**Report Individual Work Python for Finance**

**Professor:** UBEYDULLAH Ozcan

**Student:** Francesco Tassia

Paris, 30/11/2023

**Project: Advanced Option Pricing with Streamlit App**

**Overview**

The Advanced Option Pricing Streamlit App allows the calculation and display of financial options prices using Black-Scholes and Binomial models. This app also provides visualizations of historical stock data, as well as placeholder values for the Greeks associated with the options. The user interface is intuitive and easy to navigate and features a custom color theme that enhances the overall user experience.

**Code Explanation**

**Library imports**

* streamlit: Used to create the web app.
* numpy and scipy.stats: Used for numerical computations, particularly for option pricing models.
* pandas: Used for data handling.
* yfinance: Used for fetching historical stock data.
* datetime: Used for handling date and time, which is necessary for fetching historical data.

**Streamlit Configuration and Styling:**

* st.set\_page\_config: Configures the page layout and title.
* Custom CSS: Injected using st.markdown to style the background, text, and sidebar with defined color variables.

**Option Pricing Models:**

* black\_scholes: Implements the Black-Scholes model for option pricing.
* binomial\_option: Implements the Binomial model for option pricing.

**Placeholder Function for Greeks:**

* calculate\_greeks: Currently returns placeholder values. Should be updated with actual calculations for Delta, Gamma, Theta, Vega, and Rho.

**Main App Function:**

* main(): Contains the structure and logic of the Streamlit app.
* Sidebar for user input.
* Calculations of option prices using user inputs.
* Display of option prices and placeholder Greeks.
* Historical stock data visualization for predefined stock symbols.

**User Interface Elements:**

* Sidebar Inputs: Allows users to input parameters such as stock price, strike price, time to maturity, risk-free rate, volatility, and option type.
* Option Price Display: Shows calculated prices from both Black-Scholes and Binomial models.
* Greeks Display: Lists placeholder Greek values.
* Stock Data Visualization: Provides an expandable section for each stock to view its historical price data.

**Running the App**

Execute the app by entering the command "**streamlit run app.py**" to launch it in your web browser.

**Conclusion**

This Streamlit app is a basic tool for financial analysis, particularly in the realm of option pricing. It merges reliable financial models with a user-friendly interface, making it fast and simple. As already said the app is basic, but it can be implemented with an actual calculation for Greeks, more financial models, and interactive plots for more extensive analysis.