A1.a >>>

Batch 1:T=0.25,K=65,sig=0.3,r=0.08,S=60 (C=2.13337, P=5.84628).

Pass Put-Call Parity Test.

Batch 2:T=1,K=100,sig=0.2,r=0,S=100 (C=7.96557, P=7.96557).

Pass Put-Call Parity Test.

Batch 3:T=1,K=10,sig=0.5,r=0.12,S=5 (C=0.204058, P=4.07326).

Pass Put-Call Parity Test.

Batch 4:T=30,K=100,sig=0.3,r=0.08,S=100 (C=92.1757, P=1.2475).

Pass Put-Call Parity Test.

A1.b >>>

Batch 1:T=0.25,K=65,sig=0.3,r=0.08,S=60 (C=2.13337, P=5.84628).

Batch 2:T=1,K=100,sig=0.2,r=0,S=100 (C=7.96557, P=7.96557).

Batch 3:T=1,K=10,sig=0.5,r=0.12,S=5 (C=0.204058, P=4.07326).

Batch 4:T=30,K=100,sig=0.3,r=0.08,S=100 (C=92.1757, P=1.2475).

A1.c >>>

Batch 1:

T=0.25,K=65,sig=0.3,r=0.08,S=10 (C=7.792e-36, P=53.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=11 (C=1.88964e-32, P=52.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=12 (C=1.64204e-29, P=51.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=13 (C=6.19303e-27, P=50.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=14 (C=1.17207e-24, P=49.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=15 (C=1.24529e-22, P=48.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=16 (C=8.11387e-21, P=47.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=17 (C=3.47944e-19, P=46.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=18 (C=1.03991e-17, P=45.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=19 (C=2.27042e-16, P=44.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=20 (C=3.76503e-15, P=43.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=21 (C=4.89964e-14, P=42.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=22 (C=5.1436e-13, P=41.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=23 (C=4.45934e-12, P=40.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=24 (C=3.25772e-11, P=39.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=25 (C=2.0405e-10, P=38.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=26 (C=1.11246e-09, P=37.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=27 (C=5.34891e-09, P=36.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=28 (C=2.29454e-08, P=35.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=29 (C=8.8713e-08, P=34.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=30 (C=3.11926e-07, P=33.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=31 (C=1.00545e-06, P=32.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=32 (C=2.99241e-06, P=31.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=33 (C=8.27565e-06, P=30.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=34 (C=2.13896e-05, P=29.7129).

T=0.25,K=65,sig=0.3,r=0.08,S=35 (C=5.19359e-05, P=28.713).

T=0.25,K=65,sig=0.3,r=0.08,S=36 (C=0.000119024, P=27.713).

T=0.25,K=65,sig=0.3,r=0.08,S=37 (C=0.000258548, P=26.7132).

T=0.25,K=65,sig=0.3,r=0.08,S=38 (C=0.000534403, P=25.7134).

T=0.25,K=65,sig=0.3,r=0.08,S=39 (C=0.00105474, P=24.714).

T=0.25,K=65,sig=0.3,r=0.08,S=40 (C=0.00199417, P=23.7149).

T=0.25,K=65,sig=0.3,r=0.08,S=41 (C=0.00362244, P=22.7165).

T=0.25,K=65,sig=0.3,r=0.08,S=42 (C=0.00633924, P=21.7193).

T=0.25,K=65,sig=0.3,r=0.08,S=43 (C=0.010714, P=20.7236).

T=0.25,K=65,sig=0.3,r=0.08,S=44 (C=0.0175282, P=19.7304).

T=0.25,K=65,sig=0.3,r=0.08,S=45 (C=0.0278174, P=18.7407).

T=0.25,K=65,sig=0.3,r=0.08,S=46 (C=0.0429083, P=17.7558).

T=0.25,K=65,sig=0.3,r=0.08,S=47 (C=0.0644467, P=16.7774).

T=0.25,K=65,sig=0.3,r=0.08,S=48 (C=0.0944125, P=15.8073).

T=0.25,K=65,sig=0.3,r=0.08,S=49 (C=0.135117, P=14.848).

T=0.25,K=65,sig=0.3,r=0.08,S=50 (C=0.189181, P=13.9021).

Batch 2:

T=1,K=100,sig=0.2,r=0,S=10 (C=3.05867e-31, P=90).

T=1,K=100,sig=0.2,r=0,S=11 (C=7.50875e-29, P=89).

T=1,K=100,sig=0.2,r=0,S=12 (C=9.39062e-27, P=88).

T=1,K=100,sig=0.2,r=0,S=13 (C=6.76817e-25, P=87).

T=1,K=100,sig=0.2,r=0,S=14 (C=3.08735e-23, P=86).

T=1,K=100,sig=0.2,r=0,S=15 (C=9.58525e-22, P=85).

T=1,K=100,sig=0.2,r=0,S=16 (C=2.14514e-20, P=84).

T=1,K=100,sig=0.2,r=0,S=17 (C=3.62362e-19, P=83).

T=1,K=100,sig=0.2,r=0,S=18 (C=4.79653e-18, P=82).

T=1,K=100,sig=0.2,r=0,S=19 (C=5.13087e-17, P=81).

T=1,K=100,sig=0.2,r=0,S=20 (C=4.55058e-16, P=80).

T=1,K=100,sig=0.2,r=0,S=21 (C=3.41899e-15, P=79).

T=1,K=100,sig=0.2,r=0,S=22 (C=2.21616e-14, P=78).

T=1,K=100,sig=0.2,r=0,S=23 (C=1.25872e-13, P=77).

T=1,K=100,sig=0.2,r=0,S=24 (C=6.34869e-13, P=76).

T=1,K=100,sig=0.2,r=0,S=25 (C=2.87668e-12, P=75).

T=1,K=100,sig=0.2,r=0,S=26 (C=1.18282e-11, P=74).

T=1,K=100,sig=0.2,r=0,S=27 (C=4.45231e-11, P=73).

T=1,K=100,sig=0.2,r=0,S=28 (C=1.54615e-10, P=72).

T=1,K=100,sig=0.2,r=0,S=29 (C=4.98755e-10, P=71).

T=1,K=100,sig=0.2,r=0,S=30 (C=1.50356e-09, P=70).

T=1,K=100,sig=0.2,r=0,S=31 (C=4.25893e-09, P=69).

T=1,K=100,sig=0.2,r=0,S=32 (C=1.13899e-08, P=68).

T=1,K=100,sig=0.2,r=0,S=33 (C=2.8884e-08, P=67).

T=1,K=100,sig=0.2,r=0,S=34 (C=6.97279e-08, P=66).

T=1,K=100,sig=0.2,r=0,S=35 (C=1.60803e-07, P=65).

T=1,K=100,sig=0.2,r=0,S=36 (C=3.5539e-07, P=64).

T=1,K=100,sig=0.2,r=0,S=37 (C=7.54907e-07, P=63).

T=1,K=100,sig=0.2,r=0,S=38 (C=1.54526e-06, P=62).

T=1,K=100,sig=0.2,r=0,S=39 (C=3.05545e-06, P=61).

T=1,K=100,sig=0.2,r=0,S=40 (C=5.84877e-06, P=60).

T=1,K=100,sig=0.2,r=0,S=41 (C=1.08604e-05, P=59).

T=1,K=100,sig=0.2,r=0,S=42 (C=1.95985e-05, P=58).

T=1,K=100,sig=0.2,r=0,S=43 (C=3.44297e-05, P=57).

T=1,K=100,sig=0.2,r=0,S=44 (C=5.89738e-05, P=56.0001).

T=1,K=100,sig=0.2,r=0,S=45 (C=9.8635e-05, P=55.0001).

T=1,K=100,sig=0.2,r=0,S=46 (C=0.000161299, P=54.0002).

T=1,K=100,sig=0.2,r=0,S=47 (C=0.000258226, P=53.0003).

T=1,K=100,sig=0.2,r=0,S=48 (C=0.000405172, P=52.0004).

T=1,K=100,sig=0.2,r=0,S=49 (C=0.000623757, P=51.0006).

T=1,K=100,sig=0.2,r=0,S=50 (C=0.000943109, P=50.0009).

Batch 3:

T=1,K=10,sig=0.5,r=0.12,S=10 (C=2.48011, P=1.34932).

T=1,K=10,sig=0.5,r=0.12,S=11 (C=3.20115, P=1.07036).

T=1,K=10,sig=0.5,r=0.12,S=12 (C=3.97989, P=0.849091).

T=1,K=10,sig=0.5,r=0.12,S=13 (C=4.80493, P=0.674134).

T=1,K=10,sig=0.5,r=0.12,S=14 (C=5.6668, P=0.536003).

T=1,K=10,sig=0.5,r=0.12,S=15 (C=6.55778, P=0.426982).

T=1,K=10,sig=0.5,r=0.12,S=16 (C=7.47169, P=0.340889).

T=1,K=10,sig=0.5,r=0.12,S=17 (C=8.40362, P=0.272821).

T=1,K=10,sig=0.5,r=0.12,S=18 (C=9.34971, P=0.218913).

T=1,K=10,sig=0.5,r=0.12,S=19 (C=10.3069, P=0.176132).

T=1,K=10,sig=0.5,r=0.12,S=20 (C=11.2729, P=0.142104).

T=1,K=10,sig=0.5,r=0.12,S=21 (C=12.2458, P=0.114972).

T=1,K=10,sig=0.5,r=0.12,S=22 (C=13.2241, P=0.0932814).

T=1,K=10,sig=0.5,r=0.12,S=23 (C=14.2067, P=0.0758952).

T=1,K=10,sig=0.5,r=0.12,S=24 (C=15.1927, P=0.0619213).

T=1,K=10,sig=0.5,r=0.12,S=25 (C=16.1815, P=0.050659).

T=1,K=10,sig=0.5,r=0.12,S=26 (C=17.1724, P=0.0415573).

T=1,K=10,sig=0.5,r=0.12,S=27 (C=18.165, P=0.0341815).

T=1,K=10,sig=0.5,r=0.12,S=28 (C=19.159, P=0.0281882).

T=1,K=10,sig=0.5,r=0.12,S=29 (C=20.1541, P=0.0233052).

T=1,K=10,sig=0.5,r=0.12,S=30 (C=21.1501, P=0.0193162).

T=1,K=10,sig=0.5,r=0.12,S=31 (C=22.1468, P=0.0160492).

T=1,K=10,sig=0.5,r=0.12,S=32 (C=23.1442, P=0.0133667).

T=1,K=10,sig=0.5,r=0.12,S=33 (C=24.142, P=0.0111585).

T=1,K=10,sig=0.5,r=0.12,S=34 (C=25.1401, P=0.00933635).

T=1,K=10,sig=0.5,r=0.12,S=35 (C=26.1386, P=0.00782914).

T=1,K=10,sig=0.5,r=0.12,S=36 (C=27.1374, P=0.0065795).

T=1,K=10,sig=0.5,r=0.12,S=37 (C=28.1363, P=0.00554104).

T=1,K=10,sig=0.5,r=0.12,S=38 (C=29.1355, P=0.00467613).

T=1,K=10,sig=0.5,r=0.12,S=39 (C=30.1347, P=0.00395419).

T=1,K=10,sig=0.5,r=0.12,S=40 (C=31.1341, P=0.00335029).

T=1,K=10,sig=0.5,r=0.12,S=41 (C=32.1336, P=0.00284408).

T=1,K=10,sig=0.5,r=0.12,S=42 (C=33.1332, P=0.00241887).

T=1,K=10,sig=0.5,r=0.12,S=43 (C=34.1329, P=0.00206101).

T=1,K=10,sig=0.5,r=0.12,S=44 (C=35.1326, P=0.00175922).

T=1,K=10,sig=0.5,r=0.12,S=45 (C=36.1323, P=0.00150425).

T=1,K=10,sig=0.5,r=0.12,S=46 (C=37.1321, P=0.00128842).

T=1,K=10,sig=0.5,r=0.12,S=47 (C=38.1319, P=0.00110539).

T=1,K=10,sig=0.5,r=0.12,S=48 (C=39.1317, P=0.000949906).

T=1,K=10,sig=0.5,r=0.12,S=49 (C=40.1316, P=0.000817588).

T=1,K=10,sig=0.5,r=0.12,S=50 (C=41.1315, P=0.000704793).

Batch 4:

T=30,K=100,sig=0.3,r=0.08,S=10 (C=6.08558, P=5.15738).

T=30,K=100,sig=0.3,r=0.08,S=11 (C=6.90422, P=4.97602).

T=30,K=100,sig=0.3,r=0.08,S=12 (C=7.73711, P=4.8089).

T=30,K=100,sig=0.3,r=0.08,S=13 (C=8.58239, P=4.65419).

T=30,K=100,sig=0.3,r=0.08,S=14 (C=9.43856, P=4.51036).

T=30,K=100,sig=0.3,r=0.08,S=15 (C=10.3044, P=4.37617).

T=30,K=100,sig=0.3,r=0.08,S=16 (C=11.1788, P=4.25056).

T=30,K=100,sig=0.3,r=0.08,S=17 (C=12.0608, P=4.13264).

T=30,K=100,sig=0.3,r=0.08,S=18 (C=12.9499, P=4.02165).

T=30,K=100,sig=0.3,r=0.08,S=19 (C=13.8451, P=3.91694).

T=30,K=100,sig=0.3,r=0.08,S=20 (C=14.7461, P=3.81792).

T=30,K=100,sig=0.3,r=0.08,S=21 (C=15.6523, P=3.72411).

T=30,K=100,sig=0.3,r=0.08,S=22 (C=16.5633, P=3.63506).

T=30,K=100,sig=0.3,r=0.08,S=23 (C=17.4786, P=3.55038).

T=30,K=100,sig=0.3,r=0.08,S=24 (C=18.3979, P=3.46974).

T=30,K=100,sig=0.3,r=0.08,S=25 (C=19.321, P=3.39282).

T=30,K=100,sig=0.3,r=0.08,S=26 (C=20.2476, P=3.31936).

T=30,K=100,sig=0.3,r=0.08,S=27 (C=21.1773, P=3.24911).

T=30,K=100,sig=0.3,r=0.08,S=28 (C=22.11, P=3.18184).

T=30,K=100,sig=0.3,r=0.08,S=29 (C=23.0456, P=3.11735).

T=30,K=100,sig=0.3,r=0.08,S=30 (C=23.9837, P=3.05547).

T=30,K=100,sig=0.3,r=0.08,S=31 (C=24.9242, P=2.99603).

T=30,K=100,sig=0.3,r=0.08,S=32 (C=25.8671, P=2.93888).

T=30,K=100,sig=0.3,r=0.08,S=33 (C=26.8121, P=2.88387).

T=30,K=100,sig=0.3,r=0.08,S=34 (C=27.7591, P=2.83088).

T=30,K=100,sig=0.3,r=0.08,S=35 (C=28.708, P=2.7798).

T=30,K=100,sig=0.3,r=0.08,S=36 (C=29.6587, P=2.73052).

T=30,K=100,sig=0.3,r=0.08,S=37 (C=30.6111, P=2.68294).

T=30,K=100,sig=0.3,r=0.08,S=38 (C=31.5652, P=2.63697).

T=30,K=100,sig=0.3,r=0.08,S=39 (C=32.5207, P=2.59252).

T=30,K=100,sig=0.3,r=0.08,S=40 (C=33.4777, P=2.54952).

T=30,K=100,sig=0.3,r=0.08,S=41 (C=34.4361, P=2.50789).

T=30,K=100,sig=0.3,r=0.08,S=42 (C=35.3958, P=2.46756).

T=30,K=100,sig=0.3,r=0.08,S=43 (C=36.3567, P=2.42848).

T=30,K=100,sig=0.3,r=0.08,S=44 (C=37.3188, P=2.39057).

T=30,K=100,sig=0.3,r=0.08,S=45 (C=38.282, P=2.3538).

T=30,K=100,sig=0.3,r=0.08,S=46 (C=39.2463, P=2.3181).

T=30,K=100,sig=0.3,r=0.08,S=47 (C=40.2116, P=2.28342).

T=30,K=100,sig=0.3,r=0.08,S=48 (C=41.1779, P=2.24973).

T=30,K=100,sig=0.3,r=0.08,S=49 (C=42.1452, P=2.21698).

T=30,K=100,sig=0.3,r=0.08,S=50 (C=43.1133, P=2.18512).

A1.d >>>

47.5624 45.2837 43.2119 41.3214 39.5719 37.9323 36.3816 34.9056 33.4948 32.1425

85.6106 81.383 77.1553 72.9276 68.6999 64.4722 60.2445 56.0169 51.7893 47.5624

47.5615 47.5624 47.6325 48.0086 48.8047 49.9684 51.4064 53.0355 54.7917 56.6272

49.5034 49.0109 48.5232 48.0404 47.5624 47.0891 46.6206 46.1567 45.6974 45.2427

A2.a >>>

OptionType: C,T=0.5,K=100,sig=0.36,r=0.1,S=105 Delta: 0.594629 , Gamma: 0.0134936

OptionType: P,T=0.5,K=100,sig=0.36,r=0.1,S=105 Delta: -0.356601 , Gamma: -0.356601

A2.b >>>

OptionType: C,T=0.5,K=100,sig=0.36,r=0.1,S=105

Delta : 2.25551e-19 6.18174e-18 1.12536e-16 1.46673e-15 1.44882e-14 1.1336e-13 7.27491e-13 3.93787e-12 1.83921e-11 7.55191e-11 2.76878e-10 9.18317e-10 2.78591e-09 7.80377e-09 2.0348e-08 4.97346e-08 1.14647e-07 2.50577e-07 5.21714e-07 1.03903e-06 1.98667e-06 3.65877e-06 6.5092e-06 1.1216e-05 1.87624e-05 3.05351e-05 4.84406e-05 7.50367e-05 0.00011368 0.000168682 0.000245471 0.000350761 0.000492699 0.000681019 0.000927157 0.00124435 0.00164771 0.00215423 0.00278276 0.00355398 0.00449025

Delta : 7.99889e-19 1.91133e-17 3.06528e-16 3.5504e-15 3.13999e-14 2.21388e-13 1.28747e-12 6.34636e-12 2.71108e-11 1.02212e-10 3.4529e-10 1.05853e-09 2.97663e-09 7.74877e-09 1.88211e-08 4.29453e-08 9.26003e-08 1.89662e-07 3.70674e-07 6.94045e-07 1.24942e-06 2.16936e-06 3.64316e-06 5.93265e-06 9.38929e-06 1.44717e-05 2.1763e-05 3.19861e-05 4.60161e-05 6.48894e-05 8.98063e-05 0.000122128 0.000163369 0.000215175 0.000279307 0.000357603 0.000451947 0.000564227 0.000696287 0.000849884 0.00102664

A2.c >>>

Delta :

0.951057 0.900521 0.847929 0.796931 0.749152 0.704908 0.664038 0.626242 0.591208 0.558647

0.951229 0.951229 0.951229 0.951229 0.951229 0.951229 0.951229 0.951227 0.951203 0.951057

0.951229 0.951057 0.94463 0.925902 0.902822 0.881979 0.865535 0.853558 0.845451 0.840501

0.98987 0.980021 0.970269 0.960615 0.951057 0.941594 0.932225 0.922949 0.913765 0.904673

Gamma :

3.29043e-05 0.000443572 0.00093269 0.00126105 0.00144146 0.00152149 0.00153819 0.00151601 0.0014705 0.0014115

9.85554e-32 3.4086e-23 6.85015e-18 2.90262e-14 1.23171e-11 1.16765e-09 3.92227e-08 6.21753e-07 5.6159e-06 3.29043e-05

9.89083e-13 3.29043e-05 0.000613002 0.00146514 0.00198986 0.00219373 0.00220834 0.00212732 0.00200292 0.00186236

3.42472e-05 3.39064e-05 3.3569e-05 3.3235e-05 3.29043e-05 3.25769e-05 3.22528e-05 3.19318e-05 3.16141e-05 3.12995e-05

A2.d >>>

OptionType: C,T=0.5,K=100,sig=0.36,r=0.1,S=105

Delta : 9.58887e-19 1.97552e-17 2.88609e-16 3.16816e-15 2.7332e-14 1.92005e-13 1.13007e-12 5.70343e-12 2.51607e-11 9.85836e-11 3.47721e-10 1.11677e-09 3.29808e-09 9.03197e-09 2.3105e-08 5.5565e-08 1.26328e-07 2.72857e-07 5.62345e-07 1.11015e-06 2.10653e-06 3.85392e-06 6.81691e-06 1.1687e-05 1.94639e-05 3.15536e-05 4.98846e-05 7.70393e-05 0.0001164 0.000172306 0.000250213 0.00035686 0.00050042 0.000690645 0.000938989 0.0012587 0.00166489 0.00217455 0.00280653 0.00358148 0.00452173

Gamma : 1.79775e-18 3.57948e-17 5.01914e-16 5.25719e-15 4.30705e-14 2.86276e-13 1.58986e-12 7.55686e-12 3.13576e-11 1.15488e-10 3.82786e-10 1.15532e-09 3.20729e-09 8.26048e-09 1.98855e-08 4.50345e-08 9.64907e-08 1.96568e-07 3.82408e-07 7.13202e-07 1.27957e-06 2.21521e-06 3.71076e-06 6.02947e-06 9.52425e-06 1.46552e-05 2.20067e-05 3.23026e-05 4.6419e-05 6.53924e-05 9.04227e-05 0.000122871 0.000164249 0.000216202 0.000280487 0.00035894 0.000453442 0.000565876 0.000698082 0.000851815 0.00102869