Level 9 Homework

#### D Advanced Monte Carlo

###### b)

Batch 1(Number of subintervals in time: 100, Number of simulations: 20,000):

Price, after discounting: Call = 2.08127, Put = 5.90728

Number of times origin is hit: 0

Batch 1, Call: NT = 100, NSIM = 20000, SD = 0.0342154, SE = 0.00024194

Batch 1, Put: NT = 100, NSIM = 20000, SD = 0.0586378, SE = 0.000414632

Batch 2(Number of subintervals in time: 100, Number of simulations: 20,000):

Price, after discounting: Call = 7.78593, Put = 8.03849

Number of times origin is hit: 0

Batch 2, Call: NT = 100, NSIM = 20000, SD = 0.0566055, SE = 0.000283028

Batch 2, Put: NT = 100, NSIM = 20000, SD = 0.0557316, SE = 0.000278658

Batch 1(Number of subintervals in time: 500, Number of simulations: 1,000,000):

Price, after discounting: Call = 2.13071, Put = 5.84125

Number of times origin is hit: 0

Batch 1, Call: NT = 500, NSIM = 1000000, SD = 0.00489175, SE = 4.89175e-06

Batch 1, Put: NT = 500, NSIM = 1000000, SD = 0.00824135, SE = 8.24135e-06

Batch 2(Number of subintervals in time: 500, Number of simulations: 1,000,000):

Price, after discounting: Call = 7.96142, Put = 7.95663

Number of times origin is hit: 0

Batch 2, Call: NT = 500, NSIM = 1000000, SD = 0.0153655, SE = 1.53655e-05

Batch 2, Put: NT = 500, NSIM = 1000000, SD = 0.0130987, SE = 1.30987e-05

Conclusion

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | NT | NSIM | Call | | | Put | | |
| Price | SD | SE | Price | SD | SE |
| Batch 1 | 100 | 20, 000 | 2.08127 | 0.0342154 | 0.00024194 | 5.90728 | 0.0586378 | 0.000414632 |
| 500 | 1000, 000 | 2.13071 | 0.00489175 | 4.89175e-06 | 5.84125 | 0.00824322 | 8.24135e-06 |
| Batch 2 | 100 | 20, 000 | 7.78593 | 0.0566055 | 0.000283028 | 8.03849 | 0.0557316 | 0.000278658 |
| 500 | 1000, 000 | 7.96142 | 0.0153655 | 1.53655e-05 | 7.95663 | 0.0130987 | 1.30987e -05 |