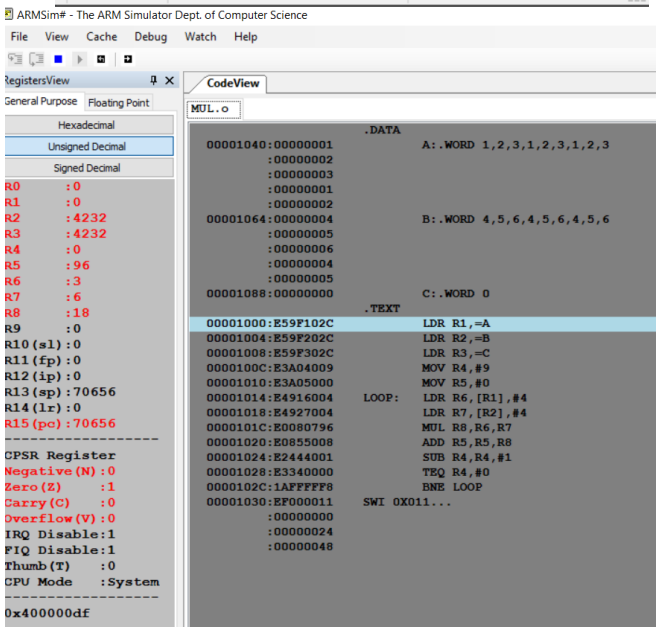
```
.DATA
        A:.WORD 1,2,3,1,2,3,1,2,3
        B:.WORD 4,5,6,4,5,6,4,5,6
        C:.WORD 0
.TEXT
        LDR R1,=A
        LDR R2,=B
        LDR R3,=C
        MOV R4,#9
        MOV R5,#0
LOOP:   LDR R6,[R1],#4
        LDR R7,[R2],#4
        MUL R8,R6,R7
        ADD R5,R5,R8
        SUB R4,R4,#1
        TEQ R4,#0
        BNE LOOP
SWI 0X011
```

100% Windows (CRLF) UTF-8



2. Write a program in ARM7TDMI-ISA to find the NORM of a square matrix of order n.

*norm - Notepad

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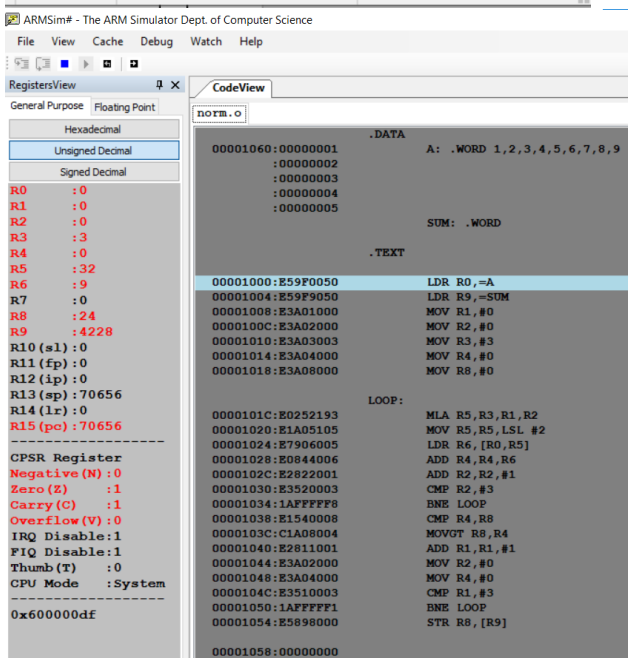
```
.DATA
        A: .WORD 1,2,3,4,5,6,7,8,9
        SUM: .WORD

.TEXT


        LDR R0,=A
        LDR R9,=SUM
        MOV R1,#0
        MOV R2,#0
        MOV R3,#3
        MOV R4,#0
        MOV R8,#0

LOOP:
        MLA R5,R3,R1,R2
        MOV R5,R5,LSL #2
        LDR R6,[R0,R5]
        ADD R4,R4,R6
        ADD R2,R2,#1
        CMP R2,#3
        BNE LOOP
        CMP R4,R8
        MOVGT R8,R4
        ADD R1,R1,#1
        MOV R2,#0
        MOV R4,#0
        CMP R1,#3
        BNE LOOP
        STR R8,[R9]
```

100% Windows (CRLF) UTF-8



3. Write a program in ARM7TDMI-ISA to find the ROWSUM of a matrix.

rowsum - Notepad

File Edit Format View Help

```
        MOV R1,#0
        MOV R2,#0
        MOV R3,#3
        MOV R4,#0
LOOP:
        MLA R5,R3,R1,R2
        MOV R5,R5,LSL #2
        LDR R6,[R0,R5]
        ADD R4,R4,R6
        ADD R2,R2,#1
        CMP R2,#3
        BNE LOOP
        STR R4,[R9],#4
        ADD R1,R1,#1
        MOV R2,#0
        MOV R4,#0
        CMP R1,#3
        BNE LOOP
```

Ln 14, Col 2 100% Windows (