

# Alan Lin

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## EDUCATION

### Boston University

Expected (May 2026)

*Bachelor of Arts in Computer Science*

*Boston, MA*

- **Relevant Coursework:** Data Science Tools & Applications, Database Systems, Distributed Systems, Software Engineering, Web App Development, Analysis of Algorithms, Functional Programming, Statistics, Linear Algebra, Computing Systems, Discrete Math, Data Structures & OOP in Java

## EXPERIENCE

### City of Boston

Sep. 2024 - Dec. 2024

*Data Analyst*

*Boston, MA*

- Analyzed and modeled City of Boston's operating and capital budget data, examining over 10 years of budget data across 50+ departments, identifying spending trends and discrepancies
- Developed and deployed linear regression models and clustering algorithms that improved the accuracy of budget allocation insights by 20%
- Created 10+ interactive visualizations, including bar charts, choropleth maps, and scatter plots, providing actionable insights that influenced strategic decisions on per capita spending in critical areas such as education and housing.

### Boston University

Jan. 2024 - May 2024

*Software Engineer : Full-Stack Developer*

*Boston, MA*

- Streamlined meal planning for users by creating an app that fetches recipes based on available ingredients, improving user convenience by 30%, by integrating the Spoonacular API and Unwrangle Sam's Club API
- Ensured quick and easy retrieval of past recipes, reducing search time by 40%, by storing and managing user's histories in Firebase' Firestore
- Integrated Google OAuth login via Firebase, enhancing user security and streamlining authentication; increased user retention by 15% and reduced login-related issues by 30%

## PROJECTS

### Latent Semantic Analysis Search Engine | *Python, Flask*

Oct. 2024

- Built a search engine that uses Latent Semantic Analysis (LSA) to retrieve top 5 relevant documents from a dataset of 18,000+ documents with 95% accuracy based on cosine similarity
- Designed a responsive web interface, handling user queries in real time with document retrieval latency under 200ms, and visualized cosine similarity scores via bar charts.
- Reduced dimensionality of the term-document matrix by 85% using Singular Value Decomposition (SVD), leading to a 50% improvement in query processing speed while maintaining high retrieval accuracy.

### KMeans Clustering Visualization | *Python, Flask, Javascript*

Sep. 2024

- Developed an interactive web application to visualize the KMeans Clustering algorithm with 4 initialization methods (Random, Farthest First, KMeans++, Manual)
- Engineered a dynamic clustering process visualization with step-by-step playback and manual centroid selection, allowing users to track algorithm convergence in under 5 seconds for datasets of up to 100 points
- Optimized clustering performance and visualization rendering, reducing load times by 20% for large datasets

### SProfile | *ReactJS, NodeJS, ExpressJS, Firebase*

Apr. 2024

- Harnessed the Spotify API to retrieve extensive data on users, artists, albums, playlists, tracks and player information, resulting in a 20% improvement in user experience
- Incorporated the TicketMaster API to deliver real-time updates on upcoming artist events, resulting in a 15% increase in app usage frequency
- Implemented Spotify's OAuth system for user authentication, ensuring seamless access to personalized music content and features; reducing unauthorized access incidents by 25%

## TECHNICAL SKILLS

**Languages:** Javascript, HTML/CSS, Java, Python, Bash/Shell, x86 Assembly Language, OCaml, C, SQL, XML

**Frameworks/Libraries:** ReactJS, ExpressJS, NextJS, ViteJS, NumPy, SciKit, Flask

**Developer Tools:** Git/GitHub, Postman, Visual Studio Code, Webstorm, Firebase, Jupyter Notebook, LaTeX