CO ENDSEM PROJECT DOCUMENTATION

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- Assumptions:
  - The machine for which the cache is designed is 32 bit.

- Input Constraints:
  - All the inputs are integers with maximum value up to 2^{31}
  - Number of Cache Lines, Block size and n(for n-way set associative cache) are acceptable only when they are in the power of 2. If this is not the case, then the program might not work as desired.
  - Address and data can take any value as long as it belongs to the set [0, 2^{31}]

- Brief Description of the Code:
  - The program starts by asking the user to provide the number of cache lines and the block size.
  - Then the program displays a list of 3 types of cache implementations and asks the user to enter a number choosing any of the three. The three implementations being:
    - Direct Mapping
    - Associative Memory
    - N-Way Set associative memory
  - If the user selects n-way set associative memory, the program asks the user to enter the value of n too.
  - Depending upon the choice of the user, the flow of control of the program shifts to the concerned part of the code.
  - In each part, the user is given 5 options:
    - Write Data in cache
    - Read data from the cache
    - Find the address from any given data
    - Print the whole cache
    - Exit from the program
  - Each part functions in its own way by asking the user to enter the required details such as address and data.
  - The user can work up as many queries as he/she wants to, the program will only end when the exit command is selected in the program.

- Error Reporting
    - In the numerous trial runs which I have tried, the program is not giving any wrong answer to any of the query in any of the three implementations.
    - One point which I would like to mention is that the input constraints have to be followed religiously. If they are ignored, then the program may or may not work in the required way.
    - Another important point is that for searching the cache using data, if two or more locations have the same data, then the program will output only the one whose address comes first in the ascending order.