Alfayed Alam

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EDUCATION

Stony Brook University — Stony Brook, NY
Bachelor of Science in Applied Mathematics and Computer Science, GPA: 3.83 — *Aug. 2021 – May. 2025(expected)*

Stuyvesant High School — New York, NY
High School Diploma with Honors, GPA: 4.00 — *Sep. 2017 – Jun. 2021*
Relevant Coursework: Multi-variable Calculus, Ordinary & Partial Differential Equations, Linear Algebra, Graph Theory & Combinatorics, Statistics, Probability Theory, Data Analysis, Financial Mathematics, Deterministic Models, Object-Oriented Programming, Data Structures, Analysis of Algorithms, Time-Series Analysis, Data Mining, Stochastic Models, Quantitative Finance, Numerical Analysis, Artificial Intelligence, Machine Learning, Computational Geometry

EXPERIENCE

Hudson River Trading — May. 2023 – Aug. 2023
Algorithm Developer Intern — *New York, New York*
- Collaboratively designed sophisticated mathematical models for trading financial derivatives across multiple strategies, utilizing time-series analysis and Python's machine learning libraries to enhance profitability and efficiency.
- Developed advanced machine learning algorithms, focusing on the Q-learning algorithm, and rigorously back-tested them to evaluate performance metrics against market benchmarks, leading to refined trading strategies.
- Partnered with peers to retrospectively analyze and refine existing quantitative models; focused on mathematical rigor and research to analytically validate the efficacy of algorithmic modifications, ensuring sustained improvements in trade accuracy and performance.

Synergy Prep — Jun. 2022 – Present
SAT Manager and Technical Developer — *Bronx, NY*
- Developed an autonomous discord bot in Python to facilitate exchange of more than 1000 problems and optimization solutions for mathematical questions for SAT and SHSAT students, which provided good practice for students
- Designed code to assign students problems based on categorized weakness through dataset accumulated by online homework and yearly statistics. This allowed for specialization of work catered to student's weakness
- Led development of a novel curriculum that improved student scores by 43% in several batches of classes, leading to several students scoring above a 1500 on the SAT and above a 500 on the SHSAT
- Designed technologies for the company as well as worked on existing software to allow students to have more avaiablilty in terms of practice questions and resources/help

PROJECTS

Time-Series Pairing Trading Bot | *Python (pandas, numpy, matplot)* — Aug. 2022 – Present
- Analyzed stock price data from Yahoo Finance and back-tested strategies with the assistance of several Python libraries to look for good opening and closing positions
- Implemented Engle-Granger test to check for cointegration between stocks
- Designed the Johansen test for cointegration to eliminate any potential problems or misses from the initial test
- Learned about Dickey-Fuller to test for stationarity between stocks

Synergy Discord Bot | *Discord, OpenAI, Vertex AI, SQLAlchemy* — Jun. 2023 – Present
- Created a discord bot that would answer students questions when tutors would not be available, answering with an accuracy of 97.6% for STEM related questions and 94.4% for reading comprehension and grammar
- Trained discord bot on thousands of questions from custom data base as well as public data, done with Vertex AI
- Integrated a resume builder for students, essentially uses Jake's Template and takes input to create a resume after several prompts (asking about name, institution, experience, projects, etc)
- Provided students with materials and such to pursue their project ideas and helped them along the way

SKILLS AND QUALIFICATIONS

Languages: Java, Python, C/C++, LaTeX, HTML, CSS, JavaScript, TypeScript, NoSQL, PostgreSQL, Docker
Libraries and Tools: NumPy, SciPy, Pandas, PyTorch, Sci-Kit Learn, Tensor Flow, Next.js, React.js, Node.js
Awards and Honors: USAMO Qualifer 2020, with index score of 256, AIME 2020 Qualifier (Received a score of 13, Top 1% in the country), 2-time AIME Qualifier, Distinguished Honor Roll AMC12 2020 (Received a score of 126, Top 1% in the country)