ABHAY AGARWAL

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Profile Summary

A strong quantitative thinker with a passion for solving interesting problems and learning continuously. I enjoy working collaboratively in team environments, asking thoughtful questions, and exploring new ideas. With a solid foundation in algorithms and general programming experience, I'm eager to contribute to technology-driven trading strategies and grow in a fast-paced, intellectually curious setting.

Education

- **Motilal Lal Nehru National Institute of Technology, Allahabad** — *2024 - Present*
  Bachelor of Technology, Electrical and Electronics Engineering — Prayagraj, India
  - CGPA: 8.30/10.00
- **Mahatma Hansraj Modern School** — *2023*
  Higher Secondary Education — Jhansi, India
  - Grade: 83.2%

Personal Projects

- **Project A: Equal-Weight S&P 500 Index Simulator** — *Feb 2025 – March 2025*
  Tools: Python, pandas, NumPy, Jupyter Notebook, matplotlib []
  - Developed a back-testing system to simulate an equal-weight S&P 500 index portfolio over historical data
  - Implemented rebalancing logic using pandas for data alignment and portfolio rebalancing every quarter
  - Created visualizations of cumulative returns and drawdowns to evaluate strategy performance
  - Applied statistical analysis to compare strategy returns with benchmark indexes, securing a 6% anunal alpha.
- **Project B: Conway's Game of Life Simulation** — *December 2024*
  Tools: Python, NumPy, Object-Oriented Programming (OOP) []
  - Developed a grid-based cellular automaton system simulating the evolution of cells based on Conway's Game of Life rules
  - Implemented interactive GUI using Pygame for real-time visualization and user-controlled start/stop/reset features
  - Created modular OOP-based design to efficiently update grid states, ensuring separation of game logic and interface
- **Project C: Quantitative Momentum Investing Strategy** — *Sept 2024 - Oct 2024*
  Tools: Python, pandas, NumPy, scikit-learn, Jupyter Notebook []
  - Engineered a ranking system using momentum indicators (12-month vs 1-month returns) to select top decile stocks
  - Implemented a backtester to simulate a long-only strategy with monthly rebalancing
  - Created portfolio performance dashboards (returns, volatility, Sharpe ratio) using matplotlib
  - Analyzed risk-adjusted returns and turnover, achieving a Sharpe ratio of 1.2 versus benchmark

Technical Skills

- **Programming Languages:** Python, R, Java
- **Mathematical & Statistical Tools:** NumPy, Pandas, Seaborn, MATLAB, Excel
- **Data Science & Machine Learning:** scikit-learn, XGBoost, TensorFlow, Keras
- **Database Systems:** SQL
- **DevOps & Version Control:** Git, GitHub
- **Specialized Area:** Data Structures & Algorithms, Probability, Statistics, Time Series Analysis
- **Core knowledge:** Operating Systems, Database Management System , Computer Networks
- **Soft skills:** Problem-solving, Teamwork, Communication, Risk & Time Management, Project Management

Achivemennts

- **Leetcode - Problem Solving:** Solved 100+ DSA problems, improving proficiency in algorithms and data structures
- **Kaggle – Dataset Exploration:** Analyzed 20+ real-world datasets related to machine learning and deep learning, gaining hands-on experience in data preprocessing, EDA, feature engineering, model building, and evaluation — achieving high accuracy in supervised and unsupervised tasks...
- **Mathematics Practice:** Solved 200+ problems across topics like probability, combinatorics, number theory, and calculus, building a strong foundation for quantitative analysis and financial modeling.