Hello everyone, today I'll be presenting my final project for our CIS 289 - Python II class. The goal of this project was to create a user-friendly application that allows users to visualize stock trends using Alpha Vantage API. For those who may be unfamiliar with the stock market, this app can help users track the performance of stocks over time and make more informed decisions about their investments.

First, let's talk about the functionality of the app:

* It allows users to input a stock symbol and a date range. A stock symbol is a unique identifier for a publicly traded company, such as "AAPL" for Apple Inc.
* The app retrieves stock data using the Alpha Vantage API and processes it with Pandas. The data includes daily adjusted stock prices, which account for factors such as dividends, stock splits, and new stock offerings.
* It then displays a line chart of the stock's closing price, along with 50-day and 200-day simple moving averages, using Matplotlib. Simple moving averages (SMAs) are commonly used technical indicators that help smooth out price data by filtering out short-term fluctuations and providing a clearer view of the overall trend. The 50-day SMA is considered a shorter-term trend indicator, while the 200-day SMA is used to gauge the longer-term trend.
* Users can also export the stock data to a CSV file for further analysis.

Let me give you a quick demo of the app. [Demonstrate the app with a couple of examples]

Let's go over the columns included in the CSV file that was exported by the app:

* Date: The trading day for which the stock data is provided.
* Open: The price at which the stock started trading on a particular day.
* High: The highest price the stock reached during a trading day.
* Low: The lowest price the stock reached during a trading day.
* Close: The price at which the stock ended trading on a particular day.
* Adjusted Close: The closing price adjusted for factors such as dividends, stock splits, and new stock offerings.
* Volume: The number of shares traded during a trading day.
* Dividend Amount: The number of dividends paid to shareholders, if any, on a particular day.
* The SMA50 and SMA200. As we discussed earlier, these Simple Moving Averages help users gain insights into the stock's short-term and long-term trends.

Throughout the development of this project, I made use of various Python concepts and libraries we learned during the course, such as:

* Tkinter for creating the graphical user interface.
* Pandas for handling and manipulating stock data.
* Matplotlib for visualizing stock trends.
* Requests for fetching stock data from the Alpha Vantage API.

One of the challenges I faced during the development was handling edge cases, such as incorrect stock symbols or unavailable data. I overcame this by implementing error handling and displaying appropriate error messages to the user.

Another challenge was working with date ranges and data slicing in Pandas. I had to make sure the data was sorted and properly sliced based on the user's input. Through practice and referring to the Pandas documentation, I managed to find the right approach.

In conclusion, working on this project has allowed me to apply the skills and knowledge I gained throughout the Python II course. I'm proud of the final result, but there's always room for improvement. In the future, I plan to expand the app's functionality by incorporating additional data sources, such as different technical indicators, enhancing the visualization with interactive features, and perhaps adding support for real-time stock data.

Thank you for listening to my presentation, and I hope you enjoyed learning about my Stock Trends App and gained a better understanding of the stock market data it presents.