Practical Applications: Client Scenarios

Scenario: High-Risk Investor

Situation: A high-risk investor wants a product that offers significant returns if coffee prices rise sharply over the next six months.

Best Practice:

- **Digital Call Options**: Recommend digital call options on coffee that pay a fixed amount if coffee prices exceed a specified level within six months. Use the binary option pricing formula to determine the option value and conduct scenario analysis to estimate the likelihood of different outcomes.
- **Quantitative Implementation**: Use the binary option pricing formula to price the digital options and conduct scenario analysis to estimate the probability of different price outcomes.

Digital Call Option: The payoff is 1 if the asset's price is above the strike price at expiration.

$$V_{\text{call}} = e^{-rT} \cdot N(d_2)$$

Digital Put Option: The payoff is 1 if the asset's price is below the strike price at expiration.

$$V_{\text{put}} = e^{-rT} \cdot N(-d_2)$$

- **Pricing Model**: Apply your coffee commodity pricing model to set the strike price and premium for the digital options, ensuring they offer an attractive payoff structure while considering market volatility and historical price data.

Explanation: Digital call options provide the high-risk, high-reward profile the investor seeks. By using your pricing model, you can accurately price these options and offer a product that meets the client's needs.