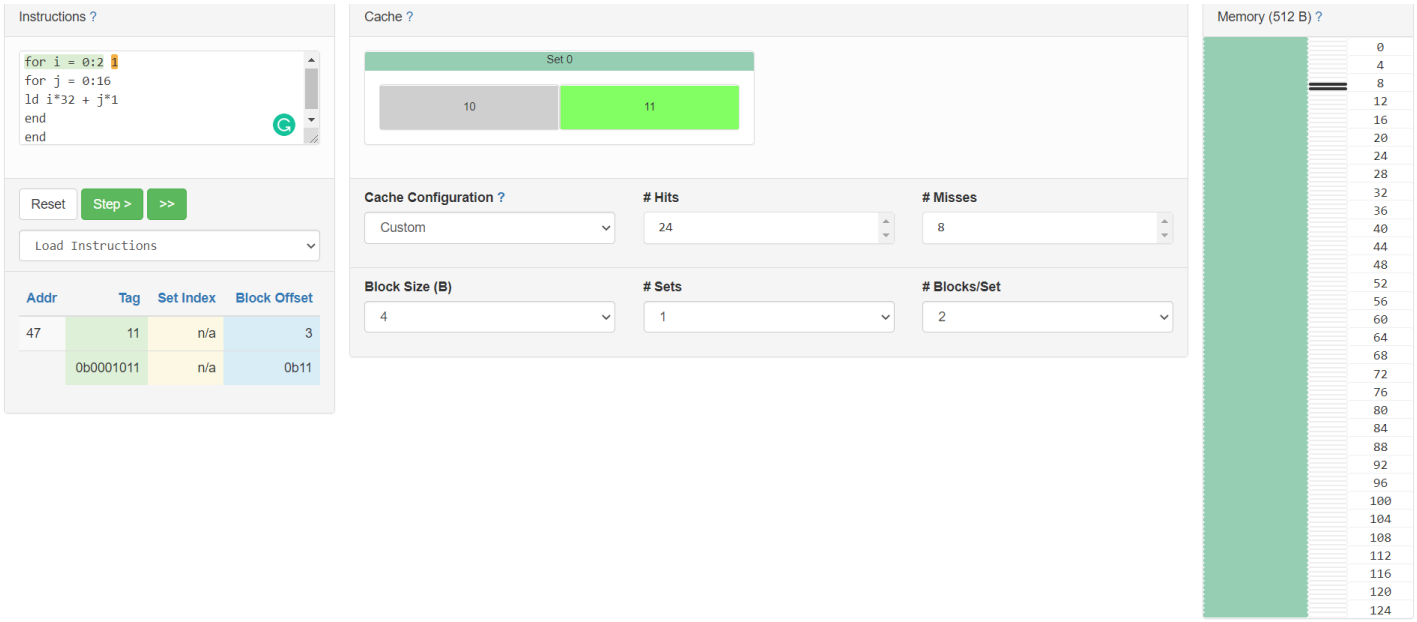
# Lab 4

## ECN – 252

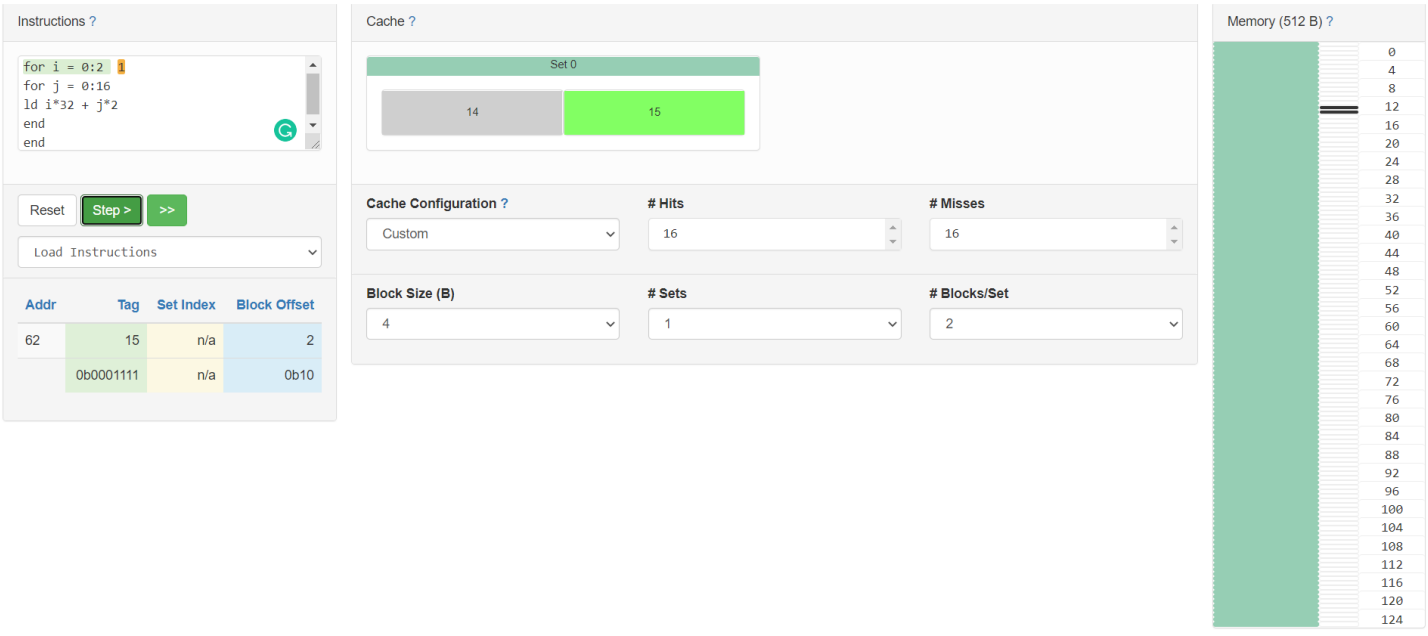
19114001 | Abhinav Saini

**Lesson 1** #sets =1, #Blocks/set = 2 and Block size = 4

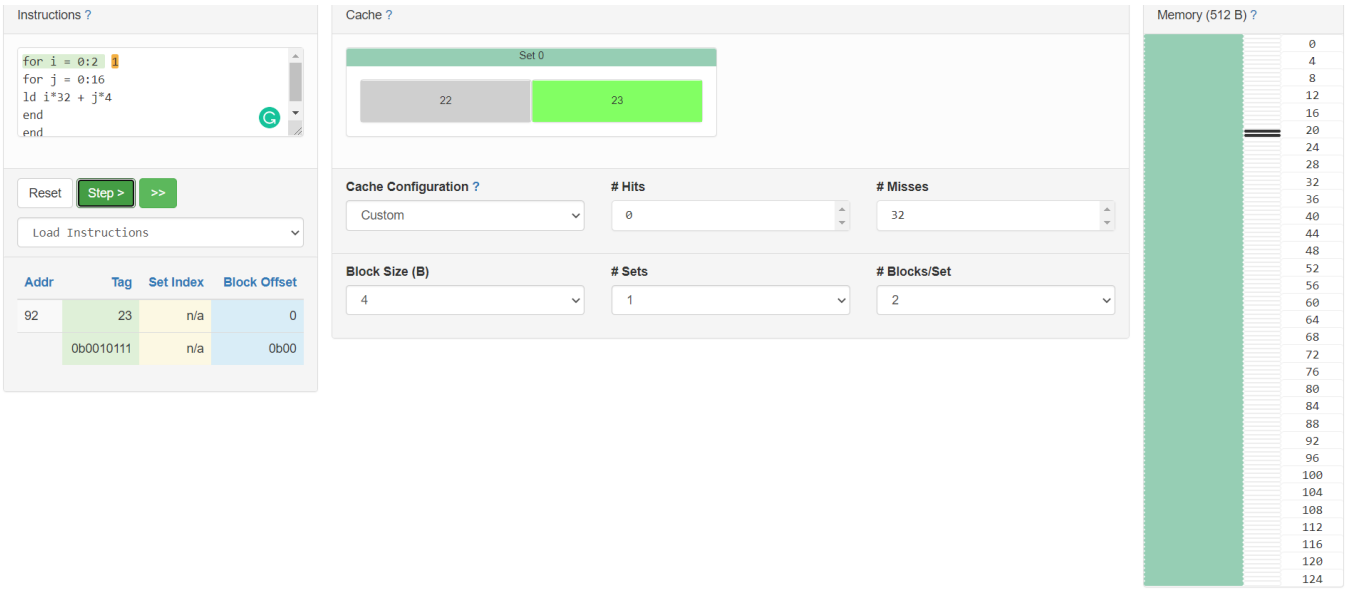
### i) K = 1 , #Hits = 24, #Misses = 8




### ii) K = 2 , #Hits = 16 , #Misses = 16

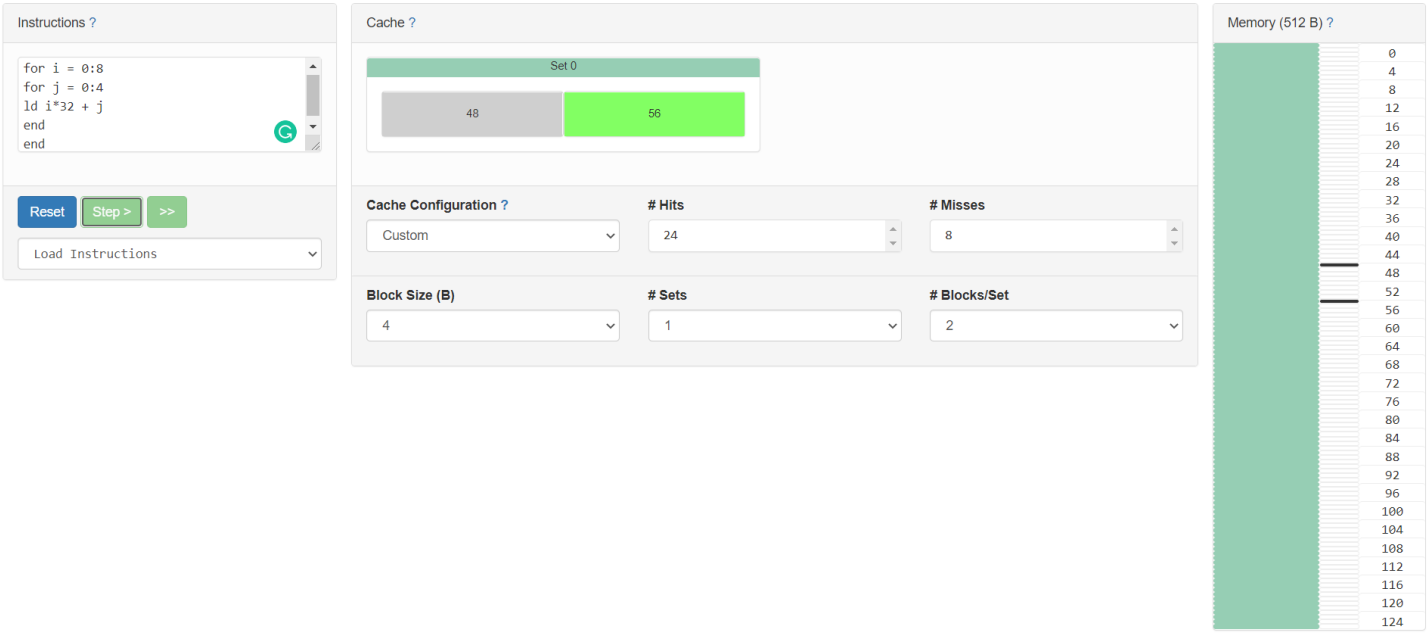


## iii) K = 4 , #Hits = 0, #Misses = 32

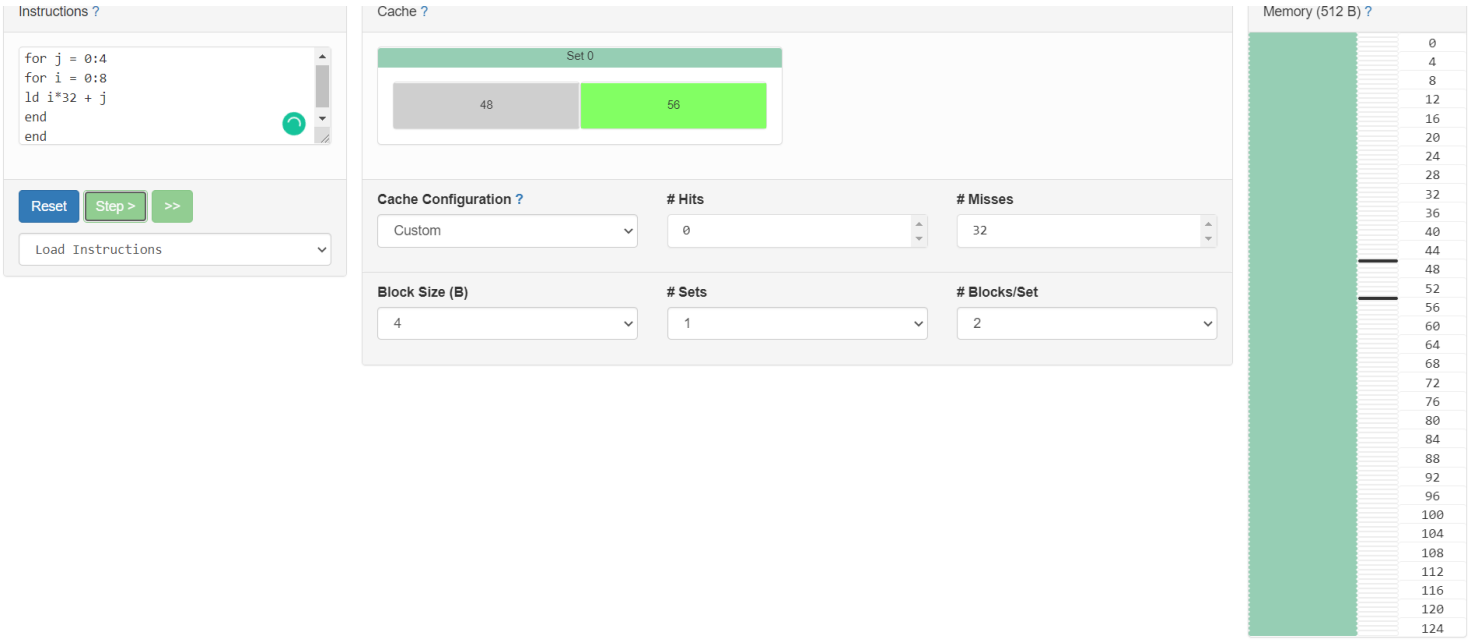



# Lesson 2

## iv) #Hits = 24 , #Misses = 8

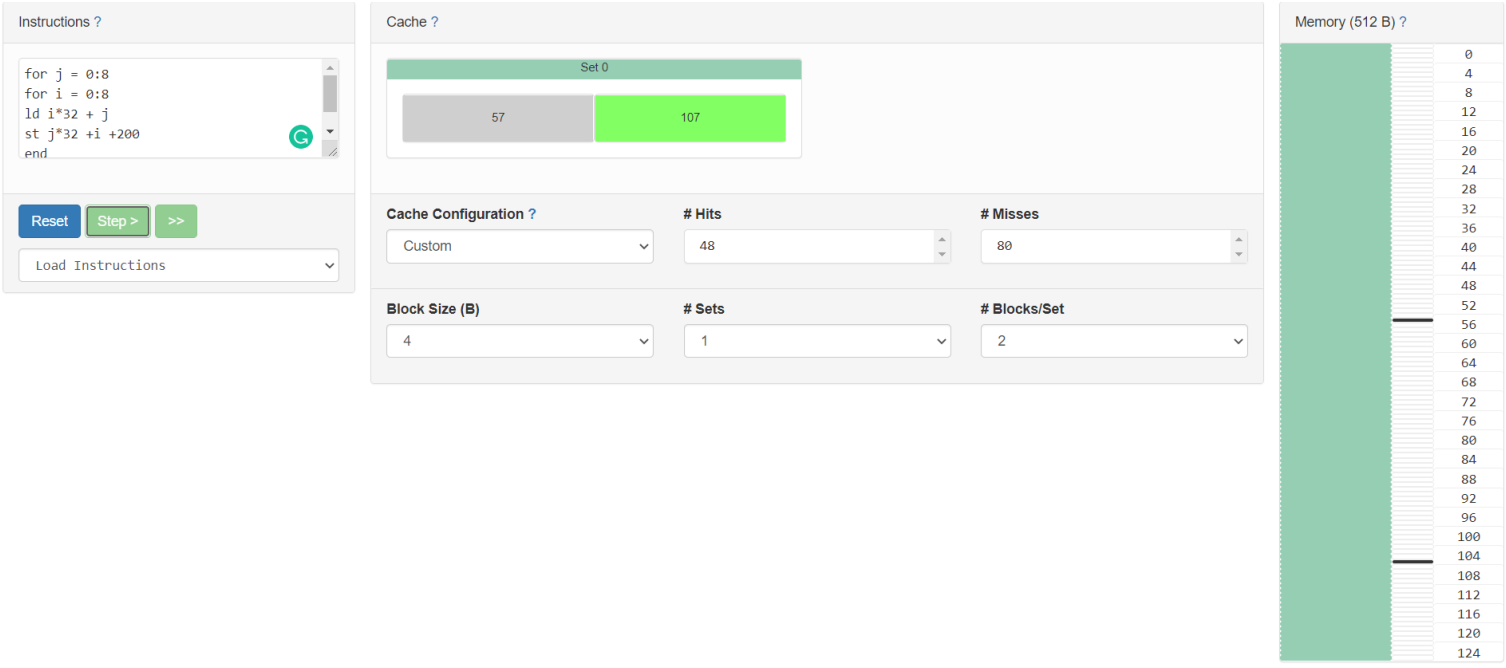


## v) #Hits = 0 , #Misses = 32

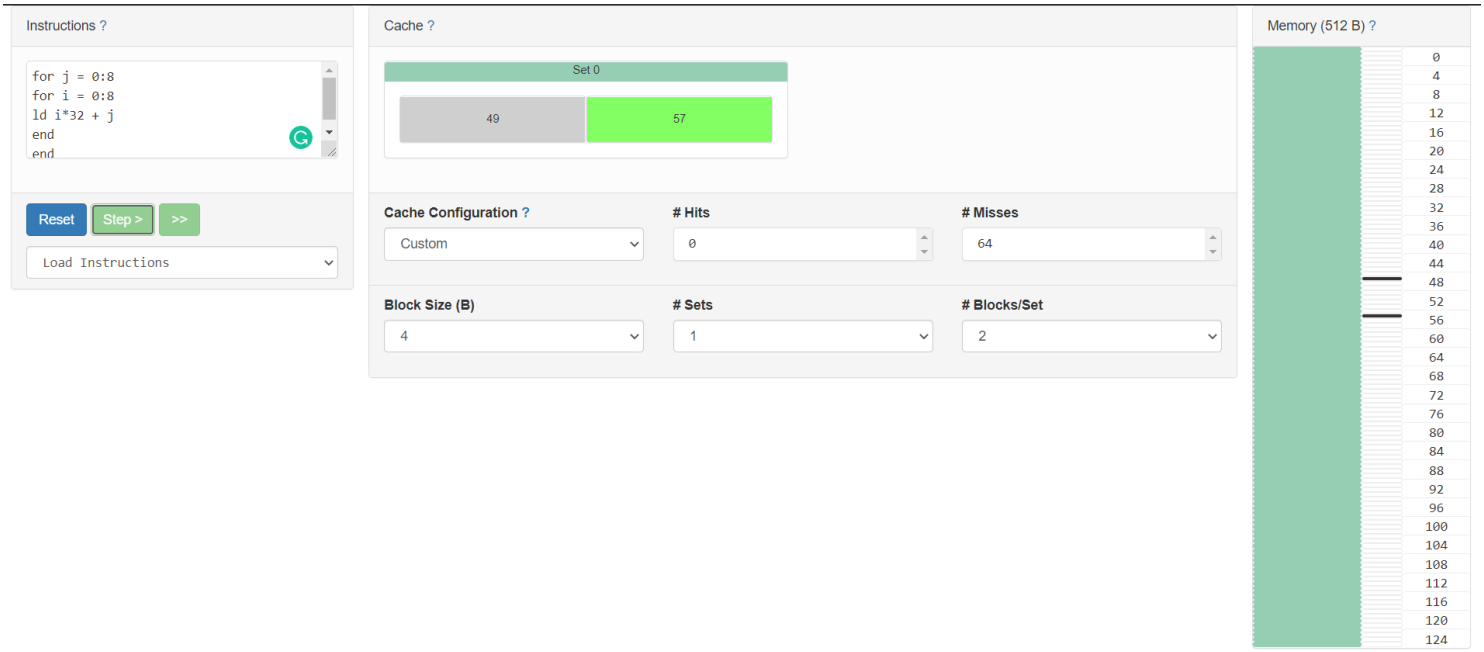



# Lesson 3

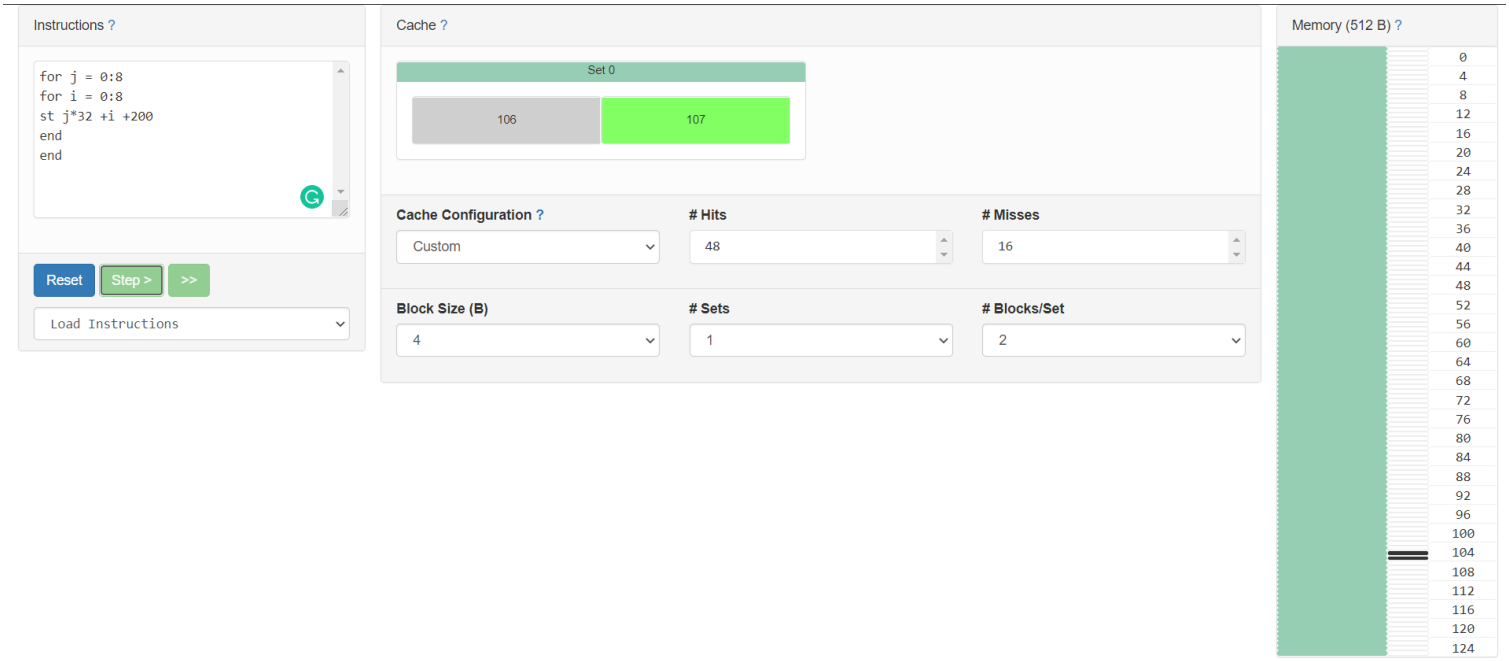
## vi) Both ld and st #Hits = 48, #Misses = 80



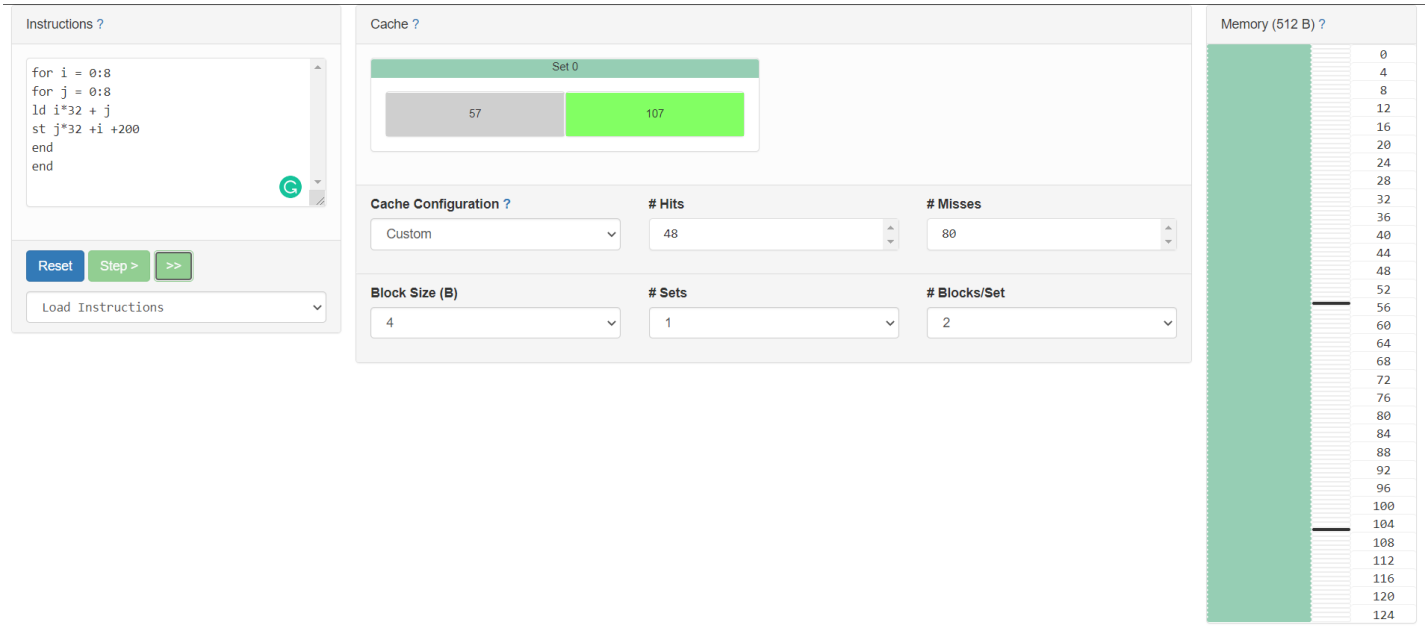
## Only ld instruction - #Hits = 0, #Misses = 64



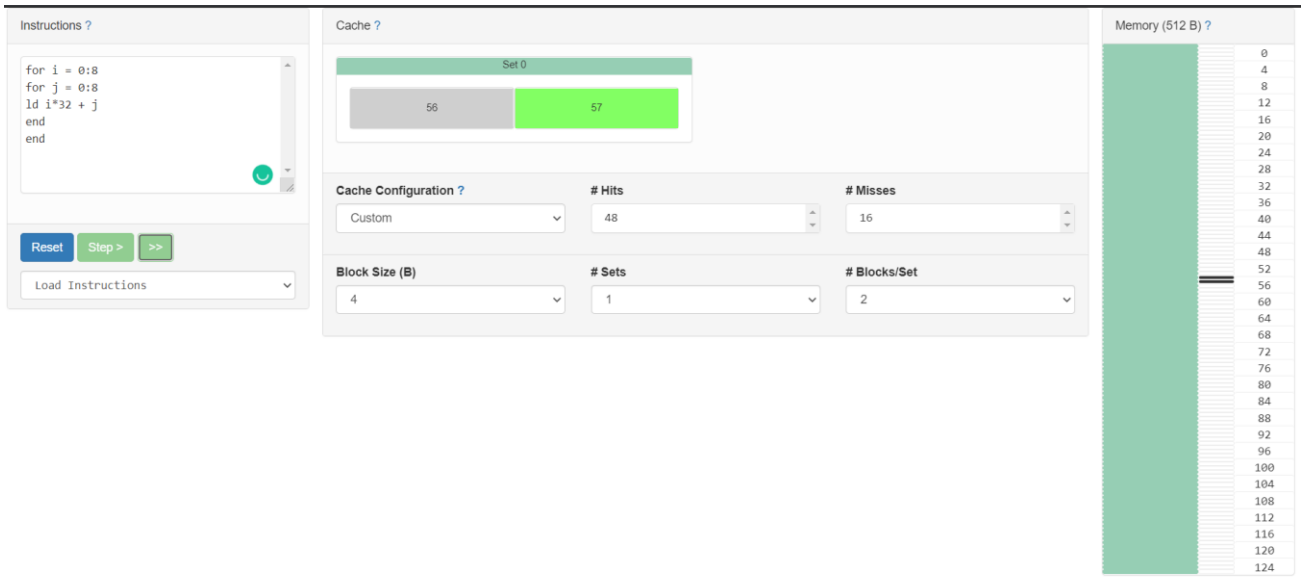

## Only st instruction - # Hits = 48, #Misses = 16



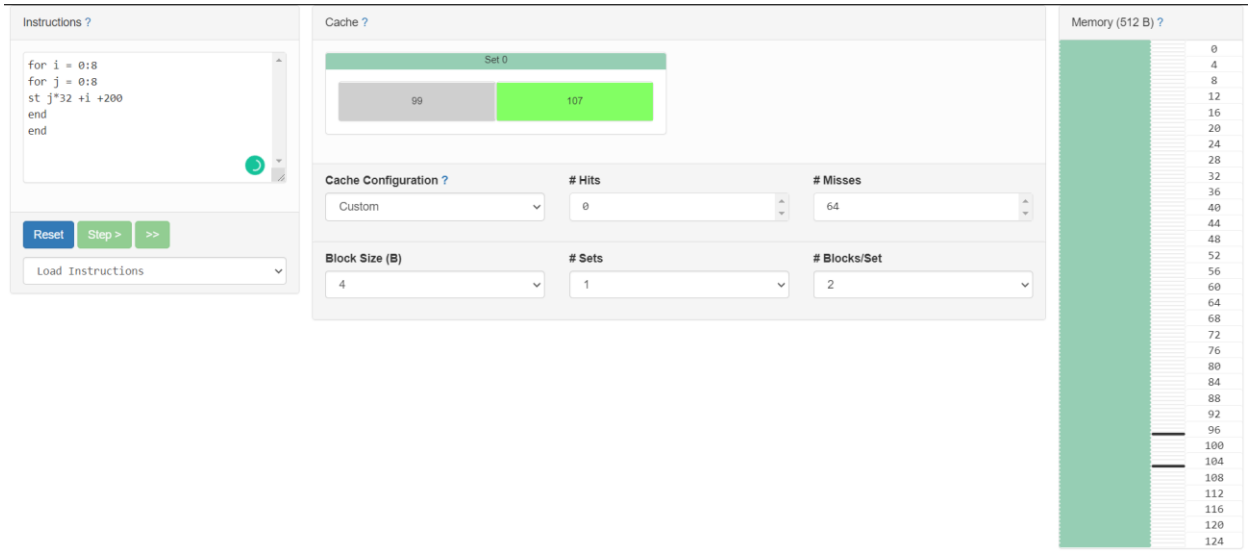
## vii) Both ld and st #Hits = 48, #Misses = 80




## Only ld instruction - #Hits = 48, #Misses = 16




## Only st instruction - #Hits = 0, #Misses = 64



## Lesson 4

**viii) Enrollment No. – 19114001**

**Decimal No. – 19114001.34567**

**Binary No. – 01001011100100011101010000001001**

| Binary Number | Decimal | Diff |
|---|---|---|
| **01001011100100011101010000001001** | **19114001.34567** | **0** |
| **01001011100100011101010000000000** | **19113984.0** | **17.34567** |
| **01001011100100011101010000000000** | **19113984.0** | **17.34567** |
| **01001011100100011101000000000000** | **19111936.0** | **2,065.34567** |
| **01001011100100010000000000000000** | **19005440.0** | **1,08,561.34567** |
| **01001011100100000000000000000000** | **18874368.0** | **2,39,633.34567** |
| **01001011000000000000000000000000** | **8388608.0** | **1,07,25,393.34567** |

## Lesson 5

**ix) Binary No. – 01001011100100011101010000001001**

| Error in Bit | Binary Number | Decimal | Diff |
|---|---|---|---|
| No error | 01001011100100011101010000001001 | 19114001.34567 | 0 |
| 1 | 00001011100100011101010000001001 | 5.61710034315e-32 | ≈-1,91,14,001.34567 |
| 2 | 01101011100100011101010000001001 | 3.52591103118e+26 | ≈3.52591103118e+26 |
| 3 | 01011011100100011101010000001001 | 8.20940134857e+16 | ≈8.20940134666e+16 |
| 4 | 01000011100100011101010000001001 | 291.656524658 | -1,91,13,709.689145342 |
| 5 | 01001111100100011101010000001001 | 4893184512.0 | 4,87,40,70,510.65433 |
| 6 | 01001001100100011101010000001001 | 1194625.125 | -1,79,19,376.22067 |
| 7 | 01001010100100011101010000001001 | 4778500.5 | -1,43,35,500.84567 |
| 8 | 01001011000100011101010000001001 | 9557001.0 | -95,57,000.34567 |
| 9 | 01001011110100011101010000001001 | 27502610.0 | 83,88,608.65433 |

## Lesson 6

### x)

| Memory | Write Latency (ns) | Leakage Power (mW) |
|---|---|---|
| **SRAM** | 0.870329ns | 82.2568mW |
| **eDRAM** | 0.426995ns | 12.0617mW |
| **STTRAM** | 4.69172ns | 37.3457mW |
| **ReRAM** | 8.71368ns | 101.578mW |