Title: Expressive power of data

Goals: Learn to solve problem and design solutions. In particular learn about
- Accessing realtime and online data from live sources in such domains as financial domain and scientific experiments.
- Data analysis and visualization using charts made from Processing commands.

Objectives:

Lab 5: Learn to analyze data and visualize it using Processing.

Lab 4: Learn to solve problems using modular solution using functional decomposition. Learn to use arithmetic operations and comparisons and nested control structures.

Lab 3: Learn to solve problems by designing algorithmic solutions. Use array data structures, functions and complex logical expressions and arithmetic operations such as modulus. Use switch statement to implement the state machine-defined logic of a game. Use pushMatrix and popMatrix of Processing to layer your sketch.

Lab 2: Learn to use graphic primitives translate, rotate; control motion was using loop(), noLoop(), frameRate(); Using control statements if..else, loops such as for and while statements.

Lab 1: Learn to (i) solve problem using Processing language (ii) use Processing Development Environment (PDE) (iii) use 2D primitives, color settings, image commands, mouse operations and the coordinate system of PDE.

Problem context:

In this lab we will design and implement a solution for analyzing data collected from online sources. In particular you will work with and plot as graph data from financial domain such as stock prices and volume of sale over a period of a year.

Problem Statement

During lecture discussed visualizing the trend for Apple stock data. The information or the details of Apple Inc. stock is collected from the online site finance.yahoo.com. The data collected is filtered using Processing functions and is plotted using Shape commands. You are required to generalize this solution given in your text book so that it can be used for analyzing more than one stock.
Implementation Details:

Study the example posted on ublearns (we discussed it in class). Understand the various functions and how the program works.

1. Implement the solution given for Apple Inc. for the one year from November 18-2013 and November 18-2014. This implementation should include the drawXLabels that display xlabels.
2. Display the stock process over a year for Apple Inc. stock.
3. Now add the functions such as **average** and **movingAverage(...)**.
4. At this point you want to compare Apple and Google stock. You are required to a split screen on the two stocks. Instead of repeating the code, reuse the code by **parameterizing** on the different variables. The Google stock will appear at the bottom half of the canvas and the Apple stock at the top half. For example, drawing legend has to be written as a function; drawGraph, drawXLabels, drawYLabels, etc. have to include extra parameters such as X1, Y1, width and height of graph area, the stock name, etc.

| Apple stock prices graph here |
| Google stock prices graph here |

It is very important you develop the solution in **incremental steps**.

- Your program should be modular with coherent functions and parameters to customize the functions.
- You can use println to debug your program.
- Your code should use variables as appropriate and use comments.
- ATTEND recitation class to learn the approaches to solving this problem and data structures and functions needed to solve the problem.

**Due date: 12/5/2014 before 6pm**