1   Options_visualization.py — Payoff Profiles for Vanilla Options

Purpose

Plots the payoff diagrams for four basic positions:

- Long Call
- Short Call
- Long Put
- Short Put

Learning focus

- Uses the payoff formula:
    - Call: $max(S - K, 0) - premium$
    - Put: $max(K - S, 0) - premium$
- Shows breakeven points visually ($strike \pm premium$).
- Compares how long and short positions mirror each other.

Trading intuition

- **Long Call**: Upside potential, limited loss.
- **Short Call**: Limited gain, potentially unlimited loss.
- **Long Put**: Profit from falling prices, limited loss.
- **Short Put**: Limited gain, potentially large loss if the asset collapses.

Experiment

Change premium and see how the breakeven shifts. This simulates market conditions where implied volatility changes option prices.

2   Options_SteamLit_App_KVOILLAUME.py — Interactive Black–Scholes Price Visualizer

Purpose

Streamlit app to explore how the Black–Scholes model option price changes when varying:

- Stock price (S)
- Strike price (K)
- Time to expiration (T)

- Interest rate (r)

- Volatility (σ)

Learning focus

- Implements d1 and d2 calculations, then call/put prices using the standard Black–Scholes formula.

- Lets you dynamically adjust parameters and see the effect on price.

- Graphically illustrates sensitivity to each parameter with the current value highlighted.

Trading intuition

- Increasing **S** benefits calls and hurts puts.

- Increasing **K** benefits puts and hurts calls.

- More **T** increases both call and put prices, since there's more time for favourable moves.

- Higher **r** raises call prices and lowers put prices (cost of carry effect).

- Higher **σ** raises both call and put prices because higher volatility increases the chance of finishing in the money.

Experiment

Set volatility to a very low level and slide the stock price around the strike — you'll see option prices change more abruptly near strike, reflecting sharper Delta shifts.