|  |  |  |
| --- | --- | --- |
| **Stock Name** | **Ticker** | **Weight** |
| Power Grid | POWERGRID | 20.31% |
| NTPC Ltd | NTPC | 18.7% |
| Bharat Electronics | BEL | 16.94% |
| Oil and Natural Gas Corporation Ltd | ONGC | 15.31% |
| Coal India Ltd | COALINDIA | 14.52% |
| Oil India Ltd | OIL | 4.11% |
| NHPC Ltd | NHPC | 3.94% |
| Cochin Shipyard Ltd | COCHINSHIP | 1.73% |
| NBCC (India) Ltd | NBCC | 1.54% |
| NLC India Ltd | NLCINDIA | 1.2% |
| SJVN Ltd | SJVN | 1.7% |

**About CPSE ETF**

The **CPSE ETF** is a sectoral **Exchange-Traded Fund (ETF)** that invests in a diversified basket of public sector enterprises (PSEs) in **India**, with a focus on the **energy sector**.

**Key Characteristics**

* **Sector Focus**: Primarily energy production, transmission, and related operations.
* **Government-Backed**: The ETF includes prominent enterprises with significant influence in India's energy infrastructure and market.

**Monte Carlo Simulation for Portfolio Risk Assessment**

**Problem Statement**

A financial analyst assesses the potential risk for a portfolio comprising 11 stocks from the CPSE ETF (Central Public Sector Enterprises ETF) and predicts its future returns using **Monte Carlo Simulation**.

**Why Monte Carlo Simulation?**  
Instead of relying solely on historical data, this method generates thousands of potential future outcomes for stock prices. By considering historical volatility and returns, it enables:

* + Estimation of the probability distribution of portfolio returns.
  + Calculation of **Value at Risk (VaR)** to quantify potential downside risks.

**Portfolio Performance Metrics:**

* **Mean Daily Return:** 0.00178
* **Annualized Mean Return:** 44.77%
* **Daily Volatility (Std Dev):** 0.00586
* **Annualized Volatility:** 9.31%

**Scenario: Market Crash**

* **Mean Return:** -14.82%
* **Standard Deviation:** 0.59%
* **Worst Case Return (5th Percentile):** -15.74%

**Scenario: Energy Sector Shock**

* **Mean Return:** 0.16%
* **Standard Deviation:** 0.53%
* **Worst Case Return (5th Percentile):** -0.69%

**Scenario: Volatility Spike**

* **Mean Return:** 0.09%
* **Standard Deviation:** 1.22%
* **Worst Case Return (5th Percentile):** -1.91%

This analysis provides a comprehensive view of portfolio behavior under different market shocks and could guide risk management strategies.