Vega

- **Vega_2D.py**:
    - Plots Vega against stock price for one volatility level, then compares multiple vol levels.
    - Shows that Vega peaks when the option is at-the-money (ATM) and drops off for deep ITM or OTM options.
    - Higher volatilities slightly flatten the Vega curve.
- **Vega_3D.py**:
    - Adds time to maturity as a dimension.
    - Demonstrates that Vega is higher for longer-dated options and shrinks as expiry approaches.

Trading insight: High Vega means large sensitivity to changes in implied volatility — important for volatility traders and vega hedging.

Delta

- **Delta_2D.py**:
    - Shows Delta for calls (0 to 1) and puts (-1 to 0), plus how it changes across vol levels.
    - Higher volatility makes the transition around strike more gradual.
- **Delta_3D.py**:
    - Adds time to maturity, showing that short-dated options have a steeper Delta curve near strike, while long-dated ones are smoother.

Trading insight: Delta is your hedge ratio. High Gamma situations require frequent hedge adjustments as Delta changes rapidly.

Gamma

- **Gamma_2D.py**:
    - Shows Gamma vs stock price for different vol levels.
    - Gamma peaks when ATM and falls away on both sides. Lower vol leads to a sharper peak.

- **Gamma_3D.py**:
    - Adds time to maturity — Gamma peaks are highest for short-dated ATM options.

Trading insight: High Gamma means Delta changes quickly — important for hedgers to anticipate.

Rho

- **Rho_3D.py:**
    - Shows Rho for calls (positive) and puts (negative) as functions of stock price and maturity.
    - Interest rate sensitivity grows with time to maturity.

Trading insight: Often minor for equity options, but critical for FX and long-dated structures.

Theta

- **Theta_2D.py**:
    - Plots time decay for calls and puts.
    - Theta is usually negative for long option holders, peaking in magnitude for ATM short-dated options.
    - Shows how volatility affects the decay rate.

Trading insight: Option sellers thrive on Theta decay but face Gamma and Vega risk.