CSARCH2	3rd Term 2024-2025
Cache Simulation Project	Prof. RLUy

Design a cache simulation system and analyze the various test set scenarios of the assigned cache mapping and replacement policy.

General Directions:

- Application platform: Web-based, with GUI (graphics user interface) instead of "text "-based output.
- Programming languages: any web-based programming languages
- Application repository (source code and analysis writeup): GitHub (make sure that I can access it).

Common Specifications:

1. Cache line = parameters (minimum of 2 words, open maximum (16 words or more), should be power-of-2)
2. Cache blocks = parameters (minimum of 4 blocks, open maximum (16 blocks or more), should be power-of-2)
3. Memory blocks = fixed. 1024 blocks
4. Read policy: non load-through

Test cases (*n* is the number of cache blocks):

a.) Sequential sequence: up to 2*n* cache block. Repeat the sequence two times.
Example: [if cache block = 4] 0,1,2,3,4,5,6,7,0,1,2,3,4,5,6,7

b.) Mid-repeat blocks: Start at block 0, repeat the sequence in the middle two times up to *n*-1 blocks, after which continue up to 2*n*. Then, repeat the sequence two times.
Example: [if cache block = 4] 0,1,2,3,1,2,3,4,5,6,7, 0,1,2,3,1,2,3,4,5,6,7

c.) Random sequence: 64 main memory blocks.

Output:

a.) System output:
   a. Cache memory snapshot.
      i. Option for step-by-step animated tracing or final memory snapshot
      ii. Provide a text log of the cache memory trace (regardless of whether it is a step-by-step or final memory snapshot).
   b. Output: 1. memory access count; 2. cache hit count; 3. cache miss count; 4. cache hit rate; 5. cache miss rate; 6. average memory access time; 7. total memory access time

b.) Detail analysis of the three test cases. It will be submitted as "readme" in your GitHub. Note: Don't forget to specify the full specs of your cache simulation system

c.) Video containing the "walkthrough" of your system. Specify the link in the Github readme, or it can be stored in GitHub.

d.) **Note**: the link to the web-based app as well as the video and analysis writeup, should all be in GitHub.

e.) Project demo if needed.

Group #	Type of cache memory
S12 Group 1	4-way BSA + LRU