GROUP E&F – MONTE CARLO PRICING METHODS

1. Answers to questions in write-up.

Group F – Finite Difference Methods (Introduction)

a) Compile and run the project as in and make sure that you get Excel output. Examine the code and try to get an idea of what is going on.

Output from batches 1-3 is saved in the DOCUMENTATION\Group F folder. Output from batch 4 produced an inaccurate "65535" number. I was unable to obtain better data even after adjusting various parameters.

b) *In this exercise, we test the FD scheme. We run the programs using the data from Batches1 to 4. Compare your answers with those from the previous exercises. That's all.*

Analysis:

The following screenshot provides data from the exact pricing method of a put option, and that of the FD scheme – testing various values of N. As demonstrated below, there are thresholds of N whereby FD scheme completely breaks down.

Batch 1:

We observe the FDM value of the put option converge towards the exact pricing method as N approaches 0, but breaks down at N = 999.

Batch 2:

We observe the FD scheme break down at N = 9099. I did not change any of the other parameters aside from N.

Batch 3:

We observe the FDM value of the put option converge towards the exact pricing method as N approaches infinity. But as N increases, it becomes quite time-consuming to wait for the CPU to complete the calculations.

Batch 4:

I was unable to anything but a "65535". Reading through TA comments in the forum, I opted to disregard this particular batch.

Batch	Exact Method Pricing - Put	FDM	FDM Value of Put Option
1	5.84628	N = 9999	5.8420683
1	5.84628	N = 7999	5.842074464
1	5.84628	N = 5999	5.842084766
1	5.84628	N = 4999	5.842093008
1	5.84628	N = 1999	5.842167225
1	5.84628	N = 999	-3.97E+45
2	7.96557	N = 11999	7.963194134
2	7.96557	N = 9999	7.963210858
2	7.96557	N =9499	7.963216139
2	7.96557	N =9099	4.06E+102
2	7.96557	N = 8999	Invalid - 65535
2	7.96557	N = 7999	Invalid - 65535
3	4.07326	N = 19999	4.071293294
3	4.07326	N = 14999	4.071290375
3	4.07326	N = 12999	4.071288578
3	4.07326	N = 9999	4.071284536
3	4.07326	N = 7999	4.071280157
4	1.2475		Invalid - 65535