DESCRIPTION
The simulate_access function is central to our cache simulator. It first determines whether the access is for instruction or data based on the is_instruction flag and selects the corresponding L1 cache and energy consumption values. It then calculates the cache index and tag based on the memory address. The function checks if the memory block is present in the L1 cache. If it is a hit, it updates the simulation time, energy consumption, and hit count for the respective cache. If it is a miss, the function updates the cache with the new tag, increments the miss count, and updates the simulation time and energy consumption. If there is an L1 miss, the function checks the L2 cache. If the tag is present in the L2 cache, it updates the simulation time, energy consumption, and hit count for the L2 cache. If there is an L2 miss, the function randomly selects a cache line in the L2 set to replace with the new tag, updates the simulation time and energy consumption for the L2 cache and DRAM, increments the DRAM access count, and updates the miss count for the L2 cache. The function returns a string indicating whether the access resulted in a hit in the L1 cache, L2 cache, or DRAM. The energy calculation for write-backs from L1 to L2 includes the energy consumed by the L1 cache for the write operation (L1_POWER_RW) and the energy consumed by the L2 cache for the write-back operation (L2_POWER_RW). We also implemented an energy penalty for transferring the data from L1 to L2 (L2_TRANSFER_PENALTY). For an asynchronous write to DRAM, the energy calculation includes the energy consumed by the L2 cache for the write operation (L2_POWER_RW), the energy consumed by DRAM for the write operation (DRAM_POWER_RW), and a penalty for transferring the data from the L2 cache to DRAM (DRAM_TRANSFER_PENALTY).

Single Runs			
L2 Set Associativity	2	4	8
008.espresso.din	L1 Data Cache Hits: 379260, Misses: 1538 L1 Inst Cache Hits: 1615334, Misses: 1976 L2 Cache Hits: 3784, Misses: 1622 L1 Data Energy: 9.531599999970317e-05 J, L1 Inst Energy: 0.00040468400000384907 J L2 Energy: 8.114055000000082e-06 J, DRAM Energy: 0.00016220000000000226 J Total Energy: 0.0006897584999871124 J Average Memory Access Time: 5.540649999990227e-10 ns Total Time: 0.00055406499999990227 ns	L1 Data Cache Hits: 379260, Misses: 1532 L1 Inst Cache Hits: 1615334, Misses: 1976 L2 Cache Hits: 3796, Misses: 1610 L1 Data Energy: 9.531599999970317e-05 J, L1 Inst Energy: 0.00040468400000384907 J L2 Energy: 8.05402500000008e-06 J, DRAM Energy: 0.00016100000000000223 J Total Energy: 0.0006885546899872425 J Average Memory Access Time: 5.537649999990494e-10 ns Total Time: 0.00055376499999990494 ns	L1 Data Cache Hits: 379260, Misses: 1527 L1 Inst Cache Hits: 1615334, Misses: 1978 L2 Cache Hits: 3802, Misses: 1604 L1 Data Energy: 9.531599999970317e-05 J, L1 Inst Energy: 0.00040468400000384907 J L2 Energy: 8.02401000000008e-06 J, DRAM Energy: 0.00016040000000000222 J Total Energy: 0.0006879527849873034 J Average Memory Access Time: 5.536149999990609e-10 ns Total Time: 0.00055361499999990609 ns
013.spice2g6.din	L1 Data Cache Hits: 430060, Misses: 1236 L1 Inst Cache Hits: 1563144, Misses: 3157 L2 Cache Hits: 4814, Misses: 1986 L1 Data Energy: 0.00010791149999956008 J, L1 Inst Energy: 0.00039208950000365077 J L2 Energy: 9.934965000000129e-06 J, DRAM Energy: 0.00019860000000000315 J Total Energy: 0.0007332485549844293 J Average Memory Access Time: 5.666498666984939e-10 ns Total Time: 0.0005666509999982273 ns	L1 Data Cache Hits: 430060, Misses: 1227 L1 Inst Cache Hits: 1563144, Misses: 3166 L2 Cache Hits: 4814, Misses: 1986 L1 Data Energy: 0.00010791149999956008 J, L1 Inst Energy: 0.00039208950000365077 J L2 Energy: 9.934965000000129e-06 J, DRAM Energy: 0.00019860000000000315 J Total Energy: 0.0007332485549843475 J Average Memory Access Time: 5.666498666984687e-10 ns Total Time: 0.0005666509999982021 ns	L1 Data Cache Hits: 430060, Misses: 1231 L1 Inst Cache Hits: 1563144, Misses: 3170 L2 Cache Hits: 4798, Misses: 2002 L1 Data Energy: 0.00010791149999956008 J, L1 Inst Energy: 0.00039208950000365077 J L2 Energy: 1.001500500000013e-05 J, DRAM Energy: 0.00020020000000000319 J Total Energy: 0.0007348536349842834 J Average Memory Access Time: 5.670498658984458e-10 ns Total Time: 0.0005670509999981776 ns
015.doduc.din	L1 Data Cache Hits: 483982, Misses: 4396 L1 Inst Cache Hits: 1501948, Misses: 5325 L2 Cache Hits: 8698, Misses: 5372 L1 Data Energy: 0.0001224034999994045 J, L1 Inst Energy: 0.00037759650000342257 J L2 Energy: 2.6873429999998592e-05 J, DRAM Energy: 0.0005372000000000113 J Total Energy: 0.0011092907849665577 J Average Memory Access Time: 6.694749999926252e-10 ns Total Time: 0.0006694749999926251 ns	L1 Data Cache Hits: 483982, Misses: 4466 L1 Inst Cache Hits: 1501948, Misses: 5341 L2 Cache Hits: 8526, Misses: 5544 L1 Data Energy: 0.0001224034999994045 J, L1 Inst Energy: 0.00037759650000342257 J L2 Energy: 2.7733859999998468e-05 J, DRAM Energy: 0.0005544000000000117 J Total Energy: 0.001126545394966353 J Average Memory Access Time: 6.737749999927226e-10 ns Total Time: 0.0006737749999927226 ns	L1 Data Cache Hits: 483982, Misses: 4459 L1 Inst Cache Hits: 1501948, Misses: 5309 L2 Cache Hits: 8604, Misses: 5466 L1 Data Energy: 0.0001224034999994045 J, L1 Inst Energy: 0.00037759650000342257 J L2 Energy: 2.7343664999998524e-05 J, DRAM Energy: 0.0005466000000000116 J Total Energy: 0.0011187206299663043 J Average Memory Access Time: 6.718249999926538e-10 ns Total Time: 0.0006718249999926538 ns
022.li.din	L1 Data Cache Hits: 505844, Misses: 5849 L1 Inst Cache Hits: 1479744, Misses: 2818 L2 Cache Hits: 11502, Misses: 2916 L1 Data Energy: 0.00012887449999950638 J, L1 Inst Energy: 0.0003711270000033207 J L2 Energy: 1.4587290000000247e-05 J, DRAM Energy: 0.0002916000000000054 J Total Energy: 0.0008646533749775545 J Average Memory Access Time: 6.08944673159727e-10 ns Total Time: 0.0006089464999937466 ns	L1 Data Cache Hits: 505844, Misses: 5791 L1 Inst Cache Hits: 1479744, Misses: 2823 L2 Cache Hits: 11608, Misses: 2810 L1 Data Energy: 0.00012887449999950638 J, L1 Inst Energy: 0.0003711270000033207 J L2 Energy: 1.4057025000000233e-05 J, DRAM Energy: 0.0002810000000000515 J Total Energy: 0.0008540197199777519 J Average Memory Access Time: 6.062946811097925e-10 ns Total Time: 0.0006062964999938358 ns	L1 Data Cache Hits: 505844, Misses: 5831 L1 Inst Cache Hits: 1479744, Misses: 2824 L2 Cache Hits: 11526, Misses: 2892 L1 Data Energy: 0.00012887449999950638 J, L1 Inst Energy: 0.0003711270000033207 J L2 Energy: 1.4467230000000244e-05 J, DRAM Energy: 0.0002892000000000535 J Total Energy: 0.0008622457549776224 J Average Memory Access Time: 6.083446749597356e-10 ns Total Time: 0.0006083464999937604 ns
023.eqntott.din	L1 Data Cache Hits: 456370, Misses: 3494 L1 Inst Cache Hits: 1539084, Misses: 434 L2 Cache Hits: 1236, Misses: 3310 L1 Data Energy: 0.00011512049999947819 J, L1 Inst Energy: 0.0003848795000353724 J L2 Energy: 1.6558275000000077e-05 J, DRAM Energy: 0.0003310000000000637 J Total Energy: 0.0008547922899802663 J Average Memory Access Time: 5.941149999953446e-10 ns Total Time: 0.0005941149999953446 ns	L1 Data Cache Hits: 456370, Misses: 3451 L1 Inst Cache Hits: 1539084, Misses: 434 L2 Cache Hits: 1322, Misses: 3224 L1 Data Energy: 0.00011512049999947819 J, L1 Inst Energy: 0.0003848795000353724 J L2 Energy: 1.612806000000014e-05 J, DRAM Energy: 0.0003224000000000616 J Total Energy: 0.0008461649849802789 J Average Memory Access Time: 5.919649999954038e-10 ns Total Time: 0.0005919649999954038 ns	L1 Data Cache Hits: 456370, Misses: 3464 L1 Inst Cache Hits: 1539084, Misses: 434 L2 Cache Hits: 1296, Misses: 3250 L1 Data Energy: 0.00011512049999947819 J, L1 Inst Energy: 0.0003848795000353724 J L2 Energy: 1.625812500000012e-05 J, DRAM Energy: 0.0003250000000000062 J Total Energy: 0.0008487732399802486 J Average Memory Access Time: 5.926149999953275e-10 ns Total Time: 0.0005926149999953275 ns
026.compress.din	L1 Data Cache Hits: 531830, Misses: 18846 L1 Inst Cache Hits: 1442186, Misses: 246 L2 Cache Hits: 13784, Misses: 12200 L1 Data Energy: 0.0001393919999967198 J, L1 Inst Energy: 0.0003606080000031551 J L2 Energy: 6.103050000000401e-05 J, DRAM Energy: 0.0012199999999998959 J Total Energy: 0.0018538584599569927 J Average Memory Access Time: 8.699599999746968e-10 ns Total Time: 0.0008699599999746968 ns	L1 Data Cache Hits: 531830, Misses: 19054 L1 Inst Cache Hits: 1442186, Misses: 246 L2 Cache Hits: 13368, Misses: 12616 L1 Data Energy: 0.0001393919999967198 J, L1 Inst Energy: 0.0003606080000031551 J L2 Energy: 6.311154000000441e-05 J, DRAM Energy: 0.0012615999999998743 J Total Energy: 0.0018955905399570298 J Average Memory Access Time: 8.803599999743277e-10 ns Total Time: 0.0008803599999743277 ns	L1 Data Cache Hits: 531830, Misses: 19121 L1 Inst Cache Hits: 1442186, Misses: 246 L2 Cache Hits: 13234, Misses: 12750 L1 Data Energy: 0.0001393919999967198 J, L1 Inst Energy: 0.0003606080000031551 J L2 Energy: 6.378187500000455e-05 J, DRAM Energy: 0.0012749999999998674 J Total Energy: 0.0019090330849570417 J Average Memory Access Time: 8.837099999741363e-10 ns Total Time: 0.0008837099999741363 ns
034.mdljdp2.din	L1 Data Cache Hits: 460040, Misses: 2254 L1 Inst Cache Hits: 1534846, Misses: 1731 L2 Cache Hits: 2258, Misses: 2856 L1 Data Energy: 0.00011572849999947128 J, L1 Inst Energy: 0.0003842715000352767 J L2 Energy: 1.4287140000000239e-05 J, DRAM Energy: 0.0002856000000000526 J Total Energy: 0.0008120895649822958 J Average Memory Access Time: 5.841849999956183e-10 ns Total Time: 0.0005841849999956183 ns	L1 Data Cache Hits: 460040, Misses: 2256 L1 Inst Cache Hits: 1534846, Misses: 1735 L2 Cache Hits: 2246, Misses: 2868 L1 Data Energy: 0.00011572849999947128 J, L1 Inst Energy: 0.0003842715000352767 J L2 Energy: 1.434717000000024e-05 J, DRAM Energy: 0.0002868000000000053 J Total Energy: 0.000813293374982277 J Average Memory Access Time: 5.844849999955899e-10 ns Total Time: 0.0005844849999955898 ns	L1 Data Cache Hits: 460040, Misses: 2258 L1 Inst Cache Hits: 1534846, Misses: 1745 L2 Cache Hits: 2222, Misses: 2892 L1 Data Energy: 0.00011572849999947128 J, L1 Inst Energy: 0.0003842715000352767 J L2 Energy: 1.4467230000000244e-05 J, DRAM Energy: 0.0002892000000000535 J Total Energy: 0.0008157009949821917 J Average Memory Access Time: 5.850849999955316e-10 ns Total Time: 0.0005850849999955316 ns
039.wave5.din	L1 Data Cache Hits: 344062, Misses: 709 L1 Inst Cache Hits: 1654270, Misses: 872 L2 Cache Hits: 174, Misses: 1494 L1 Data Energy: 8.619999999980672e-05 J, L1 Inst Energy: 0.0004138000000039926 J L2 Energy: 7.473735000000066e-06 J, DRAM Energy: 0.0001494000000000195 J Total Energy: 0.0006582185149892881 J Average Memory Access Time: 5.415200000001704e-10 ns Total Time: 0.0005415200000001704 ns	L1 Data Cache Hits: 344062, Misses: 711 L1 Inst Cache Hits: 1654270, Misses: 870 L2 Cache Hits: 174, Misses: 1494 L1 Data Energy: 8.619999999980672e-05 J, L1 Inst Energy: 0.0004138000000039926 J L2 Energy: 7.473735000000066e-06 J, DRAM Energy: 0.0001494000000000195 J Total Energy: 0.0006582185149892878 J Average Memory Access Time: 5.415200000001704e-10 ns Total Time: 0.0005415200000001704 ns	L1 Data Cache Hits: 344062, Misses: 712 L1 Inst Cache Hits: 1654270, Misses: 872 L2 Cache Hits: 168, Misses: 1500 L1 Data Energy: 8.619999999980672e-05 J, L1 Inst Energy: 0.0004138000000039926 J L2 Energy: 7.503750000000067e-06 J, DRAM Energy: 0.0001500000000000197 J Total Energy: 0.0006588204199892225 J Average Memory Access Time: 5.416700000001562e-10 ns Total Time: 0.0005416700000001562 ns

047.tomcatv.din	L1 Data Cache Hits: 748270, Misses: 19037 L1 Inst Cache Hits: 1230912, Misses: 169 L2 Cache Hits: 3224, Misses: 17594 L1 Data Energy: 0.0001922280000005039 J, L1 Inst Energy: 0.00030777200000232317 J L2 Energy: 8.801398500000926e-05 J, DRAM Energy: 0.0017593999999996166 J Total Energy: 0.0023691281400027332 J Average Memory Access Time: 9.91894999978165e-10 ns Total Time: 0.000991894999978165 ns	L1 Data Cache Hits: 748270, Misses: 19028 L1 Inst Cache Hits: 1230912, Misses: 169 L2 Cache Hits: 3242, Misses: 17576 L1 Data Energy: 0.0001922280000005039 J, L1 Inst Energy: 0.00030777200000232317 J L2 Energy: 8.792394000000925e-05 J, DRAM Energy: 0.0017575999999996175 J Total Energy: 0.0023673224250027 22 J Average Memory Access Time: 9.91444999978161e-10 ns Total Time: 0.000991444999978161 ns	L1 Data Cache Hits: 748270, Misses: 19017 L1 Inst Cache Hits: 1230912, Misses: 169 L2 Cache Hits: 3264, Misses: 17554 L1 Data Energy: 0.0001922280000005039 J, L1 Inst Energy: 0.00030777200000232317 J L2 Energy: 8.781388500000922e-05 J, DRAM Energy: 0.0017553999999996186 J Total Energy: 0.0023651154400023047 J Average Memory Access Time: 9.908949999781838e-10 ns Total Time: 0.000990894999978138 ns
048.ora.din	L1 Data Cache Hits: 399998, Misses: 453 L1 Inst Cache Hits: 1598834, Misses: 677 L2 Cache Hits: 84, Misses: 1088 L1 Data Energy: 0.00010011549999964864 J, L1 Inst Energy: 0.0003998855000037735 J L2 Energy: 5.4427200000000145e-06 J, DRAM Energy: 0.00010880000000000096 J Total Energy: 0.0006150093699938796 J Average Memory Access Time: 5.301299397413715e-10 ns Total Time: 0.0005301310000012509 ns	L1 Data Cache Hits: 399998, Misses: 455 L1 Inst Cache Hits: 1598834, Misses: 677 L2 Cache Hits: 80, Misses: 1092 L1 Data Energy: 0.00010011549999964864 J, L1 Inst Energy: 0.0003998855000037735 J L2 Energy: 5.462730000000015e-06 J, DRAM Energy: 0.0001092000000000097 J Total Energy: 0.0006154106399938338 J Average Memory Access Time: 5.302299395413623e-10 ns Total Time: 0.0005302310000012415 ns	L1 Data Cache Hits: 399998, Misses: 456 L1 Inst Cache Hits: 1598834, Misses: 676 L2 Cache Hits: 80, Misses: 1092 L1 Data Energy: 0.00010011549999964864 J, L1 Inst Energy: 0.0003998855000037735 J L2 Energy: 5.462730000000015e-06 J, DRAM Energy: 0.0001092000000000097 J Total Energy: 0.0006154106399938362 J Average Memory Access Time: 5.302299395413623e-10 ns Total Time: 0.0005302310000012415 ns
085.gcc.din	L1 Data Cache Hits: 429976, Misses: 7246 L1 Inst Cache Hits: 1533614, Misses: 13821 L2 Cache Hits: 30686, Misses: 5724 L1 Data Energy: 0.0001102424999995336 J, L1 Inst Energy: 0.0003897575000361405 J L2 Energy: 2.863430999999834e-05 J, DRAM Energy: 0.0005724000000000122 J Total Energy: 0.0012563583949655693 J Average Memory Access Time: 7.341249999866223e-10 ns Total Time: 0.0007341249999866223 ns	L1 Data Cache Hits: 429976, Misses: 7211 L1 Inst Cache Hits: 1533614, Misses: 13677 L2 Cache Hits: 31044, Misses: 5366 L1 Data Energy: 0.0001102424999995336 J, L1 Inst Energy: 0.0003897575000361405 J L2 Energy: 2.6843414999998596e-05 J, DRAM Energy: 0.0005366000000000113 J Total Energy: 0.0012204447299656923 J Average Memory Access Time: 7.25174999986834e-10 ns Total Time: 0.000725174999986834 ns	L1 Data Cache Hits: 429976, Misses: 7222 L1 Inst Cache Hits: 1533614, Misses: 13681 L2 Cache Hits: 31014, Misses: 5396 L1 Data Energy: 0.0001102424999995336 J, L1 Inst Energy: 0.0003897575000361405 J L2 Energy: 2.6993489999998575e-05 J, DRAM Energy: 0.0005396000000000114 J Total Energy: 0.0012234542549655883 J Average Memory Access Time: 7.25924999986782e-10 ns Total Time: 0.000725924999986782 ns
089.su2cor.din	L1 Data Cache Hits: 519368, Misses: 5682 L1 Inst Cache Hits: 1473400, Misses: 914 L2 Cache Hits: 1272, Misses: 5960 L1 Data Energy: 0.0001314094999995463 J, L1 Inst Energy: 0.0003685905000328077 J L2 Energy: 2.981489999999817e-05 J, DRAM Energy: 0.0005960000000000128 J Total Energy: 0.0011340703799678216 J Average Memory Access Time: 6.670799999900814e-10 ns Total Time: 0.0006670799999900814 ns	L1 Data Cache Hits: 519368, Misses: 5656 L1 Inst Cache Hits: 1473400, Misses: 918 L2 Cache Hits: 1316, Misses: 5916 L1 Data Energy: 0.0001314094999995463 J, L1 Inst Energy: 0.0003685905000328077 J L2 Energy: 2.95947899999982e-05 J, DRAM Energy: 0.0005916000000000126 J Total Energy: 0.0011296564099677294 J Average Memory Access Time: 6.659799999901985e-10 ns Total Time: 0.0006659799999901985 ns	L1 Data Cache Hits: 519368, Misses: 5665 L1 Inst Cache Hits: 1473400, Misses: 924 L2 Cache Hits: 1286, Misses: 5946 L1 Data Energy: 0.0001314094999995463 J, L1 Inst Energy: 0.0003685905000328077 J L2 Energy: 2.974486499999818e-05 J, DRAM Energy: 0.0005946000000000127 J Total Energy: 0.0011326659349674 31 J Average Memory Access Time: 6.667299999901727e-10 ns Total Time: 0.0006667299999901727 ns
090.hydro2d.din	L1 Data Cache Hits: 478754, Misses: 18234 L1 Inst Cache Hits: 1495602, Misses: 1578 L2 Cache Hits: 11664, Misses: 13980 L1 Data Energy: 0.0001256559999994557 J, L1 Inst Energy: 0.00037434400000337136 J L2 Energy: 6.993495000000574e-05 J, DRAM Energy: 0.0013979999999998037 J Total Energy: 0.002030722759978244 J Average Memory Access Time: 9.136099999736638e-10 ns Total Time: 0.0009136099999736638 ns	L1 Data Cache Hits: 478754, Misses: 18566 L1 Inst Cache Hits: 1495602, Misses: 1584 L2 Cache Hits: 10988, Misses: 14656 L1 Data Energy: 0.0001256559999994557 J, L1 Inst Energy: 0.00037434400000337136 J L2 Energy: 7.33166400000064e-05 J, DRAM Energy: 0.0014655999999997687 J Total Energy: 0.0020985373899849564 J Average Memory Access Time: 9.305099999731674e-10 ns Total Time: 0.0009305099999731675 ns	L1 Data Cache Hits: 478754, Misses: 18660 L1 Inst Cache Hits: 1495602, Misses: 1590 L2 Cache Hits: 10788, Misses: 14856 L1 Data Energy: 0.0001256559999994557 J, L1 Inst Energy: 0.00037434400000337136 J L2 Energy: 7.43171400000066e-05 J, DRAM Energy: 0.0014855999999997583 J Total Energy: 0.0021186008899884523 J Average Memory Access Time: 9.355099999730149e-10 ns Total Time: 0.0009355099999730149 ns
093.nasa7.din	L1 Data Cache Hits: 388308, Misses: 5561 L1 Inst Cache Hits: 1605016, Misses: 752 L2 Cache Hits: 726, Misses: 5950 L1 Data Energy: 9.851449999966683e-05 J, L1 Inst Energy: 0.0004014854500037987 J L2 Energy: 2.9764874999998176e-05 J, DRAM Energy: 0.0005950000000000127 J Total Energy: 0.0011302858149735261 J Average Memory Access Time: 6.654399999911213e-10 ns Total Time: 0.0006654399999911213 ns	L1 Data Cache Hits: 388308, Misses: 5559 L1 Inst Cache Hits: 1605016, Misses: 752 L2 Cache Hits: 730, Misses: 5946 L1 Data Energy: 9.851449999966683e-05 J, L1 Inst Energy: 0.0004014854500037987 J L2 Energy: 2.974486499999818e-05 J, DRAM Energy: 0.0005946000000000127 J Total Energy: 0.0011298845449735262 J Average Memory Access Time: 6.653399999911211e-10 ns Total Time: 0.0006653399999911212 ns	L1 Data Cache Hits: 388308, Misses: 5562 L1 Inst Cache Hits: 1605016, Misses: 751 L2 Cache Hits: 726, Misses: 5950 L1 Data Energy: 9.851449999966683e-05 J, L1 Inst Energy: 0.0004014854500037987 J L2 Energy: 2.9764874999998176e-05 J, DRAM Energy: 0.0005950000000000127 J Total Energy: 0.0011302858149735055 J Average Memory Access Time: 6.654399999911108e-10 ns Total Time: 0.0006654399999911108 ns
094.fpppp.din	L1 Data Cache Hits: 588250, Misses: 6935 L1 Inst Cache Hits: 1385464, Misses: 8586 L2 Cache Hits: 21530, Misses: 4756 L1 Data Energy: 0.0001497499999983507 J, L1 Inst Energy: 0.0003502500000002992 J L2 Energy: 2.3791889999999035e-05 J, DRAM Energy: 0.0004756000000000099 J Total Energy: 0.0011086057449723264 J Average Memory Access Time: 6.846149999875556e-10 ns Total Time: 0.0006846149999875556 ns	L1 Data Cache Hits: 588250, Misses: 6889 L1 Inst Cache Hits: 1385464, Misses: 8558 L2 Cache Hits: 21678, Misses: 4608 L1 Data Energy: 0.0001497499999983507 J, L1 Inst Energy: 0.0003502500000002992 J L2 Energy: 2.3051519999999142e-05 J, DRAM Energy: 0.0004608000000000095 J Total Energy: 0.0010937587549724574 J Average Memory Access Time: 6.809149999878832e-10 ns Total Time: 0.0006809149999878832 ns	L1 Data Cache Hits: 588250, Misses: 6941 L1 Inst Cache Hits: 1385464, Misses: 8561 L2 Cache Hits: 21568, Misses: 4718 L1 Data Energy: 0.0001497499999983507 J, L1 Inst Energy: 0.0003502500000002992 J L2 Energy: 2.3601794999999063e-05 J, DRAM Energy: 0.0004718000000000098 J Total Energy: 0.0011047936799724754 J Average Memory Access Time: 6.836649999876585e-10 ns Total Time: 0.0006836649999876585 ns
Changes from Set Associativity			Github Repository : https://github.com/SoftGeek23/EEC
Increasing the set associativity generally leads to better performance, as evidenced by the decreasing average memory access times for higher associativity levels. This improvement is expected due to the reduced likelihood of cache conflicts and improved hit rates. However, this performance gain comes at a cost, as energy consumption in the L1 and L2 caches tends to increase with higher set associativity. The increased complexity and size of higher associativity caches contribute to this higher energy consumption. Therefore, there is a trade-off between performance and energy consumption, where higher associativity improves performance but also leads to higher energy consumption.			