**CONVOLVE**

**32 x 32**

**Varying Depths of Cache**

**4 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 5316055

cache\_4

Number of accesses: 1464

Number of hits: 248

Number of misses: 1216

Miss Rate(%): 83.06010928961749

Hit Rate(%): 16.939890710382514

cache\_3

Number of accesses: 5271

Number of hits: 3740

Number of misses: 1531

Miss Rate(%): 29.045721874407132

Hit Rate(%): 70.95427812559286

cache\_2

Number of accesses: 53740

Number of hits: 47991

Number of misses: 5749

Miss Rate(%): 10.697804242649795

Hit Rate(%): 89.3021957573502

cache\_1

Number of accesses: 698423

Number of hits: 636060

Number of misses: 62363

Miss Rate(%): 8.92911602281139

Hit Rate(%): 91.07088397718861

AMATs:

{'cache\_1': 5.965833966029509,

'cache\_2': 55.61394827151079,

'cache\_3': 370.2998052028161,

'cache\_4': 930.6010928961749,

'mem': 1000}

**3 Level Cache**

**A screen shot of a computer

Description automatically generated**

Number of instructions: 698423

Total cycles taken: 5897423

cache\_3

Number of accesses: 5578

Number of hits: 4064

Number of misses: 1514

Miss Rate(%): 27.142344926496953

Hit Rate(%): 72.85765507350305

cache\_2

Number of accesses: 61587

Number of hits: 55583

Number of misses: 6004

Miss Rate(%): 9.748810625619043

Hit Rate(%): 90.25118937438096

cache\_1

Number of accesses: 698423

Number of hits: 622877

Number of misses: 75546

Miss Rate(%): 10.816654090715797

Hit Rate(%): 89.18334590928421

AMATs:

{'cache\_1': 6.647306813925725,

'cache\_2': 52.2093686879841,

'cache\_3': 371.4234492649695,

'mem': 1000}

**2 Level Cache**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 698423

Total cycles taken: 10654487

cache\_2

Number of accesses: 60197

Number of hits: 54368

Number of misses: 5829

Miss Rate(%): 9.683206804325797

Hit Rate(%): 90.31679319567421

cache\_1

Number of accesses: 698423

Number of hits: 625970

Number of misses: 72453

Miss Rate(%): 10.3737992591882

Hit Rate(%): 89.6262007408118

AMATs:

{'cache\_1': 12.704972238798222, 'cache\_2': 112.83206804325798, 'mem': 1000}

**1 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 87702423

cache\_1

Number of accesses: 698423

Number of hits: 625970

Number of misses: 72453

Miss Rate(%): 10.3737992591882

Hit Rate(%): 89.6262007408118

AMATs:

{'cache\_1': 104.737992591882, 'mem': 1000}

**Varying Associativity of L1 Cache**

**2-Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 5897423

cache\_3

Number of accesses: 5578

Number of hits: 4064

Number of misses: 1514

Miss Rate(%): 27.142344926496953

Hit Rate(%): 72.85765507350305

cache\_2

Number of accesses: 61587

Number of hits: 55583

Number of misses: 6004

Miss Rate(%): 9.748810625619043

Hit Rate(%): 90.25118937438096

cache\_1

Number of accesses: 698423

Number of hits: 622877

Number of misses: 75546

Miss Rate(%): 10.816654090715797

Hit Rate(%): 89.18334590928421

AMATs:

{'cache\_1': 6.647306813925725,

'cache\_2': 52.2093686879841,

'cache\_3': 371.4234492649695,

'mem': 1000}

**4-Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 5211803

cache\_3

Number of accesses: 4887

Number of hits: 3424

Number of misses: 1463

Miss Rate(%): 29.936566400654797

Hit Rate(%): 70.0634335993452

cache\_2

Number of accesses: 45530

Number of hits: 40287

Number of misses: 5243

Miss Rate(%): 11.515484296068527

Hit Rate(%): 88.48451570393148

cache\_1

Number of accesses: 698423

Number of hits: 648968

Number of misses: 49455

Miss Rate(%): 7.0809523741343

Hit Rate(%): 92.9190476258657

AMATs:

{'cache\_1': 5.38940380099509,

'cache\_2': 61.988890322563826,

'cache\_3': 399.36566400654795,

'mem': 1000}

**8-Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 5030555

cache\_3

Number of accesses: 4759

Number of hits: 3276

Number of misses: 1483

Miss Rate(%): 31.162008825383484

Hit Rate(%): 68.83799117461652

cache\_2

Number of accesses: 38330

Number of hits: 33237

Number of misses: 5093

Miss Rate(%): 13.287242368901644

Hit Rate(%): 86.71275763109836

cache\_1

Number of accesses: 698423

Number of hits: 656707

Number of misses: 41716

Miss Rate(%): 5.9728846272244756

Hit Rate(%): 94.02711537277553

AMATs:

{'cache\_1': 5.222408866627155,

'cache\_2': 70.69295876537389,

'cache\_3': 411.62008825383487,

'mem': 1000}

**Varying Block Size of L1 Cache**

**Block Size 16**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 5966563

cache\_3

Number of accesses: 5662

Number of hits: 4164

Number of misses: 1498

Miss Rate(%): 26.457082303073122

Hit Rate(%): 73.54291769692688

cache\_2

Number of accesses: 64277

Number of hits: 58133

Number of misses: 6144

Miss Rate(%): 9.558629058605723

Hit Rate(%): 90.44137094139427

cache\_1

Number of accesses: 698423

Number of hits: 619572

Number of misses: 78851

Miss Rate(%): 11.289863019975002

Hit Rate(%): 88.710136980025

AMATs:

{'cache\_1': 6.740666458295167,

'cache\_2': 50.84797262941352,

'cache\_3': 364.5708230307312,

'mem': 1000}

**Block Size 32**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 698423

Total cycles taken: 4740107

cache\_3

Number of accesses: 4828

Number of hits: 3231

Number of misses: 1597

Miss Rate(%): 33.077879038939514

Hit Rate(%): 66.92212096106049

cache\_2

Number of accesses: 21078

Number of hits: 15896

Number of misses: 5182

Miss Rate(%): 24.58487522535345

Hit Rate(%): 75.41512477464654

cache\_1

Number of accesses: 698423

Number of hits: 674590

Number of misses: 23833

Miss Rate(%): 3.4124019397986607

Hit Rate(%): 96.58759806020134

AMATs:

{'cache\_1': 5.1599373177191294,

'cache\_2': 121.90642811451968,

'cache\_3': 430.77879038939517,

'mem': 1000}

**Block Size 64**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 698423

Total cycles taken: 4209807

cache\_3

Number of accesses: 2984

Number of hits: 1378

Number of misses: 1606

Miss Rate(%): 53.82037533512064

Hit Rate(%): 46.179624664879356

cache\_2

Number of accesses: 8754

Number of hits: 5485

Number of misses: 3269

Miss Rate(%): 37.34292894676719

Hit Rate(%): 62.657071053232805

cache\_1

Number of accesses: 698423

Number of hits: 688170

Number of misses: 10253

Miss Rate(%): 1.4680215285006364

Hit Rate(%): 98.53197847149936

AMATs:

{'cache\_1': 4.733530692653675,

'cache\_2': 254.32397414954232,

'cache\_3': 638.2037533512064,

'mem': 1000}

**Block Size 128**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 698423

Total cycles taken: 3931243

cache\_3

Number of accesses: 2197

Number of hits: 508

Number of misses: 1689

Miss Rate(%): 76.87756030951297

Hit Rate(%): 23.122439690487028

cache\_2

Number of accesses: 6032

Number of hits: 3573

Number of misses: 2459

Miss Rate(%): 40.76591511936339

Hit Rate(%): 59.23408488063661

cache\_1

Number of accesses: 698423

Number of hits: 691542

Number of misses: 6881

Miss Rate(%): 0.9852195589205968

Hit Rate(%): 99.01478044107941

AMATs:

{'cache\_1': 4.6469313294109185,

'cache\_2': 370.164324935498,

'cache\_3': 868.7756030951297,

'mem': 1000}

**20 x 20**

**Varying Depths of Cache**

**4 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 2499613

cache\_4

Number of accesses: 930

Number of hits: 328

Number of misses: 602

Miss Rate(%): 64.73118279569893

Hit Rate(%): 35.26881720430107

cache\_3

Number of accesses: 3116

Number of hits: 2151

Number of misses: 965

Miss Rate(%): 30.969191270860076

Hit Rate(%): 69.03080872913992

cache\_2

Number of accesses: 25393

Number of hits: 22037

Number of misses: 3356

Miss Rate(%): 13.216240696254875

Hit Rate(%): 86.78375930374513

cache\_1

Number of accesses: 283193

Number of hits: 252220

Number of misses: 30973

Miss Rate(%): 10.937064122347657

Hit Rate(%): 89.06293587765234

AMATs:

{'cache\_1': 7.540740171476079,

'cache\_2': 59.80343626322362,

'cache\_3': 331.4364293897608,

'cache\_4': 747.3118279569893,

'mem': 1000}

**3 Level Cache**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 283193

Total cycles taken: 2931977

cache\_3

Number of accesses: 2777

Number of hits: 1799

Number of misses: 978

Miss Rate(%): 35.2178610010803

Hit Rate(%): 64.7821389989197

cache\_2

Number of accesses: 22798

Number of hits: 19741

Number of misses: 3057

Miss Rate(%): 13.409070971137819

Hit Rate(%): 86.59092902886218

cache\_1

Number of accesses: 283193

Number of hits: 256525

Number of misses: 26668

Miss Rate(%): 9.41689942901131

Hit Rate(%): 90.58310057098869

AMATs:

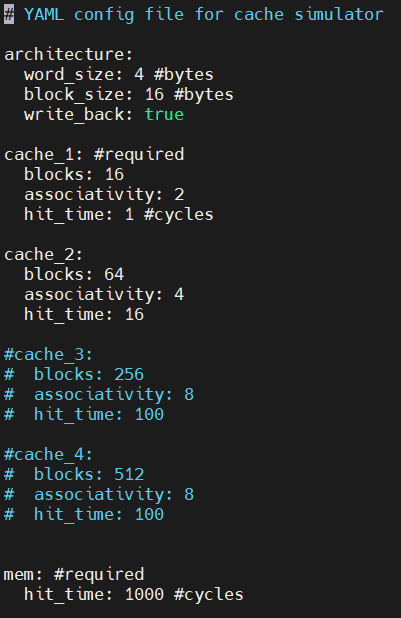
{'cache\_1': 8.216447899977727,

'cache\_2': 76.63295073265307,

'cache\_3': 452.178610010803,

'mem': 1000}

**2 Level Cache**



Simulation complete

Number of instructions: 283193

Total cycles taken: 5284377

cache\_2

Number of accesses: 22798

Number of hits: 19829

Number of misses: 2969

Miss Rate(%): 13.02307219931573

Hit Rate(%): 86.97692780068427

cache\_1

Number of accesses: 283193

Number of hits: 256525

Number of misses: 26668

Miss Rate(%): 9.41689942901131

Hit Rate(%): 90.58310057098869

AMATs:

{'cache\_1': 14.770400024412746, 'cache\_2': 146.2307219931573, 'mem': 1000}

**1 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 34596193

cache\_1

Number of accesses: 283193

Number of hits: 254508

Number of misses: 28685

Miss Rate(%): 10.129134547817213

Hit Rate(%): 89.87086545218278

AMATs:

{'cache\_1': 102.29134547817213, 'mem': 1000}

**Varying Associativity of L1 Cache**

**2 Way Associativity**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 283193

Total cycles taken: 2957501

cache\_3

Number of accesses: 2815

Number of hits: 1837

Number of misses: 978

Miss Rate(%): 34.742451154529306

Hit Rate(%): 65.2575488454707

cache\_2

Number of accesses: 25125

Number of hits: 22075

Number of misses: 3050

Miss Rate(%): 12.139303482587065

Hit Rate(%): 87.86069651741293

cache\_1

Number of accesses: 283193

Number of hits: 254120

Number of misses: 29073

Miss Rate(%): 10.266143584057517

Hit Rate(%): 89.73385641594248

AMATs:

{'cache\_1': 8.218558714575522,

'cache\_2': 70.31421931196593,

'cache\_3': 447.42451154529306,

'mem': 1000}

**4 Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 2790293

cache\_3

Number of accesses: 2684

Number of hits: 1725

Number of misses: 959

Miss Rate(%): 35.73025335320417

Hit Rate(%): 64.26974664679582

cache\_2

Number of accesses: 19342

Number of hits: 16455

Number of misses: 2887

Miss Rate(%): 14.926067624857822

Hit Rate(%): 85.07393237514218

cache\_1

Number of accesses: 283193

Number of hits: 261987

Number of misses: 21206

Miss Rate(%): 7.488179439463546

Hit Rate(%): 92.51182056053645

AMATs:

{'cache\_1': 7.309336721960858,

'cache\_2': 84.25728540518067,

'cache\_3': 457.3025335320417,

'mem': 1000}

**8 Way Associativity**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 283193

Total cycles taken: 2765581

cache\_3

Number of accesses: 2942

Number of hits: 1993

Number of misses: 949

Miss Rate(%): 32.25696804894629

Hit Rate(%): 67.7430319510537

cache\_2

Number of accesses: 17440

Number of hits: 14276

Number of misses: 3164

Miss Rate(%): 18.142201834862384

Hit Rate(%): 81.85779816513762

cache\_1

Number of accesses: 283193

Number of hits: 264042

Number of misses: 19151

Miss Rate(%): 6.762525909891841

Hit Rate(%): 93.23747409010817

AMATs:

{'cache\_1': 7.266389431633991,

'cache\_2': 92.66344432733146,

'cache\_3': 422.56968048946294,

'mem': 1000}

**Varying Block Size of L1 Cache**

**Block Size 16**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 2961501

cache\_3

Number of accesses: 2815

Number of hits: 1833

Number of misses: 982

Miss Rate(%): 34.88454706927176

Hit Rate(%): 65.11545293072825

cache\_2

Number of accesses: 25125

Number of hits: 22075

Number of misses: 3050

Miss Rate(%): 12.139303482587065

Hit Rate(%): 87.86069651741293

cache\_1

Number of accesses: 283193

Number of hits: 254120

Number of misses: 29073

Miss Rate(%): 10.266143584057517

Hit Rate(%): 89.73385641594248

AMATs:

{'cache\_1': 8.236267252062227,

'cache\_2': 70.48671385523537,

'cache\_3': 448.8454706927176,

'mem': 1000}

**Block Size 32**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 2645125

cache\_3

Number of accesses: 2703

Number of hits: 1682

Number of misses: 1021

Miss Rate(%): 37.77284498705142

Hit Rate(%): 62.22715501294858

cache\_2

Number of accesses: 11049

Number of hits: 8072

Number of misses: 2977

Miss Rate(%): 26.943614806769844

Hit Rate(%): 73.05638519323016

cache\_1

Number of accesses: 283193

Number of hits: 270836

Number of misses: 12357

Miss Rate(%): 4.363455311395409

Hit Rate(%): 95.6365446886046

AMATs:

{'cache\_1': 7.314675296117728,

'cache\_2': 144.71731335546392,

'cache\_3': 477.7284498705142,

'mem': 1000}

**Block Size 64**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 2350021

cache\_3

Number of accesses: 1802

Number of hits: 781

Number of misses: 1021

Miss Rate(%): 56.659267480577135

Hit Rate(%): 43.340732519422865

cache\_2

Number of accesses: 5143

Number of hits: 3161

Number of misses: 1982

Miss Rate(%): 38.537818393933506

Hit Rate(%): 61.4621816060665

cache\_1

Number of accesses: 283193

Number of hits: 277260

Number of misses: 5933

Miss Rate(%): 2.0950376598291625

Hit Rate(%): 97.90496234017084

AMATs:

{'cache\_1': 6.717154019611111,

'cache\_2': 272.8902744439119,

'cache\_3': 666.5926748057714,

'mem': 1000}

**Block Size 128**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 283193

Total cycles taken: 2114825

cache\_3

Number of accesses: 1289

Number of hits: 295

Number of misses: 994

Miss Rate(%): 77.11404189294026

Hit Rate(%): 22.885958107059736

cache\_2

Number of accesses: 2196

Number of hits: 779

Number of misses: 1417

Miss Rate(%): 64.52641165755921

Hit Rate(%): 35.473588342440806

cache\_1

Number of accesses: 283193

Number of hits: 280471

Number of misses: 2722

Miss Rate(%): 0.9611819501188236

Hit Rate(%): 99.03881804988117

AMATs:

{'cache\_1': 6.556743305849819,

'cache\_2': 578.1156528337722,

'cache\_3': 871.1404189294027,

'mem': 1000}