ASSIGNMENT - 1

Objective

In this assignment, you have to build an intuitive understanding of **vanilla options payoffs** by coding and visualizing the **Profit/Loss vs Spot Price** graphs. You'll implement basic strategies and plot their respective payoff curves.

What You Have to Do

You are required to write Python code that accepts the following inputs:

- **Strike Price** (`K`)
- **Premium** (`P`) that you pay (for buying) or receive (for selling)
- A range of **Spot Prices** (for example, from `K - 50` to `K + 50`)

Using these inputs, you have to generate Profit/Loss vs Spot Price plots for the following four option positions:

1. Buying a Call Option
2. Selling a Call Option
3. Buying a Put Option
4. Selling a Put Option

Each of these should be shown clearly, either in separate subplots or within one plot using different colors and legends.

Payoff Formulas

Let S be the spot price at expiry, K the strike price, and P the premium:

- **Buy Call:** Profit = max(0, S−K) − P

- **Sell Call:** Profit = P - max(0, S - K)
- **Buy Put:** Profit = max(0, K - S) - P
- **Sell Put:** Profit = P - max(0, K - S)

Your Deliverables

You have to submit:

- A Python script or Jupyter Notebook with:
    - Code to take inputs and plot the payoff graphs
    - Properly labeled graphs for all four strategies
- Comments or markdown explanations describing what you observe in the plots

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Guidelines

- Use Python (recommended libraries: `matplotlib`, `numpy`, `plotly`)
- Make the code modular and easy to modify
- Add comments so others can understand your logic
