



Analysis of Current and Future Technology Trends

Presented by
Johanna Gan
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OUTLINE

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EXECUTIVE SUMMARY



- **JavaScript** is the most commonly used programming language.
- **Python** is the fastest-growing major programming language today.
- **MySQL** is the most commonly used database but may soon come second to **PostgreSQL**.
- **Linux** continues to be the most loved and most common platform for development while **Docker** is the most up and coming.
- **React.js** and **Vue.js** are the most desired web frameworks for developers.

INTRODUCTION



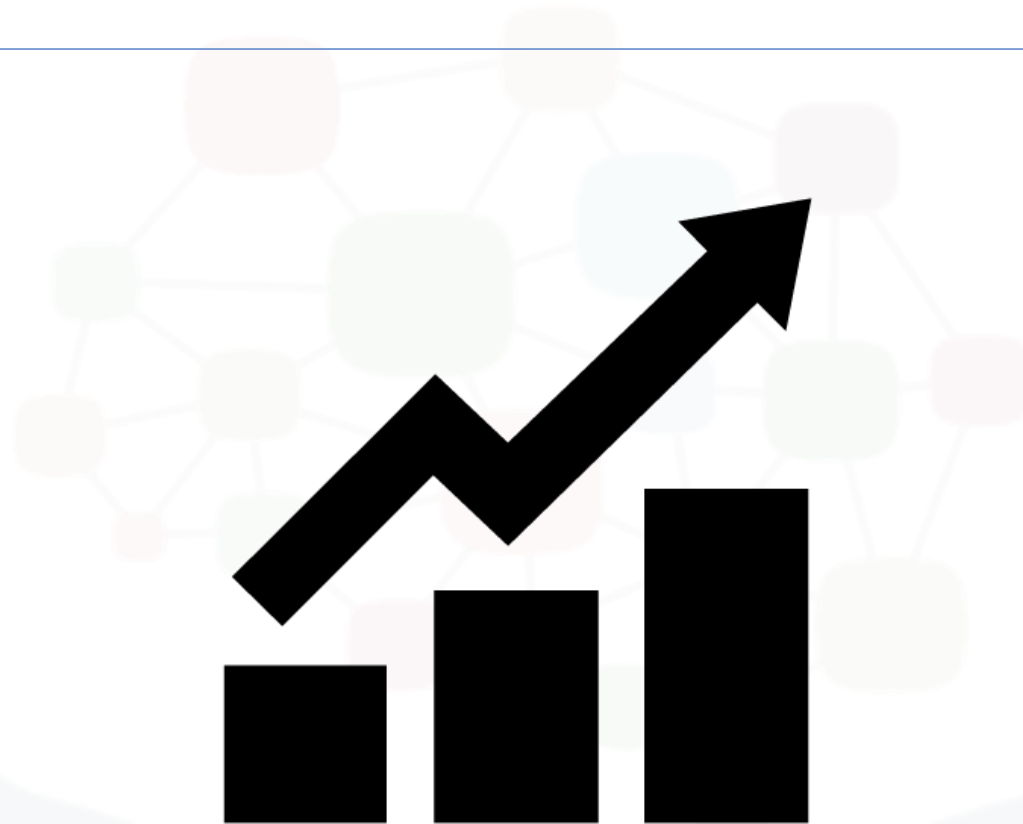
Our goals are to help stakeholders determine the trends of programming languages, databases, and platforms. This helps them better invest their resources on the technologies with the most potential and growth.

METHODOLOGY



1. Collect job trends by language via GitHub Jobs API. [1]
2. Collect average annual salary by language via web scraping. [2]
3. Collect and analyze Stack Overflow's 2019 Developer Survey. [3]
4. Organize data into dataframes and visualize via Excel and Cognos.
5. Analyze findings on trends to prioritize popular and fast growing technologies.

RESULTS

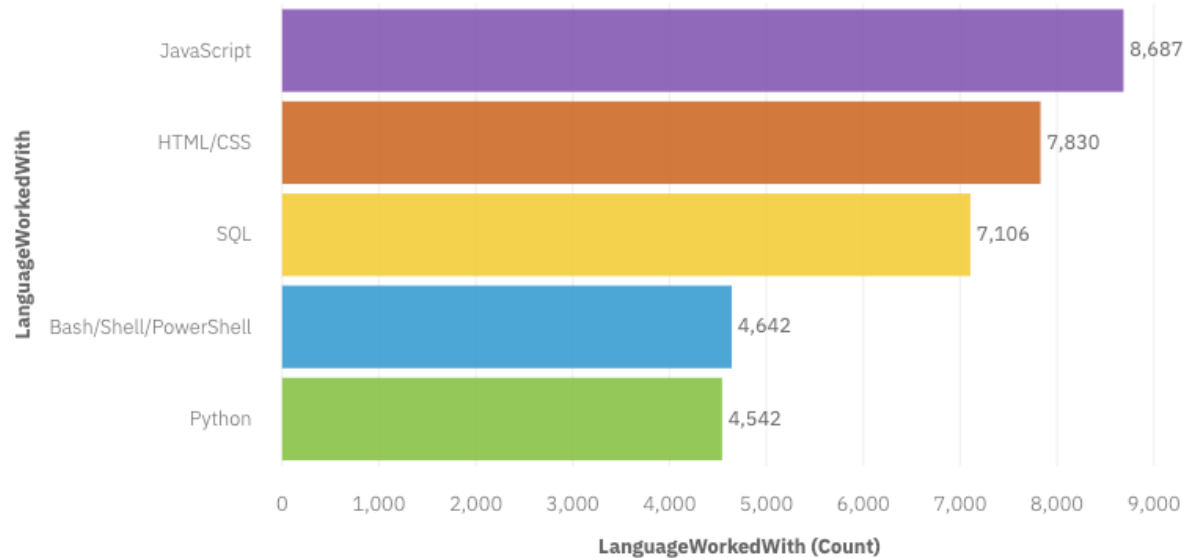


PROGRAMMING LANGUAGE TRENDS

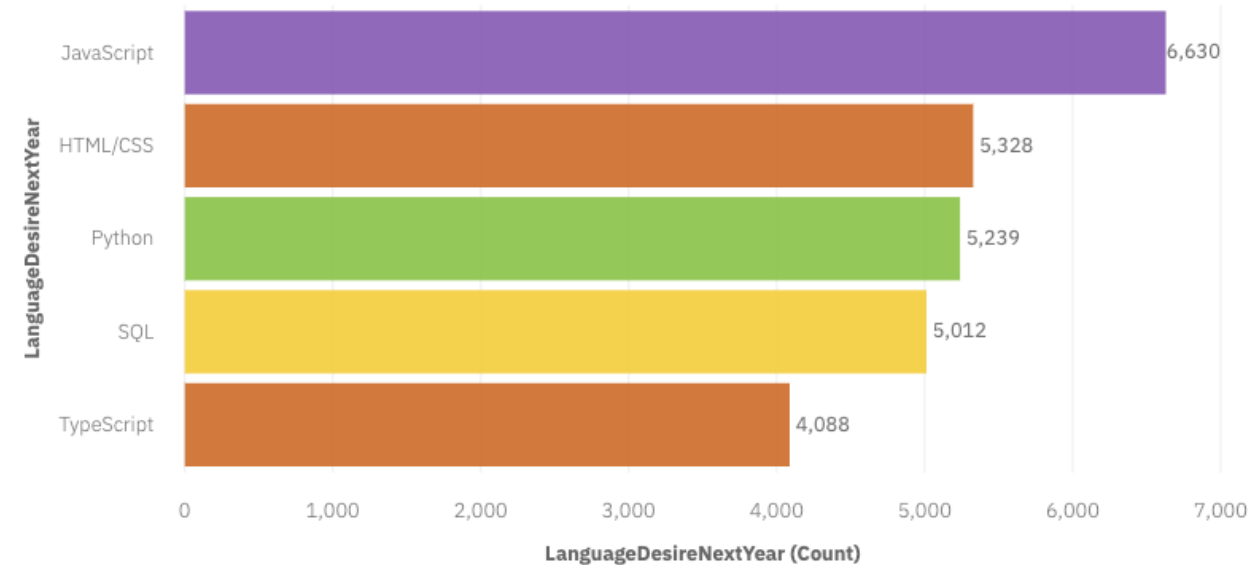
Current Year

Next Year

Top 5 Languages



Top 5 Languages



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS



JS

JavaScript remains the most popular language. It holds the status of a programming language most commonly used by professional developers.

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS



Python has proven to be the fastest growing language with a remarkable rise in the ranks. This correlates with the increasing relevance for machine learning and data science among various markets and sectors.

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS



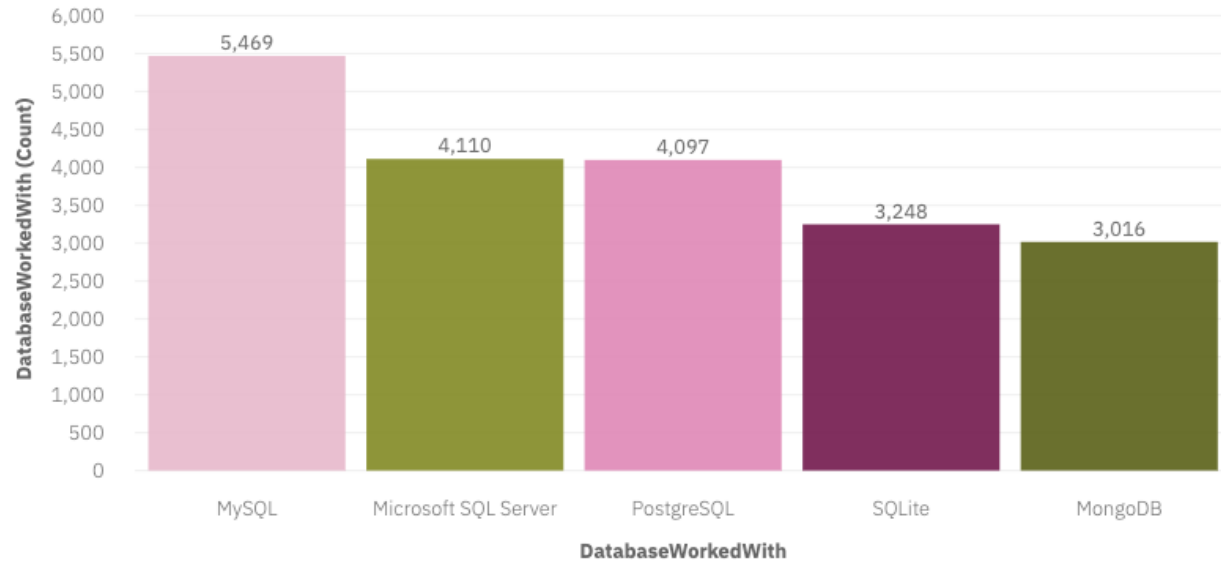
C++ is edged out while **Kotlin** emerges among the top ten after only being released for a few years. Kotlin is the preferred language for Android app development. [4]

DATABASE TRENDS

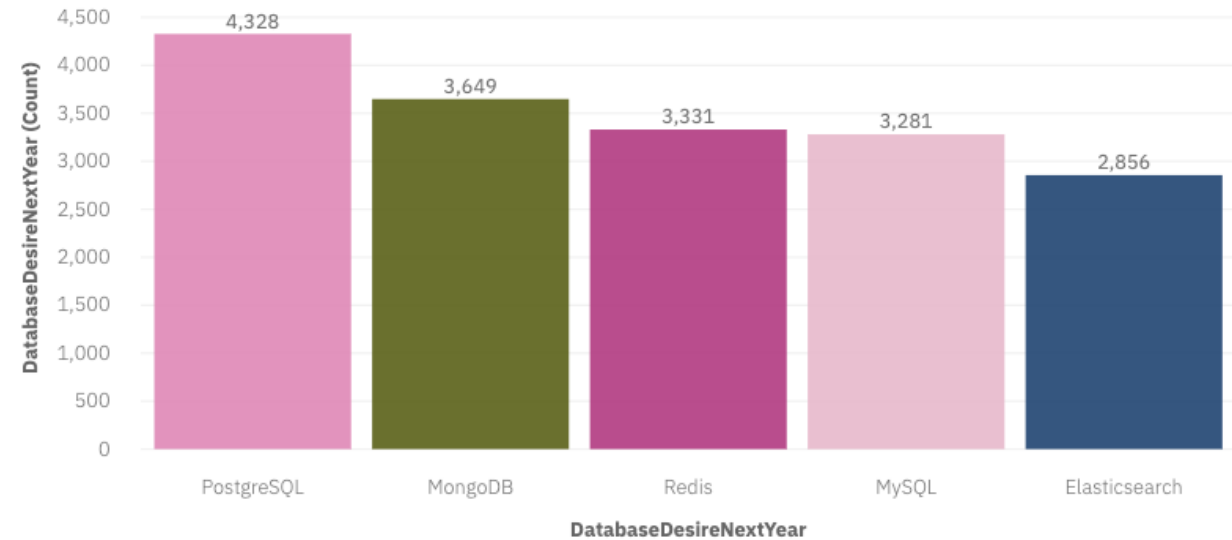
Current Year

Next Year

Top 5 Databases



Top 5 Databases



DATABASE TRENDS - FINDINGS & IMPLICATIONS



MySQL is the most commonly used database. However **PostgreSQL** is predicted to edge ahead of Microsoft SQL Server and overtake MySQL for top spot.

DATABASE TRENDS - FINDINGS & IMPLICATIONS



MongoDB also ranks high among most desired database programs. With the growth of cloud based databases, MongoDB already has a fully managed cloud service and is ahead of most vendors in the race for cloud dominance. [6]

DATABASE TRENDS - FINDINGS & IMPLICATIONS



As databases continue to transform, those that are designed to synchronize data between mobile devices are gaining popularity among developers. Strong contenders such as Google's **Firestore** and **MongoDB** continue to climb the ranks of top databases.

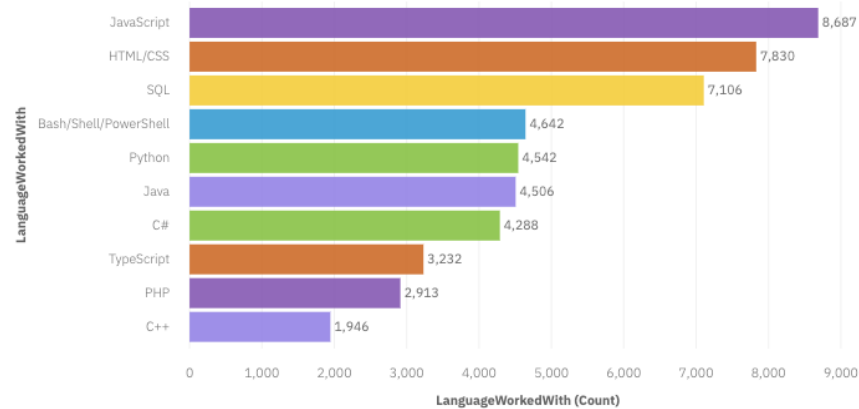
DASHBOARD



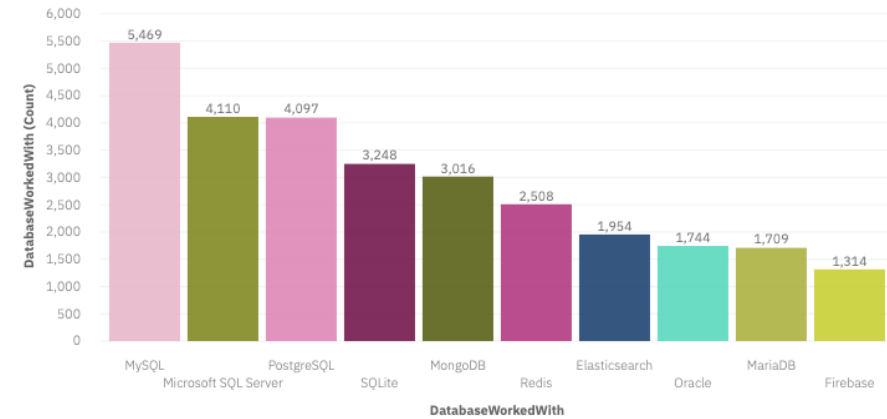
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CURRENT TECHNOLOGY USAGE

Top 10 Languages



Top 10 Databases



Platforms

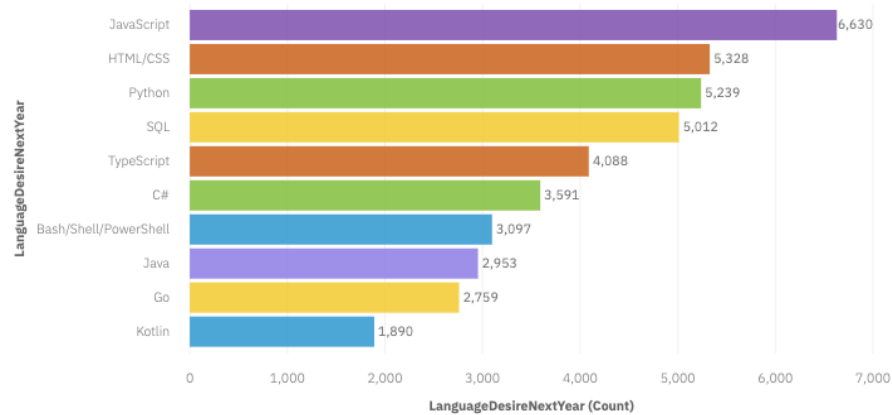


Top 10 Web Frames

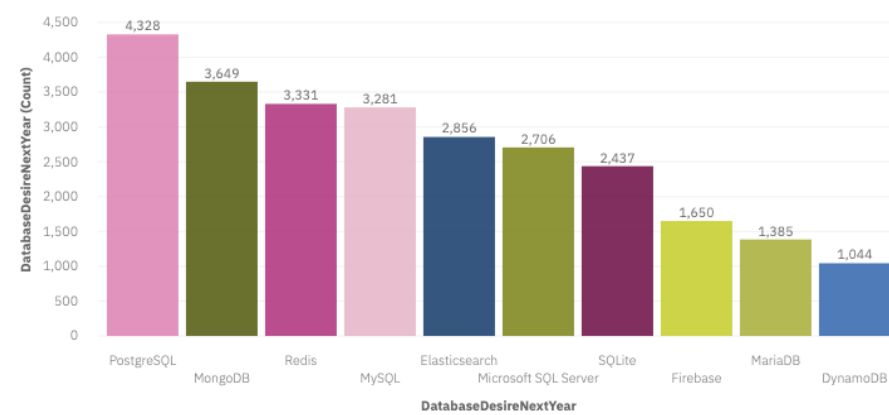


FUTURE TECHNOLOGY TREND

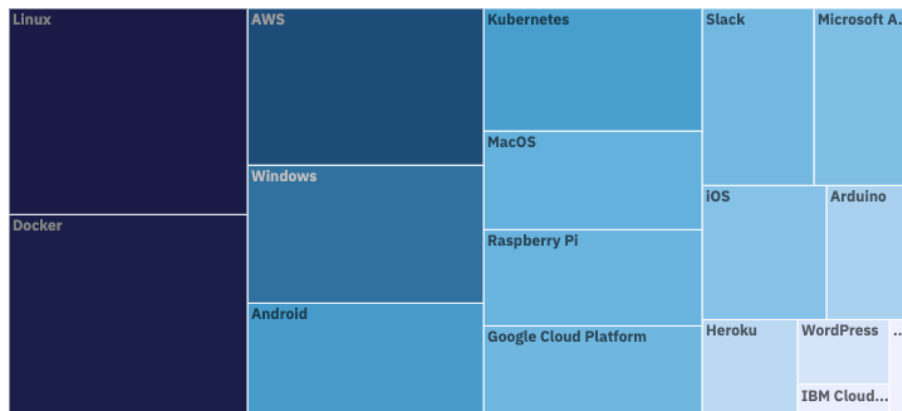
Top 10 Languages



Top 10 Databases



Platforms



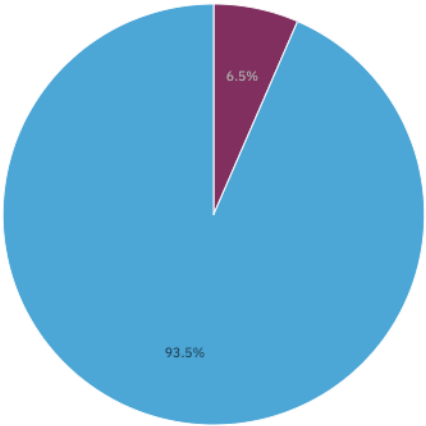
Top 10 Web Frames



DEMOGRAPHICS

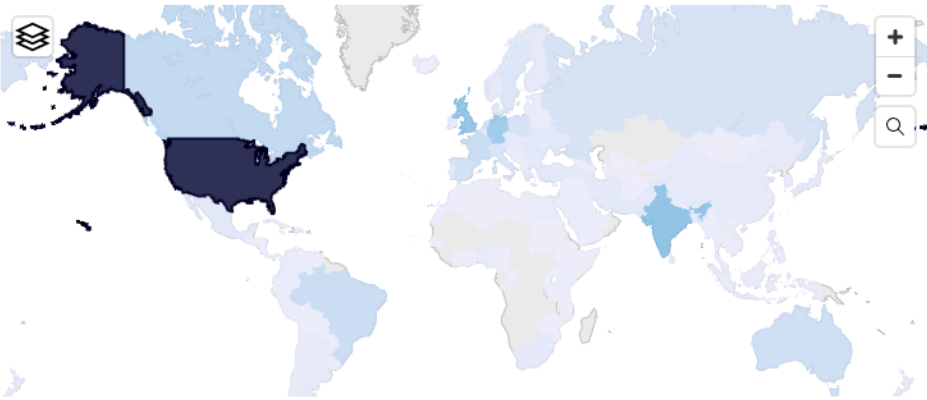
Respondent by Gender

Gender
Woman Man

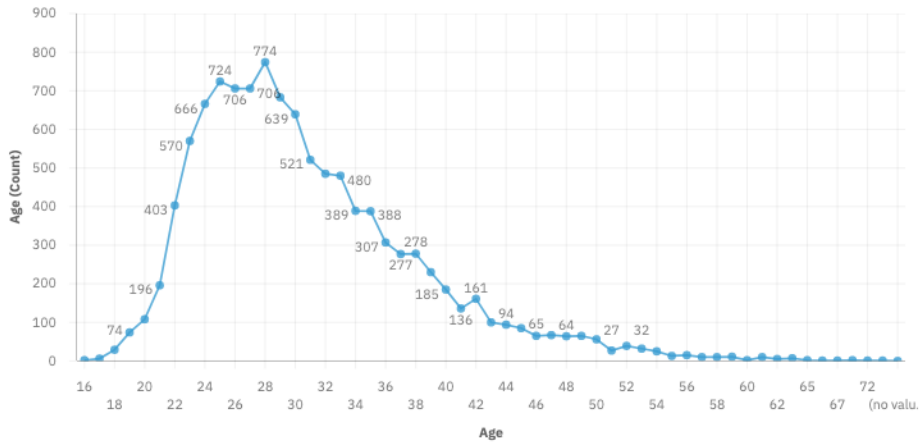


Respondent by Country

Respondent (Sum)
865 38,170,293

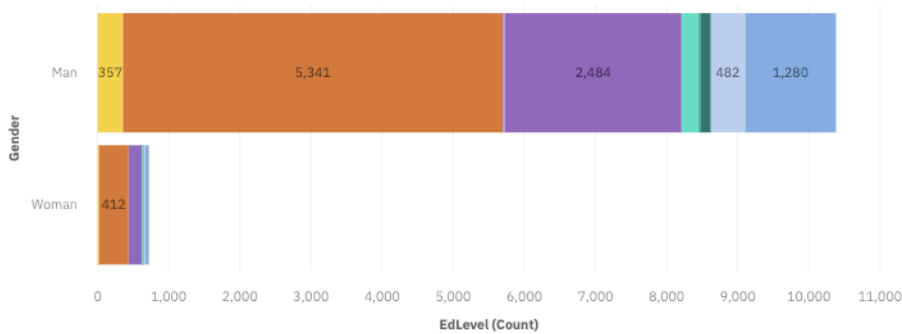


Respondent by Age



Respondent by Gender and Formal Education

EdLevel
Associate degree Bachelor's degree (BA, BS, B.E... I never completed any formal ...
Master's degree (MA, MS, M.E... Other doctoral degree (Ph.D, E... Primary/elementary school
Professional degree (JD, MD, e... Secondary school (e.g. Americ... Some college/university study ...



DISCUSSION

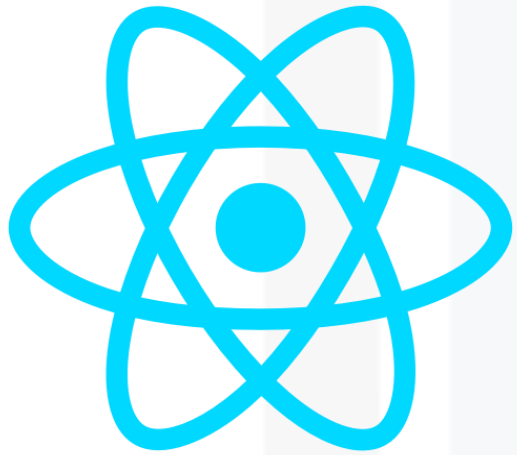


OVERALL FINDINGS & IMPLICATIONS



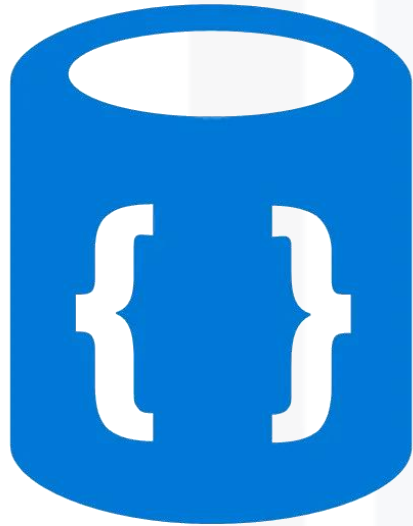
Based on Stack Overflow, there is a higher proportion of **people of color** in students than professional developers, with incremental improvement in this area each year. We expect to see an increase in demographics for people of color in the future.

OVERALL FINDINGS & IMPLICATIONS



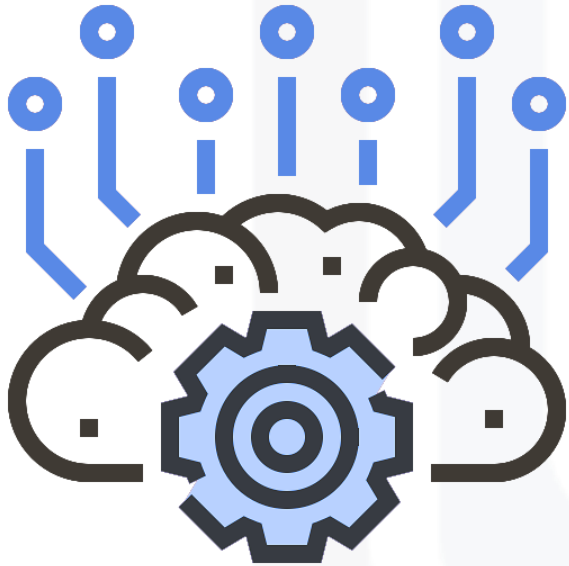
React has been touted as a favorite framework among developers, largely because it was the first to adopt a component-based architecture that other popular frameworks such as **Angular** and **Vue** have started to adopt. React is easy to pick up and allows the flexibility of being used on both server-side and client-side.

OVERALL FINDINGS & IMPLICATIONS



An upward trend of **non-relational database** systems reflects the increasingly vast quantities of ever-more complex user data that are stored in a myriad of forms, such as photo and video content, tags, and comments.

OVERALL FINDINGS & IMPLICATIONS



With the advent of machine learning and artificial intelligence, not only do we see a surge in popularity for **Python**, but also for top databases used in machine learning projects, such as **DynamoDB**, **Elasticsearch**, **MongoDB**, **Redis**, and **PostgreSQL**.



CONCLUSION

- We have presented several top trends pulled from various sources. The exact technology to use depends largely on the particular type of application and business of interest. For software applications we encourage stakeholders to focus on **JavaScript** and **Python**; for android development, **Kotlin**.
- As companies become more data-driven, the pressure to modernize and transform database management technologies will also become greater. We encourage stakeholders to leverage cloud deployment databases, such as Amazon's **DynamoDB** or **MongoDB**.
- While relational databases will continue to make up most of the database management systems, it is crucial to invest in multi-model databases in order to solve complex business problems and leverage digital tools like machine learning and Big Data, such as **PostgreSQL**, **Redis** and **MongoDB**.
- The **React.js** framework offers speed, stability, and ease of use. Since its debut, React has redefined the way developers could build user interfaces, and has laid the groundwork for component-based architecture.

CONSIDERATIONS



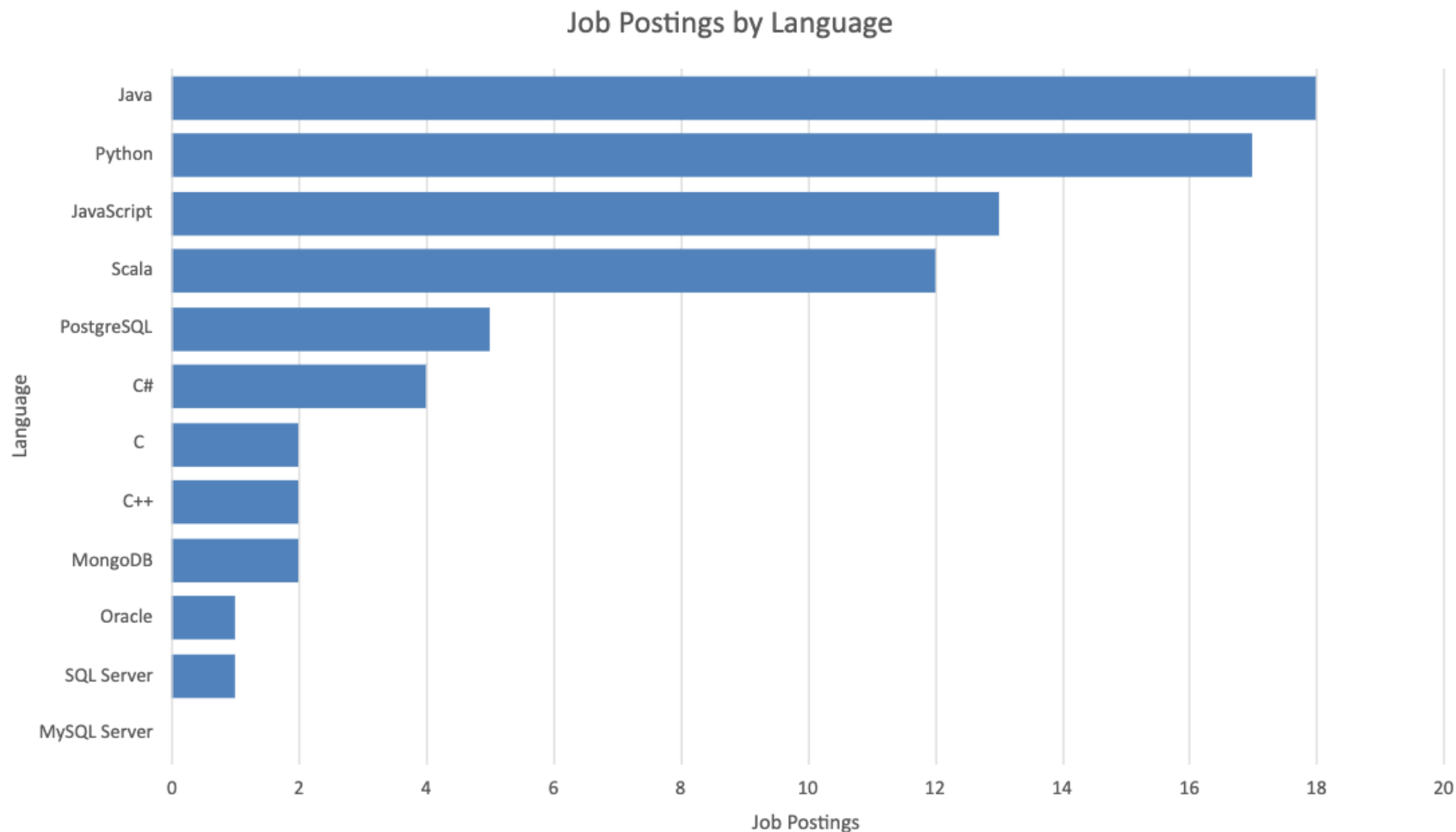
Stack Overflow's annual Developer Survey is the largest and most comprehensive survey of people who code around the world, however it is important to keep in mind that the results do not represent everyone in the developer community evenly.

APPENDIX



- [1] GitHub Jobs API <<https://jobs.github.com/api>>
- [2] Salary survey results of programming languages <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html>
- [3] Stack Overflow 2019 Developer Survey <https://insights.stackoverflow.com/survey/2019?utm_source=soc-owned&utm_medium=blog&utm_campaign=dev-survey-2019&utm_content=launch-blog>
- [4] [https://en.wikipedia.org/wiki/Kotlin_\(programming_language\)](https://en.wikipedia.org/wiki/Kotlin_(programming_language))
- [5] <https://www.dataversity.net/database-management-trends-in-2020>
- [6] <https://www.dbta.com/BigDataQuarterly/Articles/The-Database-Landscape-2021-144236.aspx?PageNum=2>

GITHUB JOB POSTINGS



POPULAR LANGUAGES

