ASSIGNMENT-1

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I)C=A+B

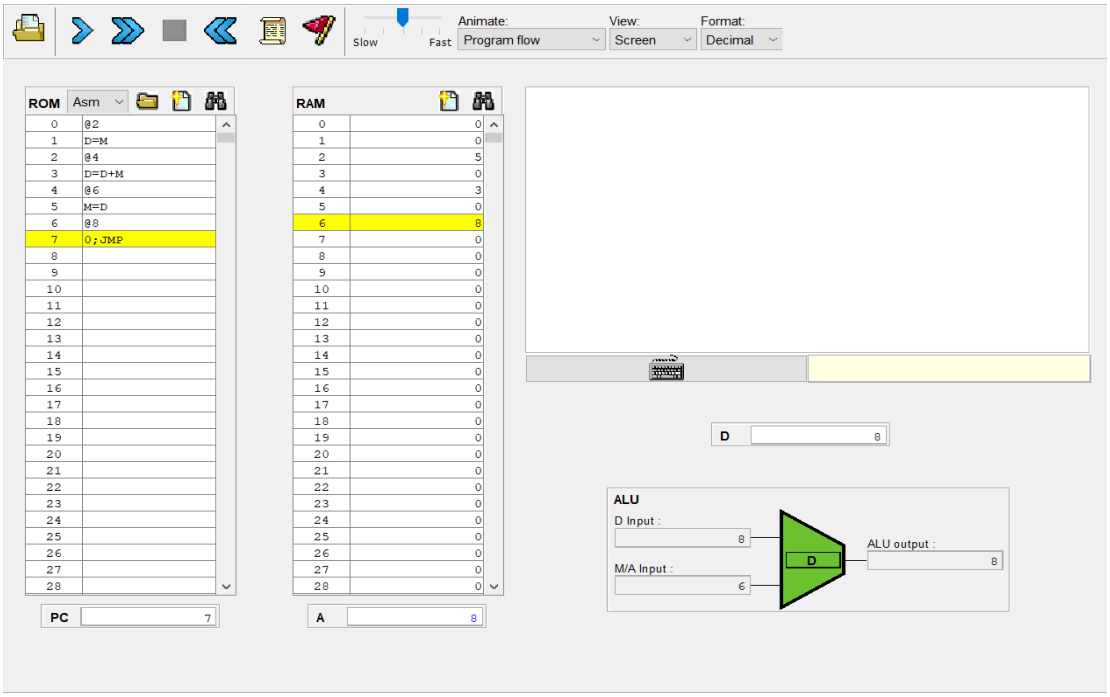
AIM:

To execute C=A+B in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

- 0 @2
- 1 D=M
- 2 @4
- 3 D=D+M
- 4 @6
- 5 M=D
- 6 @8
- 7 0;JMP

VERIFICATION SCREENSHOT:



RESULT:

The Addition of two numbers is executed successfully using CPU emulator in Nand2tetris using Assembly Language.

II)D=A+B-C

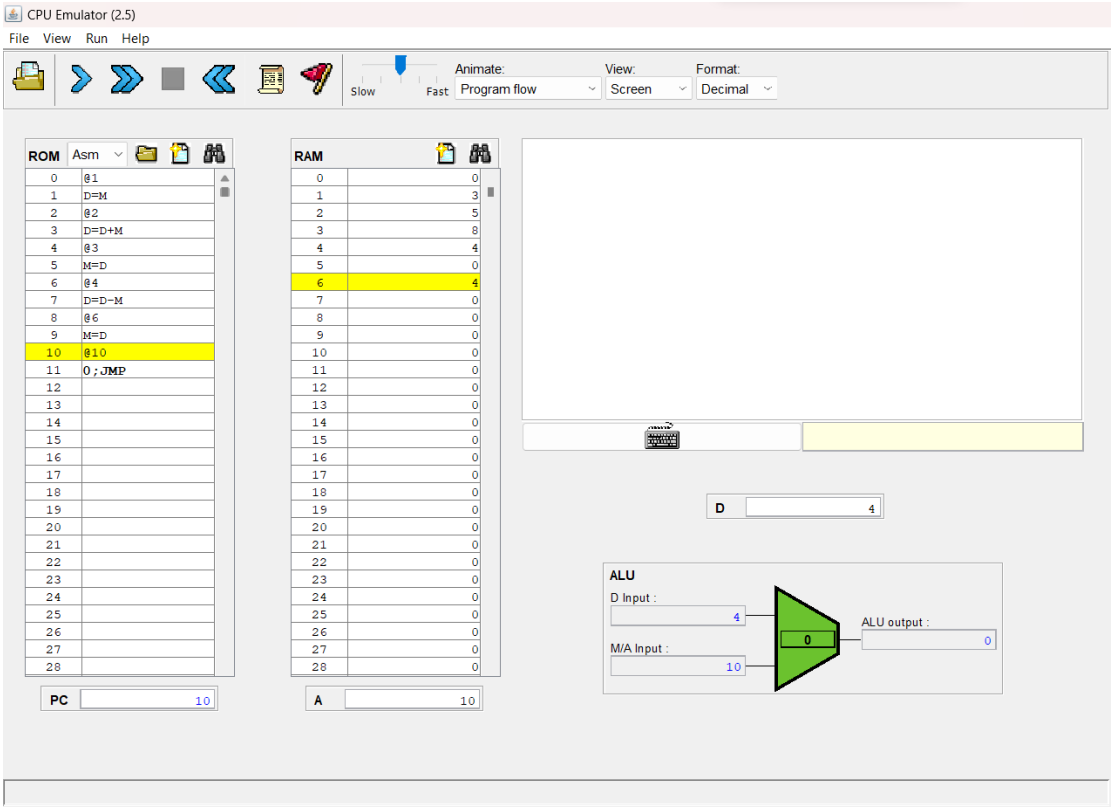
AIM:

To execute D=A+B-C in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

```
0  @1
1  D=M
2  @2
3  D=D+M
4  @3
5  M=D
6  @4
7  D=D-M
8  @6
9  M=D
10 @10
11 0;JMP
```

VERIFICATION SCREENSHOT:



RESULT:

Thus, the expression A+B-C is executed successfully using CPU emulator in Nand2tetris using Assembly Language.

III)E=(A+B)-(C+D)

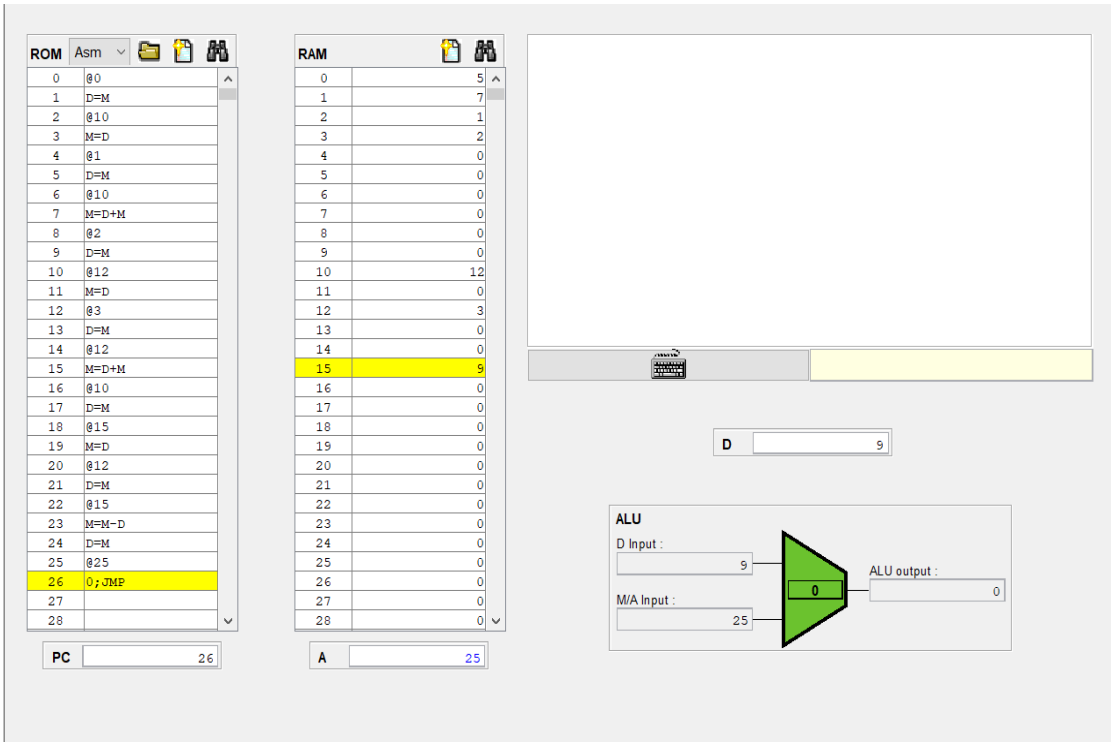
AIM:

To execute E=(A+B)-(C+D) in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

```
@0
D=M
@10
M=D
@1
D=M
@10
M=D+M
@2
D=M
@12
M=D
@3
D=M
@12
M=D+M
@10
D=M
@15
M=D
@12
D=M
@15
M=M-D
D=M
@25
0;JMP
```

VERIFICATION SCREENSHOT:



RESULT:

Thus, the expression (A+B)-(C+D) is executed successfully using CPU emulator in Nand2tetris using Assembly Language.

EXP:02 SWAPPING TWO NUMBER

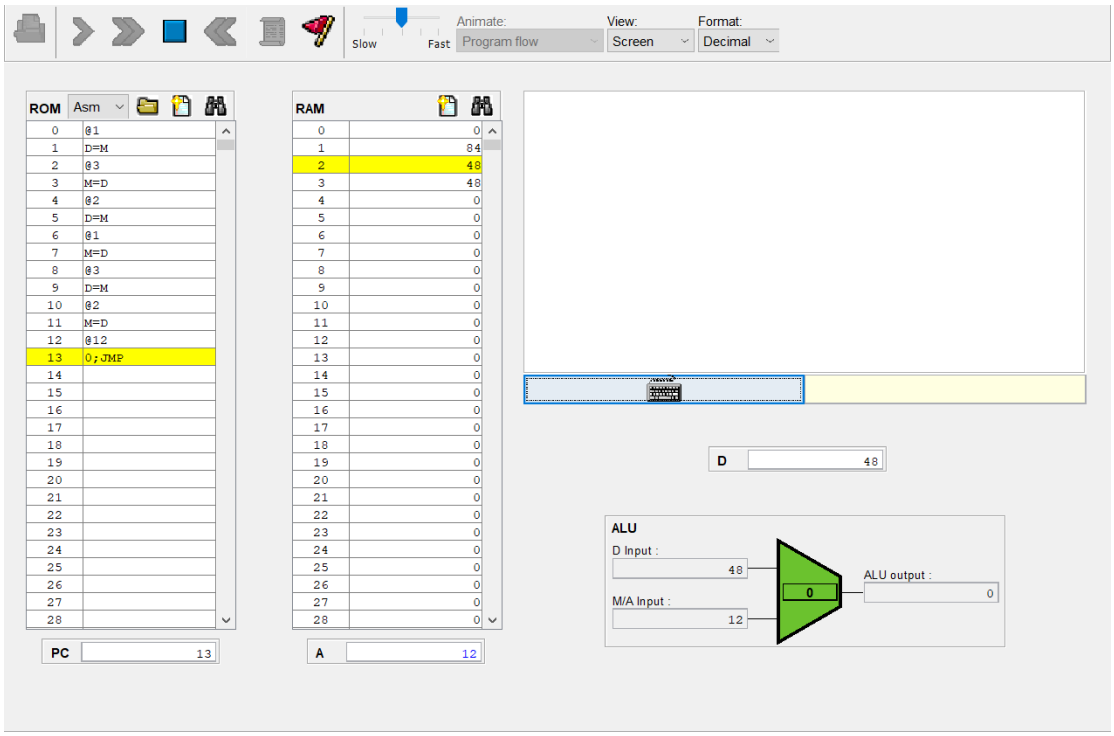
AIM:

To Swap two numbers in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

- @1
- D=M
- @3
- M=D
- @2
- D=M
- @1
- M=D
- @3
- D=M
- @2
- M=D
- @12
- 0;JMP

VERIFICATION SCREENSHOT:



RESULT:

Swapping of two numbers is executed successfully using CPU emulator in Nand2tetris using Assembly Language.

EXP NO:03 SUM OF NTH NUMBERS

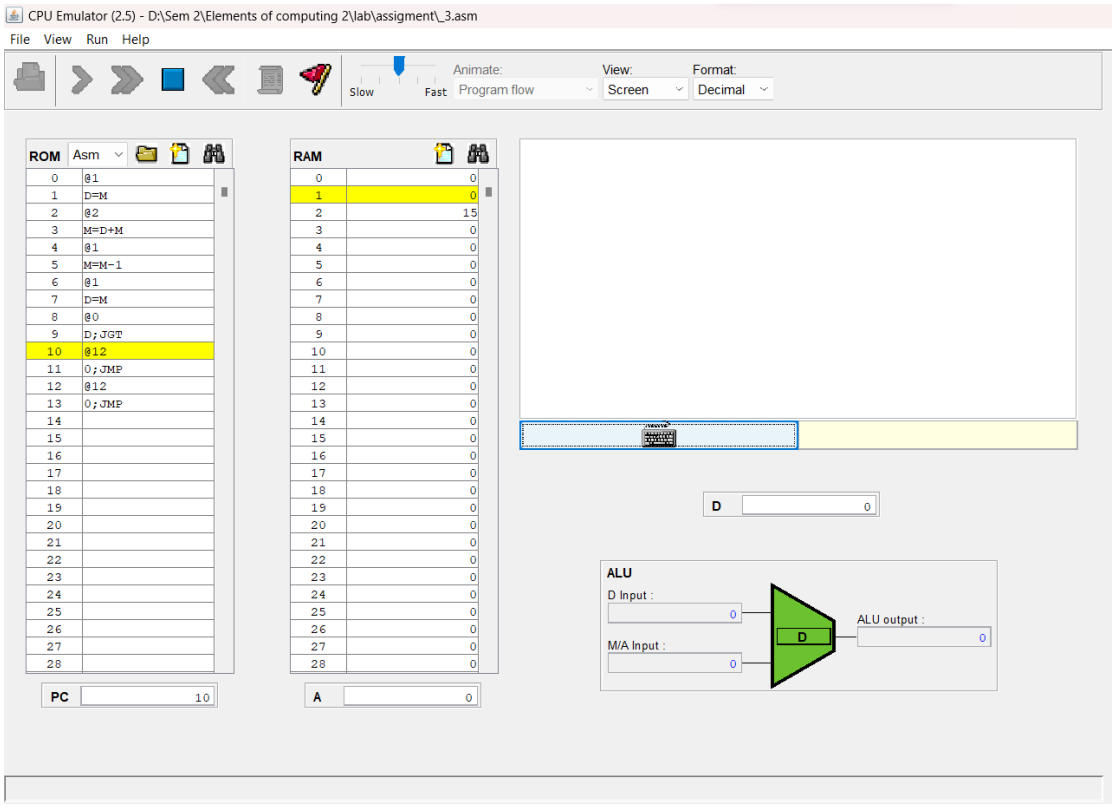
AIM:

To Sum of nth numbers in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

```
0  @1
1  D=M
2  @2
3  M=D+M
4  @1
5  M=M-1
6  @1
7  D=M
8  @0
9  D;JGT
10 @12
11 0;JMP
12 @12
13 0;JMP
```

VERIFICATION SCREENSHOT:



RESULT:

Sum of "n"th numbers is executed successfully using CPU emulator in Nand2tetris using Assembly Language.

EXP NO: 04 IF A<0 PRINT 1 ELSE PRINT 0

AIM:

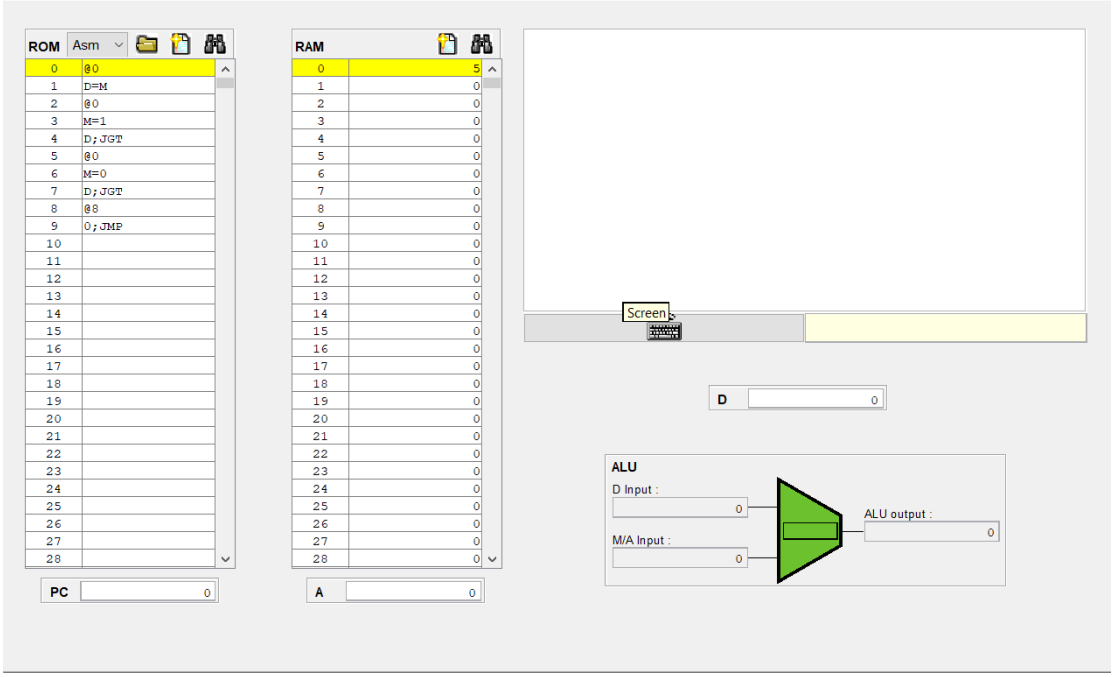
to print 1 if number>0 else print 0 USING a hack assembly language code

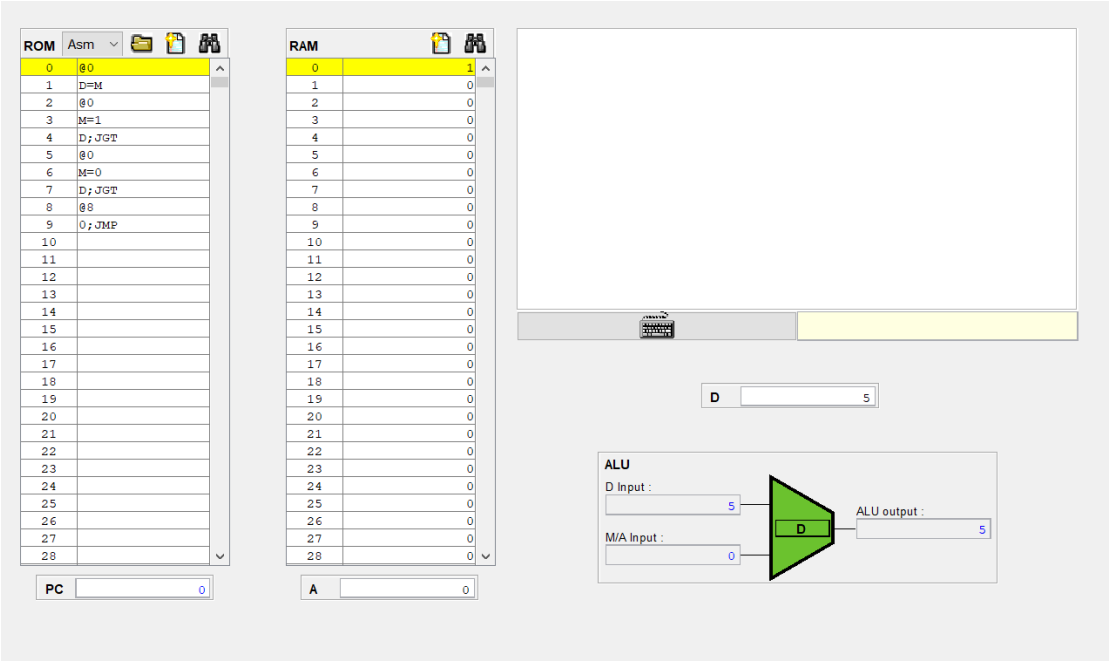
HACK ASSEMBLY CODE:

```
@0
D=M
@0
M=1
D;JGT
@0
M=0
D;JGT
@8
0;JMP
```

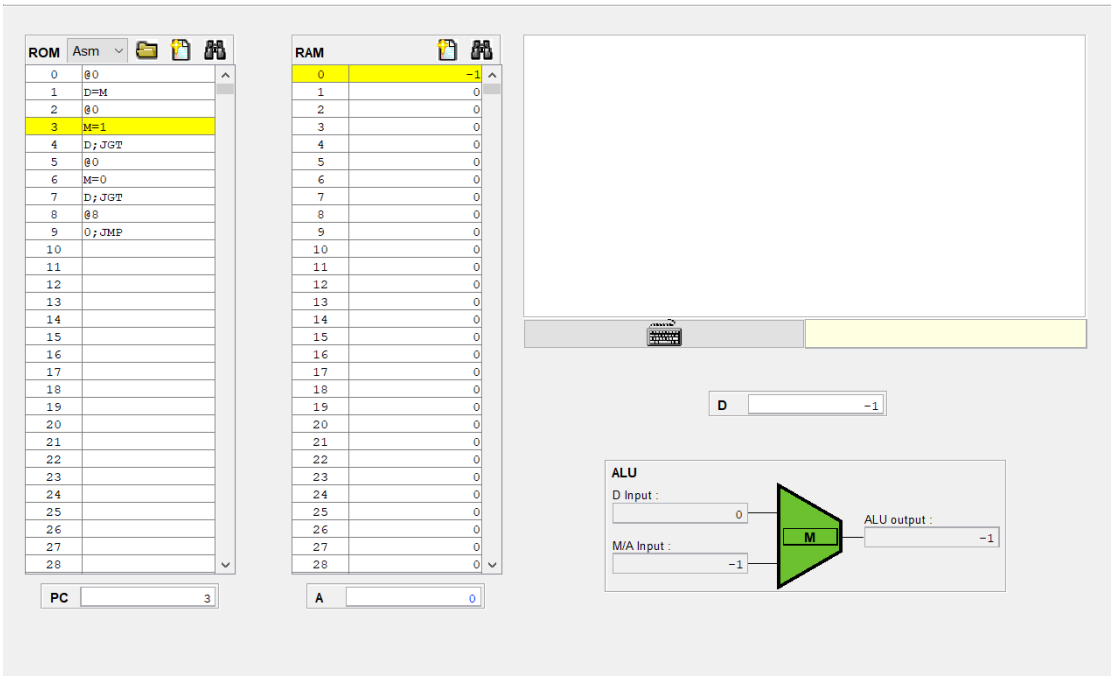
VERIFICATION SCREENSHOT:

IF PART





ELSE PART:


ROM
Asm
0 @0
1 D=M
2 @0
3 M=1
4 D;JGT
5 @0
6 M=0
7 D;JGT
8 @8
9 0;JMP
PC 3
RAM
A 0
D -1
ALU
D Input :
0
M/A Input :
-1
M
ALU output :
-1

EXPNO:05 MULTIPLICATION OF TWO NUMBERS

AIM:

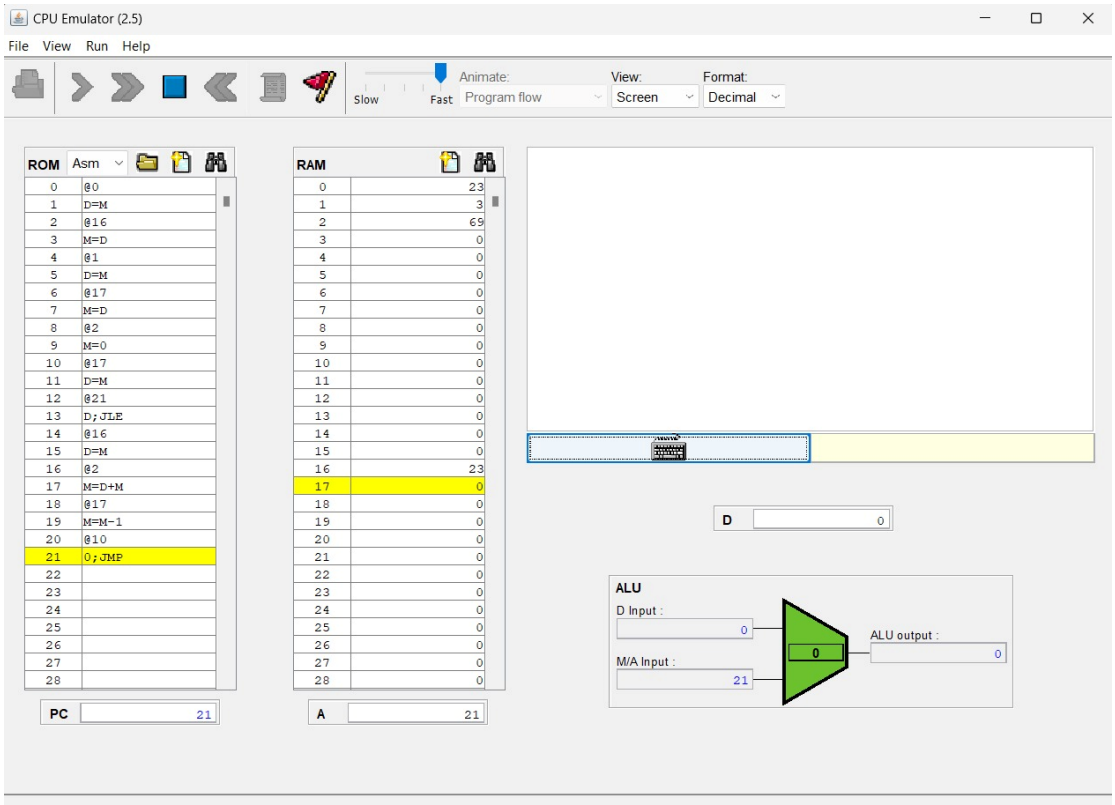
To multiplication in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

```
@0
D=M
@16
M=D
@1
D=M
@17
M=D
@2
M=0
@17
D=M
@21
D;JLE
@16
```

16. D=M
17. @2
18. M=D+M
19. @17
20. M=M-1
21. @10
22. 0;JMP

VERIFICATION SCREENSHOT:



RESULT:

The Multiplication of two numbers is executed successfully using CPU emulator in Nand2tetris using Assembly Language.

DIVISION OF TWO NUMBERS

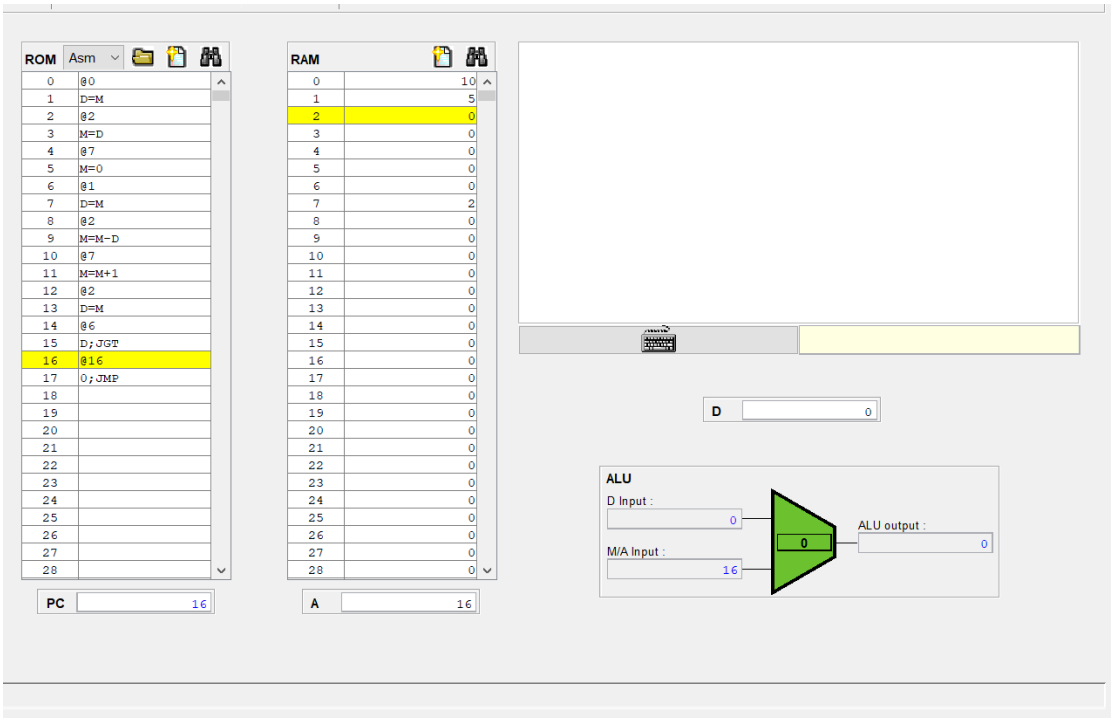
AIM:

To DIVISION of two numberss in CPU emulator using Assembly Language in Nand2tetris.

HACK ASSEMBLY CODE:

```
@0
D=M
@2
M=D
@7
M=0
@1
D=M
@2
M=M-D
@7
M=M+1
@2
D=M
@6
D;JGT
@16
0;JMP
```

VERIFICATION SCREENSHOT:



RESULT:

The Division of two numbers is executed successfully using CPU emulator in Nand2tetris using Assembly Language.