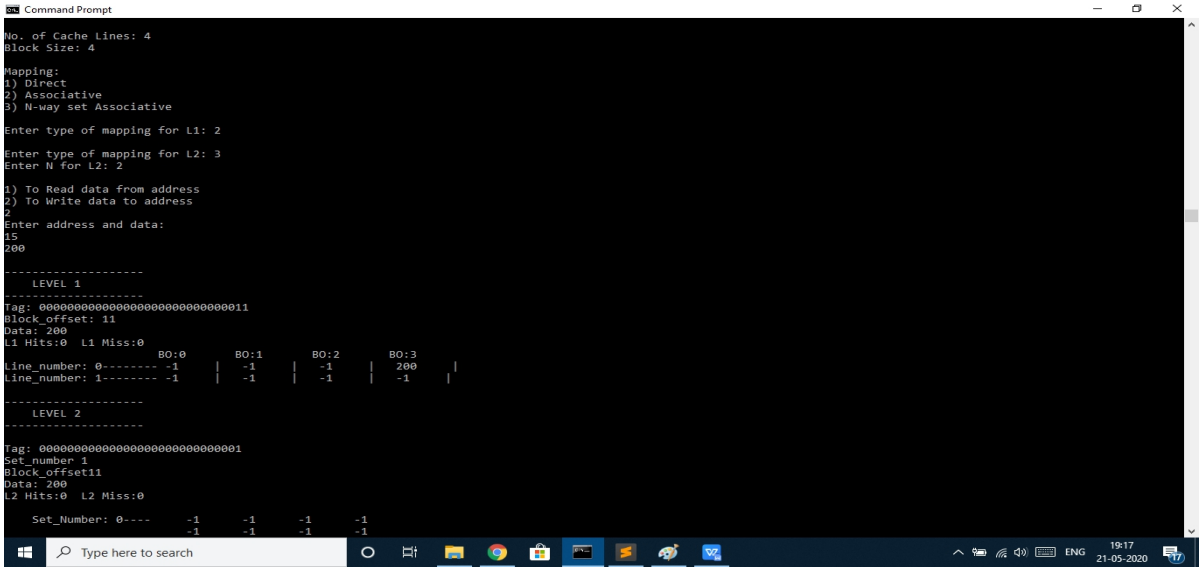
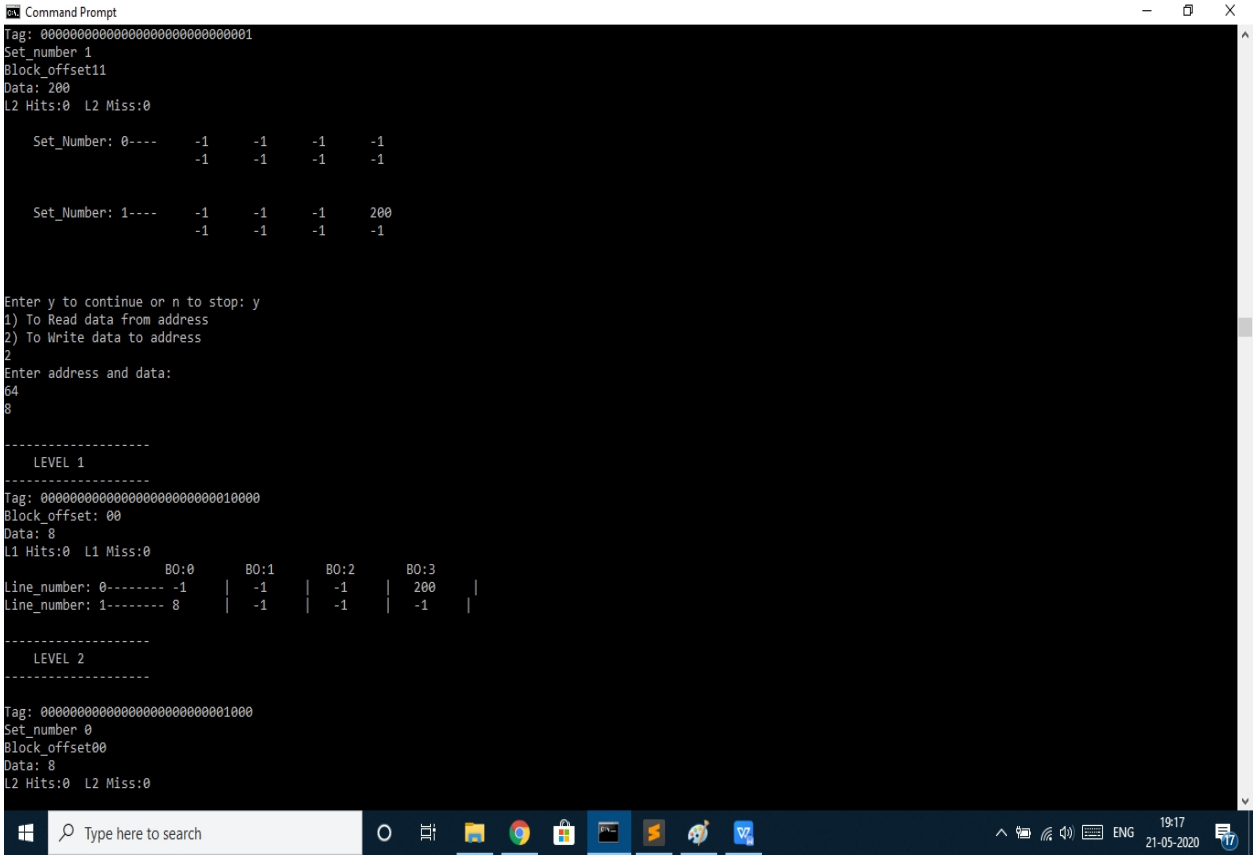
VISHRUT ARORA

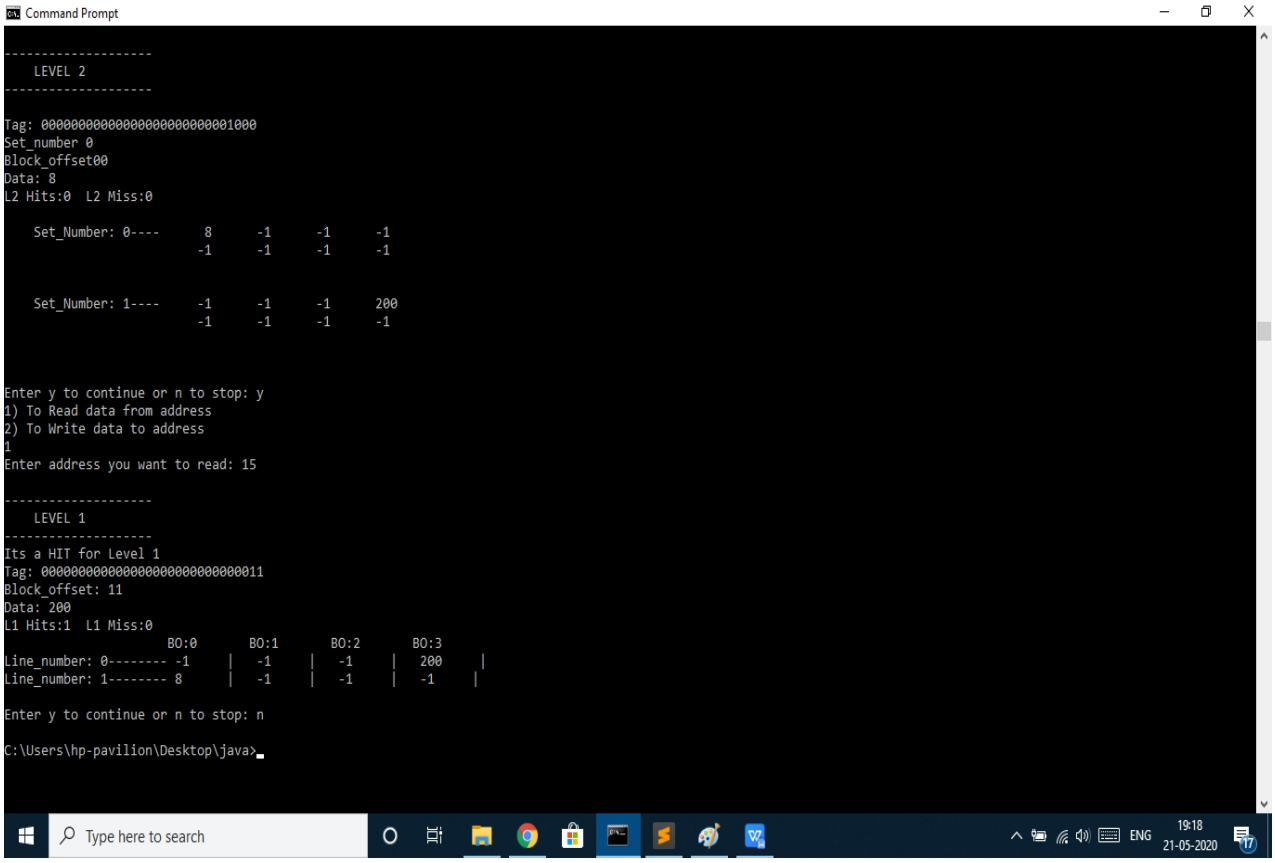
DOCUMENTATION
CACHE PROJECT LEVEL-2

In this I have taken a 2-Level cache: L1 and L2.
Mapping for both the caches is taken as input. While block size for both caches remain the same, the no. Of cache lines in L1 is half that of L2 as required. Writing is done in both caches simultaneously. Replacement strategy remains the same as in case of the Single level cache. While reading opertaion is done on L1 first. In case there is a miss, we move to L2-cache. If there is a miss in L1 and hit in L2 then we also need to write the address to L1 from L2. If there is a hit in L1 we will not search in L2. Some important variables defined:
current_data= Initiallized to "-1". Keeps track of data in L2 when there is miss in L1.
check_level=checks the current Level of cache being worked upon.
c_rows=no. Of rows in the cache(cache lines)
c_cols=no. Of columns in the cache(block size)
cache_array[][]=contents of cache memory
tag_set[],tag_bits[],tag_array[]=keeps track of the tags for different mappings
associate_counter=keeps track of the cache filled in associate mapping
set_counter[]=keeps track of cache lines filled in each set
num_set=number of sets
lines_in_each_set=Value of n (in case of n-way set or set size)
num_hits=number of hits;
num_miss=number of misses;

This is a screenshot of my cache project."-1" represents no data in the cell of the block. BO is Block_offset. There is Associative mapping in L1 and n-way-set-Associative in L2(with n=2).
The machine word length is 32 bits. The No. Of cache lines is 4 and Block Size is 4.




Command Prompt
Tag: 00000000000000000000000000000001
Set_number 1
Block_offset11
Data: 200
L2 Hits:0 L2 Miss:0
Set_Number: 0---- -1 -1 -1 -1
-1 -1 -1 -1
Set_Number: 1---- -1 -1 -1 200
-1 -1 -1 -1
Enter y to continue or n to stop: y
1) To Read data from address
2) To Write data to address
2
Enter address and data:
64
8
LEVEL 1
Tag: 00000000000000000000000000010000
Block_offset: 00
Data: 8
L1 Hits:0 L1 Miss:0
BO:0 BO:1 BO:2 BO:3
Line_number: 0-------- -1 | -1 | -1 | 200 |
Line_number: 1-------- 8 | -1 | -1 | -1 |
LEVEL 2
Tag: 00000000000000000000000000001000
Set_number 0
Block_offset00
Data: 8
L2 Hits:0 L2 Miss:0
Type here to search
ENG
19:17
21-05-2020


Command Prompt
LEVEL 2
Tag: 00000000000000000000000000001000
Set_number 0
Block_offset00
Data: 8
L2 Hits:0 L2 Miss:0
Set_Number: 0---- 8 -1 -1 -1
-1 -1 -1 -1
Set_Number: 1---- -1 -1 -1 200
-1 -1 -1 -1
Enter y to continue or n to stop: y
1) To Read data from address
2) To Write data to address
1
Enter address you want to read: 15
LEVEL 1
Its a HIT for Level 1
Tag: 00000000000000000000000000000011
Block_offset: 11
Data: 200
L1 Hits:1 L1 Miss:0
BO:0 BO:1 BO:2 BO:3
Line_number: 0-------- -1 | -1 | -1 | 200 |
Line_number: 1-------- 8 | -1 | -1 | -1 |
Enter y to continue or n to stop: n
C:\Users\hp-pavilion\Desktop\java>
Type here to search
ENG
19:18
21-05-2020