

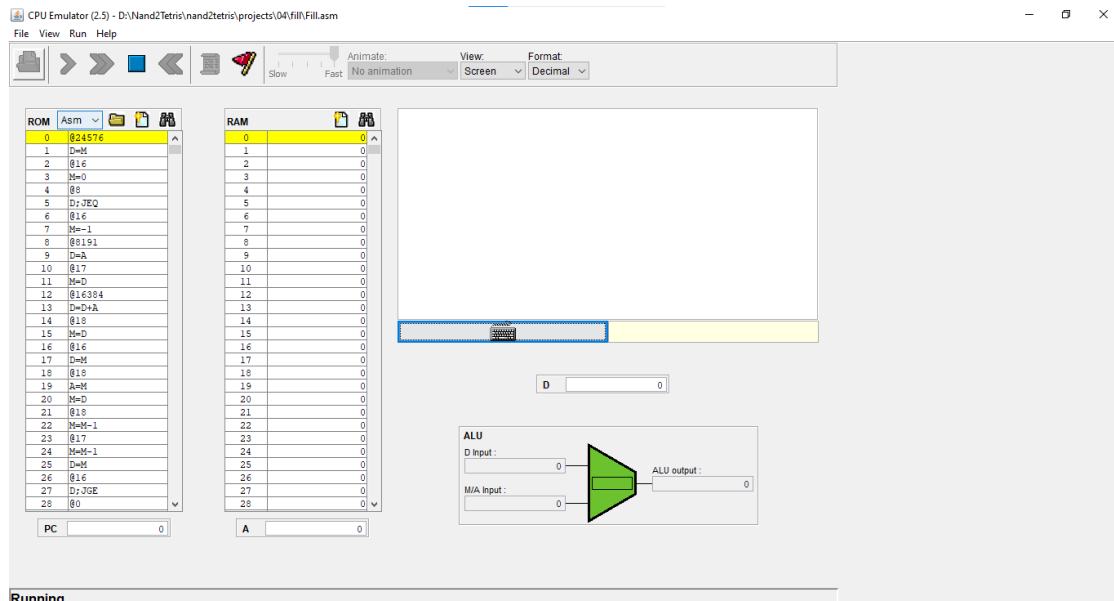
# **Nand2Tetris Project Report**

Repo Link : <https://github.com/Laxmi-Sreenivas/Nand2Tetris>

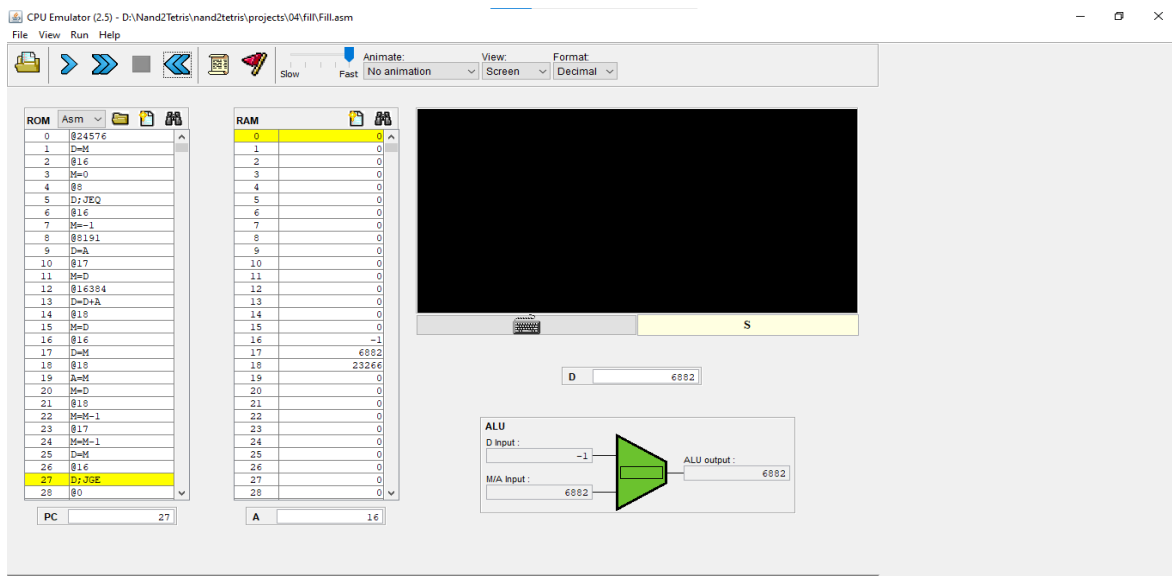
# Project 4

## Fill.asm

### When No Key is Pressed

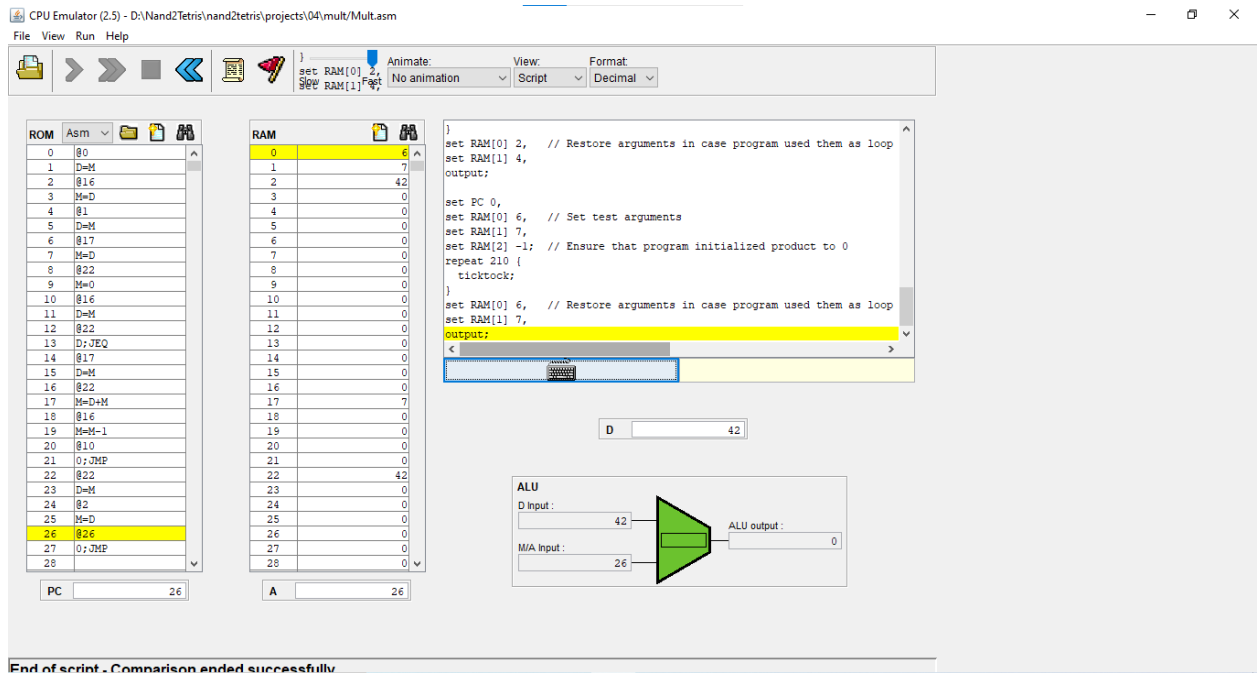


### When A Key is Pressed

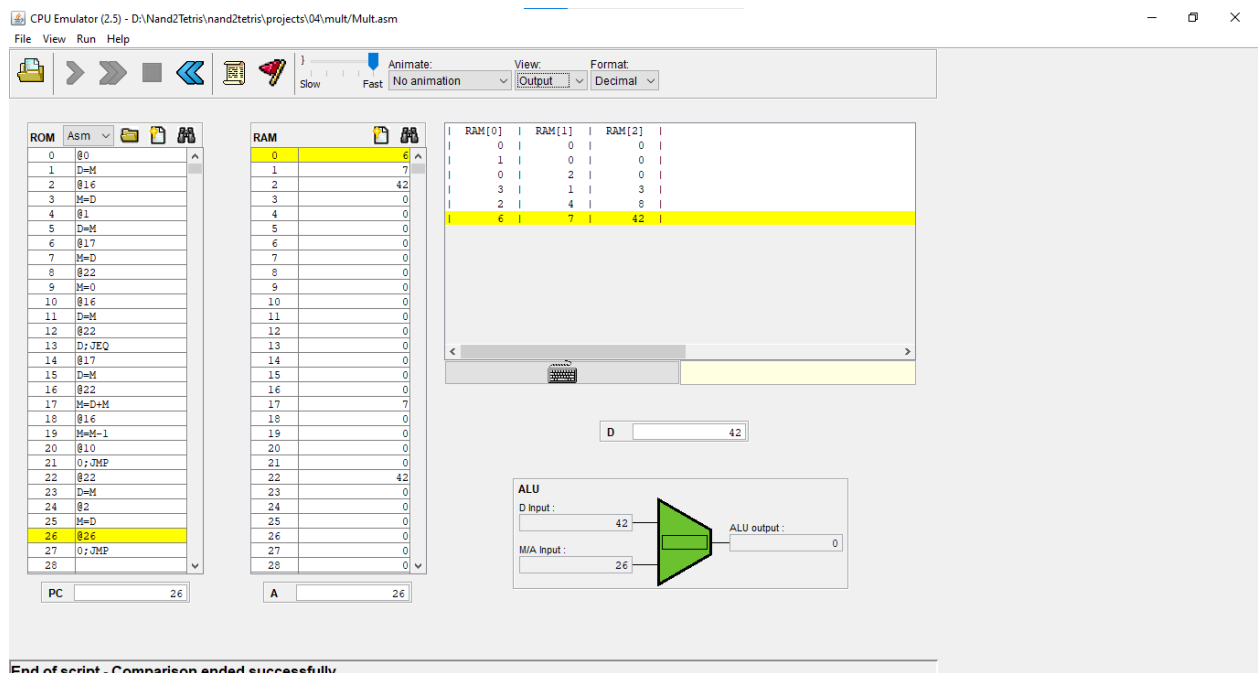


# Mult.asm

## Running Script File



## Output



# Project 5

## Computer.hdl

### Running Script File

Hardware Simulator (2.5) - D:\Nand2Tetris\nand2tetris\projects\05\CPU.hdl

File View Run Help

Chip Name: CPU (Clocked) Time: 48

Input pins		Output pins	
Name	Value	Name	Value
inM[16]	11111	outM[16]	1
instruction[16]	32767	writeM	0
reset	0	addressM[15]	32767
		pc[15]	1

**HDL**

```
// This file is part of www.nand2tetris.org
// and the book "The Elements of Computing Systems"
// by Nisan and Schocken, MIT Press
// File name: projects/05/CPU.hdl

/**
 * The Hack CPU (Central Processor)
 * two registers named A and D,
 * The CPU is designed to fetch
 * the Hack machine language. It
 * Executes the inputted instruction
 * Language specification. The instructions
 * refer to CPU-resident registers
 * memory location addressed by
 */
```

**Internal pins**

Name	Value
cType	0
aLoadALU	0
aluOutput[16]	1
aRegister[16]	32767
aType	1
loadRegisterA	1
aFinal[16]	32767
aluInput[16]	11111
loadRegisterD	0
DFinal[16]	1
aluOutputZero	0
aluOutputNe...	0
condition1	0
condition2	0

set instruction %B1110001100000110, // D:JLE  
tick, output, tock, output;

set instruction %B1110001100000111, // D:JMP  
tick, output, tock, output;

set instruction %B111011111010000, // D=1  
tick, output, tock, output;

set instruction %B1110001100000001, // D:JGT  
tick, output, tock, output;

set instruction %B1110001100000010, // D:JEQ  
tick, output, tock, output;

set instruction %B1110001100000011, // D:JGE  
tick, output, tock, output;

set instruction %B1110001100000100, // D:JLT  
tick, output, tock, output;

set instruction %B1110001100000101, // D:JNE  
tick, output, tock, output;

set instruction %B1110001100000110, // D:JLE  
tick, output, tock, output;

set instruction %B1110001100000111, // D:JMP  
tick, output, tock, output;

set reset 1:  
tick, output, tock, output;

set instruction %B0111111111111111, // %32767  
set reset 0:  
tick, output, tock, output;

End of script. Comparison ended successfully

## CPU.hdl

### Running Script File

Hardware Simulator (2.5) - D:\Nand2Tetris\nand2tetris\projects\05\CPU.hdl

File View Run Help

Chip Name: CPU (Clocked) Time: 48

Input pins		Output pins	
Name	Value	Name	Value
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instruction[16]	32767	writeM	0
reset	0	addressM[15]	32767
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**HDL**

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condition2	0

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tick, output, tock, output;

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set instruction %B1110001100000110, // D:JLE  
tick, output, tock, output;

set instruction %B1110001100000111, // D:JMP  
tick, output, tock, output;

set reset 1:  
tick, output, tock, output;

set instruction %B0111111111111111, // %32767  
set reset 0:  
tick, output, tock, output;

End of script. Comparison ended successfully

## Memory.hdl

## Running Script File

The screenshot shows the Hardware Simulator (2.5) interface. The top menu bar includes File, View, Run, and Help. The top toolbar contains icons for simulation control (play, pause, stop, reset, etc.) and a dropdown menu with options: Slow, Fast, Animate: No animation, Format: Decimal, and View: Screen.

The main window displays the configuration for the **Memory (Clocked)** chip. The **Chip Name** is "Memory (Clocked)" and the **Time** is "694549".

The **Input pins** table shows:

Name	Value
in[16]	-1
load	0
address[15]	24576

The **Output pins** table shows:

Name	Value
out[16]	89

The **HDL** section shows the Verilog code for the chip:

```
// This file is part of www.nand2tetris.org
// and the book "The Elements of Computing Systems:
// by Nisan and Schocken, MIT Press.
// File name: projects/05/Memory.v
//
// The complete address space of the chip is 2^16 = 65536.
// The chip facilitates read and write operations.
// The chip always outputs the value stored at the location
// specified by address into the memory location specified by
// address.
```

The **Internal pins** table shows:

Name	Value
loadRam1	0
loadRam2	0
loadScreen	0
loadKBD	0
loadRam	0
ramOut[16]	2222
screenOut[16]	0
kbdOut[16]	89

The **RAM 16K:** section shows the memory contents:

Address	Value
8189	0
8190	0
8191	0
8192	2222
8193	0
8194	0
8195	0

The **End of script - Comparison ended successfully** message is displayed at the bottom.