HELLO... CACHE CONTROLLER HERE...!
CLOCK NUMBER 00000101
@echo: Variables Are Properly Initiated.

FIRST WRITE REQUEST --> ADDR:16, DATA:12
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00000110
@echo: CPU can proceed to the next instruction from here.

LOADING THE SAME DATA (ADDR: 16)
LOADED SUCCESSFULLY...!
CLOCK NUMBER 00001100
16:     00000000000000000000000000001100
CPU DATA IN LINE: 00000000000000000000000000001100
@echo: Observe that the data is only available after five more clock cycles from
Write Request.
@echo: This is because controller will consider the line valid only after
neighbouring elements are fetched from Main Memory

CACHE LINE: 1
TAG: 0000000
DATA: 00: 00000000000000000000000000001100   01: 00000000000000000000000000000000
        10: 00000000000000000000000000000000   11: 00000000000000000000000000000000
VALIDITY: 1
DIRTY: 1

WRITE REQUEST ON THE SAME LINE...! --> ADDR: 2064, DATA: 23
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00001101

-----------ANALYZING THE MEMORY CONTENT---------------
CLOCK NUMBER 00010011
@echo: Overiding the cache line, forced the content in the first primary cache line
to a line in the victim cache.

CACHE LINE: 1
TAG: 0000001
DATA: 00: 00000000000000000000000000010111   01: 00000000000000000000000000000000
        10: 00000000000000000000000000000000   11: 00000000000000000000000000000000
VALIDITY: 1
DIRTY: 1

VICTIM LINE: 0
TAG: 00000000000001
DATA: 00: 00000000000000000000000000001100   01: 00000000000000000000000000000000
        10: 00000000000000000000000000000000   11: 00000000000000000000000000000000
VALIDITY: 1
DIRTY: 1
NMRU: 11

```
READING THE EARLIER DATA AGAIN(ADDR: 16)
LOADED SUCCESSFULLY...!
CLOCK NUMBER 00010110
16:      00000000000000000000000000001100
CPU DATA IN LINE:        00000000000000000000000000001100

-----------ANALYZING THE MEMORY CONTENT----------------
CLOCK NUMBER 00010111
@echo: Victim Hit: Data will be swapped between primary cache and victim cache.

CACHE LINE:     1
TAG:    0000000
DATA:   00: 00000000000000000000000000001100    01: 00000000000000000000000000000000
        10: 00000000000000000000000000000000    11: 00000000000000000000000000000000
VALIDITY:       1
DIRTY:  1

VICTIM LINE: 0
TAG:    00000010000001
DATA:   00: 00000000000000000000000000010111    01: 00000000000000000000000000000000
        10: 00000000000000000000000000000000    11: 00000000000000000000000000000000
VALIDITY:       1
DIRTY:  1
NMRU:   11

FILLING THE VICTIM...!
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00011000
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00011110
LOADED SUCCESSFULLY...!
CLOCK NUMBER 00101010
28688:  00000000000000000000000000000000
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00101011
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00110001
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00110111
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 00111101

@echo: Victim is filled while leaving a line clean(Load Instruction).
MEMORY LINE:    3586
DATA:   00: 00000000000000000000000000000000    01: 00000000000000000000000000000000
        10: 00000000000000000000000000000000    11: 00000000000000000000000000000000
----------------------VIEWING THE VICTIM CONTENT----------------------------

VICTIM LINE: 0
```

```
TAG:      00000010000001
DATA:     00: 00000000000000000000000000010111     01: 00000000000000000000000000000000
          10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:         1
DIRTY:  1
NMRU:   00


VICTIM LINE: 1
TAG:      00000000000001
DATA:     00: 00000000000000000000000000001100     01: 00000000000000000000000000000000
          10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:         1
DIRTY:  1
NMRU:   00


VICTIM LINE: 2
TAG:      00011000000001
DATA:     00: 00000000000000000000000000010111     01: 00000000000000000000000000000000
          10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:         1
DIRTY:  1
NMRU:   00


VICTIM LINE: 3
TAG:      00000110000001
DATA:     00: 00000000000000000000000000100010     01: 00000000000000000000000000000000
          10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:         1
DIRTY:  1
NMRU:   00


VICTIM LINE: 4
TAG:      00011100000001
DATA:     00: 00000000000000000000000000000000     01: 00000000000000000000000000000000
          10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:         1
DIRTY:  0
NMRU:   00


VICTIM LINE: 5
TAG:      00000100000001
DATA:     00: 00000000000000000000000000101011     01: 00000000000000000000000000000000
          10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:         1
DIRTY:  1
```

```
NMRU:    01


VICTIM LINE: 6
TAG:     00010100000001
DATA:    00: 00000000000000000000000110001      01: 00000000000000000000000000000
         10: 00000000000000000000000000000      11: 00000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:   10


VICTIM LINE: 7
TAG:     00010000000001
DATA:    00: 00000000000000000000000111011110   01: 00000000000000000000000000000
         10: 00000000000000000000000000000      11: 00000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:   11

----------------------------- VICTIM END -------------------------------------

WRITING ONE MORE DATA ON THE SAME LINE.
DATA WRITE REQUESTED SUCCESSFULLY...!
CLOCK NUMBER 01001101
@echo: Controller will choose the dirty less line and Override it(Best option since
no need for a WRITE_BACK stage)
----------------------VIEWING THE VICTIM CONTENT-----------------------------

VICTIM LINE: 0
TAG:     00000010000001
DATA:    00: 00000000000000000000000010111      01: 00000000000000000000000000000
         10: 00000000000000000000000000000      11: 00000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:   00


VICTIM LINE: 1
TAG:     00000000000001
DATA:    00: 00000000000000000000000001100      01: 00000000000000000000000000000
         10: 00000000000000000000000000000      11: 00000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:   00


VICTIM LINE: 2
TAG:     00011000000001
DATA:    00: 00000000000000000000000010111      01: 00000000000000000000000000000
```

```
        10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:    00


VICTIM LINE: 3
TAG:     00000110000001
DATA:    00: 00000000000000000000000000100010     01: 00000000000000000000000000000000
         10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:    00


VICTIM LINE: 4
TAG:     01111110000001
DATA:    00: 00000000000000000000100100010011     01: 00000000000000000000000000000000
         10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:    11


VICTIM LINE: 5
TAG:     00000100000001
DATA:    00: 00000000000000000000000000101011     01: 00000000000000000000000000000000
         10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:    00


VICTIM LINE: 6
TAG:     00010100000001
DATA:    00: 00000000000000000000000000110001     01: 00000000000000000000000000000000
         10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:    01


VICTIM LINE: 7
TAG:     00010000000001
DATA:    00: 00000000000000000000000111011110     01: 00000000000000000000000000000000
         10: 00000000000000000000000000000000     11: 00000000000000000000000000000000
VALIDITY:        1
DIRTY:  1
NMRU:    10
------------------------------ VICTIM END ------------------------------------
```