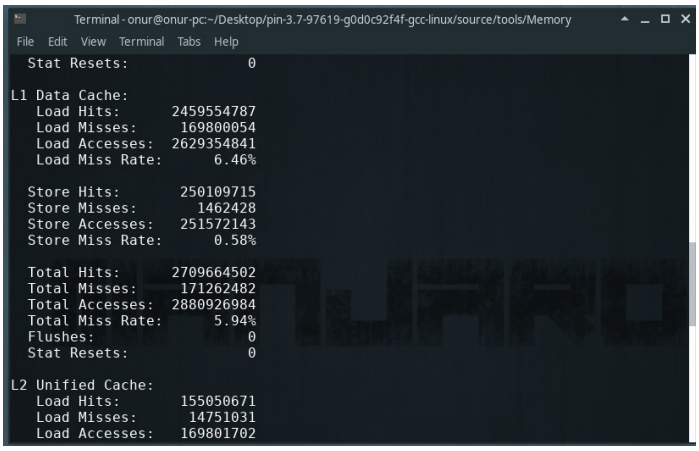
ONUR KARAKOÇ
230201045

REPORT #1

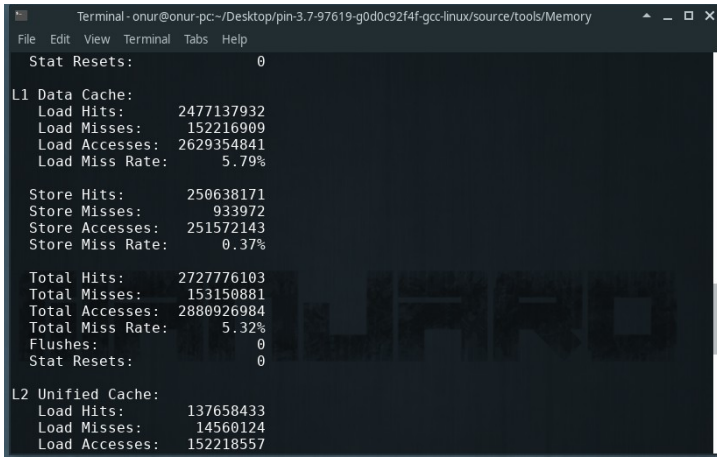
- I'am setting reference point to L1 size=16, block size=16 and L1 associativity=1. So, we'll see how L1 size / block size / L1 associativity changes affected the load miss rate.

➔ **L1 Size=16 – Block Size=16 – L1 Associativity=1 – N=500**



Load Miss Rate: 6.46%

➔ **L1 Size=16 – Block Size=16 – L1 Associativity=2 – N=500**

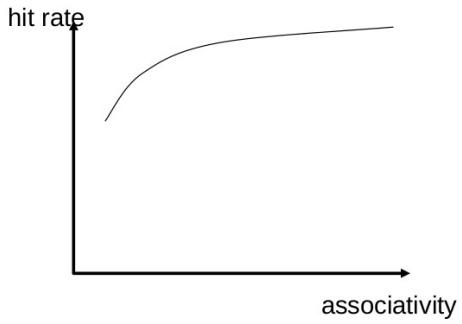


Load Miss Rate: 5.79%

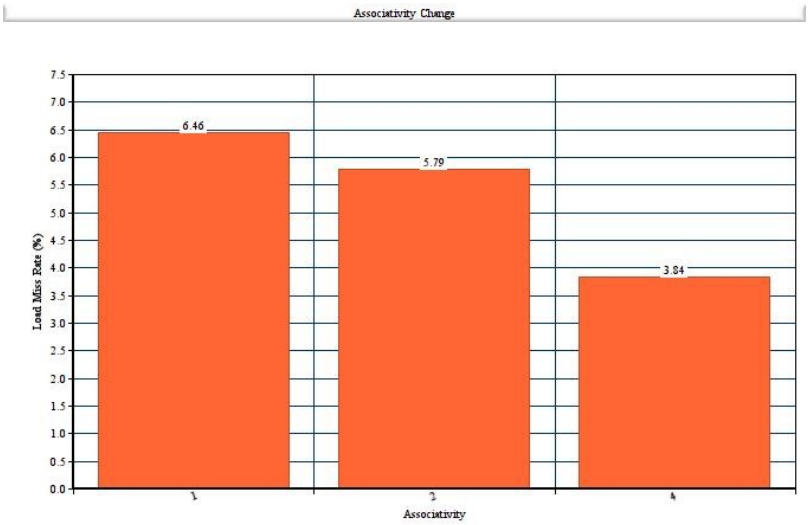
➔ **L1 Size=16 – Block Size=16 – L1 Associativity=4 – N=500**

Load Miss Rate: 3.84%

- We know that higher associativity means higher hit rate. The nature is:



- Our graph is here;

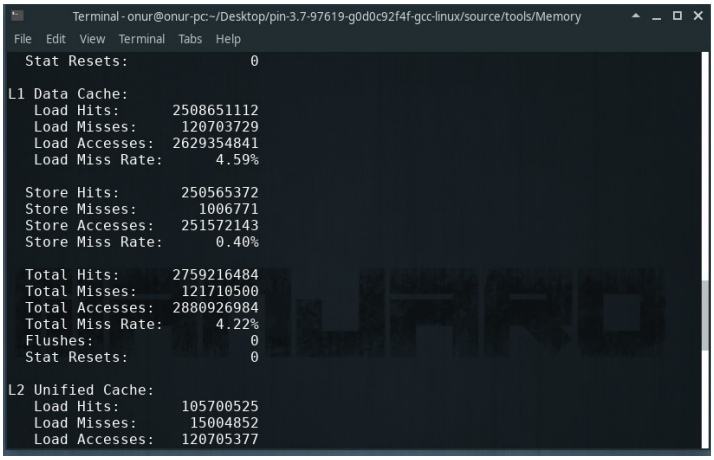


We have proved that higher associativity means lower miss rate.

Constants Variables are:

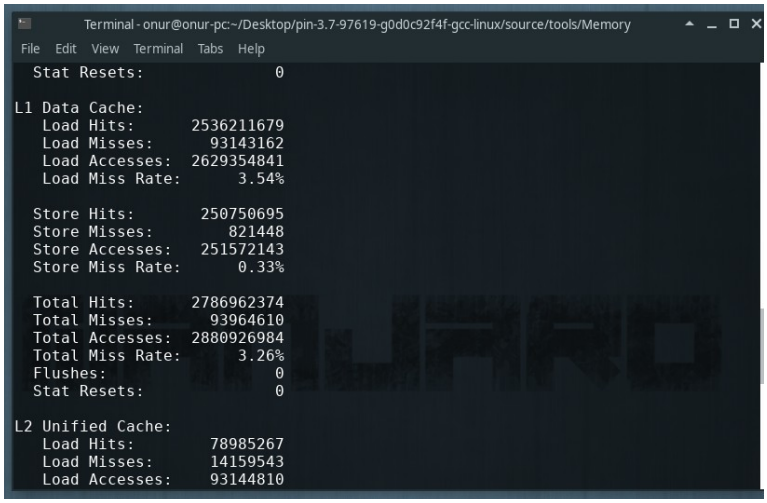
- L1 Size: 16
- Block Size: 16
- N=500

➔ **L1 Size=32 – Block Size=16 – Associativity=1 – N=500**



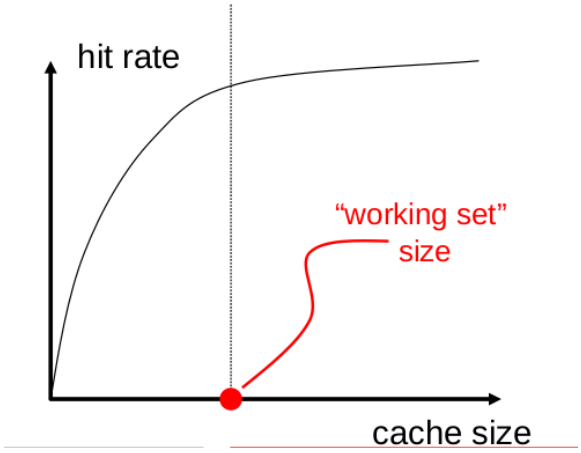
Load Miss Rate: 4.59%

➔ **L1 Size=64 – Block Size=16 – Associativity=1 – N=500**

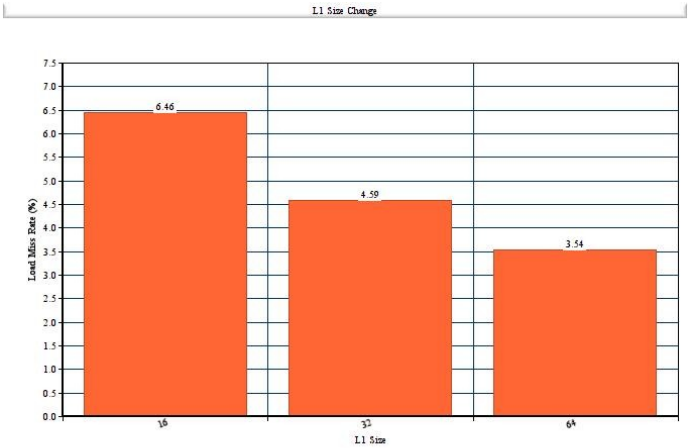


Load Miss Rate: 3.54%

- The nature of cache size-hit rate curve is here;



- Our graph:

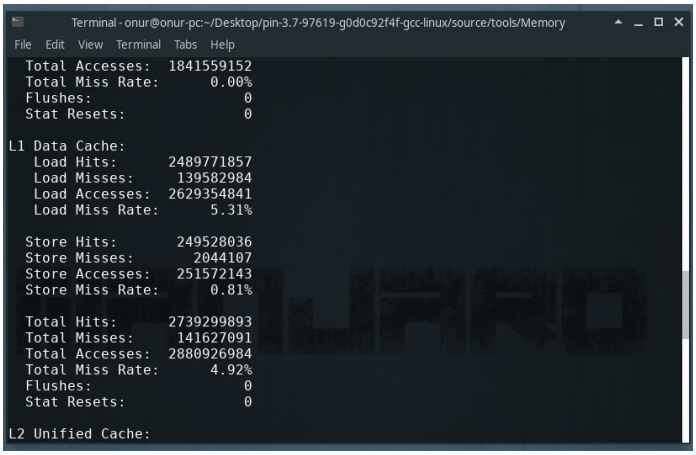


Our results are in parallel with the nature of cache size-hit rate.

Constant variables are:

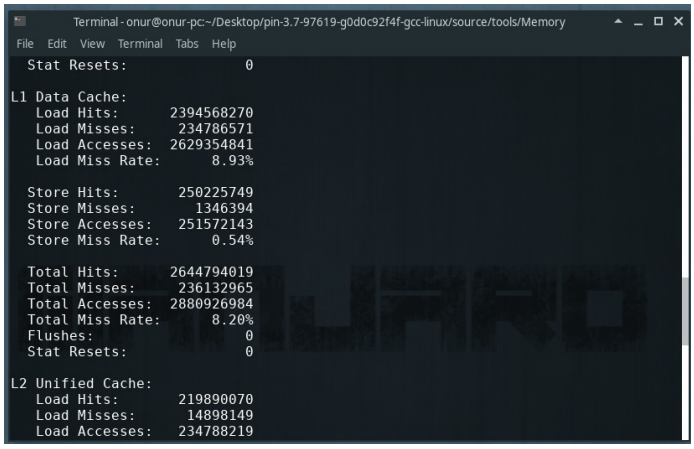
- Block Size: 16
- L1 Associativity: 1
- N: 500

➔ **L1 Size=16 – Block Size=32 – L1 Associativity=1 – N=500**



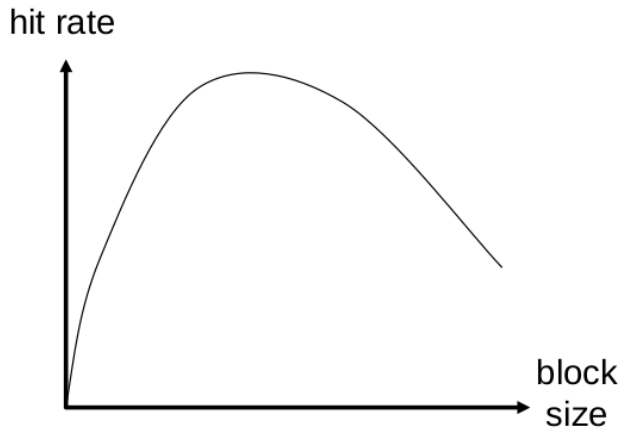
Load Miss Rate: 5.31%

➔ **L1 Size=16 – Block Size=8 – L1 Associativity=1 – N=500**

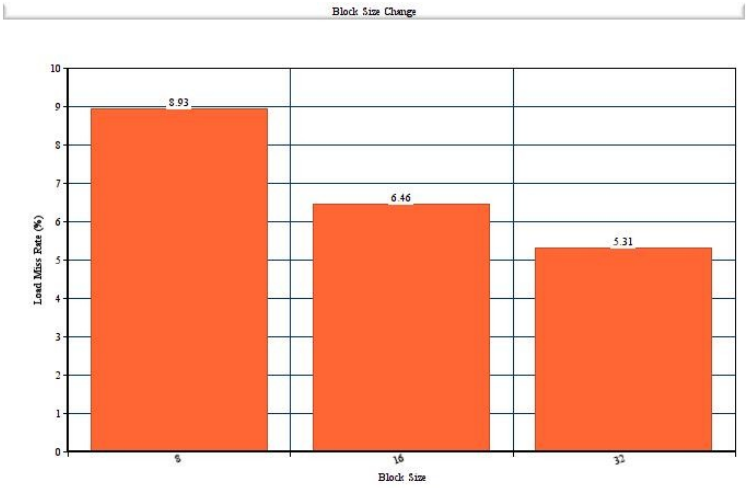


Load Miss Rate: 8.93%

- The nature of block size – hit rate is here;



- Our graph;



Our results are in parallel with the nature of block size – hit rate. We increase block size and we have seen that load miss rate is decreased.

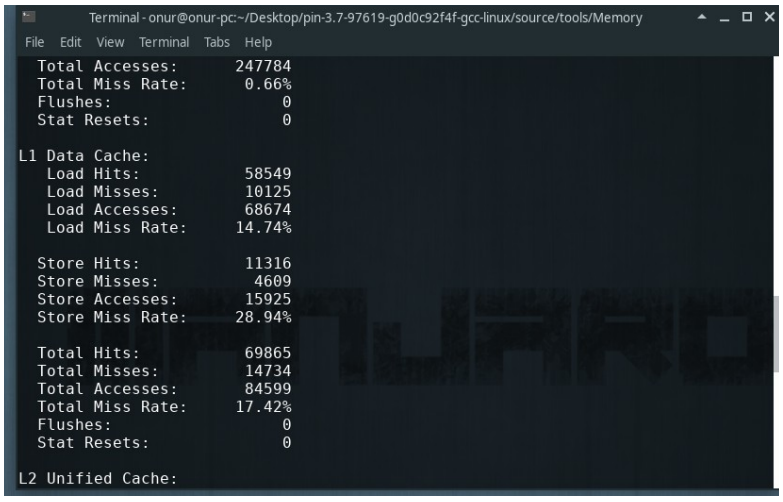
Constants variables are:

- L1 Size: 16
- L1 Associativity: 1
- N: 500

 # Second Experiment (N: 10)

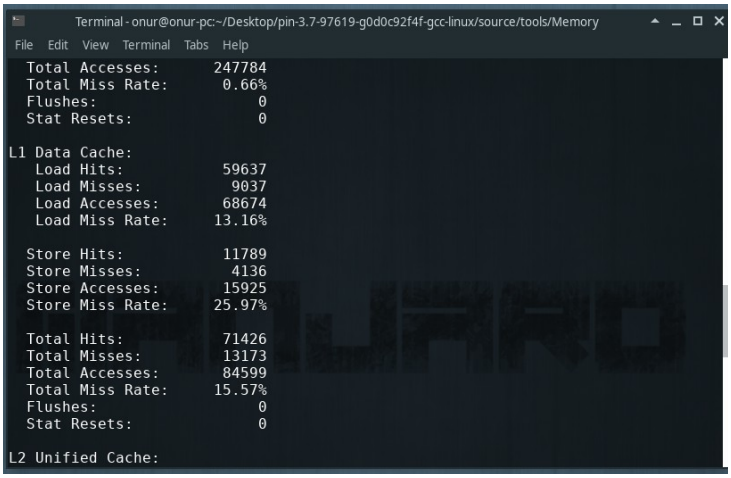
- I'am setting reference point to L1 size=16, block size=16 and L1 associativity=1. So, we'll see how L1 size / block size / L1 associativity changes affected the load miss rate.

➔ **L1 Size=16 – Block Size=16 – L1 Associativity=1 – N=10**



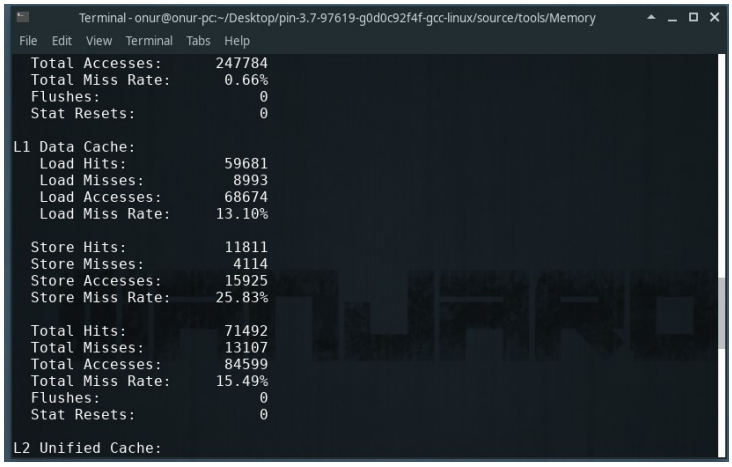
Load Miss Rate: 14.74%

➔ **L1 Size=16 – Block Size=16 – L1 Associativity=2 – N=10**



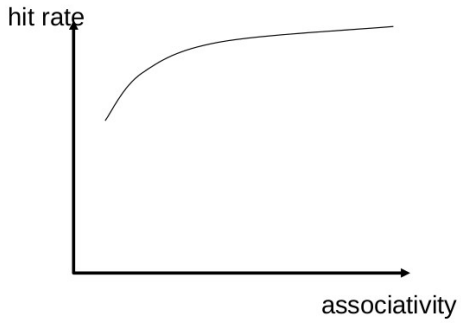
Load Miss Rate: 13.16%

➔ **L1 Size=16 – Block Size=16 – L1 Associativity=4 – N=10**

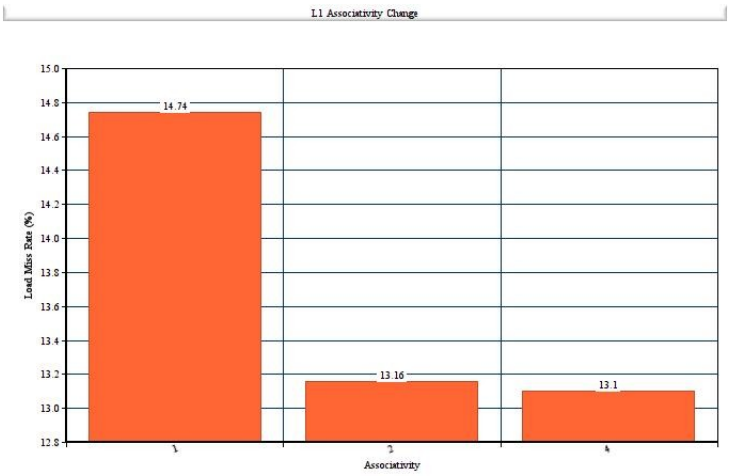


Load Miss Rate: 13.10%

- We know that higher associativity means higher hit rate. The nature is:



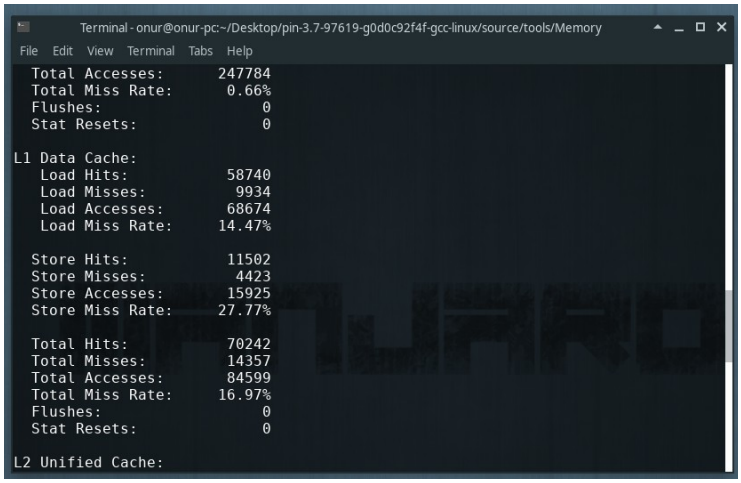
- Our graph:



We have proved that higher associativity means lower miss rate.
Constants Variables are:

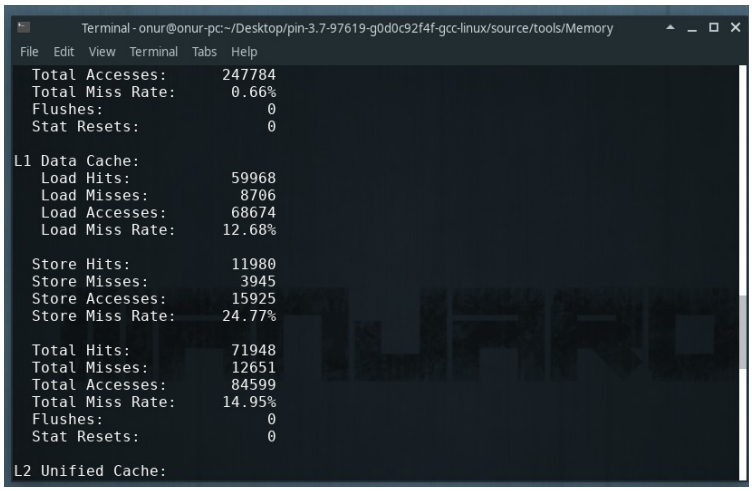
- L1 Size: 16
- Block Size: 16
- N=10

➔ **L1 Size=32 – Block Size=16 – L1 Associativity=1 – N=10**



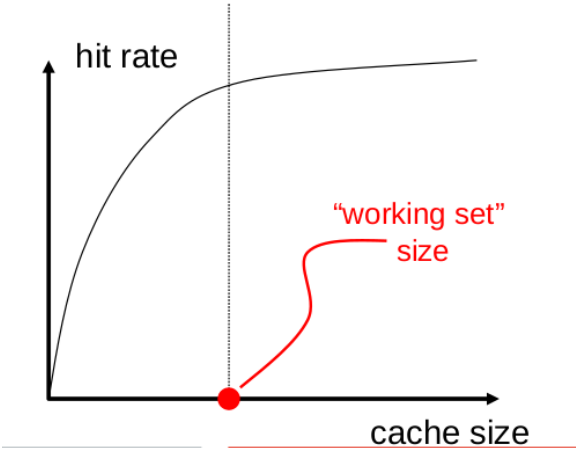
Load Miss Rate: 14.47%

➔ **L1 Size=64 – Block Size=16 – L1 Associativity=1 – N=10**

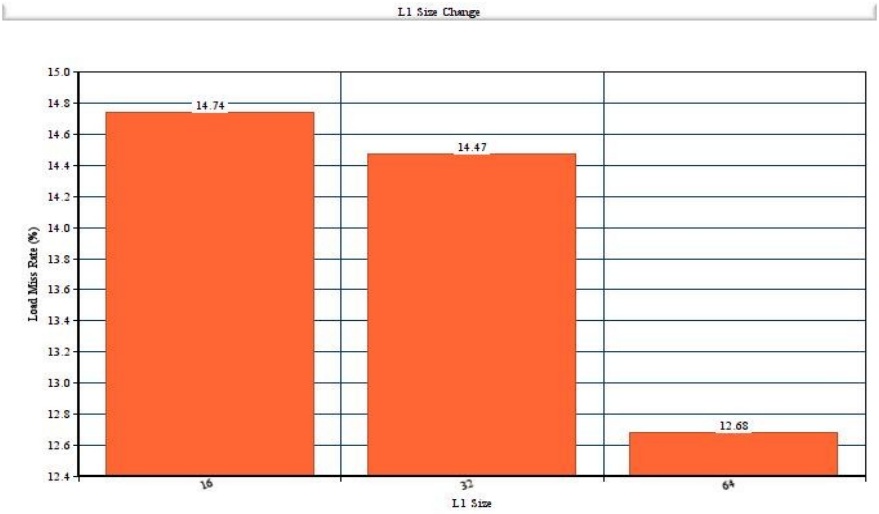


Load Miss Rate: 12.68%

- The nature of cache size-hit rate curve is here;



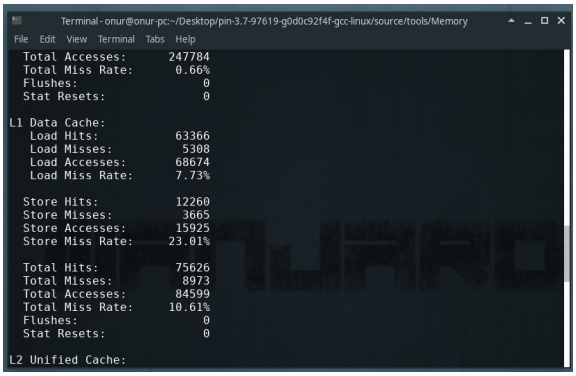
- Our graph:



Our results are in parallel with the nature of cache size-hit rate.
Constant variables are:

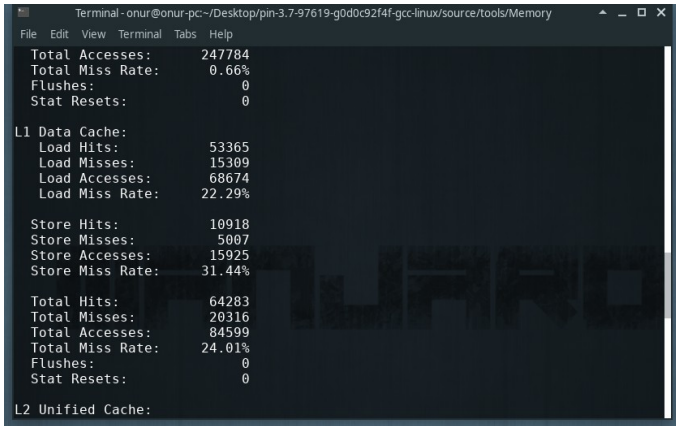
- Block Size: 16
- L1 Associativity: 1
- N: 10

➔ **L1 Size=16 – Block Size=32 – L1 Associativity=1 – N=10**



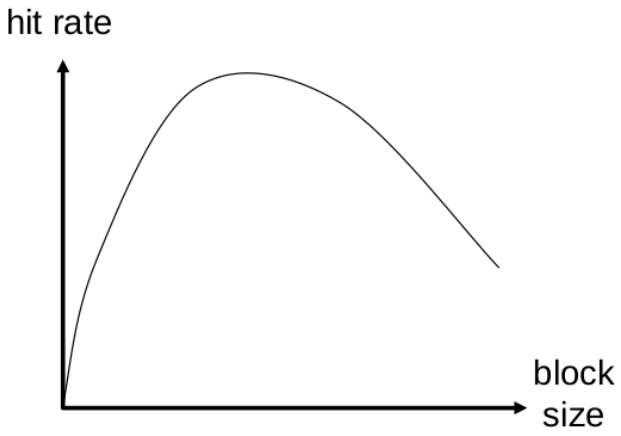
Load Miss Rate: 7.73%

➔ **L1 Size=16 – Block Size=8 – L1 Associativity=1 – N=10**

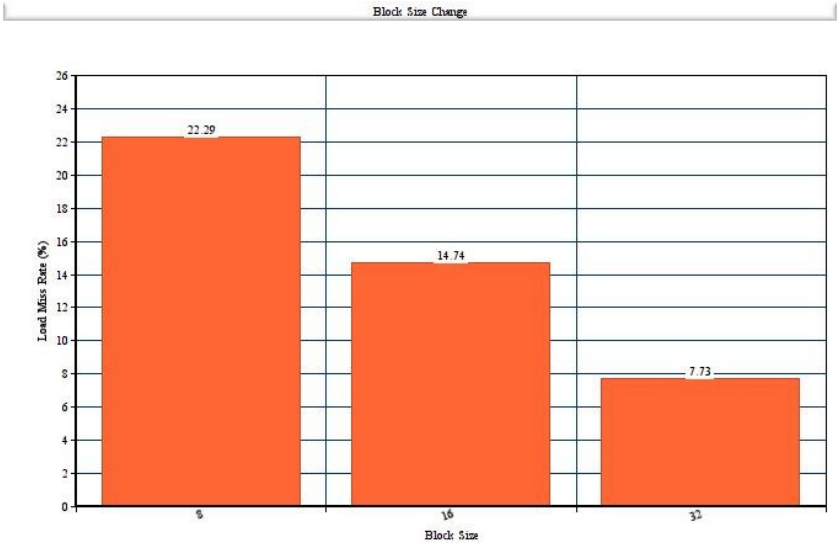


Load Miss Rate: 22.29%

- The nature of block size – hit rate is here;



- Our graph:



Our results are in parallel with the nature of block size – hit rate. We increase block size and we have seen that load miss rate is decreased.

Constants variables are:

- L1 Size: 16
- L1 Associativity: 1
- N: 10

Conclusion:

- If we want to decrease miss rate, one way of this is to increase the cache size. So this operation will reduce the conflict misses.
- Another way is to increase the block size. This will decrease compulsory misses.
- In addition increasing associativity helps reduce conflict misses. So miss rate will be decreased.
- On the other hand, if we examine the two experiments, we will see that the miss rates are larger in the second experiments(N:10).