Microprocessor and Computer Organisation Laboratory

UE21CS251B

4th Semester, Academic Year 2022-23

Date: 24-01-2023

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Week#____1_____Program Number: ____1___

TITLE:

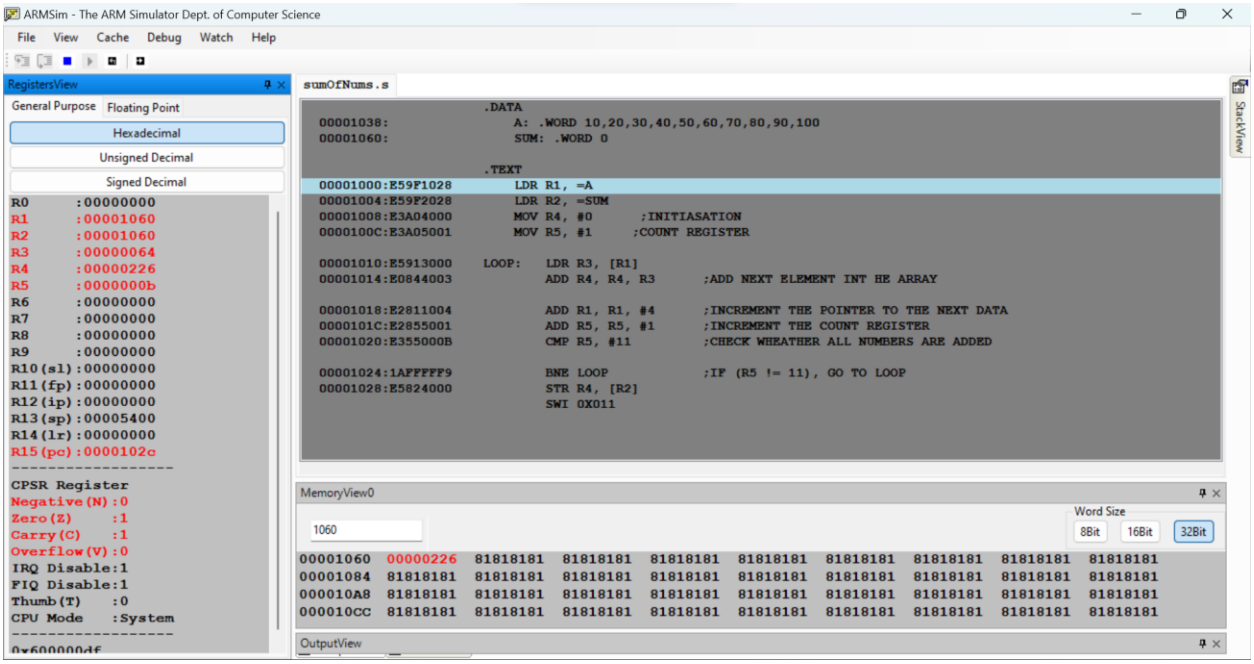
I. Code Screenshot
II. Output Screen Shot (Register set)
III. Output Screen Shot (memory set)

1. Sum of n numbers

CODE:

```
.DATA
    A: .WORD 10,20,30,40,50,60,70,80,90,100
    SUM: .WORD 0

.TEXT
    LDR R1, =A
    LDR R2, =SUM
    MOV R4, #0      ;INITIASATION
    MOV R5, #1     ;COUNT REGISTER

LOOP:   LDR R3, [R1]
        ADD R4, R4, R3      ;ADD NEXT ELEMENT INT HE ARRAY

        ADD R1, R1, #4      ;INCREMENT THE POINTER TO THE NEXT DATA
        ADD R5, R5, #1      ;INCREMENT THE COUNT REGISTER
        CMP R5, #11         ;CHECK WHEATHER ALL NUMBERS ARE ADDED

        BNE LOOP            ;IF (R5 != 11), GO TO LOOP
        STR R4, [R2]
        SWI 0X011
```

Output:

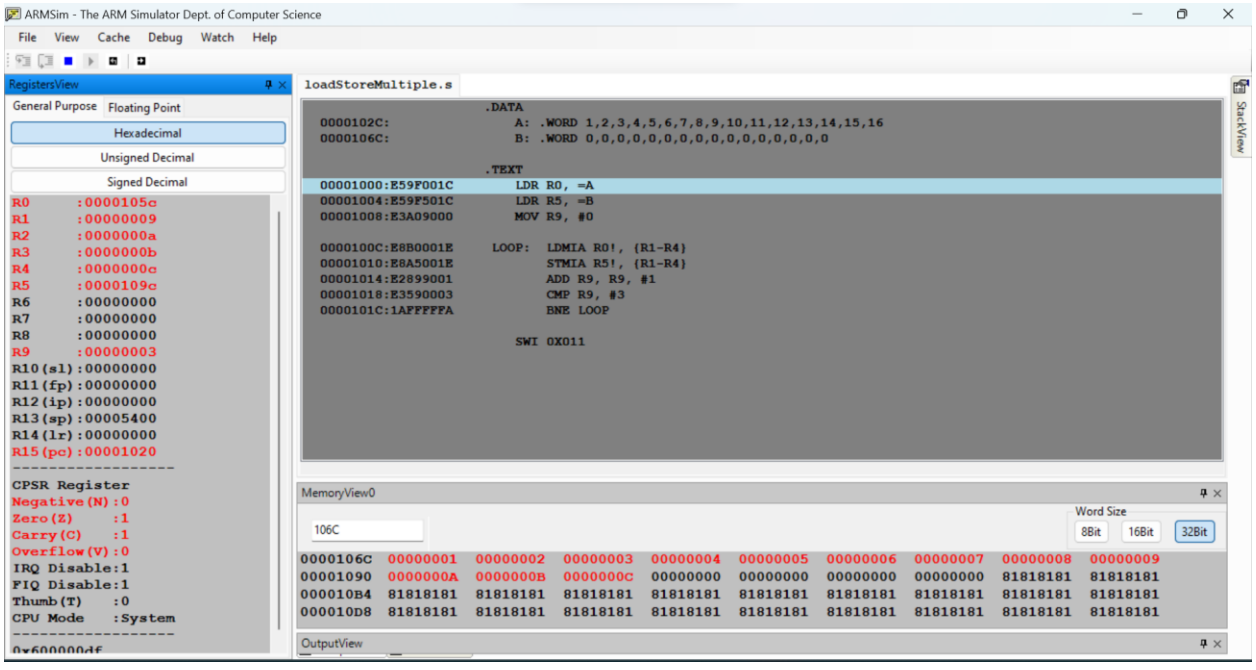


2. Block

CODE:

```
.DATA
    A: .WORD 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
    B: .WORD 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

.TEXT
    LDR R0, =A
    LDR R5, =B
    MOV R9, #0

 LOOP:  LDMIA R0!, {R1-R4}
        STMIA R5!, {R1-R4}
        ADD R9, R9, #1
        CMP R9, #3
        BNE LOOP

    SWI 0X011
```

OUTPUT:

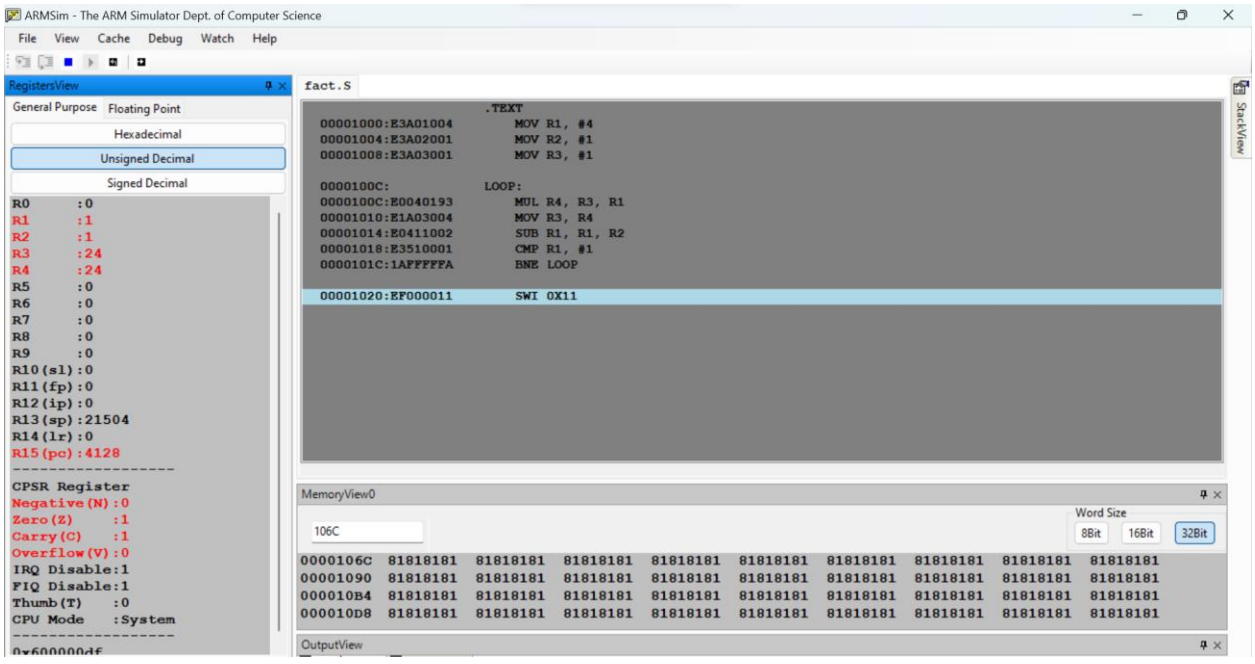


3. Factorial

CODE:

```
.TEXT
    MOV R1, #4      ;number to find factorial of
    MOV R2, #1
    MOV R3, #1

LOOP:
    MUL R4, R3, R1      ;R4 = R3 * R1
    MOV R3, R4          ;R3 = R4 ; R3 and R4 stores the factorial
    SUB R1, R1, R2
    CMP R1, #1
    BNE LOOP

    SWI 0X11
```

OUTPUT:



4. Search

```
.DATA
    ARR: .WORD 1,2,3,4,5,6,7,8,9,10
    KEY: .WORD 11

.TEXT
    LDR R1, =ARR
    LDR R2, =KEY
    LDR R3, [R2]
    MOV R4, #0      ;COUNTER
    MOV R5, #99      ;RESULT ;99 MEANS NOT FOUND

    SUB R1, R1, #4
LOOP:
    LDR R6, [R1, #4]!    ;ADD 4 TO R1 AND LOAD THE CONTENTS AT THAT LOCATION TO
R6. R1 IS ALSO UPDATED
    CMP R6, R3
    BEQ FOUND

    ADD R4, R4, #1
    CMP R4, #9      ;LENGTH OF ARRAY IS 10
    BNE LOOP

    SWI 0X11

FOUND:
    MOV R5, R4   ;STORE THE INDEX OF THE KEY IN R5
    SWI 0X11
```

OUTPUT: