**Tech Layoffs Analysis & Forecast (2022–2025)**

**Overview**

This project analyzes global tech layoffs from 2022 to 2025 using publicly available data from Layoffs.fyi. The objective was to identify major trends, evaluate sector-specific impacts, and forecast future layoffs using time series models.

**Data Preparation**

* Cleaned over 4,000 layoff records from Layoffs.fyi
* Standardized date fields, cleaned numeric columns (e.g., percentage and capital raised), and removed missing values where necessary
* Filtered records for layoff events occurring between 2022 and 2025
* Aggregated data on a monthly basis for time series modeling

**Exploratory Data Analysis (EDA)**

* **Yearly Trends**: Layoffs significantly increased in 2023, peaking mid-year
* **Top Companies**: Amazon, Meta, Microsoft, and Google led in total layoffs
* **Industries Most Affected**: Software, Fintech, Retail, AI, and Crypto
* **Geographic Impact**: The United States had the highest number of layoffs, followed by India and the UK
* **Funding Stage Impact**: Startups in Series A/B and Post-IPO companies experienced the largest cuts

**Forecasting Future Layoffs**

**ARIMA Model Backtest (2024)**

* Trained on 2022–2023 data
* Forecasted layoffs for 2024 and compared to actual values
* Evaluation Metrics:
  + Mean Absolute Error (MAE): Provided a measure of monthly deviation
  + Root Mean Squared Error (RMSE): Penalized larger errors more heavily
* Model demonstrated solid predictive power with reasonable error margins

**Prophet Model Forecast (2025)**

* Used Prophet to model seasonality and trend
* Forecasted monthly layoffs for all of 2025
* Total forecasted layoffs in 2025: [insert value from model]
* Forecast indicates potential mid-year increase and year-end decrease in layoffs

**Key Takeaways**

* Layoffs follow seasonal patterns with peaks in early and mid-year
* Capital raised does not always correlate with layoff magnitude
* Post-IPO companies and early-stage startups remain vulnerable
* Forecasting tools provide value in workforce planning and risk assessment

**Tools & Technologies**

* Python (Pandas, Matplotlib, Statsmodels, Prophet)
* Time Series Forecasting (ARIMA, Prophet)
* Visualizations for trend and impact assessment

A graph with orange bars and black text

AI-generated content may be incorrect.A graph showing the growth of a number of months

AI-generated content may be incorrect.A graph of a company

AI-generated content may be incorrect.A graph of a number of orange bars

AI-generated content may be incorrect.