Microprocessor and Computer Architecture

UE21CS251B

4th Semester, Academic Year 2022-23

Date: 13-02-2023

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section: F

Week#____4_____ Program Number: ____1__

Title of the Program

Write an ALP to add two 64 bit numbers loaded from memory and store the result in memory.

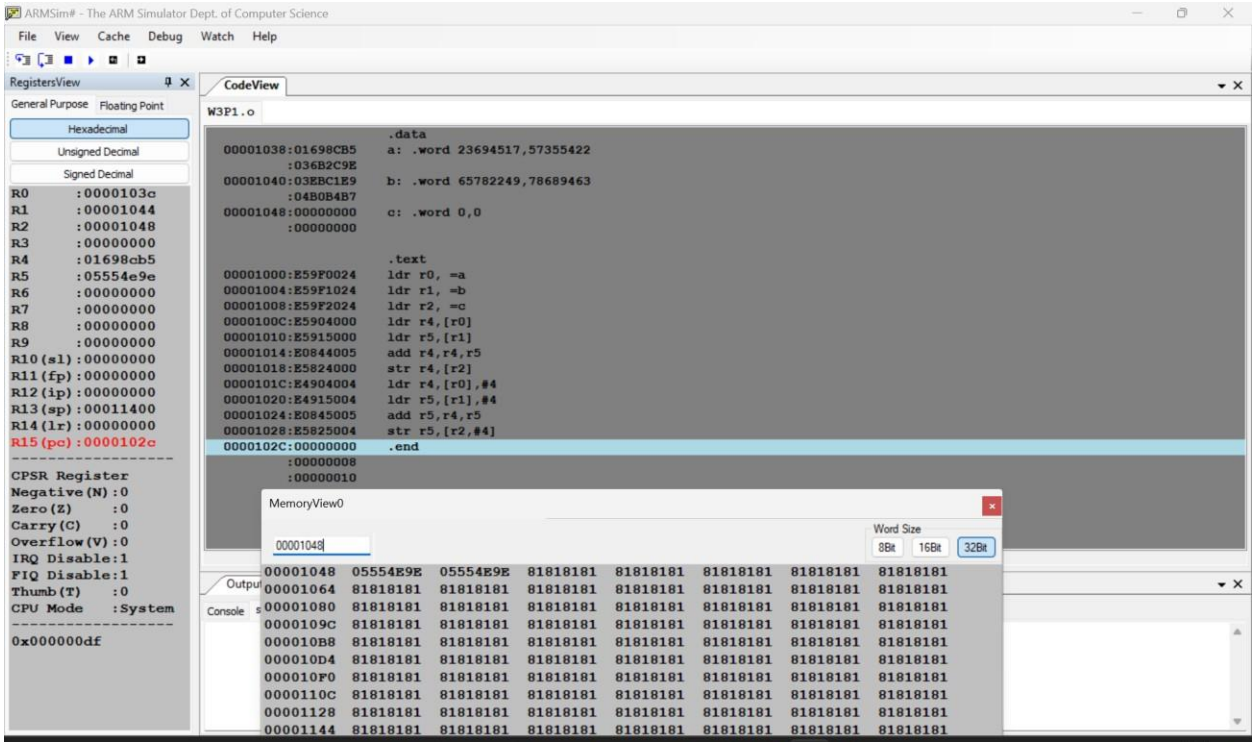
I.ARM Assembly Code

```
.data
a: .word 10,20
b: .word 30,40
c: .word 0,0

.text
ldr r0, =a
ldr r1, =b
ldr r2, =c
```

```
ldr r4,[r0]
ldr r5,[r1]
add r4,r4,r5
str r4,[r2]
ldr r4,[r0,#4]
ldr r5,[r1,#4]
add r5,r4,r5
str r5,[r2,#4]
.end
```

II. Output Screen Shot (One)



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Date:

Name: NAGAVENI L G	SRN:PES2UG21CS315	Section :F

Week#____4_____ Program Number: ____2___

Title of the Program

Write an ALP to find 1's and 2's complement of a 32 bit number

I.ARM Assembly Code

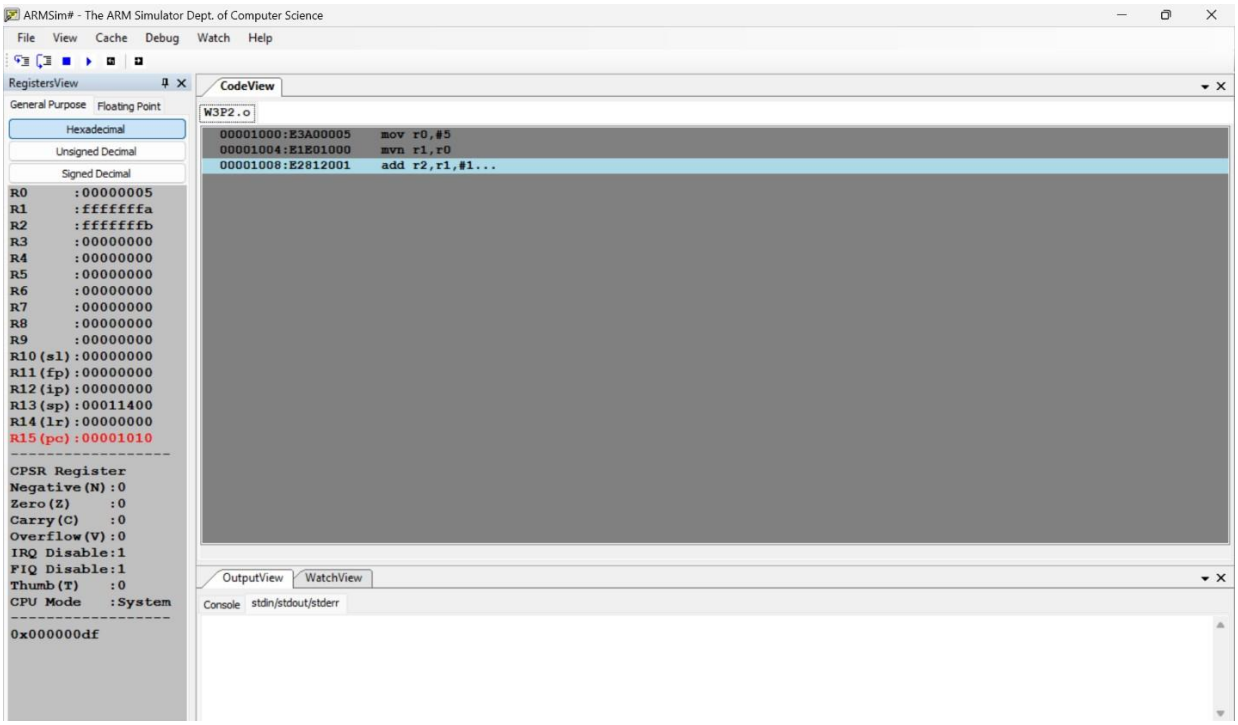
.text

mov r0,#5

mvn r1,r0

add r2,r1,#1

II. Output Screen Shot (One)



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Name: NAGAVENI L G	SRN: PES2UG21CS315	Section F

Week#____4_____ Program Number: ____3 __

Title of the Program

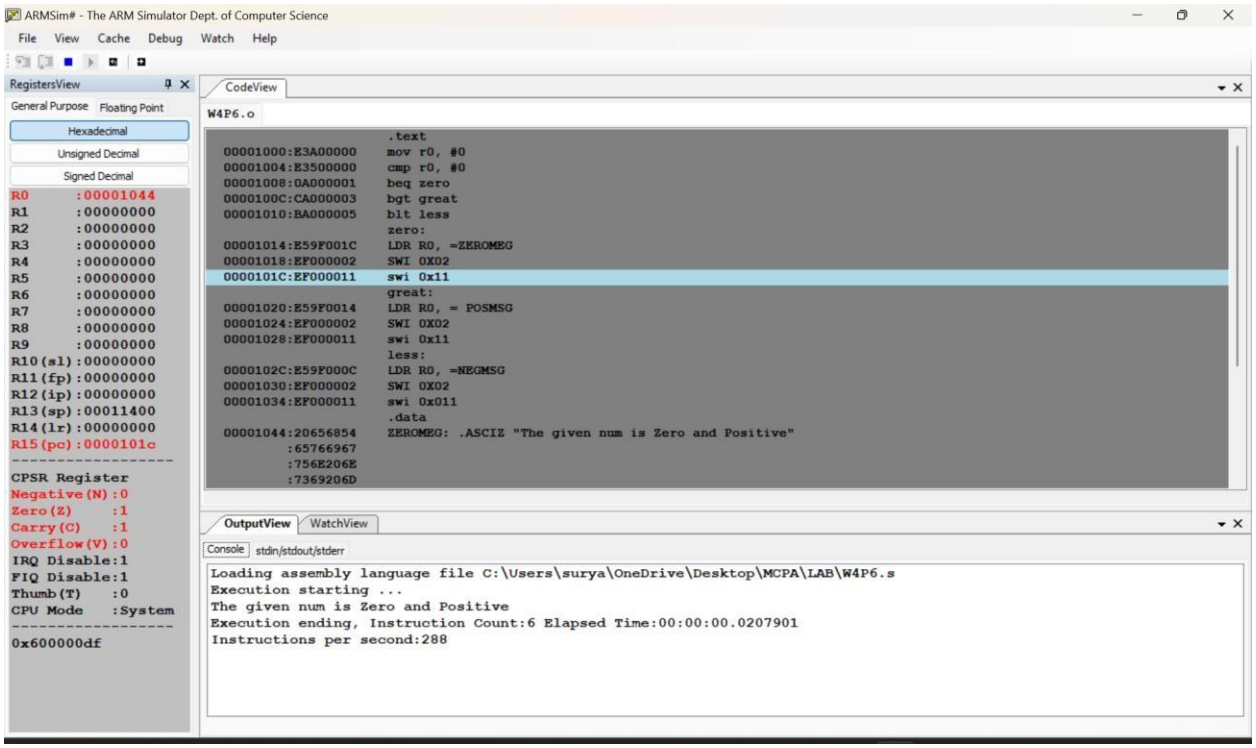
Write an ALP to scan a 32 bit number if it is negative or positive

I.ARM Assembly Code

```
.text
mov r0, #0
cmp r0, #0
beq zero
bgt great
```

```
blt less
zero:
LDR R0, =ZEROMEG
SWI 0X02
swi 0x11
great:
LDR R0, = POSMSG
SWI 0X02
swi 0x11
less:
LDR R0, =NEGMSG
SWI 0X02
swi 0x011
.data
ZEROMEG: .ASCIZ "The given num is Zero and Positive"
POSMSG: .ASCIZ "The given num is Positive"
NEGMSG: .ASCIZ "The given num is Negative"
```

II. Output Screen Shot (One)



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Week#____4_____ Program Number: ____4__

Title of the Program

Write an ALP to find the number of zeroes, positive and negative numbers in a given array

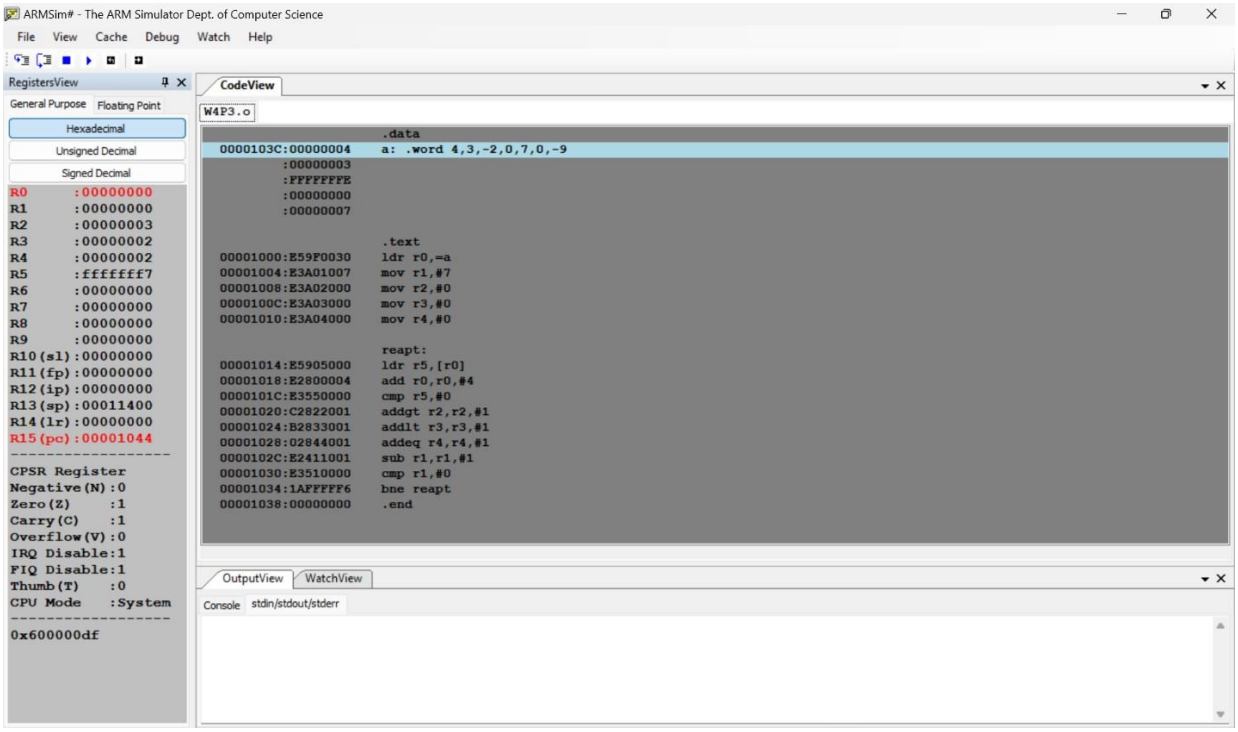
I.ARM Assembly Code

```
.data
a: .word 4,3,-2,0,7,0,-9

.text
ldr r0,=a
mov r1,#7
mov r2,#0
mov r3,#0
mov r4,#0
```

```
reapt:
ldr r5,[r0]
add r0,r0,#4
cmp r5,#0
addgt r2,r2,#1
addlt r3,r3,#1
addeq r4,r4,#1
sub r1,r1,#1
cmp r1,#0
bne reapt
.end
```

II. Output Screen Shot (One)



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Week#____4_____ Program Number: ____5__

Title of the Program

Write an ALP to count the number of 1's and 0's in a given 32 bit number.

I.ARM Assembly Code

```
.data
a: .word 46

.text
ldr r0,=a
ldr r0,[r0]
mov r1,#32
mov r2,#0
mov r3,#0
repeat:
```

movs r0,r0,lsr#1

addcs r2,r2,#1

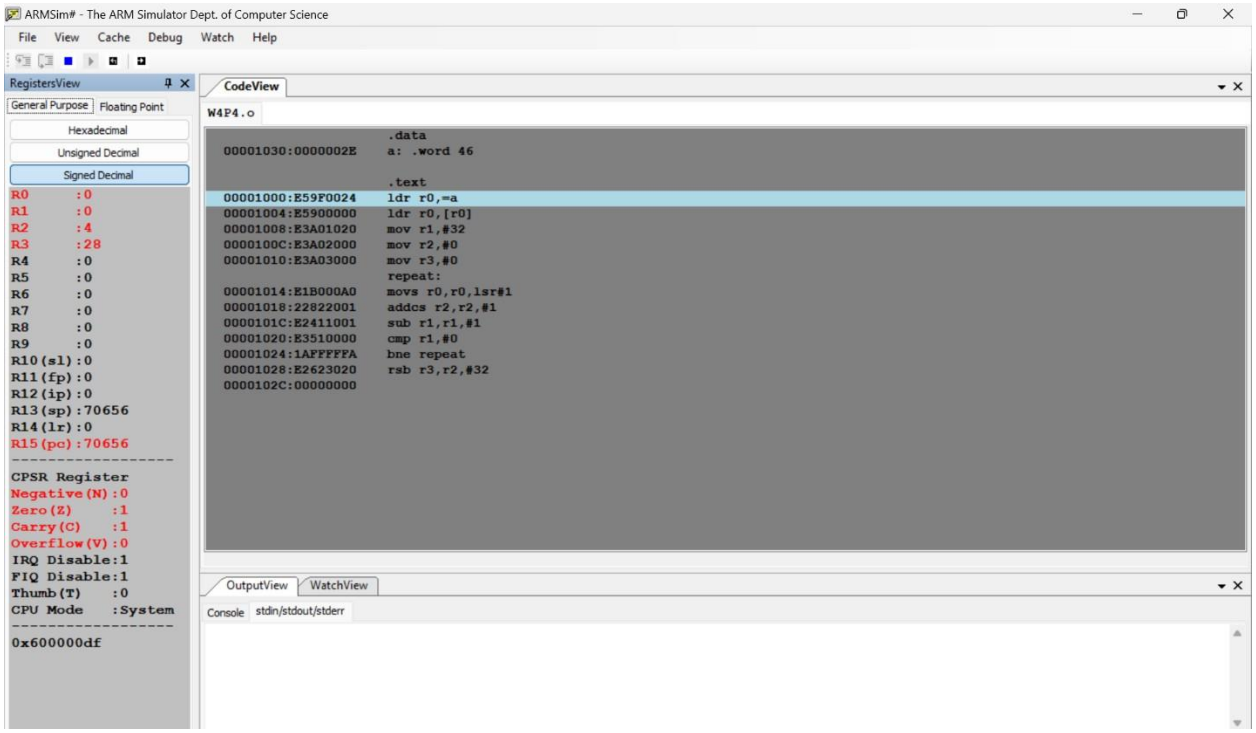
sub r1,r1,#1

cmp r1,#0

bne repeat

rsb r3,r2,#32

II. Output Screen Shot (One)



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Week#____4_____ Program Number: ____6__

Title of the Program

Write an ALP to check the given number has odd or even number of 1's and display the result. (Even Parity and Odd Parity)

I.ARM Assembly Code

```
.data
a: .word 47
b: .asciz "Odd Parity"
c: .asciz "Even Parity"
.text
```

```
ldr r0,=a
ldr r0,[r0]
mov r1,#32
mov r2,#0
repeat:
movs r0,r0,lsr#1
addcs r2,r2,#1
sub r1,r1,#1
cmp r1,#0
bne repeat
and r3,r2,#1
cmp r3,#0
bne  loop1
b loop2

loop1:
ldr r0,=b
swi 0x02
b exit
```

loop2:

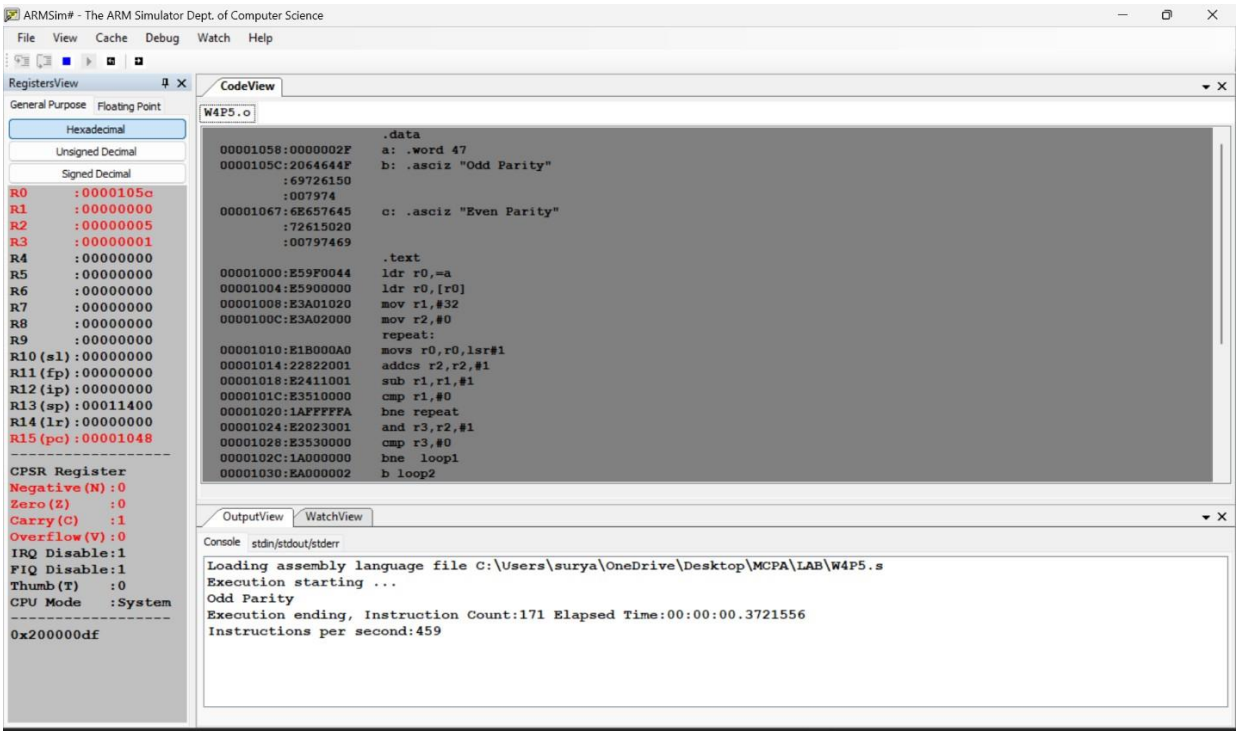
ldr r0,=c

swi 0x02

exit:swi 0x11

.end

II. Output Screen Shot (One)



Disclaimer:

- 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.

Signature:
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SRN:PES2UG21CS315
Section: F
Date:13-2-2023