**GATHER**

**128 x 128**

**Varying Depths of Cache**

**4 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 13354795

cache\_4

Number of accesses: 6220

Number of hits: 836

Number of misses: 5384

Miss Rate(%): 86.55948553054662

Hit Rate(%): 13.440514469453376

cache\_3

Number of accesses: 14860

Number of hits: 8392

Number of misses: 6468

Miss Rate(%): 43.52624495289367

Hit Rate(%): 56.47375504710632

cache\_2

Number of accesses: 57729

Number of hits: 41611

Number of misses: 16118

Miss Rate(%): 27.92010947703927

Hit Rate(%): 72.07989052296074

cache\_1

Number of accesses: 287883

Number of hits: 219156

Number of misses: 68727

Miss Rate(%): 23.873240170485925

Hit Rate(%): 76.12675982951407

AMATs:

{'cache\_1': 39.499121269251084,

'cache\_2': 161.26475080180728,

'cache\_3': 520.2871819727965,

'cache\_4': 965.5948553054662,

'mem': 1000}

**3 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 13616395

cache\_3

Number of accesses: 14889

Number of hits: 8417

Number of misses: 6472

Miss Rate(%): 43.468332325878166

Hit Rate(%): 56.531667674121834

cache\_2

Number of accesses: 62725

Number of hits: 46518

Number of misses: 16207

Miss Rate(%): 25.838182542845757

Hit Rate(%): 74.16181745715424

cache\_1

Number of accesses: 287883

Number of hits: 213067

Number of misses: 74816

Miss Rate(%): 25.988335539090535

Hit Rate(%): 74.01166446090947

AMATs:

{'cache\_1': 41.06165675070546,

'cache\_2': 154.15245308975807,

'cache\_3': 534.6833232587817,

'mem': 1000}

**2 Level Cache**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 287883

Total cycles taken: 25387107

cache\_2

Number of accesses: 58034

Number of hits: 41635

Number of misses: 16399

Miss Rate(%): 28.25757314677603

Hit Rate(%): 71.74242685322398

cache\_1

Number of accesses: 287883

Number of hits: 218421

Number of misses: 69462

Miss Rate(%): 24.12855222434114

Hit Rate(%): 75.87144777565886

AMATs:

{'cache\_1': 73.0420012964071, 'cache\_2': 298.57573146776025, 'mem': 1000}

**1 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 87200883

cache\_1

Number of accesses: 287883

Number of hits: 216976

Number of misses: 70907

Miss Rate(%): 24.6304922485871

Hit Rate(%): 75.3695077514129

AMATs:

{'cache\_1': 247.304922485871, 'mem': 1000}

**Varying Associativity of L1 Cache**

**2-Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 13472591

cache\_3

Number of accesses: 14447

Number of hits: 7947

Number of misses: 6500

Miss Rate(%): 44.992039869869174

Hit Rate(%): 55.007960130130826

cache\_2

Number of accesses: 59749

Number of hits: 43629

Number of misses: 16120

Miss Rate(%): 26.97953103817637

Hit Rate(%): 73.02046896182362

cache\_1

Number of accesses: 287883

Number of hits: 216976

Number of misses: 70907

Miss Rate(%): 24.6304922485871

Hit Rate(%): 75.3695077514129

AMATs:

{'cache\_1': 41.48414125687136,

'cache\_2': 164.36594465217678,

'cache\_3': 549.9203986986918,

'mem': 1000}

**4-Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 13539219

cache\_3

Number of accesses: 14958

Number of hits: 8621

Number of misses: 6337

Miss Rate(%): 42.365289477202836

Hit Rate(%): 57.634710522797164

cache\_2

Number of accesses: 60459

Number of hits: 44217

Number of misses: 16242

Miss Rate(%): 26.86448667692155

Hit Rate(%): 73.13551332307846

cache\_1

Number of accesses: 287883

Number of hits: 216433

Number of misses: 71450

Miss Rate(%): 24.819110541435236

Hit Rate(%): 75.18088945856476

AMATs:

{'cache\_1': 39.885753971477094,

'cache\_2': 156.67666214934556,

'cache\_3': 523.6528947720283,

'mem': 1000}

**8-Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 13420251

cache\_3

Number of accesses: 14381

Number of hits: 7819

Number of misses: 6562

Miss Rate(%): 45.62965023294625

Hit Rate(%): 54.37034976705375

cache\_2

Number of accesses: 61969

Number of hits: 46394

Number of misses: 15575

Miss Rate(%): 25.13353450919008

Hit Rate(%): 74.86646549080992

cache\_1

Number of accesses: 287883

Number of hits: 215751

Number of misses: 72132

Miss Rate(%): 25.056012338345784

Hit Rate(%): 74.9439876616542

AMATs:

{'cache\_1': 40.04152007693157,

'cache\_2': 155.81697338639287,

'cache\_3': 556.2965023294626,

'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: 287883

Total cycles taken: 13509795

cache\_3

Number of accesses: 14620

Number of hits: 8215

Number of misses: 6405

Miss Rate(%): 43.80984952120383

Hit Rate(%): 56.19015047879618

cache\_2

Number of accesses: 60673

Number of hits: 44515

Number of misses: 16158

Miss Rate(%): 26.63128574489476

Hit Rate(%): 73.36871425510523

cache\_1

Number of accesses: 287883

Number of hits: 217125

Number of misses: 70758

Miss Rate(%): 24.5787351111389

Hit Rate(%): 75.42126488886109

AMATs:

{'cache\_1': 40.15455126107564,

'cache\_2': 159.30254784889678,

'cache\_3': 538.0984952120383,

'mem': 1000}

**Block Size 32**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 287883

Total cycles taken: 12829595

cache\_3

Number of accesses: 14258

Number of hits: 7483

Number of misses: 6775

Miss Rate(%): 47.517183335671206

Hit Rate(%): 52.4828166643288

cache\_2

Number of accesses: 34195

Number of hits: 18420

Number of misses: 15775

Miss Rate(%): 46.13247550811522

Hit Rate(%): 53.86752449188478

cache\_1

Number of accesses: 287883

Number of hits: 249245

Number of misses: 38638

Miss Rate(%): 13.421424675996846

Hit Rate(%): 86.57857532400315

AMATs:

{'cache\_1': 38.75997108928385,

'cache\_2': 281.3410051528625,

'cache\_3': 575.1718333567121,

'mem': 1000}

**Block Size 64**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 287883

Total cycles taken: 12006335

cache\_3

Number of accesses: 11166

Number of hits: 4444

Number of misses: 6722

Miss Rate(%): 60.20060899158158

Hit Rate(%): 39.79939100841841

cache\_2

Number of accesses: 17497

Number of hits: 5267

Number of misses: 12230

Miss Rate(%): 69.89769674801394

Hit Rate(%): 30.102303251986058

cache\_1

Number of accesses: 287883

Number of hits: 267339

Number of misses: 20544

Miss Rate(%): 7.136232427757109

Hit Rate(%): 92.86376757224289

AMATs:

{'cache\_1': 37.158296910365394,

'cache\_2': 506.68608788194706,

'cache\_3': 702.0060899158158,

'mem': 1000}

**Block Size 128**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 287883

Total cycles taken: 11234647

cache\_3

Number of accesses: 8354

Number of hits: 1707

Number of misses: 6647

Miss Rate(%): 79.56667464687574

Hit Rate(%): 20.43332535312425

cache\_2

Number of accesses: 11332

Number of hits: 2092

Number of misses: 9240

Miss Rate(%): 81.53900458877516

Hit Rate(%): 18.46099541122485

cache\_1

Number of accesses: 287883

Number of hits: 274625

Number of misses: 13258

Miss Rate(%): 4.605343142874014

Hit Rate(%): 95.39465685712598

AMATs:

{'cache\_1': 35.370493300801584,

'cache\_2': 746.3177495032933,

'cache\_3': 895.6667464687574,

'mem': 1000}

**150 x 150**

**Varying Depths of Cache**

**4 Level Cache**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 309240

Total cycles taken: 16134596

cache\_4

Number of accesses: 7502

Number of hits: 944

Number of misses: 6558

Miss Rate(%): 87.41668888296455

Hit Rate(%): 12.583311117035457

cache\_3

Number of accesses: 18049

Number of hits: 10188

Number of misses: 7861

Miss Rate(%): 43.553659482519805

Hit Rate(%): 56.446340517480195

cache\_2

Number of accesses: 66041

Number of hits: 46422

Number of misses: 19619

Miss Rate(%): 29.707303039021216

Hit Rate(%): 70.29269696097879

cache\_1

Number of accesses: 309240

Number of hits: 231324

Number of misses: 77916

Miss Rate(%): 25.19596429957315

Hit Rate(%): 74.80403570042685

AMATs:

{'cache\_1': 44.27432861597126,

'cache\_2': 171.75103163923907,

'cache\_3': 524.2853295523211,

'cache\_4': 974.1668888296455,

'mem': 1000}

**3 Level Cache**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 309240

Total cycles taken: 16042196

cache\_3

Number of accesses: 16976

Number of hits: 9170

Number of misses: 7806

Miss Rate(%): 45.98256361922714

Hit Rate(%): 54.01743638077286

cache\_2

Number of accesses: 66041

Number of hits: 47097

Number of misses: 18944

Miss Rate(%): 28.685210702442422

Hit Rate(%): 71.31478929755758

cache\_1

Number of accesses: 309240

Number of hits: 231324

Number of misses: 77916

Miss Rate(%): 25.19596429957315

Hit Rate(%): 74.80403570042685

AMATs:

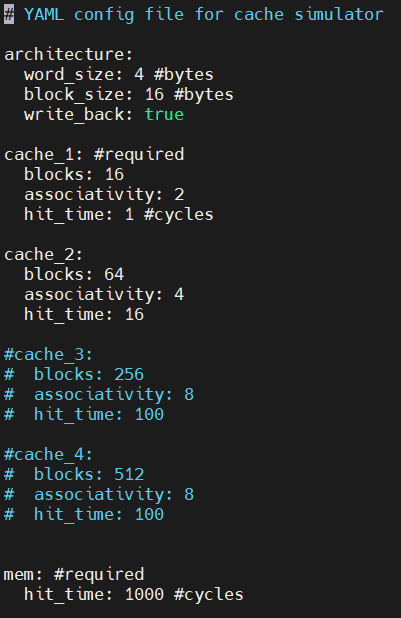
{'cache\_1': 45.492838624723156,

'cache\_2': 176.58716330804185,

'cache\_3': 559.8256361922715,

'mem': 1000}

**2 Level Cache**



Simulation complete

Number of instructions: 309240

Total cycles taken: 28185824

cache\_2

Number of accesses: 66820

Number of hits: 48243

Number of misses: 18577

Miss Rate(%): 27.801556420233464

Hit Rate(%): 72.19844357976653

cache\_1

Number of accesses: 309240

Number of hits: 231643

Number of misses: 77597

Miss Rate(%): 25.092808174880354

Hit Rate(%): 74.90719182511964

AMATs:

{'cache\_1': 74.77676152958402, 'cache\_2': 294.01556420233464, 'mem': 1000}

**1 Level Cache**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 309240

Total cycles taken: 91687240

cache\_1

Number of accesses: 309240

Number of hits: 234769

Number of misses: 74471

Miss Rate(%): 24.081942827577286

Hit Rate(%): 75.91805717242272

AMATs:

{'cache\_1': 241.81942827577285, 'mem': 1000}

**Varying Associativity of L1 Cache**

**2 Way Associativity**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 309240

Total cycles taken: 16089412

cache\_3

Number of accesses: 17639

Number of hits: 9778

Number of misses: 7861

Miss Rate(%): 44.56601848177335

Hit Rate(%): 55.43398151822666

cache\_2

Number of accesses: 64199

Number of hits: 44656

Number of misses: 19543

Miss Rate(%): 30.44128413215159

Hit Rate(%): 69.5587158678484

cache\_1

Number of accesses: 309240

Number of hits: 233031

Number of misses: 76209

Miss Rate(%): 24.64396585176562

Hit Rate(%): 75.35603414823439

AMATs:

{'cache\_1': 45.878132384692165,

'cache\_2': 182.10596725638973,

'cache\_3': 545.6601848177335,

'mem': 1000}

**4 Way Associativity**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 309240

Total cycles taken: 16074720

cache\_3

Number of accesses: 17385

Number of hits: 9771

Number of misses: 7614

Miss Rate(%): 43.79637618636756

Hit Rate(%): 56.20362381363244

cache\_2

Number of accesses: 66579

Number of hits: 47517

Number of misses: 19062

Miss Rate(%): 28.630649303834545

Hit Rate(%): 71.36935069616545

cache\_1

Number of accesses: 309240

Number of hits: 230711

Number of misses: 78529

Miss Rate(%): 25.394192213167766

Hit Rate(%): 74.60580778683223

AMATs:

{'cache\_1': 44.17584503697514,

'cache\_2': 170.02251804090454,

'cache\_3': 537.9637618636756,

'mem': 1000}

**8 Way Associativity**

A screen shot of a computer

Description automatically generated

Simulation complete

Number of instructions: 309240

Total cycles taken: 15925388

cache\_3

Number of accesses: 17443

Number of hits: 9494

Number of misses: 7949

Miss Rate(%): 45.57128934242963

Hit Rate(%): 54.42871065757037

cache\_2

Number of accesses: 61564

Number of hits: 42614

Number of misses: 18950

Miss Rate(%): 30.780975895003575

Hit Rate(%): 69.21902410499644

cache\_1

Number of accesses: 309240

Number of hits: 239194

Number of misses: 70046

Miss Rate(%): 22.651015392575346

Hit Rate(%): 77.34898460742465

AMATs:

{'cache\_1': 43.36959675690921,

'cache\_2': 187.05385177035953,

'cache\_3': 555.7128934242962,

'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: 309240

Total cycles taken: 15995324

cache\_3

Number of accesses: 16887

Number of hits: 9199

Number of misses: 7688

Miss Rate(%): 45.52614437140996

Hit Rate(%): 54.47385562859004

cache\_2

Number of accesses: 66820

Number of hits: 48243

Number of misses: 18577

Miss Rate(%): 27.801556420233464

Hit Rate(%): 72.19844357976653

cache\_1

Number of accesses: 309240

Number of hits: 231643

Number of misses: 77597

Miss Rate(%): 25.092808174880354

Hit Rate(%): 74.90719182511964

AMATs:

{'cache\_1': 43.75094940440452,

'cache\_2': 170.3713235539783,

'cache\_3': 555.2614437140996,

'mem': 1000}

**Block Size 32**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 309240

Total cycles taken: 15576960

cache\_3

Number of accesses: 16569

Number of hits: 8807

Number of misses: 7762

Miss Rate(%): 46.846520610779166

Hit Rate(%): 53.153479389220834

cache\_2

Number of accesses: 42064

Number of hits: 23613

Number of misses: 18451

Miss Rate(%): 43.864111829593

Hit Rate(%): 56.135888170407

cache\_1

Number of accesses: 309240

Number of hits: 261470

Number of misses: 47770

Miss Rate(%): 15.447548829388177

Hit Rate(%): 84.55245117061182

AMATs:

{'cache\_1': 41.99041278417421,

'cache\_2': 265.35221371944806,

'cache\_3': 568.4652061077916,

'mem': 1000}

**Block Size 64**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 309240

Total cycles taken: 14377620

cache\_3

Number of accesses: 12542

Number of hits: 4557

Number of misses: 7985

Miss Rate(%): 63.66608196459895

Hit Rate(%): 36.333918035401055

cache\_2

Number of accesses: 22240

Number of hits: 8287

Number of misses: 13953

Miss Rate(%): 62.73830935251799

Hit Rate(%): 37.26169064748201

cache\_1

Number of accesses: 309240

Number of hits: 282634

Number of misses: 26606

Miss Rate(%): 8.603673522183417

Hit Rate(%): 91.39632647781659

AMATs:

{'cache\_1': 42.14006040364801,

'cache\_2': 478.1685439082955,

'cache\_3': 736.6608196459895,

'mem': 1000}

**Block Size 128**

**A screen shot of a computer

Description automatically generated**

Simulation complete

Number of instructions: 309240

Total cycles taken: 13788116

cache\_3

Number of accesses: 10062

Number of hits: 2125

Number of misses: 7937

Miss Rate(%): 78.88093818326377

Hit Rate(%): 21.119061816736235

cache\_2

Number of accesses: 14987

Number of hits: 3859

Number of misses: 11128

Miss Rate(%): 74.25101754854207

Hit Rate(%): 25.74898245145793

cache\_1

Number of accesses: 309240

Number of hits: 291572

Number of misses: 17668

Miss Rate(%): 5.713361790195318

Hit Rate(%): 94.28663820980468

AMATs:

{'cache\_1': 39.619469596597284,

'cache\_2': 675.9500100776401,

'cache\_3': 888.8093818326377,

'mem': 1000}