

# Math 191: Probability & Statistics Assignment

## Week #13

**Title:** Control Chart Analysis of Company Stock

**Objectives:**

- To practice constructing an x-chart using Excel functions and formulas.
- To review the various ways a chart indicates a process is “out of control”.

**Directions:**

- Review section 7.7 in your textbook, the handout and the beginning of Chapter 10 in Middleton for assistance with this assignment.
  - Beyond basic arithmetic, you will need to use the following Excel formulas: AVERAGE, STDEV, and possibly IF
  - Supply all of your answers to this lab on an Excel spreadsheet that includes your name, course number and section, and data set letter.
- (1) Determine a publicly traded company whose stock price you would like to analyze. Post your choice of stock within the weekly threads. No two students may choose the same stock.
  - (2) Download a list of the stock’s closing prices for the period from Monday August 2nd until Friday October 1st, 2004. (That’s 45 stock days.) You can locate this information as follows:
    - Go to <http://finance.yahoo.com> and type in the ticker symbol to go to your company’s stock page.
    - On the right side you will see a set of links. Follow the one entitled **historical prices**.
    - Near the bottom of the page click on the link entitled **Download To Spreadsheet**.
    - Save the file under any name you wish. Open it within Excel, remove all data from before August 2nd, 2004 as well as all data other than the **dates** and the **closing prices**.
  - (3) Calculate the average  $\bar{X}$  and standard deviation  $S$  of the stock prices.
  - (4) Use these values to determine upper and lower control limits using the formulas

$$LCL = \bar{X} - 3S, \text{ and } UCL = \bar{X} + 3S.$$

- (5) Check each of the closing stock prices to see if they exceed the listed control limits.
- (6) Also check for any of the following run patterns:
  - 12 out of 13 consecutive values to one side of the center line. ( $p = 0.32\%$ )
  - 14 out of 16 consecutive values to one side of the center line. ( $p = 0.37\%$ )
  - 16 out of 19 consecutive values to one side of the center line. ( $p = 0.37\%$ )
- (7) Use the Chart Wizard to draw an X-chart showing each closing price, the center line, and the two upper control limits.
- (8) For a basic example showing stock prices (from April 1 - June 4, 2004) see

<http://www.nj.devry.edu/~dchelst/math191/redhat-1.html>.