

Optional project instead of the final

Find f , the price of an European call at time $t = 0$, with $S(0) = K = 60$, $r = 0.08$, $\sigma = 0.4$, and maturity in five months, i.e. $T = 5/12$ as follows:

- 1) **(10 points)** Using the binomial method (explain the number of steps taken, etc)
- 2) **(10 points)** From the explicit solution of the Black Sholes equation (also explain everything you do)
- 3) **(10 points)** By solving the Black Sholes PDE using Crank Nicolson (also explain everything you do)
- 4) **(10 points)** Using the Monte Carlo method described in class (also explain everything you do)