Derivatives Lab

Sessions 8–9

October 8–9, 2012

1. Implement the binomial tree model via backward induction.

   Test your code by pricing a European call option with strike price $K = 0.9$, risk-free interest rate $r = 0.05$, and maturity time $T = 1$ on a stock with initial stock price $S_0 = 1$ and annualized volatility $\sigma = 0.3$.

2. Visualize your simulation using `imshow`. Think about an appropriate color map, how to mask the missing values (Hint: use Numpy's masked arrays), and how to best map the computed values into pixel coordinates.

3. Show that an American call option should be exercised at expiration for maximal profit.