

QuantLib in Python: Valuation GUI

By Andy Leo

QuantLib is an open-source library for quantitative finance that offers a variety of features, such as yield curve bootstrapping and instrument pricing. In this project, I created option pricers for both plain vanilla European options and digital options using the Black-Scholes model. This endeavour demonstrates QuantLib's flexibility and intuitive nature that has allowed me to produce an effective final product. I additionally developed graphical user interfaces (GUIs) for the pricers with the help of Python library Tkinter. Showcases of the GUIs are display below:



The screenshot shows a Tkinter window titled "Black-Scholes Vanilla European Option Pricer". The window contains input fields for Volatility (25%), Risk-free Rate (2%), Asset Spot Price (130), Evaluation Date (2022-07-20), Exercise Date (2022-10-20), and Option Strike Price (100). It also displays calculated values for Delta (0.98536), Gamma (0.00226), Vega (2.4378), Theta (-3.14236), and Option NPV (30.5985). The "Call Option" radio button is selected. A button labeled "Option NPV & Greeks" is at the bottom, and the text "By Andy Leo" is in the bottom right corner.

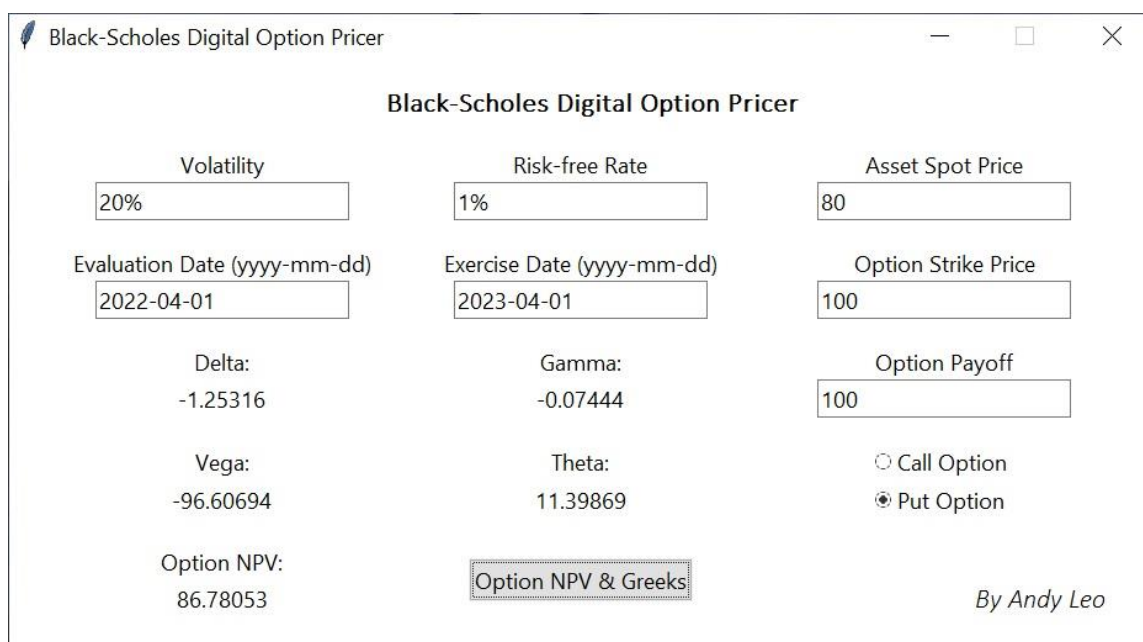
Input	Value
Volatility	25%
Risk-free Rate	2%
Asset Spot Price	130
Evaluation Date (yyyy-mm-dd)	2022-07-20
Exercise Date (yyyy-mm-dd)	2022-10-20
Option Strike Price	100

Greek	Value
Delta	0.98536
Gamma	0.00226
Vega	2.4378
Theta	-3.14236
Option NPV	30.5985

Option Type: ☒ Call Option, ☐ Put Option

Button: Option NPV & Greeks

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The screenshot shows a Tkinter window titled "Black-Scholes Digital Option Pricer". The window contains input fields for Volatility (20%), Risk-free Rate (1%), Asset Spot Price (80), Evaluation Date (2022-04-01), Exercise Date (2023-04-01), Option Strike Price (100), and Option Payoff (100). It also displays calculated values for Delta (-1.25316), Gamma (-0.07444), Vega (-96.60694), Theta (11.39869), and Option NPV (86.78053). The "Put Option" radio button is selected. A button labeled "Option NPV & Greeks" is at the bottom, and the text "By Andy Leo" is in the bottom right corner.

Input	Value
Volatility	20%
Risk-free Rate	1%
Asset Spot Price	80
Evaluation Date (yyyy-mm-dd)	2022-04-01
Exercise Date (yyyy-mm-dd)	2023-04-01
Option Strike Price	100
Option Payoff	100

Greek	Value
Delta	-1.25316
Gamma	-0.07444
Vega	-96.60694
Theta	11.39869
Option NPV	86.78053

Option Type: ☐ Call Option, ☒ Put Option

Button: Option NPV & Greeks

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