**Group D**

1. The code is attached with homework files. I used the formula as is given in pdf eventhough I feel it may not be correct. I was confused reading it up on the forum and didn’t not what to chose, so I went ahead with the pdf’s version.
2. My code is compiling and I have tested it with call options for Batch 1 and Batch 2.

Batch 1: T = 0.25, K = 65, sig = 0.30, r = 0.08, S = 60 (then C = 2.13293, P = 5.84584).

Batch 2: T = 1.0, K = 100, sig = 0.2, r = 0.0, S = 100 (then C = 7.96632, P = 7.96632).

CALL OPTION RESULTS FOR BATCH 1

Number of subintervals in time: 100

Number of simulations: 10000

Price, after discounting: 2.19291,

Number of times origin is hit: 0

Standard Deviation :0.0450668

Standard Error :0.000450668

Number of subintervals in time: 100

Number of simulations: 50000

Price, after discounting: 2.13519,

Number of times origin is hit: 0

Standard Deviation :0.0198939

Standard Error :8.89684e-05

Number of subintervals in time: 100

Number of simulations: 500000

Price, after discounting: 2.11876,

Number of times origin is hit: 0

Standard Deviation :0.00623148

Standard Error :8.81264e-06

Number of subintervals in time: 1000

Number of simulations: 50000

Price, after discounting: 2.08136,

Number of times origin is hit: 0

Standard Deviation :0.0195535

Standard Error :8.74461e-05

**Remarks:**  Batch 1 call option simulations converge very fast with small standard errors with value closest to two decimal places obtained for 100 time steps and 50000 simulations. (standard error 9E-5).

PUT OPTION RESULTS FOR BATCH 1

Number of subintervals in time: 100

Number of simulations: 50000

Price, after discounting: 5.87026,

Number of times origin is hit: 0

Standard Deviation :0.0265009

Standard Error :0.000118516

Number of subintervals in time: 100

Number of simulations: 500000

Price, after discounting: 5.86879,

Number of times origin is hit: 0

Standard Deviation :0.0083936

Standard Error :1.18703e-05

Number of subintervals in time: 1000

Number of simulations: 50000

Price, after discounting: 5.91142,

Number of times origin is hit: 0

Standard Deviation :0.0266304

Standard Error :0.000119095

Number of subintervals in time: 1000

Number of simulations: 500000

Price, after discounting: 5.84075,

Number of times origin is hit: 0

Standard Deviation :0.0083772

Standard Error :1.18472e-05

**Remarks:**  Batch 1 put option results converge as time steps and number of simulations are increased. (standard error 1E-5). Best result of 5.84 obtained for 1000 time steps and 500,000 simulations.

CALL OPTION RESULTS FOR BATCH 2

Number of subintervals in time: 100

Number of simulations: 50000

Price, after discounting: 7.95195,

Number of times origin is hit: 0

Standard Deviation :0.0590421

Standard Error :0.000264044

Number of subintervals in time: 100

Number of simulations: 500000

Price, after discounting: 7.92294,

Number of times origin is hit: 0

Standard Deviation :0.018527

Standard Error :2.62011e-05

Number of subintervals in time: 100

Number of simulations: 1000000

Price, after discounting: 7.94525,

Number of times origin is hit: 0

Standard Deviation :0.0131115

Standard Error :1.31115e-05

Number of subintervals in time: 300

Number of simulations: 1000000

Price, after discounting: 7.95947,

Number of times origin is hit: 0

Standard Deviation :0.0131441

Standard Error :1.31441e-05

**Remarks:**  Batch 2 call option simulations converge as the number of time steps and number of simulations increase. Best results thus far is 7.95 with 300 time steps, 1MM simulations and std err of 1.3E-5. Similar behavior noted for put option.