IBM Data Analyst Capstone Project: Technology Trends Survey

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OUTLINE

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EXECUTIVE SUMMARY

- **JavaScript, SQL, and HTML/CSS** dominate current programming language usage.
- **PostgreSQL** leads database adoption, with **MySQL** and **SQLite** close behind.
- **Node.js and React** are the most widely used and desired web frameworks.
- **AWS** is the leading platform for deployment and cloud services.
- Future trends show rising interest in **TypeScript, Python, Rust, Redis, and MongoDB**.
- The developer population is largely **25–34 years old**, with most holding a **Bachelor's degree**.
- Respondents represent a **global workforce**, concentrated in North America, Europe, and Asia.

INTRODUCTION

- **Purpose of the Report**
  - Analyze and visualize results from a global developer survey
  - Map the current technology landscape and forecast future trends
  - Identify shifts between technologies used today and those developers plan to learn next
- **Target Audience**
  - Technology leaders and decision-makers
  - Hiring managers and recruiters
  - Software educators and curriculum designers
  - Developers planning career growth
- **Value of the Report**
  - Compares **currently used** vs **most wanted** technologies
  - Highlights emerging trends (e.g., growing interest in Rust and TypeScript)
  - Provides demographic insights into the global developer community
  - Supports strategic decisions in hiring, training, and tech investments

METHODOLOGY

- **Data Source:**
  - Stack Overflow Developer Survey 2025

- **Collection Methods:**
  - Survey responses collected from global developers
  - Includes information on technologies used, desired technologies, demographics, and work habits

- **Data Wrangling Steps:**
  - Loaded CSV into Python (Pandas) for cleaning and analysis
  - Handled missing values in multi-select and demographic columns
  - Split semicolon-separated multi-select responses into individual entries
  - Aggregated top 10 technologies for current and future trends
  - Prepared demographic distributions (Age, Country, Education)
  - Exported cleaned and aggregated data for visualization in Cognos dashboards

PROGRAMMING LANGUAGE TRENDS

Current Year
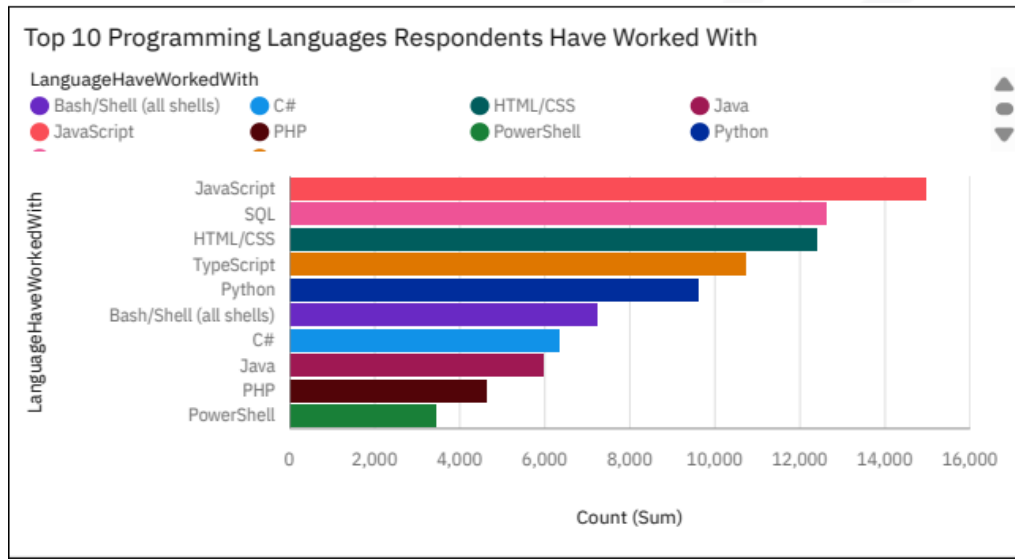
Next Year
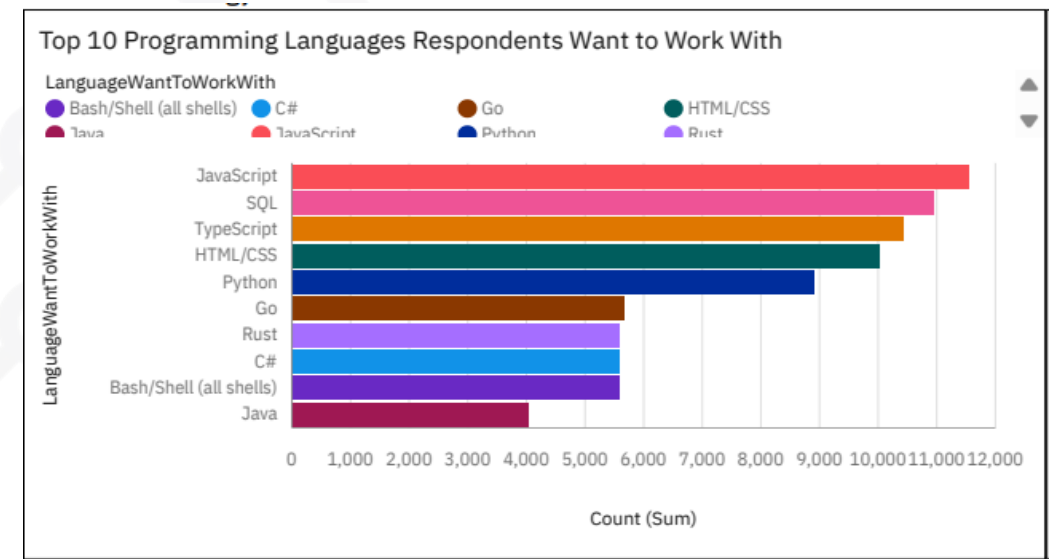
PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript, SQL, and HTML/CSS dominate current usage.
- TypeScript and Python are growing in adoption, reflecting front-end sophistication and data/automation trends.
- Java, C#, and PHP remain relevant but are lower in the top 10

Implications

- Core web development skills remain crucial for employability.
- Organizations should consider TypeScript and Python for new projects to align with market trends.
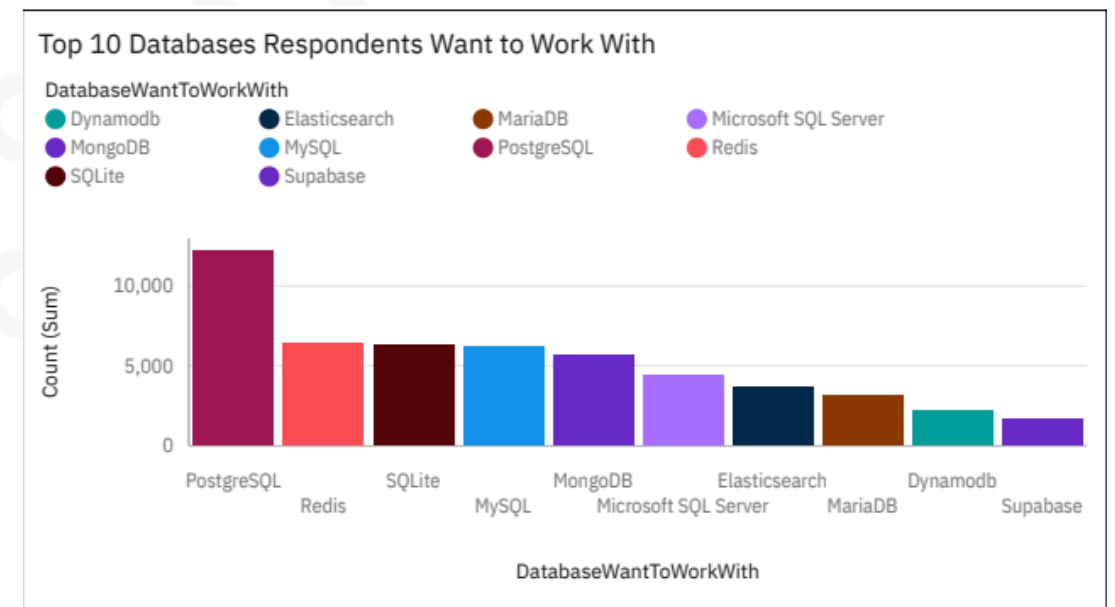- Legacy languages still matter for maintenance and enterprise environments, but focus is shifting.

DATABASE TRENDS

Current Year
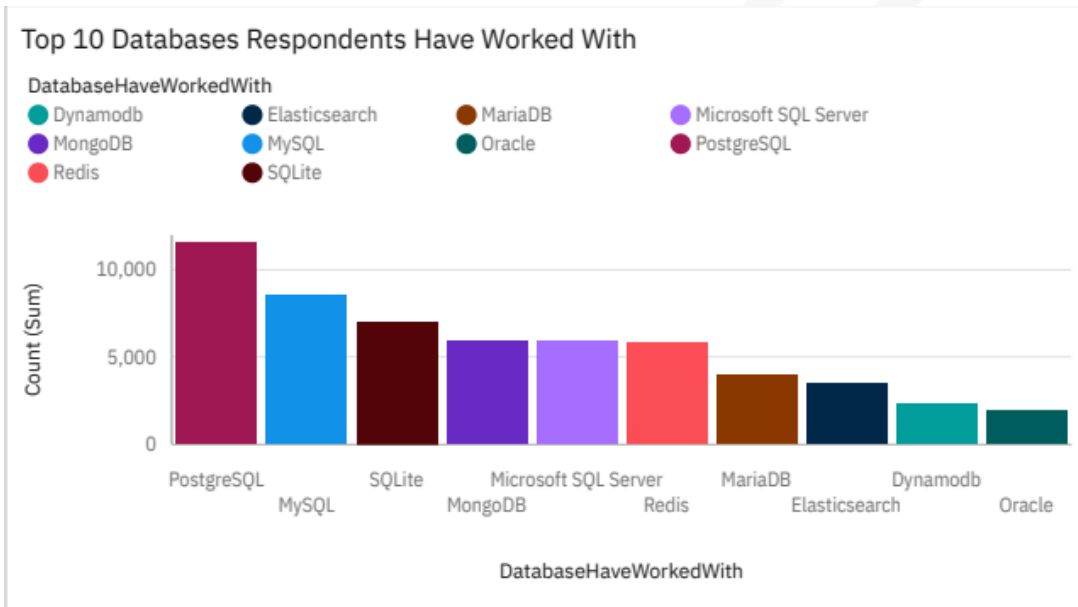
Next Year

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL leads current usage, followed by MySQL and SQLite.
- Microsoft SQL Server, MongoDB, and Redis occupy a solid middle tier.
- Cloud-native and specialized databases like DynamoDB, Elasticsearch, and Oracle round out the top 10.

Implications

- Relational databases remain the backbone of most applications.
- Middle-tier and NoSQL options indicate the need for flexible data storage strategies.
- Organizations should maintain expertise in both traditional and specialized databases for competitive advantage.
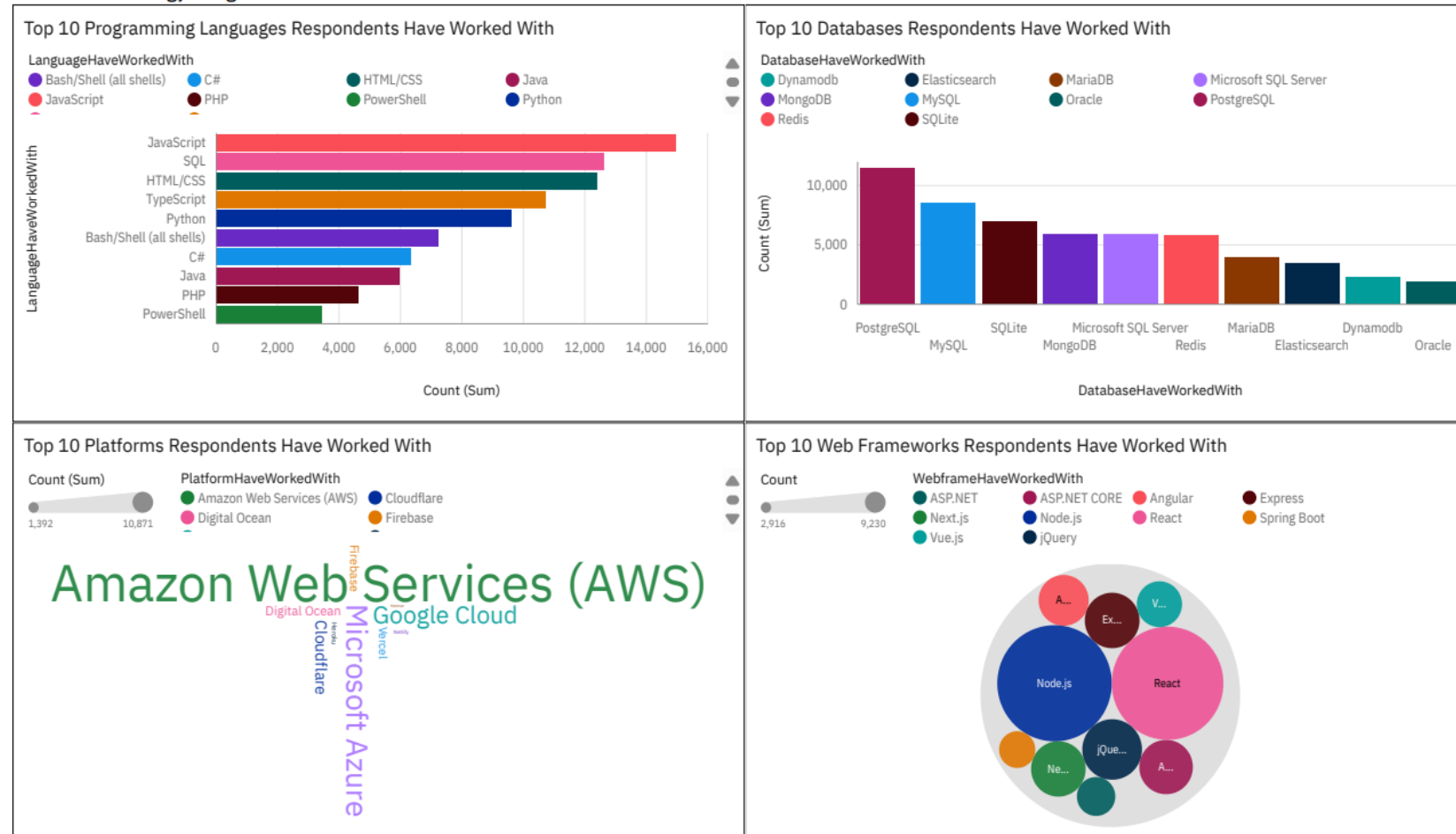
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DASHBOARD

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DASHBOARD TAB 1 – CURRENT TECHNOLOGY

DASHBOARD TAB 2 - FUTURE TECHNOLOGY
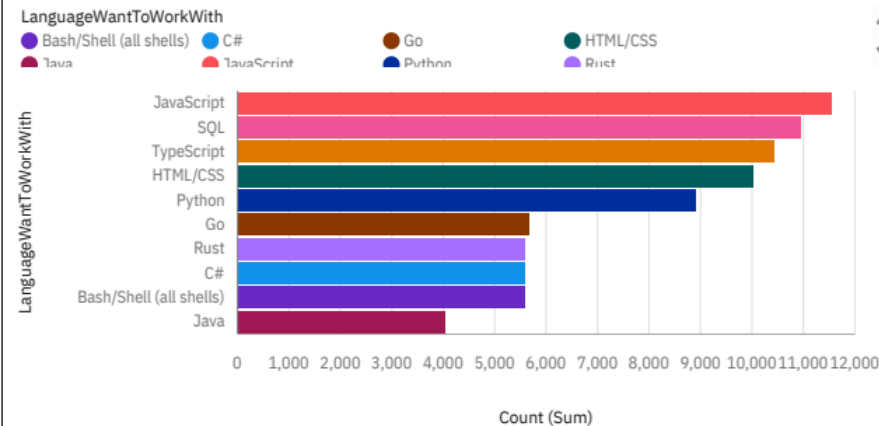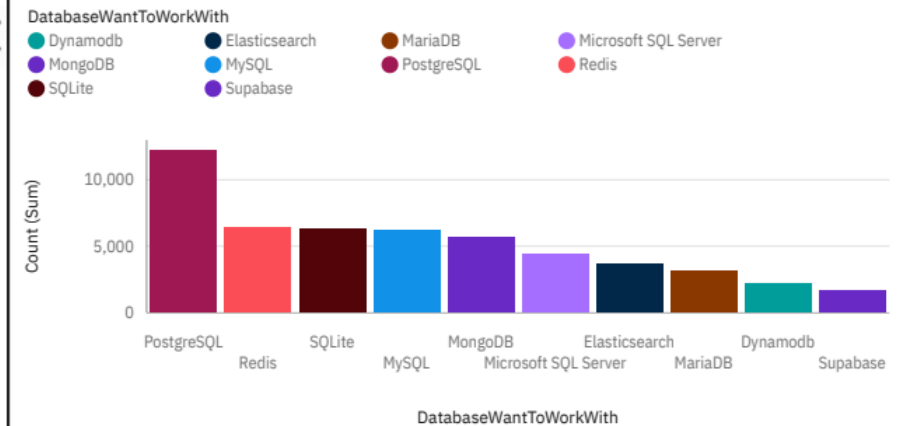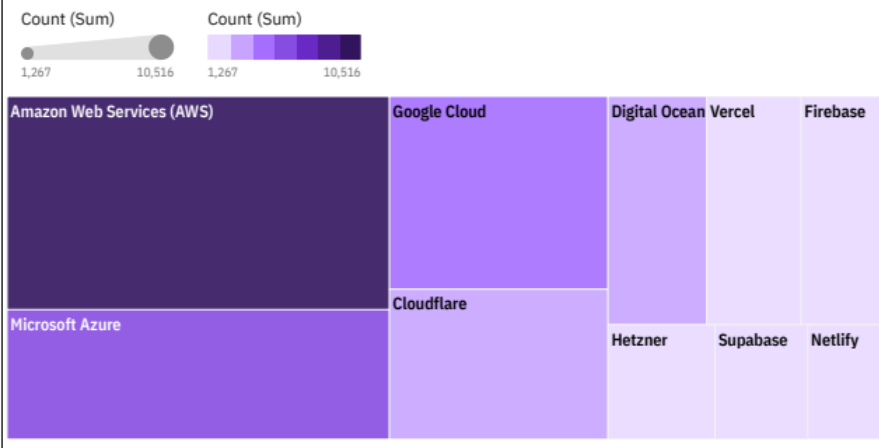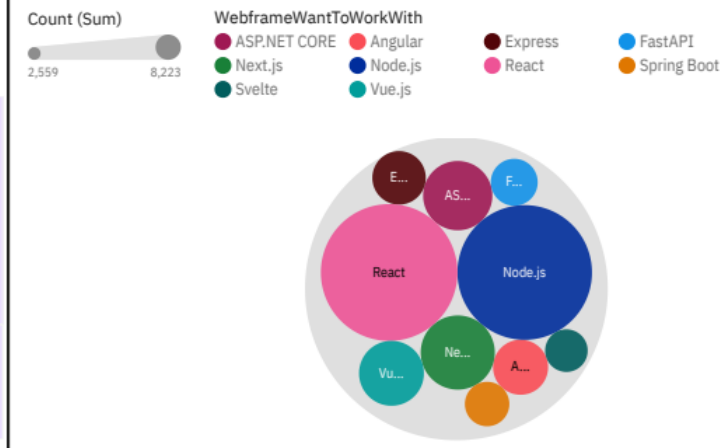
DASHBOARD TAB 3 - DEMOGRAPHICS
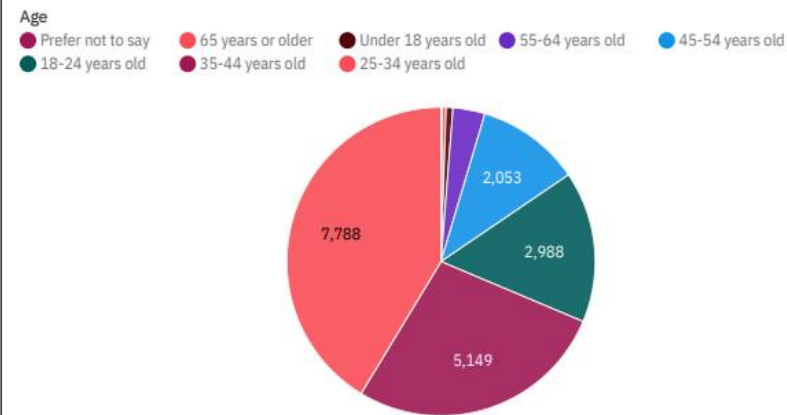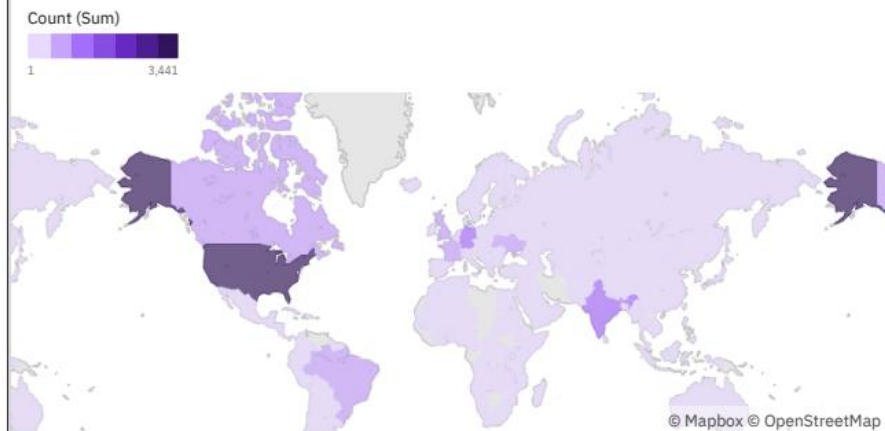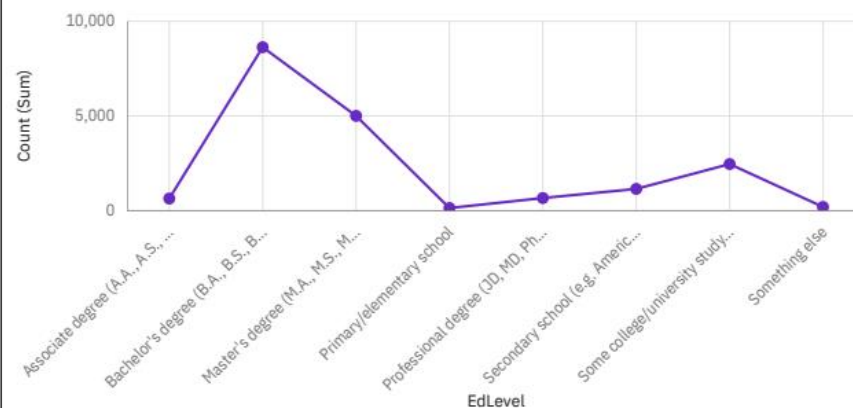
DISCUSSION

- **Technology Trends**
  - JavaScript leads current and future developer interest.
  - TypeScript is rising, now 3rd in "Want to Work With."
  - Python and Go show strong future growth potential.
- **Database & Platforms**
  - PostgreSQL dominates current and future use.
  - Redis and MongoDB are highly desired for future projects.
  - AWS remains the top cloud platform; GCP and Azure are competitive.
- **Demographics**
  - Most developers are aged 25–34.
  - A Bachelor's degree is the common education level.
  - Key talent hubs: USA, India, Germany.

OVERALL FINDINGS & IMPLICATIONS

Findings

- **PostgreSQL Dominance:** #1 database now and for the future.
- **Web Frameworks:** Node.js & React lead current and future use.
- **Language Migration:** Shift from JavaScript → TypeScript/Python; growing interest in Go & Rust.
- **Demographics:** Majority aged 25–34 with a Bachelor's degree.
- **Cloud Platforms:** AWS dominates, GCP & Azure remain significant.

Implications

- **Future-Proof Tech:** Prioritize TypeScript & PostgreSQL for long-term projects.
- **Skill Development:** Focus on Rust & Go for upskilling mid-career developers.
- **Full-Stack Consolidation:** JavaScript/TypeScript continues to unify front-end & back-end.
- **Platform Loyalty:** Developers tend to stay within adopted cloud ecosystems.
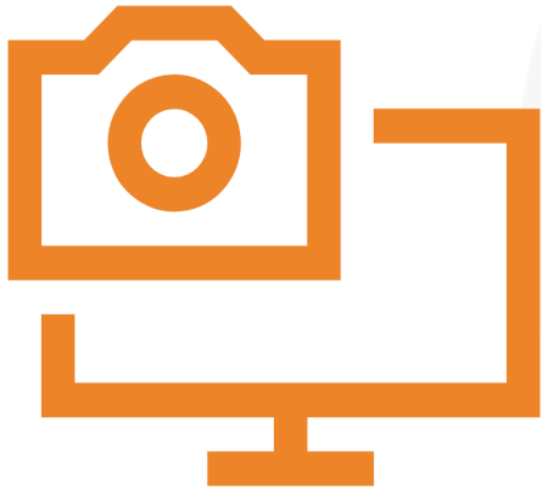
CONCLUSION

- JavaScript, SQL, HTML/CSS remain essential; TypeScript, Python, Go, Rust rising.

- PostgreSQL leads databases; Redis, MongoDB, Supabase growing.

- Node.js & React dominate frameworks; AWS stays top cloud platform.

- Most developers are 25–34 years old with a Bachelor's degree.

- Focus on desired tech and upskilling to stay ahead.

APPENDIX

- **Top Languages – Usage vs. Desire:** TypeScript, Go, Rust growing; Java, PHP declining.
- **Web Frameworks:** Node.js & React dominate; Next.js & Svelte rising.
- **Databases:** PostgreSQL stable; Redis & MongoDB increasing; Supabase emerging.
- **Developer Demographics:** 25–34 years old, mostly Bachelor's degree.
- **Cloud & Platforms:** AWS dominant; Azure & GCP gaining interest.
- **Average Salary:** Scala, Go, Rust top-paying; PHP lowest in top 10.
- **Real-World Implication:** Organizations should prioritize TypeScript, PostgreSQL, and Go for hiring, training, and future-proofing tech stacks.

POPULAR LANGUAGES

Top Programming Languages by Average Annual Salary

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