Assignment 4.

Given December 4, due end of term.

Objective: To experiment with numerical solution of stochastic differential equations

We want to compute the answer of assignment 2 using Monte Carlo solution of the stochastic differential equations (1) and (2). The formula for $f(S = 20, r = .04, t = 0)$ is

$$f(S = 20, r = .04, t = 0) = E\left[\exp\left(-\int_0^T r(t)dt\right) f_0(S(T))\right] \; . \tag{1}$$

Where start with $S(0) = 20$ and $r(0) = .04$. At expiration, the value is known to be $f_0(S) = \max(K - S, o)$. Use the forward Euler method and Milstein's method. Choose a time step, Δt and number of samples, N so that the answer is accurate to within 1% if possible on your computer. Comment on the relative merits of this method as against the method from assignment 2.