



# **MA 323 : MONTE CARLO SIMULATION LAB 9**

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# CONTROL VARIATE TECHNIQUE

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The Stock Price is estimated using GBM-Model for 300 time points and then the Payoff of Average Price Put Option is calculated. This process is run for 1000 times and then mean, standard Deviation and 95% Confidence Interval is calculated.

The option price is calculated from payoff by using:

$$\text{Option Price} = \text{Payoff} * e^{-(r*T/365)}$$

In Ques 2, The value of b is estimated using the formula given in lecture.

Then using the Control Variate Technique, the variance in calculation of Price of Average Price Payoff Option is reduced.

Average Price Payoff Option	Mean	Standard Deviation	95% Confidence Interval
PART - 1	19.3437010242	11.94175865666207	[18.6035431543, 20.083858894]
PART - 2	19.3437010242	11.94112127659801	[18.6035826596, 20.0838193887]