

# Trends in Technology

## Part 1



© IBM Corporation. All rights reserved.

# OUTLINE

---



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

# EXECUTIVE SUMMARY

---



- **Objective:** This report analyzes current and future trends in programming languages, databases, and technology skills, based on data from Stack Overflow, IBM, and GitHub job postings.
- **Key Findings:**
  - **JavaScript** is the most popular programming language today and will remain in demand in the future.
  - **MySQL** leads in database usage, but **PostgreSQL** is projected to see more demand moving forward.
- **Methodology:** Data was collected, cleaned, analyzed, and visualized using dashboards to highlight key trends.
- **Implications:**
  - Professionals should focus on in-demand skills like JavaScript and PostgreSQL.
  - Companies should adapt to emerging technologies like AI and cloud computing.
- **Conclusion:** Understanding these trends will help organizations and individuals stay competitive in the evolving IT sector.



# INTRODUCTION

---



Stack Overflow's annual Developer Survey is the largest and most comprehensive survey of developers worldwide.

Key points to note:

- The survey captures responses from nearly **90,000 developers**.
- **Results** reflect trends and **predict future developer needs**.
- **Global developer characterization** based on skills, preferences, and experience.

This presentation uses **data analytics** to highlight key trends in the demand for skills across:

- **Programming Languages**
- **Databases**
- **Platforms**
- **Web Frameworks**

**Key Inquiries Addressed:**

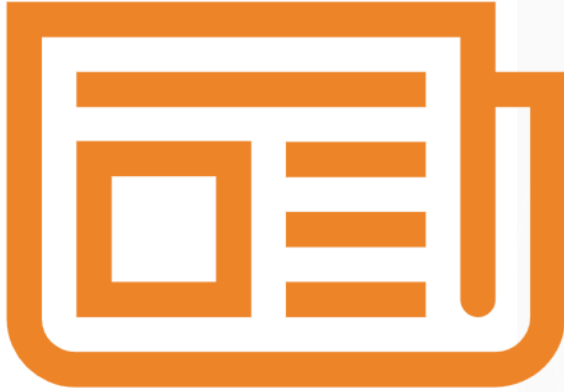
- Which programming languages are most in demand today?
- What are the most in-demand database skills?
- What popular IDEs or Web frameworks are trending?

The target audience for this research includes **IT professionals**, **HR managers**, and anyone interested in understanding the most relevant and **in-demand IT skills** today and in the future.



# METHODOLOGY

---



## 1. Data Collection & Exploration

- **Survey Data Collection:** Collected data from the Stack Overflow Developer Survey and other external sources.
- **Web Scraping:** Utilized web scraping to gather programming language wage data from IBM's website.
- **APIs:** Data on current job listings and technology demand were gathered using the GitHub Jobs API.

## 2. Data Wrangling

- Cleaned and preprocessed the dataset for analysis.
- Handled missing values and data inconsistencies.

## 3. Exploratory Data Analysis (EDA)

- **Analyzed Data Distribution:** Investigated the spread of data across key variables.
- **Outlier Detection:** Identified and handled outliers to ensure data quality.
- **Correlation Analysis:** Evaluated relationships between various columns to find insights.

## 4. Data Visualization

- Created various charts, graphs, and dashboards to highlight data trends, distributions, and comparisons.
- **Tools Used:** Python, Jupyter Notebook, Visual Studio Code, and Cognos Analytics for visualizations.

## 5. Dashboard Creation

- Dashboards were designed to present key metrics in an interactive format for better decision-making.



# RESULTS

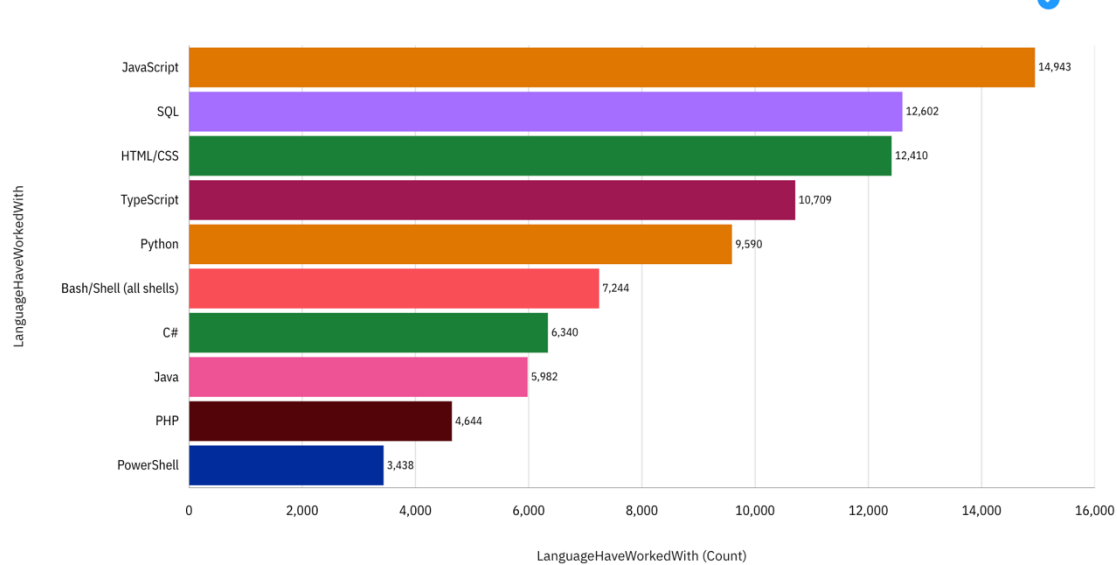
---



# PROGRAMMING LANGUAGE TRENDS

## Current Year

Top 10 Programming Languages by Usage

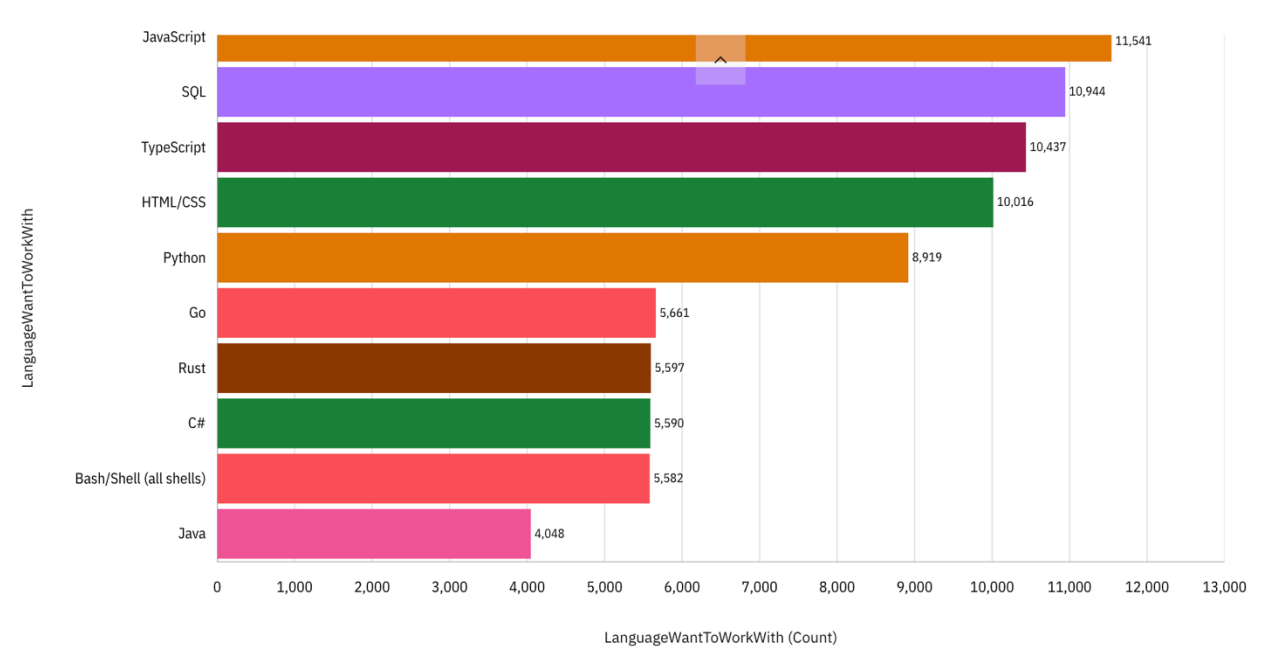


LanguageHaveWorkedWith

- Bash/Shell (all shells)
- C#
- HTML/CSS
- Java
- JavaScript
- PHP
- PowerShell
- Python
- SQL
- TypeScript

## Next Year

Most Desired Programming Languages for the Future



LanguageWantToWorkWith

- Bash/Shell (all shells)
- C#
- Go
- HTML/CSS
- Java
- JavaScript
- Python
- Rust
- SQL
- TypeScript



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

### 1. Top 10 Programming Languages by Usage:

1. **JavaScript** leads with 14,943 users.
2. **SQL** and **HTML/CSS** follow closely with 12,602 and 12,410 users respectively.
3. **TypeScript** and **Python** are also popular with 10,709 and 9,590 users.
4. **Bash/Shell (all shells)**, **C#**, **Java**, **PHP**, and **PowerShell** complete the top ten.

### 2. Most Desired Programming Languages for the Future:

1. **JavaScript** remains the most desired, with 11,541 respondents wanting to work with it.
2. **SQL**, **TypeScript**, and **HTML/CSS** are also highly desired.
3. **Python** remains a favorite, while **Go** and **Rust** are emerging as popular choices.
4. **C#**, **Bash/Shell (all shells)**, and **Java** are still desired by many.

## Implications

**Educational Focus:** Educational institutions and coding bootcamps should prioritize teaching **JavaScript**, **SQL**, **HTML/CSS**, **TypeScript**, and **Python**. These languages are both widely used and highly desired, ensuring students are equipped with market-relevant skills.

**Hiring Strategies:** Companies seeking to hire developers should focus on candidates proficient in these top programming languages. Additionally, **Go** and **Rust** are emerging as essential skills, and fostering proficiency in these languages can provide a competitive advantage.

**Career Development:** Developers should focus on gaining expertise in the most in-demand and desired languages, such as **JavaScript** and **Python**, to enhance their career prospects. Familiarity with emerging languages like **Go** and **Rust** will be beneficial in the long run.

**Tool and Technology Adoption:** Organizations should align their tech stacks with the most popular programming languages, such as **JavaScript**, **SQL**, and **Python**, to attract top talent. Adopting tools and frameworks compatible with these languages can streamline development processes and improve overall efficiency.

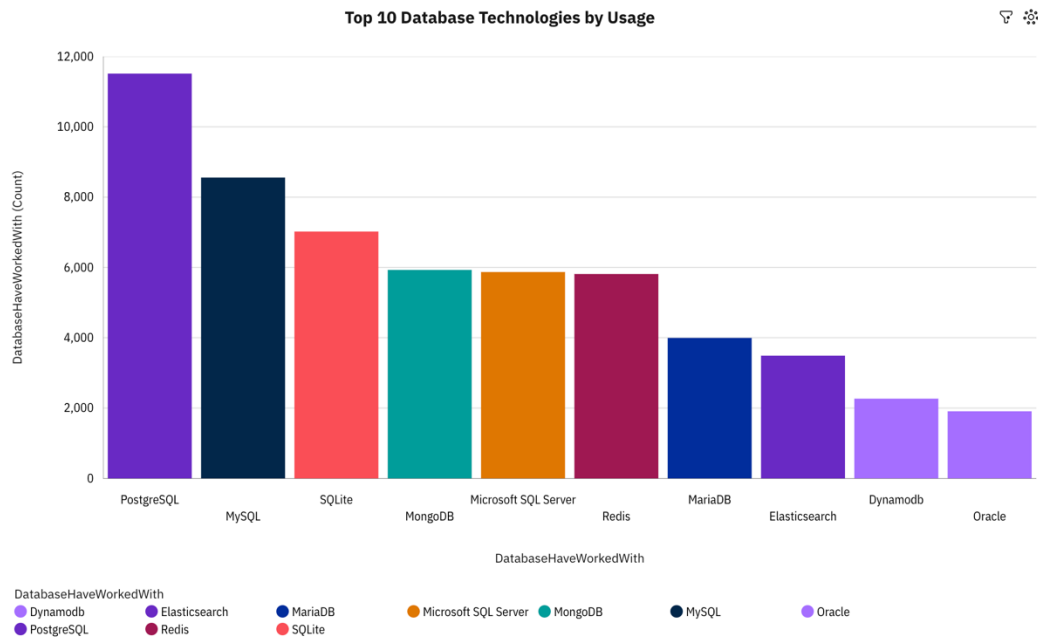
**Community and Support:** The large communities surrounding **JavaScript**, **SQL**, **HTML/CSS**, **TypeScript**, and **Python** provide developers with extensive resources, libraries, and support, enhancing productivity and fostering innovation in development.





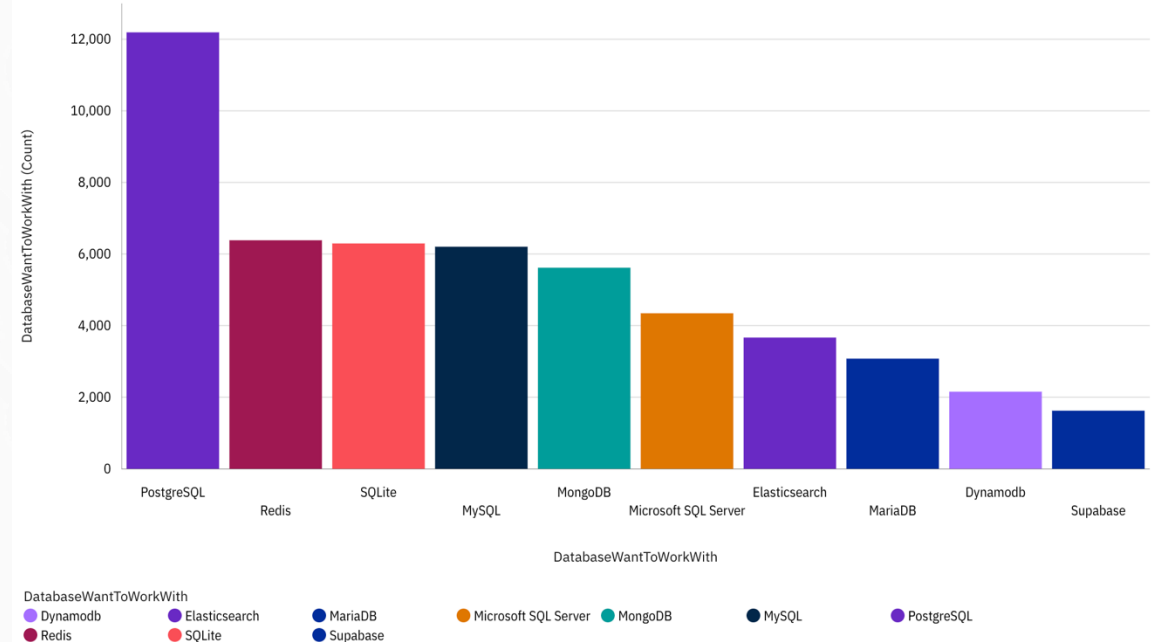
# DATABASE TRENDS

## Current Year



## Next Year

Most Desired Databases for Future Work



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

## Findings

### Current Top 10 Database Technologies by Usage:

- **PostgreSQL**, **MySQL**, and **SQLite** are the most widely used.
- **MongoDB**, **Redis**, and **MariaDB** follow closely.

### Future Desired Database Technologies:

- **PostgreSQL** remains the most desired.
- **Redis**, **SQLite**, and **MongoDB** show strong future demand.
- **Supabase** is gaining traction.

## Implications

**Educational Focus::** Educational institutions should prioritize teaching databases like PostgreSQL, MySQL, MongoDB, and Redis. These technologies are widely used and will equip students with essential skills for modern data management.

**Hiring Strategies:** Companies should focus on candidates skilled in PostgreSQL, MySQL, MongoDB, and Redis, as these technologies dominate the database landscape. Additionally, familiarity with emerging platforms like Supabase can provide a competitive advantage.

**Career Development:** Developers should gain proficiency in PostgreSQL, MySQL, and MongoDB to stay competitive. Learning technologies like Redis for caching and Elasticsearch for search optimization will enhance career prospects.

**Tool and Technology Adoption:** Organizations should integrate popular databases like PostgreSQL, MySQL, and MongoDB into their tech stacks. Adoption of platforms such as Redis and Elasticsearch can enhance performance and scalability.

**Community and Support:** With robust communities surrounding PostgreSQL, MySQL, MongoDB, and Redis, developers have access to a wealth of resources, documentation, and libraries to accelerate their work and drive innovation.



# DASHBOARD

---



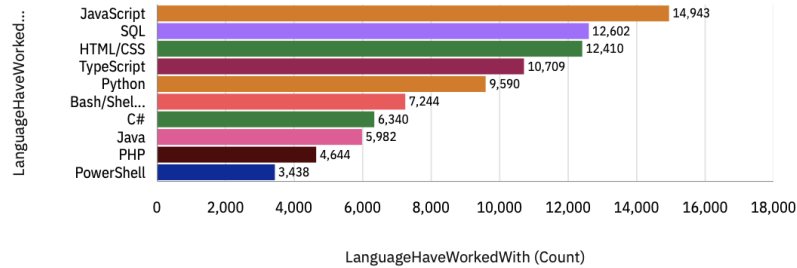
<Please present your dashboard in the following slides.>

# DASHBOARD TAB 1

## Current Technology Usage

### Top 10 Programming Languages by Usage

1

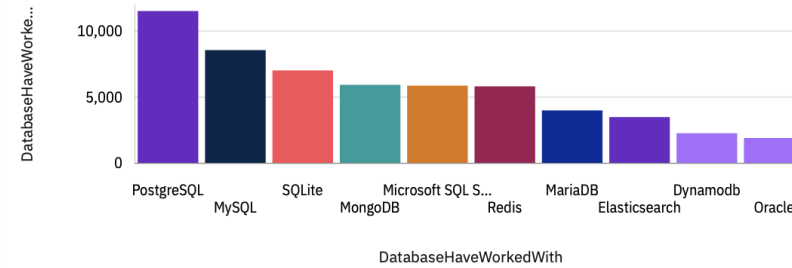


LanguageHaveWorkedWith

- Bash/Shell (all shells)
- C#
- HTML/CSS
- Java
- JavaScript
- PHP
- PowerShell
- Python
- SQL
- TypeScript

### Top 10 Database Technologies by Usage

2

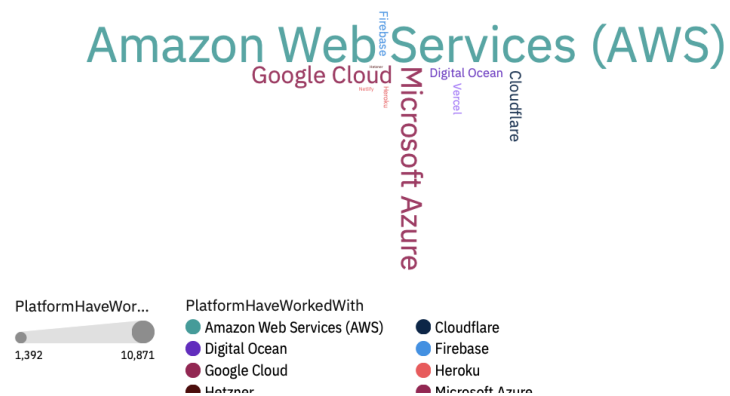


DatabaseHaveWorkedWith

- DynamoDB
- Elasticsearch
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- Oracle
- PostgreSQL
- Redis
- SQLite

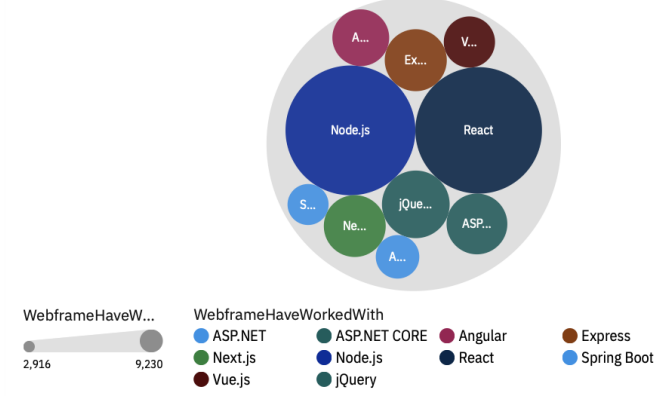
### Top 10 Platforms by Usage

3



### Top 10 Web Frameworks by Usage

4

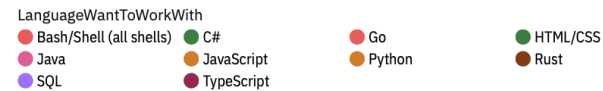
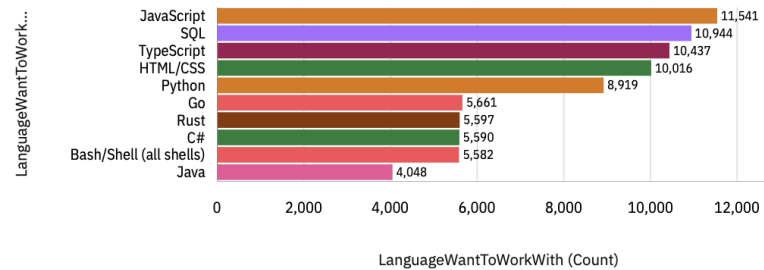


# DASHBOARD TAB 2

## Future Technology Trend

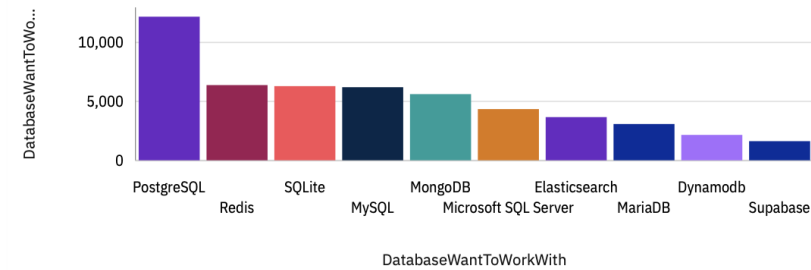
### Most Desired Programming Languages for the Future

5



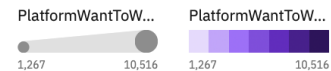
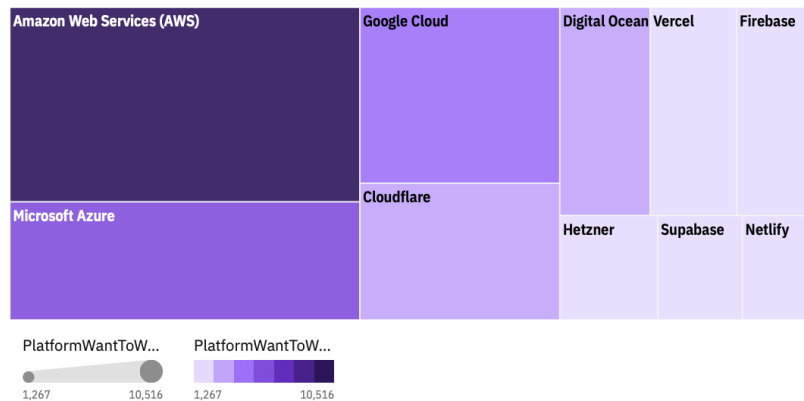
### Most Desired Databases for Future Work

6



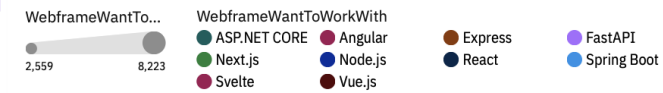
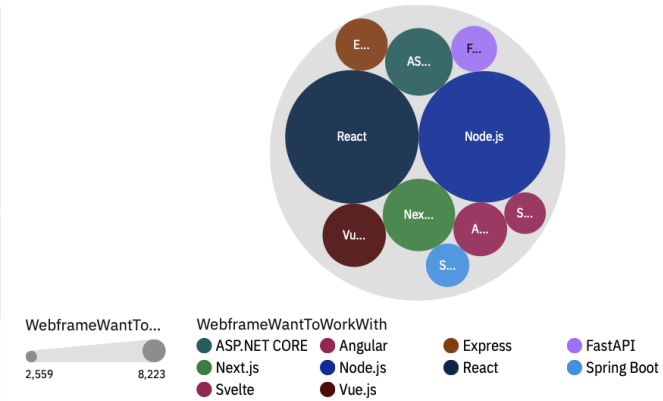
### Most Desired Platforms for Future Work

7



### Most Desired Web Frameworks for Future Work

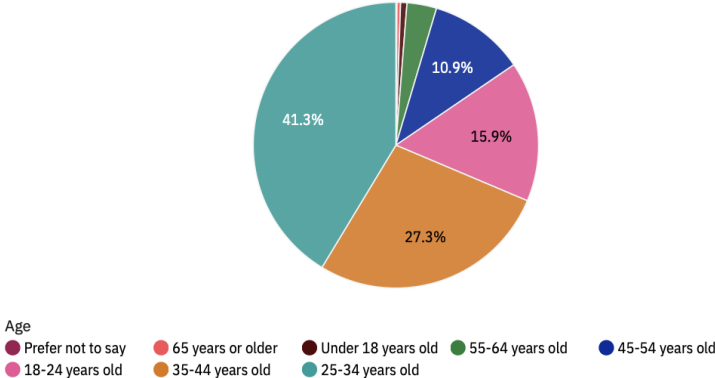
8



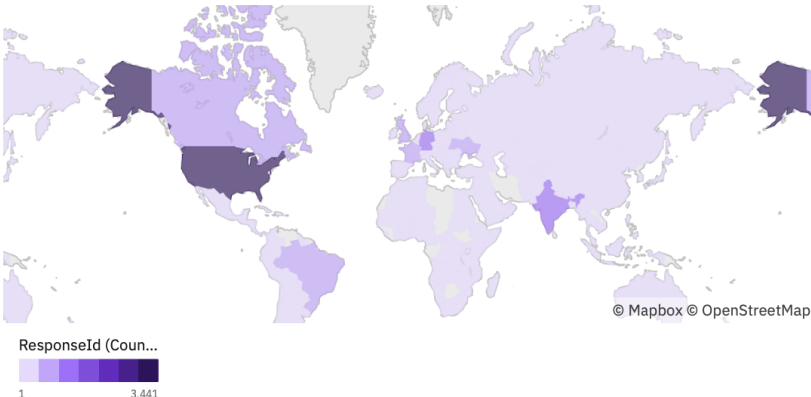
# DASHBOARD TAB 3

## Demographics

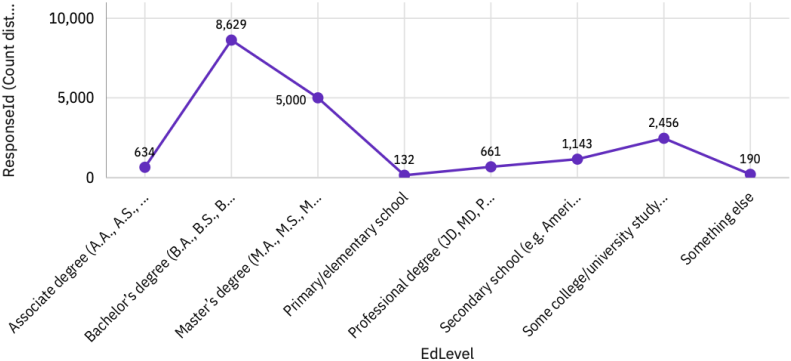
Age Demographics of Survey Participants



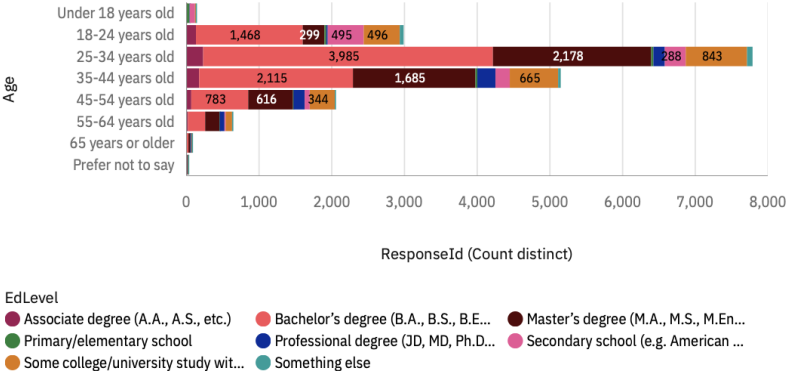
Geographical Distribution of Respondents



Respondent Distribution by Education Level



Age Distribution of Respondents by Education Level



# DISCUSSION

---



- **JavaScript & PostgreSQL:** Both are dominant in current usage and future demand, indicating their continued importance in web development and relational database management.
- **Emerging Technologies:** The rising demand for Go, Rust, and Redis highlights a shift toward performance optimization and real-time data processing in the tech industry.
- **Educational Focus:** Institutions should prioritize teaching both foundational technologies (JavaScript, SQL) and emerging languages (Go, Rust) to prepare students for future trends.
- **Industry & Career Implications:** Companies and developers should focus on mastering current in-demand skills while exploring emerging technologies to stay competitive and future-ready.



# OVERALL FINDINGS & IMPLICATIONS

---

## Findings

- **Programming Languages:** JavaScript, SQL, HTML/CSS, TypeScript, and Python are the most widely used and desired programming languages, with JavaScript leading both in current usage and future demand.
- **Database Technologies:** PostgreSQL, MySQL, MongoDB, and Redis are the most prominent database technologies, with PostgreSQL leading in both current usage and future desirability. Emerging technologies like Supabase show growing interest.
- **Technologies in Demand:** Developers should focus on mastering these key technologies to enhance their career prospects. Emerging languages like Go, Rust, and databases like Redis and Supabase are gaining traction.

## Implications

- **Educational Focus:** Educational institutions and coding bootcamps should emphasize JavaScript, SQL, Python, PostgreSQL, and MongoDB to ensure students are equipped with market-relevant skills.
- **Hiring Strategies:** Companies seeking to hire developers should prioritize candidates skilled in JavaScript, SQL, Python, PostgreSQL, MySQL, and MongoDB. Proficiency in emerging technologies like Go, Rust, Redis, and Supabase will provide a competitive edge.
- **Career Development:** Developers should focus on mastering the most in-demand technologies such as JavaScript, SQL, Python, and PostgreSQL. Familiarity with emerging technologies like Go, Rust, Redis, and Supabase will further enhance career growth.
- **Tool and Technology Adoption:** Organizations should align their tech stacks with these popular technologies to attract top talent and improve performance. Adopting tools that support JavaScript, SQL, Python, PostgreSQL, and MongoDB will streamline development processes.
- **Community and Support:** The large, active communities surrounding these technologies offer extensive resources, ensuring developers can access the tools, documentation, and support needed to foster innovation and stay ahead of trends.





# CONCLUSION

---



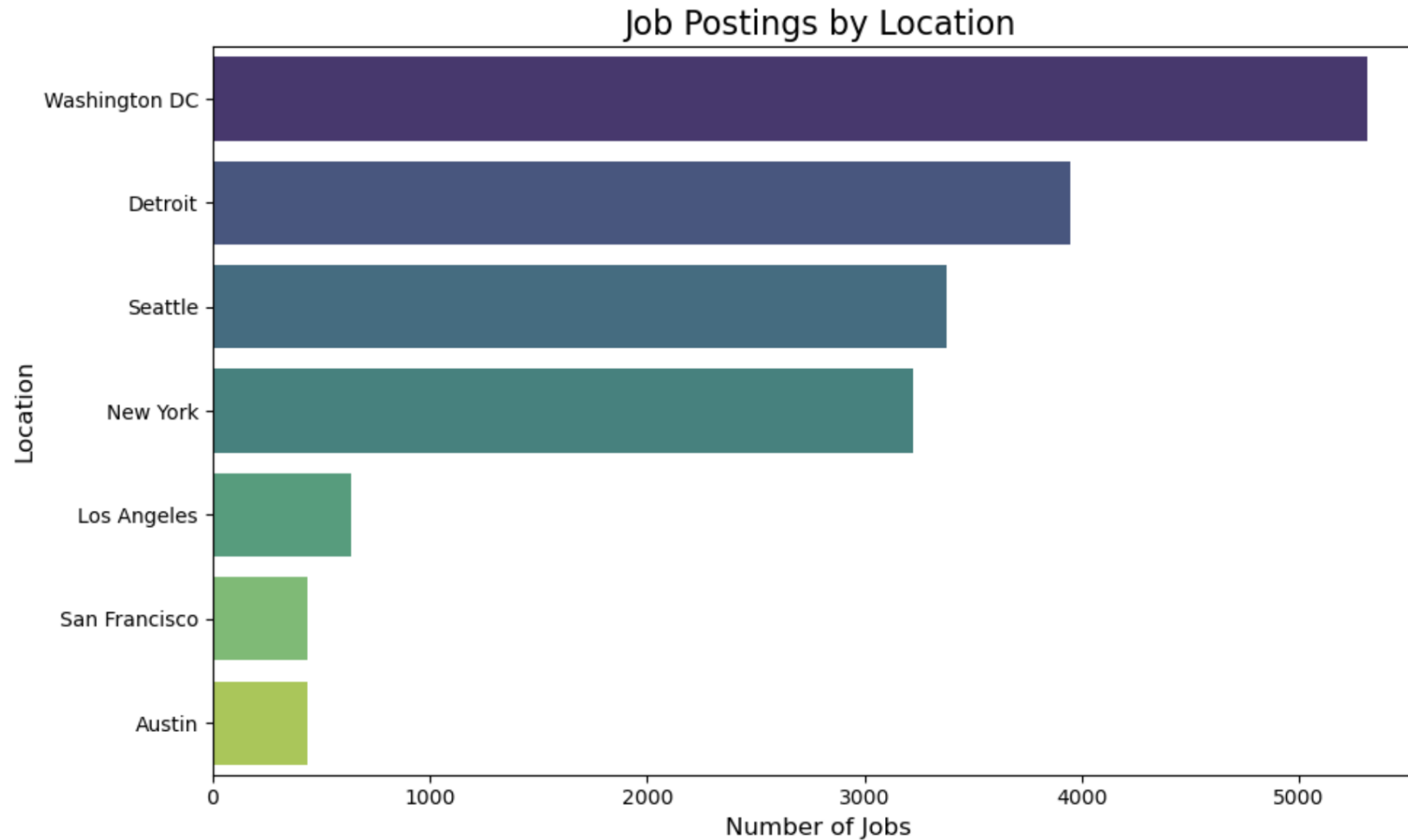
- **Current Dominance:** JavaScript, SQL, and PostgreSQL remain the most widely used and in-demand technologies, indicating their key role in both development and data management.
- **Emerging Technologies:** Growing interest in Go, Rust, Redis, and other tools highlights the shift toward scalable, high-performance solutions, which will shape the future of tech.
- **Educational Focus:** Educational institutions and coding bootcamps should emphasize both widely used technologies and emerging ones to ensure that students are equipped with the skills needed for tomorrow's tech landscape.
- **Strategic Alignment:** Organizations and developers should stay aligned with current trends while also fostering skills in emerging technologies to stay ahead in an evolving, competitive market.

# APPENDIX

---



# JOB POSTINGS



# POPULAR LANGUAGES

