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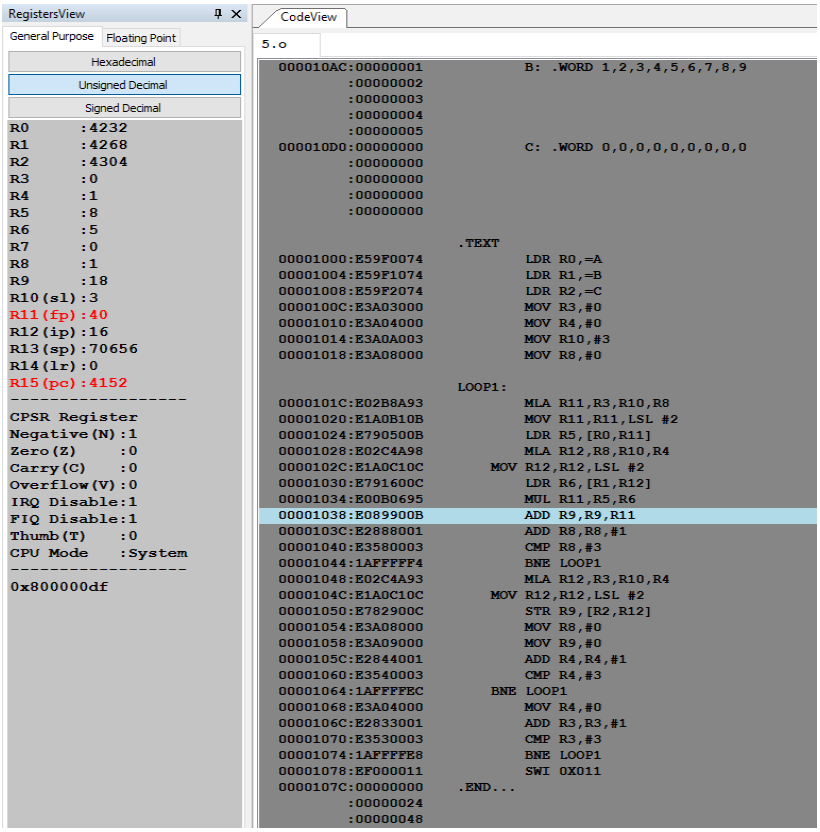
PES2UG20CS130
MPCA-Lab Week-5

Task 1: Multiply 2 matrices of order 3

Code:

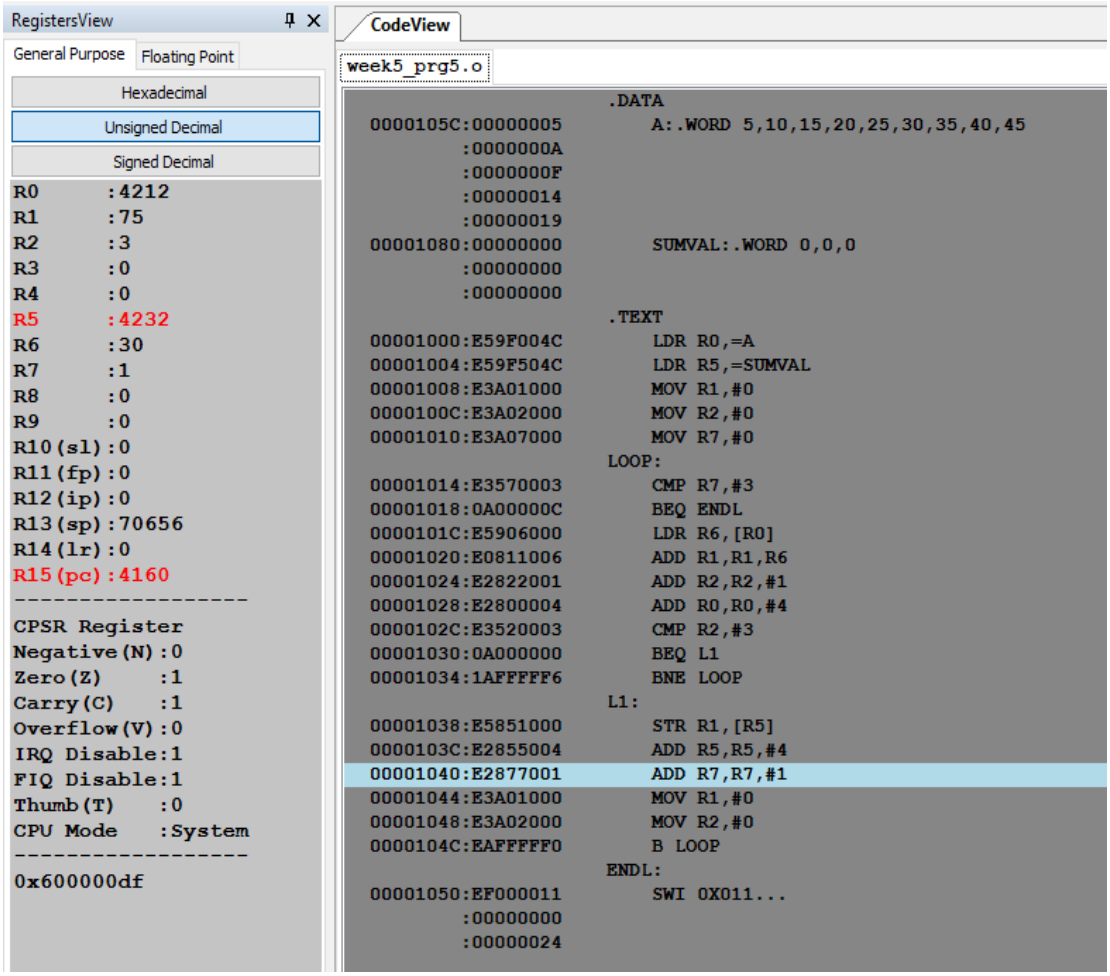
```
.DATA
      A: .WORD 9,8,7,6,5,4,3,2,1
      B: .WORD 1,2,3,4,5,6,7,8,9
      C: .WORD 0,0,0,0,0,0,0,0,0

.TEXT
      LDR R0,=A
      LDR R1,=B
      LDR R2,=C
      MOV R3,#0
      MOV R4,#0
      MOV R10,#3
      MOV R8,#0

LOOP1:
      MLA R11,R3,R10,R8
      MOV R11,R11,LSL #2
      LDR R5,[R0,R11]
      MLA R12,R8,R10,R4
    MOV R12,R12,LSL #2
      LDR R6,[R1,R12]
      MUL R11,R5,R6
      ADD R9,R9,R11
      ADD R8,R8,#1
      CMP R8,#3
      BNE LOOP1
      MLA R12,R3,R10,R4
    MOV R12,R12,LSL #2
      STR R9,[R2,R12]
      MOV R8,#0
      MOV R9,#0
      ADD R4,R4,#1
      CMP R4,#3
    BNE LOOP1
      MOV R4,#0
      ADD R3,R3,#1
      CMP R3,#3
      BNE LOOP1
      SWI 0X011
.END
```



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

Code:

```
.DATA
    A:.WORD 5,10,15,20,25,30,35,40,45
    SUMVAL:.WORD 0,0,0
.TEXT
    LDR R0,=A
    LDR R5,=SUMVAL
    MOV R1,#0
    MOV R2,#0
    MOV R7,#0
LOOP:
    CMP R7,#3
    BEQ ENDL
    LDR R6,[R0]
    ADD R1,R1,R6
    ADD R2,R2,#1
    ADD R0,R0,#4
    CMP R2,#3
    BEQ L1
    BNE LOOP
L1:
    STR R1,[R5]
    ADD R5,R5,#4
    ADD R7,R7,#1
    MOV R1,#0
    MOV R2,#0
    B LOOP
ENDL:
    SWI 0X011
```



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

Code:

```
.DATA
    A:.WORD 5,10,15,20,25,30,35,40,45
    SUMVAL:.WORD 0,0,0
.TEXT
    LDR R0,=A
    LDR R5,=SUMVAL
    MOV R1,#0
    MOV R2,#0
    MOV R7,#0
    MOV R6,R0
LOOP:
    CMP R7,#3
    BEQ ENDL
    LDR R4,[R0]
    ADD R1,R1,R4
    ADD R2,R2,#1
    ADD R0,R0,#12
    CMP R2,#3
    BEQ L1
    BNE LOOP

L1: ADD R5,R5,#4
    STR R1,[R5]
    ADD R6,R6,#4
    ADD R7,R7,#1
    MOV R1,#0
    MOV R2,#0
    MOV R0,R6
    B LOOP

L2:
    MOV R1,R0
    ADD R0,R0,#4
    B LOOP2

ENDL:
    LDR R0,=SUMVAL
    LDR R1,[R0]
    ADD R0,R0,#4
    MOV R6,#0
    LOOP2:
    CMP R6,#3
    ADD R6,R6,#1
    BEQ ENDL1
    CMP R0,R1
    BGT L2

ENDL1:
    SWI 0X011
```