Course 1dt301: Computer Technology
1 Lab Assignment 1, 2023

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Task 1:

17 dec (or 11 hex, represented by 0x11) is stored in register x2 upon the assembly and execution of the provided code.

Task 2:

11010010100 0000000010000000 00010
MOVZ - 128 2

MOVZ x2,#128

11010010100 0000000011100111 00100
MOVZ - move= 231 rd=4

MOVZ x4,#231

11001011000 00010 000000 00100 00101
SUB x=2 - x=4 x=5

SUB x5,x4,x2

D360 0CA5

11010011011 00000 000011 00101 00101
LSL rm=0 shamt=3 rn=5 rd=5

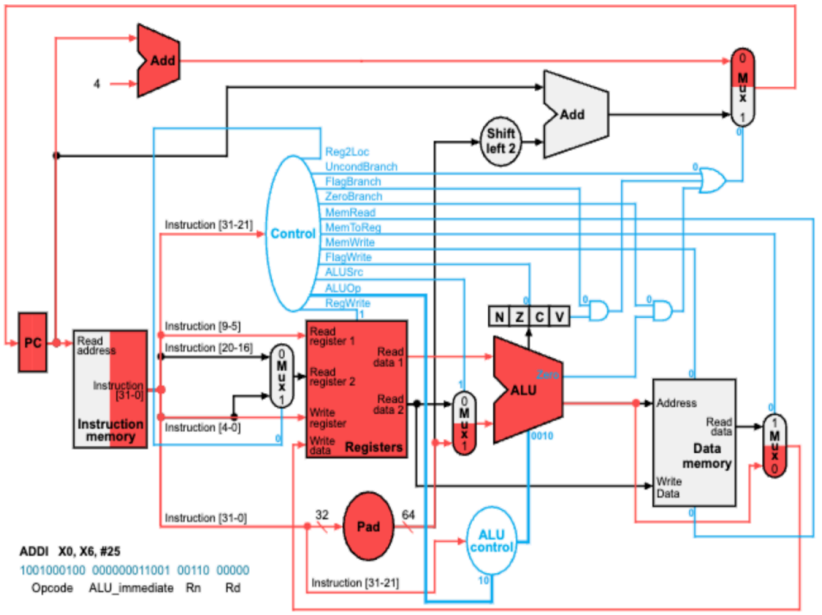
LSL x5,x5,#3

Task 3:

LEGv8 Simulator

Execution Mode: Single Cycle | Assemble | Execute Instruction | Help

```
1        MOVZ    x1, #5
2        LSL     x2, x1, #2
3        MOVZ    x3, #11
4        LSL     x4, x3, #4
5        MOVZ    x5, #25
6        ADD     x6, x2, x4
7        ADDI    x0, x6, #25
8
```

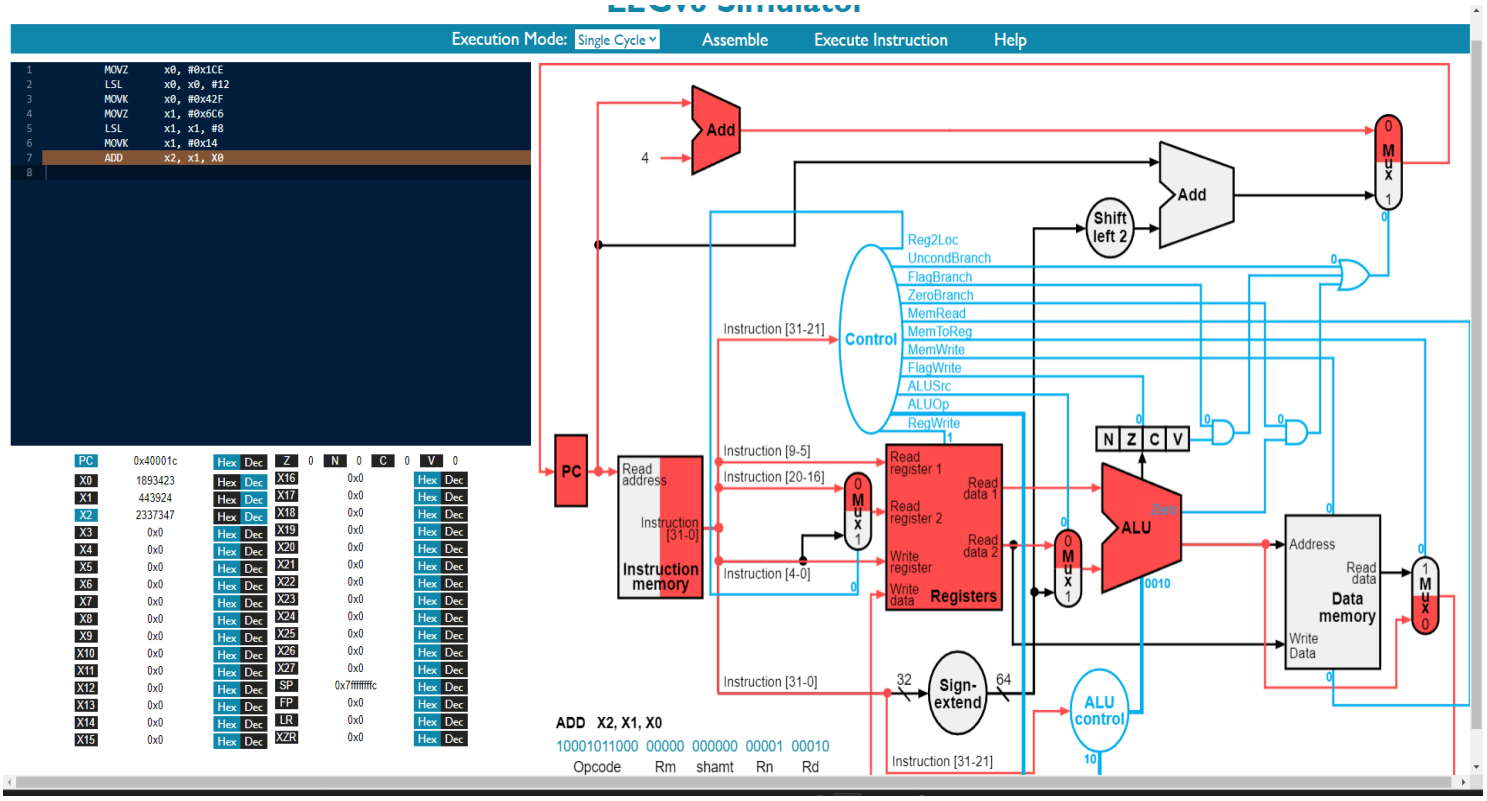


PC	0x40001c	Hex	Dec	Z	0	N	0	C	0	V	0		
X0	221	Hex	Dec	X16	0x0							Hex	Dec
X1	5	Hex	Dec	X17	0x0							Hex	Dec
X2	20	Hex	Dec	X18	0x0							Hex	Dec
X3	11	Hex	Dec	X19	0x0							Hex	Dec
X4	176	Hex	Dec	X20	0x0							Hex	Dec
X5	25	Hex	Dec	X21	0x0							Hex	Dec
X6	196	Hex	Dec	X22	0x0							Hex	Dec
X7	0x0	Hex	Dec	X23	0x0							Hex	Dec
X8	0x0	Hex	Dec	X24	0x0							Hex	Dec
X9	0x0	Hex	Dec	X25	0x0							Hex	Dec
X10	0x0	Hex	Dec	X26	0x0							Hex	Dec
X11	0x0	Hex	Dec	X27	0x0							Hex	Dec
X12	0x0	Hex	Dec	SP	0x7ffffffffc							Hex	Dec
X13	0x0	Hex	Dec	FP	0x0							Hex	Dec
X14	0x0	Hex	Dec	LR	0x0							Hex	Dec
X15	0x0	Hex	Dec	XZR	0x0							Hex	Dec

Printed Code, resulting in 221dec stored in register x0:

```
MOVZ    x1, #5
LSL     x2, x1, #2
MOVZ    x3, #11
LSL     x4, x3, #4
ADD     x6, x2, x4
ADDI    x0, x6, #25
```

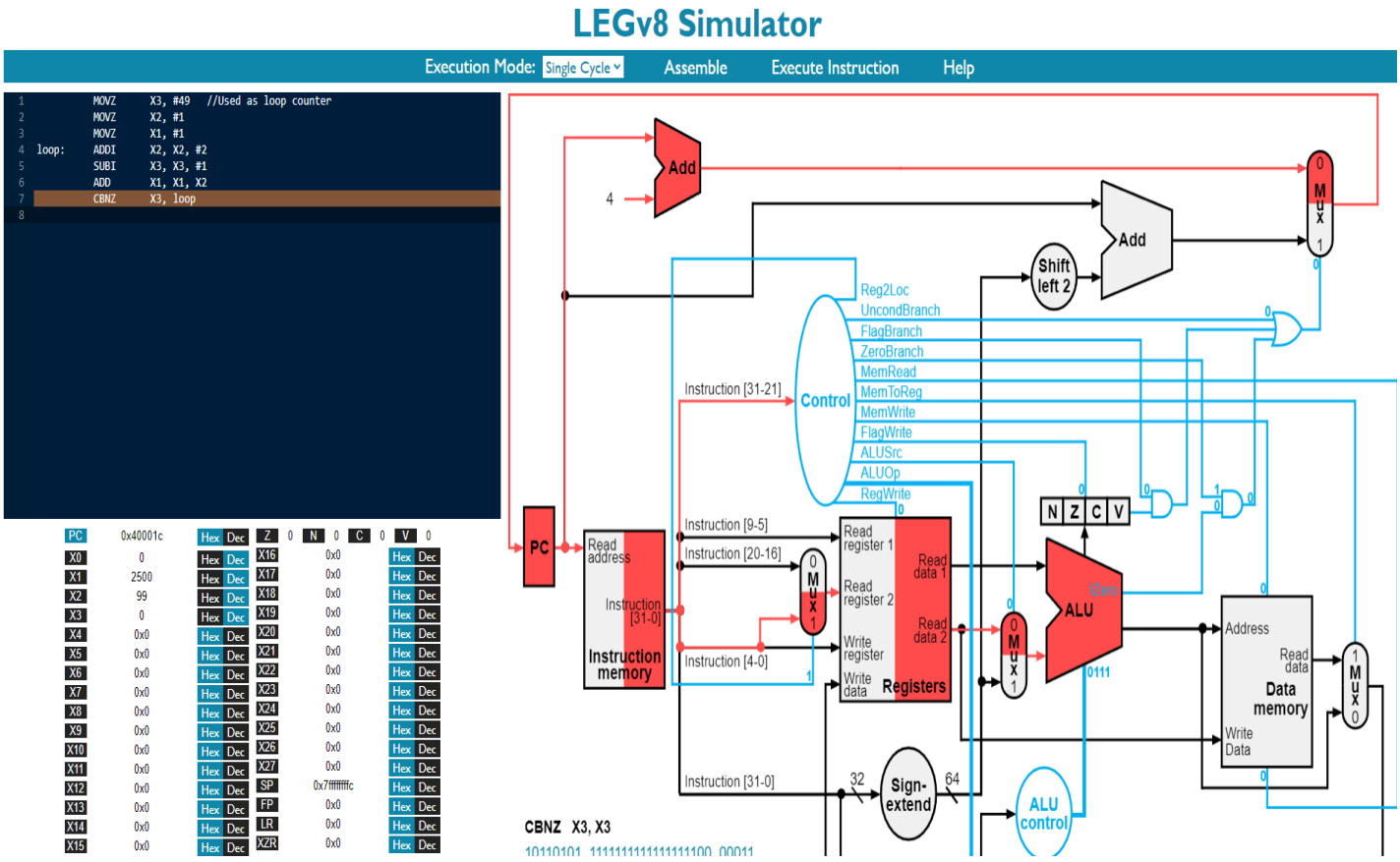
Task 4:



Printed Code, resulting in 2337347dec stored in register x2:

```
MOVZ    x0, #0x1CE
LSL     x0, x0, #12
MOVK    x0, #0x42F
MOVZ    x1, #0x6C6
LSL     x1, x1, #8
MOVK    x1, #0x14
ADD     x2, x1, X0
```

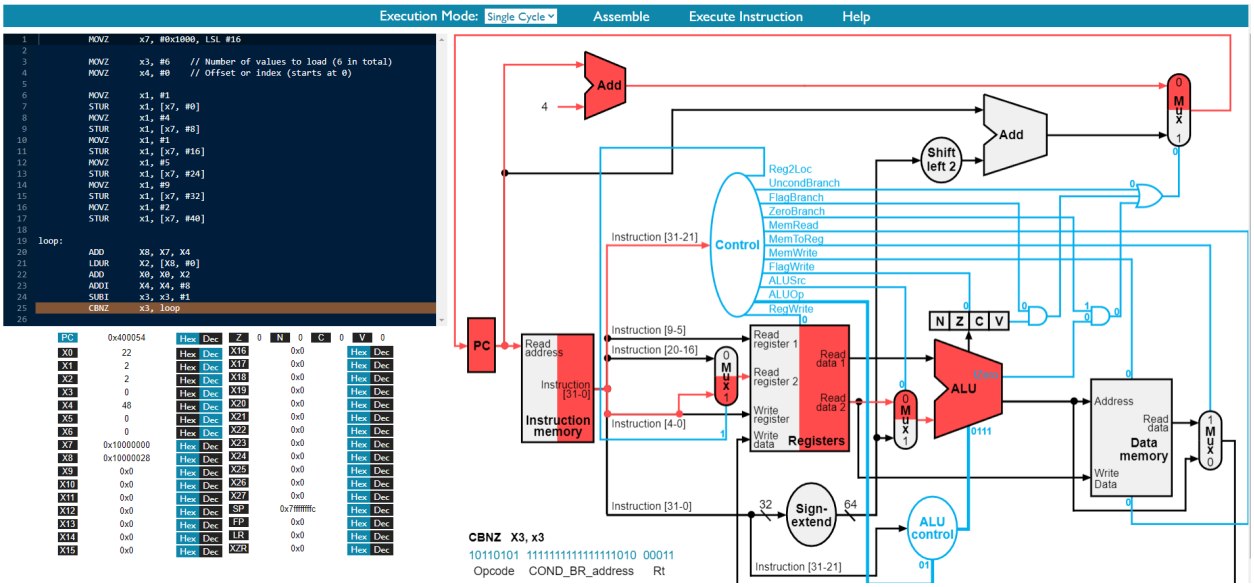
Task 5:



Printed Code, resulting in 2500dec stored in register x1:

```
        MOVZ X3, #49  // loop counter
        MOVZ X2, #1
        MOVZ X1, #1
loop:   ADDI  X2, X2, #2
        SUBI  X3, X3, #1
        ADD   X1, X1, X2
        CBNZ  X3, loop
```

Task6:



Printed code, resulting in 22dec stored in register x0.

```
MOVZ x7, #0x1000, LSL #16
MOVZ x3, #6  // Number of values to load (6 in total)
MOVZ x4, #0  // Offset or index (starts at 0)

MOVZ x1, #1
STUR  x1, [x7, #0]
MOVZ x1, #4
STUR  x1, [x7, #8]
MOVZ x1, #1
STUR  x1, [x7, #16]
MOVZ x1, #5
STUR  x1, [x7, #24]
MOVZ x1, #9
STUR  x1, [x7, #32]
MOVZ x1, #2
STUR  x1, [x7, #40]
```

loop:

```
ADD   X8, X7, X4
LDUR  X2, [X8, #0]
ADD   X0, X0, X2
ADDI  X4, X4, #8
SUBI  x3, x3, #1
CBNZ  x3, loop
```