**Quantitative Analytics Case Study – Type 2 ALT**

*The same details are available in the Jupyter notebook as well.*

The following details should help you solve a simple data and model driven case study

1. The following datasets can be accessed from this location: [https://drive.google.com/drive/folders/1qEV0ZgLeHkwSxS--lffQM6zsOklrTtwb?usp=sharing](https://urldefense.com/v3/__https:/drive.google.com/drive/folders/1qEV0ZgLeHkwSxS--lffQM6zsOklrTtwb?usp=sharing__;!!F9svGWnIaVPGSwU!shl847iDdiWzIJ8vyxsxwnlUPa8VdqLYKkO0ZLYUKNdZ1Oesky6EOEz4FWAzyLAKd7Tj4-1HKOLiu2RCR8sz5IvWVbtBHA$)
   * 1. **all\_stocks\_5yrs**: Historical prices (open/high/low/close) per stock from 2013 to 2018
     2. **constituents:** Basic financial information on each company
2. Price Change for all questions below has been defined as percentage change in closing price for one time period against another time period. For example, if APPL closing price on Mar-19-2022 was $30 and the APPL closing price on Mar-20-2022 was #60, then the day-over-day price change for APPL between Mar-19-2022 and Mar-20-2022 is:

price change day-over-day = (60-30)/30 \* 100 = 100% increase in price

1. The following questions need to be answered based on the above datasets and analysis:
   * 1. What is the correlation between the stock prices of MICROSOFT and APPLE?
     2. Which pair of stocks is most correlated between APPLE, AMAZON, MICROSOFT, AKAMAI TECHNOLOGIES?
     3. What was the day-over-day price change for MICROSOFT's stock on Feb-23-2022 vs. previous day?
     4. Between Sep-Oct 2017:
        1. Find sector with the maximum average Day-over-Day\* price change
        2. Find sector with the maximum average YoY\* price change
        3. Find date with the maximum average YoY\* price change
     5. For the entire timeframe, provide code to create the following view (3 X 3 table representing following for the 3 companies respectively):

|  |  |  |  |
| --- | --- | --- | --- |
| **Month-Year** | **AMAZON** | **SHELL** | **APPLE** |
| Oct-2015 | avg (price change YOY) | avg (price change day-over-day) | avg (price change month-over-month) |
| Nov-2015 | avg (price change YOY) | avg (price change day-over-day) | avg (price change month-over-month) |
| Dec-2015 | avg (price change YOY) | avg (price change day-over-day) | avg (price change month-over-month) |

\*Day-over-Day implies day’s value vs. previous day’s value.

\*Month-over-Month implies day’s value vs. previous month’s value.

\*YoY implies day’s values vs. last year’s value

1. Develop a reasonably robust model that can
   1. Predict next day closing price for APPLE
   2. Predict next-7-days closing price for APPLE

Note: You are free to do any analysis (visual or tabular) as a pre or post requirement for building the above model and related price prediction.

**END**