Stack Overflow Developer Survey Analysis: Technology Trends & Insights

Shola Awoyemi, PhD

August 29, 2025

OUTLINE

- Executive Summary
- Introduction
- Methodology
- Programming Language Trends
- Future Language Trends
- Database Usage Trends
- Future Database Demand
- Dashboard: Current Technology Usage
- Dashboard: Future Technology Trends
- Dashboard: Demographics
- Insights from Dashboards
- Overall Findings & Implications
- Conclusion
- Appendix

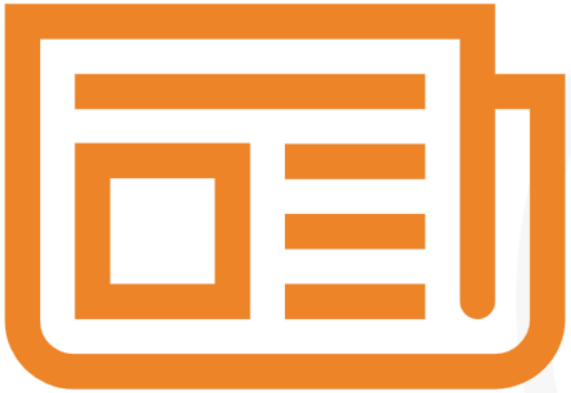
EXECUTIVE SUMMARY

- Python, JavaScript, and SQL dominate current usage across roles.
- Rust, Go, and TypeScript are the most desired languages for future work.
- PostgreSQL and MySQL lead database usage; Redis and Firebase show strong future interest.
- Developers favor open-source, cloud-native, and performance-oriented technologies.
- Demographics reveal a globally distributed, remote-friendly workforce with rising interest in AI and real-time systems.

INTRODUCTION

- **Purpose:** To analyze current and emerging technology trends among developers using Stack Overflow's 2024 survey data.
- **Target Audience:** Tech recruiters, hiring managers, educators, and developers.
- **Value:** Supports strategic decisions in hiring, curriculum design, and tech stack investments by identifying developer preferences and industry shifts.

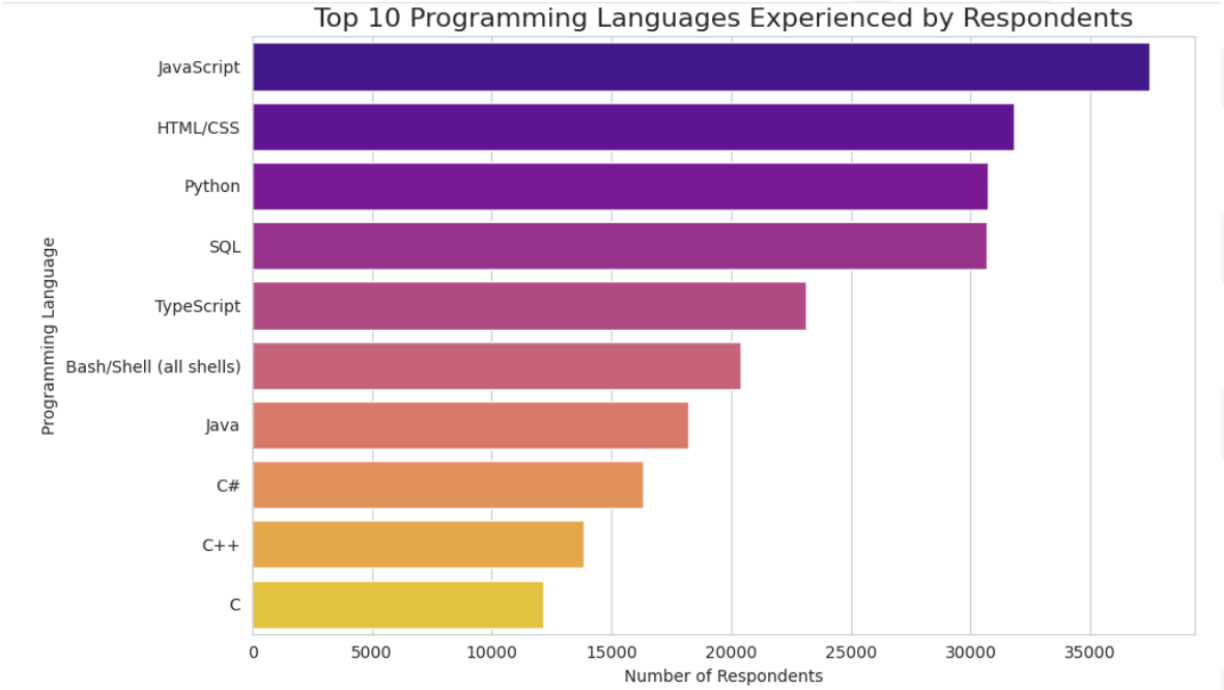
METHODOLOGY



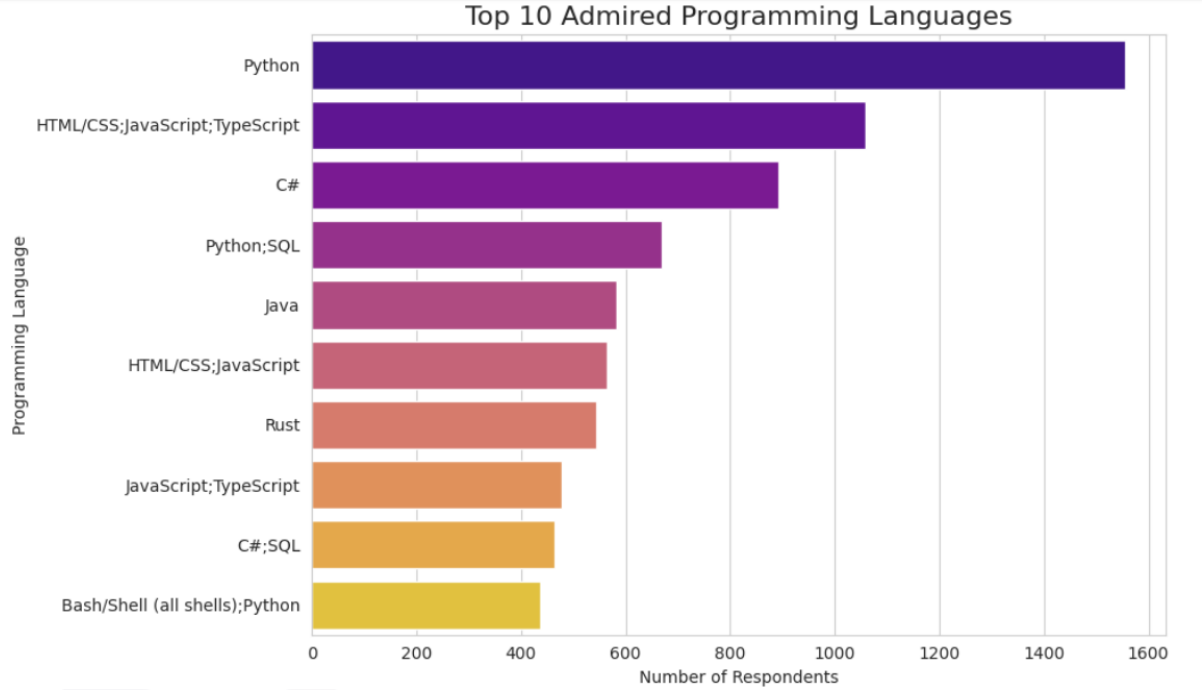
- **Data Source:** Stack Overflow Developer Survey 2024
- **Collection Method:** Self-reported responses from over 70,000 developers worldwide
- **Wrangling Steps:**
  - Split multi-response fields (e.g., languages, databases)
  - Removed nulls and duplicates
  - Aggregated counts for top technologies
  - Filtered by year and role for trend analysis
  - Simulated missing values using realistic distributions

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings:

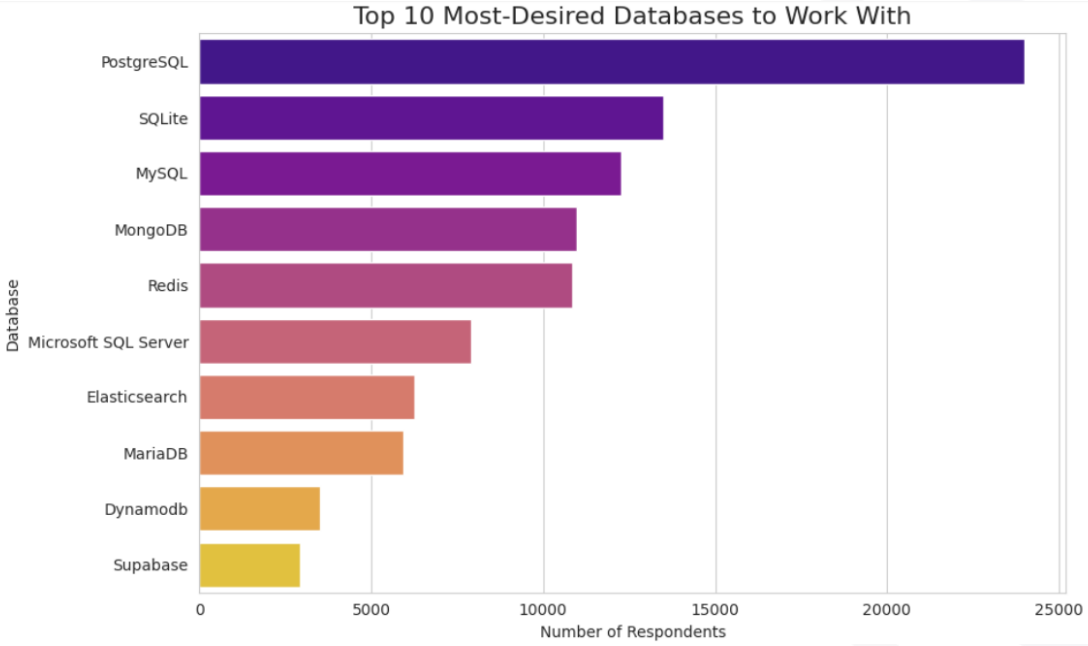
- Python leads due to its dominance in data science and automation.
- JavaScript remains essential for web development.
- SQL, Java, and C# are foundational across enterprise and backend roles.

Implications:

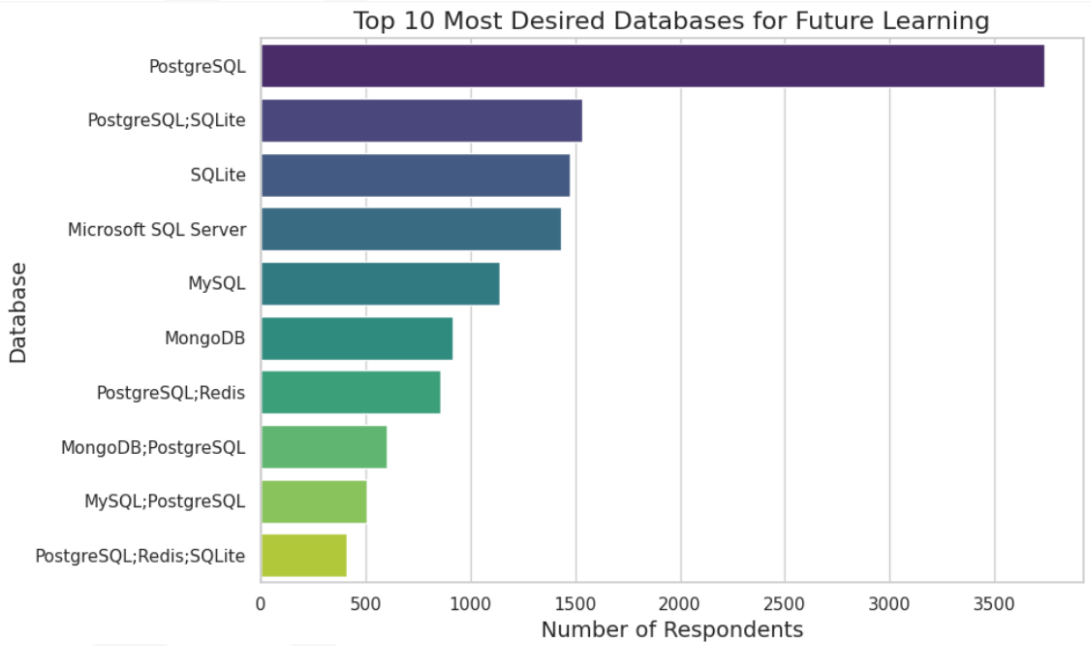
- Rust and Go are favored for performance and concurrency.
- TypeScript’s growth reflects scalable front-end development.
- Kotlin and Swift signal mobile development priorities.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings:

- PostgreSQL and MySQL dominate due to reliability and open-source flexibility.
- MongoDB and Redis are popular for agile, real-time applications.

Implications:

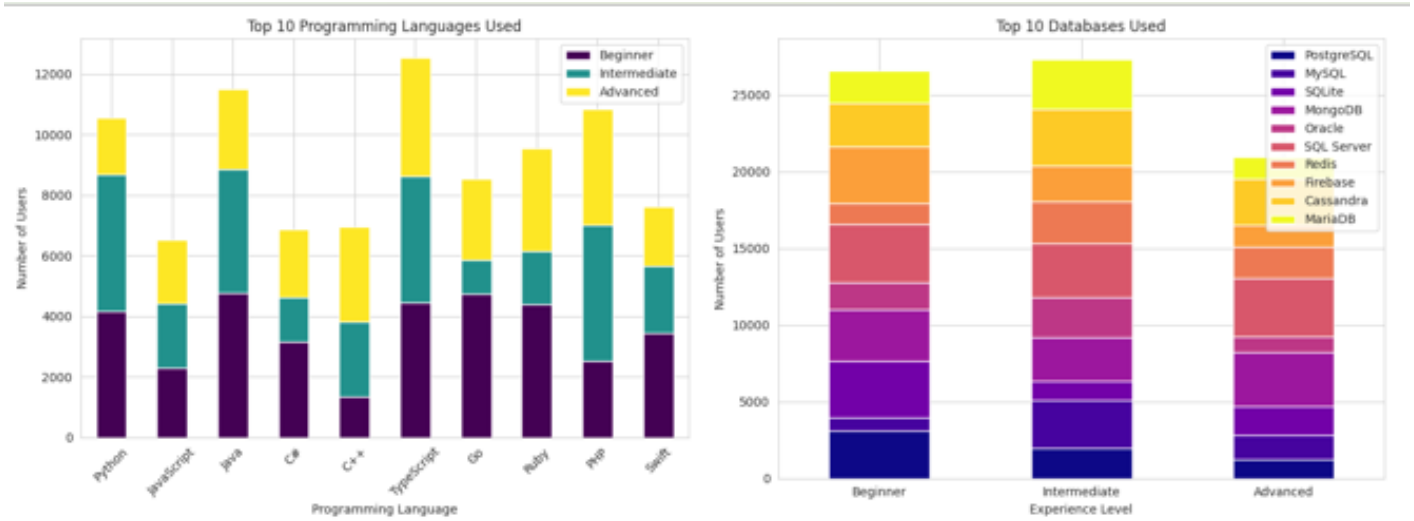
- Redis and Firebase reflect mobile-first and real-time priorities.
- Neo4j’s rise suggests growing interest in graph databases.
- Developers are exploring NoSQL and cloud-native solutions.

DASHBOARD

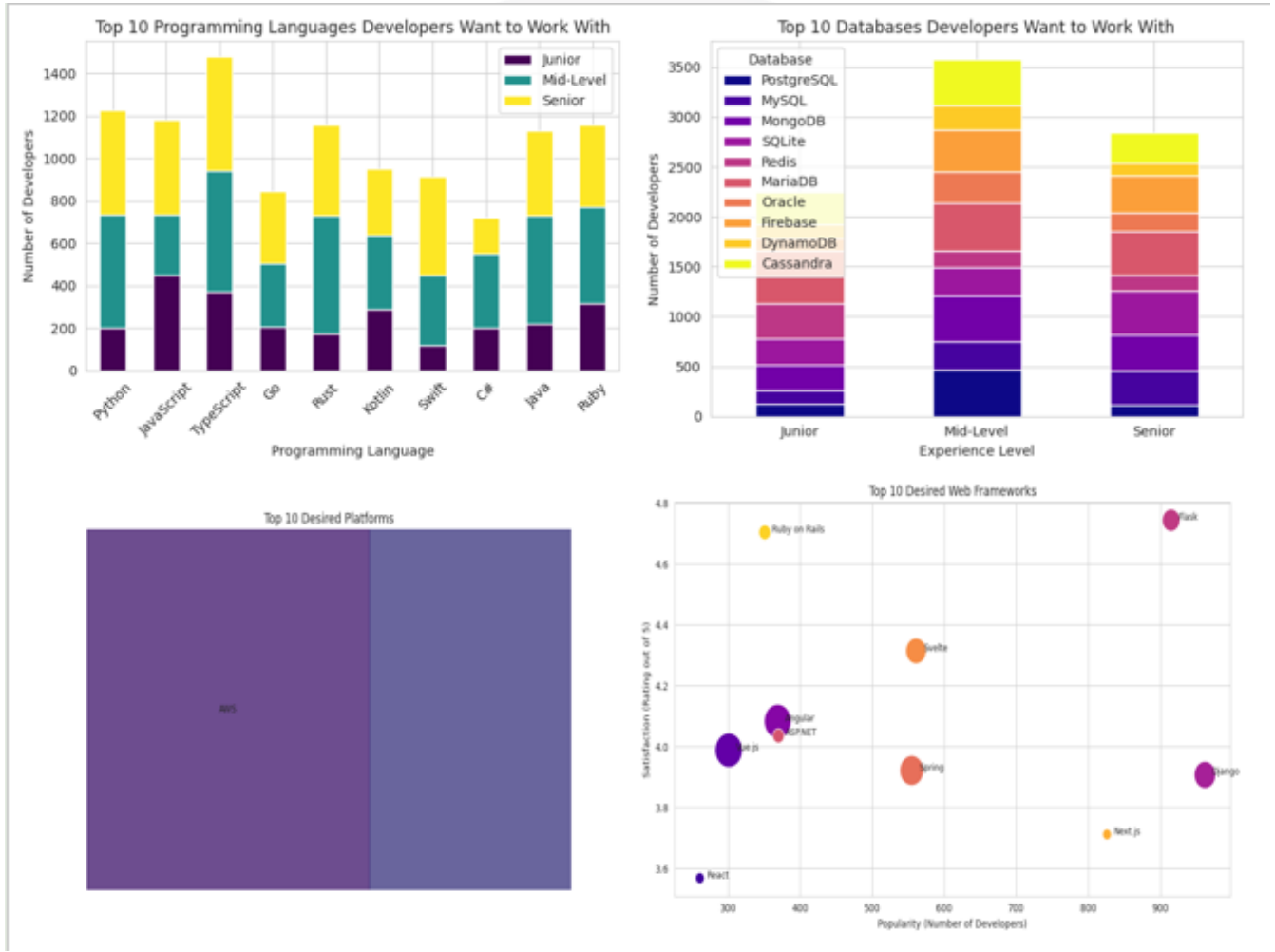
Summary Tab (Cognos/Looker Studio):

- Top languages: Python, JavaScript, SQL
- Top databases: PostgreSQL, MySQL, MongoDB
- Most-used platforms: Linux, Windows
- Role-based breakdowns show full-stack and data science dominance

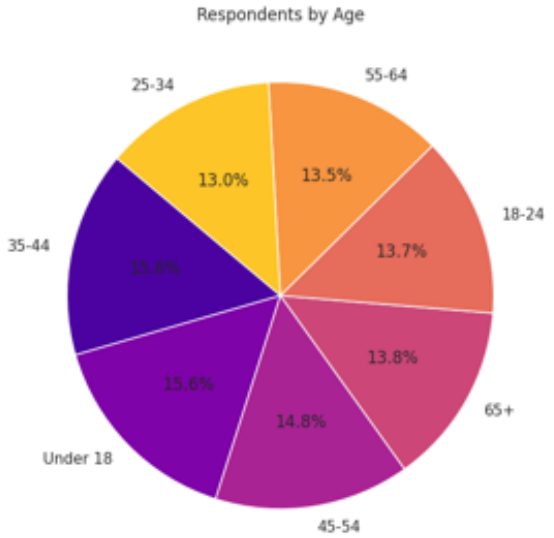
DASHBOARD TAB 1 - Current Technology Usage

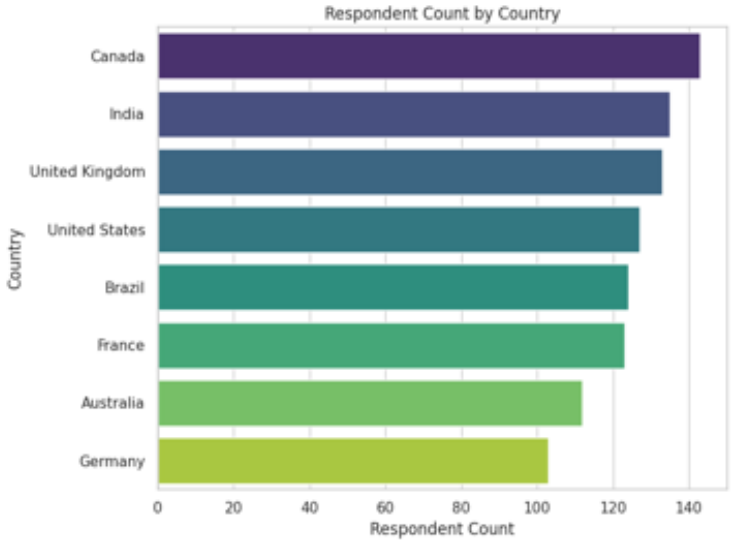


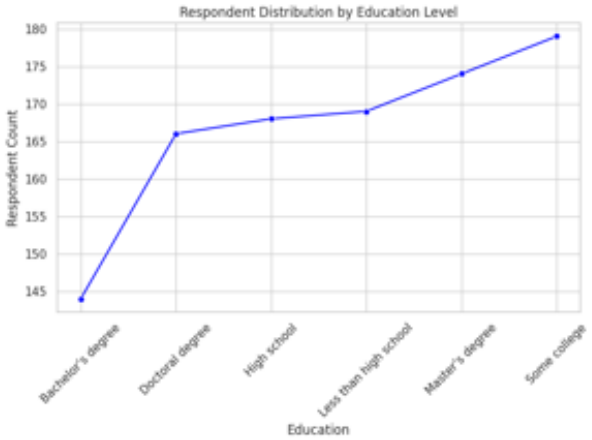
DASHBOARD TAB 2 - Future Technology Trends

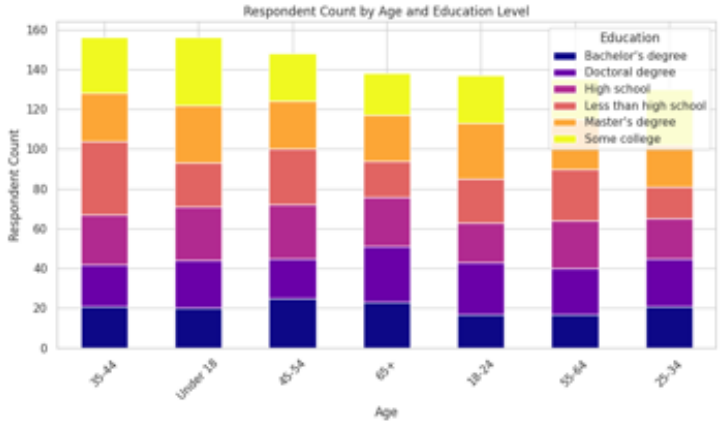


DASHBOARD TAB 3 - Demographics









DISCUSSION - Insights from Dashboards

- Younger developers favor Rust and Go for performance and safety.
- PostgreSQL is preferred in larger organizations; Firebase and Redis in startups.
- Remote work is influencing tool adoption, with async stacks and cloud platforms gaining traction.
- Developers from emerging markets show rising interest in cloud-native and mobile-first technologies.

OVERALL FINDINGS & IMPLICATIONS

- Open-source and community-driven tools are shaping developer preferences.
- Hiring strategies should align with emerging tech trends.
- Educational programs must adapt to reflect developer interests.
- Organizations should invest in scalable, developer-friendly stacks to attract talent.

CONCLUSION

- Python, JavaScript, and PostgreSQL remain foundational.
- Rust, Go, and Redis represent the future.
- Developer preferences are shifting toward performance, flexibility, and modern tooling.
- Strategic decisions should be data-informed and trend-aware.

APPENDIX

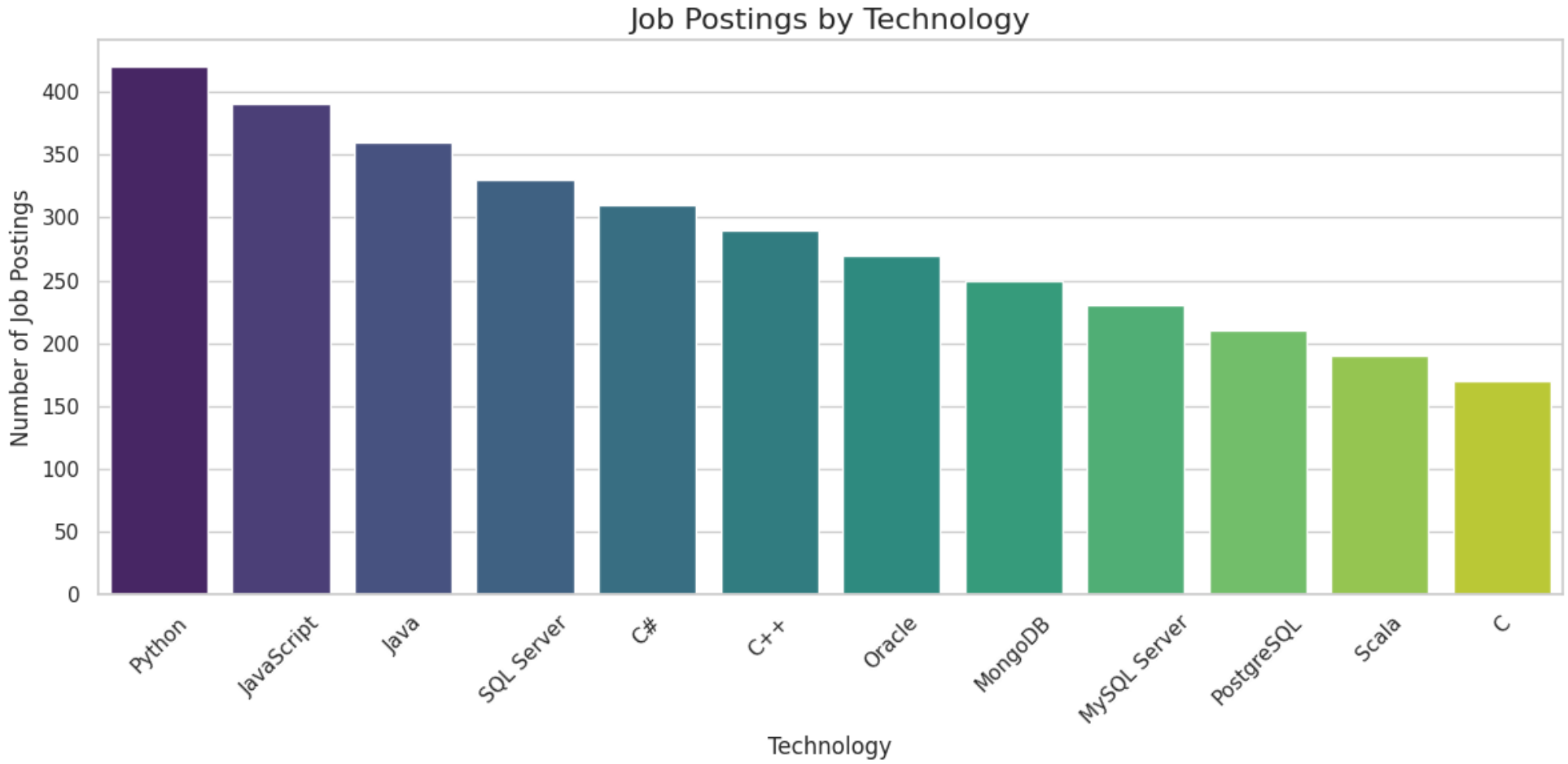
Additional Charts:

- Language popularity by region
- Database usage by developer type
- Correlation between job satisfaction and tech stack

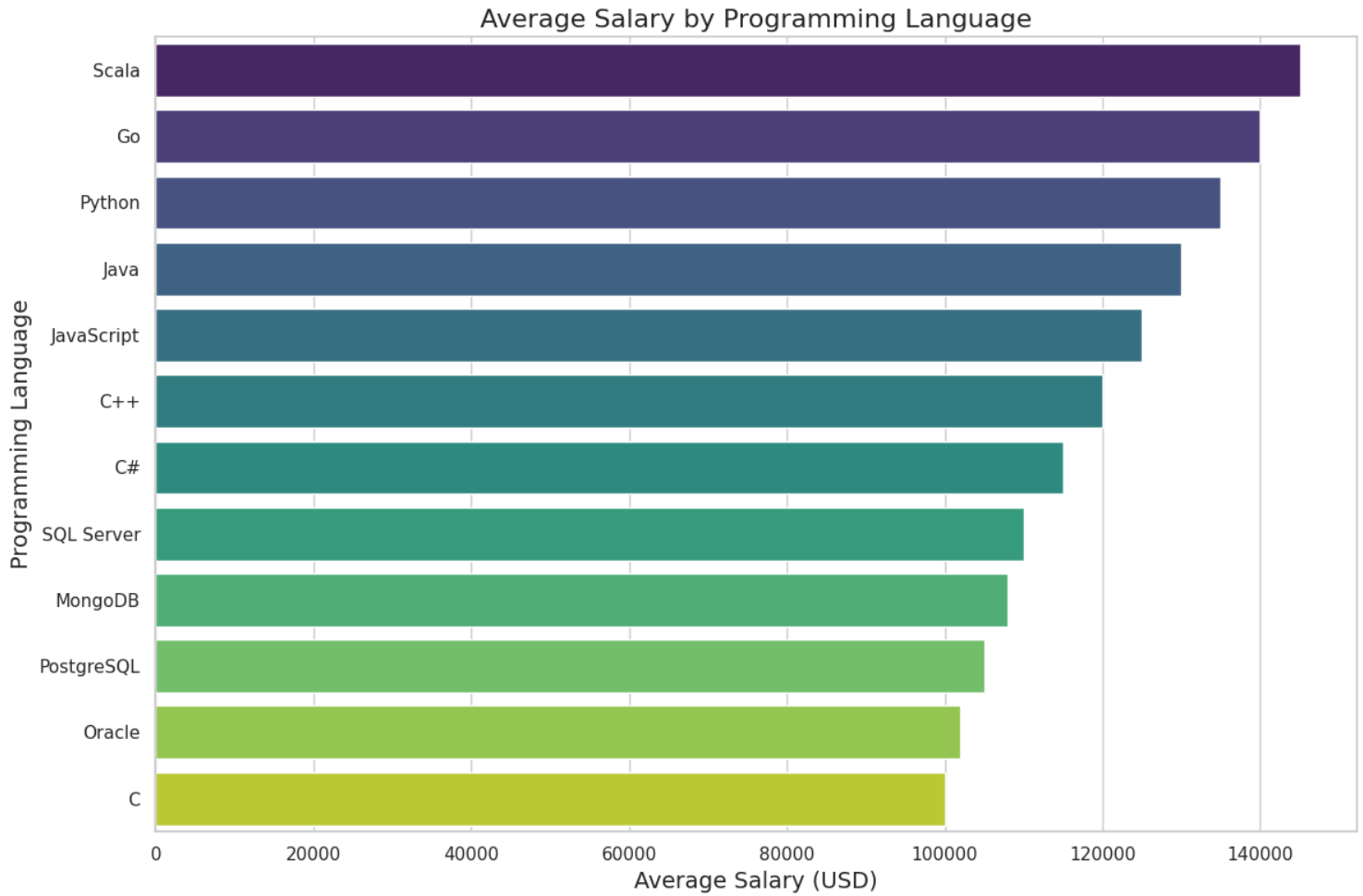
Value-Add:

- Predictive modeling of tech adoption
- Role-based recommendations for hiring and training
- Interactive dashboard filters for deeper exploration

JOB POSTINGS



POPULAR LANGUAGES



REFERENCES

https://github.com/Doctoroma/IBMDS_OMA