I. Volatility

1. Download three months of daily stock prices for FACEBOOK (from12 /27/2019 to 3/27/2020)

* 1. from: finance.yahoo.com

1. Following the example in Chapter 15, compute the daily return;
2. Compute the standard deviation.

II. B-S Model

1. Lookup
   1. the yield on a three-month U.S. T-bill (from Federal Reserve bank);
2. Assuming the standard deviation is what you computed in part 3 and assume today is 3/27/2020, please determine the prices of **the call and put** that mature on 4/17/20 **and have the exercise price of $160** using the Black-Scholes basics model.
   1. Hint: When computing output variables, please use cell reference.
3. On 3/27/2020, the option premium of a call that matures on 4/17/2020 **with K=$160** is $7.70. The option premium of a put option that has the same exercise price and maturity date is $10.75. Compare the option prices you computed in part 5 with these two trading prices. Are they the same? If they are different, why?

III. Implied Volatility

1. Use the call option premium (trading price=$7.70) in part 5 to determine the implied volatility from the call option.
   1. Hint: You need to use goal seek function in Excel.
2. Assuming the standard deviation is what you computed in part 7 and assume today is 3/27/2020, determine the price of the call that **expires on** 4/17/2020 with the **exercise price of $155** using the Black-Scholes basics model.
3. On 3/27/2020, the option premium of a call that matures **on** 4/17/2020 with the **exercise price of $155** is $11.21. Compare the option price you computed in part 8. Are they the same? If they are different, why?

IV. Binominal Tree Model

1. If we use binominal tree model to value the option, assume there are 30 steps (trees), what is u and what is d? (Please use the volatility computed in part I.3.)