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IBM Data Analytics Professional Certificate - Capstone

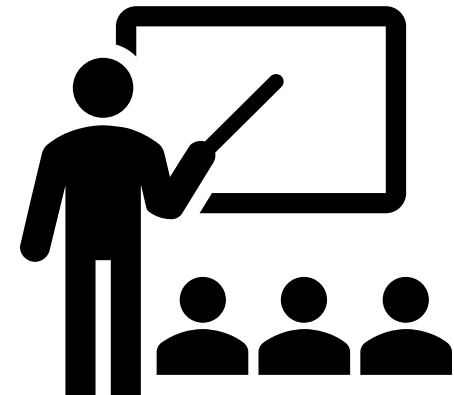
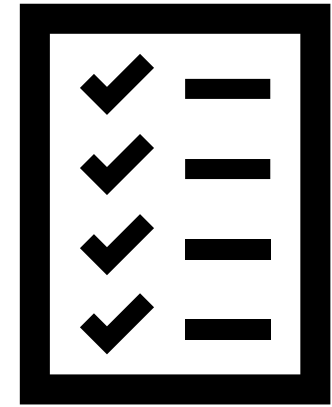
Global Developer Trends

Exploring Current and Future Technology Preferences

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REPORT OUTLINE

- Executive Summary
- Introduction
- Methodology
- Results
 - Programing Language Trends
 - Database Trends
 - Dashboard
 - Discussion About Demographics
 - Analysis by Age Group
- Overall Findings & Implications
- Conclusion
- Appendix



EXECUTIVE SUMMARY

- The Stack Overflow Developer Survey provides a snapshot of the evolving **global developer landscape**. Analysis of this dataset reveals patterns in technology adoption and future interest.
- **Python, HTML, and JavaScript** remain cornerstones of the developer ecosystem, while emerging languages such as **Go** and **TypeScript** are shaping the next wave of innovation.
- Similarly, while **relational databases** remain dominant, the rising enthusiasm for **NoSQL solutions** like **MongoDB** and **Redis** signals a transition toward more modern, cloud-oriented development.
- These findings suggest that data professionals who embrace **flexibility, upskilling, and continuous learning** will be best positioned to thrive in the rapidly changing tech industry.



INTRODUCTION



- This report explores the evolving landscape of developer technology preferences using data from the Stack Overflow Developer Survey.



- Its main purpose is to compare the tools and technologies developers use today with those they want to use in the near future.



- The target audience includes data analysts, developers, hiring managers, and educators seeking to align their skills, hiring practices, or curricula with global technology trends.



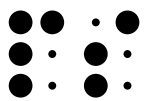
- The value of this analysis lies in its ability to highlight where the industry is heading — helping professionals and organizations make informed, future-oriented decisions.



METHODOLOGY



- **Data Source:** Stack Overflow Developer Survey (public dataset on Kaggle).



- **Data Cleaning:** Removed duplicates and null values, standardized numeric and categorical columns, split multi-response fields, and created new variables such as *Region* and *EmploymentCategory* for better analysis.

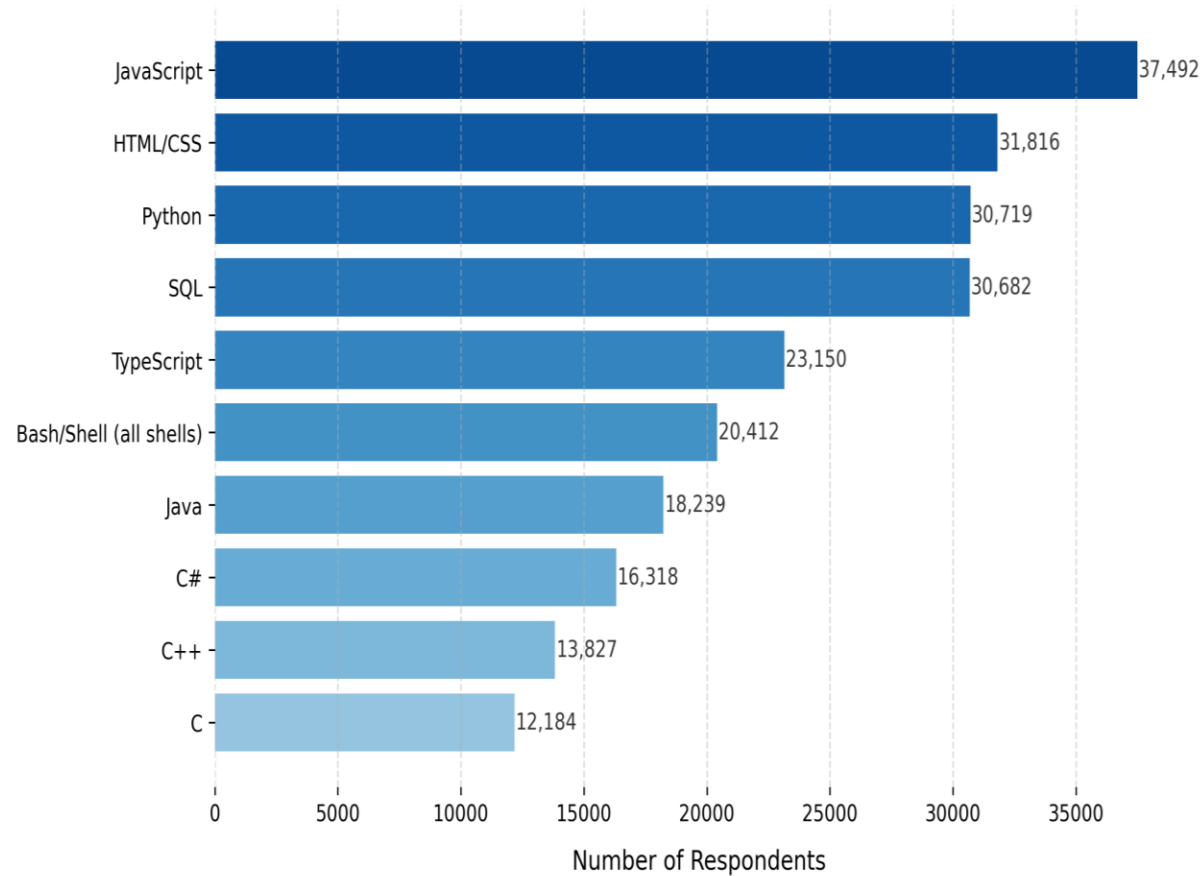


- **Tools Used:** Python and SQL for wrangling and visualization, Google Looker Studio for dashboard creation.

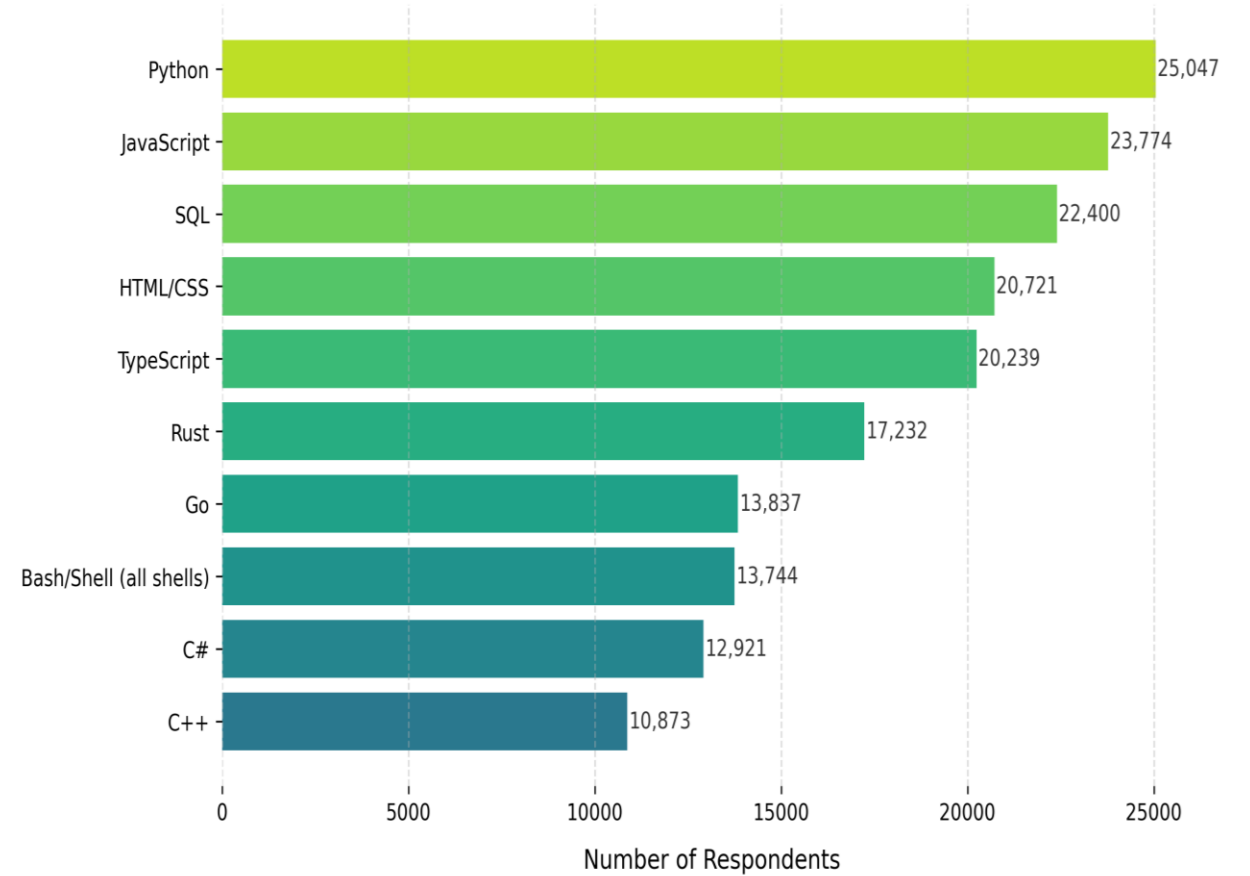


PROGRAMMING LANGUAGE TRENDS

Top 10 Programming Languages (Current Year)



Top 10 Programming Languages Respondents Want to Work With Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS:

Python and JavaScript Dominance

- **Python** and **JavaScript** are some of the most widely used languages, and the most desired for next year, showing their continued relevance across industries.

Emerging Interest in Modern Languages

- Languages like **Rust**, **Go**, and **TypeScript** have lower current usage but show strong growth in respondents' "want to work with" preferences for next year.

Stable Demand for Established Languages

- **Java** and **C** maintain steady interest but show little projected growth. These languages remain critical in enterprise and legacy systems, but growth in interest is plateauing compared to newer languages.

IMPLICATIONS:

Skill Development Focus

- Learners and professionals should prioritize **Python** and emerging languages like **TypeScript** or **Go** to stay competitive in the job market.

Hiring Strategy

- Companies looking to attract talent should offer projects or roles involving **trending languages** to align with developer interests and future-proof their teams.

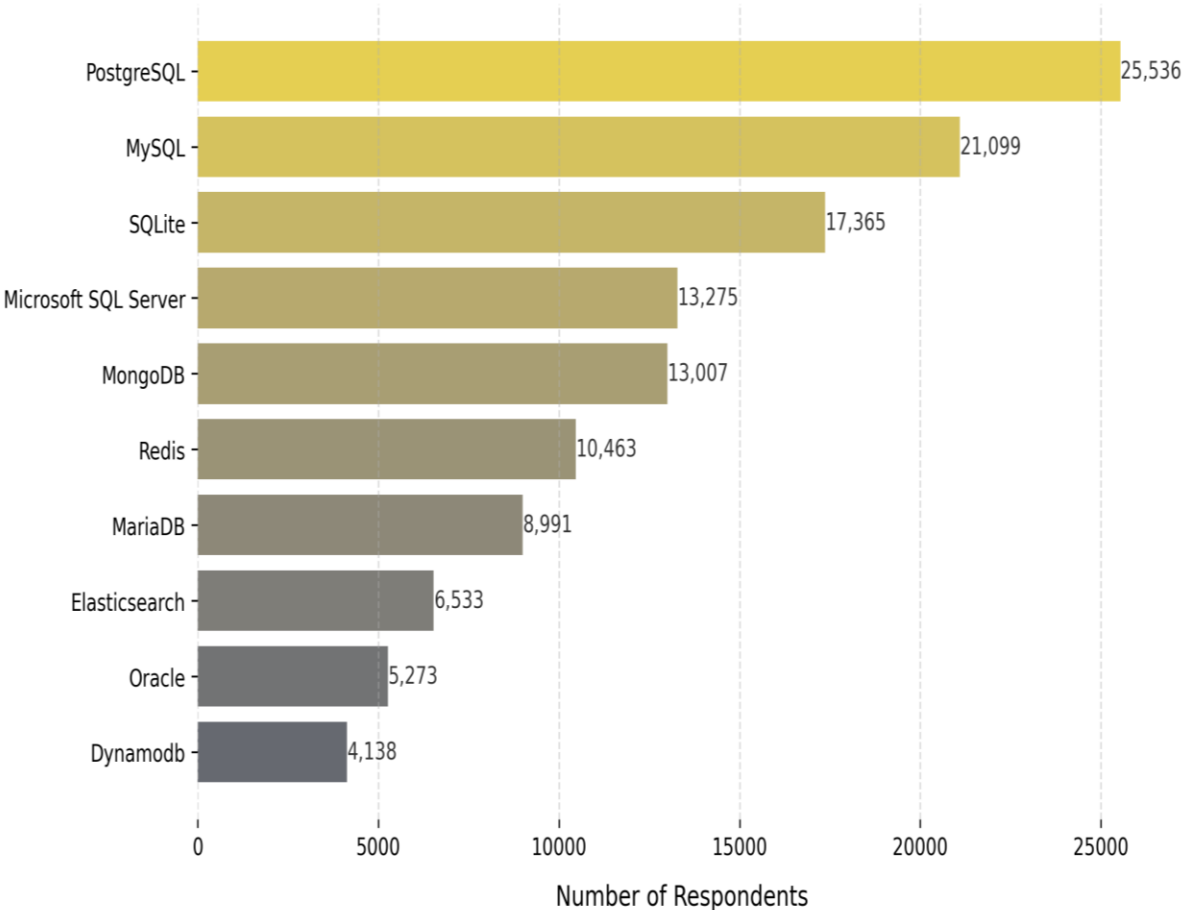
Curriculum and Training Adjustments

- Educational programs and bootcamps can emphasize **Python**, **JavaScript** plus emerging languages, ensuring graduates have in-demand skills.

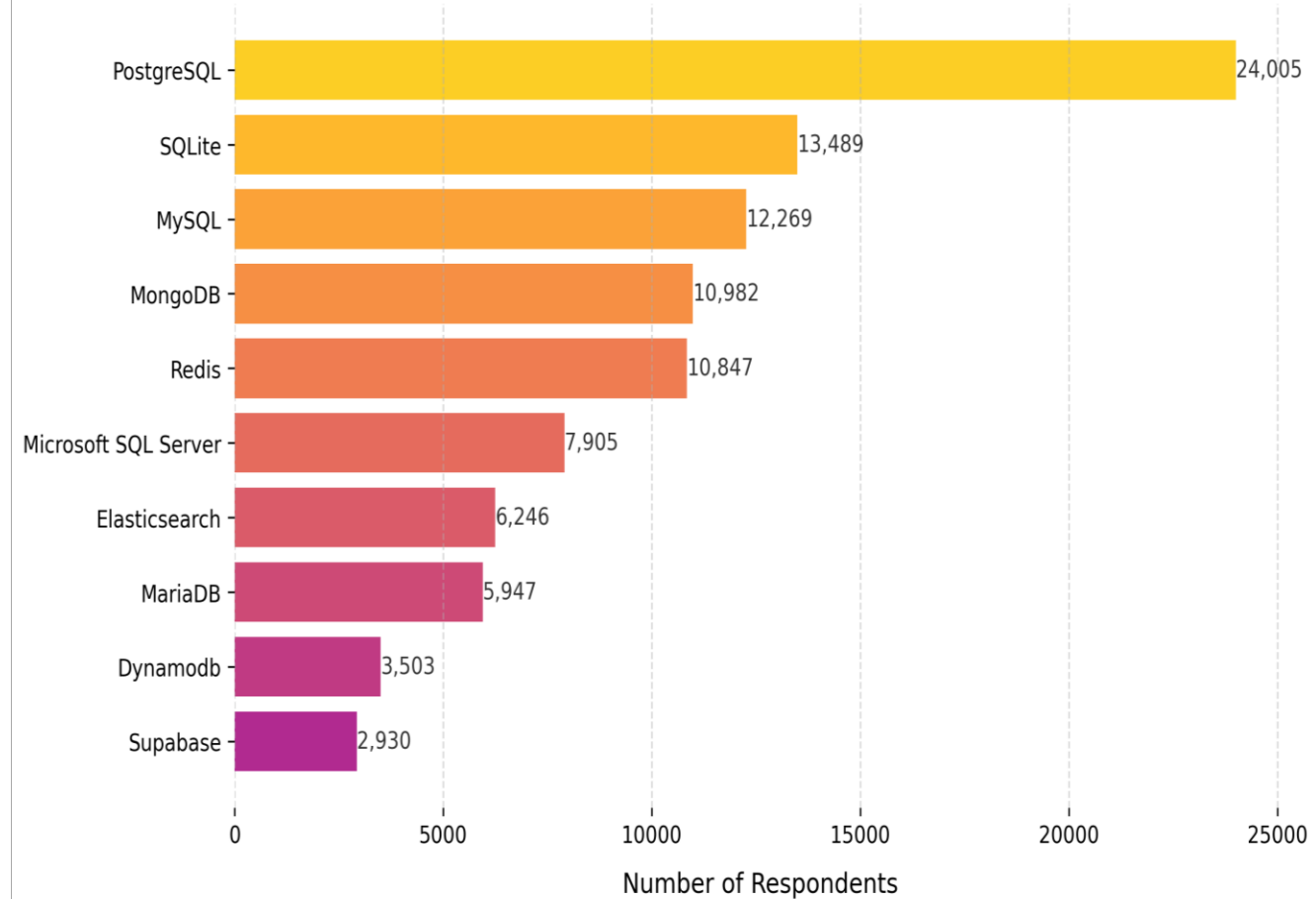


DATABASE TRENDS

Top 10 Databases Respondents Currently Work With



Top 10 Databases Respondents Want to Work With Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS:

SQL Remains Dominant

- **SQL** databases are currently the most widely used and continue to be the most desired for next year. **PostgreSQL** is the dominant database for current and next year.

Rising Interest in NoSQL and Cloud Databases

- Databases such as **MongoDB** and **Redis** show higher interest in the 'want to work with next year' category compared to their current usage.

Stable Demand for Traditional Databases

- **Oracle**, **MySQL** and **Microsoft SQL Server** remain consistently used but show slower growth in projected interest.

IMPLICATIONS:

Focus on Learning Modern Databases

- Professionals should strengthen skills in **NoSQL** and **cloud-based** databases alongside **SQL** to stay competitive and adaptable.

Hiring and Project Planning

- Companies should consider offering opportunities or projects with modern database technologies to attract and retain top talent.

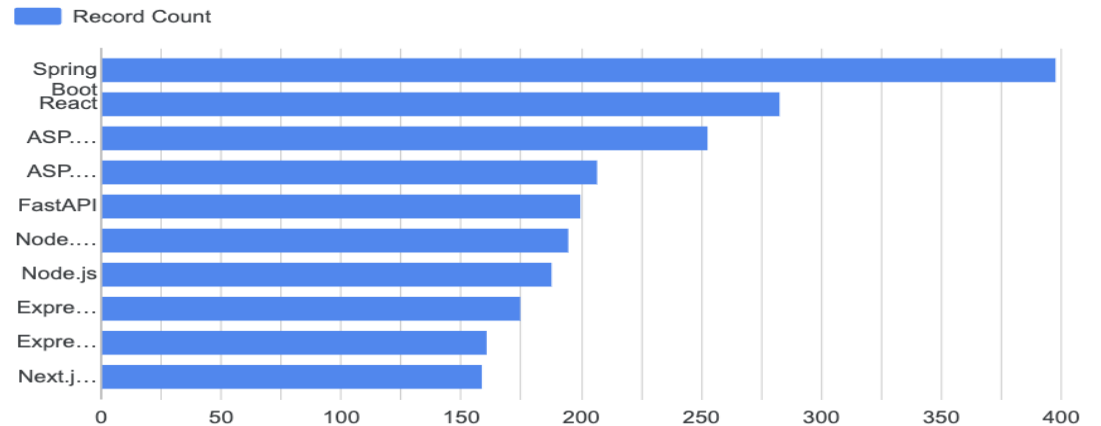
Training and Curriculum Updates

- Educational programs and training bootcamps can integrate emerging databases and **cloud platforms** into the curriculum to align with developer demand and industry trends.

Skills Network

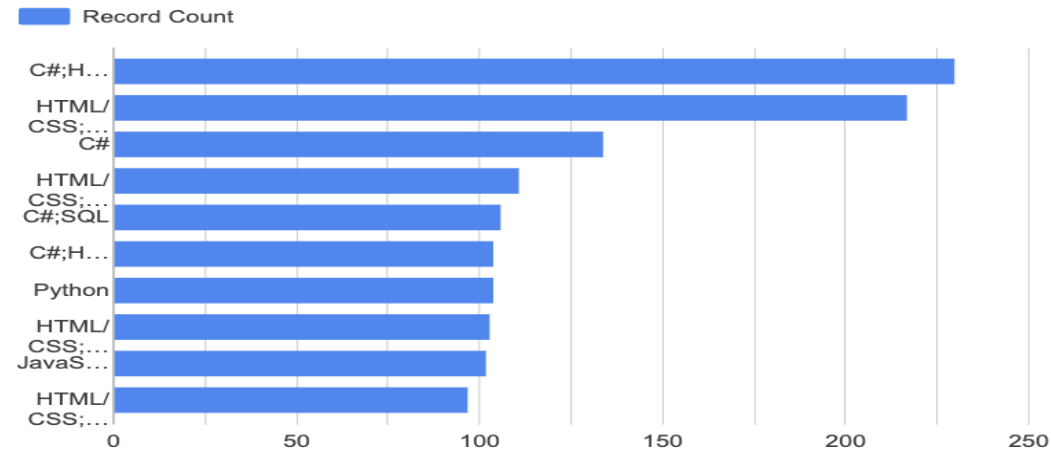


Top 10 Frameworks Used

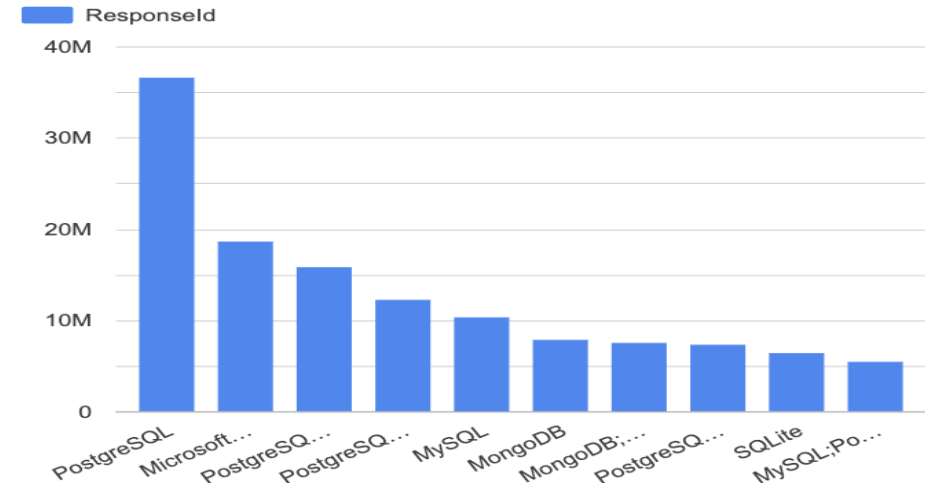


Future Technology Trend

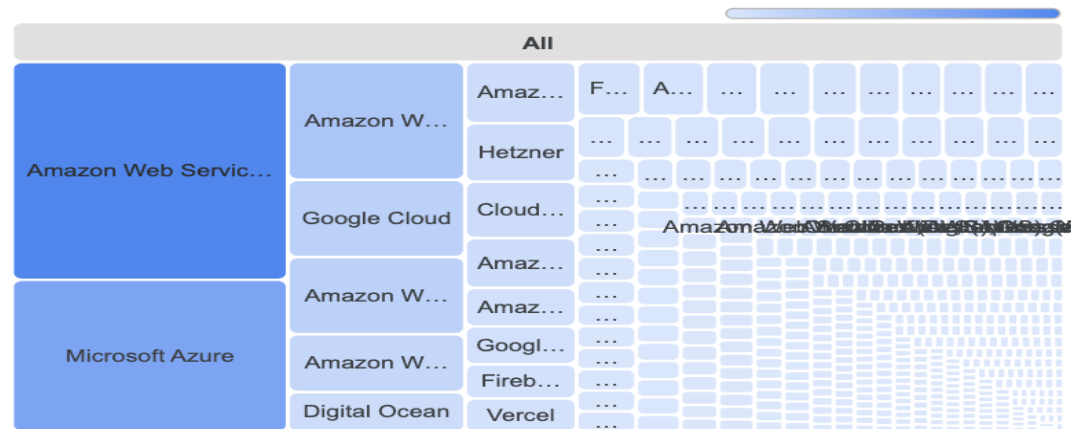
Top 10 LanguageWantToWorkWith



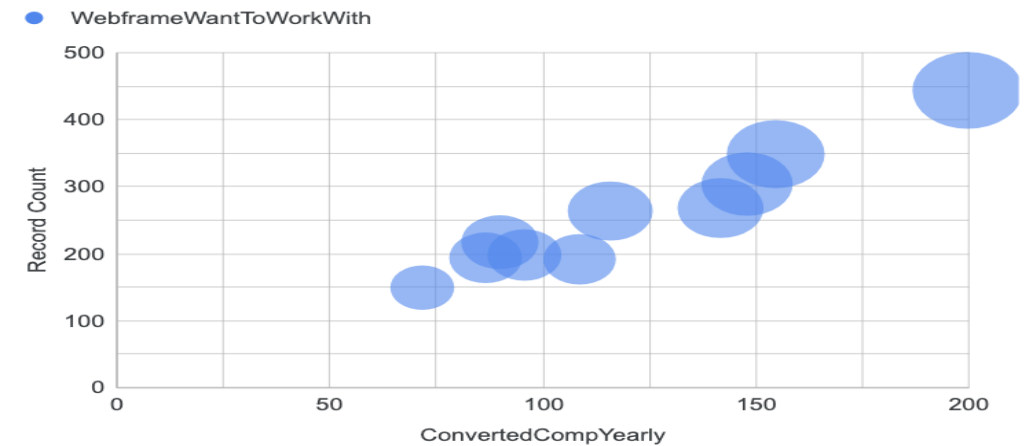
Top 10 DatabaseWantToWorkWith



Platform Want To Work With

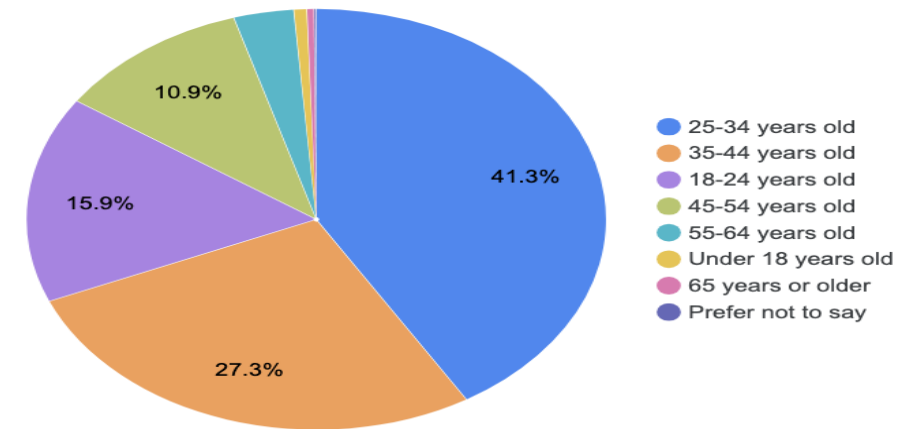


Top 10 FrameworksWantToWorkWith

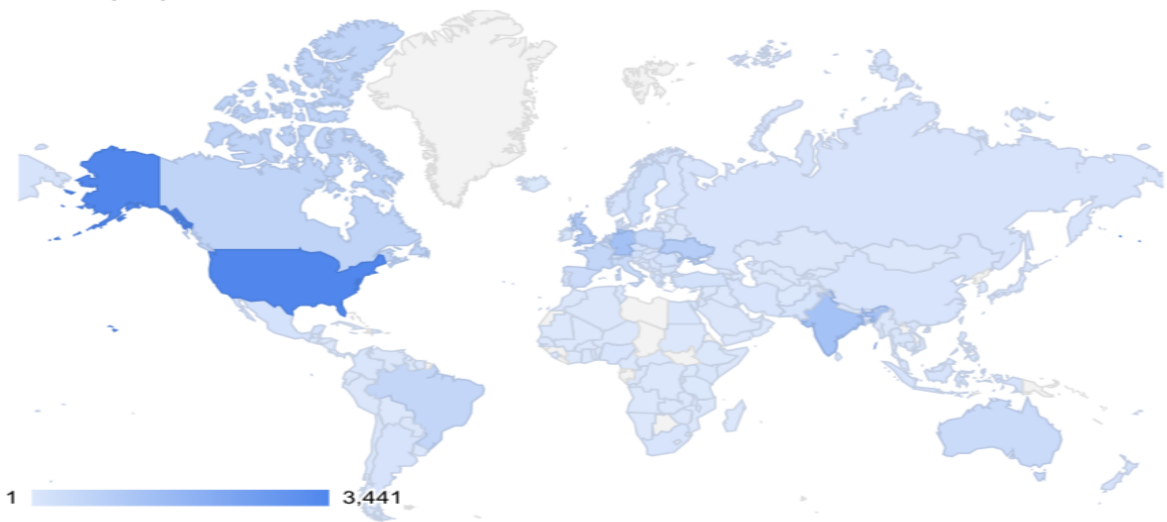


Demographics

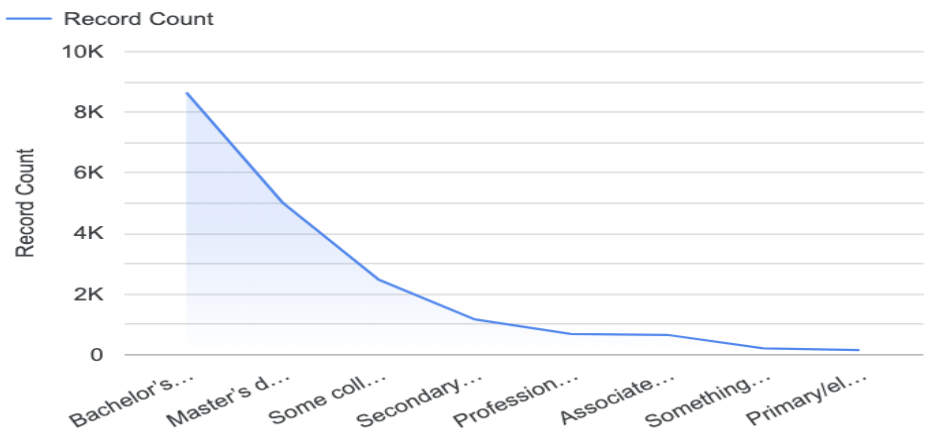
Age by Record Count



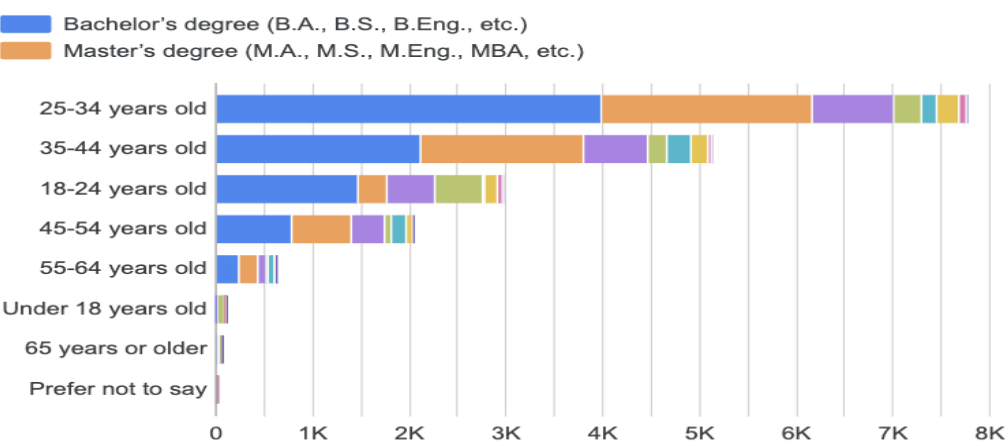
Country by Record Count



Record Count by EdLevel



Record Count by Age and EdLevel

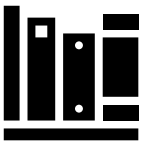


Discussion About Demographics



Experienced, Early-to-Mid Career Respondents

- Most respondents are aged 25–44, indicating that the dataset primarily reflects professionals with some industry experience rather than students or very early-career individuals.
- Implication: The survey insights are relevant for mid-level workforce trends in tech and data fields.



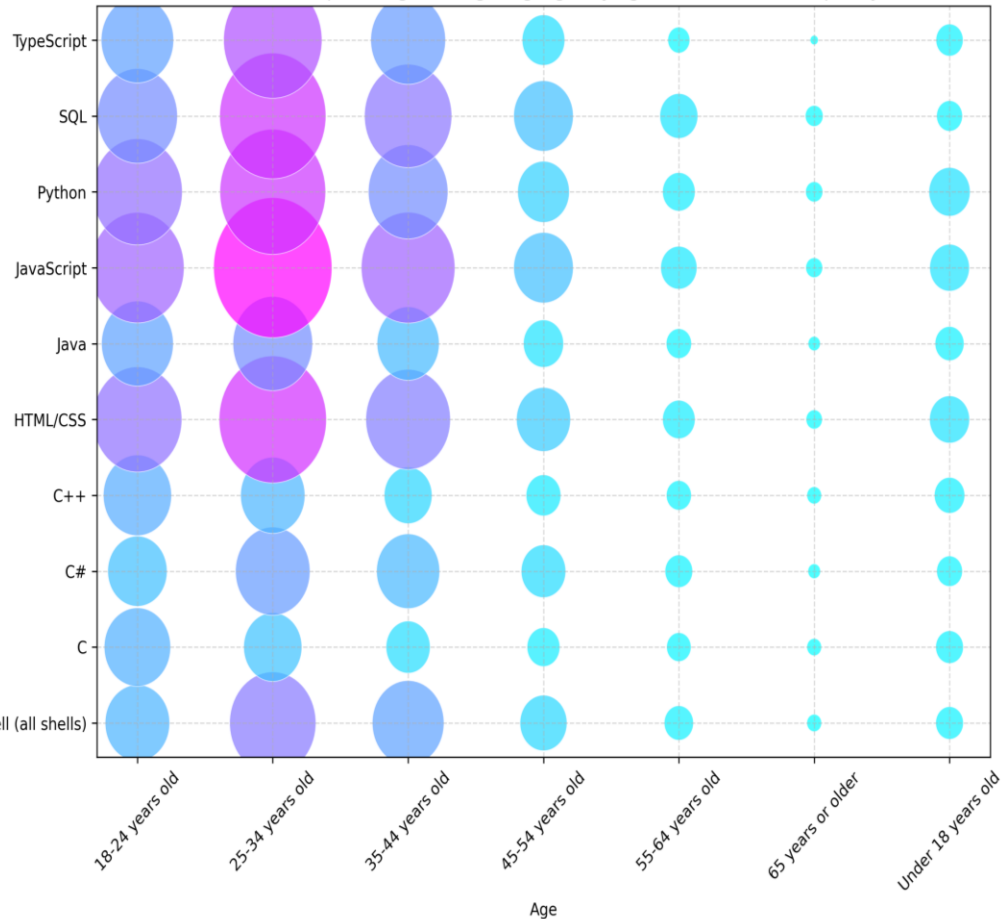
Highly Educated Respondents

- Majority hold a Bachelor's or Master's degree.
- Implication: Trends in programming language and database preferences reflect a well-educated audience, which may correlate with awareness of emerging technologies and professional development goals.

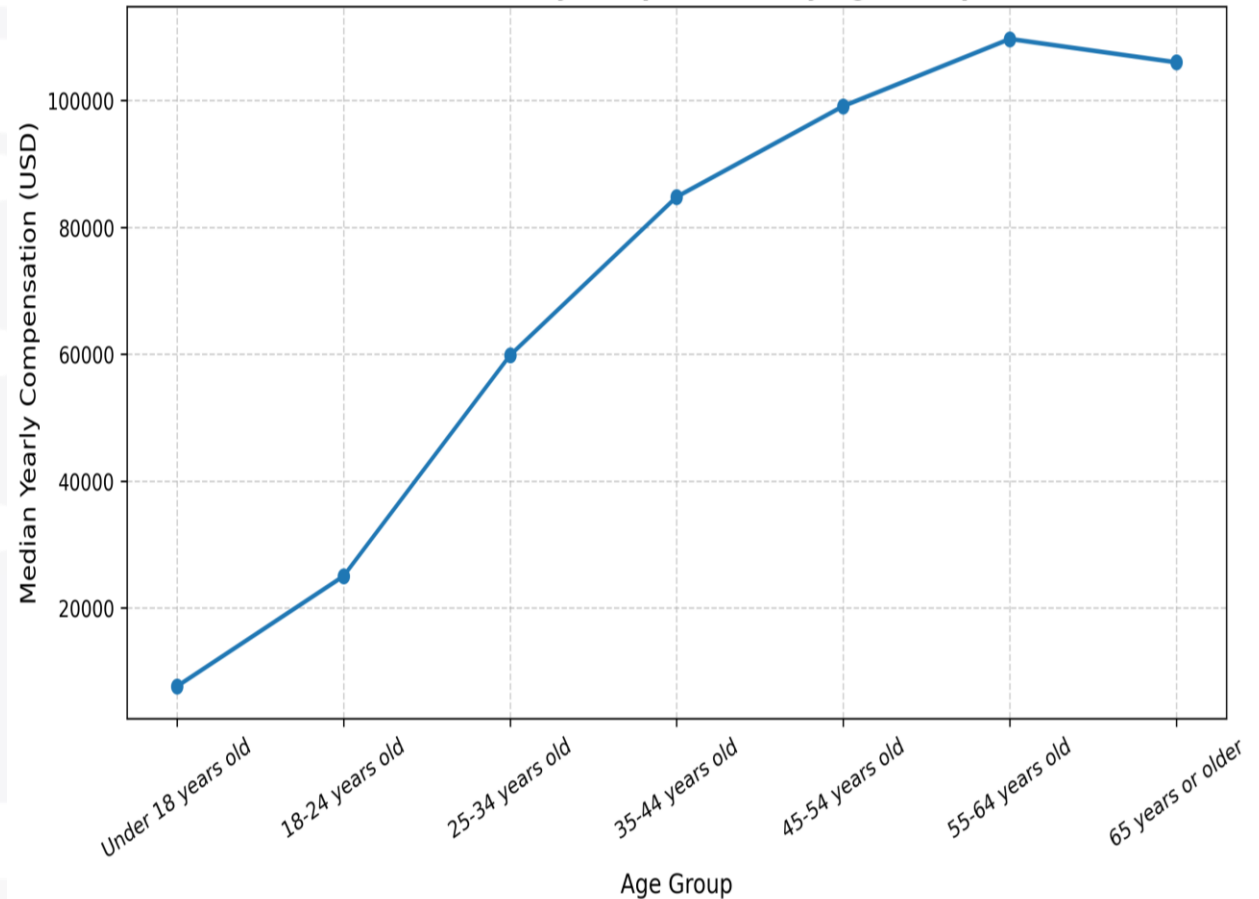


Analysis by Age Group

Bubble Plot: Top 10 Programming Languages by Age (Size & Color = Frequency)



Median Yearly Compensation by Age Group



Insights about Age Group Analysis

- The *Median Yearly Compensation by Age Group* chart reveals that developers aged **55–64** earn the highest salaries overall.
- When analyzing programming language usage by age group, the *Bubble Plot* shows that **JavaScript** and **SQL** are the most commonly used languages among developers in this age range.
- It's interesting to compare **TypeScript** and **Python** usage across age groups. Both languages show similar adoption rates among developers aged **25–34** and **35–44**. However, in the **18–24** group, **Python** stands out as the dominant choice — suggesting that most new developers begin their programming journey with Python before moving on to other languages like TypeScript.



Overall Findings and Implications



Finding: Python dominates current usage, while **TypeScript**, **Go**, and **Rust** are rising in interest. Databases like **MongoDB** and **Redis** are trending upward.

- **Implications:** Prioritize learning **Python**, modern languages, and emerging databases to stay competitive. Developing skills in both **relational (SQL, PostgreSQL, MySQL)** and **NoSQL/cloud databases** broadens employability.



Finding: Developers show increasing interest in **scalable, cloud-friendly databases** and modern programming languages.

- **Implications:** Data professionals should become familiar with **cloud platforms** (AWS, GCP, Azure) and **distributed database systems** to meet market demands.



Finding: High educational attainment suggests data professionals value **continued growth**.

- **Implications:** Continuous learning is critical: explore **certifications, online courses, and practical projects** aligned with future technology trends. Staying updated on industry surveys and emerging tools ensures that skillsets remain relevant in a rapidly evolving field.



CONCLUSION



- **Respondent Profile Shapes Insights**
- **The majority of respondents are US-based professionals, aged 25–44, and hold Bachelor’s or Master’s degrees.** This indicates that the survey results reflect a **mid-career, highly educated tech workforce**, providing reliable insights into **current and future skill preferences**.



- **Programming Language Trends**
- **Current usage:** Python dominates, followed by JavaScript, SQL, and Java.
- **Future interest:** Emerging languages such as **TypeScript, Go, and Rust** show strong growth in “want to work with next year,” signaling a shift toward **modern, versatile, and high-performance languages**.



- **Database Trends**
- **Current usage: Relational databases** (MySQL, PostgreSQL, SQL Server) remain the most widely used.
- **Future interest: NoSQL and cloud-friendly databases** like **MongoDB** and **Redis** are rapidly gaining traction, reflecting a growing focus on **scalable, flexible, and real-time data solutions**.

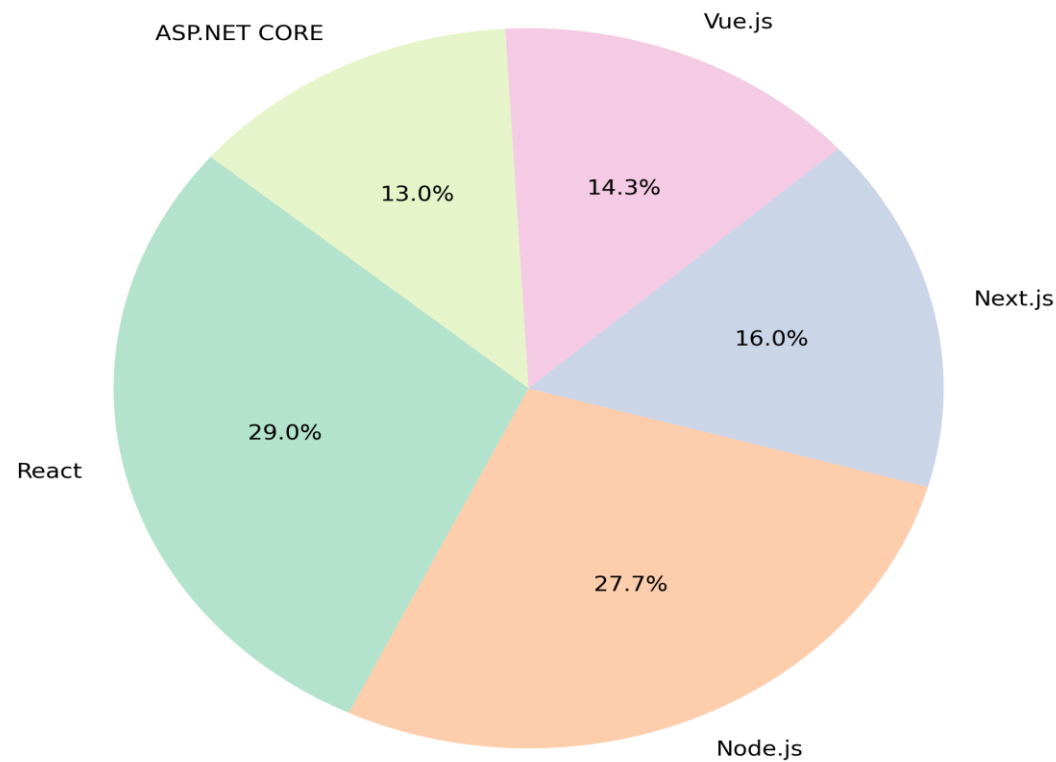


APPENDIX

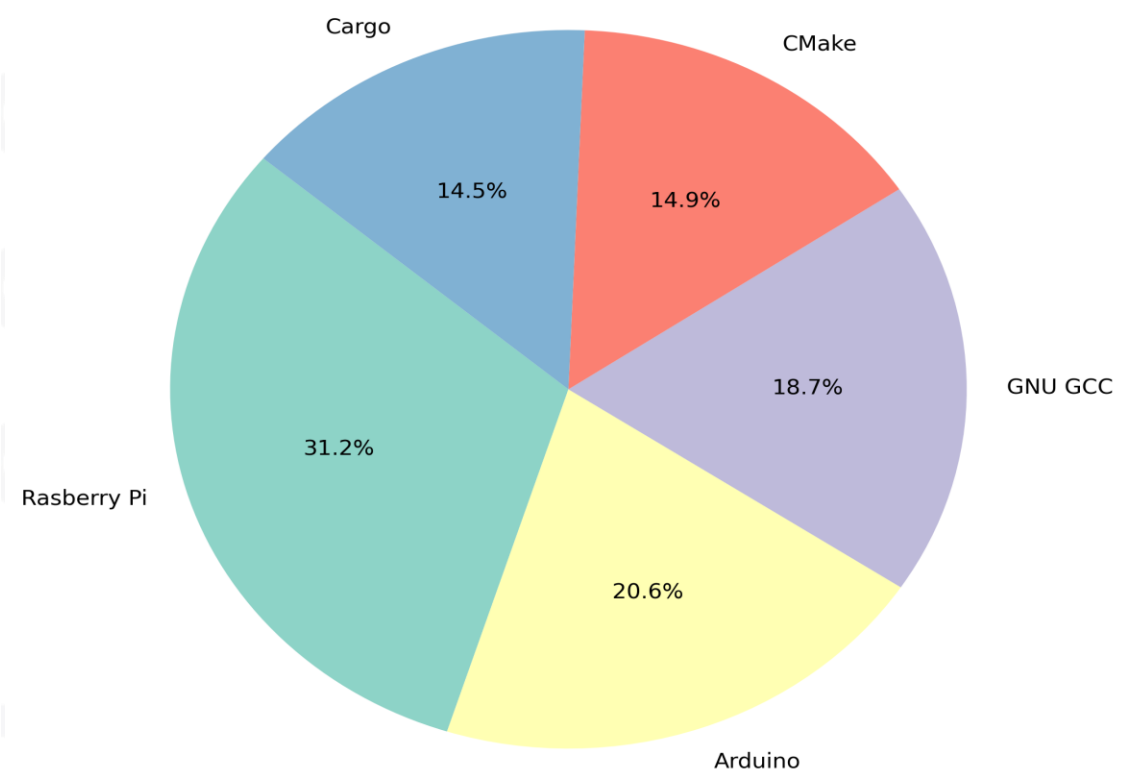
- Extra relevant graphs and charts that helped with the overall analysis and conclusions.

Frameworks & Embedded Technologies Respondents Want to Work With

Top 5 Web Frameworks Respondents Want to Work With

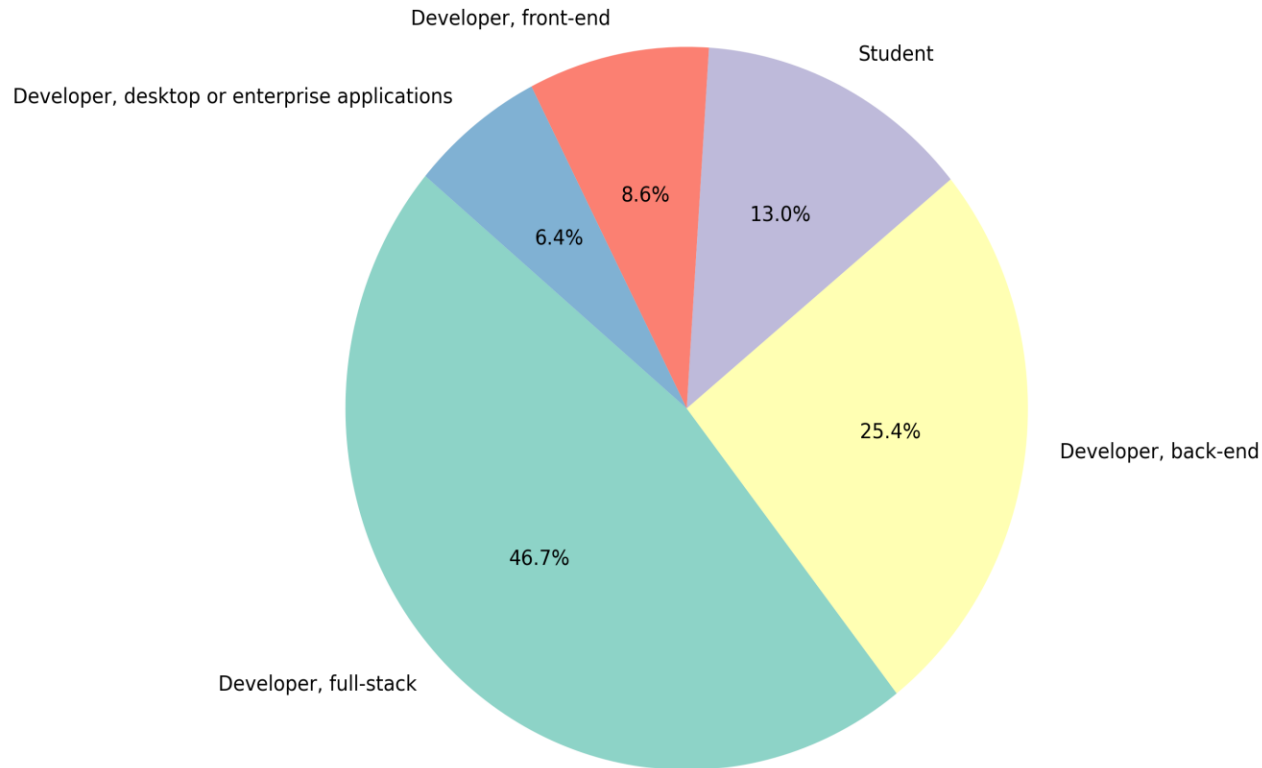


Top 5 Embedded Technologies Respondents Want to Work With

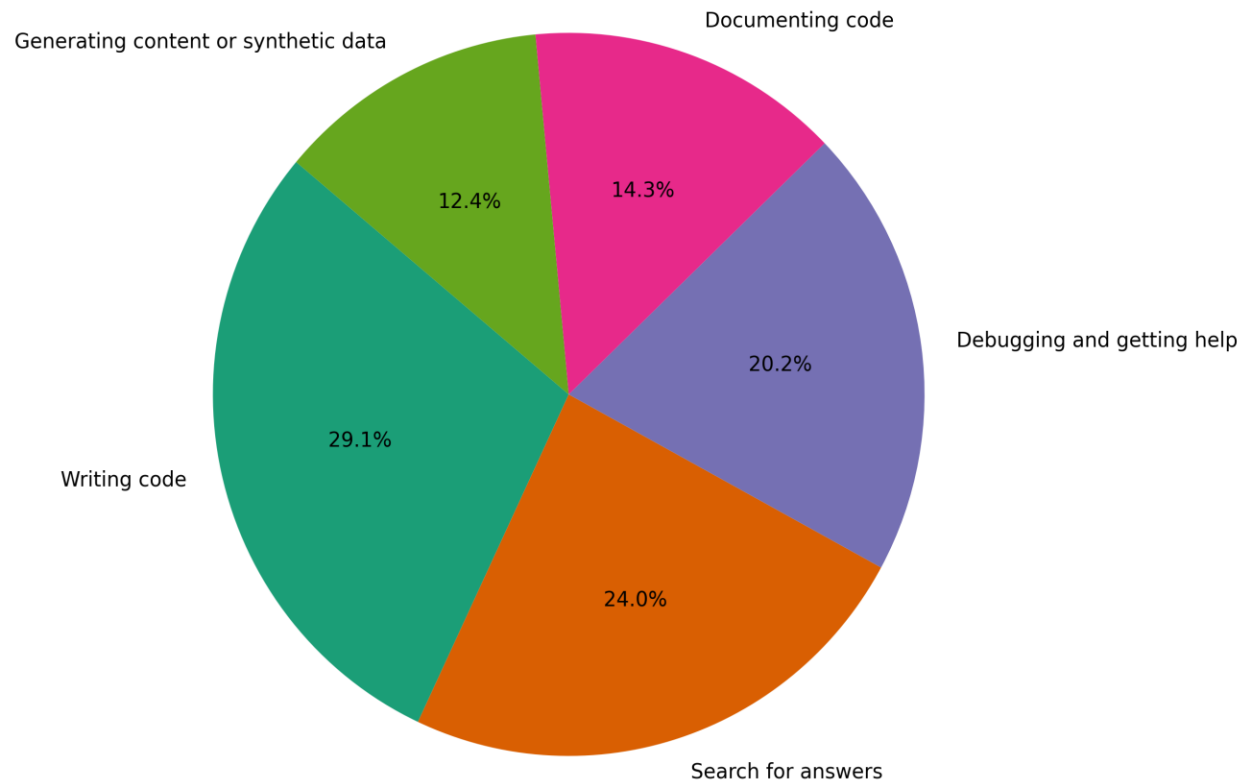


Developer Roles & Uses of AI Tools

Top 5 Developer Roles Among Respondents

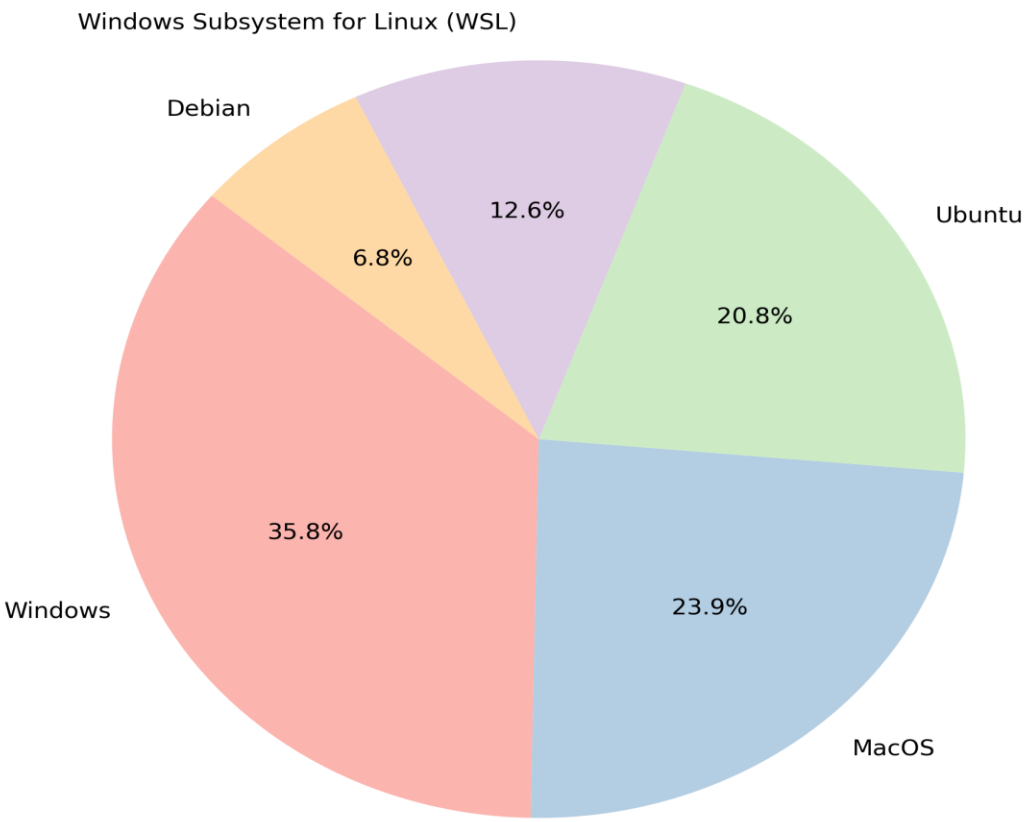


Top 5 AI Tools Developers Are Currently Using

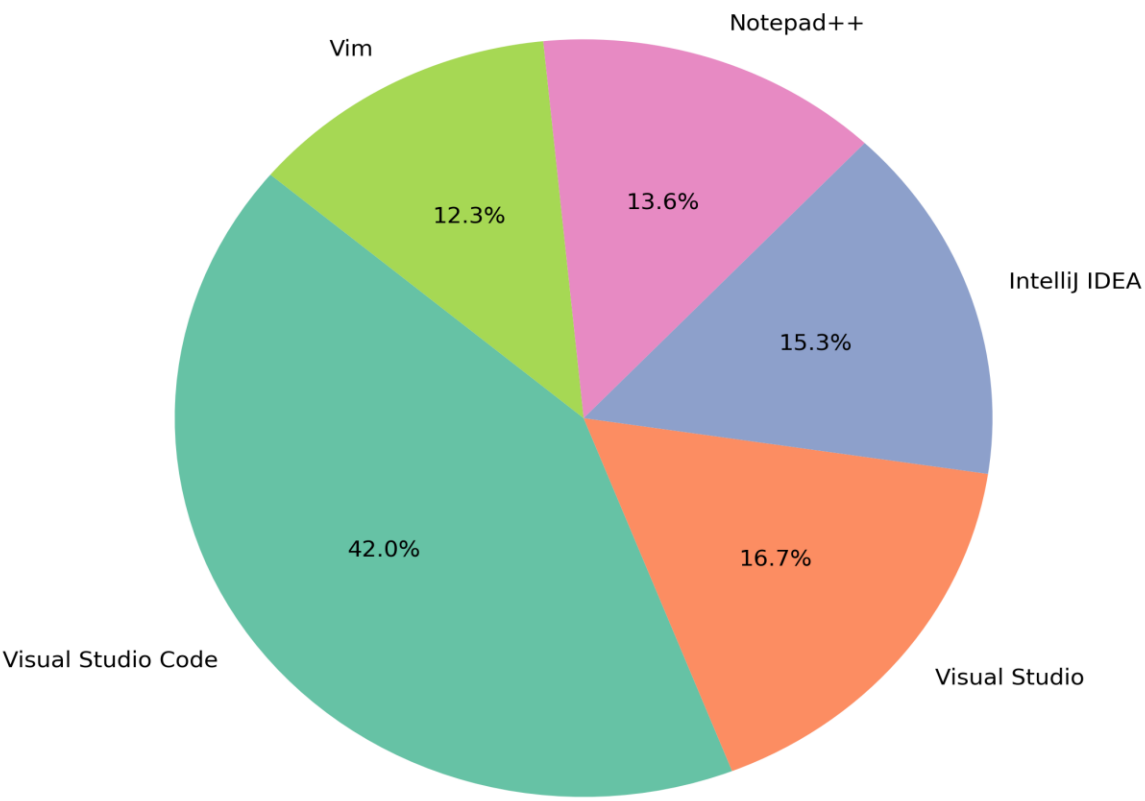


Current Operating Systems & Collaboration Tools

Top Operating Systems Developers Use Professionally

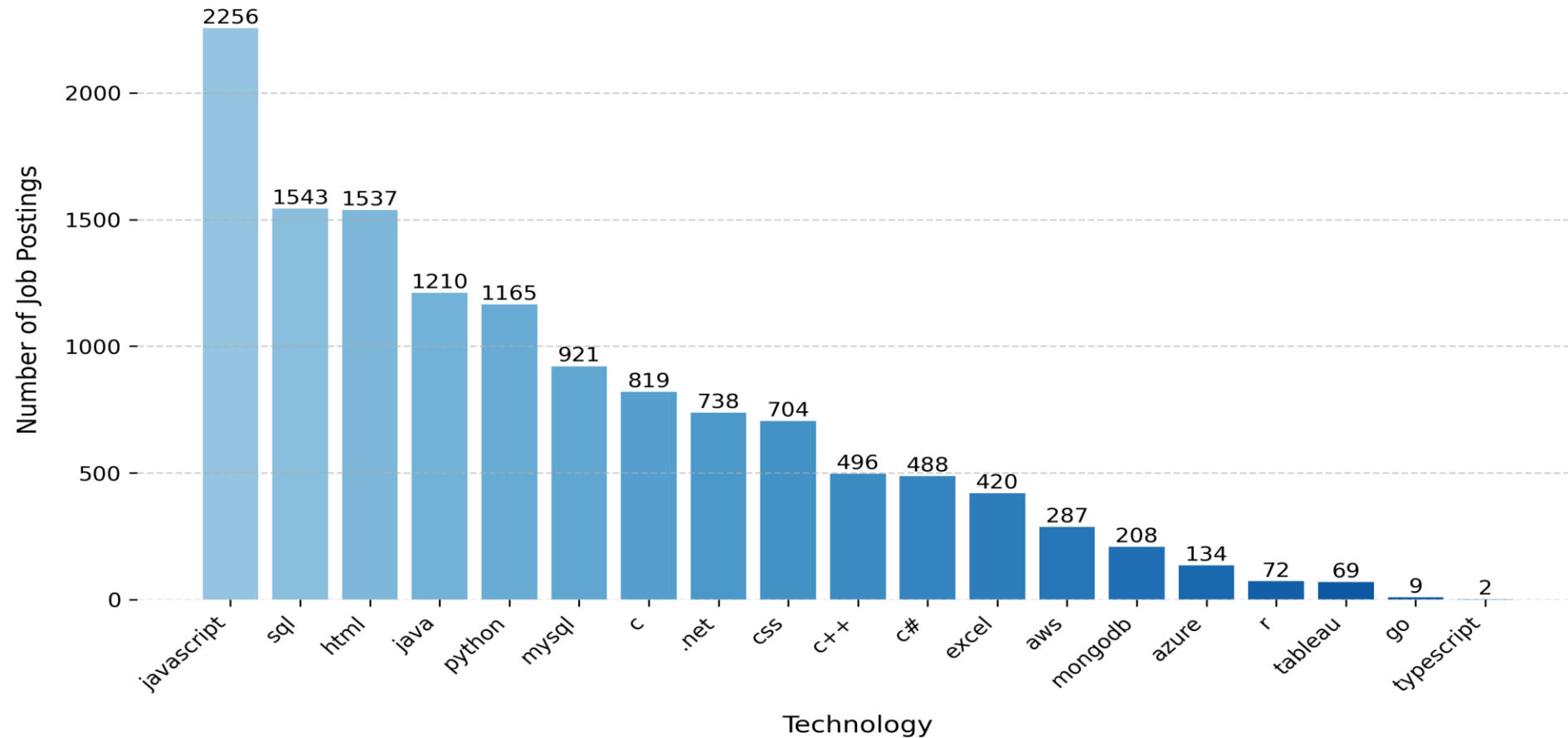


Top 5 Collaboration Tools Respondents Have Worked With



Job Postings Data

Number of Job Postings by Technology



Popular Languages

