



# IBM Data Analyst Capstone Project

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# OUTLINE



- Executive Summary
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- Methodology
- Results
  - Visualization – Charts
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
- Appendix
  - Job Postings
  - Popular Languages



# EXECUTIVE SUMMARY

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Analysing trends among different areas of the information world showed to see potential needed skillsets

Languages that do well for web such as – HTML/CSS, Javascript, Typescripts are popular now and will continue in the future.

Open Source PostgreSQL is among the most popular databases and projected to be strong for the ongoing future.

Salary outlook is good for web based languages, but the job market looks weak at this point overall





# INTRODUCTION



- Data Analysis of the 2024 Stack Overflow Annual Survey for the **IBM Data Analyst Capstone Project**
- Objective - to identify an skillsets that maybe needed in the future based on responses from current developers that could lead to better opportunities for an individual in the information technology world.
- Things to be highlighted:
  - Top 10 (current & future)
    - Database technologies
    - Web Frameworks
    - Programming Languages



# METHODOLOGY



## Data Used

- Modified GitHub Jobs API
- Programming language salaries from Web Scraping
- Modified Stack Overflow Survey Results

## Analysis & Visualizing

- Data was normalized using Pandas in a Jupiter notebook in Visual Studio Code
- Google Looker Studio was used to create a visual dashboard of the findings.

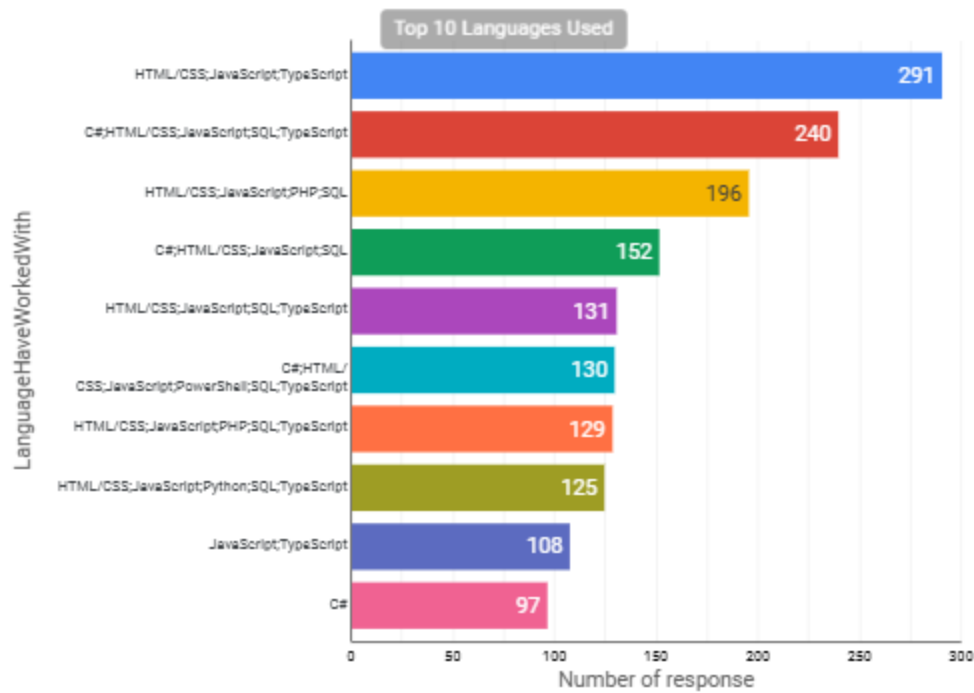


# PROGRAMMING LANGUAGE TRENDS

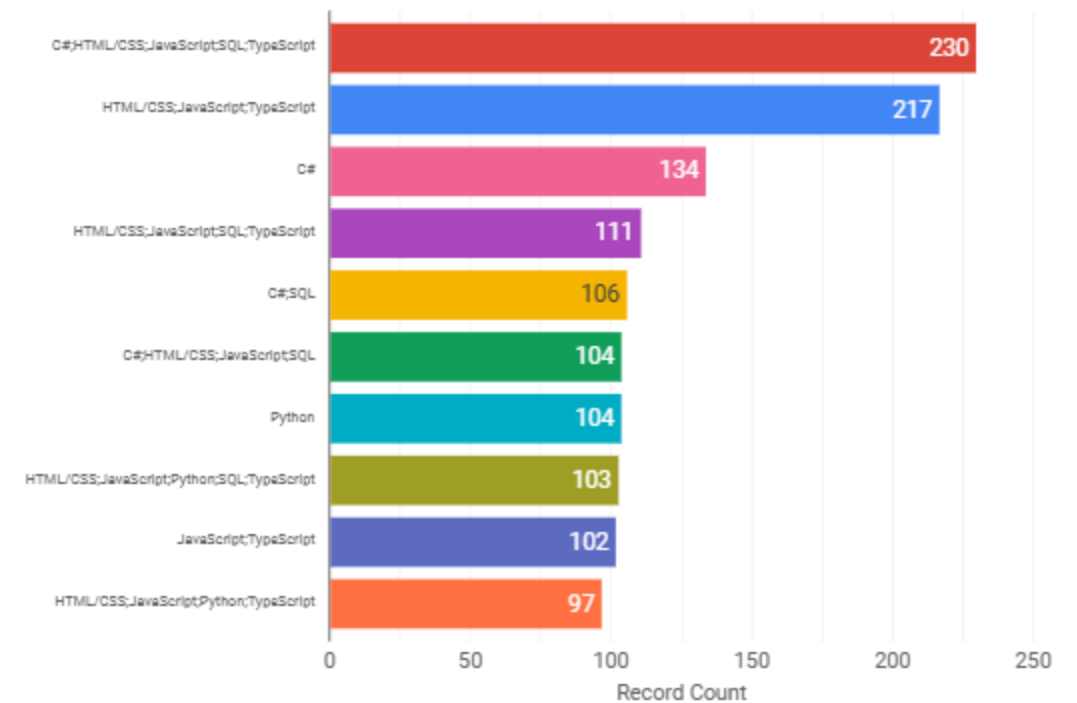
2024

2025

Top 10 Languages Used



Top 10 Languages Desired Next Year



# PROGRAMMING LANGUAGE TRENDS FINDINGS & IMPLICATIONS



## Findings

- Web based languages continue to be among the most popular
- Javascript, HTML/CSS, Typescript, SQL among top favorites
- C# & php are still being supported

## Implications

Languages that support web and mobile applications are currently among the most popular. They also will continue to be one of the more desirable languages to learn.

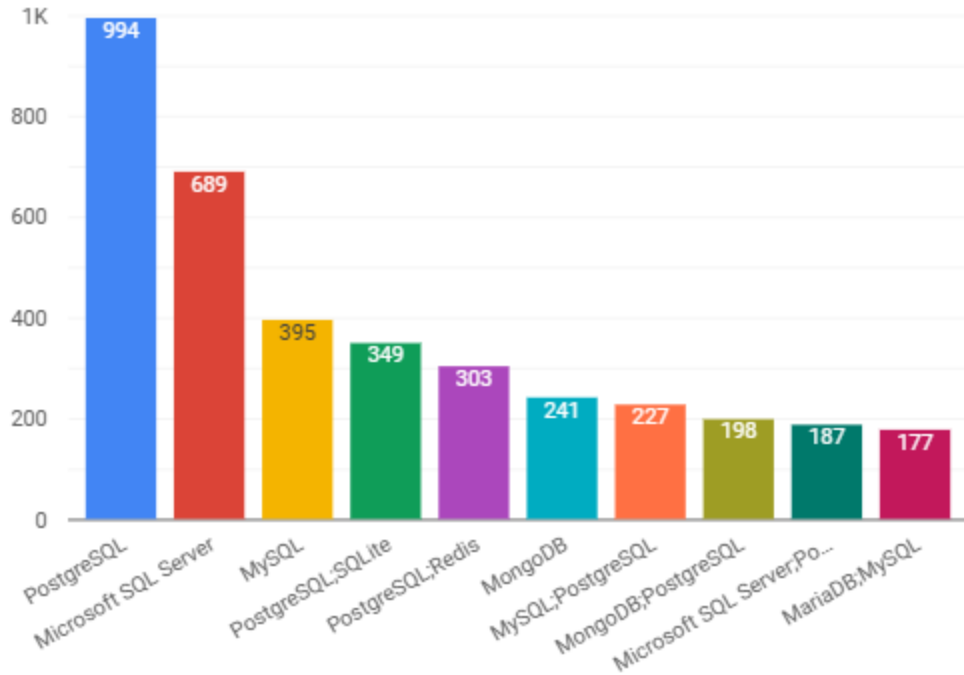
SQL is a language that will continue to be used as more and more content is being created every day and corporations will continue to store it for analysis for the foreseeable future.



# DATABASE TRENDS

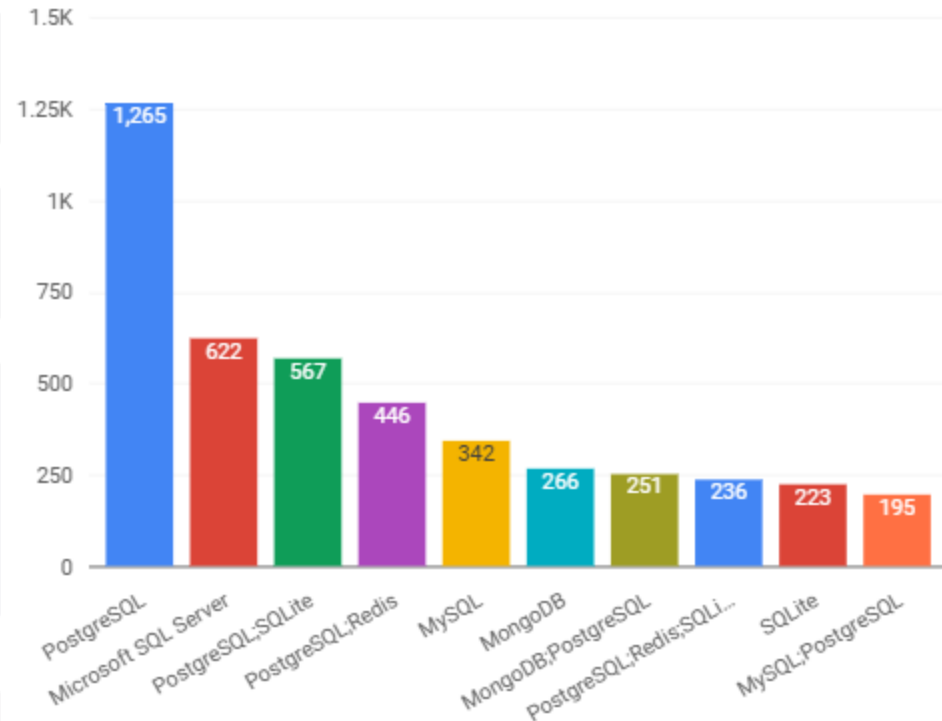
## 2024

Top 10 Databases Used



## 2025

Top 10 Databases Desired Next Year



# DATABASE TRENDS

## FINDINGS & IMPLICATIONS

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### Findings

- PostgreSQL is the most popular database
- Microsoft Server is a distant second
- MongoDB is the top ranked NoSQL database

### Implications

- Microsoft is losing ground to PostgreSQL, which could mean that developer's clients are revolting against Microsoft's payment ideologies.
- The growing interest of PostgreSQL makes in a worthwhile look to see if adding it to your skillset makes sense

# DASHBOARD

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Dashboard of visual data was created using

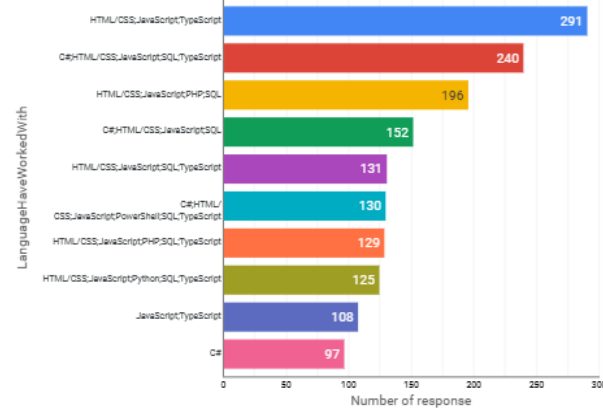
## **Google Looker Studio**

I choose Looker Studio to gain exposure to the software, since I had used Cognos earlier and believe that it could align with small business customers in the future.

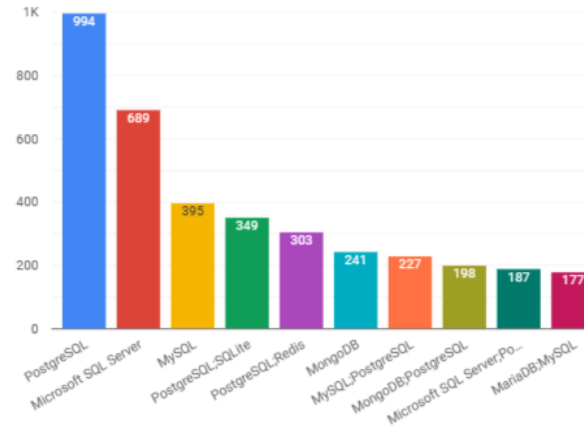


# DASHBOARD TAB 1

Top 10 Languages Used



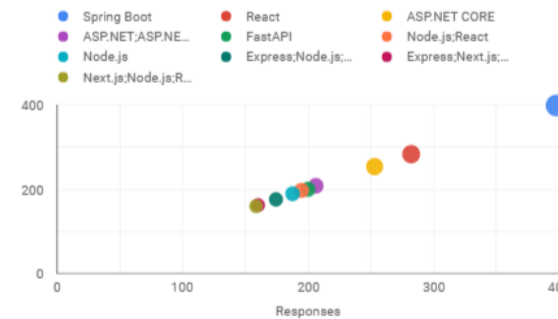
Top 10 Databases Used



Top 10 Platforms Used



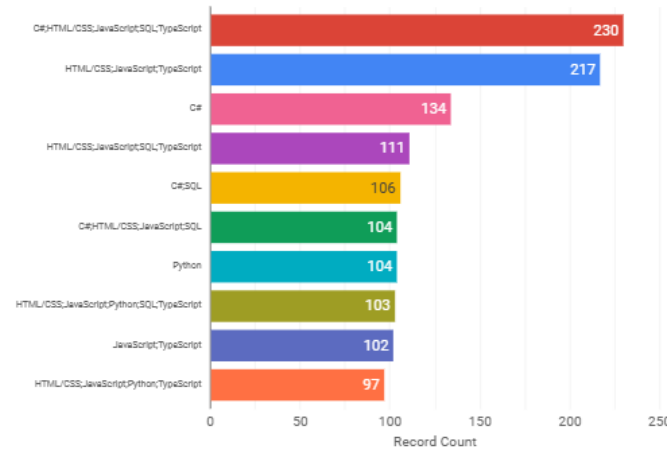
Top 10 Web Frameworks Used



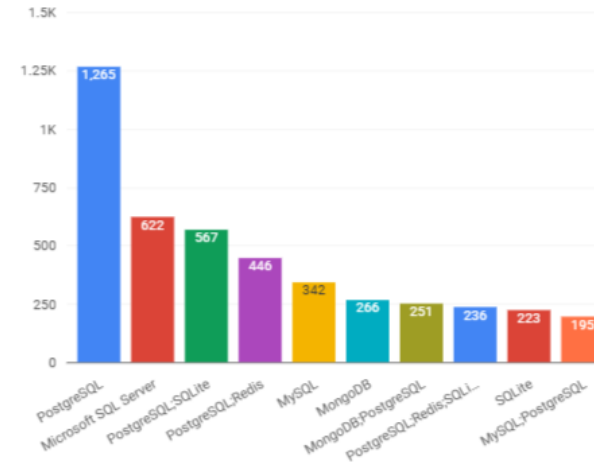


# DASHBOARD TAB 2

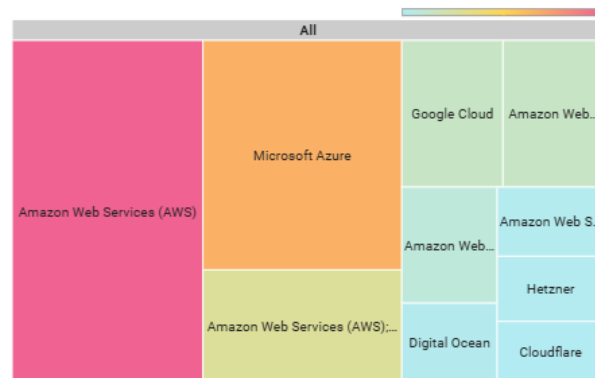
Top 10 Languages Desired Next Year



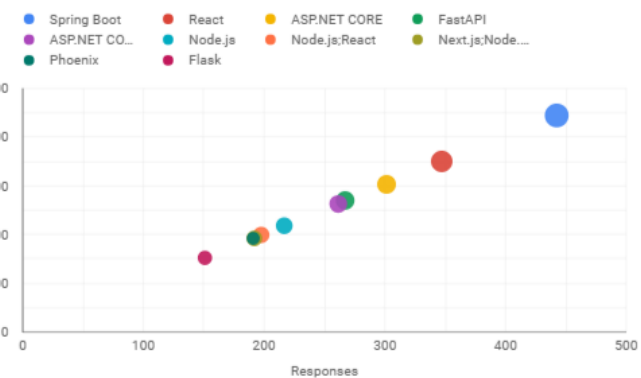
Top 10 Databases Desired Next Year



Top 10 Desired Platforms



Top 10 Desired Web Frameworks

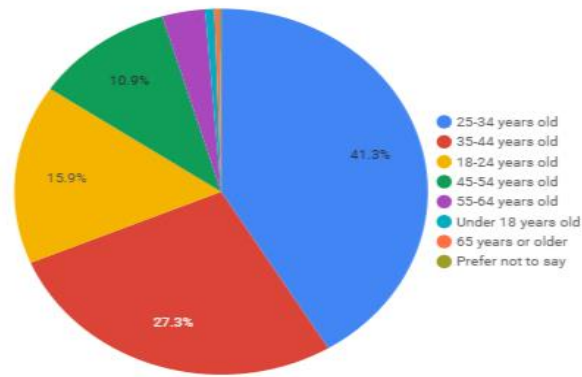




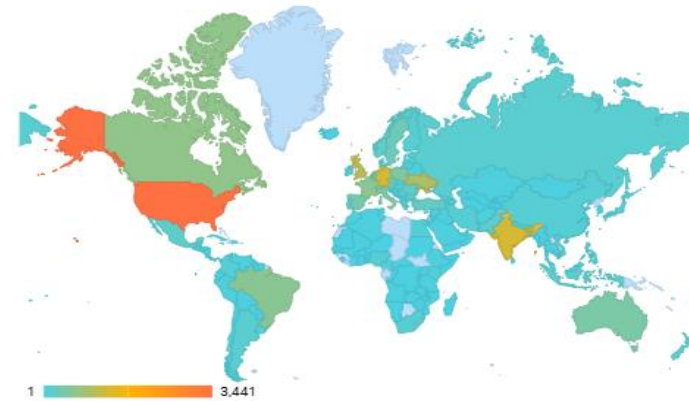
# DASHBOARD TAB 3

## Demographics

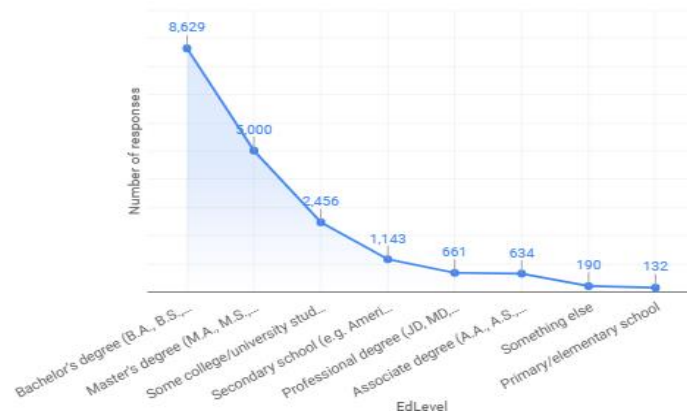
### Respondents by Age



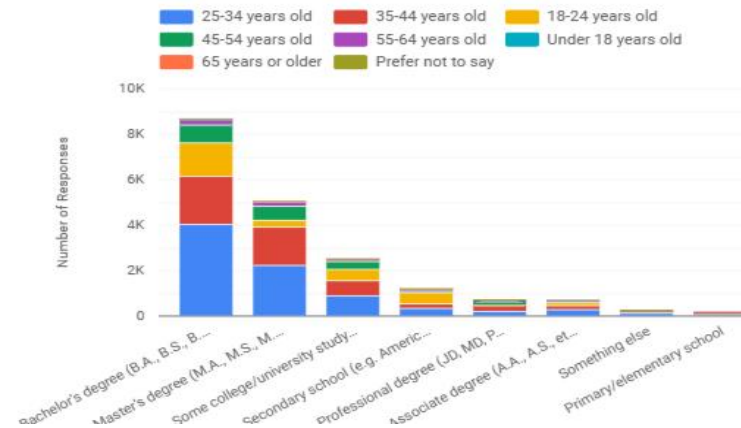
### Respondent Count by Country



### Respondent Distribution by Education Level



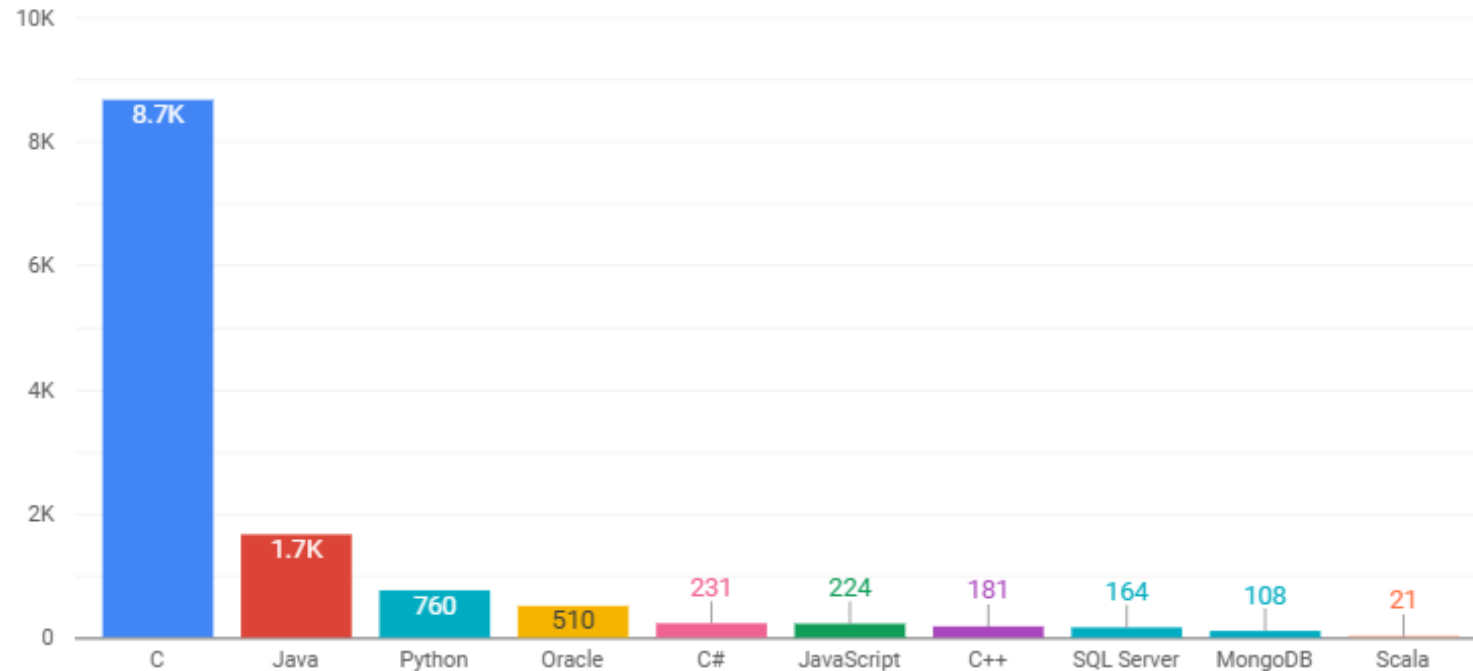
### Respondent Count by Age, Classified by Education Level





# DASHBOARD TAB 4

Total Jobs by Language

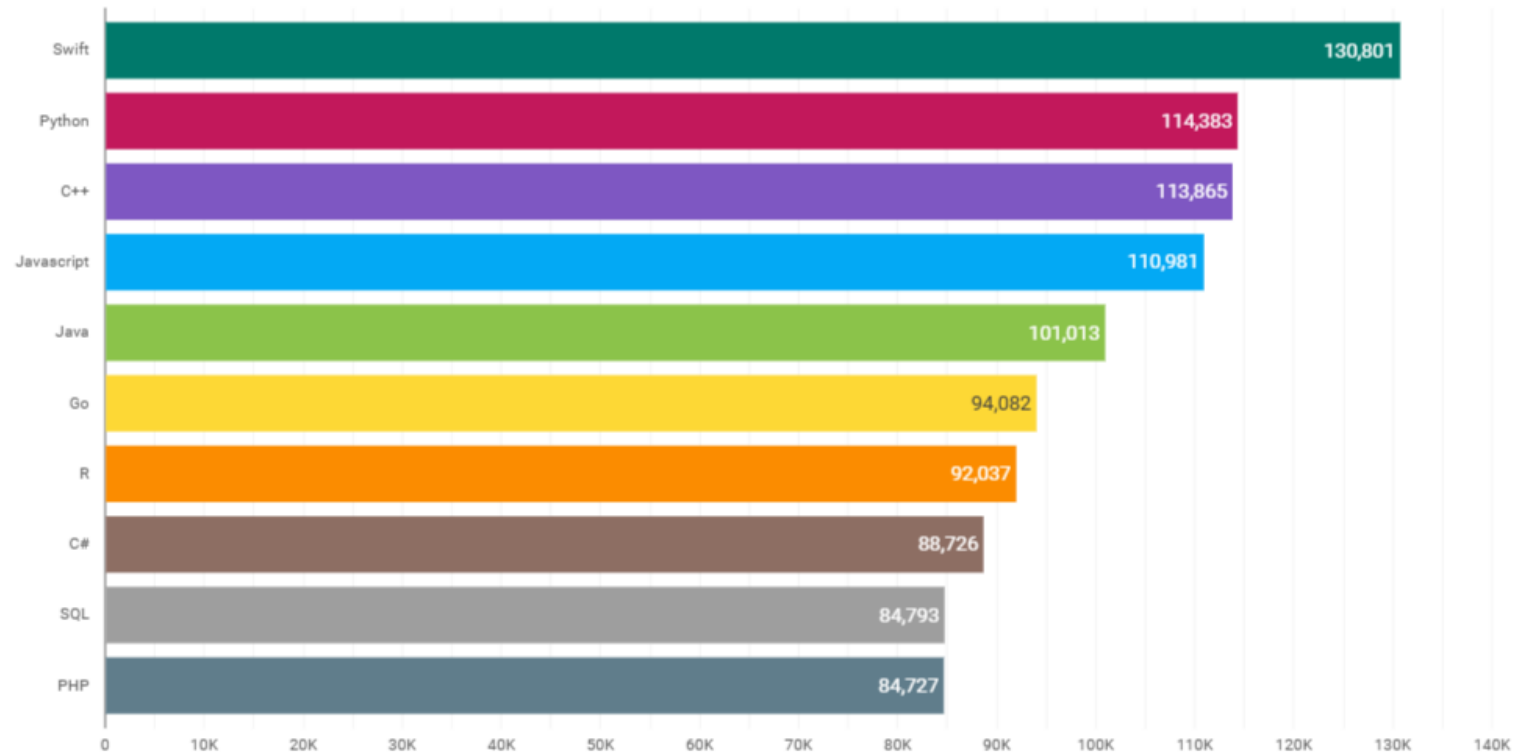




# DASHBOARD TAB 5

Data Gathered by the 2024 Stack Overflow Annual Survey  
48,019 -Respondents shared salary information \*\*\*

Average Salary by Language Name



# DISCUSSION

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**What did we discover?**



# OVERALL FINDINGS & IMPLICATIONS

## Findings

- Web support languages are popular and well paying
- Open Source Database technology is a leading trend Finding 3
- Java's - Spring Boot, JavaScript's React and Microsoft's ASP.Net are the top three web frameworks
- Web based technologies such as Amazon Web Services and Microsoft Azure are popular.

## Implications

- Ensuring that you have HTML/CSS, JavaScript, Typescript, C# & SQL in your skillset will allow you the most flexibility.
- PostgreSQL's gain in popularity could signal a move away from Microsoft's SQL Server, this could lead to more opportunities for database administrators that know PostgreSQL.
- Cloud administration is a skillset that will be in need as corporations and small business harness the power of the cloud.





# CONCLUSION



If you are wondering what skillset you should be adding next in your information technology career.

It is clear that:

- ✓ Web based technology skills are what will be needed in the future.
  - Programming
  - Administration & Support
- ✓ Stacking skillsets such as:
  - HTML/CSS, JavaScript, SQL, C#, Database Administration, Python, C#, Typescripts



# APPENDIX



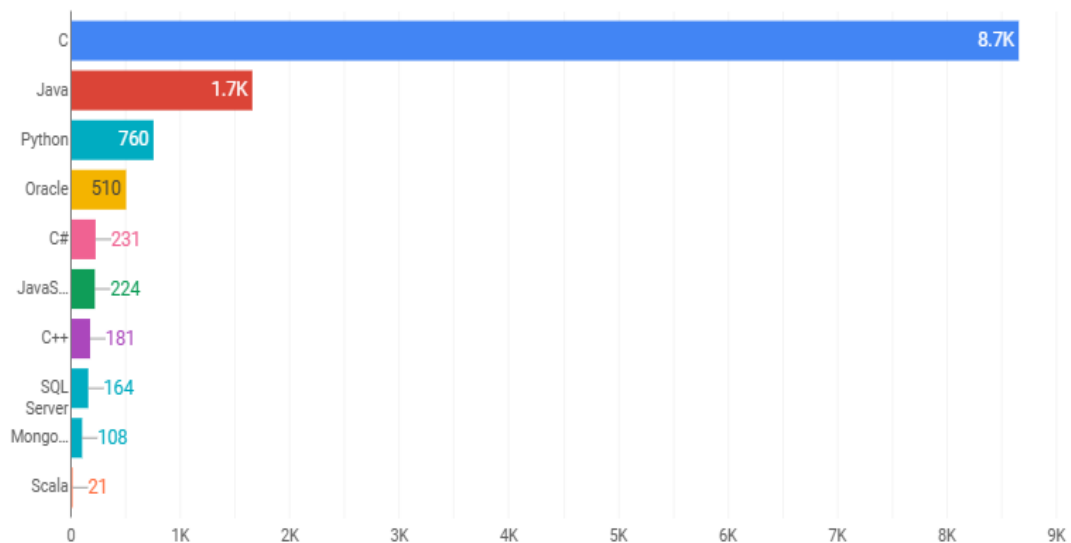
- \*\*\* 2024 Stack Overflow Developer Survey - [https://survey.stackoverflow.co/2024/?utm\\_medium=referral&utm\\_source=blog&utm\\_campaign=dev-survey-2024&utm\\_content=results](https://survey.stackoverflow.co/2024/?utm_medium=referral&utm_source=blog&utm_campaign=dev-survey-2024&utm_content=results)
- Jobs Data - <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/module%201/Accessing%20Data%20Using%20APIs/jobs.json>
- Programming Languages - [https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming\\_Languages.html](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html)
- Survey data - <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/HLOosvsPglwt5dgOOh1RSg/survey-data-updated.csv>



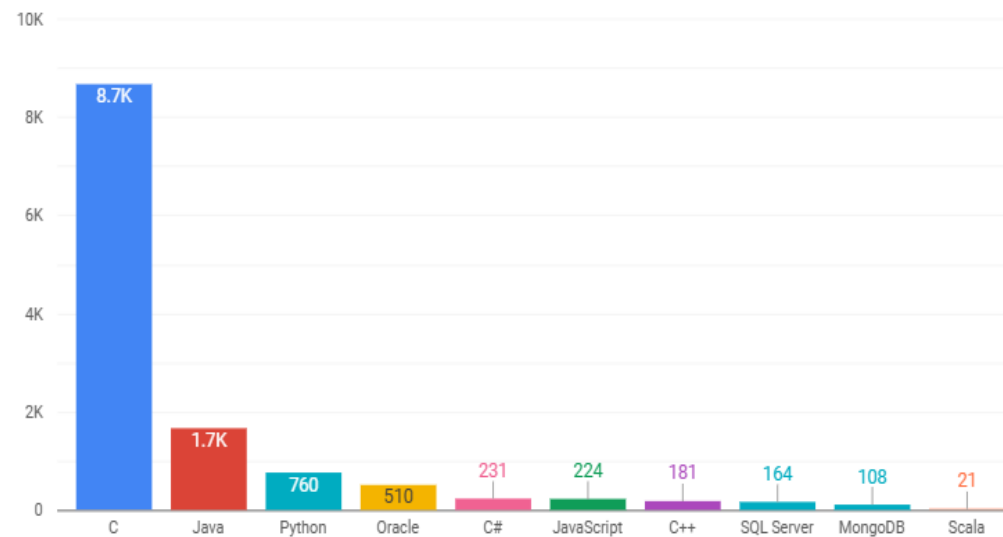
# JOB POSTINGS



Total Jobs by Language



Total Jobs by Language





# POPULAR LANGUAGES

Average Salary by Language Name

