Cumulative **Freq**uency **Out**lier Analysis

(FreqOut)

About

FreqOut is a Universal Windows Platform stock analysis application. FreqOut performs a High Jump analysis on current stock data, displays the high jump alongside of the price in a graph, and runs a cumulative frequency distribution on the calculated high jump data. The data is pulled using Tiingo Stock and Financial Markets API and the analysis is calculated on the client side.

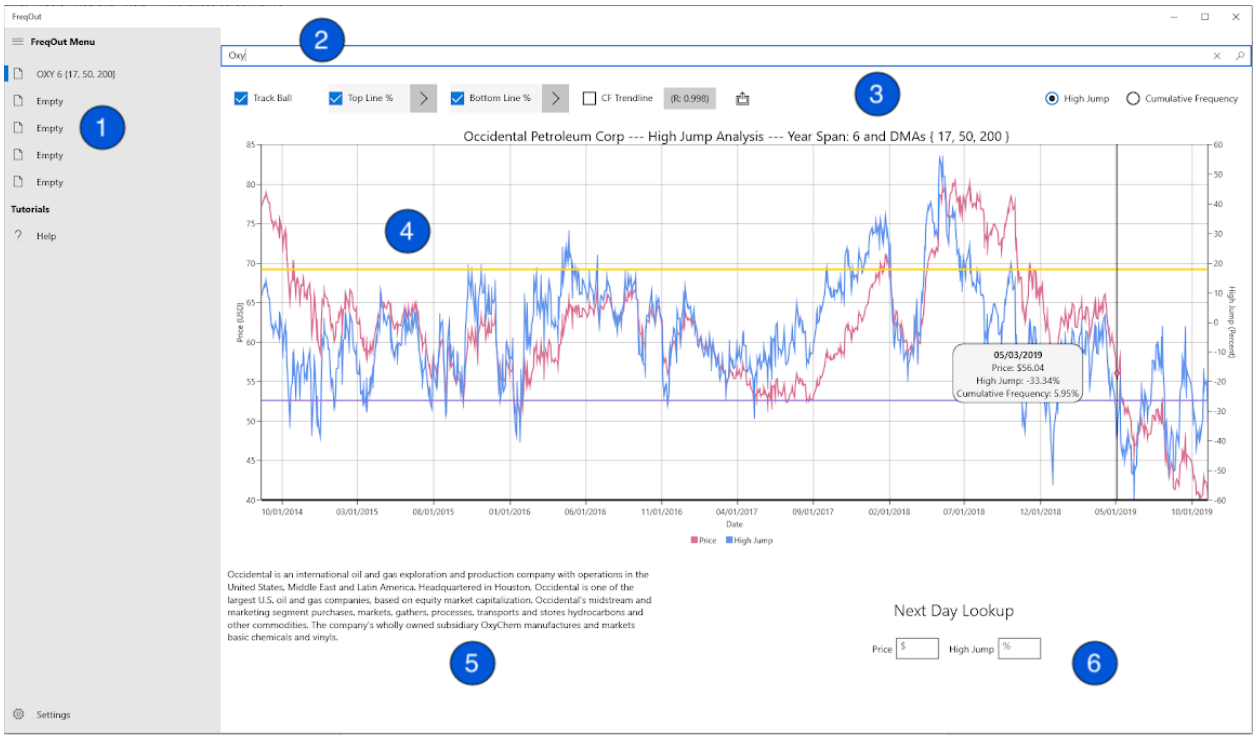
Basic Requirements

- Windows 10 environment
- Internet connection
- A free Tiingo API key (instructions for obtaining this key can be found within the application)

Features

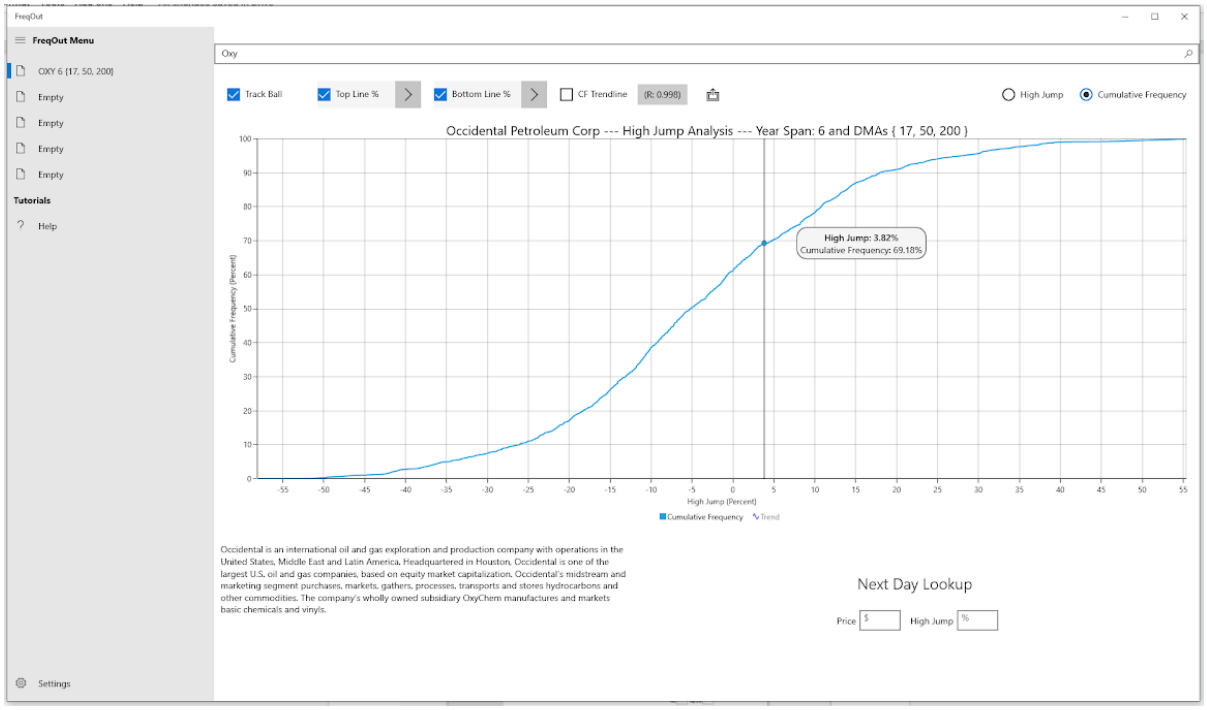
- High jump analysis with cumulative frequency distribution upon ticker search
- Graph interactivity such as:
    - Track ball
    - Windowed zooming
    - Scrolling
    - Exporting graph as image
    - Tool tips
- Customizable top and bottom lines for further analysis
    - Default top is 90th percentile
    - Default bottom is 10th percentile
- Next day lookup
    - Ability to look up the next day's high jump given a price
    - Ability to look up the next day's price given a high jump
- Set in navigation pane
    - Ability to open up to 5 different pages and switch easily for comparison
- Settings are customizable in the Daily Moving Averages (DMA) and year span
- Ability to view the equation for the trendline and it's R-squared value

Screenshots of the UI

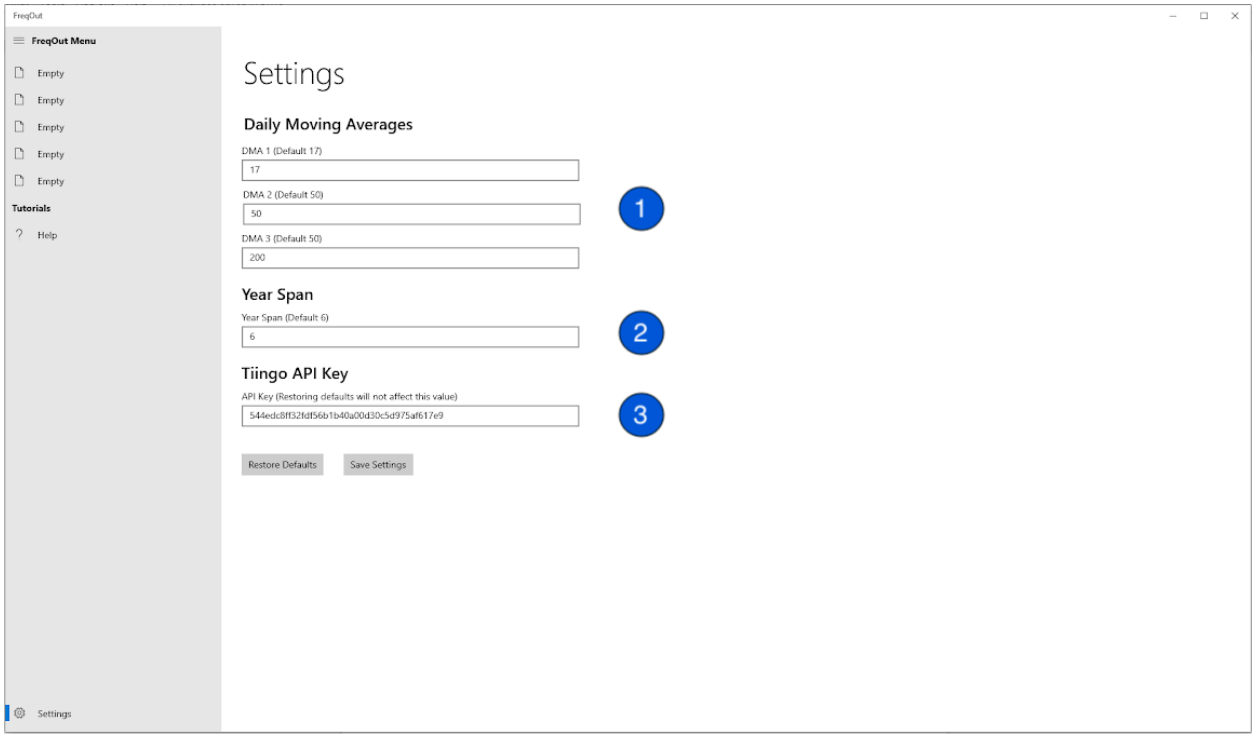


1. Navigation Pane
    a. Once an empty page has some data, the title will change to reflect the ticker symbol, the year span, and the DMAs
2. Search bar
    a. Search for any stock/ticker symbol here
    b. Case does not matter
    c. Notifications upon invalid ticker symbols
3. Toolbar
    a. Toggle the visibility of Trackball, top and bottom lines, Cumulative Frequency (CF) trendline
    b. View and click on the R-squared value to copy CF equation to clipboard
    c. Export graph as image in multiple formats
    d. Switch between graph views
        i. High jump
        ii. Cumulative Frequency
4. Graph View
    a. Displays the price in red, high jump in blue, top line in yellow, and bottom line in purple
    b. Tooltip is displayed to show the date, price, high jump, and corresponding CF percentage of that high jump point

5. Stock description
    a. This description is pulled from Tiingo and is displayed to give a bit more information about the company associated with the ticker symbol
6. Next Day Lookup
    a. Entering a price in the price box will calculate the high jump point for the next day
    b. Entering a high jump percentage in the high jump box will calculate the price needed to reach that high jump percentage.



Additional image to show an example of the cumulative frequency distribution view



1. Daily Moving Averages
    a. Defaults are 17, 50, and 200
2. Year Span
    a. Default year span is 6 years
3. Tiingo API Key
    a. This key is required to access stock data
    b. Does not reset upon restoring defaults

High Jump Analysis

$$High\ Jump = ((Price / DMA1 - 1) + (Price / DMA2 - 1) + (Price / DMA3 - 1)) \times 100$$

- Because the high jump analysis relies on the daily moving averages, there must be “n” number of data points where n >= Max(DMA).
    - Ex: 190 data points with the largest DMA being the default of 200 would return an error message saying, “insufficient data size for high jump analysis”

Next Day Lookup

- The forward price-to-high-jump lookup is arbitrary as it is just plugging in the next day’s price and calculating the high jump as usual.
- The Backward high-jump-to-price was slightly more complex and required a Goal Seek algorithm
    - TridentGoalSeek NuGet package v.1.0.2

Data Visualization

- All graphing is done using the Syncfusion Charting library
- https://help.syncfusion.com/uwp/overview