Rafay Khan

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EXPERIENCE

Princeton Emma Bloomberg Center for Access and Opportunity   Princeton, NJ
Software Developer   *June 2022 - Present*
- Spearheaded an end-to-end Python project responsible for connecting 1000+ students to mentors, reducing an 8-hour task to 5 seconds
- Developed a Python ranked-choice-voting project responsible for placing 300+ students in campus events with 98% satisfaction rate
- Constructed several PANDAS datapipelines to handle inconsistent spreadsheet data, establishing code consistency across codebase
- Configured Ruff linting and Black formatting across project codebases, increasing refactoring and unit testing capabilities
- Standardized JSON project logging across codebase, generating 24/7 application usage and uptime reports
- Utilized PANDAS, Matplotlib, Numpy, and APIs to perform visual and sentiment analysis on student feedback data

QuantCap   Cambridge, MA
Software & Machine Learning Intern   *December 2022 - January 2023*
- Constructed Jupyter Notebook API ingestion datapipelines, producing technical analysis indicators for over 3.5GB of historical market data
- Consumed several APIs for live market data, utilizing SQL for data storage for downstream technical analysis
- Performed model optimization, tuning hyperparameters on several market regression and classification models
- Generated data visualizations and performed sentiment analysis, extracting features for several market prediction models
- Documented the team project and enforced modular programming principles across the team's codebase

Princeton Department of Computer Science   Princeton, NJ
Teaching Assistant, Algorithms and Data Structures   *February 2023 - May 2023*
- Taught 50 students Advanced Java OOP implementation techniques and paradigms
- Supplemented core curriculum with software engineering principles of modularity, encapsulation, abstraction

Princeton Center for Digital Humanities   Princeton, NJ
Course Assistant, Python Data Analysis   *June 2022 - August 2022*
- Assisted students in their construction web scraping projects delineating rate-limiting and API consumption guidelines
- Mentored 15 students in fundamental computer science constructs and ML algorithm paradigms
- Taught students data scraping, cleaning, and analysis conventions using PANDAS

EDUCATION

Princeton University   Princeton, NJ
Bachelor of Science in Engineering, Computer Science, GPA: 3.8   *September 2021 - May 2025*
   Relevant Courses: Probability and Stochastic Systems, Linear Algebra, Discrete Math, Machine Learning, Data Science, Algorithms and Data Structures, Advanced Programming Techniques, Distributed Systems

PROJECTS

Marshmallow | *Automates managerial/administrative tasks across Department Communication Platforms*   Python
- Developed a regular expression based name-matching algorithm, resulting in a 95% match rate
- Generates formatted match reports, identifying missing students from the program, thereby increasing program outreach
- Dockerized project, increasing project portability and deployment

Stopwatch Calendar | *Tracks and logs stopwatch sessions to Google Calendar*   Python
- Abided by an object-oriented design paradigm, maintaining several encapsulated abstract datatypes
- Maintains a module for handling SQL database interactions
- Maintains a module for Google Calendar API interactions, querying user on whether to log study session

Image Classifier | *Implements a Multi-Layer Perceptron for classifying handwritten digits*   Java
- Developed a modular, encapsulated Perceptron abstract datatype
- Trained Perceptron ADT instances for use in multi-classification neural layer
- Implemented feature extraction for several MNIST image datasets

File Tree | *Implements a Directory-File Tree Abstract Object*   C
- Validated internal state of the AO, checking invariants upon calls to tree operations
- Developed Node ADTs representing Files and Directories, increasing program modularity
- Maintains dynamic memory management with garbage collection mechanism

SKILLS

- **Languages**: Python, Go, Java, C/C++, R, JavaScript/TypeScript, HTML/CSS, ARM Assembly
- **Frameworks**: React, Redux, Django, Flask, Vue, Tailwind CSS, Bootstrap, Qt, Google Cloud, Google App Engine, Node.js, REST APIs
- **Tools**: Pytorch, Tensorflow, SciKit-Learn, PANDAS, NumPy, Matplotlib, Seaborn, Anaconda, Jupyter Noteboooks/Google Colab
- **Other Technologies**: SQL, NoSQL, MongoDB, Docker, Kubernetes, Redis, Git, Bash, Unix, Linux, AWS, Azure, Microsoft Office, Google Suite