Stack Overflow Developer Survey Dataset Analysis

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EXECUTIVE SUMMARY

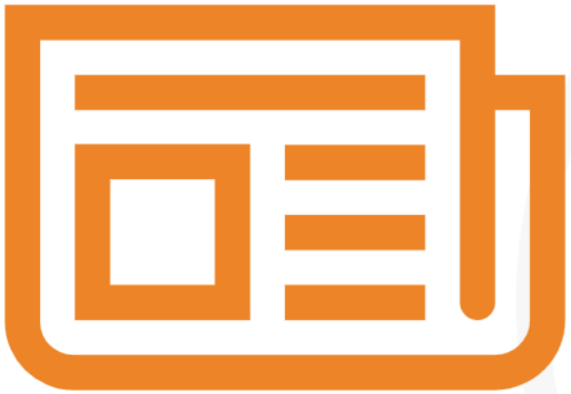
1. The analysis draws on the **2024 Stack Overflow Developer Survey**, which collected responses from **over 65,000 developers** worldwide to reveal global trends and preferences.
2. **JavaScript, Python, and SQL** emerged as the most widely used and in-demand programming languages:
   2.1 JavaScript remains dominant in both current usage and future interest
   2.2 Python shows strong versatility across data science, scripting, and web development
   2.3 SQL continues to be essential for backend and data-related roles
3. **PostgreSQL** is the most preferred database, followed by **MySQL** and **Redis**.
4. **AWS**, **Google Cloud**, and **Microsoft Azure** lead in both current and future cloud platform usage.
5. Dashboards created using **IBM Cognos Analytics** visualized key patterns in **technology usage**, **developer demographics**, and **education levels**.

INTRODUCTION

- This report analyzes developer trends based on the 2024 Stack Overflow Developer Survey.
- The primary goal is to identify the most in-demand programming languages, databases, platforms, and tools.
- The insights will help organizations align hiring, training, and development strategies with current market needs.
- The report supports strategic workforce planning in a rapidly evolving tech landscape.

I. Enables IT leaders to anticipate future skill requirements.
II. Provides data-driven guidance for curriculum designers and L&D professionals.

METHODOLOGY



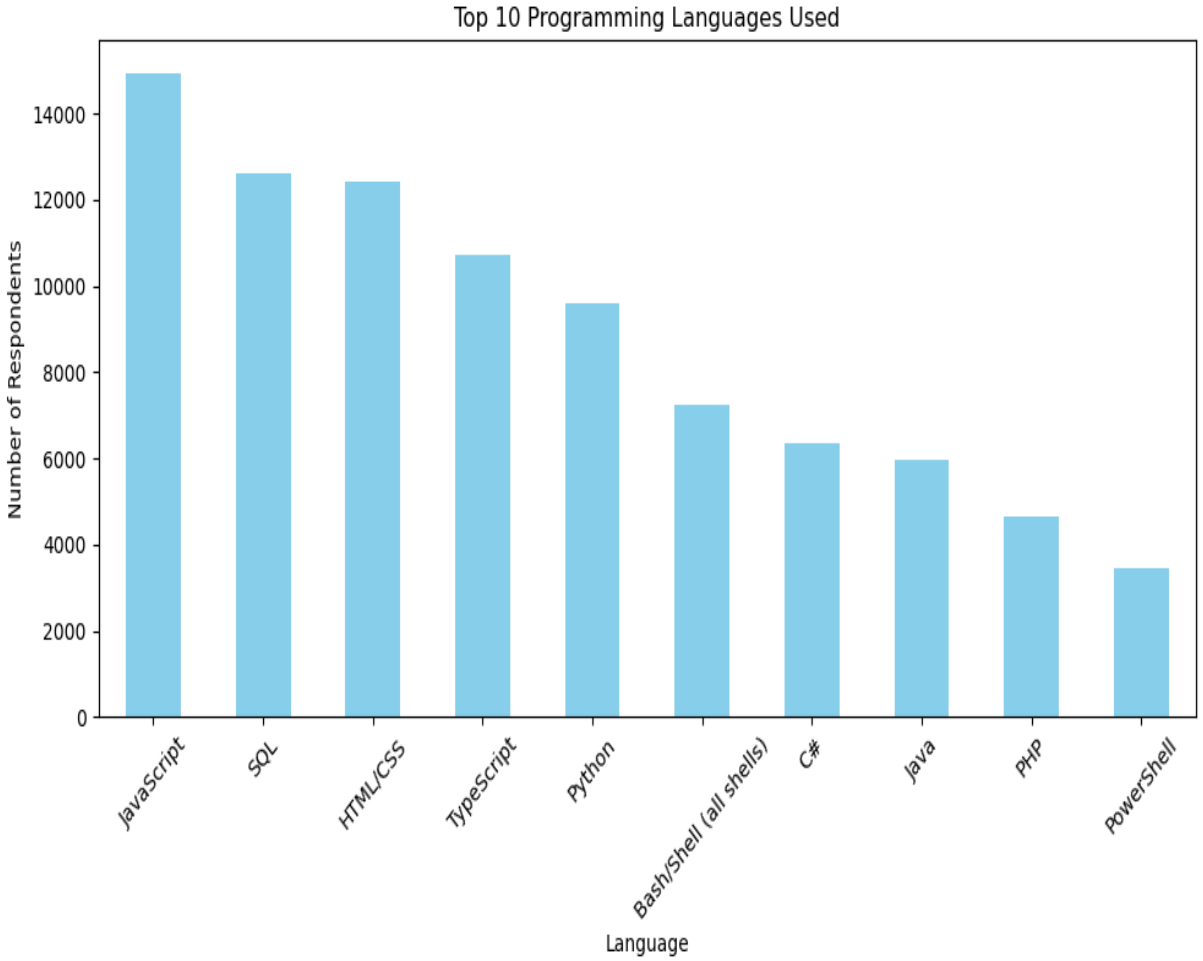
- Data collected from Stack Overflow Developer Survey 2024 (primary source)
- Additional sources include job postings and training portals via API & web scraping
- Survey data acquired in .csv format for processing and analysis
- Data prepared using Python and pandas for transformation, aggregation and visualization

I. Removed duplicates, irrelevant columns, and cleaned invalid entries

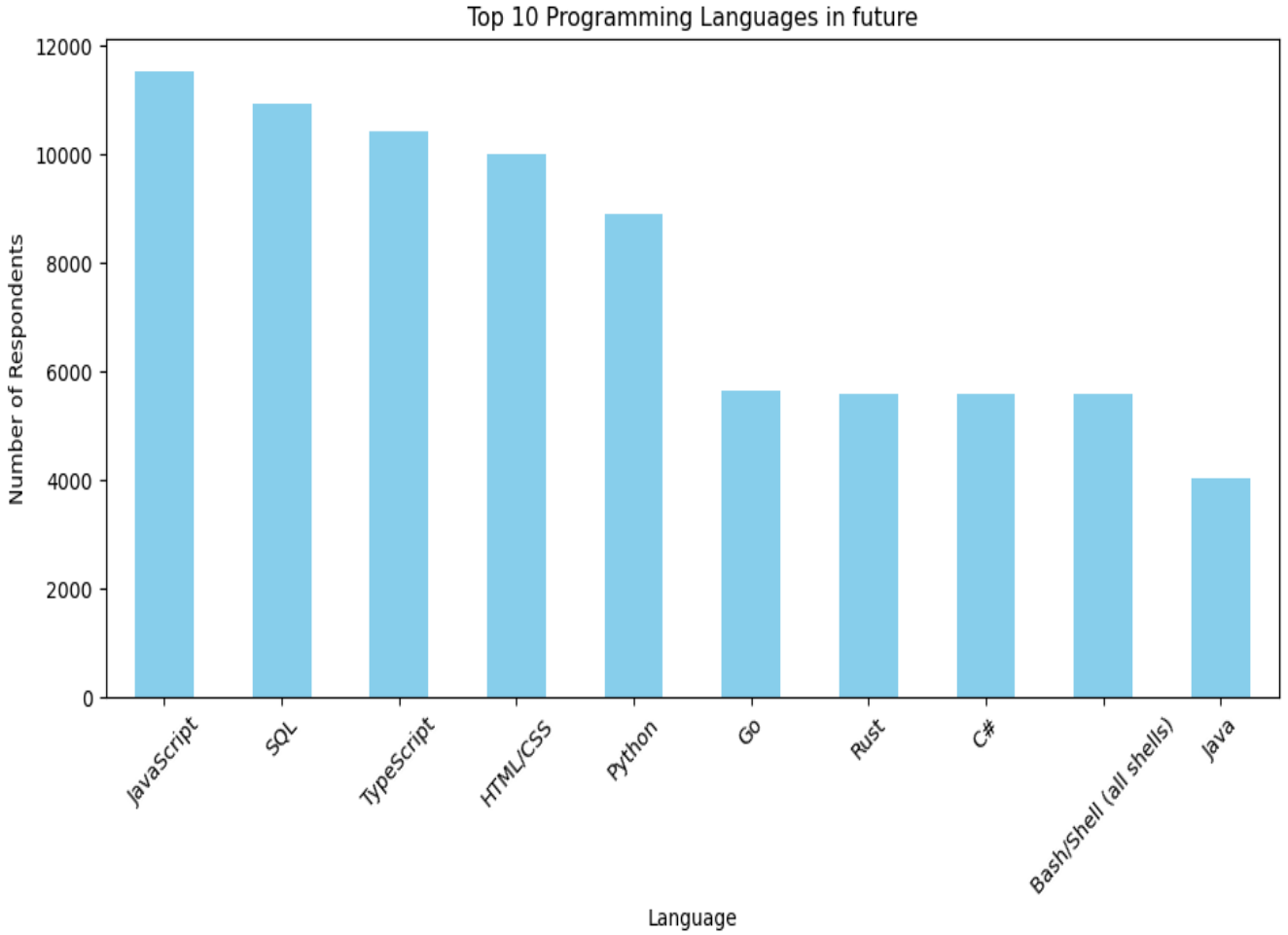
II. Grouped responses by category (e.g., language, database, platform) and exported clean data to IBM Cognos Analytics

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

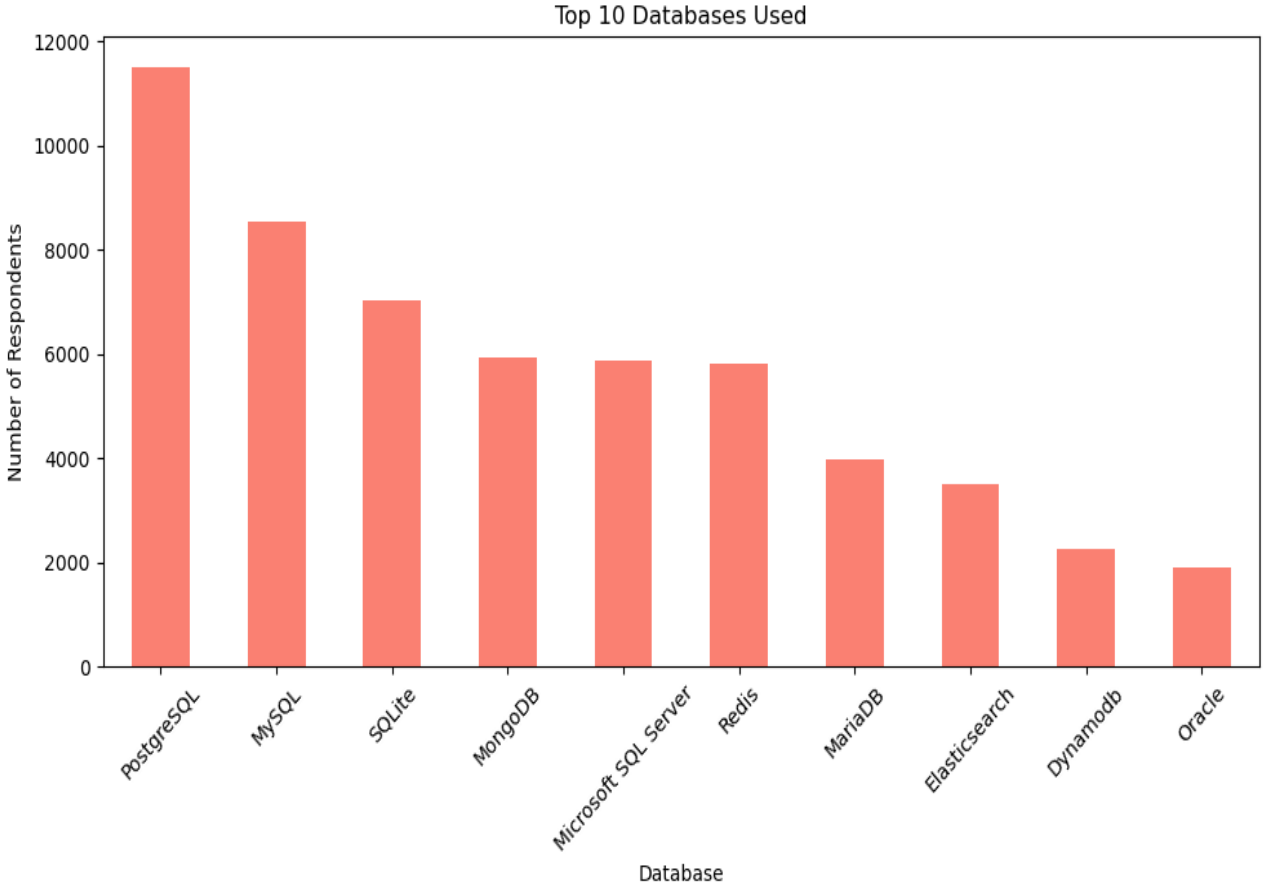
- **JavaScript** remains the most popular & highly anticipated language for future use
- Emerging languages like Go and Rust show strong future growth potential.
- Python continues to be a versatile and widely used language.

Implications

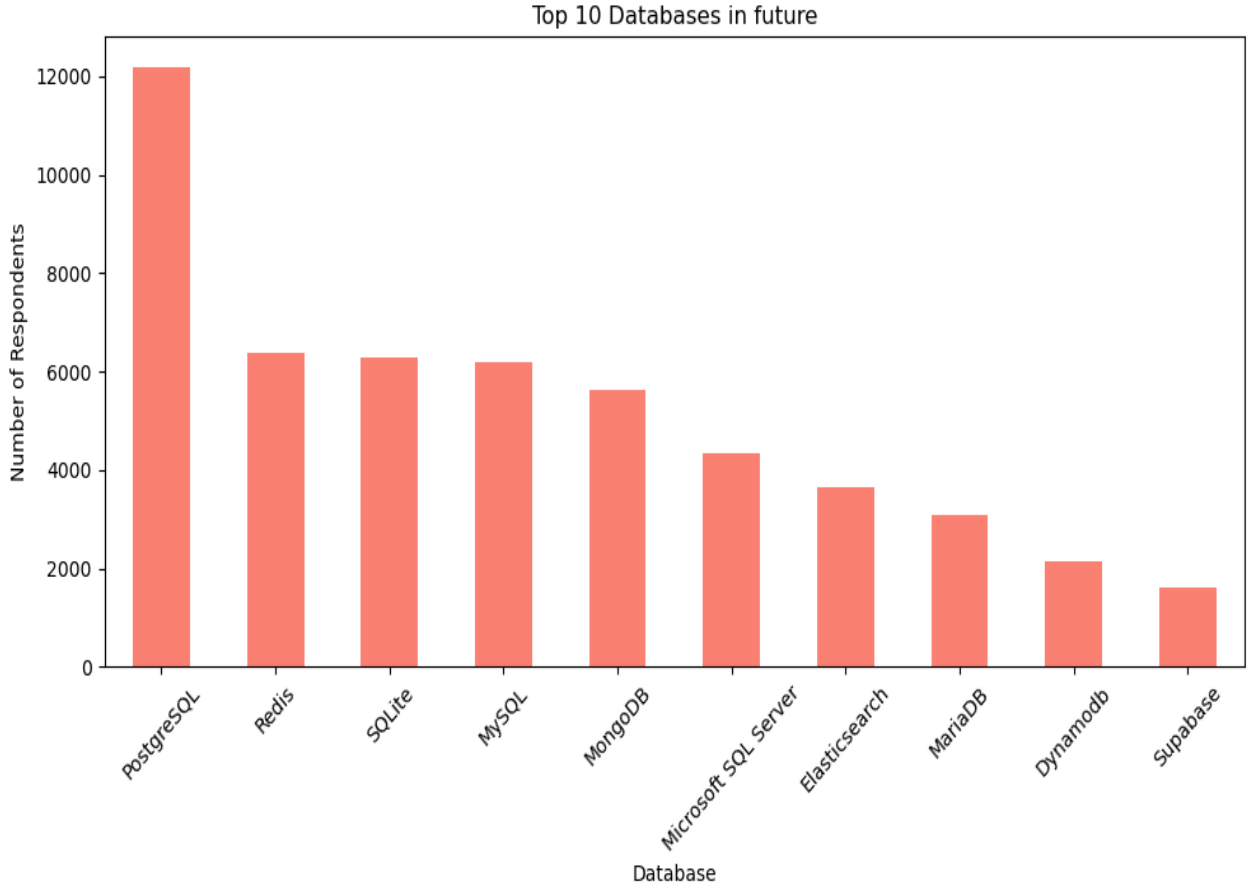
- Developers should focus on mastering JavaScript and TypeScript to stay competitive.
- Organizations may benefit from investing in Go and Rust for performance-critical projects.
- Continued emphasis on Python skills will support diverse applications, including data science and automation.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL is both the most used and most desired database among developers.
- Traditional databases like MySQL, SQLite, and Microsoft SQL Server remain highly used.
- Interest in newer, high-performance databases like Redis and Supabase is increasing.

Implications

- Developers should deepen expertise in PostgreSQL due to its widespread use and demand.
- Legacy systems still rely heavily on MySQL and SQL Server, indicating continued relevance in enterprise environments.
- Organizations exploring real-time and scalable applications should consider integrating Redis or Supabase into their tech stack.

DASHBOARD

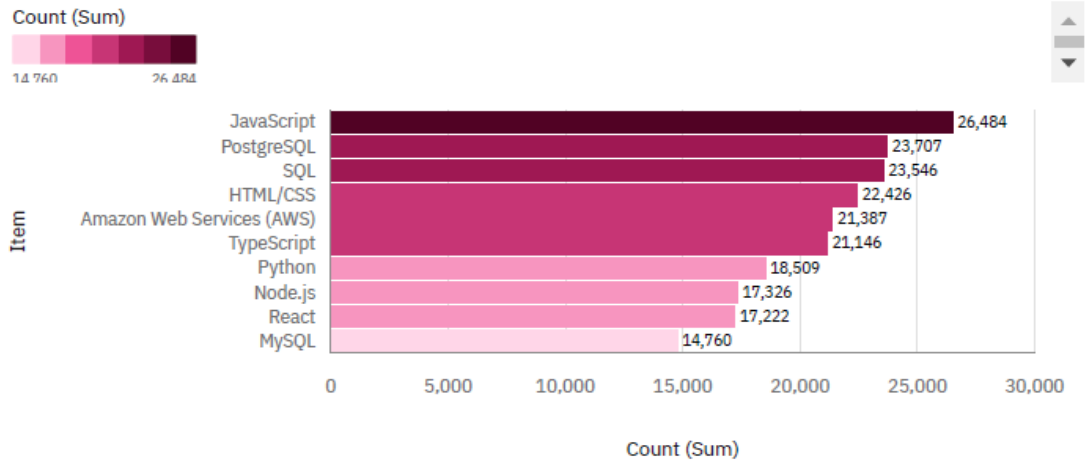
Link for the Cognos dashboard

https://github.com/Farhanaislam1/IBM-Data-Analyst-Capstone-Project/blob/main/Capstone-dashboard-1-2.pdf

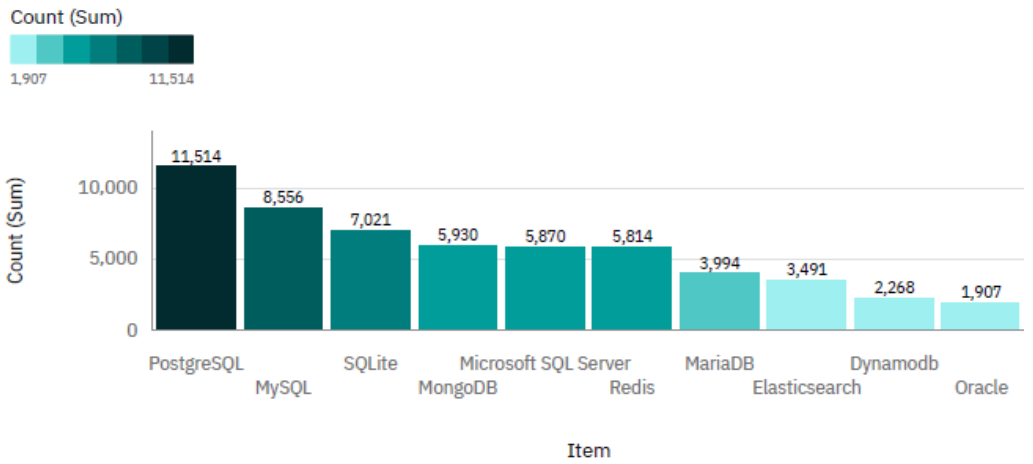
https://github.com/Farhanaislam1/IBM-Data-Analyst-Capstone-Project/blob/main/Demographic%20dashboard.pdf

DASHBOARD TAB 1-Current Technology Usage

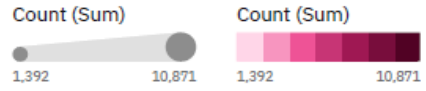
Top 10 Programming Languages Used



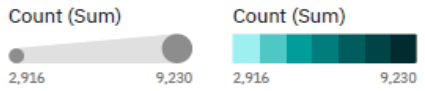
Top 10 Databases Used

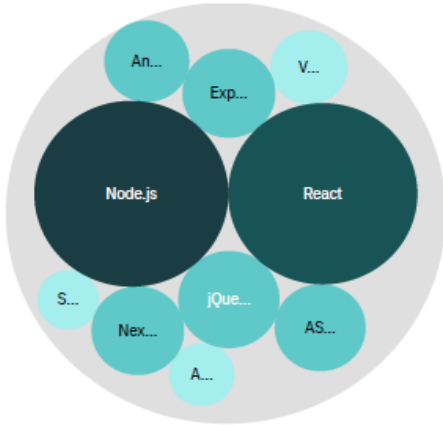


Top 10 Platforms Used



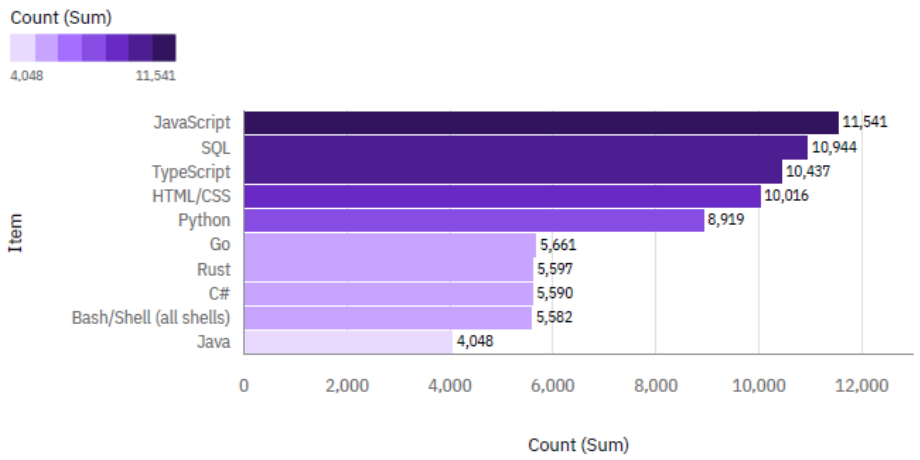
Top 10 Web Frameworks Used



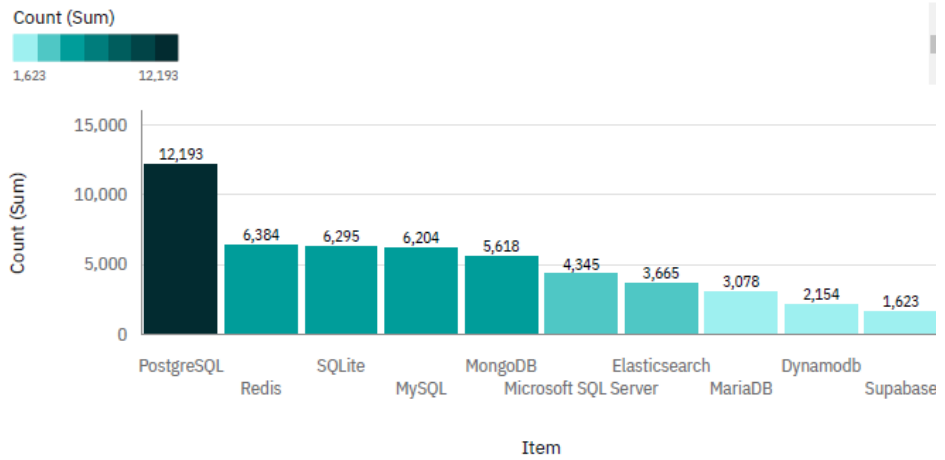


DASHBOARD TAB 2-Future Technology Trend

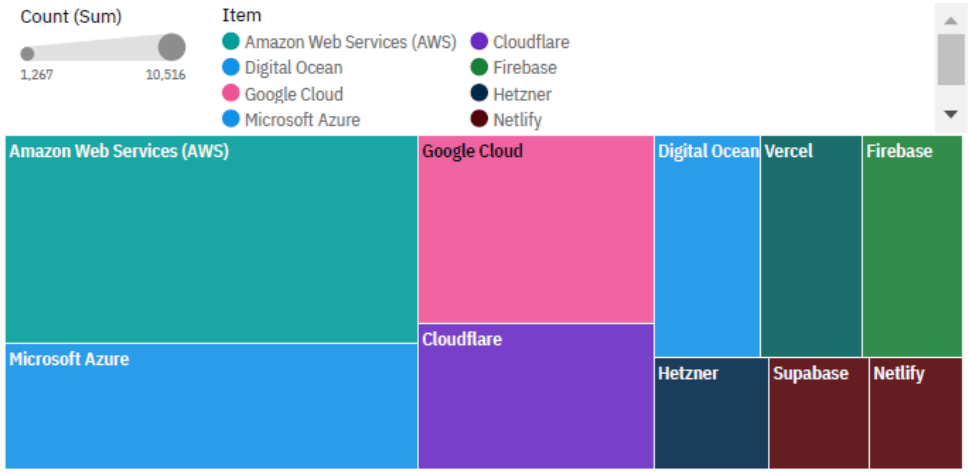
Top 10 Programming Languages to Work With



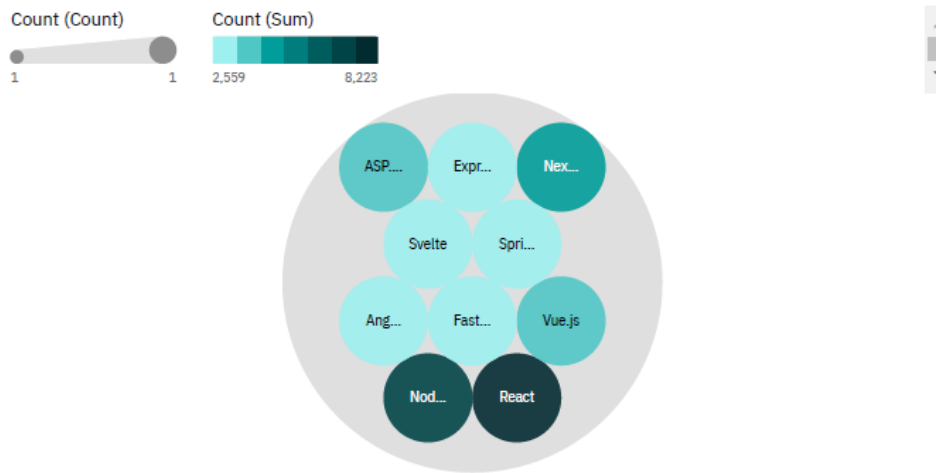
Top 10 Databases to Work With



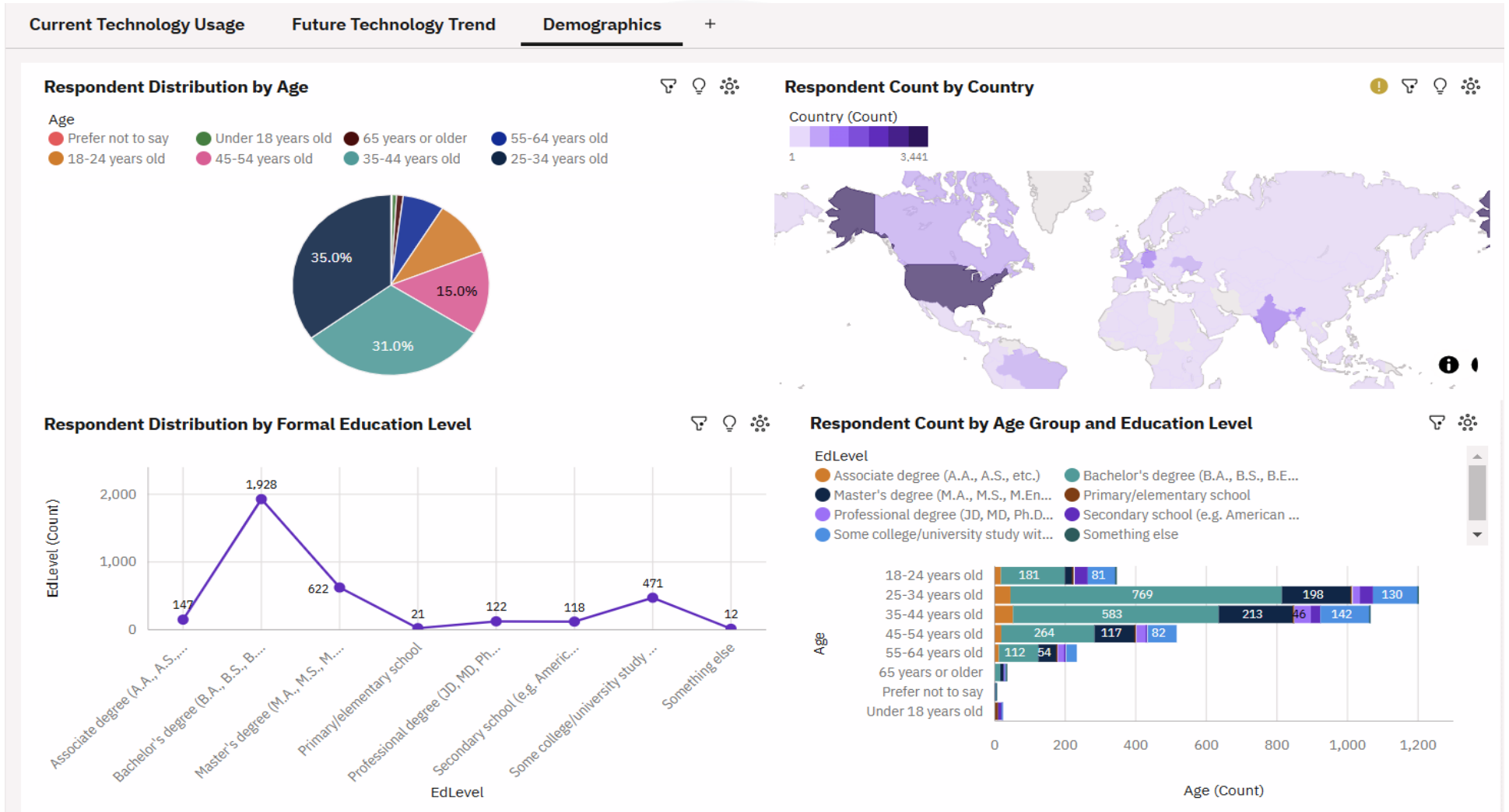
Top 10 Platforms to Work With



Top 10 Web Frameworks to Work With



DASHBOARD TAB 3-Demographics



DISCUSSION-Insights from Dashboard

- **Technology Usage:**
  - **JavaScript** and **PostgreSQL** dominate both current and future landscapes.
  - **AWS** leads in cloud platform usage; **React** and **Node.js** are the top frameworks.
- **Trends:**
  - Growing interest in modern tools like **TypeScript, Go, Rust, & Supabase**.
  - **Redis** is gaining traction for real-time applications.

DISCUSSION-Insights from Dashboard

Demographics:

Age Distribution

- The largest respondent group is **25–34 years old (35%)**, followed closely by **35–44 years (31%)**.
- Only **15%** of respondents are aged **45–54**, highlighting a younger-skewed developer population.

Geographic Concentration

- The survey has a **strong bias toward a few countries**, especially the **United States**, which leads by a significant margin.
- Other top countries include **Germany**, **India**, and the **United Kingdom**.
- This geographic skew suggests that insights may primarily reflect developer experiences in these regions.

3. Education Trends by Age

- **Bachelor's degree** is the most common education level across nearly all age groups.
- Younger respondents (e.g., under 25) show more "Some college" or "Currently studying," while older groups trend toward **Master's and Doctorate degrees**.
- This reflects traditional education pathways but also highlights lifelong learning patterns in tech careers.

OVERALL FINDINGS & IMPLICATIONS

Findings

- JavaScript, Python, and SQL are consistently the top programming languages for both current use and future interest.
- PostgreSQL leads as the most used and desired database, while emerging tools like Redis and Supabase gain traction.
- Most respondents are **aged 25–44**, with most holding a **Bachelor's or Master's degree**, and are concentrated in a few countries like the USA, Germany, and India.

Implications

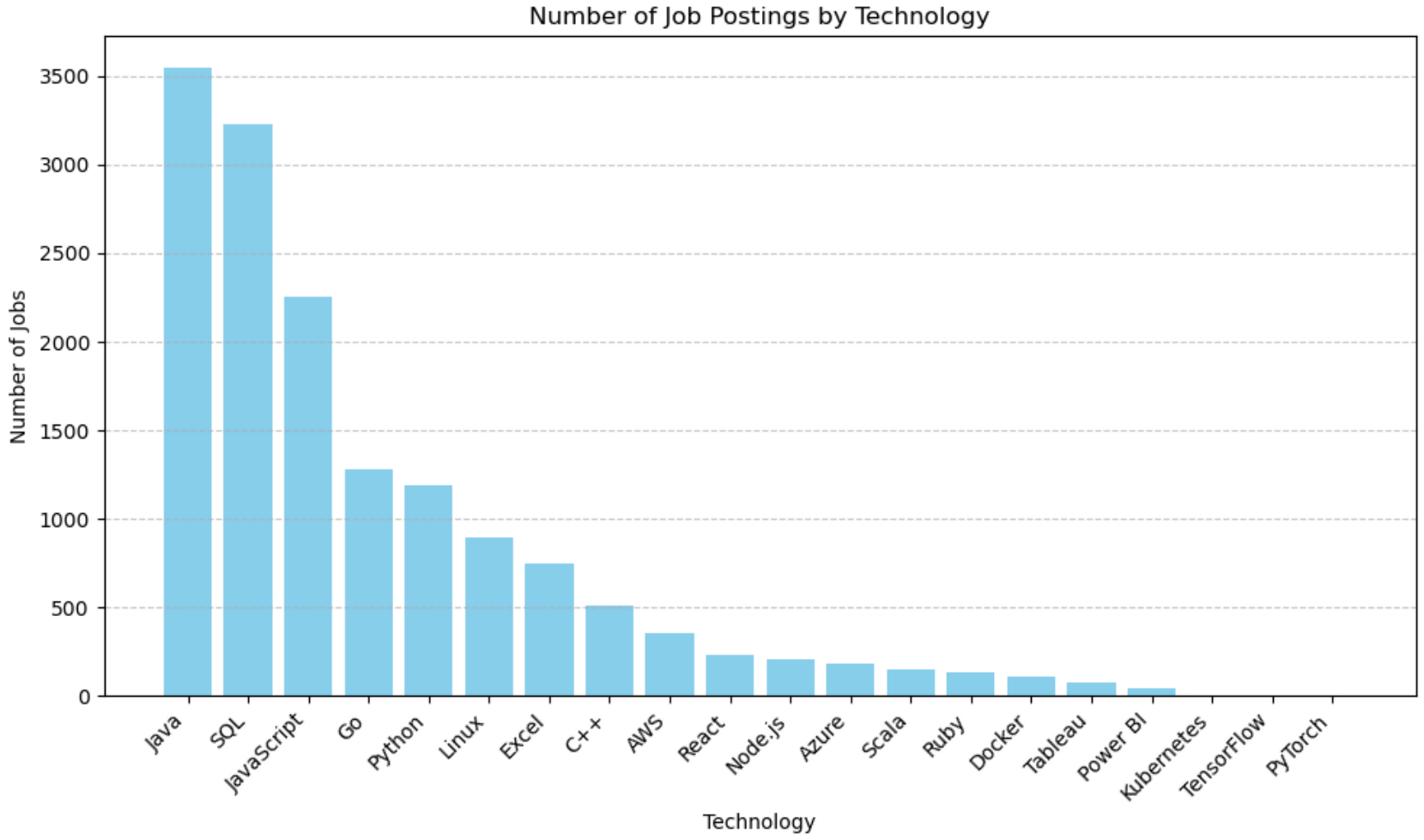
- Developers should **prioritize learning versatile and high-demand languages** to stay competitive in the job market.
- Organizations should consider **investing in modern, scalable technologies** to attract top talent and stay future-ready.
- Survey results should be **interpreted with awareness of demographic and regional biases** that may influence global generalizations.

CONCLUSION

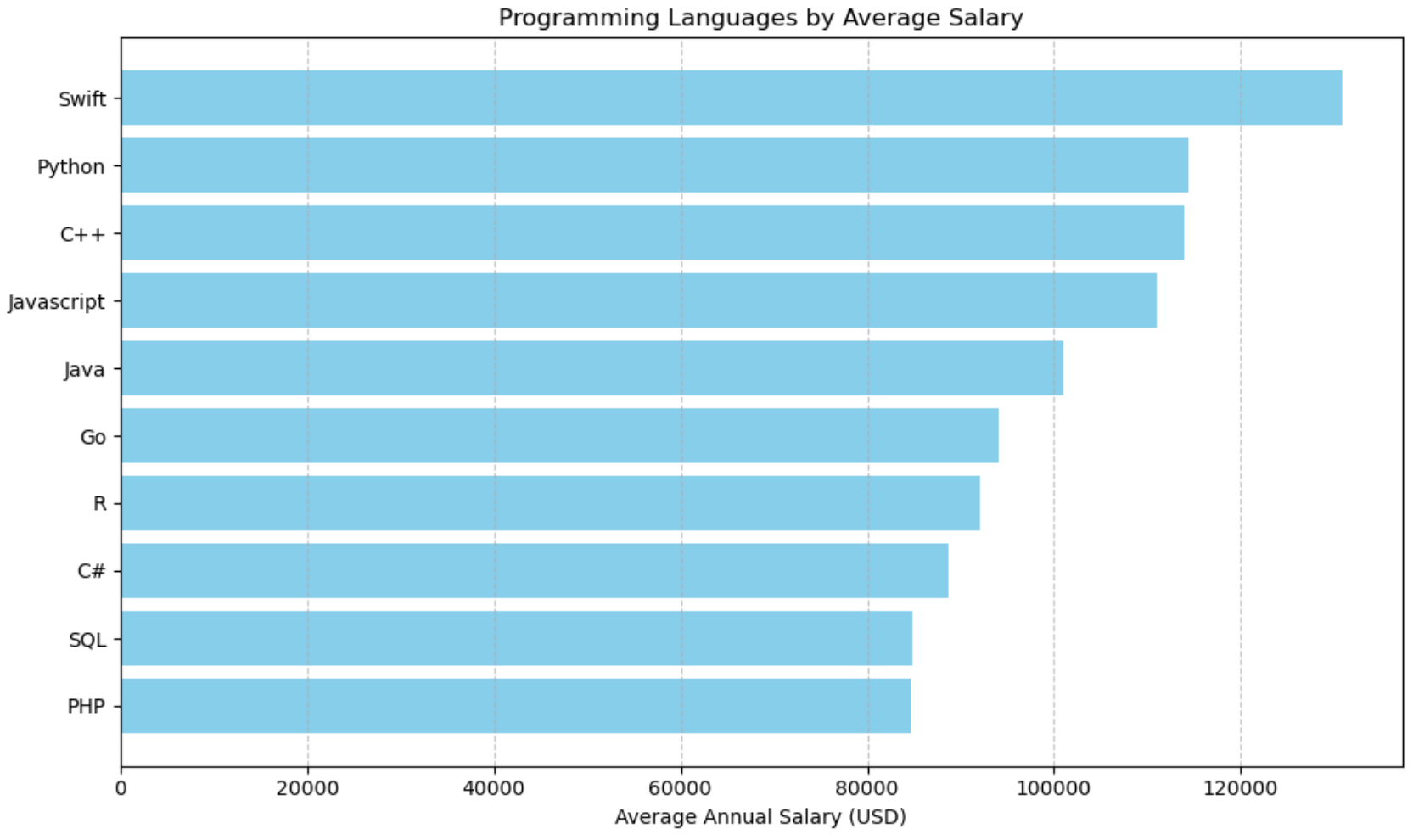
- JavaScript, Python, and SQL are the most dominant programming languages now and in future projections.
- PostgreSQL leads in database usage and preference, with increasing interest in modern options like Redis and Supabase.
- The developer community is young and globally diverse, but responses are heavily concentrated in a few countries.
- Education levels vary by age, with Bachelor’s and Master’s degrees most common, reflecting both formal and alternative learning paths.

APPENDIX

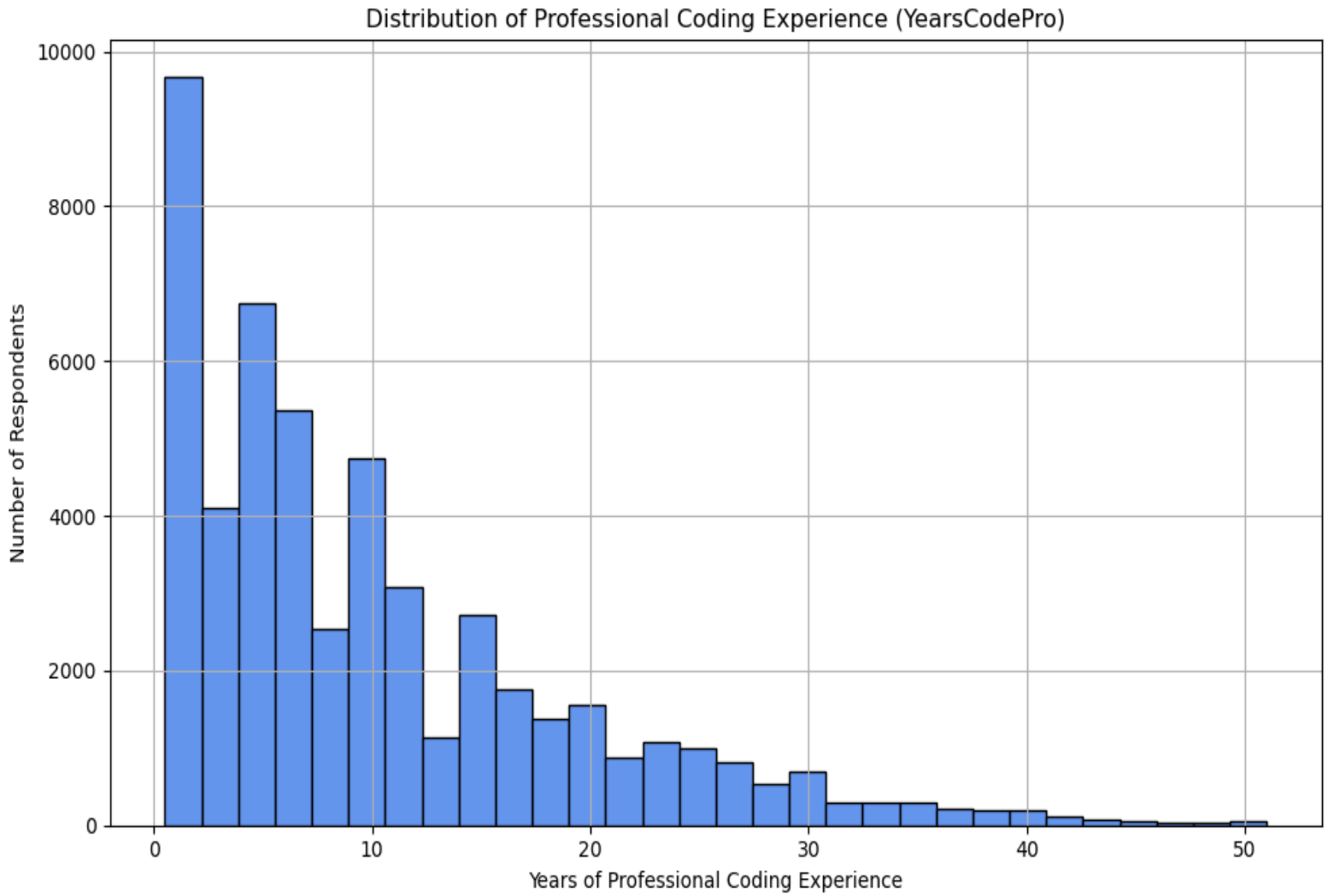
JOB POSTINGS



POPULAR LANGUAGES



DISTRIBUTION OF PROFESSIONAL CODING EXPERIENCE



TOP 20 COUNTRIES BY RESPONDENTS