PES UNIVERSITY

# Microprocessor & Computer Architecture

## MPCA-Laboratory-3

## UE20CS252

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**Section : K**

**Program**

Write a program in ARM7TDMI-ISA to find the sum of N data items at alternate [odd or even positions] locations in the memory. Store the result in the memory location.

**a. Use Pre-indexing addressing mode:**

NOTEPAD FILE:

prgm21.s - Notepad

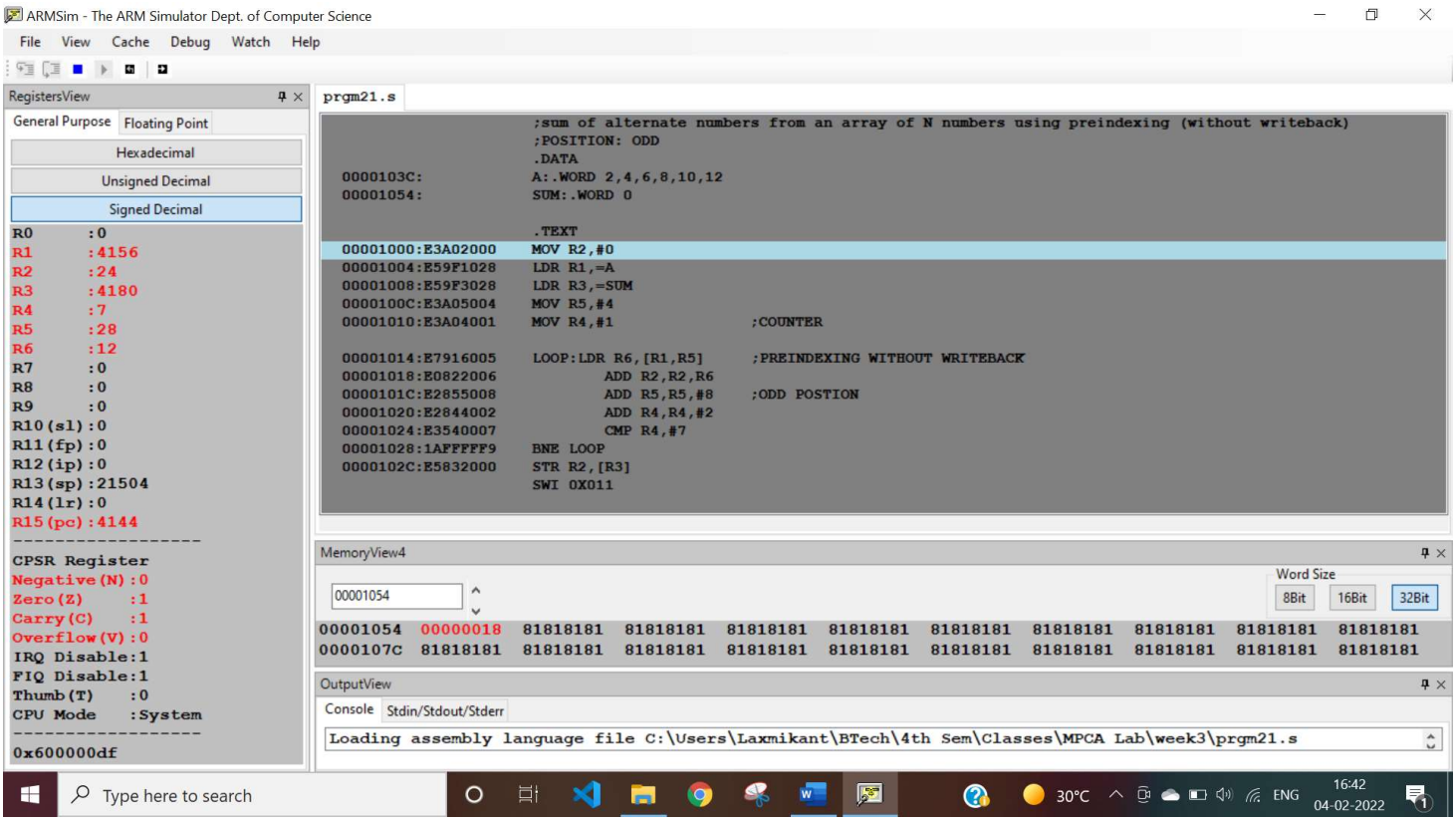
File Edit Format View Help

```
;sum of alternate numbers from an array of N numbers using preindexing (without writeback)
;POSITION: ODD
.DATA
A:.WORD 2,4,6,8,10,12
SUM:.WORD 0

.TEXT
MOV R2,#0
LDR R1,=A
LDR R3,=SUM
MOV R5,#4
MOV R4,#1               ;COUNTER

LOOP:LDR R6,[R1,R5]     ;PREINDEXING WITHOUT WRITEBACK
        ADD R2,R2,R6
        ADD R5,R5,#8    ;ODD POSTION
        ADD R4,R4,#2
        CMP R4,#7
BNE LOOP
STR R2,[R3]
SWI 0X011
```

OUTPUT SCREENSHOT:




## b. Use Post-indexing addressing mode:

NOTEPAD FILE:

prgm23.s - Notepad

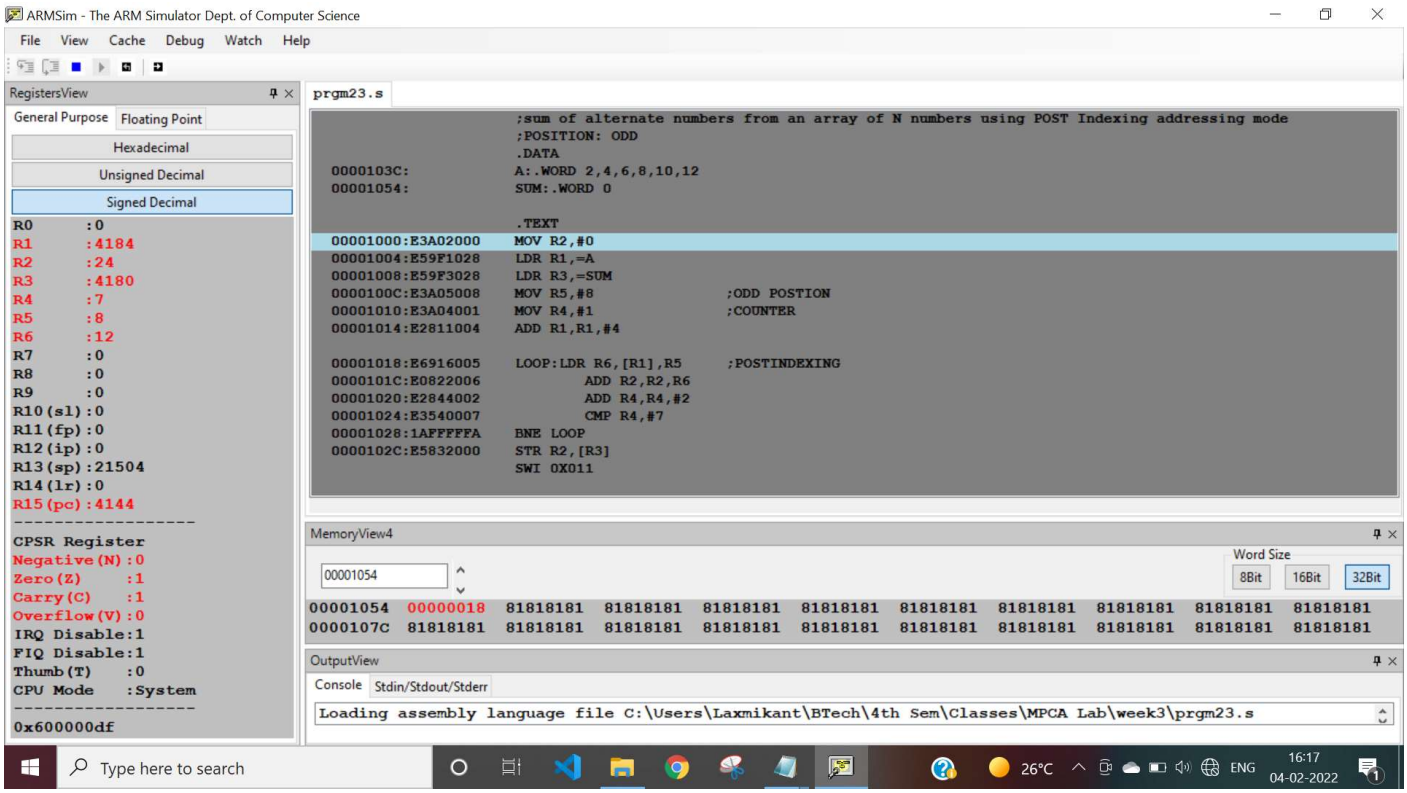
File Edit Format View Help

```
;sum of alternate numbers from an array of N numbers using POST Indexing addressing mode
;POSITION: ODD
.DATA
A:.WORD 2,4,6,8,10,12
SUM:.WORD 0

.TEXT
MOV R2,#0
LDR R1,=A
LDR R3,=SUM
MOV R5,#8               ;ODD POSTION
MOV R4,#1               ;COUNTER
ADD R1,R1,#4

LOOP:LDR R6,[R1],R5     ;POSTINDEXING
        ADD R2,R2,R6
        ADD R4,R4,#2
        CMP R4,#7
BNE LOOP
STR R2,[R3]
SWI 0X011
```

OUTPUT SCREENSHOT:




## c. Use Auto-indexing addressing mode:

NOTEPAD FILE:

prgm22.s - Notepad

File Edit Format View Help

```
;sum of alternate numbers from an array of N numbers using AUTOINDEXING (preindexing with writeback)
;POSITION: ODD
.DATA
A:.WORD 2,4,6,8,10,12
SUM:.WORD 0

.TEXT
MOV R2,#0
LDR R1,=A
LDR R3,=SUM
MOV R5,#8               ;ODD POSTION
MOV R4,#1               ;COUNTER
SUB R1,R1,#4

LOOP:LDR R6,[R1,R5]!     ;PREINDEXING WITH WRITEBACK
        ADD R2,R2,R6
        ADD R4,R4,#2
        CMP R4,#7
BNE LOOP
STR R2,[R3]
SWI 0X011
```

OUTPUT SCREENSHOT: