Sai Prakash

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Education

Indian Institute of Technology Madras — Remote
BS in Data Science and Applications — *2024 – Present*

Madras School of Economics — Chennai
Master of Arts in Applied Quantitative Finance — *2023 – 2025*

Central University of Tamil Nadu — Thiruvarur
Bachelor of Arts in Economics — *2020 – 2023*

Projects

Credit Risk Modeling | *Python, Machine Learning, Pandas, Jupyter* *2025*
- Built end-to-end credit risk models using loan data, including probability of default (PD), loss given default (LGD), and exposure at default (EAD), following Basel II guidelines
- Engineered features and built scorecards via logistic and linear regression; validated with ROC-AUC and stability index
- Automated preprocessing, evaluation, and reporting in Jupyter notebook for scalable, interpretable risk assessment

Regional Climate Cooperation Analysis | *Climate Policy, Integrated Assessment Models* *2025*
- Analyzed US–EU–China–India cooperation using RICE-2013 IAM under cooperative vs. Nash scenarios
- Showed cooperation aligns carbon pricing, lowers emissions, and slows warming with uneven welfare
- Proposed equity mechanisms—technology transfer and climate finance—to sustain global cooperation

Time Series Forecast | *R, ARIMA, Forecasting, Data Visualization* *2025*
- Built a stock price forecasting model leveraging historical SpiceJet data for time series analysis
- Automated preprocessing, stationarity checks (ADF test), and model selection with relevant R packages
- Achieved high forecast accuracy (RMSE Rs. 3.25, MAPE 7.12%) and visualized actual vs. predicted prices

Portfolio Optimization and Risk Analysis | *Julia, JuMP.jl, QuantLib.jl* *2025*
- Developed mean-variance portfolio optimization models in Julia, maximizing returns for target risk levels
- Computed and analyzed risk metrics (volatility, VaR, Expected Shortfall) to assess portfolio robustness
- Visualized efficient frontier and optimal asset allocations, enabling data-driven investment decisions

Sentiment-Based Stock Prediction | *Python, Web Scraping, NLP, Machine Learning* *2024*
- Scraped and analyzed financial news articles for sentiment using BeautifulSoup, Requests, and NLP techniques
- Engineered sentiment-based features and combined them with historical stock data to train classification models
- Achieved up to 53% prediction accuracy; documented insights and visualizations in a comprehensive term paper

Certifications

Open Course in Public Policy | *Takshashila Institution* *2025*
- Acquired knowledge of public policy, including evaluation, trade-offs, and economic reasoning in India
- Applied analytical frameworks to assess policy outcomes across political, economic, and societal dimensions

Python 101 for Data Science | *Cognitive Class, IBM* *2025*
- Gained proficiency in Python for data science, covering data structures, functions, and control flow
- Applied NumPy and Pandas for data analysis, enhancing analytical and problem-solving skills

R for Data Science | *Cognitive Class, IBM* *2025*
- Developed practical skills in R, including data frames, vectors, and control structures
- Utilized R for data manipulation and visualization to derive insights from datasets

Advanced SQL | *Kaggle* *2025*
- Mastered filtering, grouping, and sorting SQL queries, including JOINs, subqueries, and window functions
- Analyzed large datasets and improved query performance for business case studies

Technical Skills

Languages: Python, R, Julia, SQL, LaTeX
Machine Learning: Regression, Classification, Clustering, NLP algorithms
Data Analysis & Visualization Tools: Power BI, Google Looker/Data Studio, Stata, MS Excel