Unlocking Insights: Data Analysis of Developer Trends

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EXECUTIVE SUMMARY

This comprehensive data analysis offers invaluable insights for employers.

1. Identifies the most sought-after programming languages, technologies and aids in decision-making regarding skill development and training strategies.

2. The analysis provides benchmarks for compensation, demographics, and skill preferences, empowering organizations to set competitive standards.

3. It delves into work habits and behaviors, offering insights into productivity and work-life balance, ultimately contributing to employee well-being and organizational success.

INTRODUCTION

This analysis empowers employers to align their hiring, training, and technology strategies with industry trends, optimizing recruitment and workforce development while maintaining competitiveness.

Skill and Learning Trends: Identify top programming languages and technologies in demand. Plan hiring and training accordingly.

Work Habits & Behaviors: Understand work hours, coding hours, and age-related patterns. To tailor the job in a suitable manner to attract the experts.

Data-Driven Decision-Making: Make informed choices on hiring, compensation, and tech adoption.

Industry Benchmarking: Set competitive standards for compensation, demographics, and skill preferences.

METHODOLOGY

Data Source:

- Stack Overflow, a popular website for developers, conducted an online survey of software professionals across the world. The survey data was later open sourced by Stack Overflow. The data we used was the subset of it.

Data Cleaning:

- Data was cleaned to remove duplicates, missing values, and inconsistencies.
- Columns were renamed, and data types were adjusted for analysis.

Exploratory Data Analysis (EDA):

- Descriptive statistics, such as mean, median, and quartiles, were calculated to understand the data's central tendencies.
- Visualization techniques, including histograms, box plots, and scatter plots, were used to uncover patterns and trends.

METHODOLOGY

Data Aggregation:

- SQL queries were employed to aggregate data and derive meaningful insights.
- GROUP BY statements were utilized to group data by relevant attributes, such asaa age groups and programming languages.

Statistical Analysis:

- Statistical measures, including the five-number summary and correlations, were computed to gain deeper insights.
- Extensive use of Python for data extraction, cleaning, analysis, and visualization.
- Libraries such as Pandas, NumPy, Matplotlib, and Seaborn were pivotal.

Data Visualization:

- Matplotlib and Seaborn libraries in Python were used to create visual representations of data.
- Visualizations included histograms, box plots, scatter plots, pie charts, and bar charts.
- Cognos was used to create the dashboards for better visualization.
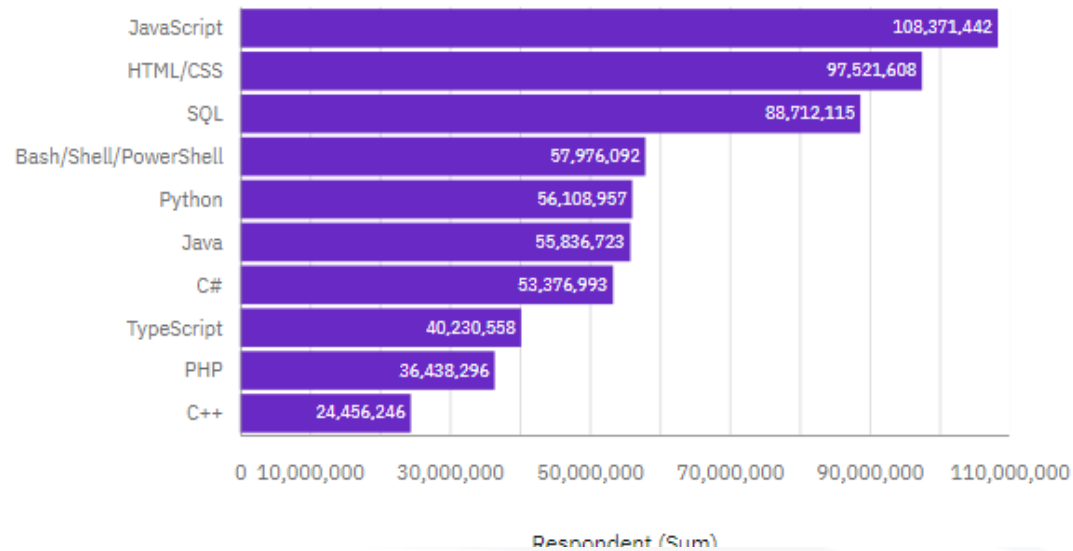
RESULTS

We explore a comprehensive dataset containing responses from technology professionals, providing a unique opportunity to analyze the trends, preferences, and characteristics of individuals within the tech sector.
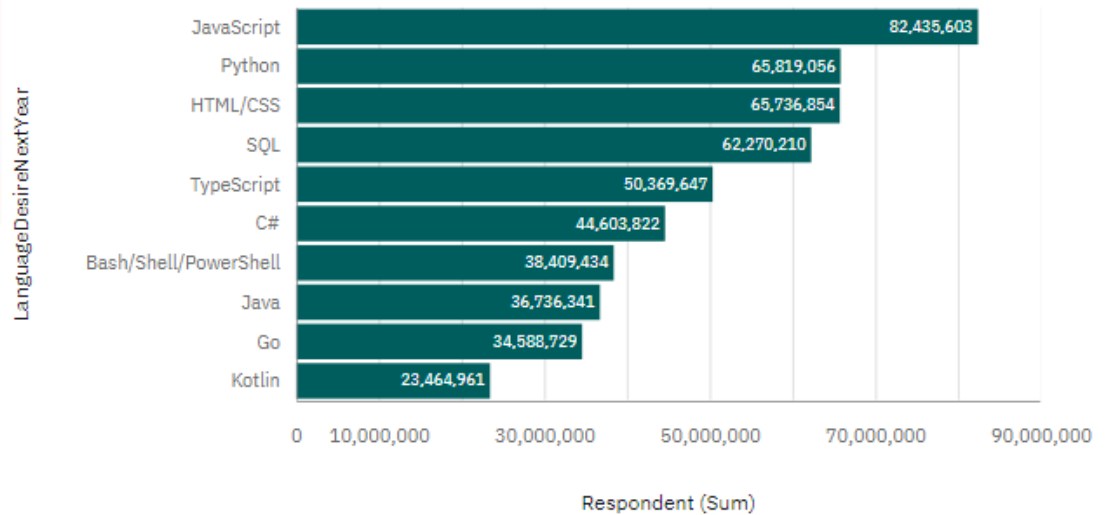
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SKILLS NETWORK

PROGRAMMING LANGUAGE TRENDS

Current Year

Next Year

Top 10 Languages Worked With

Language	Respondent (Sum)
JavaScript	108,371,442
HTML/CSS	97,521,608
SQL	88,712,115
Bash/Shell/PowerShell	57,976,092
Python	56,108,957
Java	55,836,723
C#	53,376,993
TypeScript	40,230,558
PHP	36,438,296
C++	24,456,246

Top 10 Language Desire Next Year

LanguageDesireNextYear	Respondent (Sum)
JavaScript	82,435,603
Python	65,819,056
HTML/CSS	65,736,854
SQL	62,270,210
TypeScript	50,369,647
C#	44,603,822
Bash/Shell/PowerShell	38,409,434
Java	36,736,341
Go	34,588,729
Kotlin	23,464,961

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

1. **JavaScript Dominance:** The most prevalent programming language, with over 108 million respondents working with it.

2. **Diverse Range:** Respondent counts vary widely across languages, from over 108 million for JavaScript to 24 million for C++.

3. **Key Languages:** JavaScript, HTML/CSS, and SQL are the most significant languages, representing 47.6% of all respondents (around 295 million).
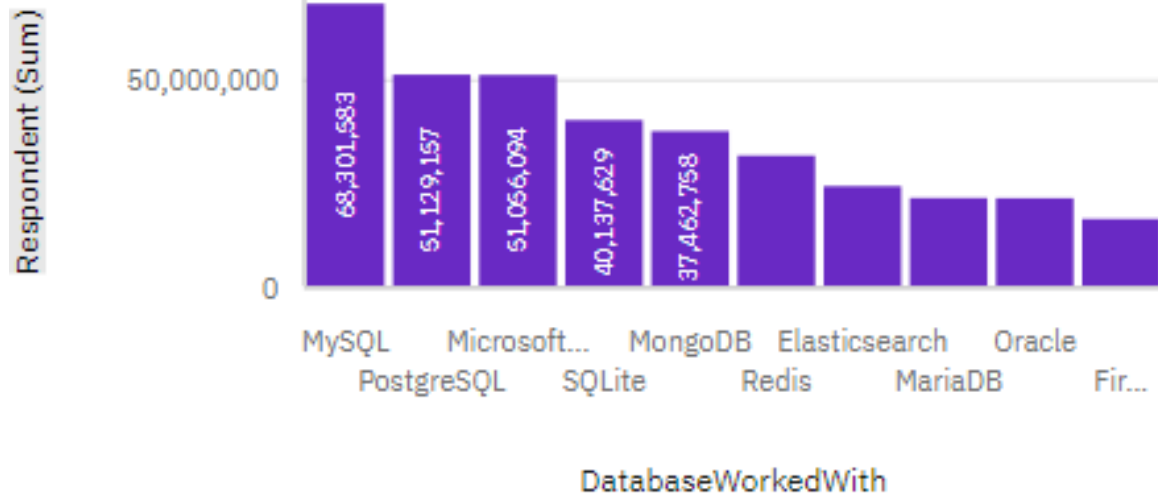
Implications

1. **Targeted Hiring:** Recognizing the dominance of JavaScript, employers can strategically focus their recruitment efforts on candidates proficient in this language.

2. **Embrace Diversity:** Encouraging developers to maintain a diverse skill set is beneficial. It allows companies to tackle a wide range of projects efficiently.

3. **Address Skill Gaps:** Understanding that JavaScript, HTML/CSS, and SQL are in high demand, employers can identify potential skill gaps within their teams and provide training accordingly.
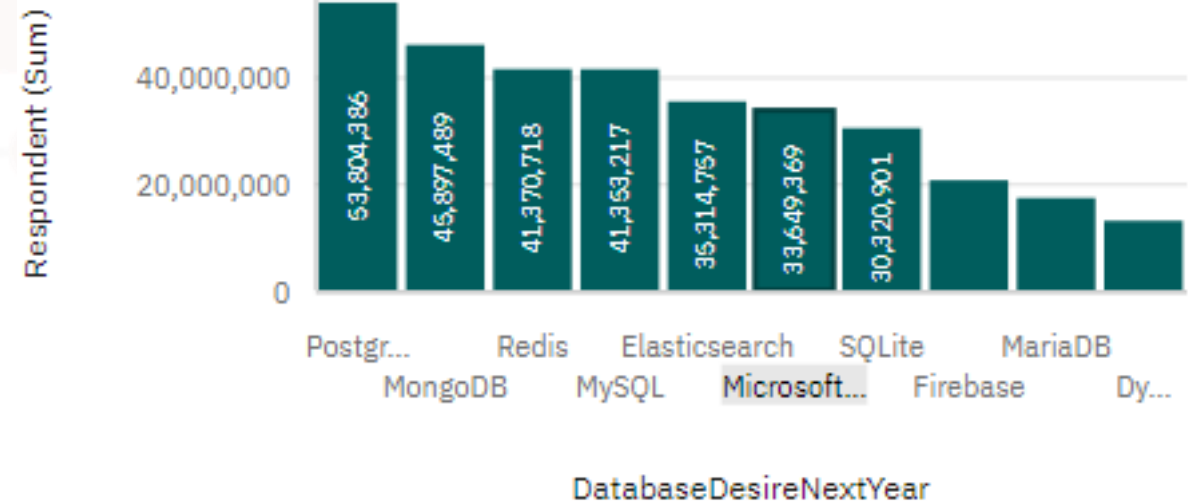
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DATABASE TRENDS

Current Year

Next Year

Top 10 Database Worked With

Respondent (Sum)

50,000,000

0

- 68,301,583
- 51,129,157
- 51,056,094
- 40,137,629
- 37,462,758

MySQL   Microsoft...   MongoDB   Elasticsearch   Oracle
PostgreSQL   SQLite   Redis   MariaDB   Fir...

DatabaseWorkedWith

Top 10 Database Desire Next Year

Respondent (Sum)

40,000,000

20,000,000

0

- 53,804,386
- 45,897,489
- 41,370,718
- 41,353,217
- 35,314,757
- 33,649,369
- 30,320,901

Postgr...   Redis   Elasticsearch   SQLite   MariaDB
MongoDB   MySQL   Microsoft...   Firebase   Dy...

DatabaseDesireNextYear

DATABASE TRENDS FINDINGS & IMPLICATIONS

Findings

1. HTML/CSS Dominance: HTML/CSS Language Worked With commands a significant 47% of MySQL Respondents, surpassing Microsoft SQL Server's 22%.

2. HTML/CSS Lead: With an impressive 41 million Respondents, Language Worked With HTML/CSS leads the pack. Within this group, Database Worked With MySQL is the primary contributor, with nearly 17 million.

3. MySQL's Appeal: Database Worked With MySQL boasts the highest total Respondent count, largely attributable to the strong presence of Language Worked With HTML/CSS.

Implications

1. HTML/CSS Skill Demand: HTML/CSS skills are highly sought after, as they are the dominant choice among developers. To meet this demand, consider hiring or upskilling employees in these areas.

2. MySQL's Significance: MySQL is a favored database platform among developers who work with HTML/CSS. Ensuring proficiency in MySQL could be valuable for database-related roles within your organization.

3. Competitive Edge: By harnessing the power of HTML/CSS and MySQL, you can gain a competitive edge in the job market and attract top talent looking for roles where these skills are valued.
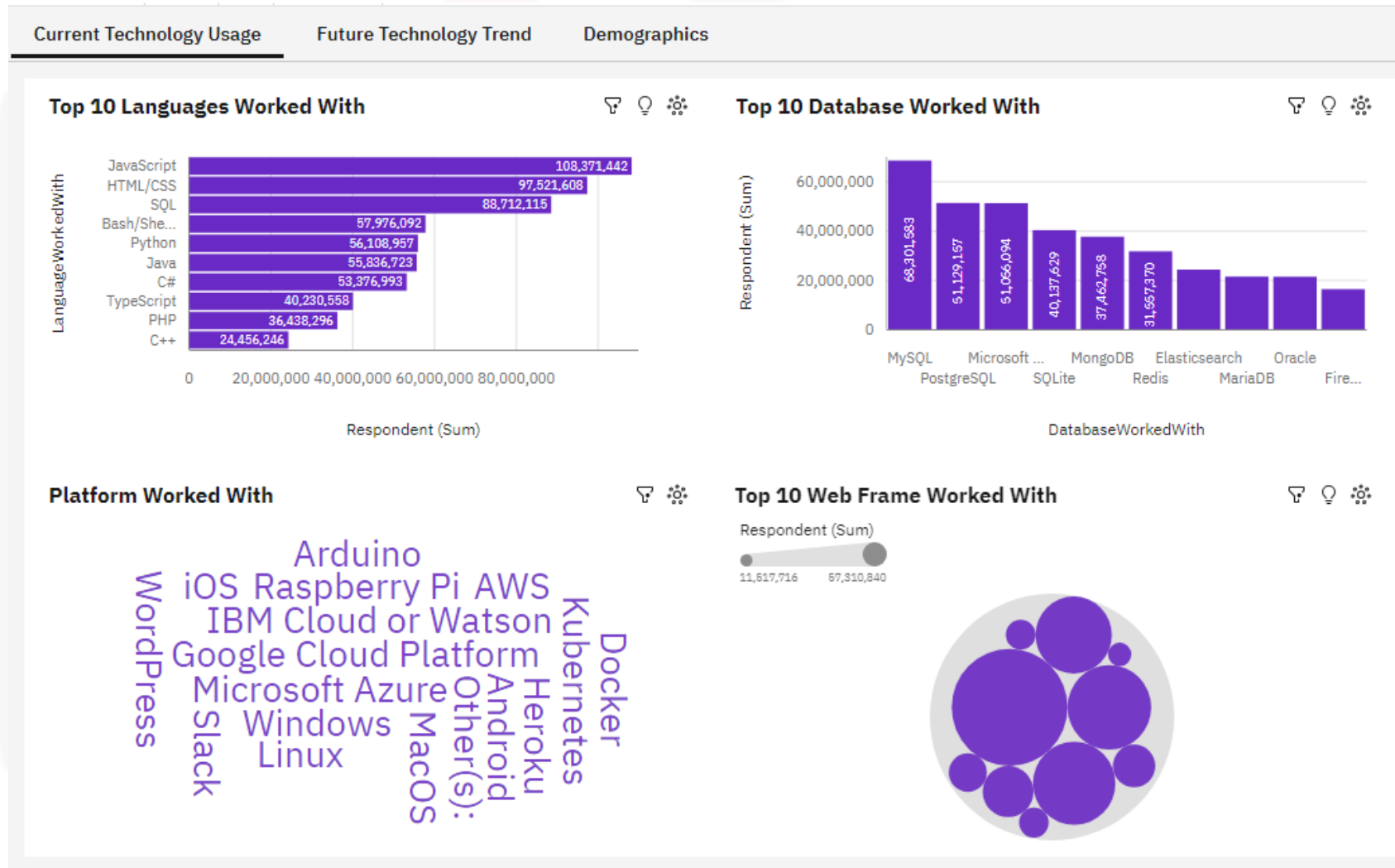
DASHBOARD

IBM Cognos Analytics Link:

https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FPeer-Graded%2BAssignment%253A%2BBuilding%2Ba%2Bdashboard%2Bwith%2BCognos%2BDashboard%2BEmbedded%2B%2528CDE%2529&action=view&mode=dashboard&subView=model0000018a9c5ad3dc_00000000
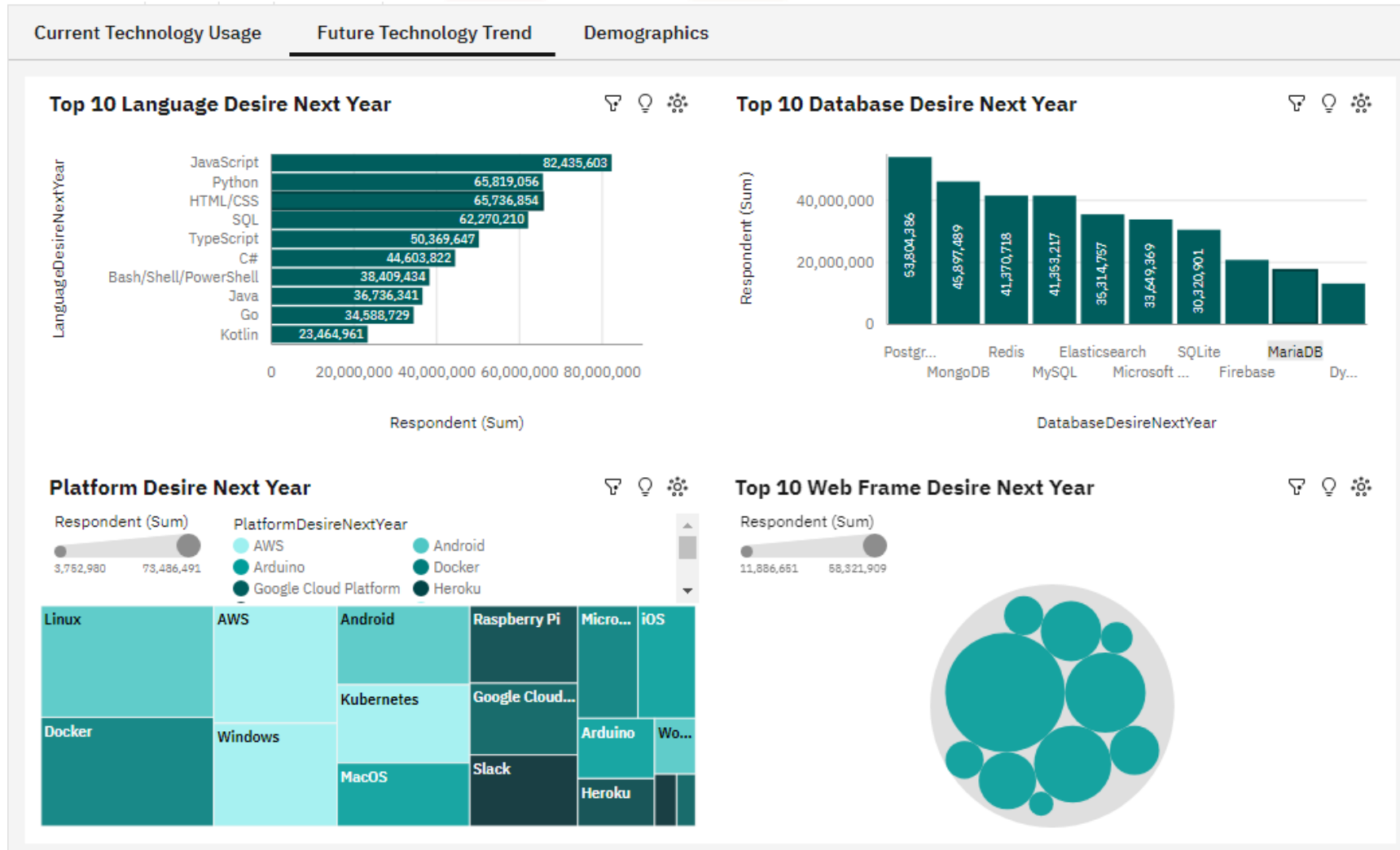
GitHub PDF Link:

https://github.com/Shafaq-Malick/IBM-Data-Analyst-Capstone-Project/blob/main/Peer-Graded%20Assignment_%20Building%20a%20dashboard%20with%20Cognos%20Dashboard%20Embedded%20(CDE).pdf
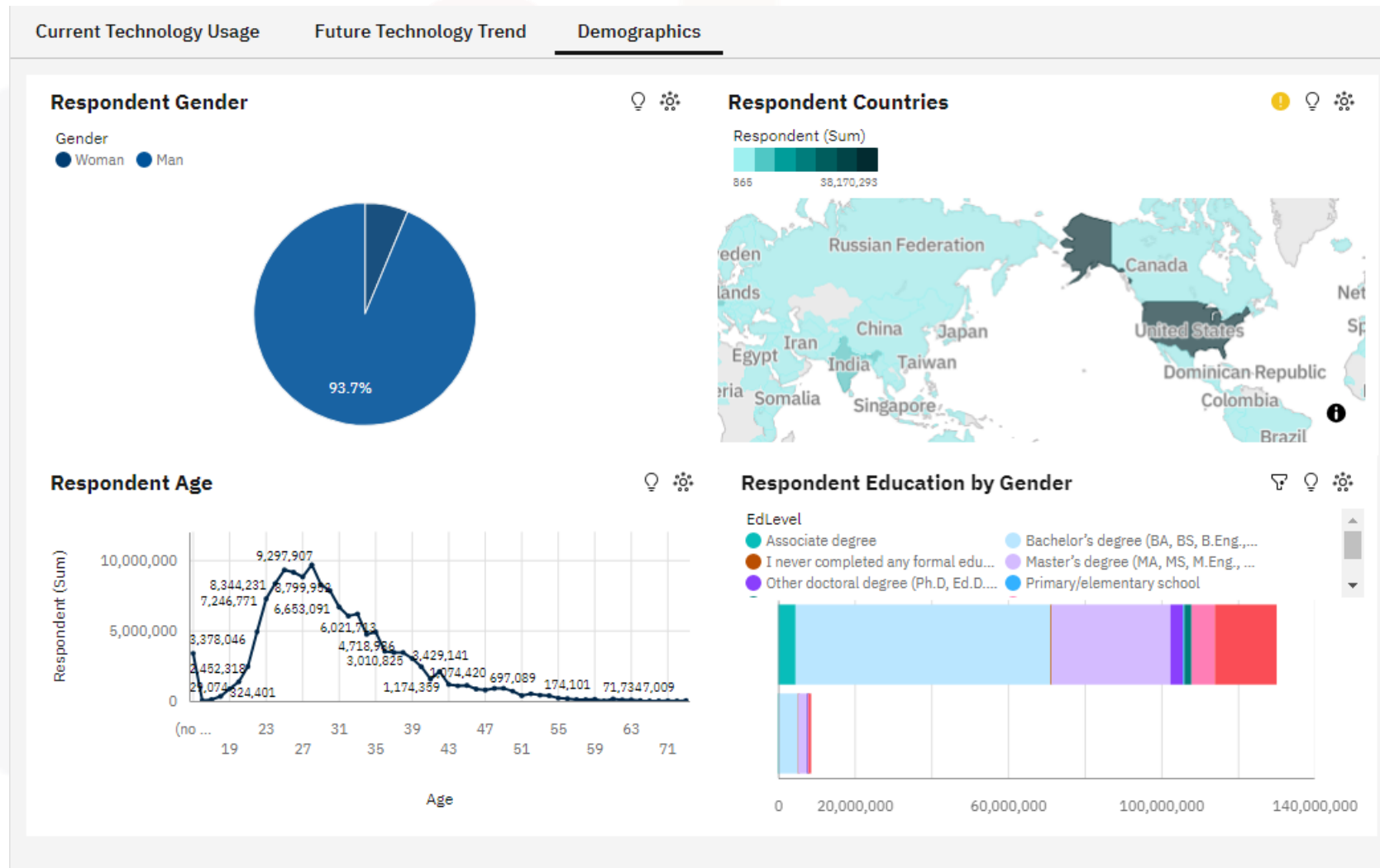
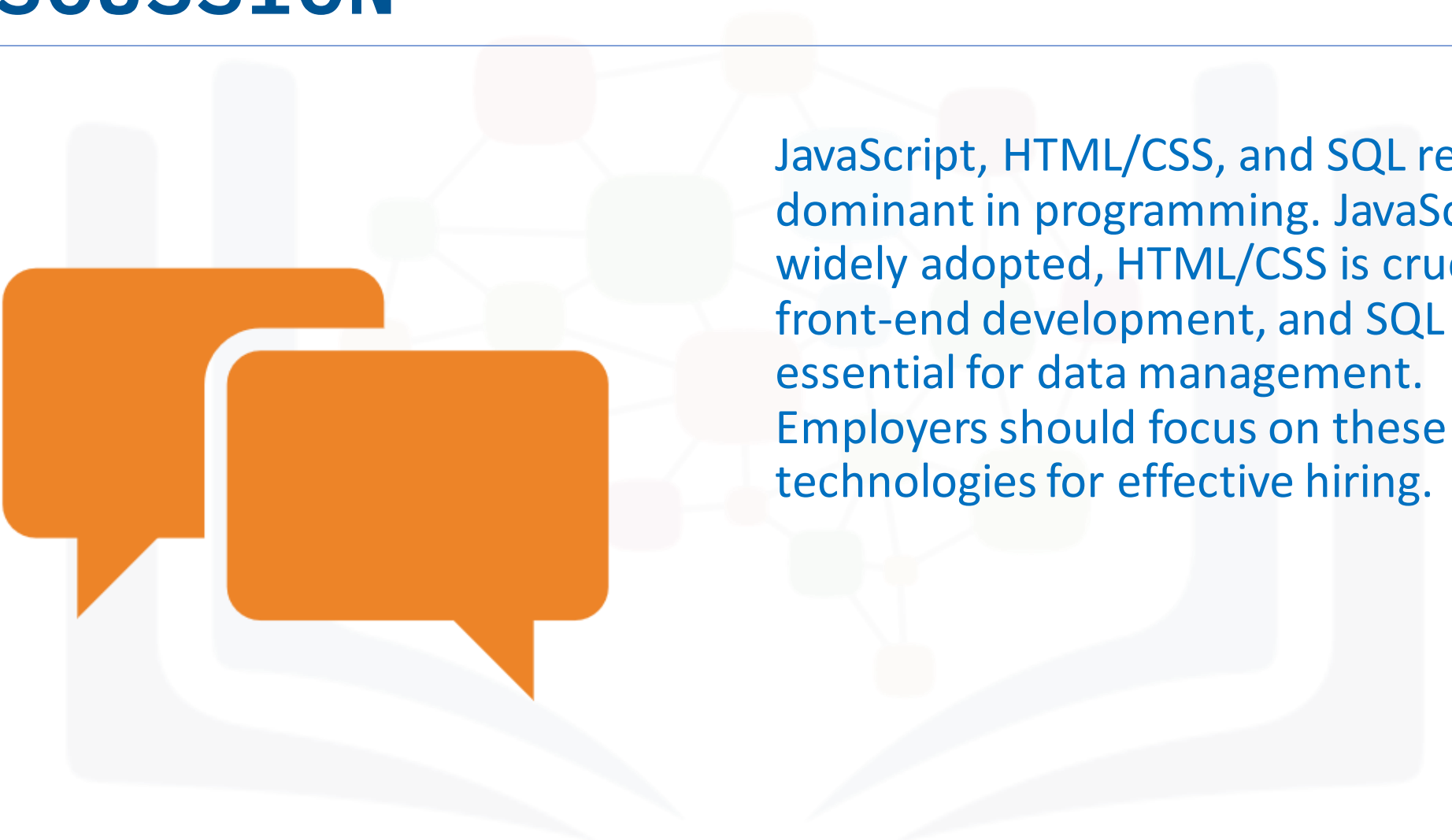IBM **Dev**eloper

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DASHBOARD TAB 1

DASHBOARD TAB 2

DASHBOARD TAB 3

DISCUSSION

JavaScript, HTML/CSS, and SQL remain dominant in programming. JavaScript is widely adopted, HTML/CSS is crucial for front-end development, and SQL is essential for data management. Employers should focus on these technologies for effective hiring.

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OVERALL FINDINGS & IMPLICATIONS

Findings

1. JavaScript Reigns Supreme: JavaScript emerges as the most popular programming language, with over 108 million respondents indicating its use, making it a pivotal skill for developers.

2. HTML/CSS Web Development: HTML/CSS closely follows JavaScript in popularity, underlining their importance in web development roles.

3. SQL for Data Management: SQL, essential for database management, ranks third in popularity, underscoring its relevance in data-centric positions.

Implications

1. JavaScript Expertise: Employers should prioritize hiring developers proficient in JavaScript, as it is the most widely used language, ensuring they can tackle a variety of web development tasks.

2. Front-End Skills: With HTML/CSS being highly popular, employers should seek candidates skilled in front-end development for creating visually appealing and user-friendly websites.

3. Data Management: SQL proficiency remains vital for businesses dealing with data, making it essential to have developers who can efficiently manage databases and extract insights.

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CONCLUSION

- In conclusion, this data analysis equips employers with essential insights into programming language preferences, work habits, and data-driven decision-making.

- These findings enable data-informed talent acquisition, skill development, and strategic decision-making, fostering competitive and sustainable organizations in a rapidly evolving tech landscape.

APPENDIX

The age histogram indicates saturation between 20 and 40, with a concentration in mid-level careers.

Histogram of Age

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JOB POSTINGS
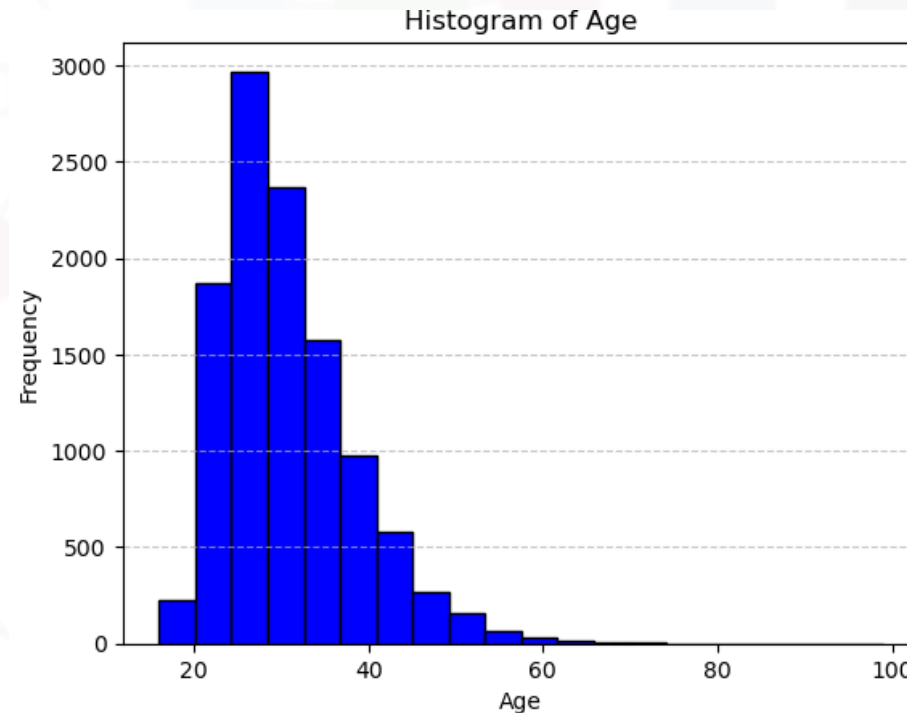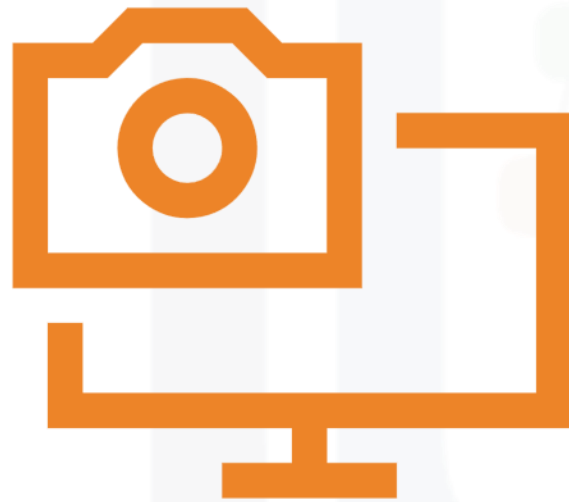
GitHub Job Postings for Selected Technologies
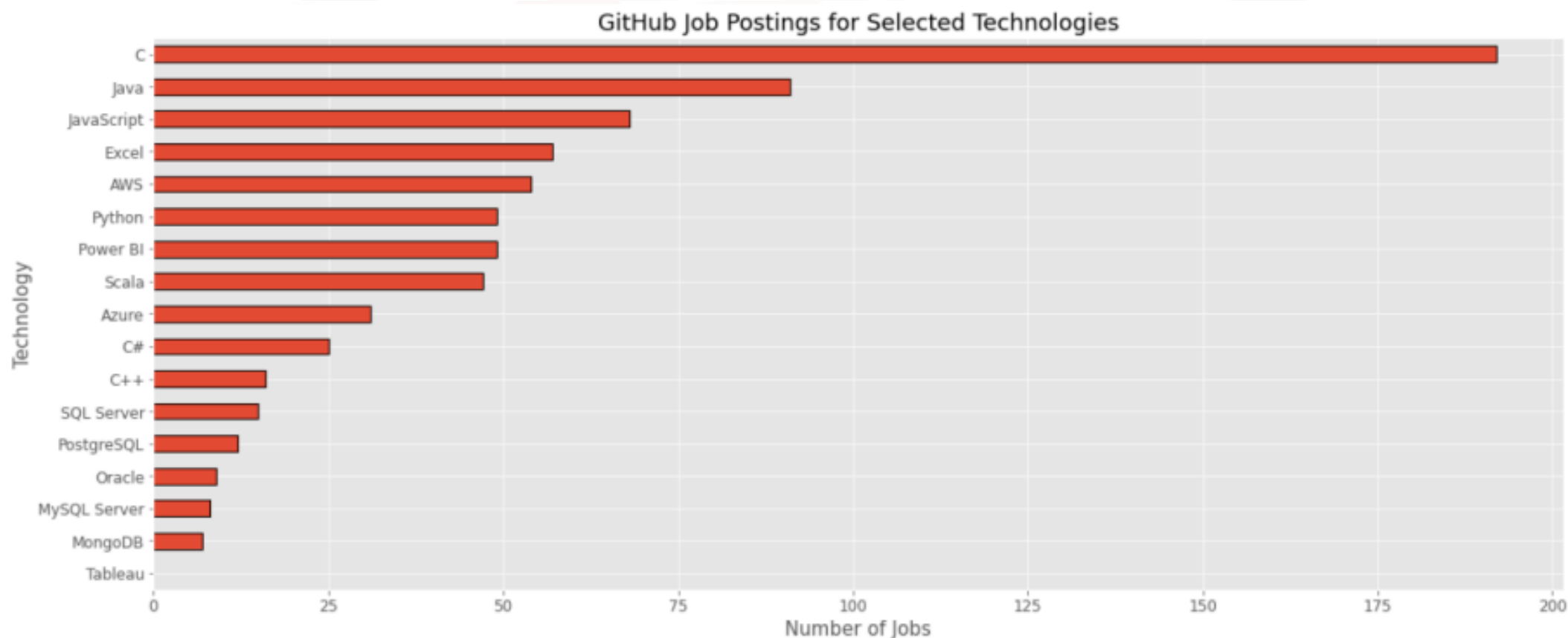
Note: Data on *GitHub* job postings for the 15 selected technologies shown above were collected using the *GitHub Jobs* API on May 26, 2023.

POPULAR LANGUAGES

Average Annual Salary by Programming Language (Descending Order)