**Project A: Exact Solutions of One-Factor Plain Option:**

**a)**

Batch 1:

Call Price = 2.13337 ,Put Price = 5.84628

Batch 2:

Call Price = 7.96557 ,Put Price = 7.96557

Batch 3:

Call Price = 0.204058, Put Price = 4.07326

Batch 4:

Cal Price = 92.1757, Put Price = 1.2475

**b)**

Batch 1:

Call Price = 2.13337,Put Price = 5.84628

Batch 2:

Call Price = 7.96557,Put Price = 7.96557

Batch 3:

Call Price = 0.204058,Put Price = 4.07326

Batch 4:

Call Price = 92.1757,Put Price = 1.2475

**c)**

Batch 1: S = 10 ,Call Price = 7.792e-36, Put Price = 53.7129

Batch 2: S = 10 ,Call Price = 3.05867e-31, Put Price = 90

Batch 3: S = 10 ,Call Price = 2.48011, Put Price = 1.34932

Batch 4: S = 10 ,Call Price = 2.48011, Put Price = 1.34932

Batch 1: S = 11 ,Call Price = 1.88964e-32, Put Price = 52.7129

Batch 2: S = 11 ,Call Price = 7.50875e-29, Put Price = 89

Batch 3: S = 11 ,Call Price = 3.20115, Put Price = 1.07036

Batch 4: S = 11 ,Call Price = 3.20115, Put Price = 1.07036

Batch 1: S = 12 ,Call Price = 1.64204e-29, Put Price = 51.7129

Batch 2: S = 12 ,Call Price = 9.39062e-27, Put Price = 88

Batch 3: S = 12 ,Call Price = 3.97989, Put Price = 0.849091

Batch 4: S = 12 ,Call Price = 3.97989, Put Price = 0.849091

Batch 1: S = 13 ,Call Price = 6.19303e-27, Put Price = 50.7129

Batch 2: S = 13 ,Call Price = 6.76817e-25, Put Price = 87

Batch 3: S = 13 ,Call Price = 4.80493, Put Price = 0.674134

Batch 4: S = 13 ,Call Price = 4.80493, Put Price = 0.674134

Batch 1: S = 14 ,Call Price = 1.17207e-24, Put Price = 49.7129

Batch 2: S = 14 ,Call Price = 3.08735e-23, Put Price = 86

Batch 3: S = 14 ,Call Price = 5.6668, Put Price = 0.536003

Batch 4: S = 14 ,Call Price = 5.6668, Put Price = 0.536003

Batch 1: S = 15 ,Call Price = 1.24529e-22, Put Price = 48.7129

Batch 2: S = 15 ,Call Price = 9.58525e-22, Put Price = 85

Batch 3: S = 15 ,Call Price = 6.55778, Put Price = 0.426982

Batch 4: S = 15 ,Call Price = 6.55778, Put Price = 0.426982

Batch 1: S = 16 ,Call Price = 8.11387e-21, Put Price = 47.7129

Batch 2: S = 16 ,Call Price = 2.14514e-20, Put Price = 84

Batch 3: S = 16 ,Call Price = 7.47169, Put Price = 0.340889

Batch 4: S = 16 ,Call Price = 7.47169, Put Price = 0.340889

Batch 1: S = 17 ,Call Price = 3.47944e-19, Put Price = 46.7129

Batch 2: S = 17 ,Call Price = 3.62362e-19, Put Price = 83

Batch 3: S = 17 ,Call Price = 8.40362, Put Price = 0.272821

Batch 4: S = 17 ,Call Price = 8.40362, Put Price = 0.272821

Batch 1: S = 18 ,Call Price = 1.03991e-17, Put Price = 45.7129

Batch 2: S = 18 ,Call Price = 4.79653e-18, Put Price = 82

Batch 3: S = 18 ,Call Price = 9.34971, Put Price = 0.218913

Batch 4: S = 18 ,Call Price = 9.34971, Put Price = 0.218913

Batch 1: S = 19 ,Call Price = 2.27042e-16, Put Price = 44.7129

Batch 2: S = 19 ,Call Price = 5.13087e-17, Put Price = 81

Batch 3: S = 19 ,Call Price = 10.3069, Put Price = 0.176132

Batch 4: S = 19 ,Call Price = 10.3069, Put Price = 0.176132

Batch 1: S = 20 ,Call Price = 3.76503e-15, Put Price = 43.7129

Batch 2: S = 20 ,Call Price = 4.55058e-16, Put Price = 80

Batch 3: S = 20 ,Call Price = 11.2729, Put Price = 0.142104

Batch 4: S = 20 ,Call Price = 11.2729, Put Price = 0.142104

Batch 1: S = 21 ,Call Price = 4.89964e-14, Put Price = 42.7129

Batch 2: S = 21 ,Call Price = 3.41899e-15, Put Price = 79

Batch 3: S = 21 ,Call Price = 12.2458, Put Price = 0.114972

Batch 4: S = 21 ,Call Price = 12.2458, Put Price = 0.114972

Batch 1: S = 22 ,Call Price = 5.1436e-13, Put Price = 41.7129

Batch 2: S = 22 ,Call Price = 2.21616e-14, Put Price = 78

Batch 3: S = 22 ,Call Price = 13.2241, Put Price = 0.0932814

Batch 4: S = 22 ,Call Price = 13.2241, Put Price = 0.0932814

Batch 1: S = 23 ,Call Price = 4.45934e-12, Put Price = 40.7129

Batch 2: S = 23 ,Call Price = 1.25872e-13, Put Price = 77

Batch 3: S = 23 ,Call Price = 14.2067, Put Price = 0.0758952

Batch 4: S = 23 ,Call Price = 14.2067, Put Price = 0.0758952

Batch 1: S = 24 ,Call Price = 3.25772e-11, Put Price = 39.7129

Batch 2: S = 24 ,Call Price = 6.34869e-13, Put Price = 76

Batch 3: S = 24 ,Call Price = 15.1927, Put Price = 0.0619213

Batch 4: S = 24 ,Call Price = 15.1927, Put Price = 0.0619213

Batch 1: S = 25 ,Call Price = 2.0405e-10, Put Price = 38.7129

Batch 2: S = 25 ,Call Price = 2.87668e-12, Put Price = 75

Batch 3: S = 25 ,Call Price = 16.1815, Put Price = 0.050659

Batch 4: S = 25 ,Call Price = 16.1815, Put Price = 0.050659

Batch 1: S = 26 ,Call Price = 1.11246e-09, Put Price = 37.7129

Batch 2: S = 26 ,Call Price = 1.18282e-11, Put Price = 74

Batch 3: S = 26 ,Call Price = 17.1724, Put Price = 0.0415573

Batch 4: S = 26 ,Call Price = 17.1724, Put Price = 0.0415573

Batch 1: S = 27 ,Call Price = 5.34891e-09, Put Price = 36.7129

Batch 2: S = 27 ,Call Price = 4.45231e-11, Put Price = 73

Batch 3: S = 27 ,Call Price = 18.165, Put Price = 0.0341815

Batch 4: S = 27 ,Call Price = 18.165, Put Price = 0.0341815

Batch 1: S = 28 ,Call Price = 2.29454e-08, Put Price = 35.7129

Batch 2: S = 28 ,Call Price = 1.54615e-10, Put Price = 72

Batch 3: S = 28 ,Call Price = 19.159, Put Price = 0.0281882

Batch 4: S = 28 ,Call Price = 19.159, Put Price = 0.0281882

Batch 1: S = 29 ,Call Price = 8.8713e-08, Put Price = 34.7129

Batch 2: S = 29 ,Call Price = 4.98755e-10, Put Price = 71

Batch 3: S = 29 ,Call Price = 20.1541, Put Price = 0.0233052

Batch 4: S = 29 ,Call Price = 20.1541, Put Price = 0.0233052

Batch 1: S = 30 ,Call Price = 3.11926e-07, Put Price = 33.7129

Batch 2: S = 30 ,Call Price = 1.50356e-09, Put Price = 70

Batch 3: S = 30 ,Call Price = 21.1501, Put Price = 0.0193162

Batch 4: S = 30 ,Call Price = 21.1501, Put Price = 0.0193162

Batch 1: S = 31 ,Call Price = 1.00545e-06, Put Price = 32.7129

Batch 2: S = 31 ,Call Price = 4.25893e-09, Put Price = 69

Batch 3: S = 31 ,Call Price = 22.1468, Put Price = 0.0160492

Batch 4: S = 31 ,Call Price = 22.1468, Put Price = 0.0160492

Batch 1: S = 32 ,Call Price = 2.99241e-06, Put Price = 31.7129

Batch 2: S = 32 ,Call Price = 1.13899e-08, Put Price = 68

Batch 3: S = 32 ,Call Price = 23.1442, Put Price = 0.0133667

Batch 4: S = 32 ,Call Price = 23.1442, Put Price = 0.0133667

Batch 1: S = 33 ,Call Price = 8.27565e-06, Put Price = 30.7129

Batch 2: S = 33 ,Call Price = 2.8884e-08, Put Price = 67

Batch 3: S = 33 ,Call Price = 24.142, Put Price = 0.0111585

Batch 4: S = 33 ,Call Price = 24.142, Put Price = 0.0111585

Batch 1: S = 34 ,Call Price = 2.13896e-05, Put Price = 29.7129

Batch 2: S = 34 ,Call Price = 6.97279e-08, Put Price = 66

Batch 3: S = 34 ,Call Price = 25.1401, Put Price = 0.00933635

Batch 4: S = 34 ,Call Price = 25.1401, Put Price = 0.00933635

Batch 1: S = 35 ,Call Price = 5.19359e-05, Put Price = 28.713

Batch 2: S = 35 ,Call Price = 1.60803e-07, Put Price = 65

Batch 3: S = 35 ,Call Price = 26.1386, Put Price = 0.00782914

Batch 4: S = 35 ,Call Price = 26.1386, Put Price = 0.00782914

Batch 1: S = 36 ,Call Price = 0.000119024, Put Price = 27.713

Batch 2: S = 36 ,Call Price = 3.5539e-07, Put Price = 64

Batch 3: S = 36 ,Call Price = 27.1374, Put Price = 0.0065795

Batch 4: S = 36 ,Call Price = 27.1374, Put Price = 0.0065795

Batch 1: S = 37 ,Call Price = 0.000258548, Put Price = 26.7132

Batch 2: S = 37 ,Call Price = 7.54907e-07, Put Price = 63

Batch 3: S = 37 ,Call Price = 28.1363, Put Price = 0.00554104

Batch 4: S = 37 ,Call Price = 28.1363, Put Price = 0.00554104

Batch 1: S = 38 ,Call Price = 0.000534403, Put Price = 25.7134

Batch 2: S = 38 ,Call Price = 1.54526e-06, Put Price = 62

Batch 3: S = 38 ,Call Price = 29.1355, Put Price = 0.00467613

Batch 4: S = 38 ,Call Price = 29.1355, Put Price = 0.00467613

Batch 1: S = 39 ,Call Price = 0.00105474, Put Price = 24.714

Batch 2: S = 39 ,Call Price = 3.05545e-06, Put Price = 61

Batch 3: S = 39 ,Call Price = 30.1347, Put Price = 0.00395419

Batch 4: S = 39 ,Call Price = 30.1347, Put Price = 0.00395419

Batch 1: S = 40 ,Call Price = 0.00199417, Put Price = 23.7149

Batch 2: S = 40 ,Call Price = 5.84877e-06, Put Price = 60

Batch 3: S = 40 ,Call Price = 31.1341, Put Price = 0.00335029

Batch 4: S = 40 ,Call Price = 31.1341, Put Price = 0.00335029

Batch 1: S = 41 ,Call Price = 0.00362244, Put Price = 22.7165

Batch 2: S = 41 ,Call Price = 1.08604e-05, Put Price = 59

Batch 3: S = 41 ,Call Price = 32.1336, Put Price = 0.00284408

Batch 4: S = 41 ,Call Price = 32.1336, Put Price = 0.00284408

Batch 1: S = 42 ,Call Price = 0.00633924, Put Price = 21.7193

Batch 2: S = 42 ,Call Price = 1.95985e-05, Put Price = 58

Batch 3: S = 42 ,Call Price = 33.1332, Put Price = 0.00241887

Batch 4: S = 42 ,Call Price = 33.1332, Put Price = 0.00241887

Batch 1: S = 43 ,Call Price = 0.010714, Put Price = 20.7236

Batch 2: S = 43 ,Call Price = 3.44297e-05, Put Price = 57

Batch 3: S = 43 ,Call Price = 34.1329, Put Price = 0.00206101

Batch 4: S = 43 ,Call Price = 34.1329, Put Price = 0.00206101

Batch 1: S = 44 ,Call Price = 0.0175282, Put Price = 19.7304

Batch 2: S = 44 ,Call Price = 5.89738e-05, Put Price = 56.0001

Batch 3: S = 44 ,Call Price = 35.1326, Put Price = 0.00175922

Batch 4: S = 44 ,Call Price = 35.1326, Put Price = 0.00175922

Batch 1: S = 45 ,Call Price = 0.0278174, Put Price = 18.7407

Batch 2: S = 45 ,Call Price = 9.8635e-05, Put Price = 55.0001

Batch 3: S = 45 ,Call Price = 36.1323, Put Price = 0.00150425

Batch 4: S = 45 ,Call Price = 36.1323, Put Price = 0.00150425

Batch 1: S = 46 ,Call Price = 0.0429083, Put Price = 17.7558

Batch 2: S = 46 ,Call Price = 0.000161299, Put Price = 54.0002

Batch 3: S = 46 ,Call Price = 37.1321, Put Price = 0.00128842

Batch 4: S = 46 ,Call Price = 37.1321, Put Price = 0.00128842

Batch 1: S = 47 ,Call Price = 0.0644467, Put Price = 16.7774

Batch 2: S = 47 ,Call Price = 0.000258226, Put Price = 53.0003

Batch 3: S = 47 ,Call Price = 38.1319, Put Price = 0.00110539

Batch 4: S = 47 ,Call Price = 38.1319, Put Price = 0.00110539

Batch 1: S = 48 ,Call Price = 0.0944125, Put Price = 15.8073

Batch 2: S = 48 ,Call Price = 0.000405172, Put Price = 52.0004

Batch 3: S = 48 ,Call Price = 39.1317, Put Price = 0.000949906

Batch 4: S = 48 ,Call Price = 39.1317, Put Price = 0.000949906

Batch 1: S = 49 ,Call Price = 0.135117, Put Price = 14.848

Batch 2: S = 49 ,Call Price = 0.000623757, Put Price = 51.0006

Batch 3: S = 49 ,Call Price = 40.1316, Put Price = 0.000817588

Batch 4: S = 49 ,Call Price = 40.1316, Put Price = 0.000817588

Batch 1: S = 50 ,Call Price = 0.189181, Put Price = 13.9021

Batch 2: S = 50 ,Call Price = 0.000943109, Put Price = 50.0009

Batch 3: S = 50 ,Call Price = 41.1315, Put Price = 0.000704793

Batch 4: S = 50 ,Call Price = 41.1315, Put Price = 0.000704793

**d)**

Batch 1: T = 1 ,Call Price = 7.15299, Put Price = 7.15556

Batch 2: T = 1 ,Call Price = 7.96557, Put Price = 7.96557

Batch 3: T = 1 ,Call Price = 0.204058, Put Price = 4.07326

Batch 4: T = 1 ,Call Price = 91.1308, Put Price = 1.75365e-06

Batch 1: T = 2 ,Call Price = 12.1667, Put Price = 7.55609

Batch 2: T = 2 ,Call Price = 11.2463, Put Price = 11.2463

Batch 3: T = 2 ,Call Price = 0.676004, Put Price = 3.54228

Batch 4: T = 2 ,Call Price = 92.1345, Put Price = 0.000746234

Batch 1: T = 3 ,Call Price = 16.347, Put Price = 7.47778

Batch 2: T = 3 ,Call Price = 13.751, Put Price = 13.751

Batch 3: T = 3 ,Call Price = 1.15381, Put Price = 3.13058

Batch 4: T = 3 ,Call Price = 93.0294, Put Price = 0.00617828

Batch 1: T = 4 ,Call Price = 20.0025, Put Price = 7.20216

Batch 2: T = 4 ,Call Price = 15.8519, Put Price = 15.8519

Batch 3: T = 4 ,Call Price = 1.59249, Put Price = 2.78033

Batch 4: T = 4 ,Call Price = 93.8302, Put Price = 0.0180434

Batch 1: T = 5 ,Call Price = 23.265, Put Price = 6.83576

Batch 2: T = 5 ,Call Price = 17.6937, Put Price = 17.6937

Batch 3: T = 5 ,Call Price = 1.98557, Put Price = 2.47368

Batch 4: T = 5 ,Call Price = 94.5459, Put Price = 0.0340504

Batch 1: T = 6 ,Call Price = 26.2087, Put Price = 6.42963

Batch 2: T = 6 ,Call Price = 19.3504, Put Price = 19.3504

Batch 3: T = 6 ,Call Price = 2.33481, Put Price = 2.20233

Batch 4: T = 6 ,Call Price = 95.1837, Put Price = 0.0511891

Batch 1: T = 7 ,Call Price = 28.8826, Put Price = 6.01115

Batch 2: T = 7 ,Call Price = 20.8663, Put Price = 20.8663

Batch 3: T = 7 ,Call Price = 2.64404, Put Price = 1.96115

Batch 4: T = 7 ,Call Price = 95.7501, Put Price = 0.0672548

Batch 1: T = 8 ,Call Price = 31.3219, Put Price = 5.59588

Batch 2: T = 8 ,Call Price = 22.2703, Put Price = 22.2703

Batch 3: T = 8 ,Call Price = 2.91744, Put Price = 1.74637

Batch 4: T = 8 ,Call Price = 96.2521, Put Price = 0.0809994

Batch 1: T = 9 ,Call Price = 33.554, Put Price = 5.19285

Batch 2: T = 9 ,Call Price = 23.5823, Put Price = 23.5823

Batch 3: T = 9 ,Call Price = 3.159, Put Price = 1.55496

Batch 4: T = 9 ,Call Price = 96.6959, Put Price = 0.0918929

Batch 1: T = 10 ,Call Price = 35.6009, Put Price = 4.80725

Batch 2: T = 10 ,Call Price = 24.817, Put Price = 24.817

Batch 3: T = 10 ,Call Price = 3.37238, Put Price = 1.38433

Batch 4: T = 10 ,Call Price = 97.0879, Put Price = 0.0998622

Batch 1: T = 11 ,Call Price = 37.481, Put Price = 4.44193

Batch 2: T = 11 ,Call Price = 25.9856, Put Price = 25.9856

Batch 3: T = 11 ,Call Price = 3.56087, Put Price = 1.23223

Batch 4: T = 11 ,Call Price = 97.4337, Put Price = 0.105095

Batch 1: T = 12 ,Call Price = 39.2102, Put Price = 4.09822

Batch 2: T = 12 ,Call Price = 27.0966, Put Price = 27.0966

Batch 3: T = 12 ,Call Price = 3.72738, Put Price = 1.09666

Batch 4: T = 12 ,Call Price = 97.7386, Put Price = 0.107908

Batch 1: T = 13 ,Call Price = 40.802, Put Price = 3.77652

Batch 2: T = 13 ,Call Price = 28.1568, Put Price = 28.1568

Batch 3: T = 13 ,Call Price = 3.8745, Put Price = 0.975858

Batch 4: T = 13 ,Call Price = 98.0073, Put Price = 0.108667

Batch 1: T = 14 ,Call Price = 42.2684, Put Price = 3.4766

Batch 2: T = 14 ,Call Price = 29.1719, Put Price = 29.1719

Batch 3: T = 14 ,Call Price = 4.00449, Put Price = 0.868232

Batch 4: T = 14 ,Call Price = 98.244, Put Price = 0.107742

Batch 1: T = 15 ,Call Price = 43.6202, Put Price = 3.19785

Batch 2: T = 15 ,Call Price = 30.1465, Put Price = 30.1465

Batch 3: T = 15 ,Call Price = 4.11938, Put Price = 0.772367

Batch 4: T = 15 ,Call Price = 98.4525, Put Price = 0.105476

Batch 1: T = 16 ,Call Price = 44.867, Put Price = 2.93941

Batch 2: T = 16 ,Call Price = 31.0843, Put Price = 31.0843

Batch 3: T = 16 ,Call Price = 4.22093, Put Price = 0.686996

Batch 4: T = 16 ,Call Price = 98.6361, Put Price = 0.102176

Batch 1: T = 17 ,Call Price = 46.0173, Put Price = 2.70026

Batch 2: T = 17 ,Call Price = 31.9888, Put Price = 31.9888

Batch 3: T = 17 ,Call Price = 4.3107, Put Price = 0.610986

Batch 4: T = 17 ,Call Price = 98.7978, Put Price = 0.0981109

Batch 1: T = 18 ,Call Price = 47.079, Put Price = 2.47931

Batch 2: T = 18 ,Call Price = 32.8627, Put Price = 32.8627

Batch 3: T = 18 ,Call Price = 4.39007, Put Price = 0.543323

Batch 4: T = 18 ,Call Price = 98.9403, Put Price = 0.0935052

Batch 1: T = 19 ,Call Price = 48.0592, Put Price = 2.27547

Batch 2: T = 19 ,Call Price = 33.7083, Put Price = 33.7083

Batch 3: T = 19 ,Call Price = 4.46026, Put Price = 0.483102

Batch 4: T = 19 ,Call Price = 99.0657, Put Price = 0.0885469

Batch 1: T = 20 ,Call Price = 48.9643, Put Price = 2.0876

Batch 2: T = 20 ,Call Price = 34.5279, Put Price = 34.5279

Batch 3: T = 20 ,Call Price = 4.52233, Put Price = 0.429514

Batch 4: T = 20 ,Call Price = 99.1762, Put Price = 0.0833892

Batch 1: T = 21 ,Call Price = 49.8003, Put Price = 1.91462

Batch 2: T = 21 ,Call Price = 35.3233, Put Price = 35.3233

Batch 3: T = 21 ,Call Price = 4.57724, Put Price = 0.381834

Batch 4: T = 21 ,Call Price = 99.2736, Put Price = 0.0781551

Batch 1: T = 22 ,Call Price = 50.5726, Put Price = 1.75547

Batch 2: T = 22 ,Call Price = 36.096, Put Price = 36.096

Batch 3: T = 22 ,Call Price = 4.62581, Put Price = 0.339418

Batch 4: T = 22 ,Call Price = 99.3593, Put Price = 0.0729414

Batch 1: T = 23 ,Call Price = 51.286, Put Price = 1.60916

Batch 2: T = 23 ,Call Price = 36.8476, Put Price = 36.8476

Batch 3: T = 23 ,Call Price = 4.66877, Put Price = 0.301689

Batch 4: T = 23 ,Call Price = 99.4349, Put Price = 0.0678229

Batch 1: T = 24 ,Call Price = 51.9453, Put Price = 1.47471

Batch 2: T = 24 ,Call Price = 37.5794, Put Price = 37.5794

Batch 3: T = 24 ,Call Price = 4.70679, Put Price = 0.268134

Batch 4: T = 24 ,Call Price = 99.5015, Put Price = 0.0628561

Batch 1: T = 25 ,Call Price = 52.5544, Put Price = 1.35124

Batch 2: T = 25 ,Call Price = 38.2925, Put Price = 38.2925

Batch 3: T = 25 ,Call Price = 4.74042, Put Price = 0.238295

Batch 4: T = 25 ,Call Price = 99.5602, Put Price = 0.058082

Batch 1: T = 26 ,Call Price = 53.1174, Put Price = 1.23789

Batch 2: T = 26 ,Call Price = 38.988, Put Price = 38.988

Batch 3: T = 26 ,Call Price = 4.77019, Put Price = 0.211762

Batch 4: T = 26 ,Call Price = 99.612, Put Price = 0.0535295

Batch 1: T = 27 ,Call Price = 53.6377, Put Price = 1.13388

Batch 2: T = 27 ,Call Price = 39.6668, Put Price = 39.6668

Batch 3: T = 27 ,Call Price = 4.79653, Put Price = 0.188172

Batch 4: T = 27 ,Call Price = 99.6576, Put Price = 0.0492171

Batch 1: T = 28 ,Call Price = 54.1187, Put Price = 1.03847

Batch 2: T = 28 ,Call Price = 40.3299, Put Price = 40.3299

Batch 3: T = 28 ,Call Price = 4.81985, Put Price = 0.1672

Batch 4: T = 28 ,Call Price = 99.6978, Put Price = 0.0451555

Batch 1: T = 29 ,Call Price = 54.5632, Put Price = 0.950971

Batch 2: T = 29 ,Call Price = 40.9779, Put Price = 40.9779

Batch 3: T = 29 ,Call Price = 4.84048, Put Price = 0.148557

Batch 4: T = 29 ,Call Price = 99.7333, Put Price = 0.0413487

Batch 1: T = 30 ,Call Price = 54.9741, Put Price = 0.870751

Batch 2: T = 30 ,Call Price = 41.6118, Put Price = 41.6118

Batch 3: T = 30 ,Call Price = 4.85875, Put Price = 0.131986

Batch 4: T = 30 ,Call Price = 99.7646, Put Price = 0.037796

Batch 1: T = 31 ,Call Price = 55.3539, Put Price = 0.79722

Batch 2: T = 31 ,Call Price = 42.232, Put Price = 42.232

Batch 3: T = 31 ,Call Price = 4.87492, Put Price = 0.117258

Batch 4: T = 31 ,Call Price = 99.7922, Put Price = 0.034493

Batch 1: T = 32 ,Call Price = 55.705, Put Price = 0.729836

Batch 2: T = 32 ,Call Price = 42.8392, Put Price = 42.8392

Batch 3: T = 32 ,Call Price = 4.88923, Put Price = 0.104168

Batch 4: T = 32 ,Call Price = 99.8165, Put Price = 0.0314322

Batch 1: T = 33 ,Call Price = 56.0296, Put Price = 0.668096

Batch 2: T = 33 ,Call Price = 43.4341, Put Price = 43.4341

Batch 3: T = 33 ,Call Price = 4.9019, Put Price = 0.0925356

Batch 4: T = 33 ,Call Price = 99.838, Put Price = 0.0286042

Batch 1: T = 34 ,Call Price = 56.3297, Put Price = 0.611536

Batch 2: T = 34 ,Call Price = 44.0171, Put Price = 44.0171

Batch 3: T = 34 ,Call Price = 4.91312, Put Price = 0.0821988

Batch 4: T = 34 ,Call Price = 99.8569, Put Price = 0.0259981

Batch 1: T = 35 ,Call Price = 56.6071, Put Price = 0.559729

Batch 2: T = 35 ,Call Price = 44.5887, Put Price = 44.5887

Batch 3: T = 35 ,Call Price = 4.92306, Put Price = 0.0730138

Batch 4: T = 35 ,Call Price = 99.8736, Put Price = 0.0236023

Batch 1: T = 36 ,Call Price = 56.8635, Put Price = 0.512282

Batch 2: T = 36 ,Call Price = 45.1494, Put Price = 45.1494

Batch 3: T = 36 ,Call Price = 4.93185, Put Price = 0.0648528

Batch 4: T = 36 ,Call Price = 99.8884, Put Price = 0.0214045

Batch 1: T = 37 ,Call Price = 57.1006, Put Price = 0.468834

Batch 2: T = 37 ,Call Price = 45.6996, Put Price = 45.6996

Batch 3: T = 37 ,Call Price = 4.93964, Put Price = 0.0576019

Batch 4: T = 37 ,Call Price = 99.9014, Put Price = 0.0193921

Batch 1: T = 38 ,Call Price = 57.3198, Put Price = 0.429051

Batch 2: T = 38 ,Call Price = 46.2397, Put Price = 46.2397

Batch 3: T = 38 ,Call Price = 4.94654, Put Price = 0.0511599

Batch 4: T = 38 ,Call Price = 99.9129, Put Price = 0.0175528

Batch 1: T = 39 ,Call Price = 57.5224, Put Price = 0.392627

Batch 2: T = 39 ,Call Price = 46.7701, Put Price = 46.7701

Batch 3: T = 39 ,Call Price = 4.95265, Put Price = 0.045437

Batch 4: T = 39 ,Call Price = 99.9231, Put Price = 0.0158743

Batch 1: T = 40 ,Call Price = 57.7097, Put Price = 0.359283

Batch 2: T = 40 ,Call Price = 47.2911, Put Price = 47.2911

Batch 3: T = 40 ,Call Price = 4.95806, Put Price = 0.040353

Batch 4: T = 40 ,Call Price = 99.932, Put Price = 0.0143449

Batch 1: T = 41 ,Call Price = 57.8829, Put Price = 0.32876

Batch 2: T = 41 ,Call Price = 47.803, Put Price = 47.803

Batch 3: T = 41 ,Call Price = 4.96285, Put Price = 0.0358368

Batch 4: T = 41 ,Call Price = 99.94, Put Price = 0.0129532

Batch 1: T = 42 ,Call Price = 58.043, Put Price = 0.30082

Batch 2: T = 42 ,Call Price = 48.3063, Put Price = 48.3063

Batch 3: T = 42 ,Call Price = 4.96709, Put Price = 0.0318251

Batch 4: T = 42 ,Call Price = 99.947, Put Price = 0.0116883

Batch 1: T = 43 ,Call Price = 58.191, Put Price = 0.275248

Batch 2: T = 43 ,Call Price = 48.8011, Put Price = 48.8011

Batch 3: T = 43 ,Call Price = 4.97084, Put Price = 0.0282618

Batch 4: T = 43 ,Call Price = 99.9531, Put Price = 0.0105401

Batch 1: T = 44 ,Call Price = 58.3279, Put Price = 0.251844

Batch 2: T = 44 ,Call Price = 49.2878, Put Price = 49.2878

Batch 3: T = 44 ,Call Price = 4.97417, Put Price = 0.0250968

Batch 4: T = 44 ,Call Price = 99.9586, Put Price = 0.00949879

Batch 1: T = 45 ,Call Price = 58.4544, Put Price = 0.230425

Batch 2: T = 45 ,Call Price = 49.7665, Put Price = 49.7665

Batch 3: T = 45 ,Call Price = 4.97712, Put Price = 0.0222857

Batch 4: T = 45 ,Call Price = 99.9634, Put Price = 0.00855542

Batch 1: T = 46 ,Call Price = 58.5713, Put Price = 0.210824

Batch 2: T = 46 ,Call Price = 50.2376, Put Price = 50.2376

Batch 3: T = 46 ,Call Price = 4.97973, Put Price = 0.019789

Batch 4: T = 46 ,Call Price = 99.9676, Put Price = 0.00770154

Batch 1: T = 47 ,Call Price = 58.6794, Put Price = 0.192886

Batch 2: T = 47 ,Call Price = 50.7013, Put Price = 50.7013

Batch 3: T = 47 ,Call Price = 4.98204, Put Price = 0.0175716

Batch 4: T = 47 ,Call Price = 99.9714, Put Price = 0.00692932

Batch 1: T = 48 ,Call Price = 58.7794, Put Price = 0.176473

Batch 2: T = 48 ,Call Price = 51.1578, Put Price = 51.1578

Batch 3: T = 48 ,Call Price = 4.98409, Put Price = 0.0156023

Batch 4: T = 48 ,Call Price = 99.9747, Put Price = 0.00623151

Batch 1: T = 49 ,Call Price = 58.8718, Put Price = 0.161454

Batch 2: T = 49 ,Call Price = 51.6073, Put Price = 51.6073

Batch 3: T = 49 ,Call Price = 4.98591, Put Price = 0.0138535

Batch 4: T = 49 ,Call Price = 99.9777, Put Price = 0.0056014

Batch 1: T = 50 ,Call Price = 58.9572, Put Price = 0.147711

Batch 2: T = 50 ,Call Price = 52.05, Put Price = 52.05

Batch 3: T = 50 ,Call Price = 4.98751, Put Price = 0.0123004

Batch 4: T = 50 ,Call Price = 99.9802, Put Price = 0.00503282

Batch 1: sig = 1 ,Call Price = 10.4409, Put Price = 14.1538

Batch 2: sig = 1 ,Call Price = 38.2925, Put Price = 38.2925

Batch 3: sig = 1 ,Call Price = 1.09832, Put Price = 4.96752

Batch 4: sig = 1 ,Call Price = 99.98, Put Price = 0.253249

Batch 1: sig = 2 ,Call Price = 21.8692, Put Price = 25.5821

Batch 2: sig = 2 ,Call Price = 68.2689, Put Price = 68.2689

Batch 3: sig = 2 ,Call Price = 2.93192, Put Price = 6.80112

Batch 4: sig = 2 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 3 ,Call Price = 31.9856, Put Price = 35.6986

Batch 2: sig = 3 ,Call Price = 86.6386, Put Price = 86.6386

Batch 3: sig = 3 ,Call Price = 4.12084, Put Price = 7.99004

Batch 4: sig = 3 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 4 ,Call Price = 40.3858, Put Price = 44.0987

Batch 2: sig = 4 ,Call Price = 95.45, Put Price = 95.45

Batch 3: sig = 4 ,Call Price = 4.69931, Put Price = 8.56852

Batch 4: sig = 4 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 5 ,Call Price = 46.9379, Put Price = 50.6508

Batch 2: sig = 5 ,Call Price = 98.7581, Put Price = 98.7581

Batch 3: sig = 5 ,Call Price = 4.91773, Put Price = 8.78694

Batch 4: sig = 5 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 6 ,Call Price = 51.7399, Put Price = 55.4528

Batch 2: sig = 6 ,Call Price = 99.73, Put Price = 99.73

Batch 3: sig = 6 ,Call Price = 4.98209, Put Price = 8.8513

Batch 4: sig = 6 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 7 ,Call Price = 55.0469, Put Price = 58.7598

Batch 2: sig = 7 ,Call Price = 99.9535, Put Price = 99.9535

Batch 3: sig = 7 ,Call Price = 4.99691, Put Price = 8.86612

Batch 4: sig = 7 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 8 ,Call Price = 57.187, Put Price = 60.8999

Batch 2: sig = 8 ,Call Price = 99.9937, Put Price = 99.9937

Batch 3: sig = 8 ,Call Price = 4.99958, Put Price = 8.86878

Batch 4: sig = 8 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 9 ,Call Price = 58.4885, Put Price = 62.2014

Batch 2: sig = 9 ,Call Price = 99.9993, Put Price = 99.9993

Batch 3: sig = 9 ,Call Price = 4.99995, Put Price = 8.86916

Batch 4: sig = 9 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 10 ,Call Price = 59.2322, Put Price = 62.9451

Batch 2: sig = 10 ,Call Price = 99.9999, Put Price = 99.9999

Batch 3: sig = 10 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 10 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 11 ,Call Price = 59.6315, Put Price = 63.3445

Batch 2: sig = 11 ,Call Price = 100, Put Price = 100

Batch 3: sig = 11 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 11 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 12 ,Call Price = 59.8331, Put Price = 63.546

Batch 2: sig = 12 ,Call Price = 100, Put Price = 100

Batch 3: sig = 12 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 12 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 13 ,Call Price = 59.9286, Put Price = 63.6416

Batch 2: sig = 13 ,Call Price = 100, Put Price = 100

Batch 3: sig = 13 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 13 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 14 ,Call Price = 59.9712, Put Price = 63.6841

Batch 2: sig = 14 ,Call Price = 100, Put Price = 100

Batch 3: sig = 14 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 14 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 15 ,Call Price = 59.9891, Put Price = 63.702

Batch 2: sig = 15 ,Call Price = 100, Put Price = 100

Batch 3: sig = 15 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 15 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 16 ,Call Price = 59.9961, Put Price = 63.709

Batch 2: sig = 16 ,Call Price = 100, Put Price = 100

Batch 3: sig = 16 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 16 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 17 ,Call Price = 59.9987, Put Price = 63.7116

Batch 2: sig = 17 ,Call Price = 100, Put Price = 100

Batch 3: sig = 17 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 17 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 18 ,Call Price = 59.9996, Put Price = 63.7125

Batch 2: sig = 18 ,Call Price = 100, Put Price = 100

Batch 3: sig = 18 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 18 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 19 ,Call Price = 59.9999, Put Price = 63.7128

Batch 2: sig = 19 ,Call Price = 100, Put Price = 100

Batch 3: sig = 19 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 19 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 20 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 20 ,Call Price = 100, Put Price = 100

Batch 3: sig = 20 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 20 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 21 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 21 ,Call Price = 100, Put Price = 100

Batch 3: sig = 21 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 21 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 22 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 22 ,Call Price = 100, Put Price = 100

Batch 3: sig = 22 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 22 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 23 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 23 ,Call Price = 100, Put Price = 100

Batch 3: sig = 23 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 23 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 24 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 24 ,Call Price = 100, Put Price = 100

Batch 3: sig = 24 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 24 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 25 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 25 ,Call Price = 100, Put Price = 100

Batch 3: sig = 25 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 25 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 26 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 26 ,Call Price = 100, Put Price = 100

Batch 3: sig = 26 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 26 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 27 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 27 ,Call Price = 100, Put Price = 100

Batch 3: sig = 27 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 27 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 28 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 28 ,Call Price = 100, Put Price = 100

Batch 3: sig = 28 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 28 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 29 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 29 ,Call Price = 100, Put Price = 100

Batch 3: sig = 29 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 29 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 30 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 30 ,Call Price = 100, Put Price = 100

Batch 3: sig = 30 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 30 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 31 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 31 ,Call Price = 100, Put Price = 100

Batch 3: sig = 31 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 31 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 32 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 32 ,Call Price = 100, Put Price = 100

Batch 3: sig = 32 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 32 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 33 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 33 ,Call Price = 100, Put Price = 100

Batch 3: sig = 33 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 33 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 34 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 34 ,Call Price = 100, Put Price = 100

Batch 3: sig = 34 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 34 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 35 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 35 ,Call Price = 100, Put Price = 100

Batch 3: sig = 35 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 35 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 36 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 36 ,Call Price = 100, Put Price = 100

Batch 3: sig = 36 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 36 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 37 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 37 ,Call Price = 100, Put Price = 100

Batch 3: sig = 37 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 37 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 38 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 38 ,Call Price = 100, Put Price = 100

Batch 3: sig = 38 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 38 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 39 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 39 ,Call Price = 100, Put Price = 100

Batch 3: sig = 39 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 39 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 40 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 40 ,Call Price = 100, Put Price = 100

Batch 3: sig = 40 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 40 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 41 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 41 ,Call Price = 100, Put Price = 100

Batch 3: sig = 41 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 41 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 42 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 42 ,Call Price = 100, Put Price = 100

Batch 3: sig = 42 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 42 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 43 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 43 ,Call Price = 100, Put Price = 100

Batch 3: sig = 43 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 43 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 44 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 44 ,Call Price = 100, Put Price = 100

Batch 3: sig = 44 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 44 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 45 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 45 ,Call Price = 100, Put Price = 100

Batch 3: sig = 45 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 45 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 46 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 46 ,Call Price = 100, Put Price = 100

Batch 3: sig = 46 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 46 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 47 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 47 ,Call Price = 100, Put Price = 100

Batch 3: sig = 47 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 47 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 48 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 48 ,Call Price = 100, Put Price = 100

Batch 3: sig = 48 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 48 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 49 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 49 ,Call Price = 100, Put Price = 100

Batch 3: sig = 49 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 49 ,Call Price = 100, Put Price = 0.273237

Batch 1: sig = 50 ,Call Price = 60, Put Price = 63.7129

Batch 2: sig = 50 ,Call Price = 100, Put Price = 100

Batch 3: sig = 50 ,Call Price = 5, Put Price = 8.8692

Batch 4: sig = 50 ,Call Price = 100, Put Price = 0.273237

Batch 1: K = 51 ,Call Price = 10.4543, Put Price = 0.444386

Batch 2: K = 51 ,Call Price = 49.0014, Put Price = 0.00140179

Batch 3: K = 51 ,Call Price = 8.04889e-06, Put Price = 40.233

Batch 4: K = 51 ,Call Price = 99.028, Put Price = 0.421522

Batch 1: K = 52 ,Call Price = 9.6122, Put Price = 0.582535

Batch 2: K = 52 ,Call Price = 48.0021, Put Price = 0.00205003

Batch 3: K = 52 ,Call Price = 6.73871e-06, Put Price = 41.1199

Batch 4: K = 52 ,Call Price = 99.0123, Put Price = 0.433152

Batch 1: K = 53 ,Call Price = 8.80017, Put Price = 0.750701

Batch 2: K = 53 ,Call Price = 47.003, Put Price = 0.0029522

Batch 3: K = 53 ,Call Price = 5.65324e-06, Put Price = 42.0068

Batch 4: K = 53 ,Call Price = 98.9967, Put Price = 0.444856

Batch 1: K = 54 ,Call Price = 8.02135, Put Price = 0.952081

Batch 2: K = 54 ,Call Price = 46.0042, Put Price = 0.00418956

Batch 3: K = 54 ,Call Price = 4.75198e-06, Put Price = 42.8937

Batch 4: K = 54 ,Call Price = 98.9812, Put Price = 0.456635

Batch 1: K = 55 ,Call Price = 7.27865, Put Price = 1.18957

Batch 2: K = 55 ,Call Price = 45.0059, Put Price = 0.00586328

Batch 3: K = 55 ,Call Price = 4.00209e-06, Put Price = 43.7806

Batch 4: K = 55 ,Call Price = 98.9657, Put Price = 0.468486

Batch 1: K = 56 ,Call Price = 6.57456, Put Price = 1.46569

Batch 2: K = 56 ,Call Price = 44.0081, Put Price = 0.00809753

Batch 3: K = 56 ,Call Price = 3.37686e-06, Put Price = 44.6675

Batch 4: K = 56 ,Call Price = 98.9503, Put Price = 0.480409

Batch 1: K = 57 ,Call Price = 5.91114, Put Price = 1.78246

Batch 2: K = 57 ,Call Price = 43.011, Put Price = 0.0110428

Batch 3: K = 57 ,Call Price = 2.85453e-06, Put Price = 45.5545

Batch 4: K = 57 ,Call Price = 98.9349, Put Price = 0.492402

Batch 1: K = 58 ,Call Price = 5.28988, Put Price = 2.1414

Batch 2: K = 58 ,Call Price = 42.0149, Put Price = 0.0148791

Batch 3: K = 58 ,Call Price = 2.4173e-06, Put Price = 46.4414

Batch 4: K = 58 ,Call Price = 98.9197, Put Price = 0.504464

Batch 1: K = 59 ,Call Price = 4.71174, Put Price = 2.54346

Batch 2: K = 59 ,Call Price = 41.0198, Put Price = 0.0198192

Batch 3: K = 59 ,Call Price = 2.05061e-06, Put Price = 47.3283

Batch 4: K = 59 ,Call Price = 98.9045, Put Price = 0.516594

Batch 1: K = 60 ,Call Price = 4.1771, Put Price = 2.98903

Batch 2: K = 60 ,Call Price = 40.0261, Put Price = 0.0261118

Batch 3: K = 60 ,Call Price = 1.7425e-06, Put Price = 48.2152

Batch 4: K = 60 ,Call Price = 98.8894, Put Price = 0.528791

Batch 1: K = 61 ,Call Price = 3.6858, Put Price = 3.47792

Batch 2: K = 61 ,Call Price = 39.034, Put Price = 0.0340443

Batch 3: K = 61 ,Call Price = 1.48315e-06, Put Price = 49.1021

Batch 4: K = 61 ,Call Price = 98.8743, Put Price = 0.541053

Batch 1: K = 62 ,Call Price = 3.23714, Put Price = 4.00945

Batch 2: K = 62 ,Call Price = 38.0439, Put Price = 0.0439453

Batch 3: K = 62 ,Call Price = 1.26446e-06, Put Price = 49.9891

Batch 4: K = 62 ,Call Price = 98.8593, Put Price = 0.55338

Batch 1: K = 63 ,Call Price = 2.82995, Put Price = 4.58246

Batch 2: K = 63 ,Call Price = 37.0562, Put Price = 0.0561866

Batch 3: K = 63 ,Call Price = 1.07972e-06, Put Price = 50.876

Batch 4: K = 63 ,Call Price = 98.8444, Put Price = 0.565771

Batch 1: K = 64 ,Call Price = 2.46266, Put Price = 5.19538

Batch 2: K = 64 ,Call Price = 36.0712, Put Price = 0.0711846

Batch 3: K = 64 ,Call Price = 9.23404e-07, Put Price = 51.7629

Batch 4: K = 64 ,Call Price = 98.8295, Put Price = 0.578225

Batch 1: K = 65 ,Call Price = 2.13337, Put Price = 5.84628

Batch 2: K = 65 ,Call Price = 35.0894, Put Price = 0.0894016

Batch 3: K = 65 ,Call Price = 7.90917e-07, Put Price = 52.6498

Batch 4: K = 65 ,Call Price = 98.8147, Put Price = 0.590741

Batch 1: K = 66 ,Call Price = 1.83988, Put Price = 6.53299

Batch 2: K = 66 ,Call Price = 34.1113, Put Price = 0.111346

Batch 3: K = 66 ,Call Price = 6.78444e-07, Put Price = 53.5367

Batch 4: K = 66 ,Call Price = 98.8, Put Price = 0.603317

Batch 1: K = 67 ,Call Price = 1.57982, Put Price = 7.25313

Batch 2: K = 67 ,Call Price = 33.1376, Put Price = 0.13757

Batch 3: K = 67 ,Call Price = 5.82812e-07, Put Price = 54.4237

Batch 4: K = 67 ,Call Price = 98.7853, Put Price = 0.615954

Batch 1: K = 68 ,Call Price = 1.3507, Put Price = 8.0042

Batch 2: K = 68 ,Call Price = 32.1687, Put Price = 0.168672

Batch 3: K = 68 ,Call Price = 5.01371e-07, Put Price = 55.3106

Batch 4: K = 68 ,Call Price = 98.7706, Put Price = 0.628649

Batch 1: K = 69 ,Call Price = 1.14994, Put Price = 8.78364

Batch 2: K = 69 ,Call Price = 31.2053, Put Price = 0.205293

Batch 3: K = 69 ,Call Price = 4.31911e-07, Put Price = 56.1975

Batch 4: K = 69 ,Call Price = 98.7561, Put Price = 0.641404

Batch 1: K = 70 ,Call Price = 0.97498, Put Price = 9.58889

Batch 2: K = 70 ,Call Price = 30.2481, Put Price = 0.24811

Batch 3: K = 70 ,Call Price = 3.72581e-07, Put Price = 57.0844

Batch 4: K = 70 ,Call Price = 98.7416, Put Price = 0.654215

Batch 1: K = 71 ,Call Price = 0.823313, Put Price = 10.4174

Batch 2: K = 71 ,Call Price = 29.2978, Put Price = 0.297839

Batch 3: K = 71 ,Call Price = 3.21829e-07, Put Price = 57.9714

Batch 4: K = 71 ,Call Price = 98.7271, Put Price = 0.667083

Batch 1: K = 72 ,Call Price = 0.692506, Put Price = 11.2668

Batch 2: K = 72 ,Call Price = 28.3552, Put Price = 0.355227

Batch 3: K = 72 ,Call Price = 2.78355e-07, Put Price = 58.8583

Batch 4: K = 72 ,Call Price = 98.7127, Put Price = 0.680007

Batch 1: K = 73 ,Call Price = 0.580247, Put Price = 12.1348

Batch 2: K = 73 ,Call Price = 27.421, Put Price = 0.421048

Batch 3: K = 73 ,Call Price = 2.41061e-07, Put Price = 59.7452

Batch 4: K = 73 ,Call Price = 98.6984, Put Price = 0.692987

Batch 1: K = 74 ,Call Price = 0.484371, Put Price = 13.0191

Batch 2: K = 74 ,Call Price = 26.4961, Put Price = 0.496097

Batch 3: K = 74 ,Call Price = 2.09027e-07, Put Price = 60.6321

Batch 4: K = 74 ,Call Price = 98.6841, Put Price = 0.70602

Batch 1: K = 75 ,Call Price = 0.402866, Put Price = 13.9178

Batch 2: K = 75 ,Call Price = 25.5812, Put Price = 0.581186

Batch 3: K = 75 ,Call Price = 1.81472e-07, Put Price = 61.519

Batch 4: K = 75 ,Call Price = 98.6698, Put Price = 0.719108

Batch 1: K = 76 ,Call Price = 0.333892, Put Price = 14.829

Batch 2: K = 76 ,Call Price = 24.6771, Put Price = 0.677135

Batch 3: K = 76 ,Call Price = 1.5774e-07, Put Price = 62.406

Batch 4: K = 76 ,Call Price = 98.6556, Put Price = 0.732248

Batch 1: K = 77 ,Call Price = 0.275777, Put Price = 15.7511

Batch 2: K = 77 ,Call Price = 23.7848, Put Price = 0.784768

Batch 3: K = 77 ,Call Price = 1.37274e-07, Put Price = 63.2929

Batch 4: K = 77 ,Call Price = 98.6415, Put Price = 0.745441

Batch 1: K = 78 ,Call Price = 0.227017, Put Price = 16.6825

Batch 2: K = 78 ,Call Price = 22.9049, Put Price = 0.904907

Batch 3: K = 78 ,Call Price = 1.19602e-07, Put Price = 64.1798

Batch 4: K = 78 ,Call Price = 98.6274, Put Price = 0.758686

Batch 1: K = 79 ,Call Price = 0.186274, Put Price = 17.622

Batch 2: K = 79 ,Call Price = 22.0384, Put Price = 1.03836

Batch 3: K = 79 ,Call Price = 1.04324e-07, Put Price = 65.0667

Batch 4: K = 79 ,Call Price = 98.6134, Put Price = 0.771981

Batch 1: K = 80 ,Call Price = 0.152364, Put Price = 18.5683

Batch 2: K = 80 ,Call Price = 21.1859, Put Price = 1.18593

Batch 3: K = 80 ,Call Price = 9.10988e-08, Put Price = 65.9536

Batch 4: K = 80 ,Call Price = 98.5994, Put Price = 0.785327

Batch 1: K = 81 ,Call Price = 0.124248, Put Price = 19.5203

Batch 2: K = 81 ,Call Price = 20.3484, Put Price = 1.34838

Batch 3: K = 81 ,Call Price = 7.96377e-08, Put Price = 66.8406

Batch 4: K = 81 ,Call Price = 98.5855, Put Price = 0.798722

Batch 1: K = 82 ,Call Price = 0.101022, Put Price = 20.4773

Batch 2: K = 82 ,Call Price = 19.5265, Put Price = 1.52646

Batch 3: K = 82 ,Call Price = 6.96936e-08, Put Price = 67.7275

Batch 4: K = 82 ,Call Price = 98.5716, Put Price = 0.812167

Batch 1: K = 83 ,Call Price = 0.0819036, Put Price = 21.4384

Batch 2: K = 83 ,Call Price = 18.7209, Put Price = 1.72087

Batch 3: K = 83 ,Call Price = 6.10557e-08, Put Price = 68.6144

Batch 4: K = 83 ,Call Price = 98.5578, Put Price = 0.82566

Batch 1: K = 84 ,Call Price = 0.0662202, Put Price = 22.4029

Batch 2: K = 84 ,Call Price = 17.9323, Put Price = 1.93228

Batch 3: K = 84 ,Call Price = 5.3544e-08, Put Price = 69.5013

Batch 4: K = 84 ,Call Price = 98.544, Put Price = 0.839201

Batch 1: K = 85 ,Call Price = 0.0533971, Put Price = 23.3703

Batch 2: K = 85 ,Call Price = 17.1613, Put Price = 2.16132

Batch 3: K = 85 ,Call Price = 4.70043e-08, Put Price = 70.3882

Batch 4: K = 85 ,Call Price = 98.5303, Put Price = 0.85279

Batch 1: K = 86 ,Call Price = 0.042946, Put Price = 24.34

Batch 2: K = 86 ,Call Price = 16.4086, Put Price = 2.40856

Batch 3: K = 86 ,Call Price = 4.13048e-08, Put Price = 71.2752

Batch 4: K = 86 ,Call Price = 98.5166, Put Price = 0.866425

Batch 1: K = 87 ,Call Price = 0.0344544, Put Price = 25.3117

Batch 2: K = 87 ,Call Price = 15.6745, Put Price = 2.67452

Batch 3: K = 87 ,Call Price = 3.63322e-08, Put Price = 72.1621

Batch 4: K = 87 ,Call Price = 98.5029, Put Price = 0.880107

Batch 1: K = 88 ,Call Price = 0.0275751, Put Price = 26.2851

Batch 2: K = 88 ,Call Price = 14.9597, Put Price = 2.95967

Batch 3: K = 88 ,Call Price = 3.19891e-08, Put Price = 73.049

Batch 4: K = 88 ,Call Price = 98.4893, Put Price = 0.893834

Batch 1: K = 89 ,Call Price = 0.0220181, Put Price = 27.2597

Batch 2: K = 89 ,Call Price = 14.2644, Put Price = 3.26442

Batch 3: K = 89 ,Call Price = 2.8192e-08, Put Price = 73.9359

Batch 4: K = 89 ,Call Price = 98.4758, Put Price = 0.907607

Batch 1: K = 90 ,Call Price = 0.0175414, Put Price = 28.2354

Batch 2: K = 90 ,Call Price = 13.5891, Put Price = 3.58911

Batch 3: K = 90 ,Call Price = 2.48689e-08, Put Price = 74.8228

Batch 4: K = 90 ,Call Price = 98.4623, Put Price = 0.921424

Batch 1: K = 91 ,Call Price = 0.0139446, Put Price = 29.212

Batch 2: K = 91 ,Call Price = 12.934, Put Price = 3.93403

Batch 3: K = 91 ,Call Price = 2.19577e-08, Put Price = 75.7098

Batch 4: K = 91 ,Call Price = 98.4488, Put Price = 0.935286

Batch 1: K = 92 ,Call Price = 0.0110622, Put Price = 30.1893

Batch 2: K = 92 ,Call Price = 12.2994, Put Price = 4.2994

Batch 3: K = 92 ,Call Price = 1.94048e-08, Put Price = 76.5967

Batch 4: K = 92 ,Call Price = 98.4354, Put Price = 0.949191

Batch 1: K = 93 ,Call Price = 0.0087578, Put Price = 31.1672

Batch 2: K = 93 ,Call Price = 11.6854, Put Price = 4.68538

Batch 3: K = 93 ,Call Price = 1.7164e-08, Put Price = 77.4836

Batch 4: K = 93 ,Call Price = 98.422, Put Price = 0.96314

Batch 1: K = 94 ,Call Price = 0.00691996, Put Price = 32.1456

Batch 2: K = 94 ,Call Price = 11.0921, Put Price = 5.09208

Batch 3: K = 94 ,Call Price = 1.51953e-08, Put Price = 78.3705

Batch 4: K = 94 ,Call Price = 98.4087, Put Price = 0.977131

Batch 1: K = 95 ,Call Price = 0.00545754, Put Price = 33.1243

Batch 2: K = 95 ,Call Price = 10.5195, Put Price = 5.51954

Batch 3: K = 95 ,Call Price = 1.3464e-08, Put Price = 79.2574

Batch 4: K = 95 ,Call Price = 98.3954, Put Price = 0.991165

Batch 1: K = 96 ,Call Price = 0.00429639, Put Price = 34.1034

Batch 2: K = 96 ,Call Price = 9.96773, Put Price = 5.96773

Batch 3: K = 96 ,Call Price = 1.194e-08, Put Price = 80.1444

Batch 4: K = 96 ,Call Price = 98.3822, Put Price = 1.00524

Batch 1: K = 97 ,Call Price = 0.00337639, Put Price = 35.0826

Batch 2: K = 97 ,Call Price = 9.43659, Put Price = 6.43659

Batch 3: K = 97 ,Call Price = 1.05974e-08, Put Price = 81.0313

Batch 4: K = 97 ,Call Price = 98.369, Put Price = 1.01936

Batch 1: K = 98 ,Call Price = 0.00264894, Put Price = 36.0621

Batch 2: K = 98 ,Call Price = 8.92597, Put Price = 6.92597

Batch 3: K = 98 ,Call Price = 9.41349e-09, Put Price = 81.9182

Batch 4: K = 98 ,Call Price = 98.3558, Put Price = 1.03352

Batch 1: K = 99 ,Call Price = 0.00207486, Put Price = 37.0417

Batch 2: K = 99 ,Call Price = 8.43571, Put Price = 7.43571

Batch 3: K = 99 ,Call Price = 8.36861e-09, Put Price = 82.8051

Batch 4: K = 99 ,Call Price = 98.3427, Put Price = 1.04771

Batch 1: K = 100 ,Call Price = 0.00162267, Put Price = 38.0215

Batch 2: K = 100 ,Call Price = 7.96557, Put Price = 7.96557

Batch 3: K = 100 ,Call Price = 7.44563e-09, Put Price = 83.692

Batch 4: K = 100 ,Call Price = 98.3296, Put Price = 1.06195

**Option Sensitivities, aka the Greeks**

a.)

The formula for gamma for call and put future option pricing is implemented in the code. Please refer to it.

b.)

Delta of Call Option = 0.594629

Delta of Put Option = -0.356601

Gamma of Call Option = 0.0134936

Gamma of Put Option = 0.0134936

S = 10: Call Price Delta = 2.25551e-19

10: Put Price Delta = -0.951229

S = 11: Call Price Delta = 6.18174e-18

11: Put Price Delta = -0.951229

S = 12: Call Price Delta = 1.12536e-16

12: Put Price Delta = -0.951229

S = 13: Call Price Delta = 1.46673e-15

13: Put Price Delta = -0.951229

S = 14: Call Price Delta = 1.44882e-14

14: Put Price Delta = -0.951229

S = 15: Call Price Delta = 1.1336e-13

15: Put Price Delta = -0.951229

S = 16: Call Price Delta = 7.27491e-13

16: Put Price Delta = -0.951229

S = 17: Call Price Delta = 3.93787e-12

17: Put Price Delta = -0.951229

S = 18: Call Price Delta = 1.83921e-11

18: Put Price Delta = -0.951229

S = 19: Call Price Delta = 7.55191e-11

19: Put Price Delta = -0.951229

S = 20: Call Price Delta = 2.76878e-10

20: Put Price Delta = -0.951229

S = 21: Call Price Delta = 9.18317e-10

21: Put Price Delta = -0.951229

S = 22: Call Price Delta = 2.78591e-09

22: Put Price Delta = -0.951229

S = 23: Call Price Delta = 7.80377e-09

23: Put Price Delta = -0.951229

S = 24: Call Price Delta = 2.0348e-08

24: Put Price Delta = -0.951229

S = 25: Call Price Delta = 4.97346e-08

25: Put Price Delta = -0.951229

S = 26: Call Price Delta = 1.14647e-07

26: Put Price Delta = -0.951229

S = 27: Call Price Delta = 2.50577e-07

27: Put Price Delta = -0.951229

S = 28: Call Price Delta = 5.21714e-07

28: Put Price Delta = -0.951229

S = 29: Call Price Delta = 1.03903e-06

29: Put Price Delta = -0.951228

S = 30: Call Price Delta = 1.98667e-06

30: Put Price Delta = -0.951227

S = 31: Call Price Delta = 3.65877e-06

31: Put Price Delta = -0.951226

S = 32: Call Price Delta = 6.5092e-06

32: Put Price Delta = -0.951223

S = 33: Call Price Delta = 1.1216e-05

33: Put Price Delta = -0.951218

S = 34: Call Price Delta = 1.87624e-05

34: Put Price Delta = -0.951211

S = 35: Call Price Delta = 3.05351e-05

35: Put Price Delta = -0.951199

S = 36: Call Price Delta = 4.84406e-05

36: Put Price Delta = -0.951181

S = 37: Call Price Delta = 7.50367e-05

37: Put Price Delta = -0.951154

S = 38: Call Price Delta = 0.00011368

38: Put Price Delta = -0.951116

S = 39: Call Price Delta = 0.000168682

39: Put Price Delta = -0.951061

S = 40: Call Price Delta = 0.000245471

40: Put Price Delta = -0.950984

S = 41: Call Price Delta = 0.000350761

41: Put Price Delta = -0.950879

S = 42: Call Price Delta = 0.000492699

42: Put Price Delta = -0.950737

S = 43: Call Price Delta = 0.000681019

43: Put Price Delta = -0.950548

S = 44: Call Price Delta = 0.000927157

44: Put Price Delta = -0.950302

S = 45: Call Price Delta = 0.00124435

45: Put Price Delta = -0.949985

S = 46: Call Price Delta = 0.00164771

46: Put Price Delta = -0.949582

S = 47: Call Price Delta = 0.00215423

47: Put Price Delta = -0.949075

S = 48: Call Price Delta = 0.00278276

48: Put Price Delta = -0.948447

S = 49: Call Price Delta = 0.00355398

49: Put Price Delta = -0.947675

S = 50: Call Price Delta = 0.00449025

50: Put Price Delta = -0.946739

**c)**

Gamma:

T = 25: Gamma of Call Price = 0.000112738

25: Gamma of Put Price = 0.000112738

T = 26: Gamma of Call Price = 9.84222e-05

26: Gamma of Put Price = 9.84222e-05

T = 27: Gamma of Call Price = 8.59881e-05

27: Gamma of Put Price = 8.59881e-05

T = 28: Gamma of Call Price = 7.51764e-05

28: Gamma of Put Price = 7.51764e-05

T = 29: Gamma of Call Price = 6.5766e-05

29: Gamma of Put Price = 6.5766e-05

T = 30: Gamma of Call Price = 5.75678e-05

30: Gamma of Put Price = 5.75678e-05

T = 31: Gamma of Call Price = 5.04195e-05

31: Gamma of Put Price = 5.04195e-05

T = 32: Gamma of Call Price = 4.41818e-05

32: Gamma of Put Price = 4.41818e-05

T = 33: Gamma of Call Price = 3.87347e-05

33: Gamma of Put Price = 3.87347e-05

T = 34: Gamma of Call Price = 3.39747e-05

34: Gamma of Put Price = 3.39747e-05

T = 35: Gamma of Call Price = 2.98126e-05

35: Gamma of Put Price = 2.98126e-05

T = 36: Gamma of Call Price = 2.6171e-05

36: Gamma of Put Price = 2.6171e-05

T = 37: Gamma of Call Price = 2.29831e-05

37: Gamma of Put Price = 2.29831e-05

T = 38: Gamma of Call Price = 2.01909e-05

38: Gamma of Put Price = 2.01909e-05

T = 39: Gamma of Call Price = 1.77441e-05

39: Gamma of Put Price = 1.77441e-05

T = 40: Gamma of Call Price = 1.55989e-05

40: Gamma of Put Price = 1.55989e-05

T = 41: Gamma of Call Price = 1.37173e-05

41: Gamma of Put Price = 1.37173e-05

T = 42: Gamma of Call Price = 1.20663e-05

42: Gamma of Put Price = 1.20663e-05

T = 43: Gamma of Call Price = 1.0617e-05

43: Gamma of Put Price = 1.0617e-05

T = 44: Gamma of Call Price = 9.34428e-06

44: Gamma of Put Price = 9.34428e-06

T = 45: Gamma of Call Price = 8.22627e-06

45: Gamma of Put Price = 8.22627e-06

T = 46: Gamma of Call Price = 7.24381e-06

46: Gamma of Put Price = 7.24381e-06

T = 47: Gamma of Call Price = 6.38019e-06

47: Gamma of Put Price = 6.38019e-06

T = 48: Gamma of Call Price = 5.62081e-06

48: Gamma of Put Price = 5.62081e-06

T = 49: Gamma of Call Price = 4.95289e-06

49: Gamma of Put Price = 4.95289e-06

T = 50: Gamma of Call Price = 4.36524e-06

50: Gamma of Put Price = 4.36524e-06

T = 51: Gamma of Call Price = 3.84808e-06

51: Gamma of Put Price = 3.84808e-06

T = 52: Gamma of Call Price = 3.39285e-06

52: Gamma of Put Price = 3.39285e-06

T = 53: Gamma of Call Price = 2.99202e-06

53: Gamma of Put Price = 2.99202e-06

T = 54: Gamma of Call Price = 2.63902e-06

54: Gamma of Put Price = 2.63902e-06

T = 55: Gamma of Call Price = 2.32806e-06

55: Gamma of Put Price = 2.32806e-06

T = 56: Gamma of Call Price = 2.05408e-06

56: Gamma of Put Price = 2.05408e-06

T = 57: Gamma of Call Price = 1.81263e-06

57: Gamma of Put Price = 1.81263e-06

T = 58: Gamma of Call Price = 1.59981e-06

58: Gamma of Put Price = 1.59981e-06

T = 59: Gamma of Call Price = 1.41219e-06

59: Gamma of Put Price = 1.41219e-06

T = 60: Gamma of Call Price = 1.24675e-06

60: Gamma of Put Price = 1.24675e-06

T = 61: Gamma of Call Price = 1.10085e-06

61: Gamma of Put Price = 1.10085e-06

T = 62: Gamma of Call Price = 9.72148e-07

62: Gamma of Put Price = 9.72148e-07

T = 63: Gamma of Call Price = 8.58606e-07

63: Gamma of Put Price = 8.58606e-07

T = 64: Gamma of Call Price = 7.58421e-07

64: Gamma of Put Price = 7.58421e-07

T = 65: Gamma of Call Price = 6.70007e-07

65: Gamma of Put Price = 6.70007e-07

T = 66: Gamma of Call Price = 5.9197e-07

66: Gamma of Put Price = 5.9197e-07

T = 67: Gamma of Call Price = 5.23083e-07

67: Gamma of Put Price = 5.23083e-07

T = 68: Gamma of Call Price = 4.62263e-07

68: Gamma of Put Price = 4.62263e-07

T = 69: Gamma of Call Price = 4.08559e-07

69: Gamma of Put Price = 4.08559e-07

T = 70: Gamma of Call Price = 3.61132e-07

70: Gamma of Put Price = 3.61132e-07

T = 71: Gamma of Call Price = 3.19243e-07

71: Gamma of Put Price = 3.19243e-07

T = 72: Gamma of Call Price = 2.82241e-07

72: Gamma of Put Price = 2.82241e-07

T = 73: Gamma of Call Price = 2.49552e-07

73: Gamma of Put Price = 2.49552e-07

T = 74: Gamma of Call Price = 2.2067e-07

74: Gamma of Put Price = 2.2067e-07

T = 75: Gamma of Call Price = 1.95148e-07

75: Gamma of Put Price = 1.95148e-07

K = 50: Gamma of Call Price = 0.000138977

50: Gamma of Put Price = 0.000138977

K = 51: Gamma of Call Price = 0.000175548

51: Gamma of Put Price = 0.000175548

K = 52: Gamma of Call Price = 0.000219447

52: Gamma of Put Price = 0.000219447

K = 53: Gamma of Call Price = 0.000271619

53: Gamma of Put Price = 0.000271619

K = 54: Gamma of Call Price = 0.00033304

54: Gamma of Put Price = 0.00033304

K = 55: Gamma of Call Price = 0.000404696

55: Gamma of Put Price = 0.000404696

K = 56: Gamma of Call Price = 0.000487575

56: Gamma of Put Price = 0.000487575

K = 57: Gamma of Call Price = 0.000582644

57: Gamma of Put Price = 0.000582644

K = 58: Gamma of Call Price = 0.000690835

58: Gamma of Put Price = 0.000690835

K = 59: Gamma of Call Price = 0.000813027

59: Gamma of Put Price = 0.000813027

K = 60: Gamma of Call Price = 0.000950031

60: Gamma of Put Price = 0.000950031

K = 61: Gamma of Call Price = 0.00110257

61: Gamma of Put Price = 0.00110257

K = 62: Gamma of Call Price = 0.00127127

62: Gamma of Put Price = 0.00127127

K = 63: Gamma of Call Price = 0.00145662

63: Gamma of Put Price = 0.00145662

K = 64: Gamma of Call Price = 0.00165902

64: Gamma of Put Price = 0.00165902

K = 65: Gamma of Call Price = 0.0018787

65: Gamma of Put Price = 0.0018787

K = 66: Gamma of Call Price = 0.00211574

66: Gamma of Put Price = 0.00211574

K = 67: Gamma of Call Price = 0.00237009

67: Gamma of Put Price = 0.00237009

K = 68: Gamma of Call Price = 0.00264153

68: Gamma of Put Price = 0.00264153

K = 69: Gamma of Call Price = 0.00292967

69: Gamma of Put Price = 0.00292967

K = 70: Gamma of Call Price = 0.00323398

70: Gamma of Put Price = 0.00323398

K = 71: Gamma of Call Price = 0.00355378

71: Gamma of Put Price = 0.00355378

K = 72: Gamma of Call Price = 0.0038882

72: Gamma of Put Price = 0.0038882

K = 73: Gamma of Call Price = 0.00423629

73: Gamma of Put Price = 0.00423629

K = 74: Gamma of Call Price = 0.0045969

74: Gamma of Put Price = 0.0045969

K = 75: Gamma of Call Price = 0.00496883

75: Gamma of Put Price = 0.00496883

K = 76: Gamma of Call Price = 0.0053507

76: Gamma of Put Price = 0.0053507

K = 77: Gamma of Call Price = 0.0057411

77: Gamma of Put Price = 0.0057411

K = 78: Gamma of Call Price = 0.00613848

78: Gamma of Put Price = 0.00613848

K = 79: Gamma of Call Price = 0.00654127

79: Gamma of Put Price = 0.00654127

K = 80: Gamma of Call Price = 0.00694782

80: Gamma of Put Price = 0.00694782

K = 81: Gamma of Call Price = 0.00735647

81: Gamma of Put Price = 0.00735647

K = 82: Gamma of Call Price = 0.00776551

82: Gamma of Put Price = 0.00776551

K = 83: Gamma of Call Price = 0.00817326

83: Gamma of Put Price = 0.00817326

K = 84: Gamma of Call Price = 0.00857803

84: Gamma of Put Price = 0.00857803

K = 85: Gamma of Call Price = 0.00897814

85: Gamma of Put Price = 0.00897814

K = 86: Gamma of Call Price = 0.00937199

86: Gamma of Put Price = 0.00937199

K = 87: Gamma of Call Price = 0.009758

87: Gamma of Put Price = 0.009758

K = 88: Gamma of Call Price = 0.0101347

88: Gamma of Put Price = 0.0101347

K = 89: Gamma of Call Price = 0.0105005

89: Gamma of Put Price = 0.0105005

K = 90: Gamma of Call Price = 0.0108542

90: Gamma of Put Price = 0.0108542

K = 91: Gamma of Call Price = 0.0111945

91: Gamma of Put Price = 0.0111945

K = 92: Gamma of Call Price = 0.0115202

92: Gamma of Put Price = 0.0115202

K = 93: Gamma of Call Price = 0.0118302

93: Gamma of Put Price = 0.0118302

K = 94: Gamma of Call Price = 0.0121236

94: Gamma of Put Price = 0.0121236

K = 95: Gamma of Call Price = 0.0123994

95: Gamma of Put Price = 0.0123994

K = 96: Gamma of Call Price = 0.012657

96: Gamma of Put Price = 0.012657

K = 97: Gamma of Call Price = 0.0128957

97: Gamma of Put Price = 0.0128957

K = 98: Gamma of Call Price = 0.013115

98: Gamma of Put Price = 0.013115

K = 99: Gamma of Call Price = 0.0133144

99: Gamma of Put Price = 0.0133144

K = 100: Gamma of Call Price = 0.0134936

100: Gamma of Put Price = 0.0134936

sig = 1: Gamma of Call Price = 0.00467465

1: Gamma of Put Price = 0.00467465

sig = 2: Gamma of Call Price = 0.00194117

2: Gamma of Put Price = 0.00194117

sig = 3: Gamma of Call Price = 0.000947108

3: Gamma of Put Price = 0.000947108

sig = 4: Gamma of Call Price = 0.000458677

4: Gamma of Put Price = 0.000458677

sig = 5: Gamma of Call Price = 0.000209088

5: Gamma of Put Price = 0.000209088

sig = 6: Gamma of Call Price = 8.76161e-05

6: Gamma of Put Price = 8.76161e-05

sig = 7: Gamma of Call Price = 3.33258e-05

7: Gamma of Put Price = 3.33258e-05

sig = 8: Gamma of Call Price = 1.14194e-05

8: Gamma of Put Price = 1.14194e-05

sig = 9: Gamma of Call Price = 3.50797e-06

9: Gamma of Put Price = 3.50797e-06

sig = 10: Gamma of Call Price = 9.62887e-07

10: Gamma of Put Price = 9.62887e-07

sig = 11: Gamma of Call Price = 2.35599e-07

11: Gamma of Put Price = 2.35599e-07

sig = 12: Gamma of Call Price = 5.12965e-08

12: Gamma of Put Price = 5.12965e-08

sig = 13: Gamma of Call Price = 9.92525e-09

13: Gamma of Put Price = 9.92525e-09

sig = 14: Gamma of Call Price = 1.70485e-09

14: Gamma of Put Price = 1.70485e-09

sig = 15: Gamma of Call Price = 2.59755e-10

15: Gamma of Put Price = 2.59755e-10

sig = 16: Gamma of Call Price = 3.50825e-11

16: Gamma of Put Price = 3.50825e-11

sig = 17: Gamma of Call Price = 4.19788e-12

17: Gamma of Put Price = 4.19788e-12

sig = 18: Gamma of Call Price = 4.44823e-13

18: Gamma of Put Price = 4.44823e-13

sig = 19: Gamma of Call Price = 4.17254e-14

19: Gamma of Put Price = 4.17254e-14

sig = 20: Gamma of Call Price = 3.46363e-15

20: Gamma of Put Price = 3.46363e-15

sig = 21: Gamma of Call Price = 2.54368e-16

21: Gamma of Put Price = 2.54368e-16

sig = 22: Gamma of Call Price = 1.65232e-17

22: Gamma of Put Price = 1.65232e-17

sig = 23: Gamma of Call Price = 9.49151e-19

23: Gamma of Put Price = 9.49151e-19

sig = 24: Gamma of Call Price = 4.82072e-20

24: Gamma of Put Price = 4.82072e-20

sig = 25: Gamma of Call Price = 2.16449e-21

25: Gamma of Put Price = 2.16449e-21

sig = 26: Gamma of Call Price = 8.59033e-23

26: Gamma of Put Price = 8.59033e-23

sig = 27: Gamma of Call Price = 3.01314e-24

27: Gamma of Put Price = 3.01314e-24

sig = 28: Gamma of Call Price = 9.3398e-26

28: Gamma of Put Price = 9.3398e-26

sig = 29: Gamma of Call Price = 2.55813e-27

29: Gamma of Put Price = 2.55813e-27

sig = 30: Gamma of Call Price = 6.19069e-29

30: Gamma of Put Price = 6.19069e-29

sig = 31: Gamma of Call Price = 1.32358e-30

31: Gamma of Put Price = 1.32358e-30

sig = 32: Gamma of Call Price = 2.49993e-32

32: Gamma of Put Price = 2.49993e-32

sig = 33: Gamma of Call Price = 4.17103e-34

33: Gamma of Put Price = 4.17103e-34

sig = 34: Gamma of Call Price = 6.1471e-36

34: Gamma of Put Price = 6.1471e-36

sig = 35: Gamma of Call Price = 8.00177e-38

35: Gamma of Put Price = 8.00177e-38

sig = 36: Gamma of Call Price = 9.19962e-40

36: Gamma of Put Price = 9.19962e-40

sig = 37: Gamma of Call Price = 9.34119e-42

37: Gamma of Put Price = 9.34119e-42

sig = 38: Gamma of Call Price = 8.37655e-44

38: Gamma of Put Price = 8.37655e-44

sig = 39: Gamma of Call Price = 6.63349e-46

39: Gamma of Put Price = 6.63349e-46

sig = 40: Gamma of Call Price = 4.63893e-48

40: Gamma of Put Price = 4.63893e-48

sig = 41: Gamma of Call Price = 2.86469e-50

41: Gamma of Put Price = 2.86469e-50

sig = 42: Gamma of Call Price = 1.5621e-52

42: Gamma of Put Price = 1.5621e-52

sig = 43: Gamma of Call Price = 7.52145e-55

43: Gamma of Put Price = 7.52145e-55

sig = 44: Gamma of Call Price = 3.19772e-57

44: Gamma of Put Price = 3.19772e-57

sig = 45: Gamma of Call Price = 1.20038e-59

45: Gamma of Put Price = 1.20038e-59

sig = 46: Gamma of Call Price = 3.97853e-62

46: Gamma of Put Price = 3.97853e-62

sig = 47: Gamma of Call Price = 1.16425e-64

47: Gamma of Put Price = 1.16425e-64

sig = 48: Gamma of Call Price = 3.00801e-67

48: Gamma of Put Price = 3.00801e-67

sig = 49: Gamma of Call Price = 6.86142e-70

49: Gamma of Put Price = 6.86142e-70

sig = 50: Gamma of Call Price = 1.38179e-72

50: Gamma of Put Price = 1.38179e-72

sig = 51: Gamma of Call Price = 2.45674e-75

51: Gamma of Put Price = 2.45674e-75

Delta:

T = 25: Delta of Call Price = 0.0675612

25: Delta of Put Price = -0.0145238

T = 26: Delta of Call Price = 0.0614627

26: Delta of Put Price = -0.0128109

T = 27: Delta of Call Price = 0.055903

27: Delta of Put Price = -0.0113025

T = 28: Delta of Call Price = 0.0508362

28: Delta of Put Price = -0.00997386

T = 29: Delta of Call Price = 0.04622

29: Delta of Put Price = -0.0088032

T = 30: Delta of Call Price = 0.0420156

30: Delta of Put Price = -0.00777143

T = 31: Delta of Call Price = 0.0381874

31: Delta of Put Price = -0.00686184

T = 32: Delta of Call Price = 0.0347024

32: Delta of Put Price = -0.00605976

T = 33: Delta of Call Price = 0.0315308

33: Delta of Put Price = -0.00535233

T = 34: Delta of Call Price = 0.028645

34: Delta of Put Price = -0.00472823

T = 35: Delta of Call Price = 0.0260198

35: Delta of Put Price = -0.00417754

T = 36: Delta of Call Price = 0.0236322

36: Delta of Put Price = -0.00369152

T = 37: Delta of Call Price = 0.021461

37: Delta of Put Price = -0.00326249

T = 38: Delta of Call Price = 0.0194871

38: Delta of Put Price = -0.00288372

T = 39: Delta of Call Price = 0.0176927

39: Delta of Put Price = -0.00254924

T = 40: Delta of Call Price = 0.0160618

40: Delta of Put Price = -0.00225383

T = 41: Delta of Call Price = 0.0145798

41: Delta of Put Price = -0.0019929

T = 42: Delta of Call Price = 0.0132332

42: Delta of Put Price = -0.00176237

T = 43: Delta of Call Price = 0.0120099

43: Delta of Put Price = -0.00155868

T = 44: Delta of Call Price = 0.0108987

44: Delta of Put Price = -0.00137868

T = 45: Delta of Call Price = 0.00988941

45: Delta of Put Price = -0.00121959

T = 46: Delta of Call Price = 0.00897288

46: Delta of Put Price = -0.00107896

T = 47: Delta of Call Price = 0.00814064

47: Delta of Put Price = -0.000954638

T = 48: Delta of Call Price = 0.00738503

48: Delta of Put Price = -0.00084472

T = 49: Delta of Call Price = 0.00669906

49: Delta of Put Price = -0.000747525

T = 50: Delta of Call Price = 0.00607638

50: Delta of Put Price = -0.00066157

T = 51: Delta of Call Price = 0.0055112

51: Delta of Put Price = -0.000585548

T = 52: Delta of Call Price = 0.00499826

52: Delta of Put Price = -0.000518303

T = 53: Delta of Call Price = 0.00453278

53: Delta of Put Price = -0.000458818

T = 54: Delta of Call Price = 0.00411039

54: Delta of Put Price = -0.00040619

T = 55: Delta of Call Price = 0.00372715

55: Delta of Put Price = -0.000359625

T = 56: Delta of Call Price = 0.00337944

56: Delta of Put Price = -0.000318422

T = 57: Delta of Call Price = 0.00306401

57: Delta of Put Price = -0.000281959

T = 58: Delta of Call Price = 0.00277787

58: Delta of Put Price = -0.000249688

T = 59: Delta of Call Price = 0.00251832

59: Delta of Put Price = -0.000221126

T = 60: Delta of Call Price = 0.00228291

60: Delta of Put Price = -0.000195843

T = 61: Delta of Call Price = 0.00206941

61: Delta of Put Price = -0.000173462

T = 62: Delta of Call Price = 0.00187578

62: Delta of Put Price = -0.000153648

T = 63: Delta of Call Price = 0.0017002

63: Delta of Put Price = -0.000136106

T = 64: Delta of Call Price = 0.00154098

64: Delta of Put Price = -0.000120573

T = 65: Delta of Call Price = 0.00139662

65: Delta of Put Price = -0.000106819

T = 66: Delta of Call Price = 0.00126573

66: Delta of Put Price = -9.46393e-05

T = 67: Delta of Call Price = 0.00114706

67: Delta of Put Price = -8.38528e-05

T = 68: Delta of Call Price = 0.00103948

68: Delta of Put Price = -7.42996e-05

T = 69: Delta of Call Price = 0.000941947

69: Delta of Put Price = -6.58382e-05

T = 70: Delta of Call Price = 0.000853539

70: Delta of Put Price = -5.83433e-05

T = 71: Delta of Call Price = 0.000773401

71: Delta of Put Price = -5.17041e-05

T = 72: Delta of Call Price = 0.000700763

72: Delta of Put Price = -4.58226e-05

T = 73: Delta of Call Price = 0.000634927

73: Delta of Put Price = -4.06121e-05

T = 74: Delta of Call Price = 0.000575257

74: Delta of Put Price = -3.59957e-05

T = 75: Delta of Call Price = 0.000521179

75: Delta of Put Price = -3.19055e-05

K = 50: Delta of Call Price = 0.950111

50: Delta of Put Price = -0.00111818

K = 51: Delta of Call Price = 0.949786

51: Delta of Put Price = -0.00144386

K = 52: Delta of Call Price = 0.949384

52: Delta of Put Price = -0.00184507

K = 53: Delta of Call Price = 0.948895

53: Delta of Put Price = -0.00233452

K = 54: Delta of Call Price = 0.948303

54: Delta of Put Price = -0.00292612

K = 55: Delta of Call Price = 0.947595

55: Delta of Put Price = -0.00363486

K = 56: Delta of Call Price = 0.946753

56: Delta of Put Price = -0.00447685

K = 57: Delta of Call Price = 0.94576

57: Delta of Put Price = -0.0054691

K = 58: Delta of Call Price = 0.9446

58: Delta of Put Price = -0.00662952

K = 59: Delta of Call Price = 0.943253

59: Delta of Put Price = -0.0079767

K = 60: Delta of Call Price = 0.9417

60: Delta of Put Price = -0.00952981

K = 61: Delta of Call Price = 0.939921

61: Delta of Put Price = -0.0113084

K = 62: Delta of Call Price = 0.937897

62: Delta of Put Price = -0.0133321

K = 63: Delta of Call Price = 0.935609

63: Delta of Put Price = -0.0156208

K = 64: Delta of Call Price = 0.933035

64: Delta of Put Price = -0.018194

K = 65: Delta of Call Price = 0.930159

65: Delta of Put Price = -0.0210708

K = 66: Delta of Call Price = 0.92696

66: Delta of Put Price = -0.0242697

K = 67: Delta of Call Price = 0.923421

67: Delta of Put Price = -0.0278084

K = 68: Delta of Call Price = 0.919526

68: Delta of Put Price = -0.0317037

K = 69: Delta of Call Price = 0.915258

69: Delta of Put Price = -0.035971

K = 70: Delta of Call Price = 0.910605

70: Delta of Put Price = -0.0406246

K = 71: Delta of Call Price = 0.905552

71: Delta of Put Price = -0.0456769

K = 72: Delta of Call Price = 0.90009

72: Delta of Put Price = -0.0511391

K = 73: Delta of Call Price = 0.894209

73: Delta of Put Price = -0.0570203

K = 74: Delta of Call Price = 0.887902

74: Delta of Put Price = -0.0633278

K = 75: Delta of Call Price = 0.881162

75: Delta of Put Price = -0.070067

K = 76: Delta of Call Price = 0.873988

76: Delta of Put Price = -0.0772413

K = 77: Delta of Call Price = 0.866377

77: Delta of Put Price = -0.084852

K = 78: Delta of Call Price = 0.858331

78: Delta of Put Price = -0.0928982

K = 79: Delta of Call Price = 0.849852

79: Delta of Put Price = -0.101377

K = 80: Delta of Call Price = 0.840945

80: Delta of Put Price = -0.110284

K = 81: Delta of Call Price = 0.831617

81: Delta of Put Price = -0.119613

K = 82: Delta of Call Price = 0.821876

82: Delta of Put Price = -0.129354

K = 83: Delta of Call Price = 0.811733

83: Delta of Put Price = -0.139496

K = 84: Delta of Call Price = 0.801201

84: Delta of Put Price = -0.150029

K = 85: Delta of Call Price = 0.790293

85: Delta of Put Price = -0.160936

K = 86: Delta of Call Price = 0.779025

86: Delta of Put Price = -0.172204

K = 87: Delta of Call Price = 0.767414

87: Delta of Put Price = -0.183816

K = 88: Delta of Call Price = 0.755477

88: Delta of Put Price = -0.195752

K = 89: Delta of Call Price = 0.743235

89: Delta of Put Price = -0.207994

K = 90: Delta of Call Price = 0.730708

90: Delta of Put Price = -0.220522

K = 91: Delta of Call Price = 0.717916

91: Delta of Put Price = -0.233313

K = 92: Delta of Call Price = 0.704882

92: Delta of Put Price = -0.246348

K = 93: Delta of Call Price = 0.691628

93: Delta of Put Price = -0.259602

K = 94: Delta of Call Price = 0.678176

94: Delta of Put Price = -0.273053

K = 95: Delta of Call Price = 0.664551

95: Delta of Put Price = -0.286679

K = 96: Delta of Call Price = 0.650775

96: Delta of Put Price = -0.300455

K = 97: Delta of Call Price = 0.636871

97: Delta of Put Price = -0.314358

K = 98: Delta of Call Price = 0.622864

98: Delta of Put Price = -0.328366

K = 99: Delta of Call Price = 0.608775

99: Delta of Put Price = -0.342454

K = 100: Delta of Call Price = 0.594629

100: Delta of Put Price = -0.356601

sig = 1: Delta of Call Price = 0.631321

1: Delta of Put Price = -0.319909

sig = 2: Delta of Call Price = 0.733243

2: Delta of Put Price = -0.217986

sig = 3: Delta of Call Price = 0.818763

3: Delta of Put Price = -0.132466

sig = 4: Delta of Call Price = 0.878795

4: Delta of Put Price = -0.0724349

sig = 5: Delta of Call Price = 0.915644

5: Delta of Put Price = -0.0355854

sig = 6: Delta of Call Price = 0.935563

6: Delta of Put Price = -0.0156665

sig = 7: Delta of Call Price = 0.945063

7: Delta of Put Price = -0.00616632

sig = 8: Delta of Call Price = 0.949064

8: Delta of Put Price = -0.00216558

sig = 9: Delta of Call Price = 0.950552

9: Delta of Put Price = -0.000677497

sig = 10: Delta of Call Price = 0.951041

10: Delta of Put Price = -0.000188559

sig = 11: Delta of Call Price = 0.951183

11: Delta of Put Price = -4.66354e-05

sig = 12: Delta of Call Price = 0.951219

12: Delta of Put Price = -1.02405e-05

sig = 13: Delta of Call Price = 0.951227

13: Delta of Put Price = -1.99499e-06

sig = 14: Delta of Call Price = 0.951229

14: Delta of Put Price = -3.44587e-07

sig = 15: Delta of Call Price = 0.951229

15: Delta of Put Price = -5.27433e-08

sig = 16: Delta of Call Price = 0.951229

16: Delta of Put Price = -7.15074e-09

sig = 17: Delta of Call Price = 0.951229

17: Delta of Put Price = -8.5839e-10

sig = 18: Delta of Call Price = 0.951229

18: Delta of Put Price = -9.12066e-11

sig = 19: Delta of Call Price = 0.951229

19: Delta of Put Price = -8.57536e-12

sig = 20: Delta of Call Price = 0.951229

20: Delta of Put Price = -7.13318e-13

sig = 21: Delta of Call Price = 0.951229

21: Delta of Put Price = -5.25135e-14

sig = 22: Delta of Call Price = 0.951229

22: Delta of Put Price = -3.33067e-15

sig = 23: Delta of Call Price = 0.951229

23: Delta of Put Price = -2.22045e-16

sig = 24: Delta of Call Price = 0.951229

24: Delta of Put Price = 0

sig = 25: Delta of Call Price = 0.951229

25: Delta of Put Price = 0

sig = 26: Delta of Call Price = 0.951229

26: Delta of Put Price = 0

sig = 27: Delta of Call Price = 0.951229

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sig = 28: Delta of Call Price = 0.951229

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sig = 29: Delta of Call Price = 0.951229

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sig = 30: Delta of Call Price = 0.951229

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sig = 31: Delta of Call Price = 0.951229

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sig = 32: Delta of Call Price = 0.951229

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sig = 39: Delta of Call Price = 0.951229

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sig = 40: Delta of Call Price = 0.951229

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sig = 41: Delta of Call Price = 0.951229

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sig = 42: Delta of Call Price = 0.951229

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sig = 43: Delta of Call Price = 0.951229

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sig = 44: Delta of Call Price = 0.951229

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sig = 45: Delta of Call Price = 0.951229

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sig = 46: Delta of Call Price = 0.951229

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sig = 47: Delta of Call Price = 0.951229

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sig = 48: Delta of Call Price = 0.951229

48: Delta of Put Price = 0

sig = 49: Delta of Call Price = 0.951229

49: Delta of Put Price = 0

sig = 50: Delta of Call Price = 0.951229

50: Delta of Put Price = 0

sig = 51: Delta of Call Price = 0.951229

51: Delta of Put Price = 0

d.)

Using divided differences:

Delta and Gamma for Call Option

h = 1, Call Option: Delta = 0.59458 ,Gamma = 0.0134928

h = 2, Call Option: Delta = 0.594436 ,Gamma = 0.0134903

h = 3, Call Option: Delta = 0.594195 ,Gamma = 0.0134862

h = 4, Call Option: Delta = 0.59386 ,Gamma = 0.0134804

h = 5, Call Option: Delta = 0.59343 ,Gamma = 0.0134729

h = 6, Call Option: Delta = 0.592906 ,Gamma = 0.0134637

h = 7, Call Option: Delta = 0.592292 ,Gamma = 0.0134529

h = 8, Call Option: Delta = 0.591588 ,Gamma = 0.0134403

h = 9, Call Option: Delta = 0.590796 ,Gamma = 0.0134259

h = 10, Call Option: Delta = 0.589918 ,Gamma = 0.0134098

Delta and Gamma for Put Option

h = 1, Put Option: Delta = -0.356649 ,Gamma = 0.0134928

h = 2, Put Option: Delta = -0.356794 ,Gamma = 0.0134903

h = 3, Put Option: Delta = -0.357034 ,Gamma = 0.0134862

h = 4, Put Option: Delta = -0.35737 ,Gamma = 0.0134804

h = 5, Put Option: Delta = -0.3578 ,Gamma = 0.0134729

h = 6, Put Option: Delta = -0.358323 ,Gamma = 0.0134637

h = 7, Put Option: Delta = -0.358938 ,Gamma = 0.0134529

h = 8, Put Option: Delta = -0.359642 ,Gamma = 0.0134403

h = 9, Put Option: Delta = -0.360434 ,Gamma = 0.0134259

h = 10, Put Option: Delta = -0.361311 ,Gamma = 0.0134098

Dicussion:

To compare, as the h gets smaller the delta and gamma for both call and put options gets closer to the value offered by formula. If h could be much smaller, the accuracy of deltas & gammas would be much higher.

Delta of Call Option = 0.594629

Delta of Put Option = -0.356601

Gamma of Call Option = 0.0134936

Gamma of Put Option = 0.0134936