COSC5910 Project proposal for
XXX and YYY

Purpose
Test and compare different methods of pricing options for stocks that do not pay dividends.

Main Application

Take inputs from user for:	T – Time to expiry
RF – Risk free interest rate	C - Call price
SD – Standard deviation of changes in stock price	K – Strike price

- The app will then convert to ensure all inputs are in same time increments. That is, if maturity in days then annual RF rate must be converted to days. Stock class will also be utilized to get current price of the underlying security.
- Pricing is then done using the Black-Scholes formula – either by finding a class that can do this or by developing the Java code in the main app. This code can be tested independently by manual calculation or using calculators set up on certain websites.
- Pricing is then done using the Cox-Ross-Rubinstein formula – we have found a class that does this.
- The resulting prices are compared to the actual call price. The calculated prices and the actual prices are output on the screen along with the % deviation from the actual for each calculated price.
- These results are also written to a file for later analysis by the secondary application.

Secondary application
Read file produced by all previous runs of main app and calculate statistics for average % error for each of the pricing methods and % of time over/under estimated by each of the pricing methods.

Possible extensions of main app
Calculation of historical standard deviation – this would be done by one of two methods:
(A) Finding a class that could access historical data over the Internet (that is, from Yahoo). We are not sure if data is available in the format required. If this data is obtained, the app would calculate the standard deviation from raw data.
(B) More feasible. The data could be submitted in a file modified from a spreadsheet. (It is possible to download closing price data into a spreadsheet). It may be necessary to modify the main app to run from a test file rather than user interface if this method is implemented.

Modify main app to also work on stock which pay dividends - We will need to research the methodology required to do this.

Use Black Scholes to calculate implied volatility - This implied volatility could then be used in the CRR model to see if this gives a better estimate.

Obtain option data from MSE – We can see whether it is possible to download option data from MSE (C, K, T, stock symbol). Is there a class that does this? Does each option have a unique identifier.