Microprocessor and Computer Architecture Laboratory
UE20CS256

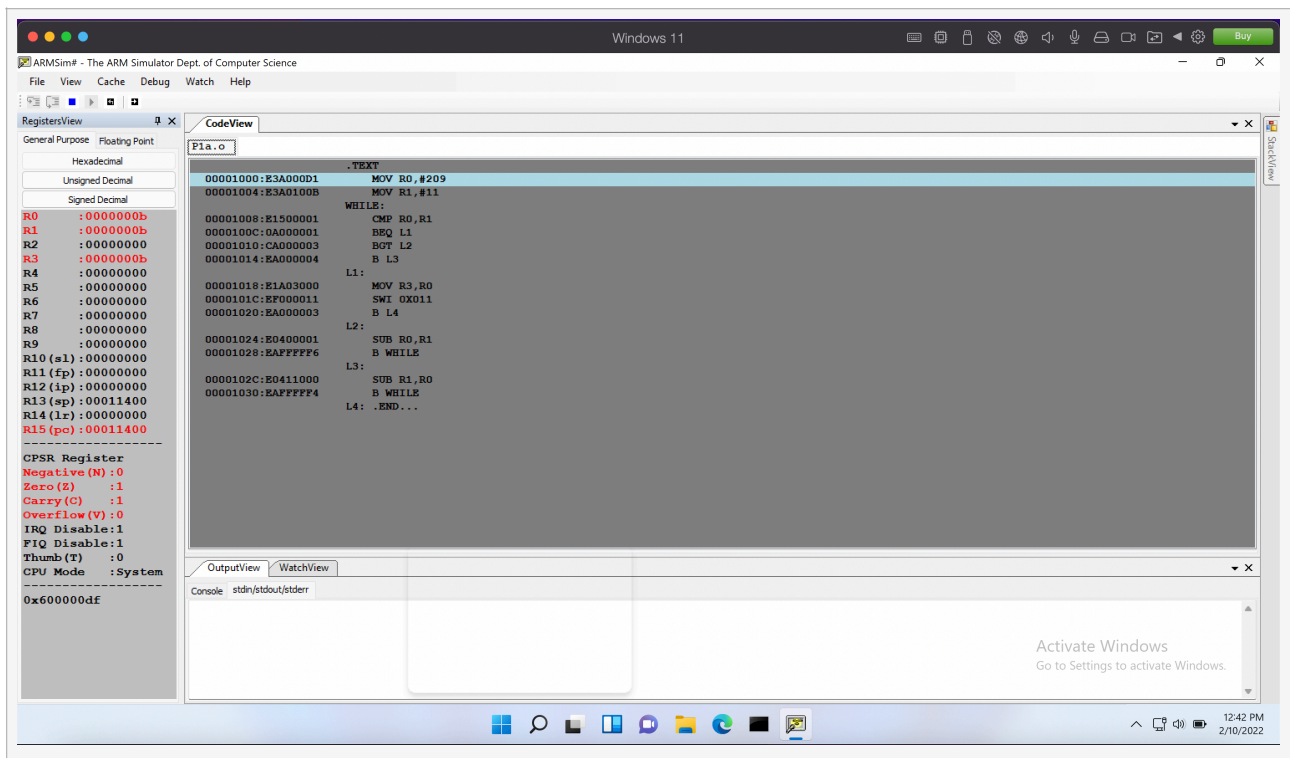| Name: Naman Choudhary	SRN: PES2UG20CS209	Section: D

Week 4

Program Number	1 a
Program Qn	Write a program in ARM7TDMI-ISA to find GCD of two numbers. Assume operands to be in the CPU registers
ARM Assembly Code	

```
.TEXT
    MOV R0,#209
    MOV R1,#11
WHILE:
    CMP R0,R1
    BEQ L1
    BGT L2
    B L3
L1:
    MOV R3,R0
    SWI 0X011
    B L4
L2:
    SUB R0,R1
    B WHILE
L3:
    SUB R1,R0
    B WHILE
L4:  .END
```
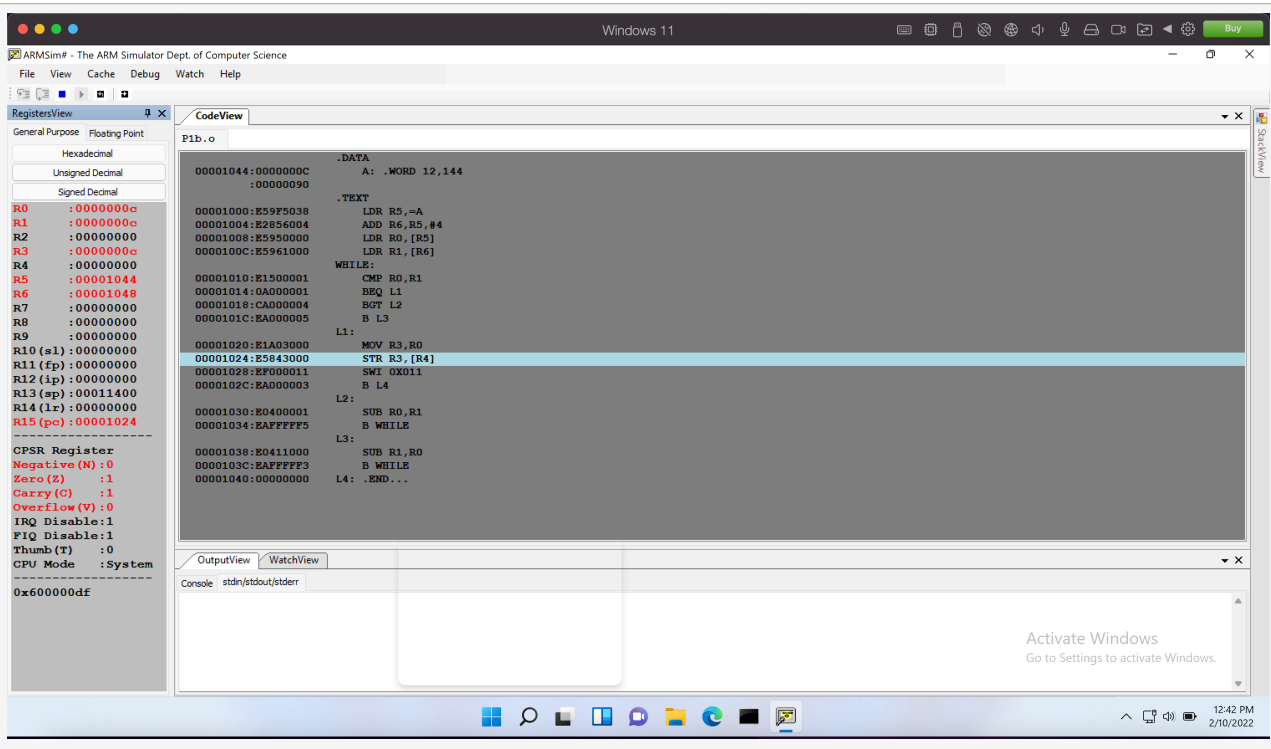
Output Screenshot

Program Number	1 b
Program Qn	Write a program in ARM7TDMI-ISA to find GCD of two numbers. Assume operands in the memory locations
ARM Assembly Code	

```
.DATA
    A: .WORD 12,144
.TEXT
    LDR R5,=A
    ADD R6,R5,#4
    LDR R0,[R5]
    LDR R1,[R6]
WHILE:
    CMP R0,R1
    BEQ L1
    BGT L2
    B L3
L1:
    MOV R3,R0
    STR R3,[R4]
    SWI 0X011
    B L4
L2:
    SUB R0,R1
    B WHILE
L3:
    SUB R1,R0
    B WHILE
L4: .END
```
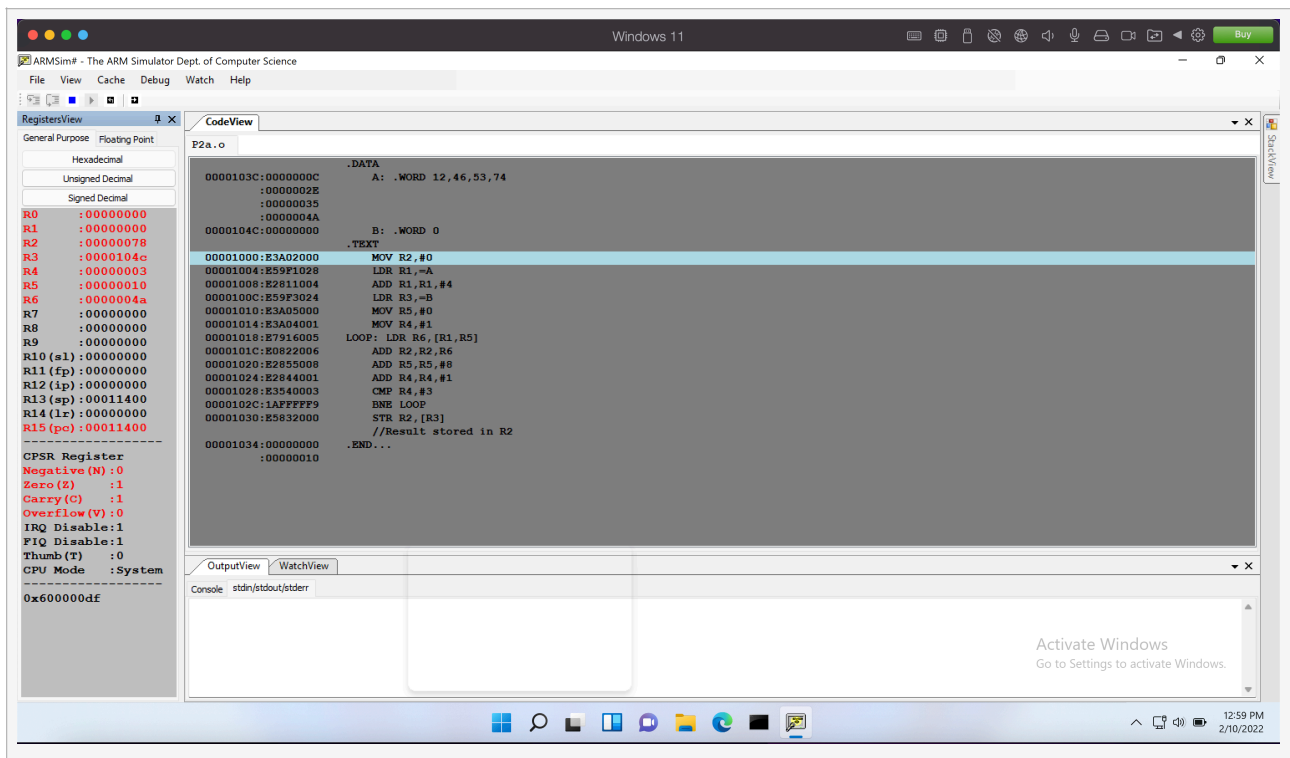
Output Screenshot

Program Number	2 a
Program Qn	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. Use Pre-indexing addressing mode

ARM Assembly Code

```
.DATA
    A:  .WORD 12,46,53,74
    B:  .WORD 0
.TEXT
    MOV R2,#0
    LDR R1,=A
    ADD R1,R1,#4
    LDR R3,=B
    MOV R5,#0
    MOV R4,#1
LOOP: LDR R6,[R1,R5]
    ADD R2,R2,R6
    ADD R5,R5,#8
    ADD R4,R4,#1
    CMP R4,#3
    BNE LOOP
    STR R2,[R3]
    //Result stored in R2
.END
```
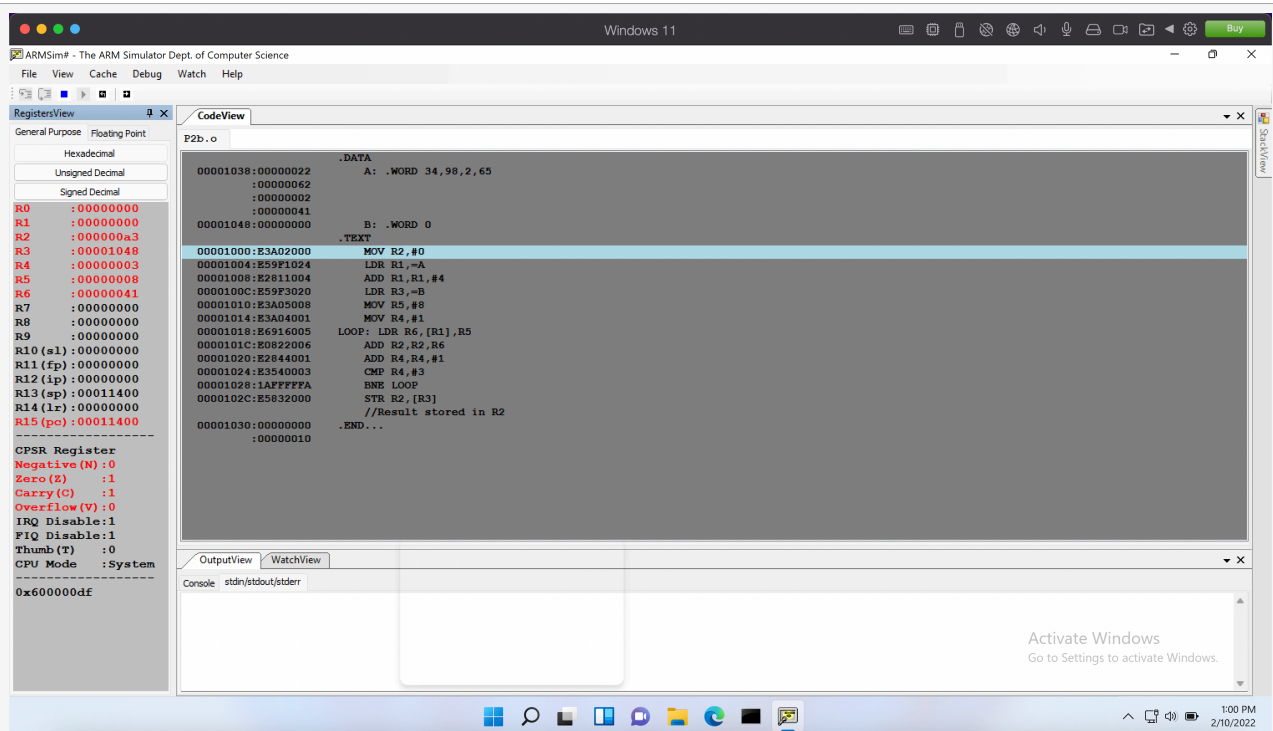
Output Screenshot

Program Number	2 b
Program Qn	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. Use Post- Indexing addressing mode
ARM Assembly Code	

Within the CodeView of the simulator:

```
                        .DATA
0000103C:0000000C       A: .WORD 12,46,53,74
        :0000002E
        :00000035
        :0000004A
0000104C:00000000       B: .WORD 0
                        .TEXT
00001000:E3A02000           MOV R2,#0
00001004:E59F1028           LDR R1,=A
00001008:E2811004           ADD R1,R1,#4
0000100C:E59F3024           LDR R3,=B
00001010:E3A05000           MOV R5,#0
00001014:E3A04001           MOV R4,#1
00001018:E7916005       LOOP: LDR R6,[R1,R5]
0000101C:E0822006           ADD R2,R2,R6
00001020:E2855008           ADD R5,R5,#8
00001024:E2844001           ADD R4,R4,#1
00001028:E3540003           CMP R4,#3
0000102C:1AFFFFF9           BNE LOOP
00001030:E5832000           STR R2,[R3]
                            //Result stored in R2
00001034:00000000       .END...
        :00000010
```

```
.DATA
    A:  .WORD 34,98,2,65
    B:  .WORD 0
.TEXT
    MOV R2,#0
    LDR R1,=A
    ADD R1,R1,#4
    LDR R3,=B
    MOV R5,#8
    MOV R4,#1
LOOP: LDR R6,[R1],R5
    ADD R2,R2,R6
    ADD R4,R4,#1
    CMP R4,#3
    BNE LOOP
    STR R2,[R3]
    //Result stored in R2
.END
```

Output Screenshot

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.

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