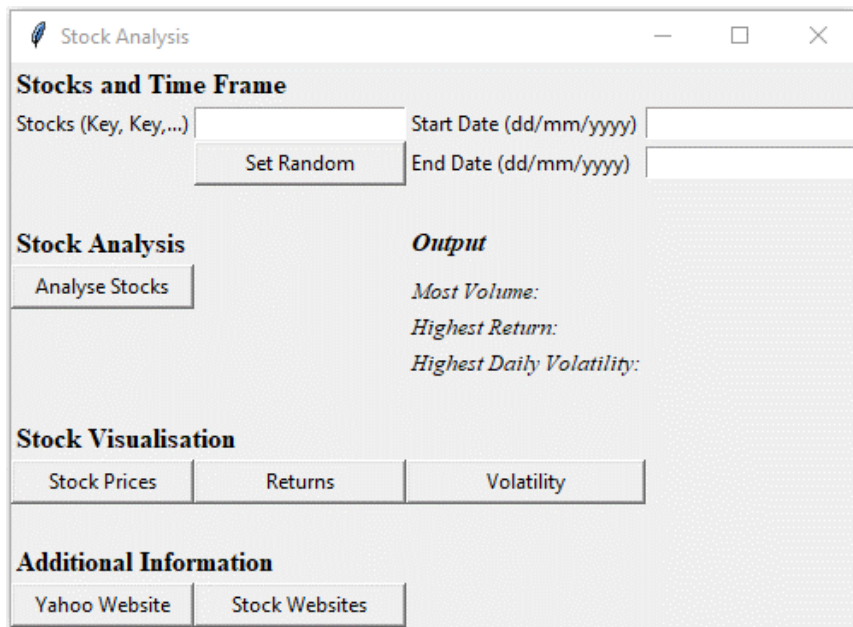


# Step-by-step user guide - Stock Analysis program

## Step 1:

Open stock\_analysis.py and run the program. A console is going to open that looks like this:

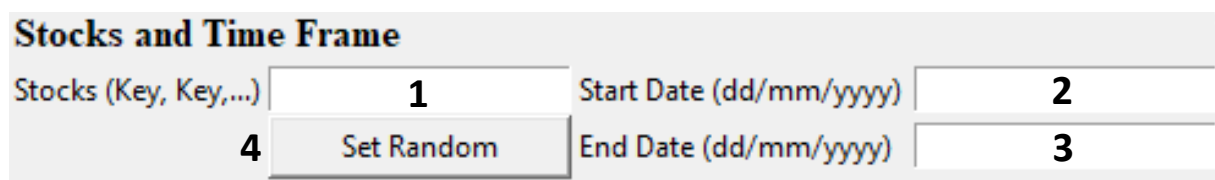


The screenshot shows a window titled "Stock Analysis" with a standard macOS-style title bar (close, zoom, and full-screen buttons). The interface is divided into several sections:

- Stocks and Time Frame:** Contains a text input field labeled "Stocks (Key, Key,...)", a "Set Random" button, and two date input fields labeled "Start Date (dd/mm/yyyy)" and "End Date (dd/mm/yyyy)".
- Stock Analysis:** Contains a button labeled "Analyse Stocks".
- Output:** A text area displaying the results of the analysis, with labels for "Most Volume:", "Highest Return:", and "Highest Daily Volatility:".
- Stock Visualisation:** Contains three buttons labeled "Stock Prices", "Returns", and "Volatility".
- Additional Information:** Contains two buttons labeled "Yahoo Website" and "Stock Websites".

## Step 2:

Add all the different stocks you want to analyse in the **input box (1)** and type in the start and end date for the time frame you want to cover in the **input boxes (2) and (3)**.



This image shows the same "Stocks and Time Frame" section of the program, but with numbered annotations to guide the user:

- 1** points to the "Stocks (Key, Key,...)" input field.
- 2** points to the "Start Date (dd/mm/yyyy)" input field.
- 3** points to the "End Date (dd/mm/yyyy)" input field.
- 4** points to the "Set Random" button.

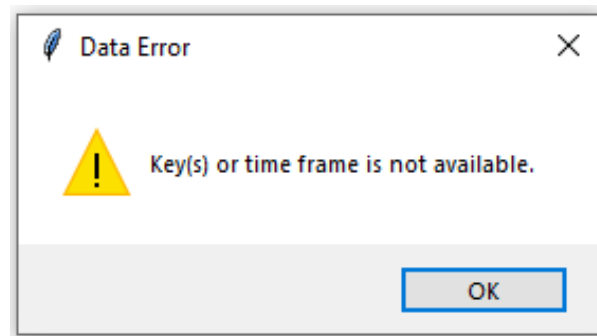
For the **input box (1)** – make sure to type the stocks with the right keys. For example, instead of writing Netflix you need to write NFLX in order for the program to work. You can look up the keys for each stock on Yahoo Finance. Also, if you want to add more than one stock, you can separate them with a comma like this: NFLX,FB,AAPL

For the **input boxes (2) and (3)** – make sure to type the start and end date in the correct format and right order. The right order is start date < end date and the right format is dd/mm/yyyy. An example would be 31/12/2017 as start date and 01/07/2019 as end date.

If you just want to quickly try out the program, you can also click on the '**Set Random**' (**4**) button. This will automatically fill out all three input boxes.

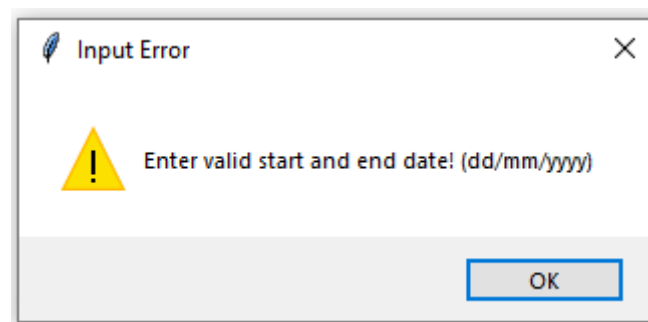
There are two types of errors: **data error** and **input error**

#### **Data Error:**



This error will appear if you entered stock keys or a time frame which are not available. For example, if you write APPL instead of AAPL for the Apple stock this error will occur. A time frame which is not available would be if the start date is later than the end date or if there is no data available for the given time frame. For example, if the user writes 20/12/2019 as start date and 20/12/2018 as end date or uses a year like 1910. This will also lead to a data error.

#### **Input Error**



This error will appear if you entered a time frame with a wrong format or are simply not possible. For example, if you enter 24.06.2017 instead of 24/06/2017 this error will occur. Writing an impossible date like 34/14/22 will also lead to an input error.

### Step 3:

After you typed in all the stocks you want to analyse and also the time frame you want to cover, you can click on the button 'Analyse Stocks' (5).

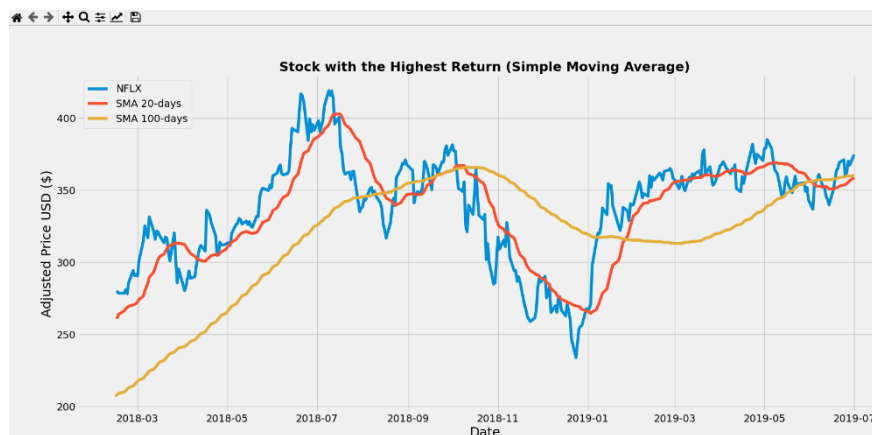
Stocks and Time Frame	
Stocks (Key, Key,...)	NFLX,FB,AAPL
Start Date (dd/mm/yyyy)	31/12/2017
End Date (dd/mm/yyyy)	01/07/2019
<input type="button" value="Set Random"/>	

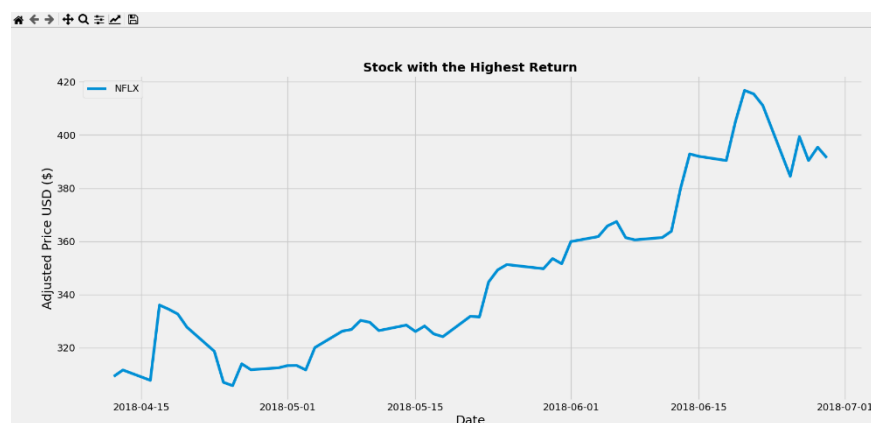
Stock Analysis	Output
<input type="button" value="Analyse Stocks"/>	<i>Most Volume:</i>
<b>5</b>	<i>Highest Return:</i>
	<i>Highest Daily Volatility:</i>

This will do two things:

1. Firstly, it will open a graph which visualizes the stock with the highest return and also, if possible, its 20-days/100-days simple moving average. In this example, consisting of Netflix, Facebook and Apple the Netflix stock has the highest return over the given time frame.



If between the start and end date there are less than 100 days, the 20-days and 100-days simple moving average will not be calculated. Therefore, the graph will only show the stock with the highest return:



2. Secondly, it will automatically analyse all the stocks which you typed into the input box. This will show you the stock with the most volume, the stock with the highest return and the stock with the highest daily volatility over the given time frame. You can see this in the console '**Output**' (6) section after you close the previously opened graph:

Stocks and Time Frame	
Stocks (Key, Key,...)	NFLX,FB,AAPL
Start Date (dd/mm/yyyy)	31/12/2017
End Date (dd/mm/yyyy)	01/07/2019
<input type="button" value="Set Random"/>	
<b>Stock Analysis</b>	<b>Output</b>
<input type="button" value="Analyse Stocks"/>	<b>6</b>
	<i>Most Volume:</i> AAPL
	<i>Highest Return:</i> NFLX
	<i>Highest Daily Volatility:</i> NFLX

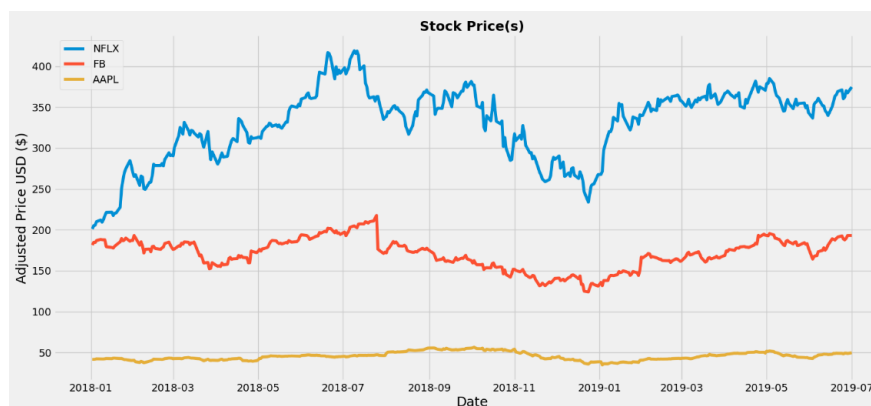
In our example the Apple stock has the most volume and the Netflix stock has the highest return as well as the highest daily volatility over the given time frame.

## Step 4:

If you want to see the differences in stock price, return and daily volatility of the analysed stocks in detail, you can do this with the buttons in the next section called '**Stock Visualisation**'. There you will find the following buttons: '**Stock Prices**' (7), '**Returns**' (8) and '**Volatility**' (9)

Stocks and Time Frame	
Stocks (Key, Key,...)	NFLX,FB,AAPL
Start Date (dd/mm/yyyy)	31/12/2017
End Date (dd/mm/yyyy)	01/07/2019
<input type="button" value="Set Random"/>	
Stock Analysis	
<input type="button" value="Analyse Stocks"/>	
Output	
Most Volume:	AAPL
Highest Return:	NFLX
Highest Daily Volatility:	NFLX
Stock Visualisation	
<input type="button" value="Stock Prices"/>	<input type="button" value="Returns"/>
<b>7</b>	<b>8</b>

The button '**Stock Prices**' (7) opens the following graph where you will find the stock prices of the stocks over the analysed time frame:

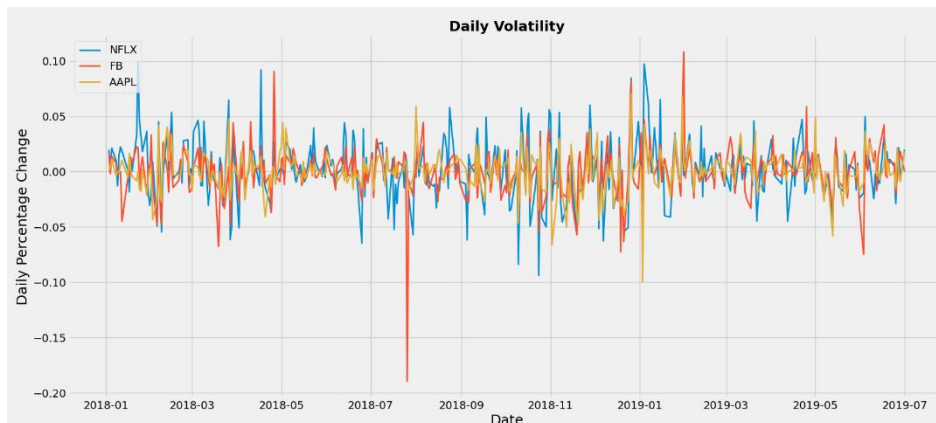


The button '**Return**' (8) opens the following graph where you will find the returns of the stocks over the analysed time frame:

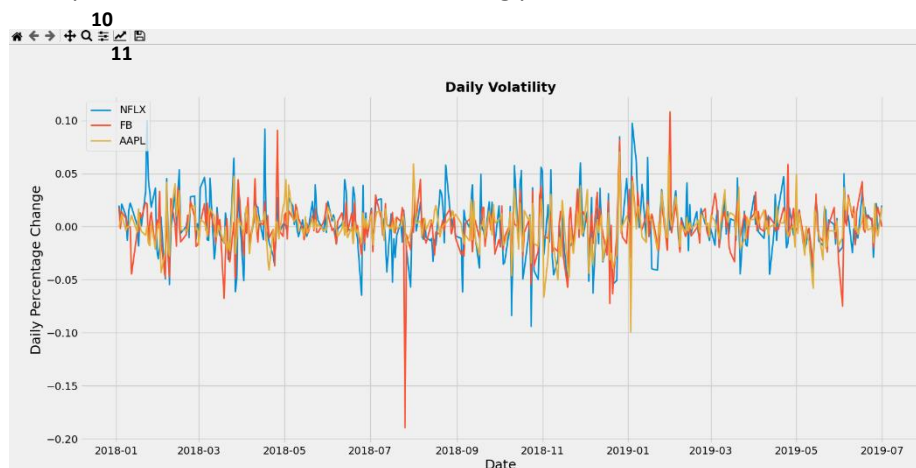


Note: In this graph, all stocks start on '1.0'. This makes the comparison easier.

The button '**Volatility**' (9) opens the following graph where you will find the daily volatility of each stock over the analysed time frame:




If you want to **configure (10)** or **edit (11)** any of the graphs, you can simply do this by clicking the buttons on the top left corner, shown on the following picture:



### Step 5:

Lastly, if you want additional information on the stocks, you can open all their Yahoo Finance websites by simply clicking on the button **'Stock Websites' (12)** in the **'Additional Information'** section. If you only want to open the main Yahoo Finance website, you can do this by clicking on the **'Yahoo Website' (13)** button:


**Stock Analysis**

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**Stocks and Time Frame**

Stocks (Key, Key,...)
 
 Startdate (dd/mm/yyyy)

Enddate (dd/mm/yyyy)

---

**Stock Analysis**

**Output**

Most Volume: AAPL  
 Highest Return: NFLX  
 Highest Daily Volatility: NFLX

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**Stock Visualisation**

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**Additional Information**