# Homework 3

ECON 6204 (8204) - 001

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**Purpose**: Experiment on Monte Carlo Integration.

The aim is to compute prices of European call and put options using **explicit Euler method** and then compare these values with the option values obtained from the analytical solution from Black-Scholes method. In other words, compare option values from Monte Carlo simulations and those obtained from analytical solution.

**Output:**

| Index | N | BSM_C | MC_C | Error_call | BSM_P | MC_P | Error_put |
|---|---|---|---|---|---|---|---|
| 0 | 100 | 30.3017 | 29.7742 | 0.527464 | 27.3462 | 28.4104 | 1.06417 |
| 1 | 1000 | 30.3017 | 29.7571 | 0.544555 | 27.3462 | 27.7258 | 0.379546 |

## **Analysis**:

When dt = 0.01

With the increase in number of simulations, the error values of Call and put values decrease. However, we find the 1000 number of simulations as optimal point as it has lowest error values.

When dt = 0.001

With the increase in number of simulations, the error values of Call and Put values decrease, even more as compared to when dt = 0.01