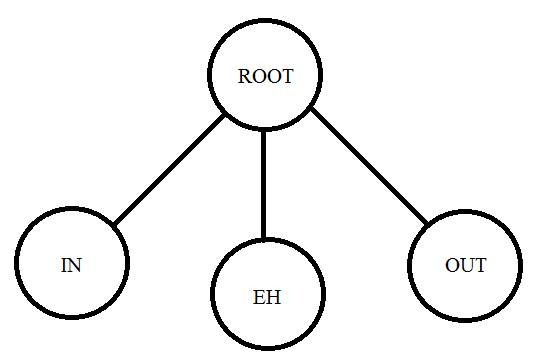
**TESTING WITH PROBABILITY TREE**

To ensure that the probability tree class and selector functions were working properly, a single-level tree and a two-level tree were tested with differing probability curves. The results of these tests can be seen below.

**ONE LEVEL**

To begin testing the basic functionality of the probability tree, I constructed a single-level tree consisting of a root with three child nodes titled “In,” “Eh,” and “Out” as can be seen in the figure below:



**Figure 1.1**

I gave each of the nodes varying probabilities to test a variety of probability curves to make sure that the selector was distributing choices properly. Then, I put a call to the selector function in a for-loop such that it selected a child node in the tree 10,000 times and incremented a count for whichever node was chosen. To get a general idea of the consistency of the program, I ran this test three separate times for each of the specified curves. The different curves for the test consisted of: Equal Probabilities, Increasing Probabilities, Decreasing Probabilities, a Bell-Curve, and an Inverse Bell-Curve. The results of each of these tests are as follows:

**Test 1: Equal Probabilities**

In, Out, and Eh all had probabilities of 0.3333333

Run 1: of 10,000

Eh? count: 3277

In count: 3344

Out count: 3379

Run 2: of 10,000

Eh? count: 3313

In count: 3328

Out count: 3359

Run 3: of 10,000

Eh? count: 3263

In count: 3318

Out count: 3419

TEST RESULTS: PASSED

**Test 2: Differing Probabilities – Increasing**

Out = 0.2, Eh = 0.3, In = 0.5

Run 1: of 10,000

Eh? count: 2948

In count: 5053

Out count: 1999

Run 2: of 10,000

Eh? count: 3018

In count: 4984

Out count: 1998

Run 3: of 10,000

Eh? count: 3057

In count: 5002

Out count: 1941

TEST RESULTS: PASSED

**Test 3: Differing Probabilities – Decreasing**

Out = 0.5, Eh = 0.3, In = 0.2

Run 1: of 10,000

Eh? count: 3050

In count: 2002

Out count: 4948

Run 2: of 10,000

Eh? count: 2970

In count: 1939

Out count: 5091

Run 3: of 10,000

Eh? count: 3016

In count: 2012

Out count: 4972

TEST RESULTS: PASSED

**Test 4: Differing Probabilities – Bell Curve**

Out = 0.2, Eh = 0.6, In = 0.2

Run 1: of 10,000

Eh? count: 6091

In count: 1938

Out count: 1971

Run 2: of 10,000

Eh? count: 6056

In count: 1947

Out count: 1997

Run 3: of 10,000

Eh? count: 6013

In count: 1992

Out count: 1995

TEST RESULTS: PASSED

**Test 5: Differing Probabilities – Inverse Bell Curve**

Out = .4, Eh = .2, In = .4

Run 1: of 10,000

Eh? count: 2042

In count: 3991

Out count: 3967

Run 2: of 10,000

Eh? count: 1960

In count: 3963

Out count: 4077

Run 3: of 10,000

Eh? count: 1942

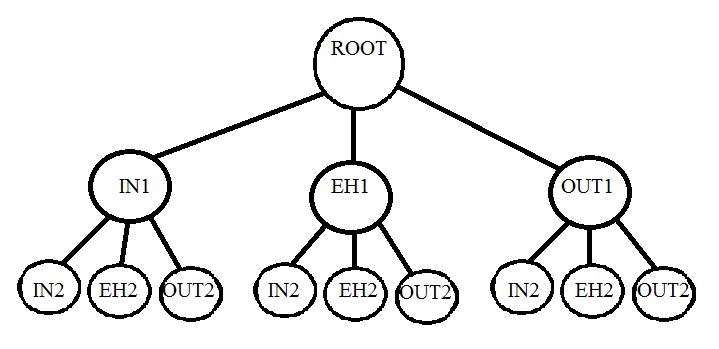
In count: 3976

Out count: 4082

TEST RESULTS: PASSED

**TWO LEVELS**

To test the probability tree structure more thoroughly, it was necessary to test a tree with multiple levels to make sure that the probabilities set remained intact. So like the first tree, I had a root with three child nodes “In1,” “Eh1,” and “Out1,” but for the two-level tree, I added an “In2,” “Eh2,” and “Out2” node to each of the first-layer nodes, as can be seen in the figure below:



**Figure 1.2**

To test this, I put a call to the selector function as the argument to a second call to the selector function, which provided an output of a second-level child node. This was wrapped with a for loop, which looped 10,000 times and kept track of how many times each second-level node was selected. To be thorough, I tested the same five probability curves as in the single-level tests, but applied all of the combinations of the trends to each child node, resulting in the 25 tests whose results can be seen on the next page.

**Test 1: Equal Probabilities**

In1, In2, Out1, Out2, Eh1, and Eh2 all had probabilities of .3333333.

0.3333333 x 0.3333333 = ~ 0.1111111

Run 1: of 10,000

Out-Out count: 1071

Out-Eh count: 1110

Out-In count: 1104

Eh-Out count: 1044

Eh-Eh count: 1136

Eh-In count: 1090

In-Out count: 1142

In-Eh count: 1165

In-In count: 1138

Run 2: of 10,000

Out-Out count: 1105

Out-Eh count: 1065

Out-In count: 1171

Eh-Out count: 1096

Eh-Eh count: 1137

Eh-In count: 1097

In-Out count: 1121

In-Eh count: 1100

In-In count: 1108

Run 3: of 10,000

Out-Out count: 1128

Out-Eh count: 1129

Out-In count: 1118

Eh-Out count: 1090

Eh-Eh count: 1125

Eh-In count: 1126

In-Out count: 1083

In-Eh count: 1104

In-In count: 1097

TEST RESULTS: PASSED

**Test 2: Differing Probabilities – Equal, Increasing**

Out1 = 0.3333333, Eh1 = 0.33333333, In1 = 0.3333333

Out2 = 0.2, Eh2 = 0.3, Eh3 = 0.5

Run 1: of 10,000

Out-Out count: 690

Out-Eh count: 985

Out-In count: 1649

Eh-Out count: 650

Eh-Eh count: 1040

Eh-In count: 1627

In-Out count: 662

In-Eh count: 989

In-In count: 1708

Run 2: of 10,000

Out-Out count: 653

Out-Eh count: 1069

Out-In count: 1650

Eh-Out count: 640

Eh-Eh count: 1029

Eh-In count: 1629

In-Out count: 611

In-Eh count: 1026

In-In count: 1693

Run 3: of 10,000

Out-Out count: 685

Out-Eh count: 1023

Out-In count: 1674

Eh-Out count: 661

Eh-Eh count: 973

Eh-In count: 1639

In-Out count: 674

In-Eh count: 1045

In-In count: 1626

TEST RESULTS: PASSED

**Test 3: Differing Probabilities – Equal, Decreasing**

Out1 = 0.3333333, Eh1 = 0.33333333, In1 = 0.3333333

Out2 = 0.5, Eh2 = 0.3, Eh3 = 0.2

Run 1: of 10,000

Out-Out count: 1615

Out-Eh count: 1010

Out-In count: 688

Eh-Out count: 1685

Eh-Eh count: 984

Eh-In count: 630

In-Out count: 1674

In-Eh count: 1016

In-In count: 698

Run 2: of 10,000

Out-Out count: 1729

Out-Eh count: 1021

Out-In count: 653

Eh-Out count: 1671

Eh-Eh count: 968

Eh-In count: 688

In-Out count: 1655

In-Eh count: 955

In-In count: 660

Run 3: of 10,000

Out-Out count: 1725

Out-Eh count: 985

Out-In count: 674

Eh-Out count: 1656

Eh-Eh count: 944

Eh-In count: 648

In-Out count: 1690

In-Eh count: 1014

In-In count: 664

TEST RESULTS: PASSED

**Test 4: Differing Probabilities – Equal, Bell-Curve**

Out1 = 0.3333333, Eh1 = 0.33333333, In1 = 0.3333333

Out2 = 0.2, Eh2 = 0.6, Eh3 = 0.2

Run 1: of 10,000

Out-Out count: 694

Out-Eh count: 1966

Out-In count: 695

Eh-Out count: 656

Eh-Eh count: 2069

Eh-In count: 660

In-Out count: 661

In-Eh count: 1970

In-In count: 629

Run 2: of 10,000

Out-Out count: 707

Out-Eh count: 1981

Out-In count: 639

Eh-Out count: 686

Eh-Eh count: 2039

Eh-In count: 652

In-Out count: 685

In-Eh count: 1976

In-In count: 635

Run 3: of 10,000

Out-Out count: 688

Out-Eh count: 1992

Out-In count: 644

Eh-Out count: 672

Eh-Eh count: 1952

Eh-In count: 658

In-Out count: 704

In-Eh count: 2039

In-In count: 651

TEST RESULTS: PASSED

**Test 5: Differing Probabilities – Equal, Inverse Bell-Curve**

Out1 = 0.3333333, Eh1 = 0.33333333, In1 = 0.3333333

Out2 = 0.4, Eh2 = 0.2, Eh3 = 0.4

Run 1: of 10,000

Out-Out count: 1304

Out-Eh count: 679

Out-In count: 1291

Eh-Out count: 1338

Eh-Eh count: 622

Eh-In count: 1285

In-Out count: 1384

In-Eh count: 711

In-In count: 1386

Run 2: of 10,000

Out-Out count: 1376

Out-Eh count: 677

Out-In count: 1342

Eh-Out count: 1332

Eh-Eh count: 656

Eh-In count: 1333

In-Out count: 1335

In-Eh count: 598

In-In count: 1351

Run 3: of 10,000

Out-Out count: 1401

Out-Eh count: 662

Out-In count: 1301

Eh-Out count: 1314

Eh-Eh count: 668

Eh-In count: 1324

In-Out count: 1377

In-Eh count: 653

In-In count: 1300

TEST RESULTS: PASSED

**Test 6: Differing Probabilities – Increasing, Equal**

Out1 = .2, Eh1 = .3, In1 = .5

Out2 = 0.3333333, Eh2 = 0.3333333, In2 = 0.3333333

0.2 x 0.3333333 = 0.06666666  ~ 0.0667

0.3 x 0.3333333 = 0.09999999  ~ 0.1000

0.5 x 0.3333333 = 0.16666665  ~ 0.1667

Run 1: of 10,000

Out-Out count: 694

Out-Eh count: 688

Out-In count: 665

Eh-Out count: 954

Eh-Eh count: 998

Eh-In count: 982

In-Out count: 1661

In-Eh count: 1663

In-In count: 1695

Run 2: of 10,000

Out-Out count: 671

Out-Eh count: 634

Out-In count: 706

Eh-Out count: 993

Eh-Eh count: 996

Eh-In count: 972

In-Out count: 1637

In-Eh count: 1744

In-In count: 1647

Run 3: of 10,000

Out-Out count: 678

Out-Eh count: 674

Out-In count: 663

Eh-Out count: 990

Eh-Eh count: 1004

Eh-In count: 1045

In-Out count: 1627

In-Eh count: 1688

In-In count: 1631

TEST RESULTS: PASSED

**Test 7: Differing Probabilities – Increasing, Increasing**

Out1 = 0.2, Eh1 = 0.3, In1 = 0.5

Out2 = 0.2, Eh2 = 0.3, In2 = 0.5

*0.2 x 0.2 = 0.0400*

*0.2 x 0.3 = 0.0600*

*0.2 x 0.5 = 0.1000*

*0.3 x 0.2 = 0.0600*

*0.3 x 0.3 = 0.0900*

*0.3 x 0.5 = 0.1500*

*0.5 x 0.2 = 0.1000*

*0.5 x 0.3 = 0.1500*

*0.5 x 0.5 = 0.2500*

Run 1: of 10,000

Out-Out count: 445

Out-Eh count: 571

Out-In count: 1032

Eh-Out count: 584

Eh-Eh count: 913

Eh-In count: 1475

In-Out count: 1008

In-Eh count: 1494

In-In count: 2478

Run 2: of 10,000

Out-Out count: 381

Out-Eh count: 610

Out-In count: 975

Eh-Out count: 642

Eh-Eh count: 929

Eh-In count: 1443

In-Out count: 990

In-Eh count: 1481

In-In count: 2549

Run 3: of 10,000

Out-Out count: 378

Out-Eh count: 588

Out-In count: 993

Eh-Out count: 624

Eh-Eh count: 949

Eh-In count: 1434

In-Out count: 973

In-Eh count: 1541

In-In count: 2520

TEST RESULTS: PASSED

**Test 8: Differing Probabilities – Increasing, Decreasing**

Out1 = 0.2, Eh1 = 0.3, In1 = 0.5

Out2 = 0.5, Eh2 = 0.3, In2 = 0.2

Run 1: of 10,000

Out-Out count: 991

Out-Eh count: 580

Out-In count: 400

Eh-Out count: 1556

Eh-Eh count: 899

Eh-In count: 674

In-Out count: 2389

In-Eh count: 1528

In-In count: 983

Run 2: of 10,000

Out-Out count: 997

Out-Eh count: 598

Out-In count: 382

Eh-Out count: 1463

Eh-Eh count: 953

Eh-In count: 579

In-Out count: 2553

In-Eh count: 1491

In-In count: 984

Run 3: of 10,000

Out-Out count: 1025

Out-Eh count: 604

Out-In count: 399

Eh-Out count: 1537

Eh-Eh count: 928

Eh-In count: 591

In-Out count: 2424

In-Eh count: 1487

In-In count: 1005

TEST RESULTS: PASSED

**Test 9: Differing Probabilities – Increasing, Bell-Curve**

Out1 = 0.2, Eh1 = 0.3, In1 = 0.5

Out2 = 0.2, Eh2 = 0.6, In2 = 0.2

Run 1: of 10,000

Out-Out count: 425

Out-Eh count: 1166

Out-In count: 408

Eh-Out count: 605

Eh-Eh count: 1791

Eh-In count: 584

In-Out count: 991

In-Eh count: 3017

In-In count: 1013

Run 2: of 10,000

Out-Out count: 394

Out-Eh count: 1132

Out-In count: 376

Eh-Out count: 596

Eh-Eh count: 1866

Eh-In count: 625

In-Out count: 1012

In-Eh count: 3009

In-In count: 990

Run 3: of 10,000

Out-Out count: 423

Out-Eh count: 1140

Out-In count: 432

Eh-Out count: 572

Eh-Eh count: 1774

Eh-In count: 597

In-Out count: 993

In-Eh count: 3042

In-In count: 1027

TEST RESULTS: PASSED

**Test 10: Differing Probabilities – Increasing, Inverse Bell-Curve**

Out1 = 0.2, Eh1 = 0.3, In1 = 0.5

Out2 = 0.4, Eh2 = 0.2, In2 = 0.4

Run 1: of 10,000

Out-Out count: 795

Out-Eh count: 432

Out-In count: 800

Eh-Out count: 1212

Eh-Eh count: 604

Eh-In count: 1181

In-Out count: 2011

In-Eh count: 1018

In-In count: 1947

Run 2: of 10,000

Out-Out count: 784

Out-Eh count: 413

Out-In count: 803

Eh-Out count: 1224

Eh-Eh count: 589

Eh-In count: 1213

In-Out count: 2017

In-Eh count: 990

In-In count: 1967

Run 3: of 10,000

Out-Out count: 802

Out-Eh count: 382

Out-In count: 769

Eh-Out count: 1198

Eh-Eh count: 605

Eh-In count: 1241

In-Out count: 1967

In-Eh count: 976

In-In count: 2060

TEST RESULTS: PASSED

**Test 11: Differing Probabilities – Decreasing, Equal**

Out1 = 0.5, Eh1 = 0.3, In1 = 0.2

Out2 = 0.3333333, Eh2 = 0.3333333, In2 = 0.3333333

0.5 x 0.3333333 = 0.16666665  ~ 0.1667

0.3 x 0.3333333 = 0.09999999  ~ 0.1000

0.2 x 0.3333333 = 0.06666666  ~ 0.0667

Run 1: of 10,000

Out-Out count: 1617

Out-Eh count: 1713

Out-In count: 1657

Eh-Out count: 1039

Eh-Eh count: 1062

Eh-In count: 984

In-Out count: 658

In-Eh count: 629

In-In count: 641

Run 2: of 10,000

Out-Out count: 1641

Out-Eh count: 1605

Out-In count: 1755

Eh-Out count: 931

Eh-Eh count: 1014

Eh-In count: 1031

In-Out count: 672

In-Eh count: 669

In-In count: 682

Run 3: of 10,000

Out-Out count: 1592

Out-Eh count: 1706

Out-In count: 1715

Eh-Out count: 999

Eh-Eh count: 962

Eh-In count: 987

In-Out count: 684

In-Eh count: 692

In-In count: 663

TEST RESULTS: PASSED

**Test 12: Differing Probabilities – Decreasing, Increasing**

Out1 = 0.5, Eh1 = 0.3, In1 = 0.2

Out2 = 0.2, Eh2 = 0.3, In2 = 0.5

Run 1: of 10,000

Out-Out count: 1002

Out-Eh count: 1541

Out-In count: 2521

Eh-Out count: 575

Eh-Eh count: 860

Eh-In count: 1464

In-Out count: 404

In-Eh count: 611

In-In count: 1022

Run 2: of 10,000

Out-Out count: 1018

Out-Eh count: 1504

Out-In count: 2519

Eh-Out count: 566

Eh-Eh count: 924

Eh-In count: 1465

In-Out count: 381

In-Eh count: 592

In-In count: 1031

Run 3: of 10,000

Out-Out count: 1035

Out-Eh count: 1572

Out-In count: 2449

Eh-Out count: 624

Eh-Eh count: 896

Eh-In count: 1477

In-Out count: 351

In-Eh count: 638

In-In count: 958

TEST RESULTS: PASSED

**Test 13: Differing Probabilities – Decreasing, Decreasing**

Out1 = 0.5, Eh1 = 0.3, In1 = 0.2

Out2 = 0.5, Eh2 = 0.3, In2 = 0.2

Run 1: of 10,000

Out-Out count: 2561

Out-Eh count: 1522

Out-In count: 1007

Eh-Out count: 1514

Eh-Eh count: 883

Eh-In count: 598

In-Out count: 959

In-Eh count: 594

In-In count: 362

Run 2: of 10,000

Out-Out count: 2518

Out-Eh count: 1482

Out-In count: 1065

Eh-Out count: 1461

Eh-Eh count: 892

Eh-In count: 606

In-Out count: 993

In-Eh count: 584

In-In count: 399

Run 3: of 10,000

Out-Out count: 2436

Out-Eh count: 1511

Out-In count: 1018

Eh-Out count: 1563

Eh-Eh count: 926

Eh-In count: 575

In-Out count: 1007

In-Eh count: 566

In-In count: 398

TEST RESULTS: PASSED

**Test 14: Differing Probabilities – Decreasing, Bell-Curve**

Out1 = 0.5, Eh1 = 0.3, In1 = 0.2

Out2 = 0.2, Eh2 = 0.6, In2 = 0.2

Run 1: of 10,000

Out-Out count: 970

Out-Eh count: 2999

Out-In count: 991

Eh-Out count: 619

Eh-Eh count: 1811

Eh-In count: 623

In-Out count: 408

In-Eh count: 1156

In-In count: 423

Run 2: of 10,000

Out-Out count: 955

Out-Eh count: 3116

Out-In count: 1013

Eh-Out count: 600

Eh-Eh count: 1759

Eh-In count: 604

In-Out count: 390

In-Eh count: 1175

In-In count: 388

Run 3: of 10,000

Out-Out count: 1016

Out-Eh count: 3006

Out-In count: 998

Eh-Out count: 626

Eh-Eh count: 1795

Eh-In count: 555

In-Out count: 408

In-Eh count: 1188

In-In count: 408

TEST RESULTS: PASSED

**Test 15: Differing Probabilities – Decreasing, Inverse Bell-Curve**

Out1 = 0.5, Eh1 = 0.3, In1 = 0.2

Out2 = 0.4, Eh2 = 0.2, In2 = 0.4

Run 1: of 10,000

Out-Out count: 2006

Out-Eh count: 958

Out-In count: 2012

Eh-Out count: 1183

Eh-Eh count: 583

Eh-In count: 1253

In-Out count: 806

In-Eh count: 392

In-In count: 807

Run 2: of 10,000

Out-Out count: 2004

Out-Eh count: 1001

Out-In count: 1960

Eh-Out count: 1202

Eh-Eh count: 597

Eh-In count: 1232

In-Out count: 815

In-Eh count: 416

In-In count: 773

Run 3: of 10,000

Out-Out count: 2021

Out-Eh count: 988

Out-In count: 2009

Eh-Out count: 1196

Eh-Eh count: 577

Eh-In count: 1210

In-Out count: 767

In-Eh count: 403

In-In count: 829

TEST RESULTS: PASSED

**Test 16: Differing Probabilities – Bell Curve, Equal**

Out1 = 0.2, Eh1 = 0.6, In1 = 0.2

Out2 = 0.3333333, Eh2 = 0.3333333, In2 = 0.3333333

0.2 x 0.3333333 = 0.06666666  ~ 0.0667

0.6 x 0.3333333 = 0.19999998  ~ 0.2000

Run 1: of 10,000

Out-Out count: 687

Out-Eh count: 680

Out-In count: 676

Eh-Out count: 2001

Eh-Eh count: 2099

Eh-In count: 1957

In-Out count: 644

In-Eh count: 628

In-In count: 628

Run 2: of 10,000

Out-Out count: 682

Out-Eh count: 647

Out-In count: 648

Eh-Out count: 2090

Eh-Eh count: 1928

Eh-In count: 2017

In-Out count: 627

In-Eh count: 709

In-In count: 652

Run 3: of 10,000

Out-Out count: 705

Out-Eh count: 643

Out-In count: 683

Eh-Out count: 1948

Eh-Eh count: 2049

Eh-In count: 1966

In-Out count: 666

In-Eh count: 682

In-In count: 658

TEST RESULTS: PASSED

**Test 17: Differing Probabilities – Bell-Curve, Increasing**

Out1 = 0.2, Eh1 = 0.6, In1 = 0.2

Out2 = 0.2, Eh2 = 0.3, In2 = 0.5

Run 1: of 10,000

Out-Out count: 385

Out-Eh count: 608

Out-In count: 1010

Eh-Out count: 1167

Eh-Eh count: 1805

Eh-In count: 2982

In-Out count: 421

In-Eh count: 600

In-In count: 1022

Run 2: of 10,000

Out-Out count: 397

Out-Eh count: 581

Out-In count: 1036

Eh-Out count: 1184

Eh-Eh count: 1777

Eh-In count: 2972

In-Out count: 433

In-Eh count: 583

In-In count: 1037

Run 3: of 10,000

Out-Out count: 411

Out-Eh count: 648

Out-In count: 1081

Eh-Out count: 1187

Eh-Eh count: 1781

Eh-In count: 2903

In-Out count: 369

In-Eh count: 569

In-In count: 1051

TEST RESULTS: PASSED

**Test 18: Differing Probabilities – Bell-Curve, Decreasing**

Out1 = 0.2, Eh1 = 0.6, In1 = 0.2

Out2 = 0.5, Eh2 = 0.3, In2 = 0.2

Run 1: of 10,000

Out-Out count: 1040

Out-Eh count: 600

Out-In count: 364

Eh-Out count: 3021

Eh-Eh count: 1751

Eh-In count: 1277

In-Out count: 974

In-Eh count: 599

In-In count: 374

Run 2: of 10,000

Out-Out count: 1009

Out-Eh count: 564

Out-In count: 407

Eh-Out count: 2996

Eh-Eh count: 1797

Eh-In count: 1202

In-Out count: 1028

In-Eh count: 599

In-In count: 398

Run 3: of 10,000

Out-Out count: 1021

Out-Eh count: 612

Out-In count: 346

Eh-Out count: 2972

Eh-Eh count: 1856

Eh-In count: 1159

In-Out count: 1028

In-Eh count: 601

In-In count: 405

TEST RESULTS: PASSED

**Test 19: Differing Probabilities – Bell-Curve, Bell-Curve**

Out1 = 0.2, Eh1 = 0.6, In1 = 0.2

Out2 = 0.2, Eh2 = 0.6, In2 = 0.2

Run 1: of 10,000

Out-Out count: 410

Out-Eh count: 1266

Out-In count: 400

Eh-Out count: 1173

Eh-Eh count: 3629

Eh-In count: 1183

In-Out count: 403

In-Eh count: 1196

In-In count: 340

Run 2: of 10,000

Out-Out count: 429

Out-Eh count: 1173

Out-In count: 413

Eh-Out count: 1215

Eh-Eh count: 3592

Eh-In count: 1207

In-Out count: 396

In-Eh count: 1194

In-In count: 381

Run 3: of 10,000

Out-Out count: 397

Out-Eh count: 1257

Out-In count: 371

Eh-Out count: 1224

Eh-Eh count: 3579

Eh-In count: 1163

In-Out count: 406

In-Eh count: 1225

In-In count: 378

TEST RESULTS: PASSED

**Test 20: Differing Probabilities – Bell-Curve, Inverse Bell-Curve**

Out1 = 0.2, Eh1 = 0.6, In1 = 0.2

Out2 = 0.4, Eh2 = 0.2, In2 = 0.4

Run 1: of 10,000

Out-Out count: 817

Out-Eh count: 425

Out-In count: 850

Eh-Out count: 2428

Eh-Eh count: 1158

Eh-In count: 2307

In-Out count: 807

In-Eh count: 429

In-In count: 779

Run 2: of 10,000

Out-Out count: 760

Out-Eh count: 451

Out-In count: 803

Eh-Out count: 2486

Eh-Eh count: 1209

Eh-In count: 2344

In-Out count: 784

In-Eh count: 386

In-In count: 777

Run 3: of 10,000

Out-Out count: 831

Out-Eh count: 401

Out-In count: 831

Eh-Out count: 2362

Eh-Eh count: 1217

Eh-In count: 2362

In-Out count: 789

In-Eh count: 426

In-In count: 781

TEST RESULTS: PASSED

**Test 21: Differing Probabilities – Inverse Bell Curve, Equal**

Out1 = 0.4, Eh1 = 0.2, In1 = 0.4

Out2 = 0.3333333, Eh2 = 0.3333333, In2 = 0.3333333

Run 1: of 10,000

Out-Out count: 1320

Out-Eh count: 1348

Out-In count: 1343

Eh-Out count: 723

Eh-Eh count: 692

Eh-In count: 666

In-Out count: 1323

In-Eh count: 1328

In-In count: 1257

Run 2: of 10,000

Out-Out count: 1328

Out-Eh count: 1367

Out-In count: 1299

Eh-Out count: 707

Eh-Eh count: 676

Eh-In count: 666

In-Out count: 1404

In-Eh count: 1288

In-In count: 1265

Run 3: of 10,000

Out-Out count: 1316

Out-Eh count: 1366

Out-In count: 1406

Eh-Out count: 630

Eh-Eh count: 673

Eh-In count: 646

In-Out count: 1309

In-Eh count: 1310

In-In count: 1344

TEST RESULTS: PASSED

**Test 22: Differing Probabilities – Inverse Bell-Curve, Increasing**

Out1 = 0.4, Eh1 = 0.2, In1 = 0.4

Out2 = 0.2, Eh2 = 0.3, In2 = 0.5

Run 1: of 10,000

Out-Out count: 827

Out-Eh count: 1175

Out-In count: 2058

Eh-Out count: 427

Eh-Eh count: 564

Eh-In count: 979

In-Out count: 810

In-Eh count: 1214

In-In count: 1946

Run 2: of 10,000

Out-Out count: 808

Out-Eh count: 1197

Out-In count: 2008

Eh-Out count: 384

Eh-Eh count: 616

Eh-In count: 996

In-Out count: 777

In-Eh count: 1210

In-In count: 2004

Run 3: of 10,000

Out-Out count: 784

Out-Eh count: 1165

Out-In count: 2018

Eh-Out count: 394

Eh-Eh count: 614

Eh-In count: 1049

In-Out count: 779

In-Eh count: 1229

In-In count: 1968

TEST RESULTS: PASSED

**Test 23: Differing Probabilities – Inverse Bell-Curve, Decreasing**

Out1 = 0.4, Eh1 = 0.2, In1 = 0.4

Out2 = 0.5, Eh2 = 0.3, In2 = 0.2

Run 1: of 10,000

Out-Out count: 1954

Out-Eh count: 1132

Out-In count: 804

Eh-Out count: 1038

Eh-Eh count: 623

Eh-In count: 381

In-Out count: 2013

In-Eh count: 1235

In-In count: 820

Run 2: of 10,000

Out-Out count: 2060

Out-Eh count: 1164

Out-In count: 820

Eh-Out count: 975

Eh-Eh count: 599

Eh-In count: 437

In-Out count: 1944

In-Eh count: 1150

In-In count: 851

Run 3: of 10,000

Out-Out count: 2080

Out-Eh count: 1183

Out-In count: 781

Eh-Out count: 961

Eh-Eh count: 604

Eh-In count: 393

In-Out count: 1976

In-Eh count: 1282

In-In count: 740

TEST RESULTS: PASSED

**Test 24: Differing Probabilities – Inverse Bell-Curve, Bell-Curve**

Out1 = 0.4, Eh1 = 0.2, In1 = 0.4

Out2 = 0.2, Eh2 = 0.6, In2 = 0.2

Run 1: of 10,000

Out-Out count: 813

Out-Eh count: 2342

Out-In count: 840

Eh-Out count: 435

Eh-Eh count: 1134

Eh-In count: 401

In-Out count: 773

In-Eh count: 2475

In-In count: 787

Run 2: of 10,000

Out-Out count: 817

Out-Eh count: 2378

Out-In count: 732

Eh-Out count: 462

Eh-Eh count: 1167

Eh-In count: 413

In-Out count: 783

In-Eh count: 2417

In-In count: 831

Run 3: of 10,000

Out-Out count: 825

Out-Eh count: 2412

Out-In count: 755

Eh-Out count: 424

Eh-Eh count: 1197

Eh-In count: 417

In-Out count: 773

In-Eh count: 2383

In-In count: 814

TEST RESULTS: PASSED

**Test 25: Differing Probabilities – Inverse Bell-Curve, Inverse Bell-Curve**

Out1 = 0.4, Eh1 = 0.2, In1 = 0.4

Out2 = 0.4, Eh2 = 0.2, In2 = 0.4

Run 1: of 10,000

Out-Out count: 1618

Out-Eh count: 832

Out-In count: 1598

Eh-Out count: 788

Eh-Eh count: 425

Eh-In count: 782

In-Out count: 1629

In-Eh count: 804

In-In count: 1524

Run 2: of 10,000

Out-Out count: 1590

Out-Eh count: 827

Out-In count: 1634

Eh-Out count: 772

Eh-Eh count: 364

Eh-In count: 794

In-Out count: 1616

In-Eh count: 797

In-In count: 1606

Run 3: of 10,000

Out-Out count: 1604

Out-Eh count: 813

Out-In count: 1598

Eh-Out count: 814

Eh-Eh count: 426

Eh-In count: 754

In-Out count: 1566

In-Eh count: 786

In-In count: 1639

TEST RESULTS: PASSED

**OVERALL RESULTS: PASSED**

Need to handle case where sum of child probabilities < 1. That fails.