# Stock Price Analysis
# Project Report

**Version 1.1**

# Revision History

| Date | Version | Description | Author |
|---|---|---|---|
| 05/10/2022 | 1.0 | Initial draft | Sanjana Balagar |
| 05/17/2022 | 1.1 | Final revision | Sanjana Balagar |
| | | | |

# Table of Contents

# 1. Introduction

## 1.1 Purpose of this document

The purpose of this document is to report the findings of Stock Price Analysis. This document includes details about the deliverables and time plans. It also summarizes all the visualizations created using Tableau.

## 1.2 Definitions and acronyms

### *1.2.1 Acronyms and abbreviations*

| Acronym or abbreviation | Definitions |
|---|---|
| Open | Opening price from the first transaction of the day |
| Close | Last price anyone paid for a share during the business hours of exchange |
| High | Highest price paid for a share during the day |
| Low | Lowest price paid for a share during the day |
| Volume | Total number of shares exchanged during the day |
| SPY | Popular fund that tracks the Standard & Poor's (S&P) 500 Index, which comprises of top 500 U.S. companies |

# 2. Background and Objectives

1. Stock Market
   Stock or share is a basic unit of a company that anyone can purchase. It is done through a stock exchange (like New York Stock Exchange - NYSE), which is a marketplace for buying and selling stocks. Based on the demand for a stock, the price can move up or down daily. Investing is essentially owning a stock for a long period to capture gains as companies grow.

2. Stock Dataset
   The dataset contains FAANG and SPY data from the year 1984 to 2017. This amounts for a total of 25K rows. The table below shows the data as viewed in Tableau data source tab.

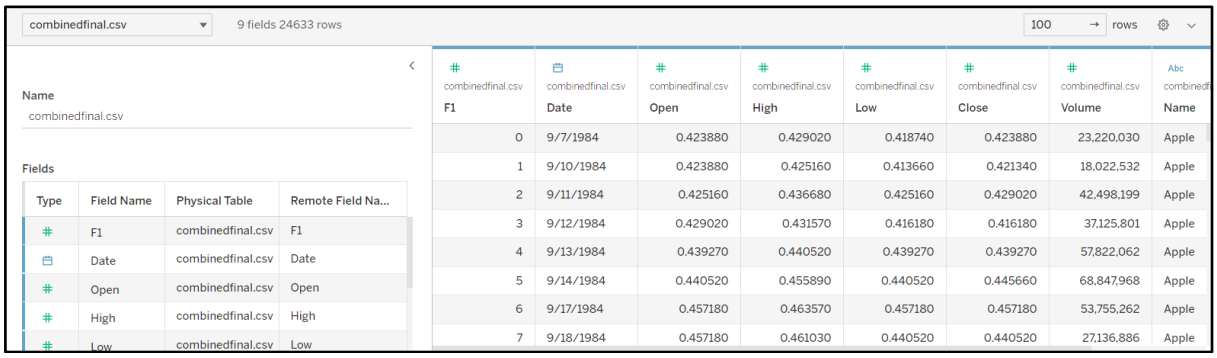


*Figure 1: Dataset as seen from Tableau data source tab*

3. Visualization Goal
   All the visualizations are created using Tableau. With the existing data from the source, stock price trend and relative performance of FAANG and SPY are created. In addition, using calculated fields more comprehensive visualizations are created. These are as follows:

   a. If you invested $1,000, how much would you have now?
      The goal of this visualization is to show how a $1,000 one-time investment made at the beginning of a year grows overtime. The period chosen is 5 years (from 2013 – 2017). Moreover, the period can be adjusted with filters to see the performance over any given period.

   b. If you invested $100 weekly, how much would you have now?
      In this visualization, the performance of a weekly recurring investment is evaluated for all the FAANG stocks. For reference, SPY performance is captured as well.

## 3. Architecture & High-Level Design

1. Calculated Fields for $1,000 Growth
   The table below gives an example of all the calculated fields used for creating visualizations that capture $1,000 growth performance.

| | | Date | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Name | | 2013 | 2014 | 2015 | 2016 | 2017 |
| SPY | Amount | 1,299 | 1,496 | 1,538 | 1,692 | 1,964 |
| | Buy | 132 | 132 | 132 | 132 | 132 |
| | Change | 39 | 65 | 71 | 91 | 127 |
| | Max. Close | 171 | 197 | 203 | 223 | 259 |
| | Min. Open | 132 | 162 | 179 | 176 | 222 |
| | Return % | 0 | 0 | 0 | 0 | 96 |

*Figure 2: $1,000 growth from 2013 – 2017 for SPY*

| Calculated Field | Description |
|---|---|
| Buy<br>Results are computed along Table (across).<br>`IF FIRST() = 0 THEN MIN([Open]) ELSE PREVIOUS_VALUE(0) END` | Price at which a share was bought. Only the first value is relevant for this field across the table (captured using function FIRST). In our example (see table), the buy price is $132. |
| Change<br>`MAX([Close])-[Buy]` | Price difference between the maximum closing price and the buy price of the stock. |
| Return %<br>Results are computed along Table (across).<br>`IF LAST() = 0 THEN ([Change]/[Buy])*100 ELSE 0 END` | Total return in % at the end of the specified period is calculated. Only the last value (captured using function LAST) is used in visualizations to show the growth. In our example, this is 96%. |
| Amount<br>`1000+((1000/[Buy])*[Change])` | This filed captures the total portfolio. It includes the $1,000 and the capital gain over the specified period. The total amount for SPY is $1,964. |

2. Calculated Fields for Recurring Investment
   The table below shows all the calculated fields.

| | | Date | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2013 | | | | | | | | | | | | |
| | | Q4 | | | | | | | | | | | | |
| | | October | | | | November | | | | December | | | | |
| Name | | 7 | 14 | 21 | 28 | 4 | 11 | 18 | 25 | 2 | 9 | 16 | 23 | 30 |
| Facebook | Min. Open | 51 | 48 | 55 | 52 | 49 | 47 | 48 | 46 | 47 | 48 | 53 | 56 | 55 |
| | Max. Close | 51 | 50 | 54 | 50 | 48 | 46 | 46 | 45 | 47 | 49 | 54 | 58 | 54 |
| | Amount Invested | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1,000 | 1,100 | 1,200 | 1,300 |
| | Stock Performance | 100 | 200 | 316 | 392 | 474 | 553 | 643 | 725 | 862 | 996 | 1,198 | 1,391 | 1,391 |
| | Shares | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Average Return % | 0 | 0 | 5 | -2 | -5 | -8 | -8 | -9 | -4 | 0 | 9 | 16 | 7 |
| | Total Return% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |

*Figure 3: FB weekly investment performance from 2013 – 2017*

| Calculated Field | Description |
|---|---|
| Amount Invested<br>Results are computed along Table (across).<br>100+PREVIOUS_VALUE(0) | This field captures the aggregate of the amount invested. PREVIOUS_VALUE function is used to calculate the total amount. |
| Shares<br>(100/MIN([Open]))*1 | Count of number of shares bought every week. Minimum open price is used for evaluating this field. |
| Stock Performance<br>Results are computed along Table (across).<br>RUNNING_SUM([Shares])*MAX([Close]) | This is the total portfolio amount including capital gain. Running sum of shares and the maximum closing price is used to calculate the portfolio value. |
| Average Return %<br>([Stock Performance]-[Amount Invested])/[Amount Invested]*100 | Average return in % of the stock performance. |

## 4. Tableau Dashboards

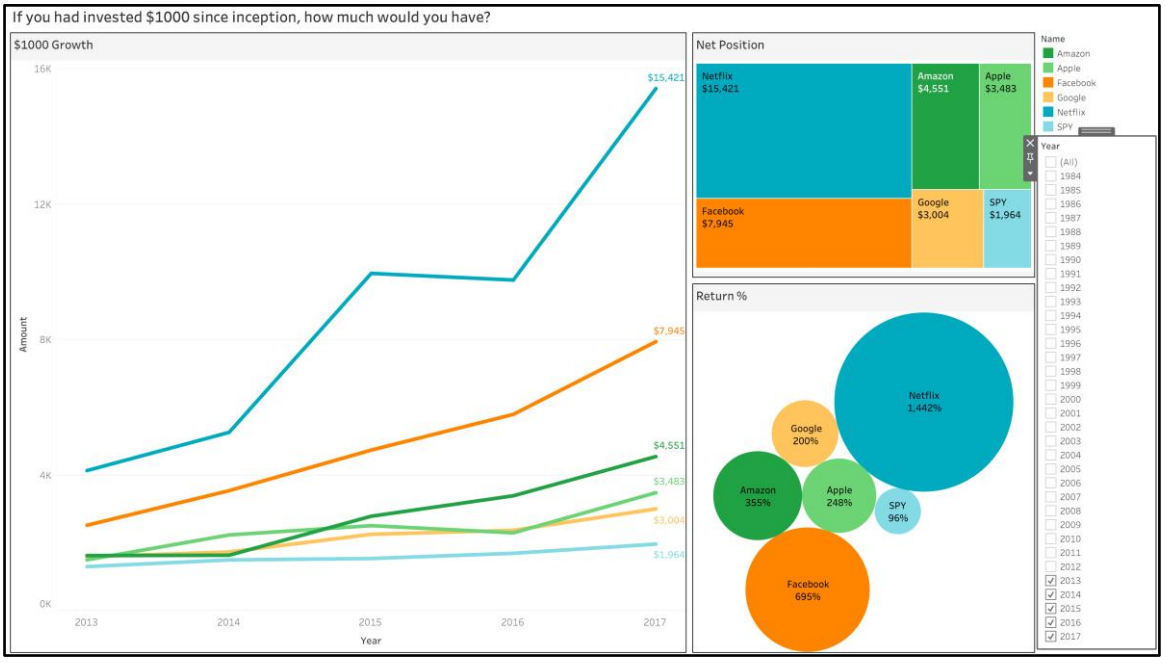


*Figure 4: Dashboard 1 showing $1,000 growth summary*

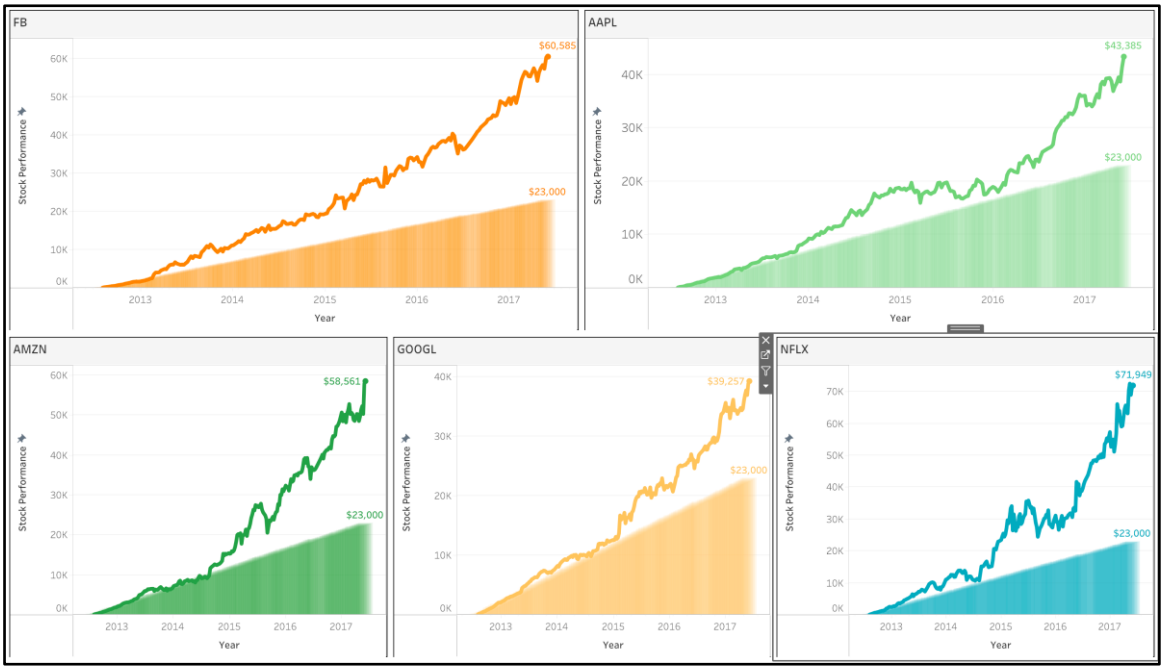


*Figure 5: Dashboard 2 showing FAANG charts (both amount invested and total growth)*


*Figure 6: Dashboard 3 comparing FAANG and SPY weekly investment performance*

## 5. Tableau Story

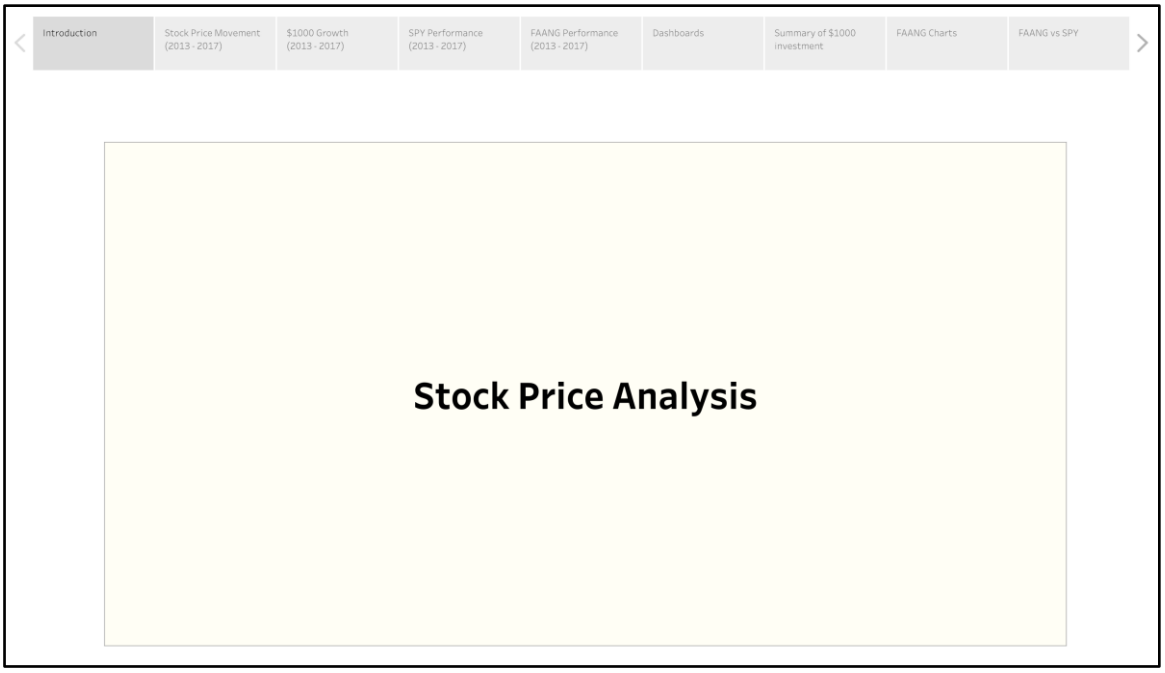


*Figure 7: Title page of the story*

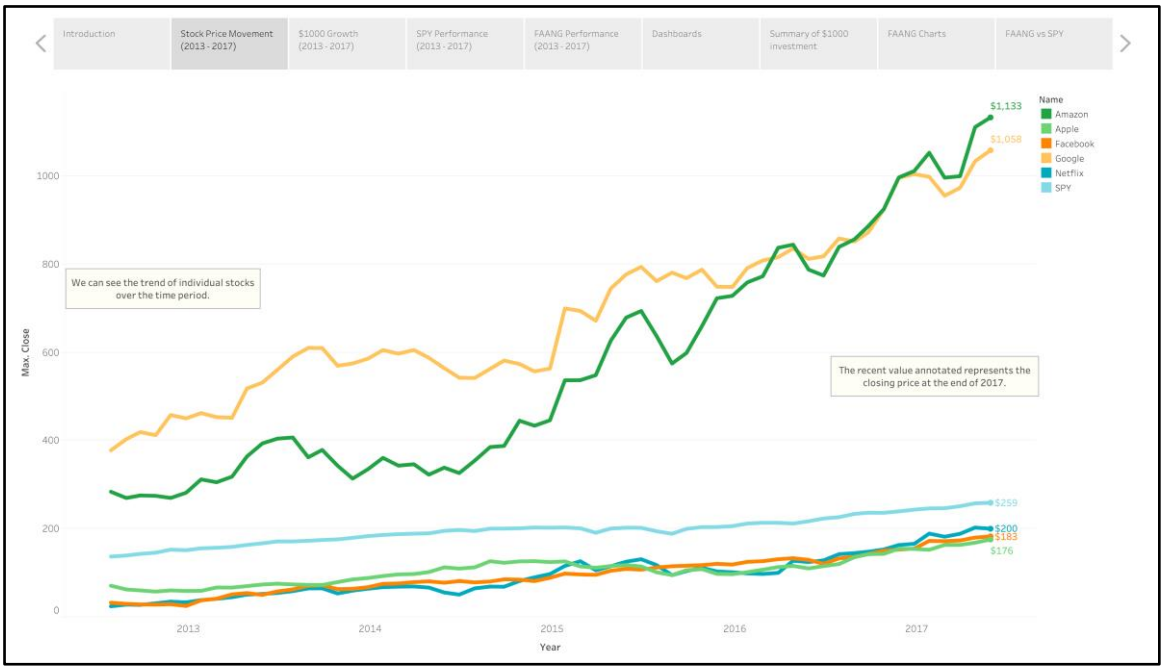


*Figure 8: Maximum closing price vs time for FAANG and SPY (with recent value highlighted)*

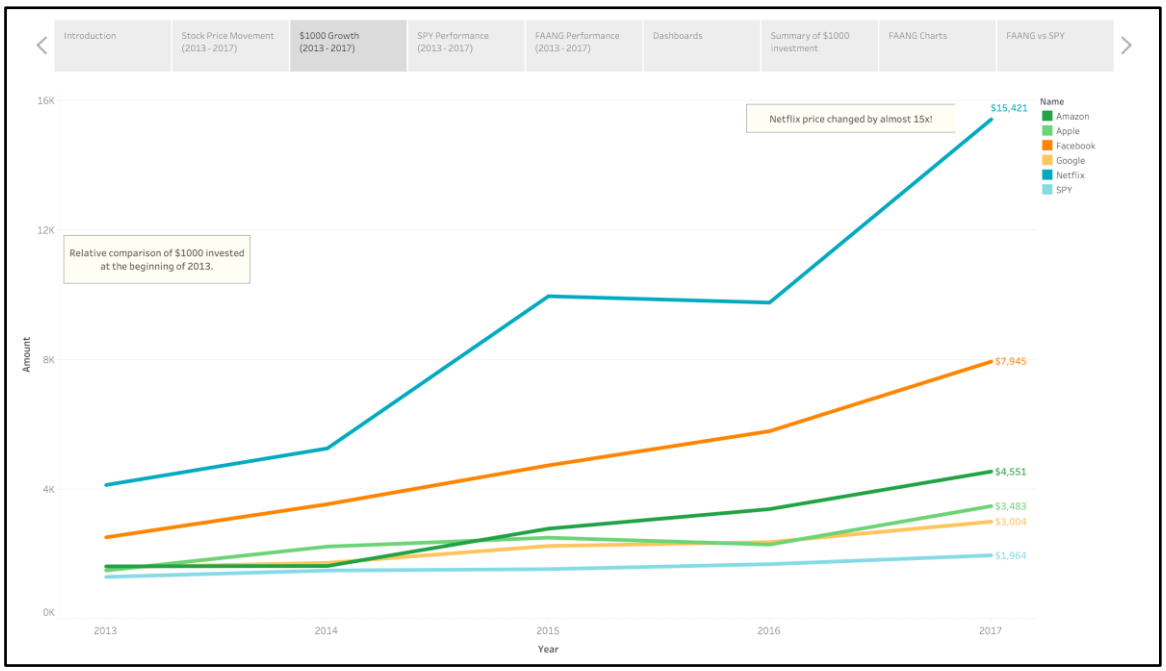


*Figure 9: Yearly growth of $1,000 of FAANG and SPY (amount at the end of 2017 highlighted)*

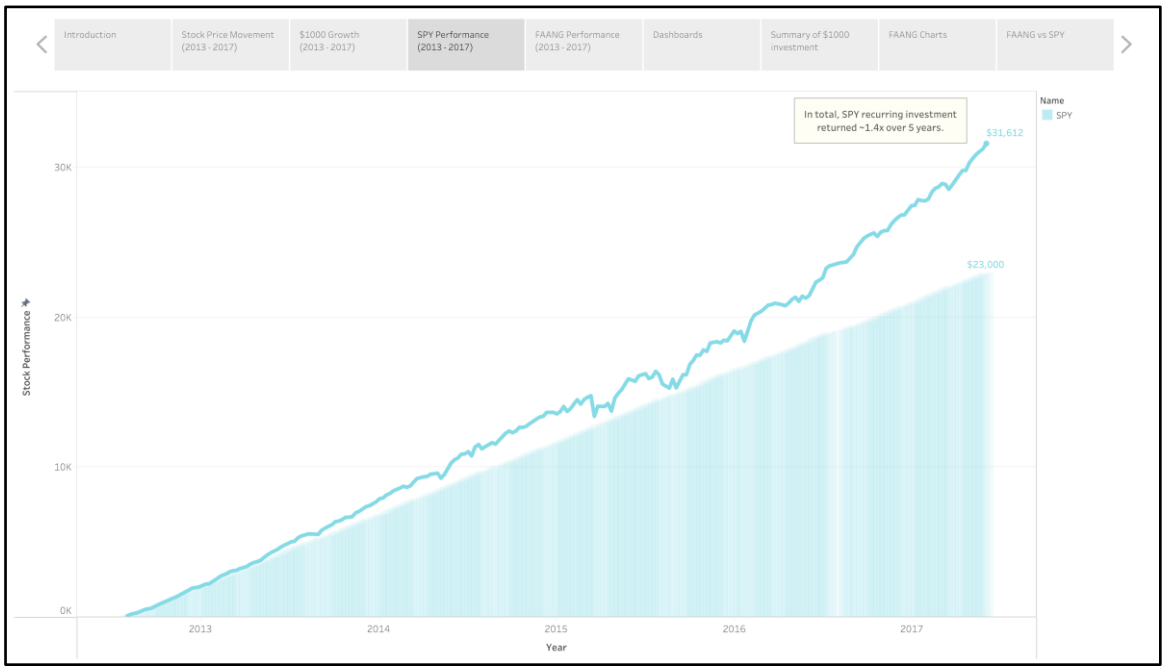


*Figure 10: SPY weekly investment performance*

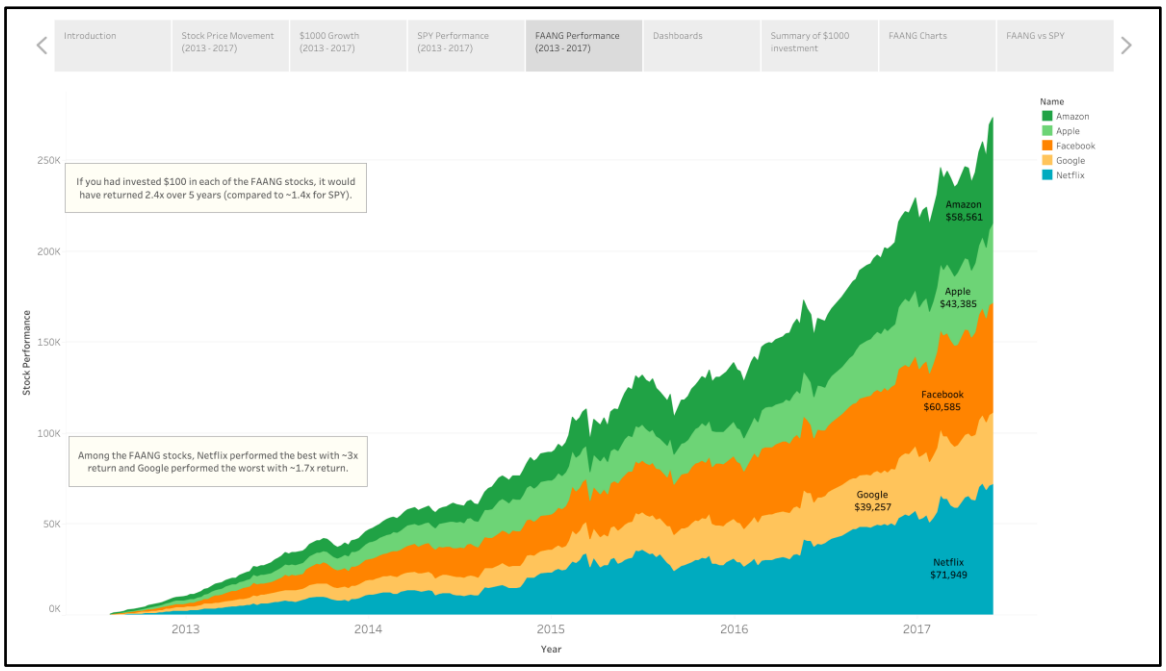


*Figure 11: FAANG weekly investment performance*

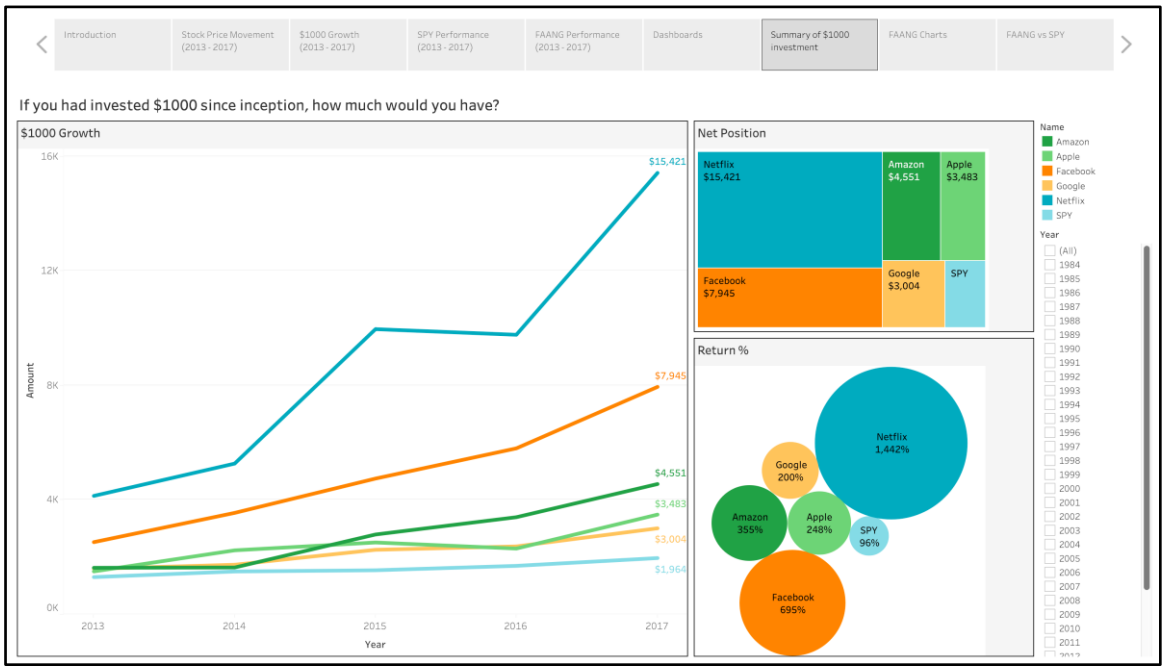


*Figure 12: Dashboard 1 inserted in the story*

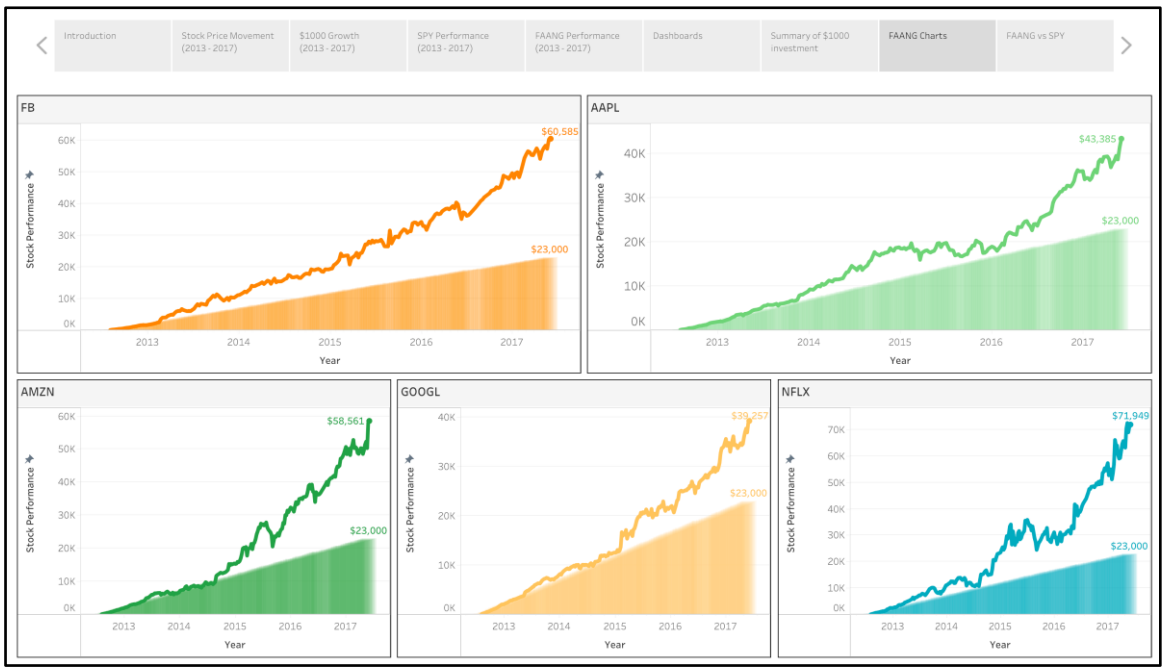


*Figure 13: Dashboard 2 inserted in the story*

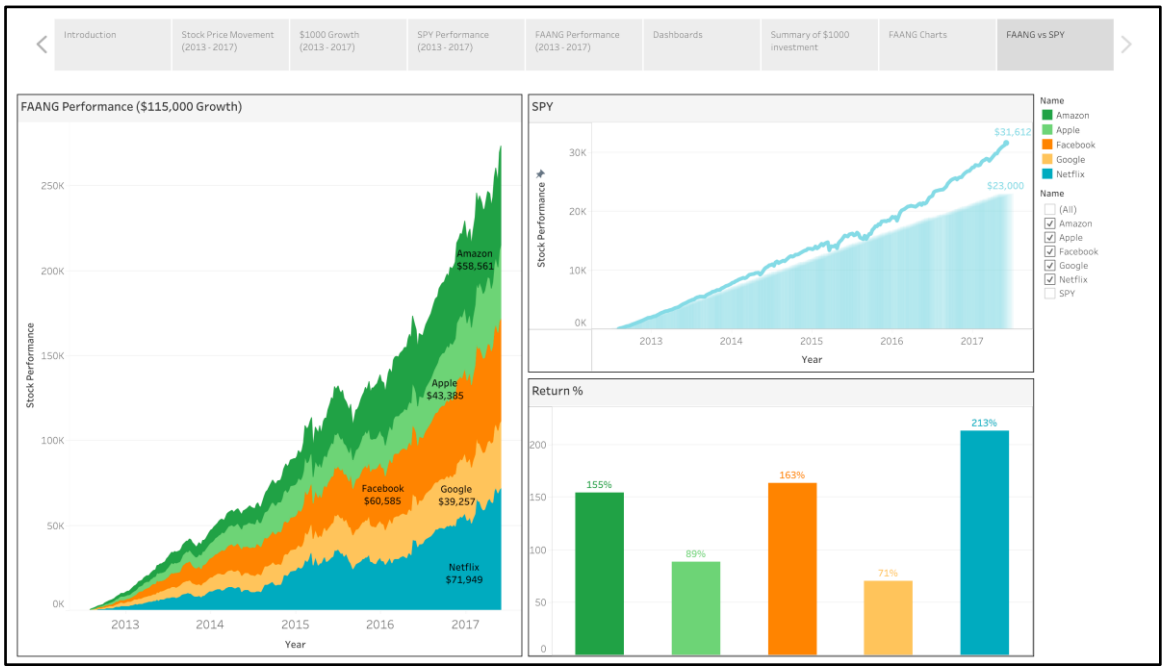


*Figure 14: Dashboard 3 inserted in the story*

## 6. Organization

### *6.1* Project group

| Name | Initials | Responsibility (roles) |
|---|---|---|
| Sanjana Balagar | SB | Project Owner |
| | | |

## 7. Development process

This project will use dataset obtained from stock market that is already in the format required. Therefore, no additional cleaning was necessary. The data was imported into Tableau, which was used for creating all the charts arranged in dashboards and story.

## 8. Deliverables

| To | Output | Planned week | Promised week | Late +/- | Delivered week | Notes |
|---|---|---|---|---|---|---|
| Canvas | Project Presentation | W19 | W19 | 0 | W19 | |
| Canvas | Project Report | W20 | W20 | 0 | W20 | |
| | | | | | | |

## 9. Project risks

| Possibility | Risk | Preventive action |
|---|---|---|
| n/a | n/a | n/a |
| | | |

## 10. Project plan

### 10.1 Time schedule

| Id | Milestone Description | Responsible Dept./Initials | Planned week | Forecast week | +/- | Actual week | Metr. | Rem. |
|---|---|---|---|---|---|---|---|---|
| 1 | Dataset preparation | SB | 1 week | W12 | 0 | W12 | | |
| 2 | Calculated fields | SB | 2 weeks | W13 | 0 | W13 | | |
| 3 | FAANG and SPY charts | SB | 2 weeks | W15 | 0 | W15 | | |
| 4 | Dashboards | SB | 1 week | W17 | 0 | W17 | | |
| 5 | Story | SB | 1 week | W17 | 0 | W17 | | |
| 6 | Presentation | SB | 1 week | W18 | 0 | W18 | | |
| 7 | Report | SB | 2 weeks | W19 | 0 | W19 | | |

## 11. References


https://finance.yahoo.com/
https://www.kaggle.com/datasets/borismarjanovic/price-volume-data-for-all-us-stocks-etfs
https://help.tableau.com/current/pro/desktop/en-us/gettingstarted_overview.htm
https://www.elearnmarkets.com/blog/25-stock-market-terms-for-beginners/