Navigating the Tech Landscape: Unveiling Emerging Skills through Data Analysis

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26-05-2023

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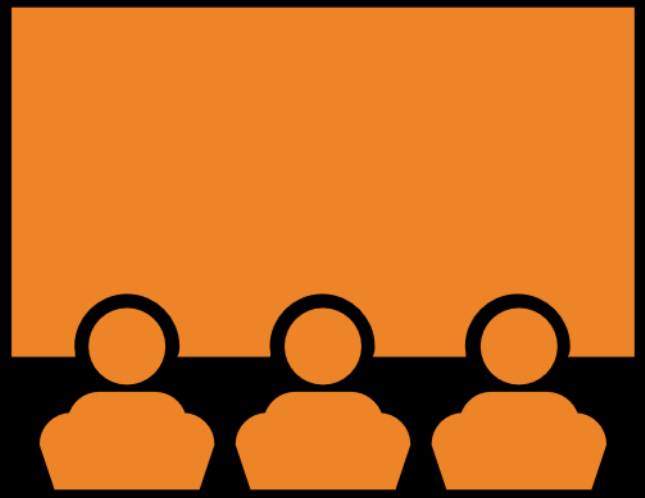
OUTLINE



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EXECUTIVE SUMMARY

This report provides insights into the current and future trends in programming languages and databases (as of 2019).

JavaScript and HTML/CSS maintain their popularity, while Python experiences a surge in demand. SQL remains vital for data management, and NoSQL databases gain traction. The emergence of TypeScript and the relevance of specialized platforms like Elasticsearch are notable.

MySQL, Microsoft SQL Server, and PostgreSQL are the leading databases, with MongoDB and Redis gaining usage. The inclusion of Firebase indicates the interest in cloud-based solutions.

Adapting to these trends and focusing on the recommended languages and databases will help businesses keep pace with changing technologies and remain competitive in the market.

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INTRODUCTION

- The rapid pace of **technological advancements** and **evolving market demands** pose significant challenges to IT and business consulting services firms.
- It is crucial to **continuously adapt** to changing technologies and acquire the necessary skills.
- This data analysis report gives **insights about top programming skills** that are currently in high demand.
  - ✓ identifies emerging trends and discoveries that can inform strategic decision-making.
  - ✓ helps the firm keep pace with changing technologies and remain competitive.

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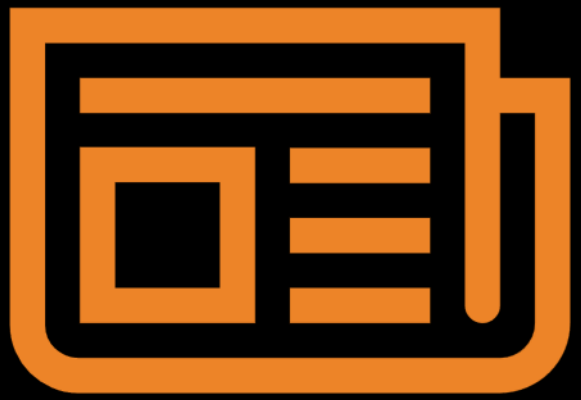
METHODOLOGY



1. Data Collection
   - This report is based on the Stack Overflow's Annual Developer Survey[1], which is the largest and most comprehensive survey of people who code around the world.
   - A modified, randomized subset of the 2019 Survey Results[2] has been used.
   - Loading the .csv file into a Jupiter Notebook using Python/pandas.
2. Data transformation/cleaning/wrangling
   - Finding and removing duplicates, imputing missing values, normalizing data.
3. Exploratory Data Analysis (statistical techniques)
   - Finding the distribution of data, presence of outliers and determining the correlation between different columns in the data set.
4. Data visualization with Python/Pandas
   - Accessing Stack Overflow online survey data from SQLite database[3] using SQL queries to extract data and create visualizations for distribution, relationship, composition, comparison of data.
5. Dashboard Creation
   - By utilizing IBM Cognos Dashboard Embedded (CDE), a comprehensive dashboard was constructed to analyze the Stack Overflow Developer Survey 2019 data, consisting of two modified .csv files.[4, 5]
6. Appendix
   - List of Job Openings 2019 : Web scraping invoking the GitHub Jobs API from Python; using pandas, write scraped data into a csv file.[6]
   - Salary survey table 2019 : Web scraping html table from web site using pandas, write scraped data into a csv file.[7]

RESULTS

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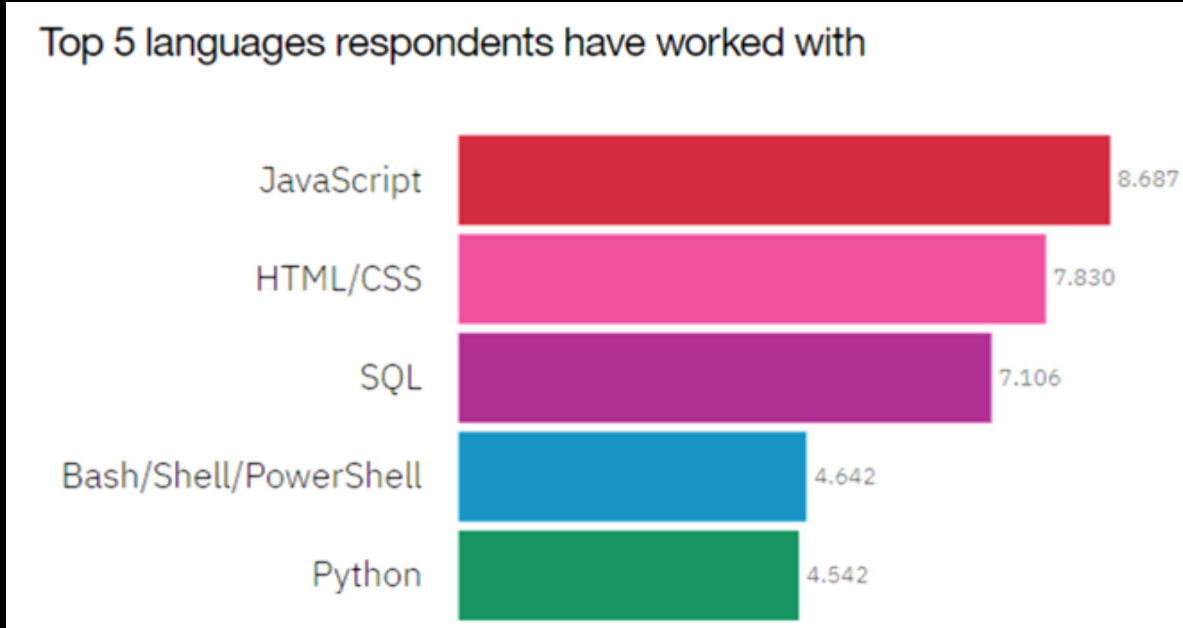
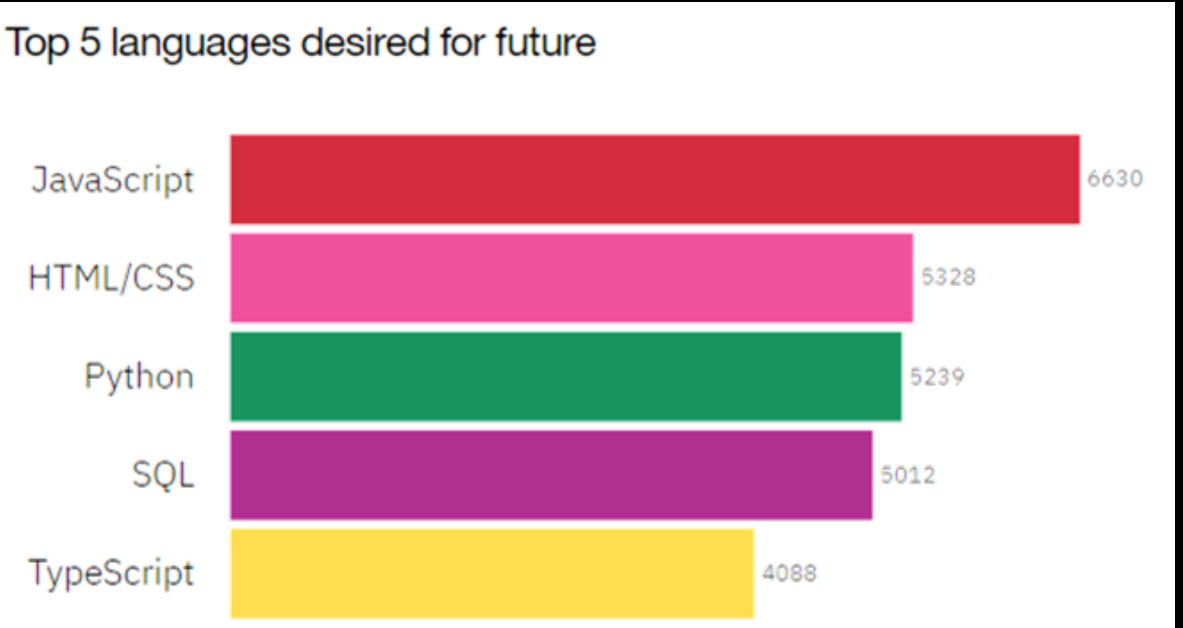
PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

Current year (2019):

- JavaScript is the most popular language, with 26% of respondents working with it, followed by HTML/CSS at 24% and SQL at 22%.
- Bash/Shell/PowerShell is currently in 4th place, slightly before Python (both around 14%)

Future Trends:

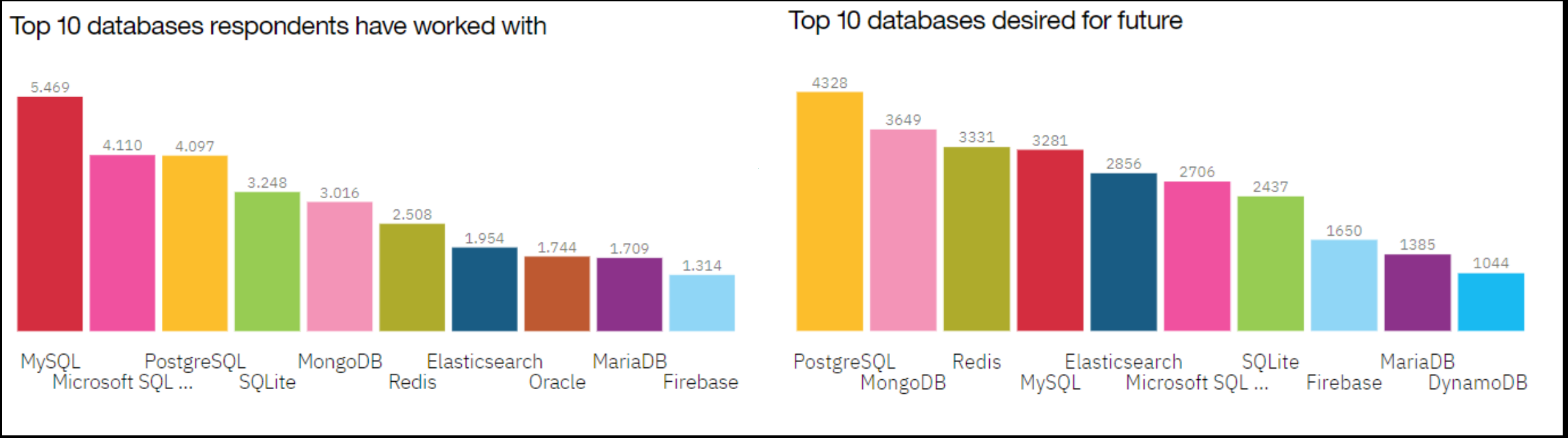
- JavaScript and HTML/CSS remain highly popular, as 25% and 20% of respondents express a desire to learn these languages.
- Python experiences a surge in popularity for future trends, with 20% of respondents expressing a desire to learn this language, elevating it to the third position before SQL (19%).
- Although Bash/Shell/PowerShell is currently ranking fourth, it is not among the top five language trends for the next year.
- While TypeScript did not rank among the top five languages used in the current year, 16% of respondents express an interest in learning it in the future.

Implications

- JavaScript remains a dominant language in both current usage and future learning plans. Its versatility and widespread use in web development contribute to its popularity.
- HTML/CSS, as essential languages for web development, continue to be highly sought after for both current usage and future learning. This reflects the ongoing demand for web-based applications and the need for front-end development skills.
- SQL's popularity indicates the continued importance of data management and database skills. As data-driven applications and analytics become increasingly crucial, proficiency in SQL remains valuable.
- Python's usage in the current year and high interest for future learning highlight its versatility and broad application across various domains, including data analysis, machine learning, and scripting.
- The emergence of TypeScript in the desired languages for future learning suggests a recognition of its benefits, such as enhanced type safety and scalability, particularly among JavaScript developers.

DATABASE TRENDS

Current Year



Next Year

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

Current year (2019):

- Number one database MySQL is worked with by 17% of the respondents, followed by Microsoft SQL Server and PostgreSQL (both 13%).
- SQLite and MongoDB are utilized by 10% of the respondents.
- Redis is used by 8% of the respondents, Elasticsearch and Oracle by 6% of the respondents.
- MariaDB (5%) and Firebase (4%) compose the last 2 spots in the top 10 database ranking.

Future Trends:

- PostgreSQL is the most desired database for future learning (15%), followed by MongoDB (12%), Redis and MySQL (both 11%).
- Elasticsearch shows a notable interest among 10% of respondents.
- Microsoft SQL Server and SQLite remain desired databases for learning, with 9% and 8% of respondents expressing interest.
- Firebase, MariaDB and DynamoDB attract 6-4% of respondents who express an interest in learning it.

Implications

- MySQL, Microsoft SQL Server, and PostgreSQL are the most widely used databases in the current year. This indicates their continued importance in various applications and industries.
- MongoDB and Redis have gained significant usage in the current year, highlighting the growing popularity of NoSQL databases and their ability to handle large volumes of unstructured data.
- The desire to learn PostgreSQL, MongoDB, and Redis in the next year suggests the recognition of their value and increasing demand for skills in these databases. They offer scalability, flexibility, and specialized use cases.
- Elasticsearch, known for its search and analytics capabilities, shows a significant interest among respondents for future learning. This indicates the importance of efficient data retrieval and analysis in modern applications.
- The presence of Microsoft SQL Server and SQLite in both the current year's usage and desired databases for the next year indicates their consistent relevance and demand.
- The inclusion of Firebase, a backend-as-a-service platform, among the desired databases for learning suggests the increasing interest in cloud-based solutions for data storage and management.

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DASHBOARD

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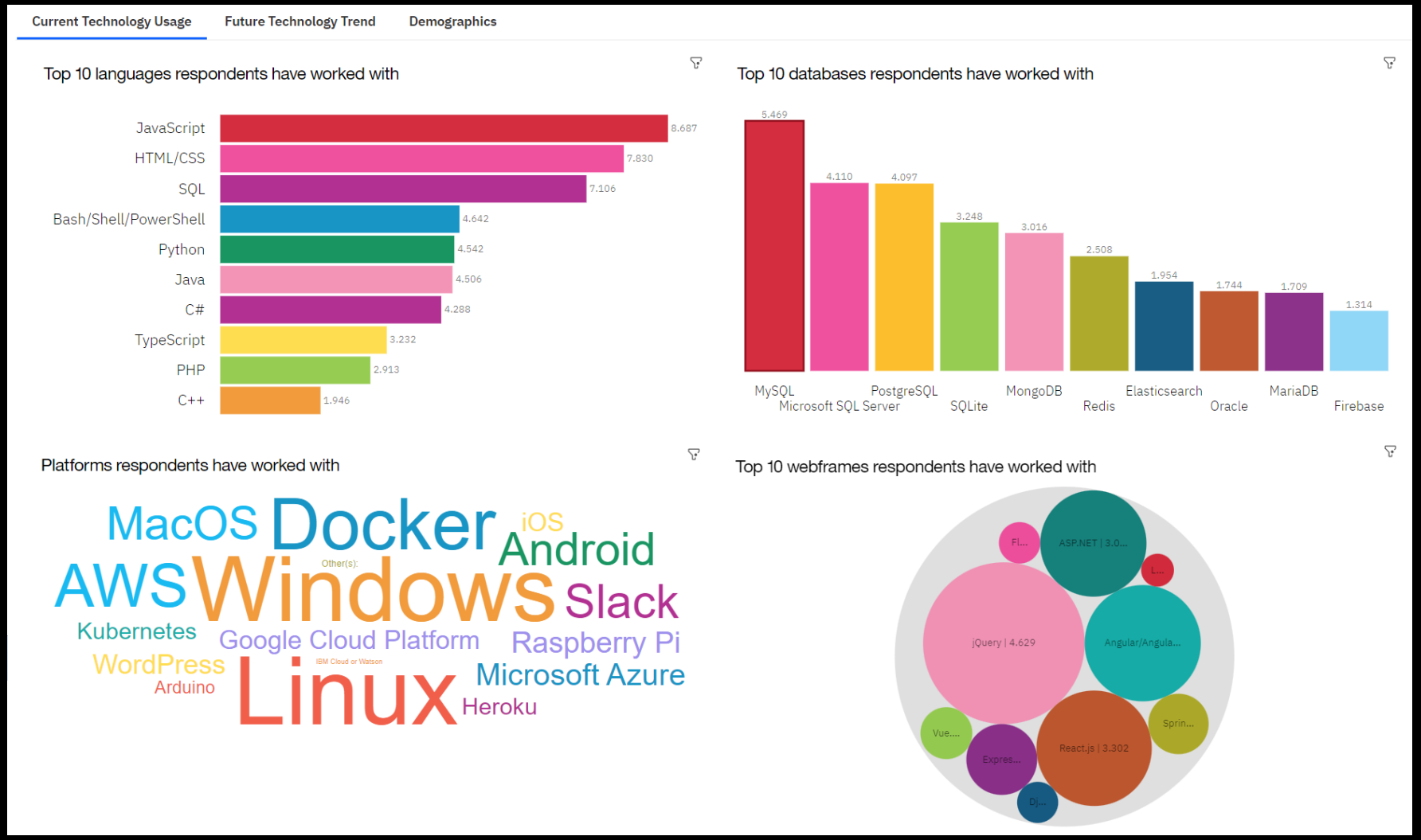
DASHBOARD TAB 1



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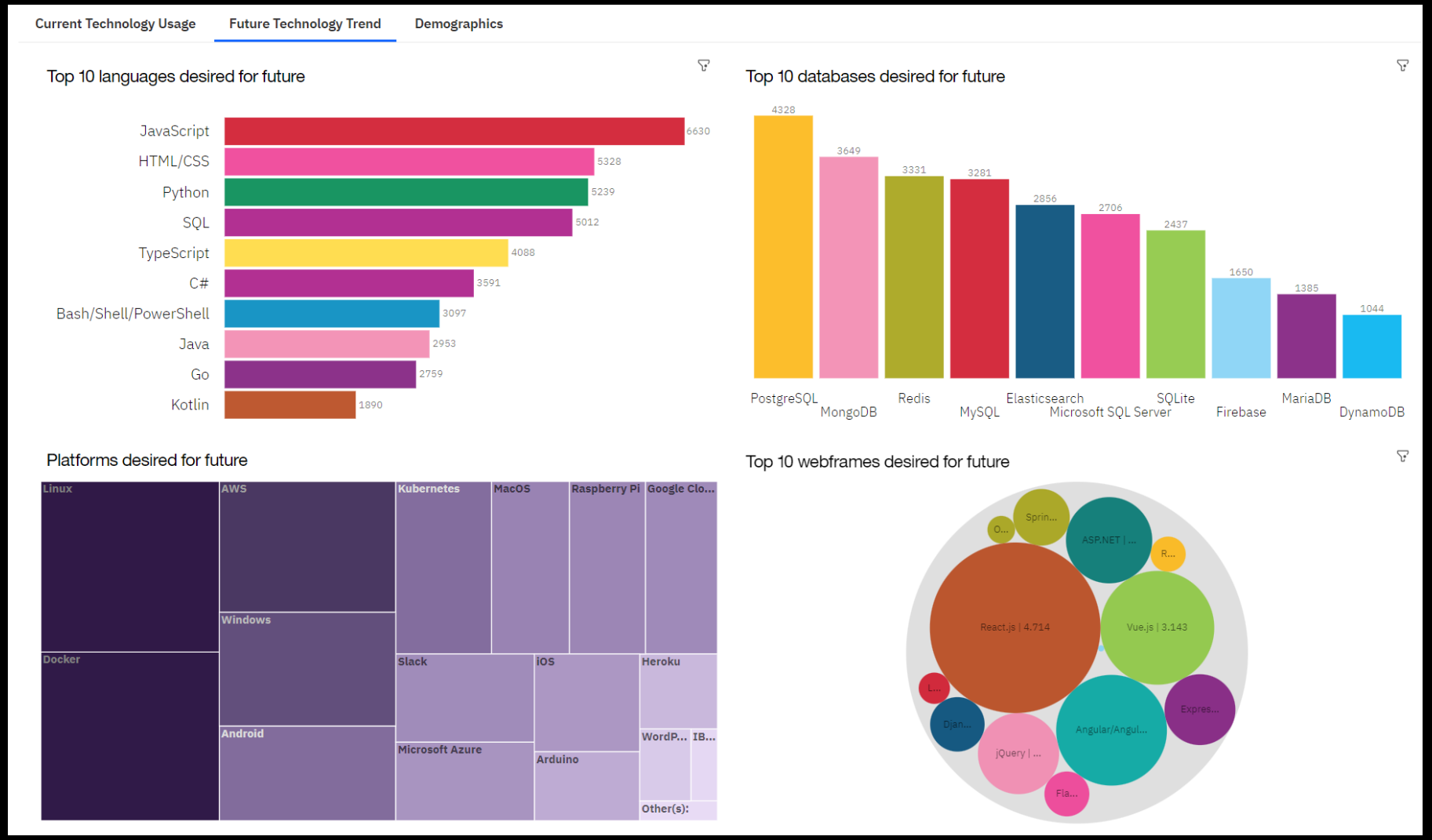
DASHBOARD TAB 2



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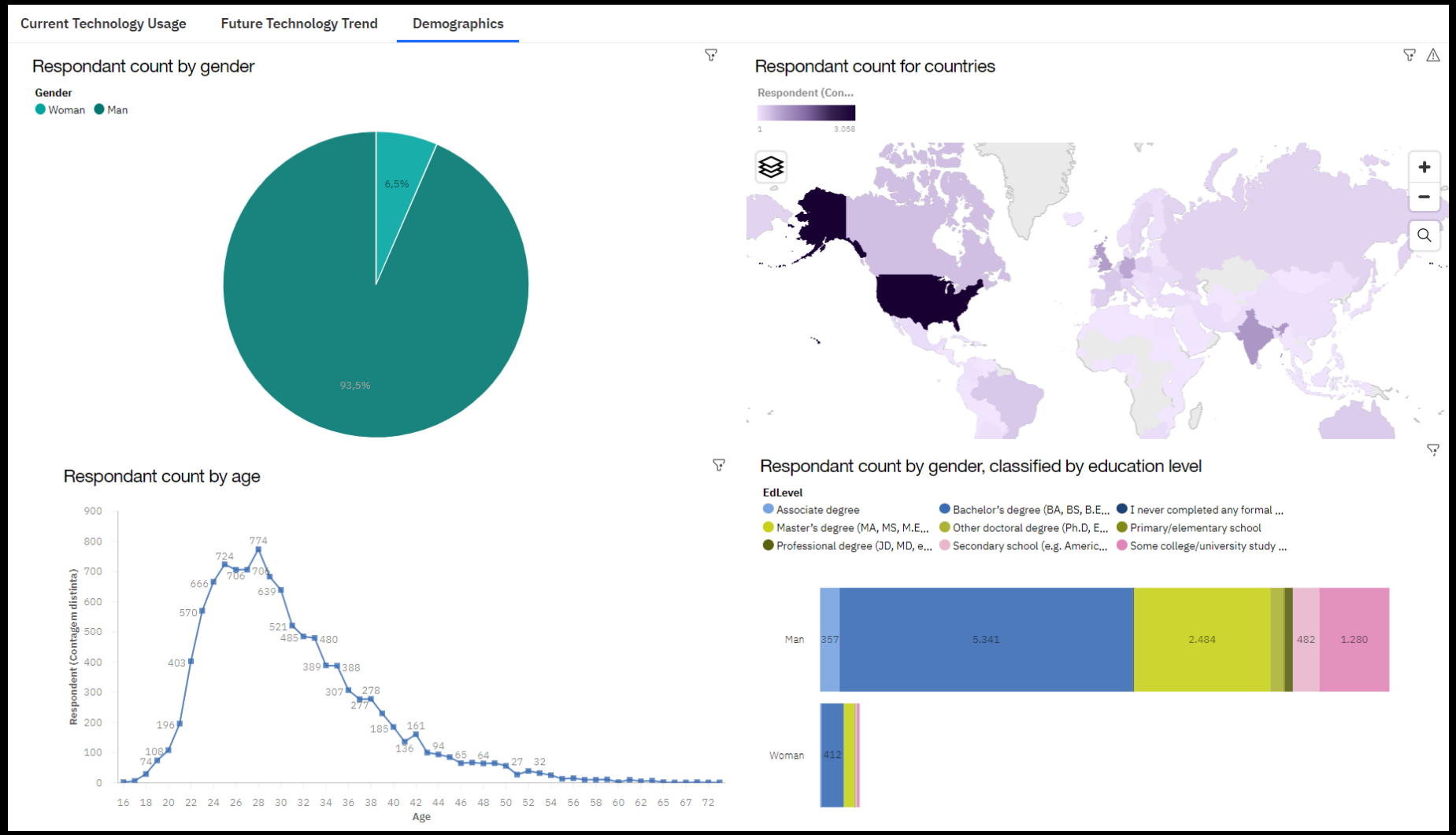
DASHBOARD TAB 3



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DISCUSSION

“Data is the compass, analysis is the map, and insights are the keys to unlock a world of opportunities."

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OVERALL FINDINGS & IMPLICATIONS

- Prominent programming languages include JavaScript, HTML/CSS, SQL, Python, and TypeScript.
- Widely used databases are MySQL, Microsoft SQL Server, and PostgreSQL.
- NoSQL databases like MongoDB and Redis are gaining popularity.
- Elasticsearch is noteworthy for search and analytics capabilities.
- Windows and Slack are experiencing a significant decline in interest, while Linux and Docker remain strong.
- Vue.js and React.js are both growing in popularity among web frameworks.
- Aspiring programmers and professionals should prioritize gaining proficiency in these tools to align with industry trends and meet the increasing demand.
- IT firms should focus on recruiting talent with expertise in these technical skills to stay competitive in the market.

CONCLUSION

- JavaScript, HTML/CSS, SQL, and Python are key programming languages to focus on for staying competitive.
- The popularity of NoSQL databases and specialized database platforms like Elasticsearch should not be overlooked.
- Adapting to emerging trends, such as TypeScript, can provide a competitive edge.
- Embracing cloud-based solutions, like Firebase, can enhance data management capabilities.

→ Carve out budget in order to hire additional staff with skills needed to fill any gaps.

→ Set a side budget or put a program in place to upskill those already employed.

→ Make adjustments in staff for those skills no longer in demand.

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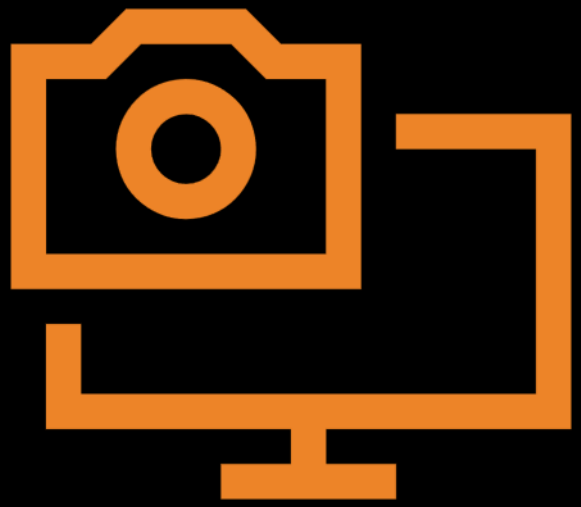
APPENDIX



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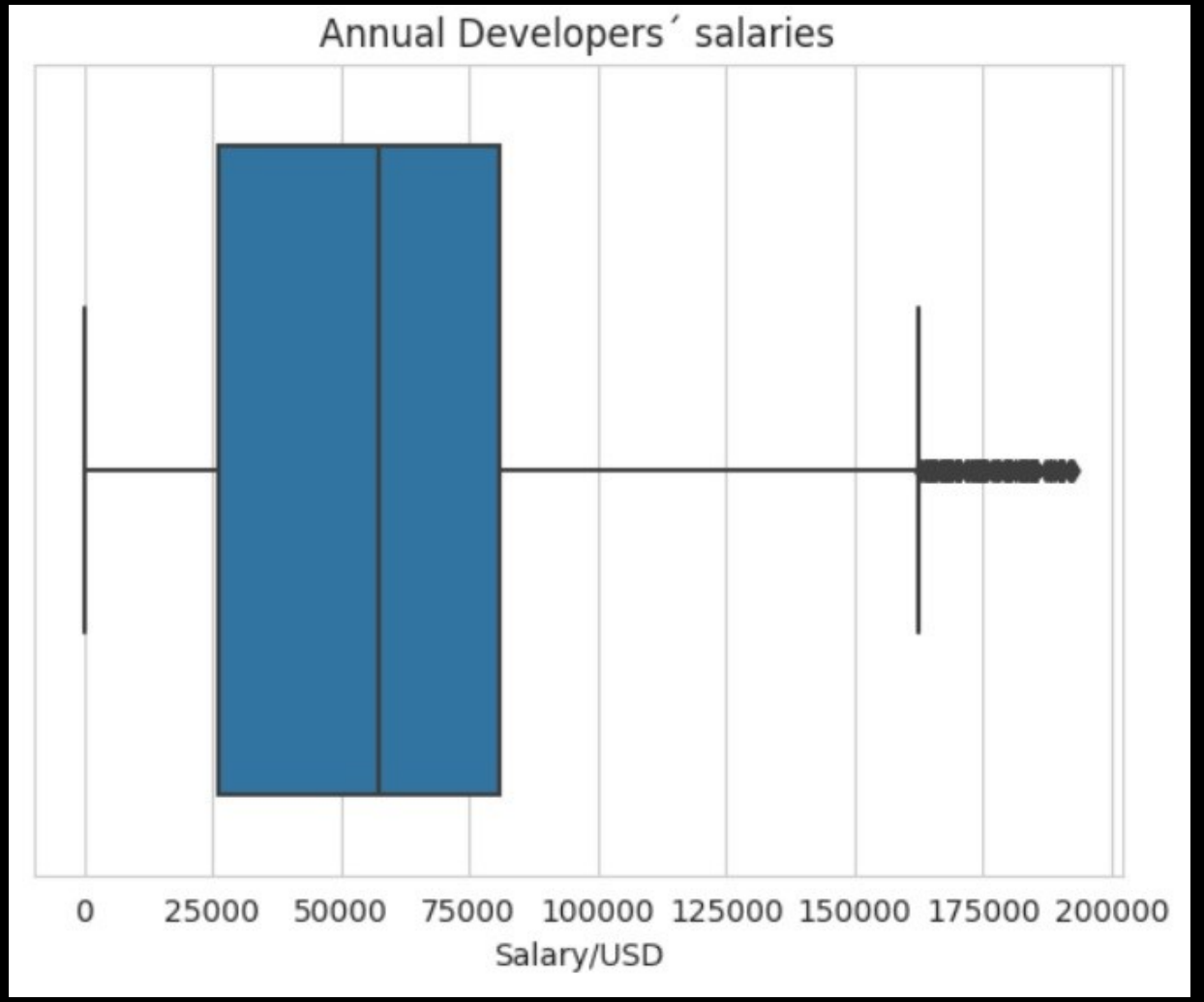
SURVEY RESPONDANTS AVERAGE SALARY



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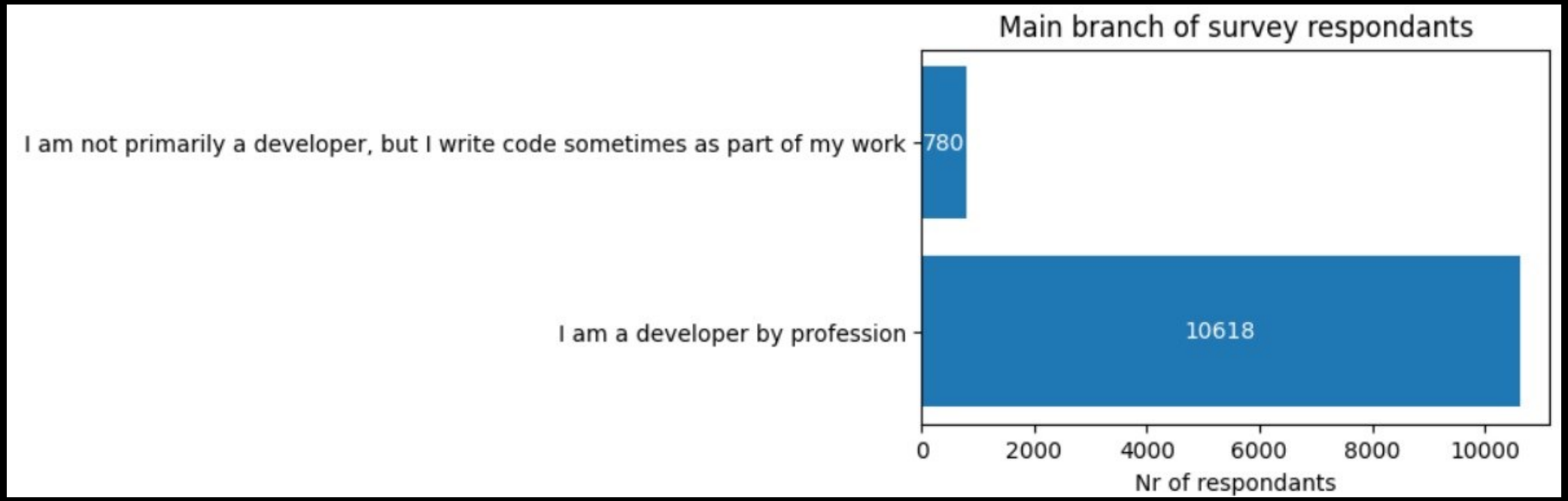
MAIN BRANCH OF SURVEY RESPONDANTS



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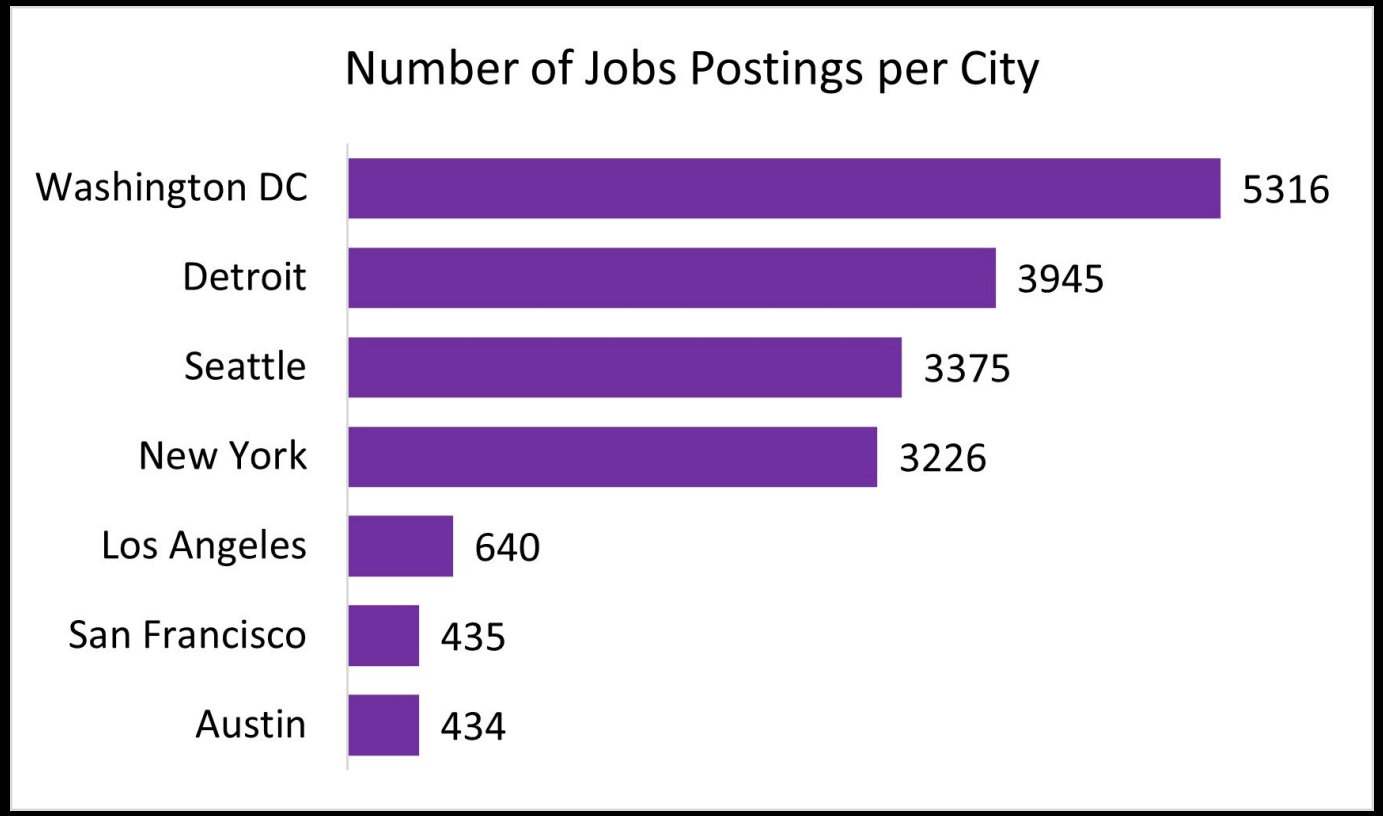
GITHUB JOB POSTINGS



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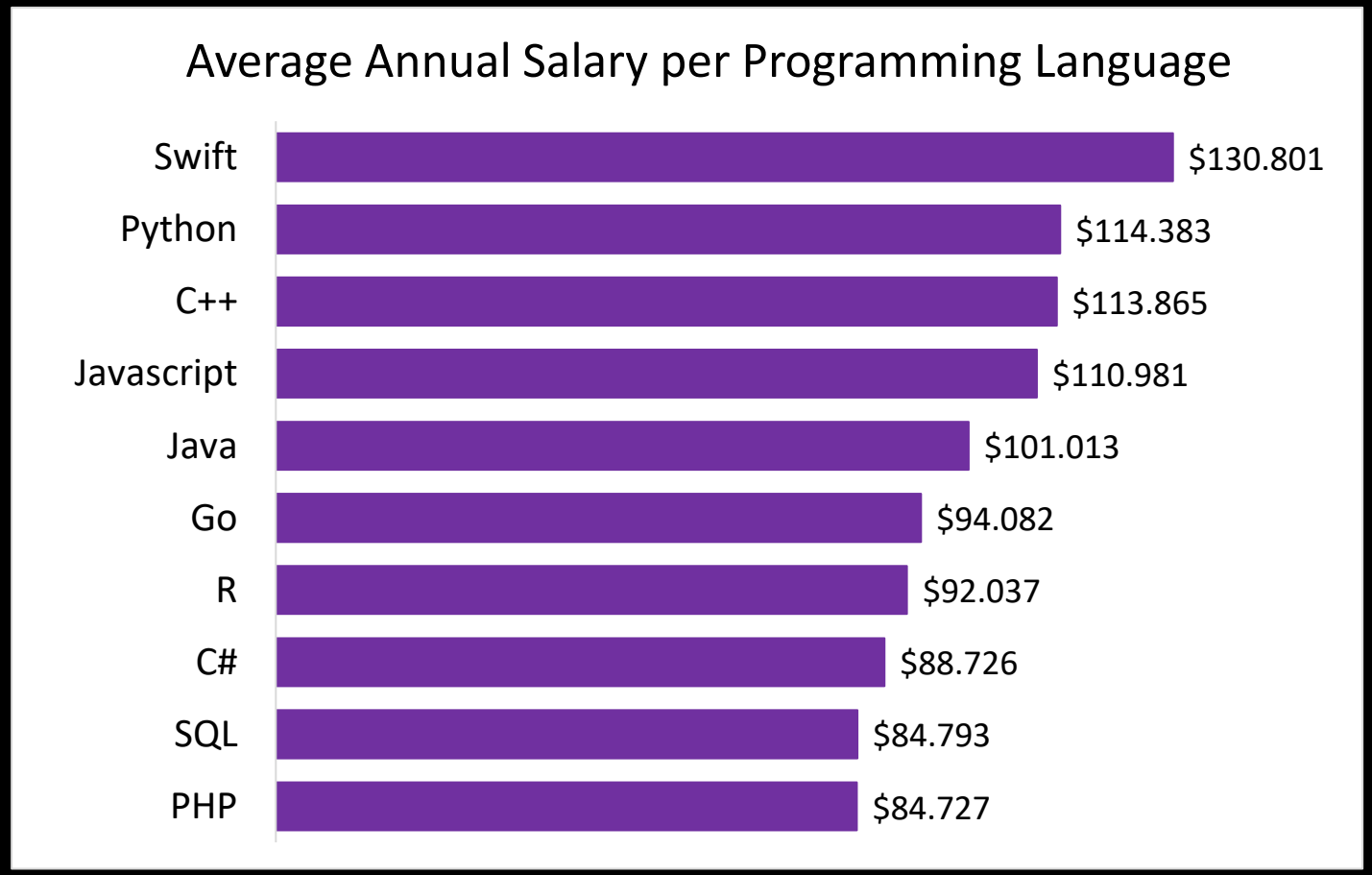
POPULAR LANGUAGES



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REFERENCES

1. Stack Overflow online 2019 survey

2. Stack Overflow online 2019 survey, modified subset

3. Stack Overflow online 2019 survey, modified subset database file

4. Stack Overflow online 2019 survey Demographics data

5. Stack Overflow online 2019 survey Technologies data

6. Job Openings, modified subset

7. Salary survey table

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