

Technology Trends in Programming and Databases

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OUTLINE



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EXECUTIVE SUMMARY



- **Top Programming Languages in Demand:**
 - JavaScript, HTML/CSS, SQL, Bash/Shell/PowerShell, and Python continue to lead across multiple domains.
- **Database Skills in High Demand:**
 - MySQL, Microsoft SQL Server, PostgreSQL, SQLite, and MongoDB remain dominant in both legacy and cloud-native environments.
- **Leading Platforms:**
 - Windows and Linux maintain strong developer preference.
 - Docker and AWS are now essentials in modern DevOps and backend workflows.
 - Slack appears as a key tool within team-based development ecosystems.
- **Popular Web Frameworks:**
 - jQuery and Angular still hold ground, while React.js has taken the lead.
 - ASP.NET continues to serve backend devs, and Express is widely used in Node.js stacks.
- **Trends for the Near Future:**
 - Python moves into the top three, reflecting its role in data, ML, and automation.
 - SQL and TypeScript follow closely behind.
 - Redis and Elasticsearch emerge within the top five databases for speed and search-driven applications.
 - Android ranks among the top five most demanded platforms.
 - React.js leads the front-end landscape, while Vue.js makes its way into the top ranks as a rising framework.



INTRODUCTION



- In the ever-evolving world of technology and development, understanding trends is essential for staying ahead. This analysis focuses on the key shifts taking place in the programming landscape, web development frameworks, and the broader demographics of professional developers worldwide.
- The **Stack Overflow** Developer Survey offers a comprehensive view of the global developer ecosystem.
- It captures a wide range of data—from preferred tools and technologies to career goals and workplace expectations.
- The 2019 edition marked the 9th consecutive year of the survey, with nearly 90,000 developers sharing their experiences and insights.
- These findings give us a unique window into how tech roles are changing and what skills are becoming essential in the industry.
- Let's unpack some of the most impactful insights drawn from this rich dataset.



METHODOLOGY



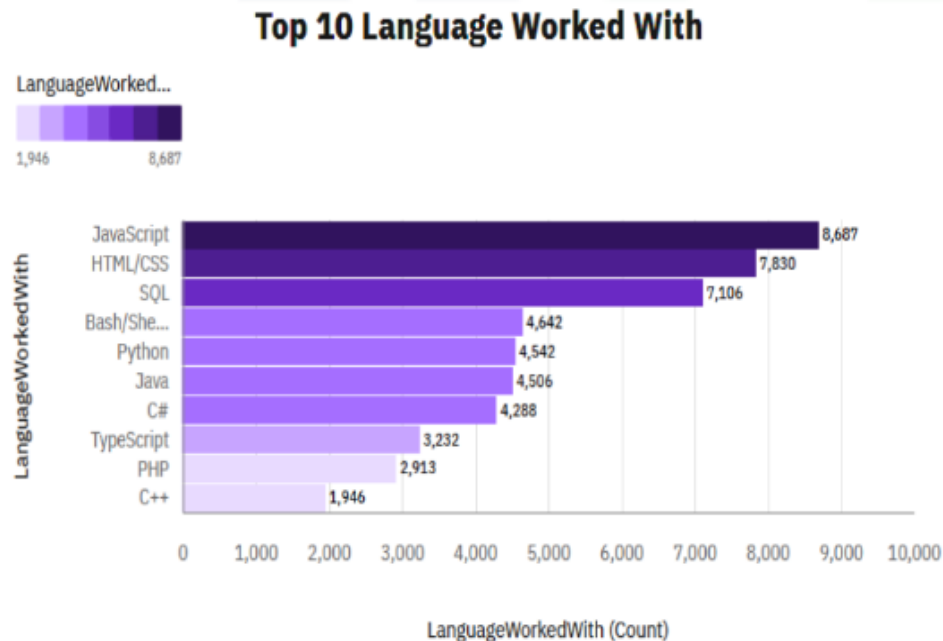
This analysis is grounded in the Stack Overflow Developer Survey, conducted between January 23 and February 14, with input from 88,883 developers across 179 countries.

- I engaged with the dataset through a hands-on learning experience via IBM's Coursera labs, which included:
 - Web Scraping
 - Dataset Exploration
 - Data Wrangling
 - Exploratory Data Analysis (EDA)
 - Data Visualization
- These steps enabled a full-cycle understanding of the data—from collection to insight generation.

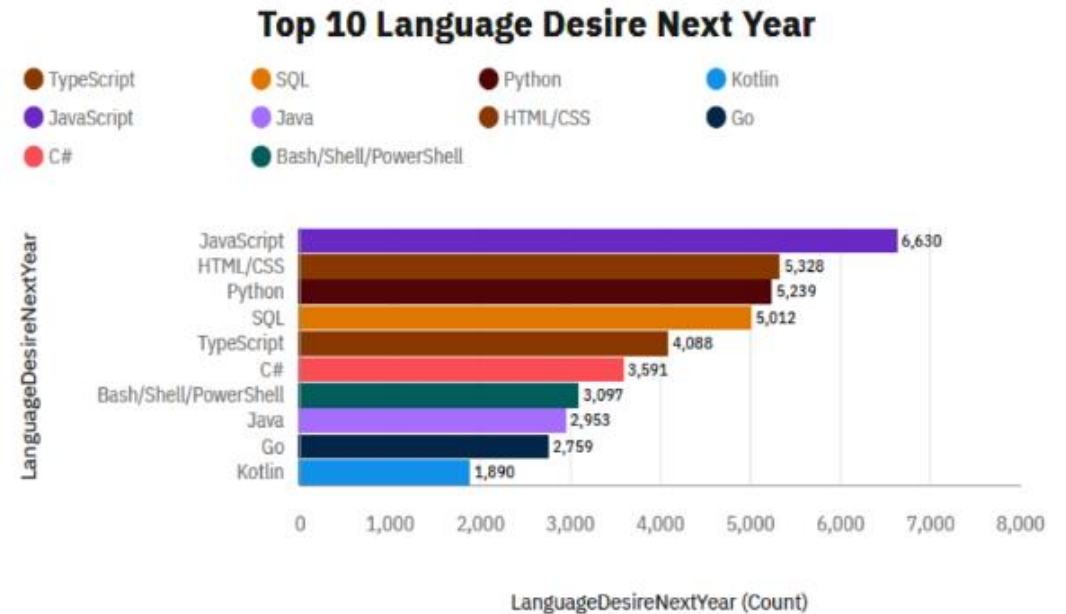
The visual analysis and storytelling were developed using IBM Cognos Analytics, which allowed for interactive dashboards and clean data visuals to present key insights effectively.

PROGRAMMING LANGUAGE TRENDS

2019



Following Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript and HTML/CSS are the most widely used languages among developers across the board.
- SQL maintains a strong position, reflecting its critical utility in data-driven applications.
- Python has officially overtaken Java in overall usage, indicating a shift in developer preferences.

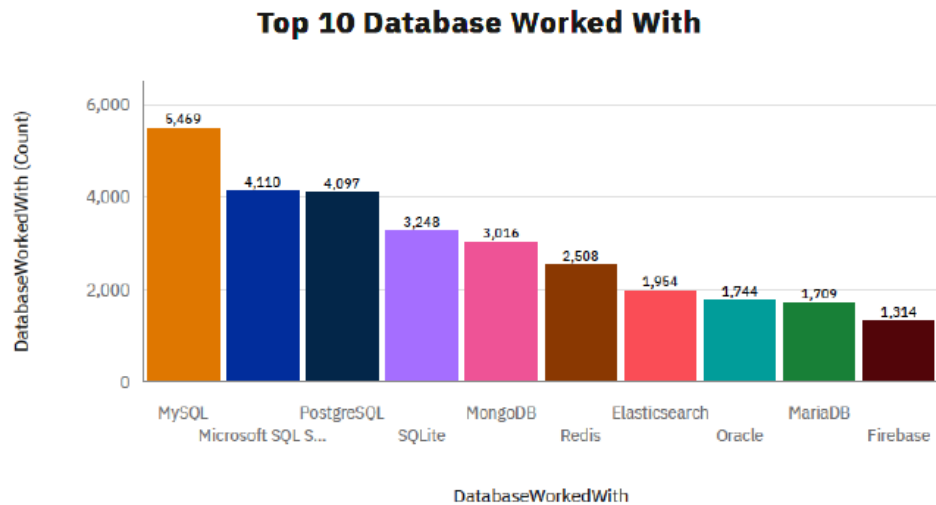
Implications

- The continued dominance of JavaScript and HTML/CSS reinforces their role as foundational technologies for any web-focused development stack—proficiency in these is now a baseline expectation for developers.
- The consistent demand for SQL highlights the growing need for robust data handling and database integration skills, even outside traditional database roles.
- Python's upward trend is likely due to its simplicity and cross-functional application—from backend development to machine learning and automation—making it a strategic language to learn for career flexibility and relevance.

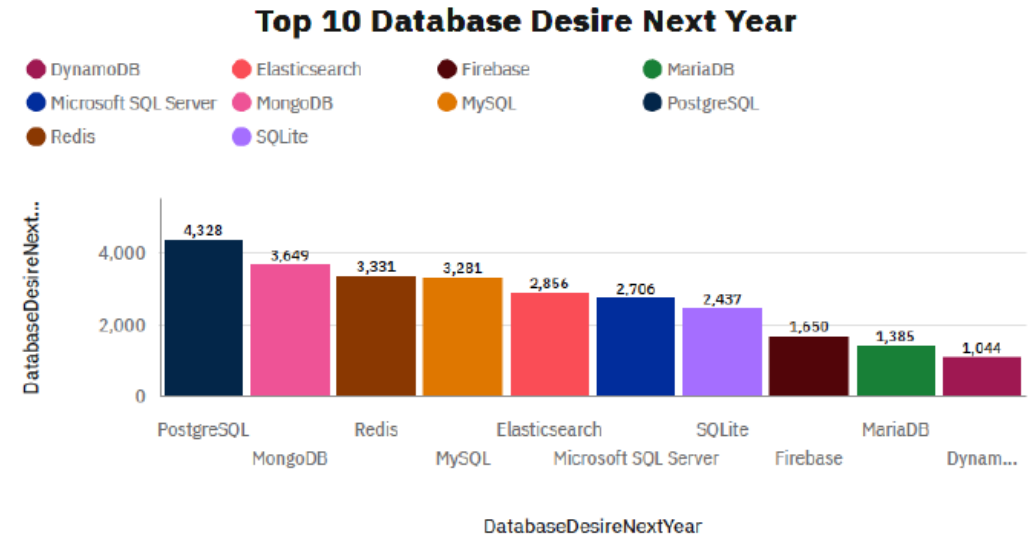


DATABASE TRENDS

2019



Following Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- **MySQL** ranks as the most commonly used database management system among developers.
- **PostgreSQL** and **Microsoft SQL Server** follow closely, maintaining strong adoption across industries.
- **MongoDB** stands out as the most popular NoSQL solution in the dataset.

Implications

- The widespread use of **MySQL**, **PostgreSQL**, and **Microsoft SQL Server** emphasizes the continued relevance of relational databases, especially in structured, transactional systems.
- **MongoDB**'s growing presence signals a shift toward schema-less data models and scalable architecture, particularly in fast-moving web and mobile environments.
- The variety of DBMS choices across the developer community reflects a clear trend: database technology must be aligned with specific use cases—whether that's consistency, scalability, or performance.



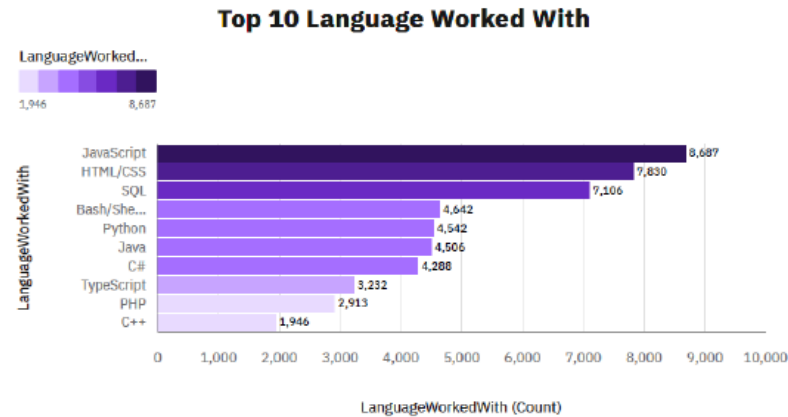
DASHBOARD



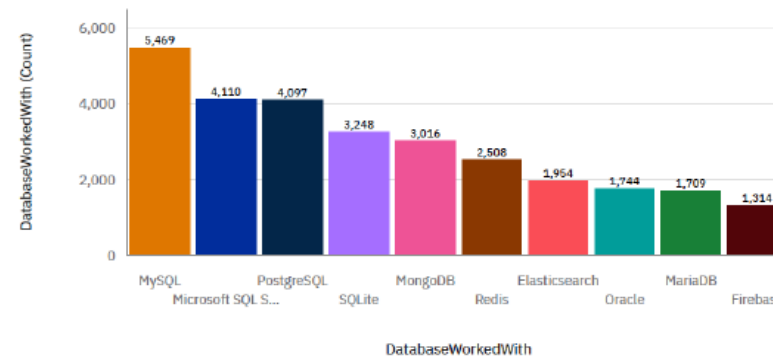
https://github.com/AvyDle/IBM_Data_Analyst_Capstone_Project/blob/main/Dashboards_on_Cognos.pdf

CURRENT TECHNOLOGY USAGE

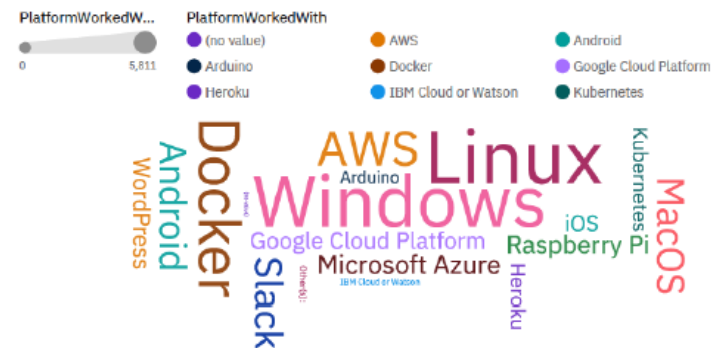
Current Technology Usage



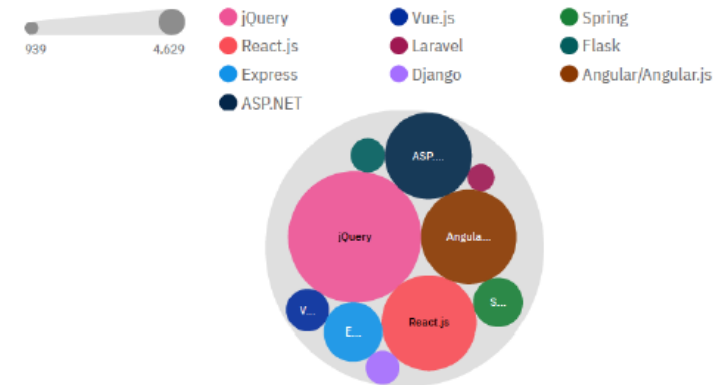
Top 10 Database Worked With



Platform Worked With

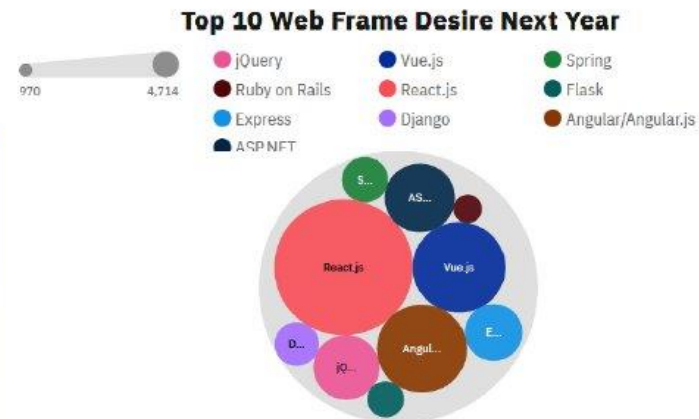
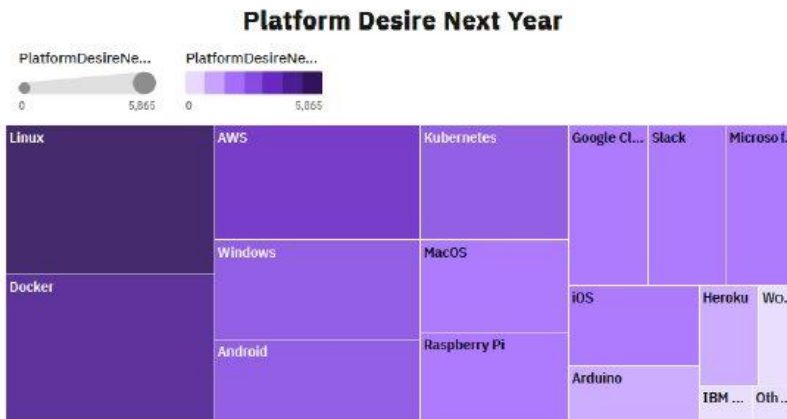
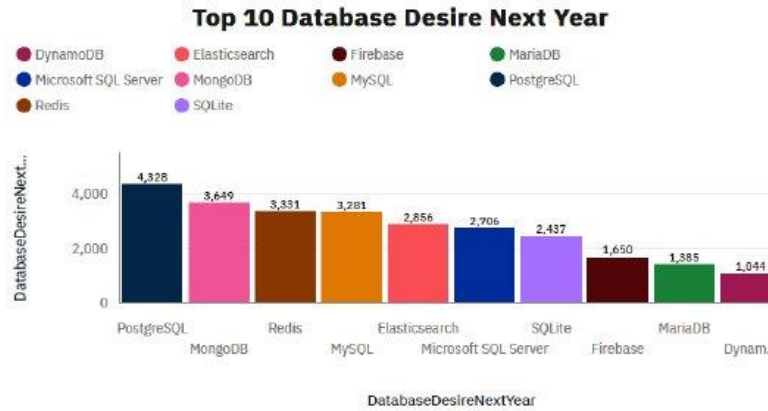
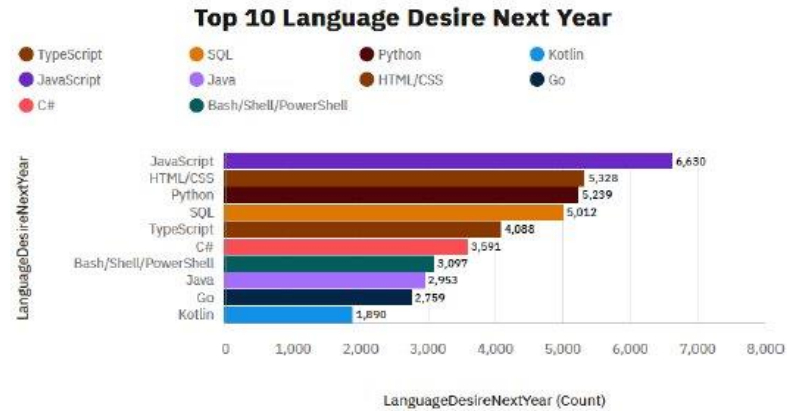


Top 10 Web Frame Worked With



FUTURE TECHNOLOGY TREND

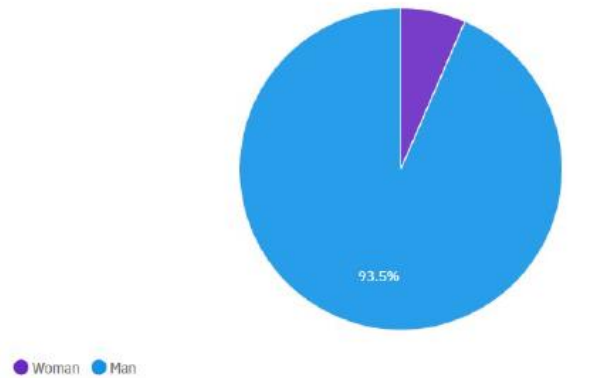
Future Technology Trend



DEMOGRAPHICS

Demographics

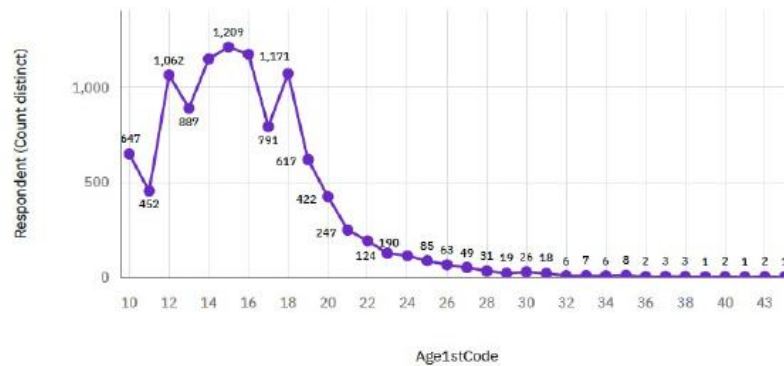
Respondent classified by Gender



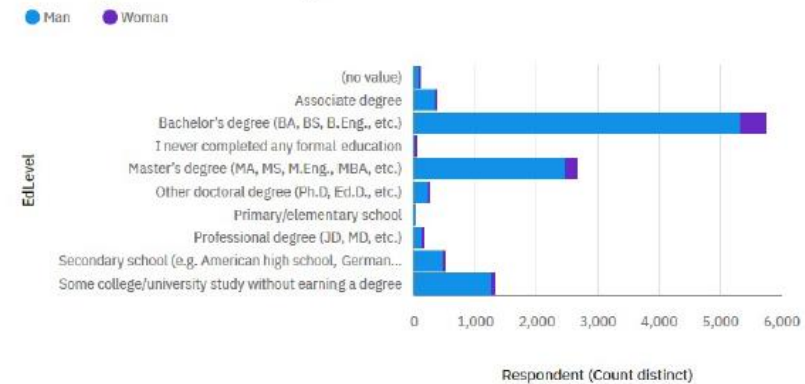
Respondent Count for Countries



Respondent Count by Age



Respondent Count by Gender and Formal Education Level



DISCUSSION



- The dashboards highlight several defining patterns shaping today's tech ecosystem:
- The prevalence of **JavaScript** and **HTML/CSS** reinforces the centrality of web development in the modern software landscape. These tools remain non-negotiables for client-facing solutions.
- MySQL's position as the most used DBMS reflects how structured data and relational models continue to underpin a wide variety of applications, from small-scale services to enterprise platforms.
- These insights spotlight broader discussions around:
 - The growing importance of client-side scripting and responsive UI/UX design
 - Ongoing shifts in web frameworks—with React.js rising and jQuery holding ground
 - The increasing convergence between frontend flexibility and backend stability in shaping scalable web ecosystems
- Together, these observations paint a picture of a developer ecosystem grounded in versatility, performance, and a heavy emphasis on user-centric web applications.



OVERALL FINDINGS & IMPLICATIONS

Findings

- **Technology Trends:** The continued dominance of JavaScript and HTML/CSS highlights the critical need for developers to stay current with evolving web technologies.
- **Data Management:** High usage of MySQL, PostgreSQL, and SQL Server emphasizes the foundational role of relational databases in application development.
- **Tool Diversity:** The range of programming languages and database systems in use reflects a highly varied tech landscape—where selecting the right tool requires contextual awareness and strategic alignment.

Implications

- **Web-Centric Development:** The prevalence of web-based tools and frameworks reinforces the dominance of online platforms and digital experiences, pushing developers to refine both front-end and full-stack capabilities.
- **Flexible Data Architecture:** The diversity in DBMS usage demonstrates the need for adaptive data solutions. Organizations must align database choices with workload needs, scalability targets, and data models.
- **Standardization Benefits:** Technologies like JavaScript and MySQL have become de facto standards. This streamlines interoperability, collaboration, and onboarding across global development teams.



CONCLUSION



- The findings highlight the constantly evolving nature of the programming field and emphasize how crucial technology is in fueling innovation across various industries. As developers work in this ever-changing environment, it's essential to:
- Have a solid understanding of a variety of programming languages.
- Be proficient in database systems to tackle the challenges of modern applications.
- Strive for the best possible outcomes in software development projects.



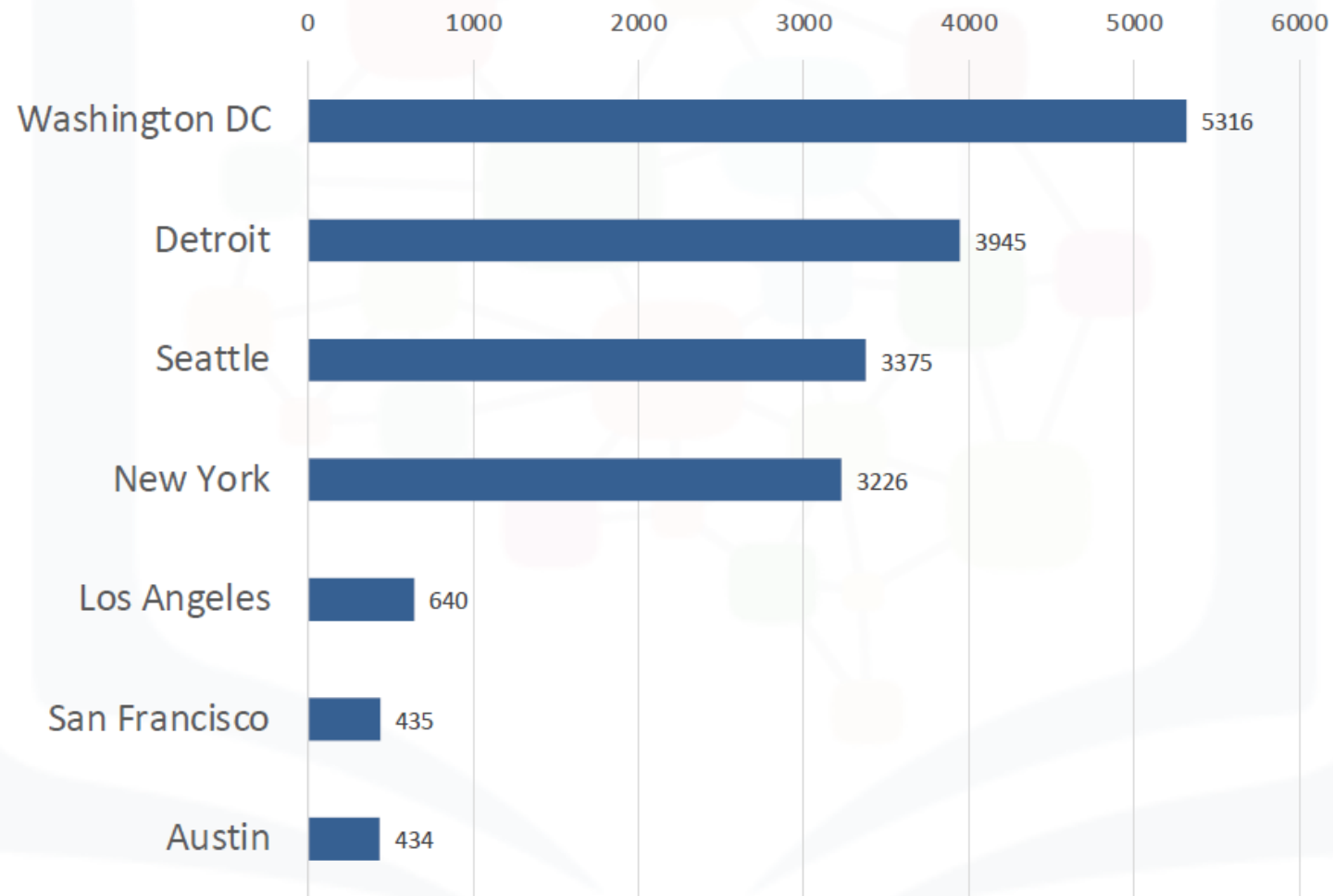
APPENDIX



- A- Job Postings Chart
- B- Popular Languages Chart



JOB POSTINGS



POPULAR LANGUAGES

