

# Data Analysis of Developers

Ezran Cheah, 29 July 2025



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# OUTLINE

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- Executive Summary
- Introduction
- Methodology
- Results
  - Visualization – Charts
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
- Appendix



# EXECUTIVE SUMMARY

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## **Survey Source**

Based on the Stack Overflow Developer Survey 2023 with nearly 20,000 responses globally.

## **Objective**

To analyze what developers use today, what they aspire to learn next, and who they are — by location, education, and age.

## **Key Insights**

JavaScript, Python, and SQL dominate in both use and interest.

PostgreSQL is the most favored database by both current usage and aspiration.

Newcomers like Supabase, Go, and Rust are gaining traction, signaling a shift in developer focus.

Demographics indicate strong global diversity, with concentration in key tech-active regions.



# INTRODUCTION

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## About the Survey

This analysis is based on the Stack Overflow Developer Survey, one of the largest and most comprehensive annual surveys of developers worldwide. The dataset includes responses nearly 20,000 developers across a broad range of backgrounds, geographies, and experience levels.

## Purpose of This Report

The aim of this report is to explore current technology trends, developer preferences, and demographic insights to better understand:

- Which languages, databases, platforms, and web frameworks are most used today
- What developers are most interested in learning next
- Who the developers are — by age, location, and education



# METHODOLOGY

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## Data Source

- Stack Overflow Developer Survey 2023 (CSV file)
- Contains responses on technologies used, desired technologies, demographics, and more

## Tools & Libraries Used

- **Python** for data processing and cleaning
- **Pandas** for data manipulation
- **Matplotlib / WordCloud / OpenPyXL** for data visualization and Excel export
- **Looker Studio** for interactive charting and dashboard creation

## Data Preparation Steps

- Cleaned raw survey data by removing nulls, standardizing column names, and fixing encoding issues
- Split multi-response columns (e.g., languages used) using `(.str.split())` and `explode()`
- Normalized values (e.g., simplifying education levels, removing extra whitespace and smart quotes)
- Counted frequency of technologies using `(.value_counts())`
- Converted currency/salary strings to numeric values using regex

## Visualization Strategy

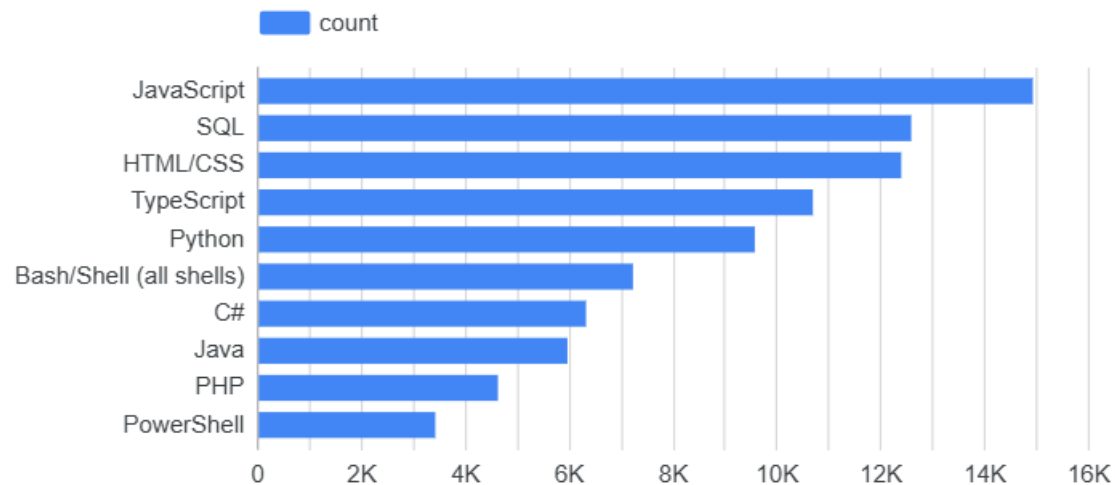
- Grouped charts by topic: Languages, Databases, Platforms, Frameworks, Demographics
- Used appropriate chart types:
  - ✓ Bar/Column charts for ranking
  - ✓ Word cloud for platform variety
  - ✓ Bubble scatter for framework popularity
  - ✓ Tree map for visual distribution
  - ✓ Map and pie charts for demographic spread



# PROGRAMMING LANGUAGE TRENDS

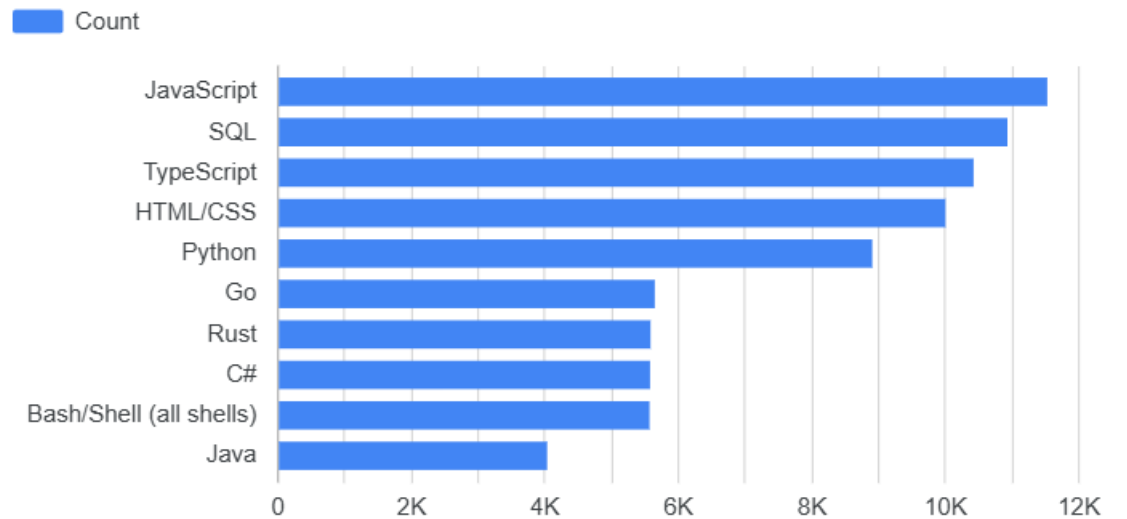
## Current Year

### Top 10 Languages Used



## Next Year

### Top 10 Languages Desired



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

1. Languages like JavaScript, SQL, TypeScript, HTML/CSS, and Python appear in both charts — they're not only widely used but also in high demand for continued use or learning.
2. Bash/Shell, Java, PHP, PowerShell rank in the "used" chart but fall behind or disappear from the "desired" chart.
3. Go and Rust appear only in the "desired" chart, not in the "used" chart.

## Implications

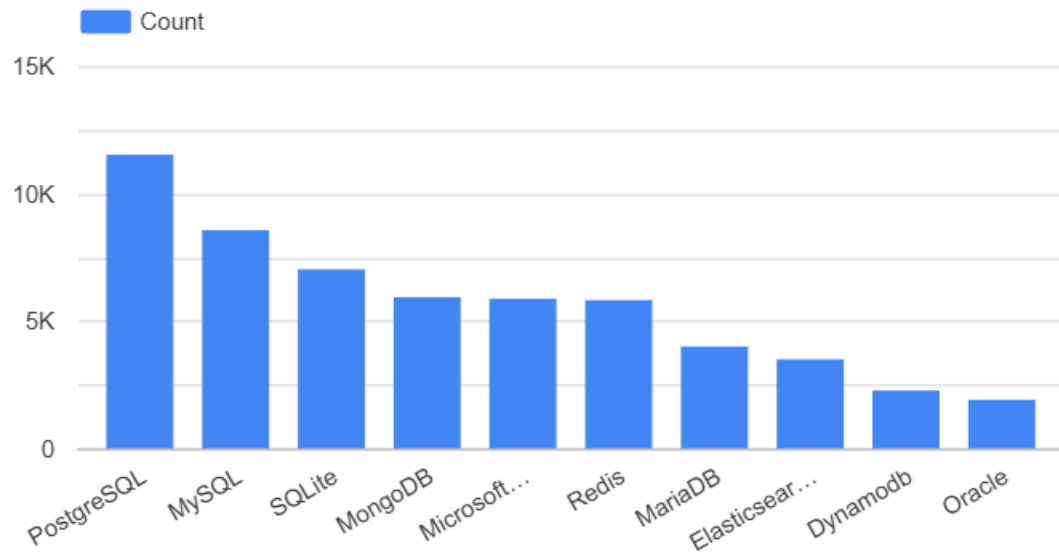
1. These are clearly seen as core technologies in the modern stack — essential for both backend and frontend roles.
2. Developers might be required to use them but don't actively want to focus on them
3. These are emerging or modern languages gaining developer interest



# DATABASE TRENDS

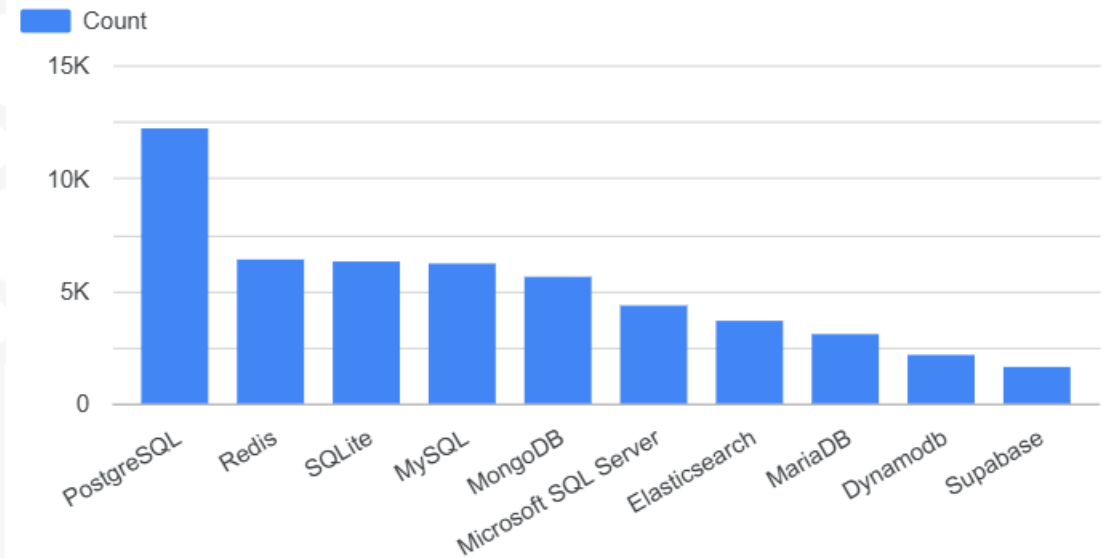
## Current Year

Top 10 Databases Used



## Next Year

Top 10 Databases Desired





# DATABASE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

1. PostgreSQL dominates both charts - indicates it's both highly adopted and well-liked by developers
2. Redis jumps from middle of the usage chart to #2 in desired with SQLite also on the rise in the desired chart
3. MySQL and Microsoft SQL Server see drop in interest

## Implications

1. PostgreSQL remains a must-have skill
2. Using PostgreSQL, Redis, or MongoDB may improve developer attraction and retention
3. Drop in MySQL and Microsoft SQL Server suggests developers may use them out of necessity (legacy systems, enterprise stacks), but don't prefer them for future work



# DASHBOARD

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<Please present your dashboard in the following slides.>

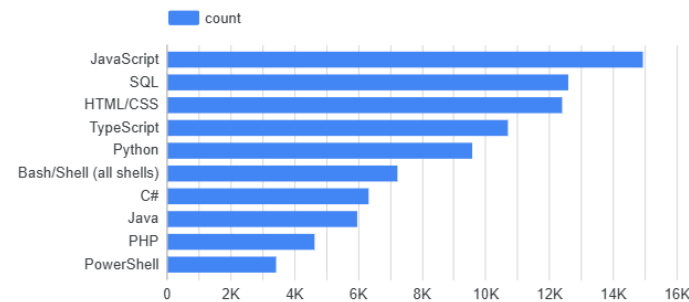


# DASHBOARD TAB 1

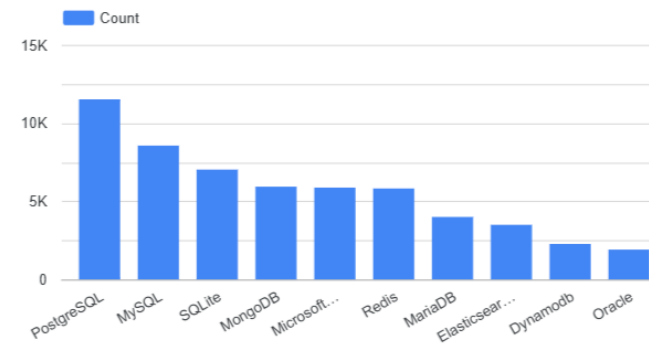
## Current Technology Usage

### Languages and Databases

Top 10 Languages Used



Top 10 Databases Used

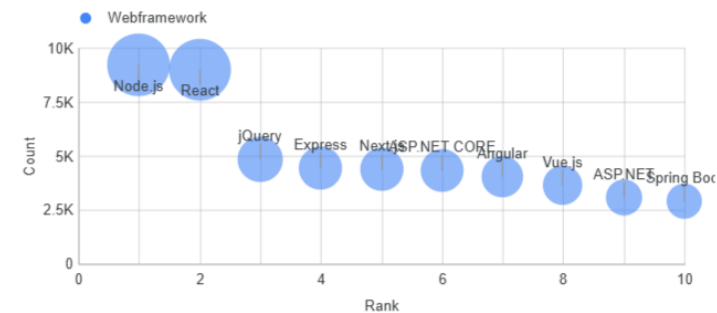


### Platforms and WebFrameworks

Platforms Used (WordCloud)



Top 10 Webframeworks Used

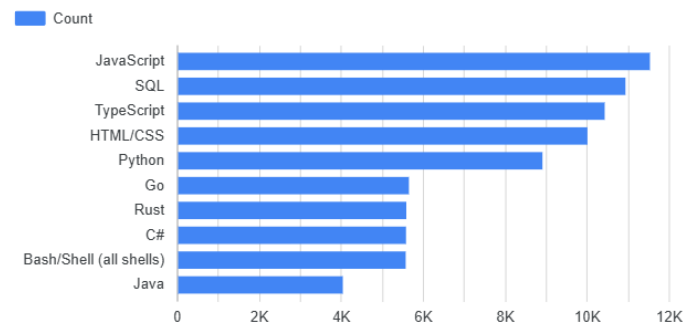


# DASHBOARD TAB 2

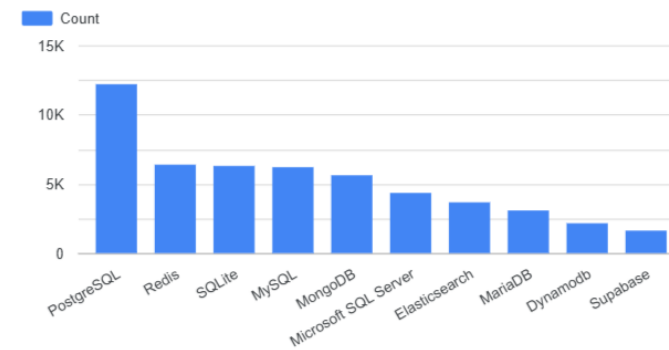
## Future Technology Trends

### Languages and Databases

Top 10 Languages Desired

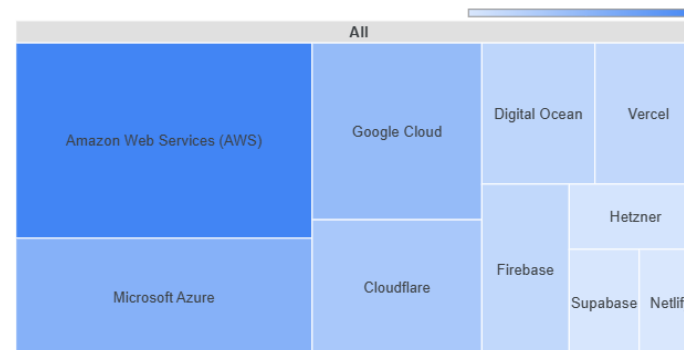


Top 10 Databases Desired

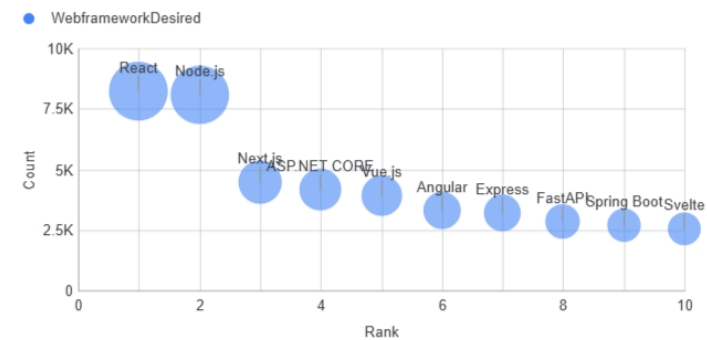


### Platforms and WebFrameworks

Top 10 Desired Platforms



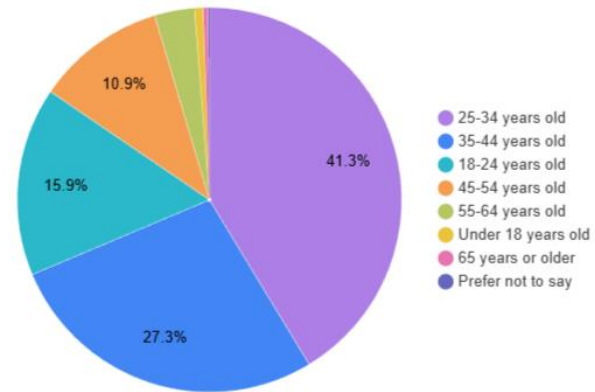
Top 10 Desired Webframeworks



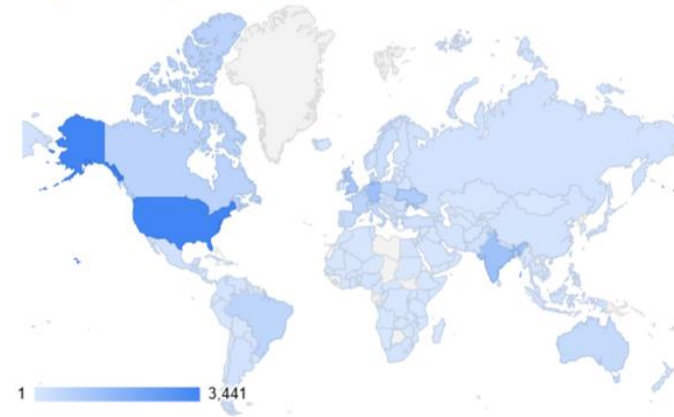
# DASHBOARD TAB 3

## Demographics

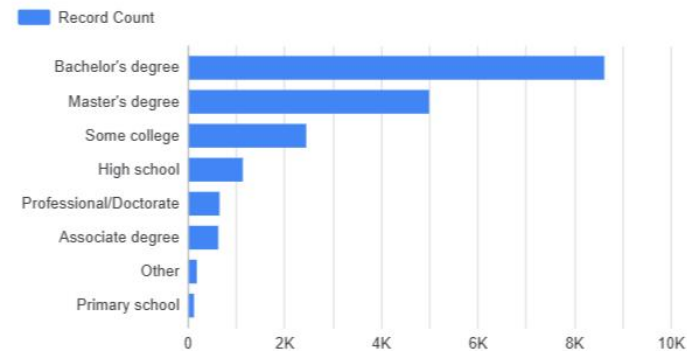
Respondents by Age



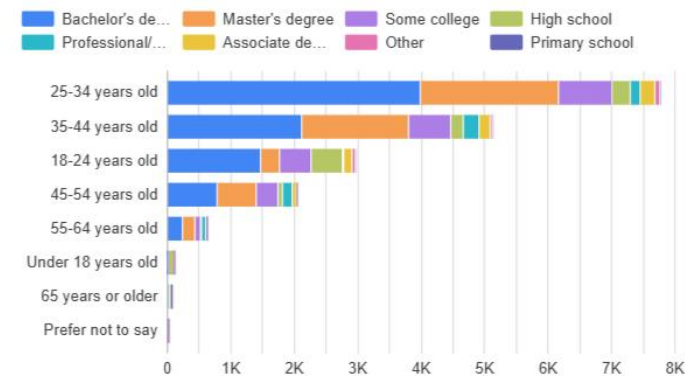
Respondents by Country



Respondents by Education Level



Respondents by Age and Education Level



# DISCUSSION

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# OVERALL FINDINGS & IMPLICATIONS

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## Findings

- Full-stack languages dominate: Languages like JavaScript, SQL, TypeScript, and Python are consistently at the top in both usage and desire.
- PostgreSQL leads across database technologies, being both the most used and most desired database.
- Developer preferences are shifting toward modern, high-performance, and open-source technologies like Redis, Go, Rust, and Supabase.

## Implications

- Hiring & curriculum should prioritize full-stack technologies and PostgreSQL to align with developer trends.
- Legacy technologies like PHP, PowerShell, and SQL Server may require additional incentives or modernization strategies.
- Emerging tech like Supabase and Rust present growth opportunities for developers and companies aiming to stay ahead of the curve.



# CONCLUSION

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- The developer ecosystem is evolving toward **flexible, open-source, and modern tools**.
- **PostgreSQL and JavaScript** remain foundational technologies across use cases.
- There is a growing interest in **lightweight frameworks** and **new developer platforms** that emphasize speed and productivity.
- **Demographics like age, education, and country** play a key role in shaping preferences — indicating where tech education and hiring efforts should be focused.





# APPENDIX

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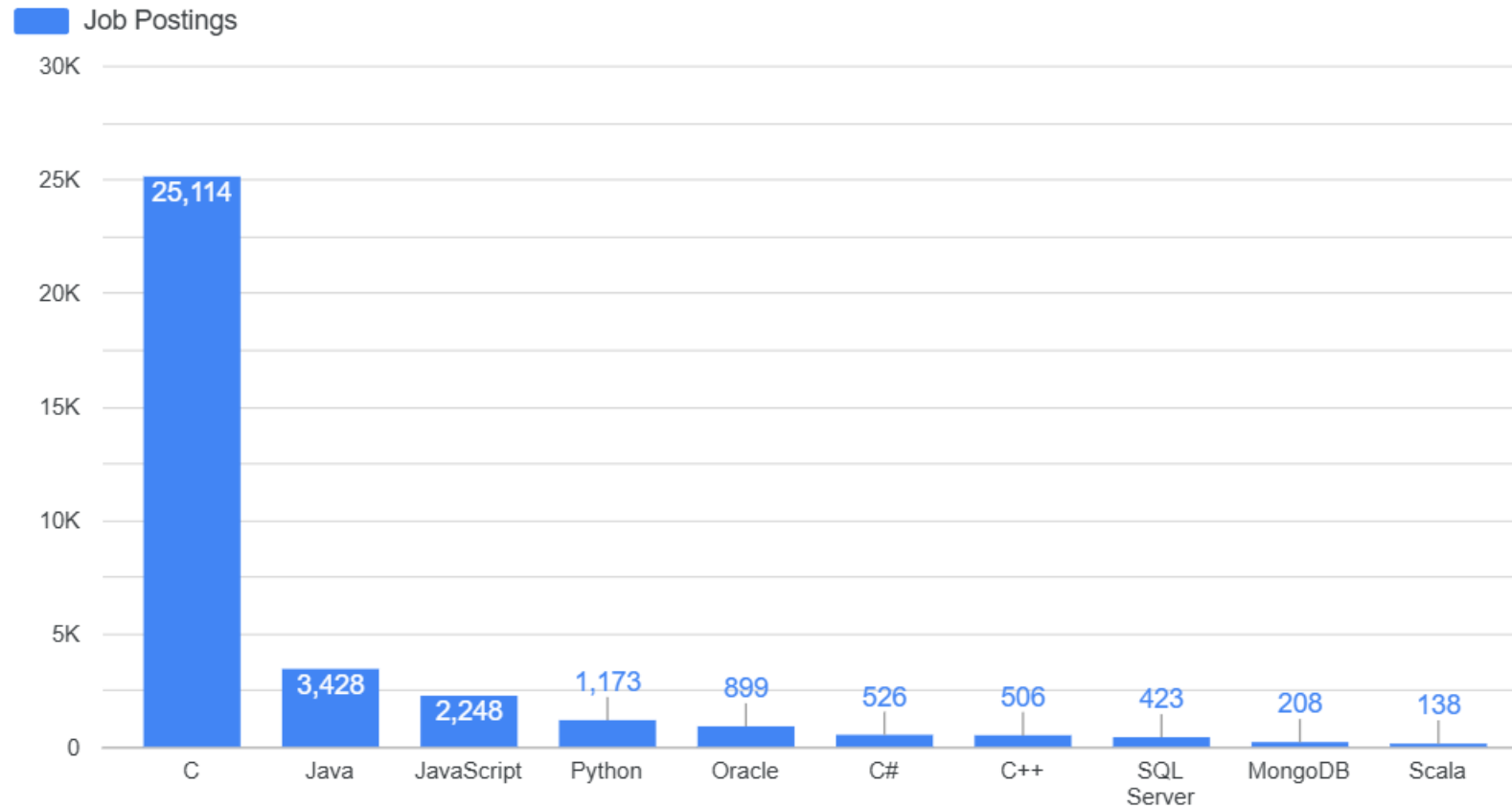


1. Job Postings
2. Popular Languages



# JOB POSTINGS

Job Postings by Technology



# POPULAR LANGUAGES

Average Salary by Language

