

C/C++ compatible Skeleton:

```

1  #include <stdio.h>
2  #include <stdbool.h>
3
4  // Constants for the cache configuration
5  #define NUM_SETS /* Configure number of sets */
6  #define ASSOC /* Configure cache associativity */
7  #define BLOCK_SIZE 64 // 64 bytes as block size
8
9  // Define the arrays for the cache simulation
10 long long int tag_array[NUM_SETS][ASSOC];
11 long long int lru_position[NUM_SETS][ASSOC];
12 bool dirty[NUM_SETS][ASSOC];
13
14 // Variables to maintain the simulation statistics
15 int Hit = 0;
16 int Miss = 0;
17
18 // Forward declarations
19 void Update_lru(long long int add);
20 void Update_fifo(long long int add);
21
22 // Function to simulate cache access
23 void Simulate_access(char op, long long int add) {
24     int set = (add / BLOCK_SIZE) % NUM_SETS;
25     long long int tag = add / BLOCK_SIZE;
26
27     for(int i = 0; i < ASSOC; i++) {
28         if(tag == tag_array[set][i]) {
29             // Cache hit scenario
30             Hit++;
31             // Choose policy (LRU or FIFO) based on the configuration
32             if(/* LRU policy is chosen */) {
33                 Update_lru(add);
34             } else {
35                 Update_fifo(add);
36             }
37         } else {
38             // Cache miss scenario
39             Miss++;
40             // Handle the miss scenario here
41         }
42     }
43 }
44
45 // Update functions for different policies
46 void Update_lru(long long int add) {
47     // Logic for updating LRU policy
48 }
49
50 void Update_fifo(long long int add) {
51     // Logic for updating FIFO policy
52 }
53
54 int main() {
55     char op;
56     long long int add;
57     FILE *file = fopen(/* Path to the trace file */, "r");
58
59     // Check if the file opened successfully
60     if(!file) {

```

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61     printf("Error: Could not open the trace file.\n");
62     return 1;
63 }
64
65 // Read until end of file
66 while(!feof(file)) {
67     // Read operation and address
68     fscanf(file, " %c %llx", &op, &add);
69
70     // Begin the simulation for each address read
71     Simulate_access(op, add);
72 }
73
74 // Print out the statistics
75 printf("Hits: %d\n", Hit);
76 printf("Misses: %d\n", Miss);
77
78 return 0;
79 }

```