FM 5022
Hw8

1) Compute $E(X_t)$ if

$$X_t = \sum_{i=0}^{N_t} Y_i$$

where N_t is a Poisson process with parameter λ and $Y_i, i \geq 0$ are normal iid random variables with mean μ.

2) Suppose that we are considering a model in which the volatility is stochastic and is independent from the underlying process. For example, in an easy case we could postulate that σ can take two values on $[0, T]$:

$$\sigma = \begin{cases} \sigma_1 & \text{with probability } p \\ \sigma_2 & \text{with probability } 1 - p \end{cases}$$

How would you price a call in this situation?

(We talked about this in class. Now, assume that the choice of σ_1 or σ_2 is done for the whole period. In other words, each path has either volatility σ_1 or σ_2 between $[0, T]$.)

3) Using the method discussed in class to value american path-dependent options using binomial trees find the price of a lookback american put on an underlying S which is trading at \$100.

Use $r = .01, \sigma = .20, T = 6$ months, $\Delta t = 2$ months .

Remember that the payoff is $S_{max} - S_T$.