Stack Overflow Annual Developer Survey 2024

June 23, 2025

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EXECUTIVE SUMMARY

- **Web and Backend Technologies Dominate**
  JavaScript, HTML/CSS, SQL, and Python continue to lead usage and desirability, underscoring the dominance of web and backend development in the tech landscape.

- **Emerging Languages Signal System-Level and Security Focus**
  The rise of Rust and Go in developer preference reflects growing interest in high-performance, secure system-level programming.

- **Cloud Platforms and Scalable Databases are Central to Modern Development**
  AWS, Google Cloud, PostgreSQL, MySQL, and SQLite remain top choices, highlighting the importance of scalability, flexibility, and strong community support.

- **Frameworks Show Backend Preference with Growing Frontend Diversity**
  ASP.NET, Node.js, and Express lead among frameworks, while tools like Django, Angular, and Ruby on Rails gain moderate interest, indicating evolving frontend strategies.

- **Shift Toward Open-Source and Developer-Centric Tools**
  Supabase's rise and Oracle's fall in desirability mark a broader transition toward open-source, agile, and developer-friendly technologies.

- **Demographics Skew Young, Educated, and Western**
  Most respondents are aged 25–34 with Bachelor's degrees, primarily from the USA and Europe, shaping global development trends and preferences.

- **Developers Favor Versatile, Object-Oriented Languages and Reliable Tools**
  Preferences consistently lean toward declarative, object-oriented programming with scalable databases and flexible frameworks that support diverse deployment environments.
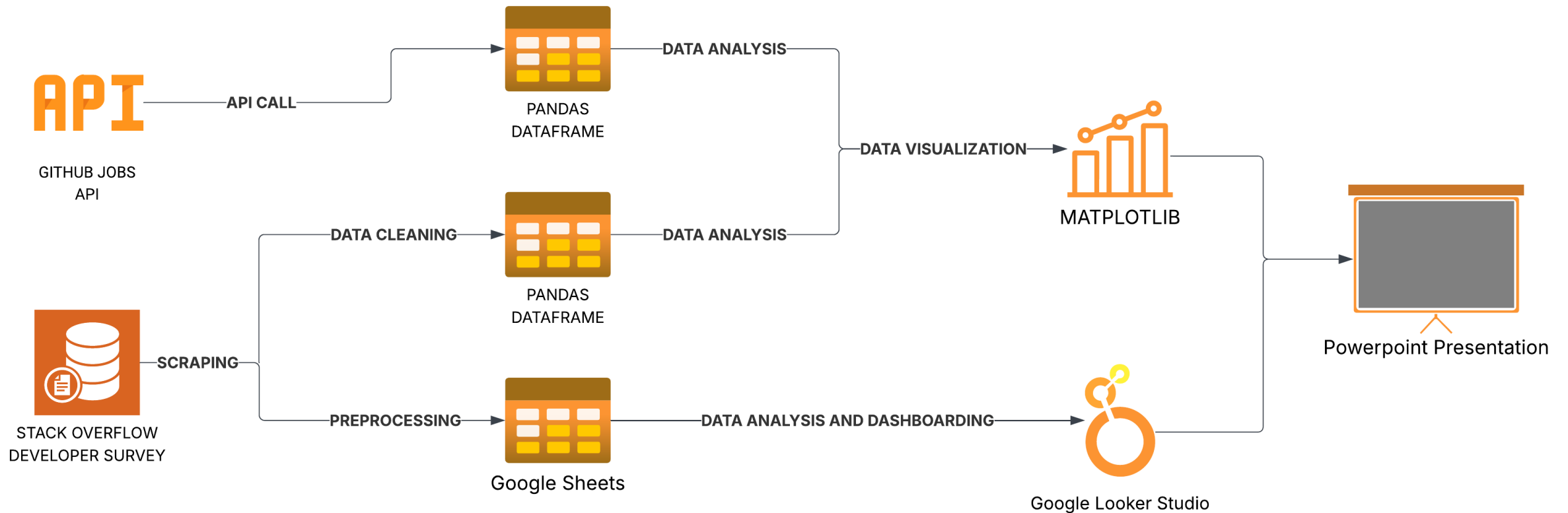
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INTRODUCTION

- **The 2024 Stack Overflow Annual Developer** Survey is a global annual survey that captures insights into developer roles, tools, and trends.

- It gathers information about developer demographics, current technology usage, & future technology trends.

- The survey presents a snapshot of the developer ecosystem and its direction for the next year.
  - It shows opinions and appraisals by developers of existing technology
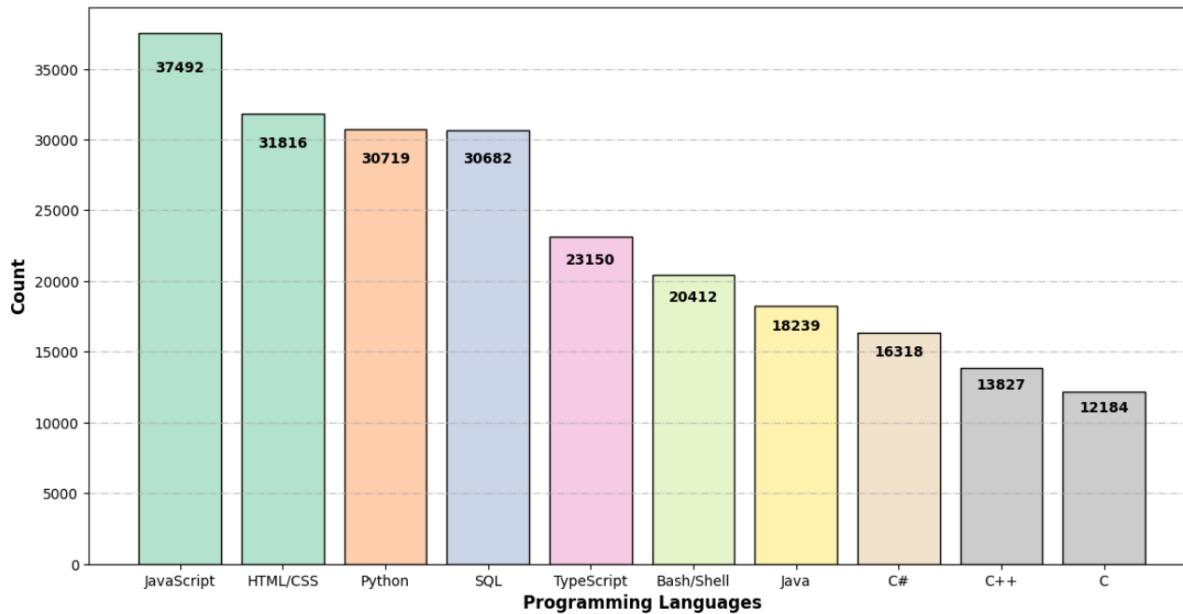 - These opinions can inform company decisions in terms of technology adoption.

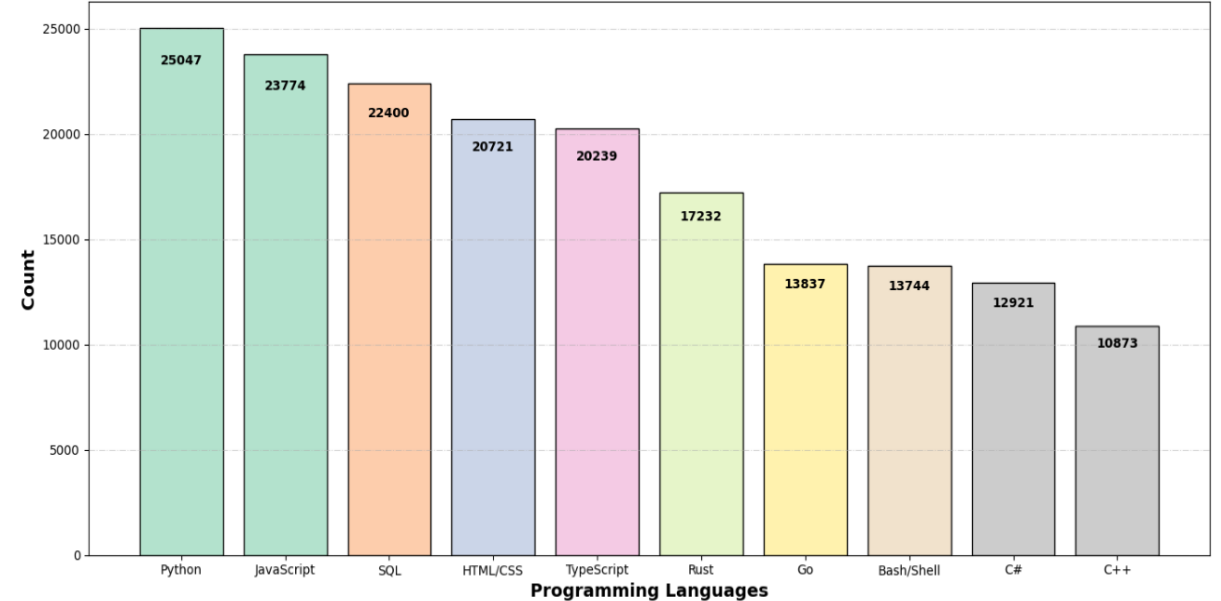# METHODOLOGY

PROGRAMMING LANGUAGE TRENDS

Current Year

Next Year

Top 10 Languages Used this Year

JavaScript: 37492
HTML/CSS: 31816
Python: 30719
SQL: 30682
TypeScript: 23150
Bash/Shell: 20412
Java: 18239
C#: 16318
C++: 13827
C: 12184

Top Languages Desired Next Year

Python: 25047
JavaScript: 23774
SQL: 22400
HTML/CSS: 20721
TypeScript: 20239
Rust: 17232
Go: 13837
Bash/Shell: 13744
C#: 12921
C++: 10873

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Web development languages like **Javascript**, **HTML/CSS** and **SQL** top the most used language
- **Python** tops desired language while **Rust, Go** breaks into top 10 desired languages.
- The **C family, JAVA** and **Bash/Shell** retain positions in both languages used and desired languages.
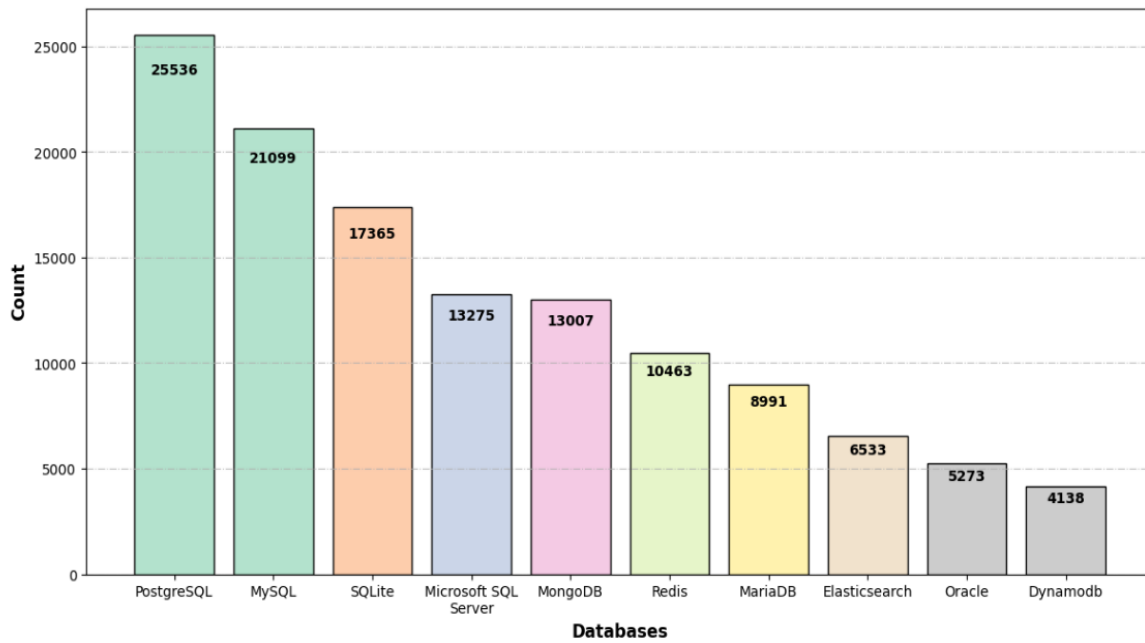
Implications

- **Web technologies** continue to dominate the tech landscape.
- **Python's** continued popularity highlights its **versatility** and **utility** in **data science**, scientific computing and **ML/AI**
- **Rust** and **Go's** emerging popularity implies a growing desire in tech for system level development and security
- **C/C++**, **JAVA** & **Bash/Shell'**s continuing popularity is owed to their importance in **backend**, **system**, **DevOps**.
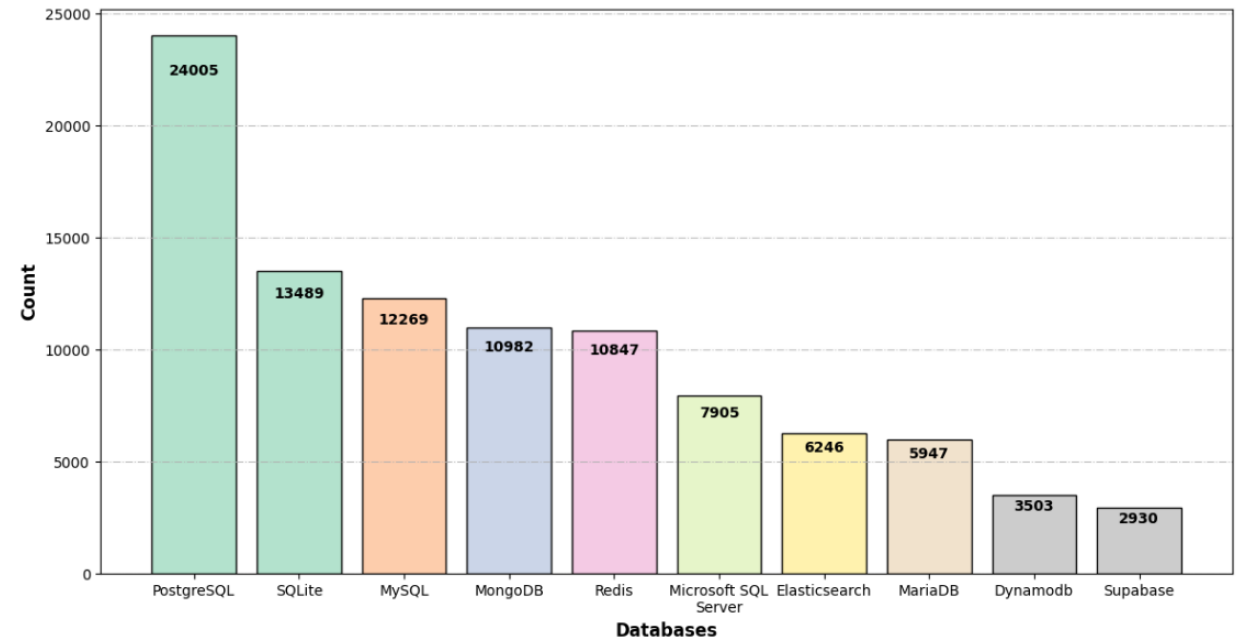
DATABASE TRENDS

Current Year

Next Year

Top 10 Databases Used this Year

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- **PostgreSQL**, **MySQL**, **SQLite** consistently rank as the top databases in current use and desired for next year.

- **MongoDB**, **Elasticsearch** and **Microsoft SQL Server** and **Redis** retains middle rank positions as most used and desired for next year.

- **DynamoDB**, **MariaDB** narrowly retains their ranks while **Supabase** supplants **ORACLE** which no longer ranks in the top 10 desired DB's next year.

Implications

- **PostgreSQL**, **MySQL**, and **SQLite** consistent top rank highlights their reliability, flexibility and strong community support.

- **MongoDB**, **Elasticsearch**, **Microsoft SQL Server**, and **Redis** maintain middle ranks reflect their roles in NoSQL, full-text search, enterprise and caching scenarios.

- **DynamoDB** and **MariaDB** keep their spots, suggesting dedicated niche userbase.

- **Supabase** overtaking **Oracle** indicates shift away from legacy enterprise systems toward opensource, developer friendly platforms.
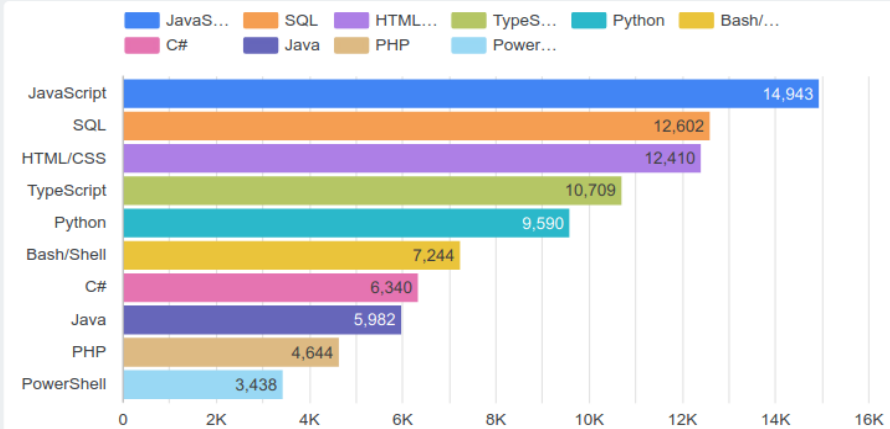
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DASHBOARD

View interactive dashboard here:

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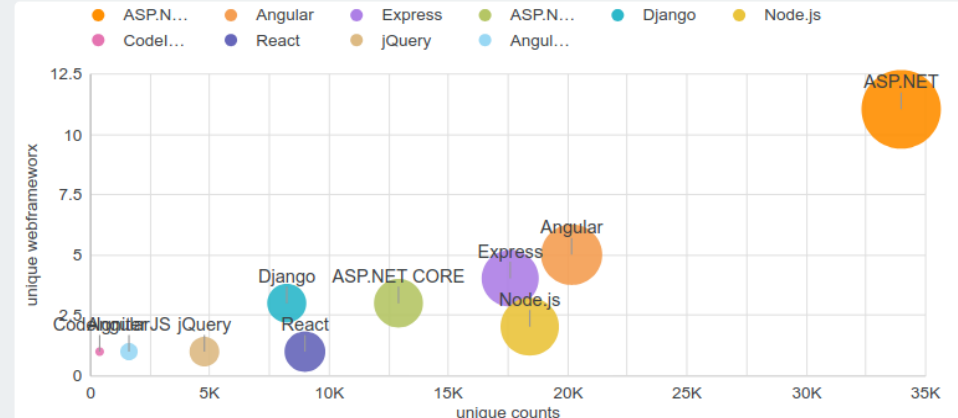58-97a1-4f3d-85af-107d6ece8bc8

DASHBOARD TAB 1

DASHBOARD TAB 2

Top 10 Languages Desired Next Year

Legend: Java..., SQL, Type..., HTM..., Python, Go, Rust, C#, Bash..., Java

Language	Value
JavaScript	11,541
SQL	10,944
TypeScript	10,437
HTML/CSS	10,016
Python	8,919
Go	5,661
Rust	5,597
C#	5,590
Bash/Shell	5,582
Java	4,048
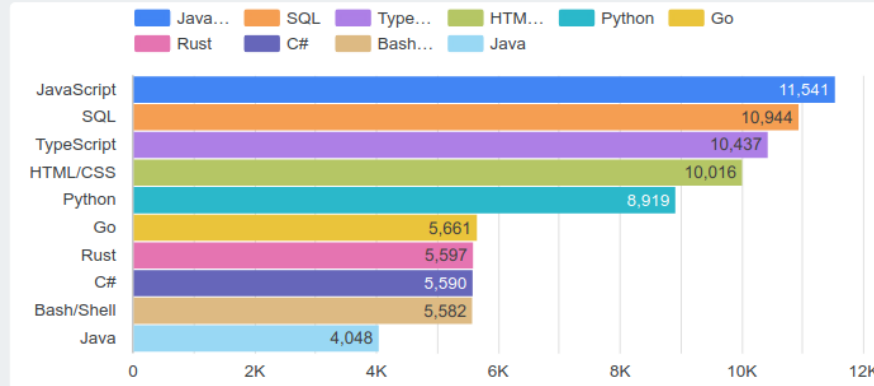
Top 10 Databases Desired Next Year

Legend: PostgreSQL, Redis, SQLite, MySQL, MongoDB, Microsoft ..., Elasticsear..., MariaDB, Dynamodb, Supabase

Database	Value
PostgreSQL	12,193
Redis	6,384
SQLite	6,295
MySQL	6,204
MongoDB	5,618
Microsoft SQL Server	4,345
Elasticsearch	3,665
MariaDB	3,078
Dynamodb	2,154
Supabase	1,623

Top 10 Desired Platforms

- Amazon Web Services (AWS) : 26.85%
- Google Cloud : 13.87%
- Cloudflare : 10.77%
- Microsoft Azure : 16.29%
- Digital Ocean : 7.43%
- Firebase : 6.95%
- Vercel : 7.09%
- Hetzner : ...
- Supabase : 3.49%
- Netlify : 3.24%

Top 10 Desired Web Frameworks Next Year
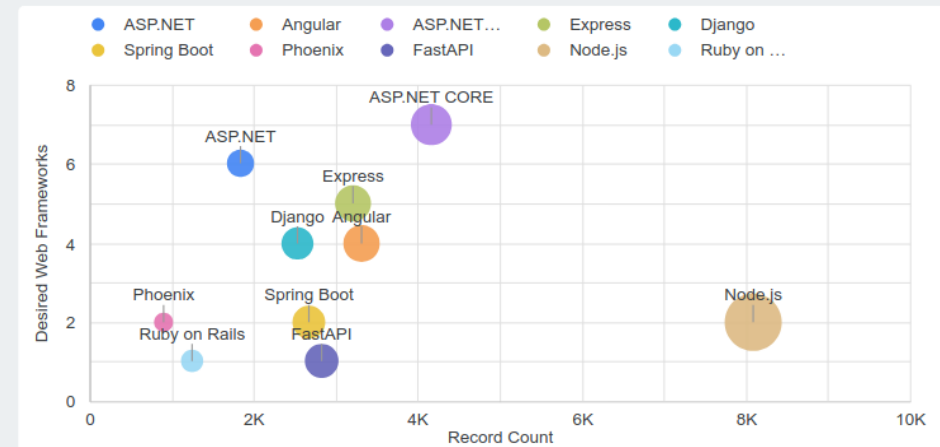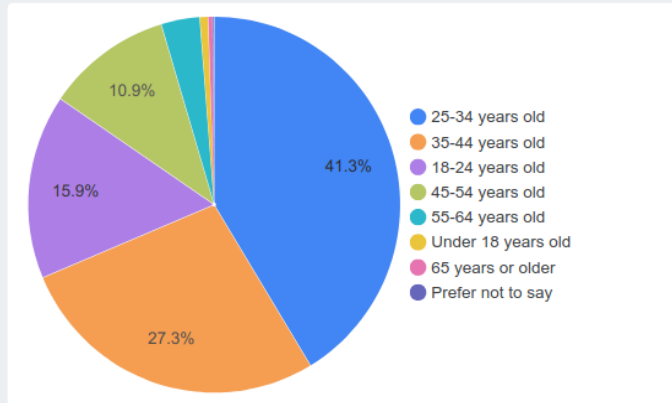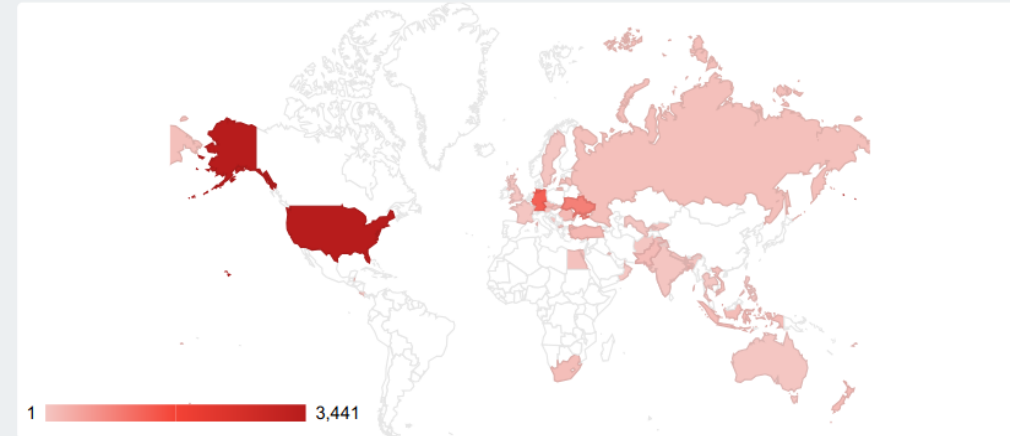
Legend: ASP.NET, Angular, ASP.NET..., Express, Django, Spring Boot, Phoenix, FastAPI, Node.js, Ruby on ...

Y-axis: Desired Web Frameworks
X-axis: Record Count

- ASP.NET CORE
- ASP.NET
- Express
- Django Angular
- Phoenix
- Ruby on Rails
- Spring Boot
- FastAPI
- Node.js

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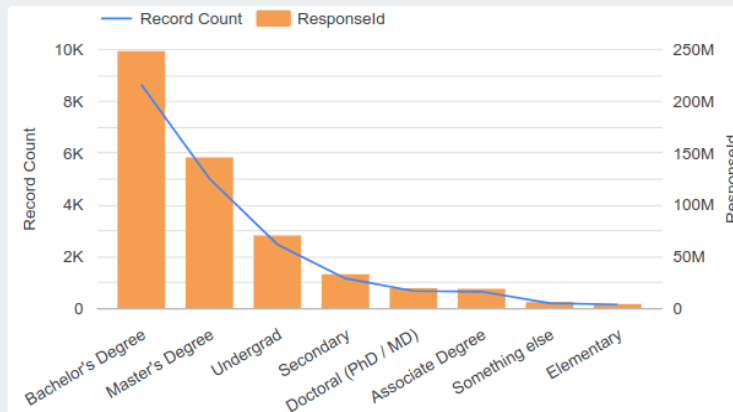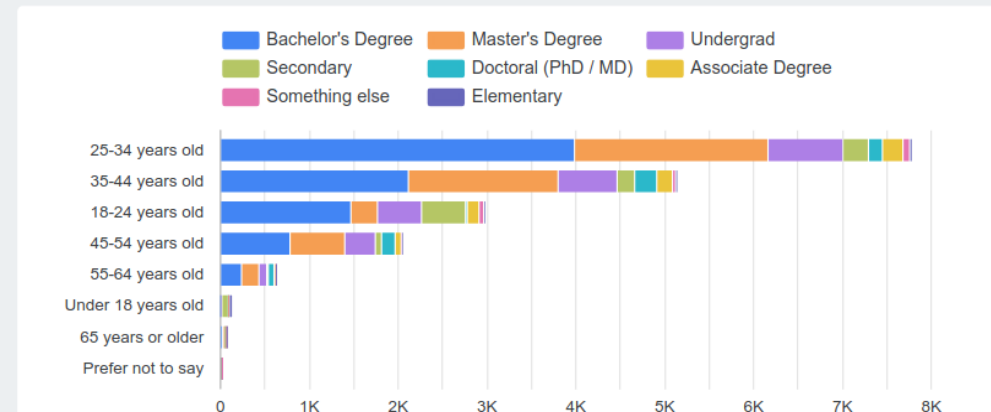
DASHBOARD TAB 3

DISCUSSION

- The dashboard provides a snapshot into the current sentiment among developers

- It summarizes data around Current Technology Usage, Future Technology Trends and Demographics

OVERALL FINDINGS & IMPLICATIONS

Findings

- The top frameworks used this year are **asp.net**, **express**, **node.js**. mid-rank are a**sp.net core**, **django**, **react** and lower ranked are **JQuery** and **Angular JS**

- the top platforms are **AWS, Google Cloud**, **Cloudflare**, **Firebase**, **Akamai**, **IBM** among the mid to lower ranks are **VMWare, Heroku, Vercel**, and **Oracle Cloud Infrastructure**

Implications

- **Current Technology Usage** shows that developers prefer declarative, object oriented languages and open-source, scalable and reliable databases

- **Frameworks**: Backend-focused and enterprise-ready frameworks like ASP.NET and Node.js dominate, while modern frontend tools are more fragmented, reflecting diverse development styles and gradual shifts from legacy tools.

- **Platforms**: Major cloud providers lead due to scalability and versatility, while developer-friendly platforms like Firebase and Vercel gain traction, signaling a demand for fast, integrated deployment solutions.

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OVERALL FINDINGS & IMPLICATIONS

Findings

- The most desired platforms for next year are **AWS**, **Microsoft Azure**, **Google Cloud** mid-rank are Cloudflare, Digital Ocean and Vercel.

- The most desired frameworks are **Node JS**, **ASP.Net CORE**, **Express** and mid-rank are Angular, ASP.NET, FAST API, Django and low ranked are Phoenix, etc.

- **Ruby On Rails** made it to top 10 desired languages next year despite not being on top 10 most used this year.

Implications

- **Future Technology Trends** shows that developers maintain preference for declarative, object oriented languages and open-source, scalable and reliable databases but have also developed interest in system, devops and backend languages.

- **Platforms**: Cloud giants remain highly desirable, showing developer focus on scalability and job market relevance, while interest in emerging ones reflect growing demand for simpler options.

- **Frameworks**: The rise of **Node.js**, **ASP.NET Core**, and **Express** signals strong interest in efficient backend-focused development, while in **Angular**, **Django**, and underdogs like **Phoenix** and **Ruby on Rails** suggests developers are exploring alternatives

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OVERALL FINDINGS & IMPLICATIONS

Findings

- The largest age group of respondents is 25–34 (41.3%), followed by 35–44 (27.3%) and 18–24 (15.9%); the youngest and oldest groups have the fewest respondents.

- A majority of respondents hold a Bachelor's degree, with fewer having Master's or PhD/professional degrees.

- Most respondents are from the USA and Europe, with other regions contributing far fewer responses.

- Most 25–34-year-olds have a Bachelor's degree; older age groups show consistent Bachelor's dominance except for 55–64, where Master's degrees nearly match.

Implications

- Most developer insights reflect the experience and preferences of early to mid-career professionals.

- Bachelor's-level education remains the dominant entry point into the tech industry.

- Survey results may be skewed toward Western industry trends and work environments.

- Higher education levels appear to increase with age, possibly reflecting career progression or generational access to advanced study.

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CONCLUSION

- **Web and backend technologies remain dominant**, with JavaScript, SQL, and Python leading usage and desirability, indicating continued demand for full-stack and data-driven development skills.

- **Cloud platforms and scalable databases like PostgreSQL, MySQL, AWS, and Google Cloud are consistently preferred**, reflecting developers' priorities around reliability, scalability, and community support.

- **Developers are increasingly exploring modern and efficient backend frameworks (Node.js, ASP.NET Core, Express) and emerging languages (Rust, Go)**, signaling interest in performance, security, and backend system development.

- **The developer demographic skews young, educated, and Western**, which shapes trends toward open-source, object-oriented tools and highlights the need for global inclusivity in future developer surveys and platforms.
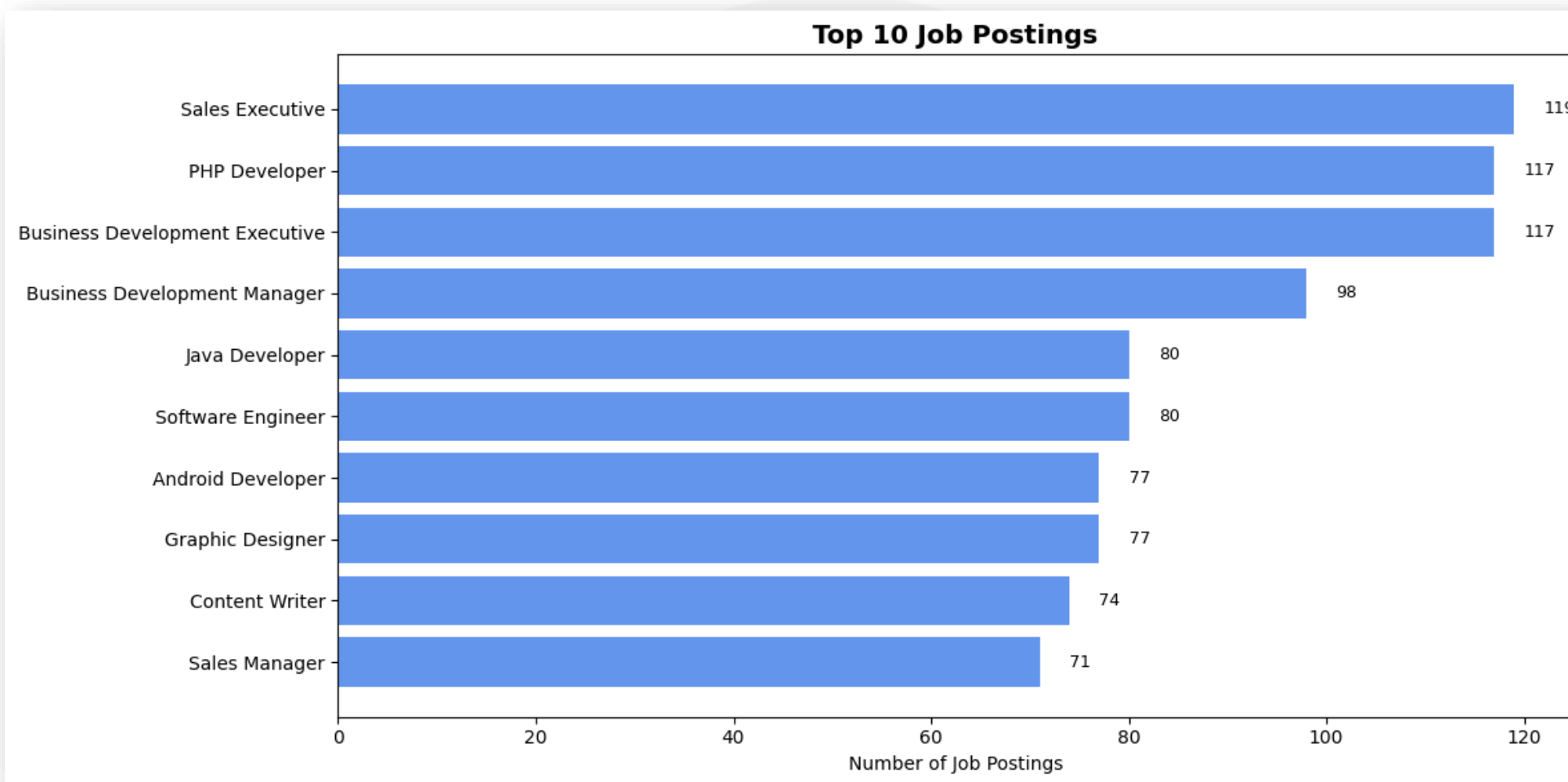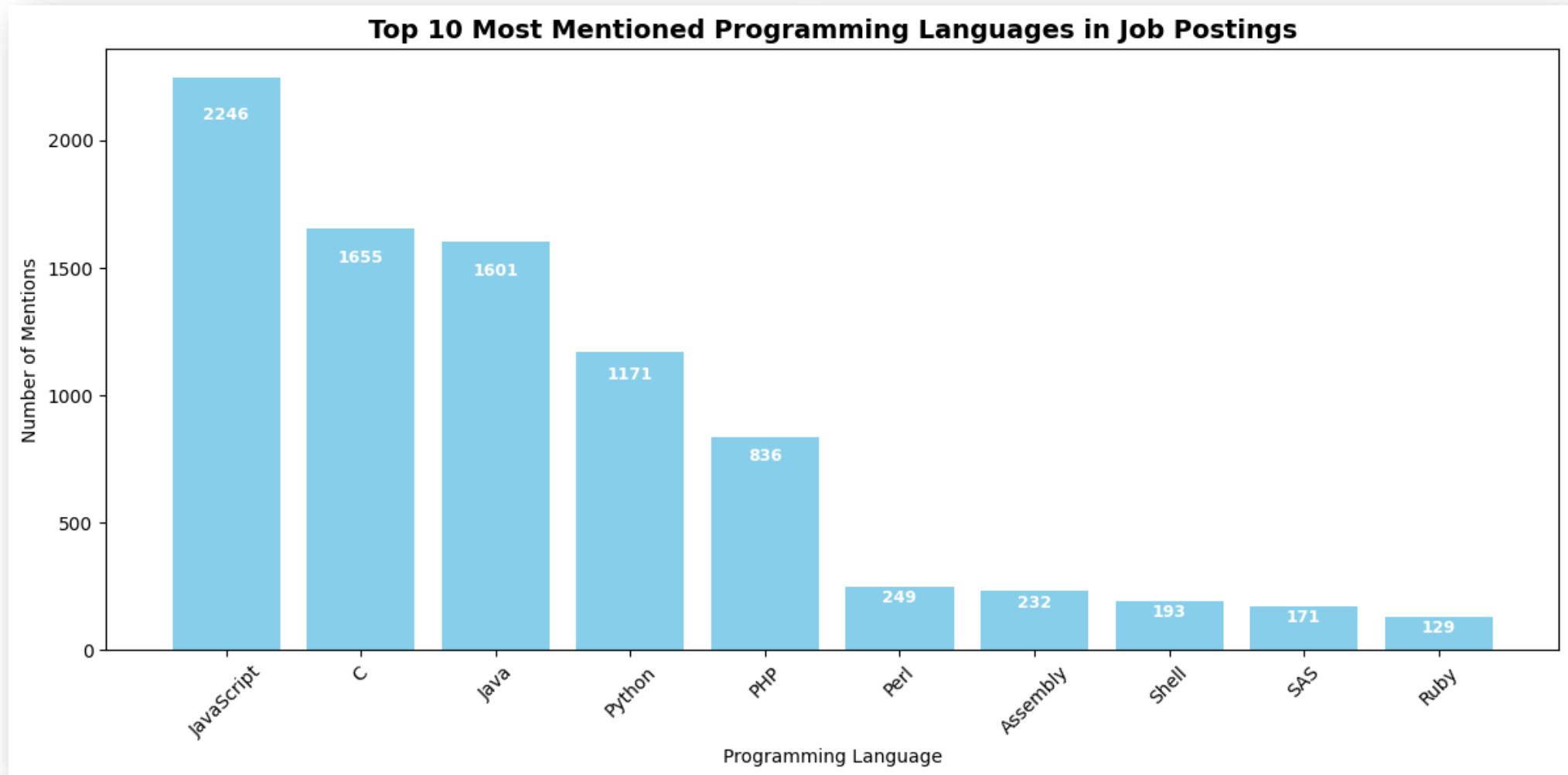
APPENDIX

1. **Job Postings**
2. **Popular Languages**
3. Languages Used by Different Age Groups
4. Desired Database According to Job Satisfaction
5. IDE Usage across Age Groups
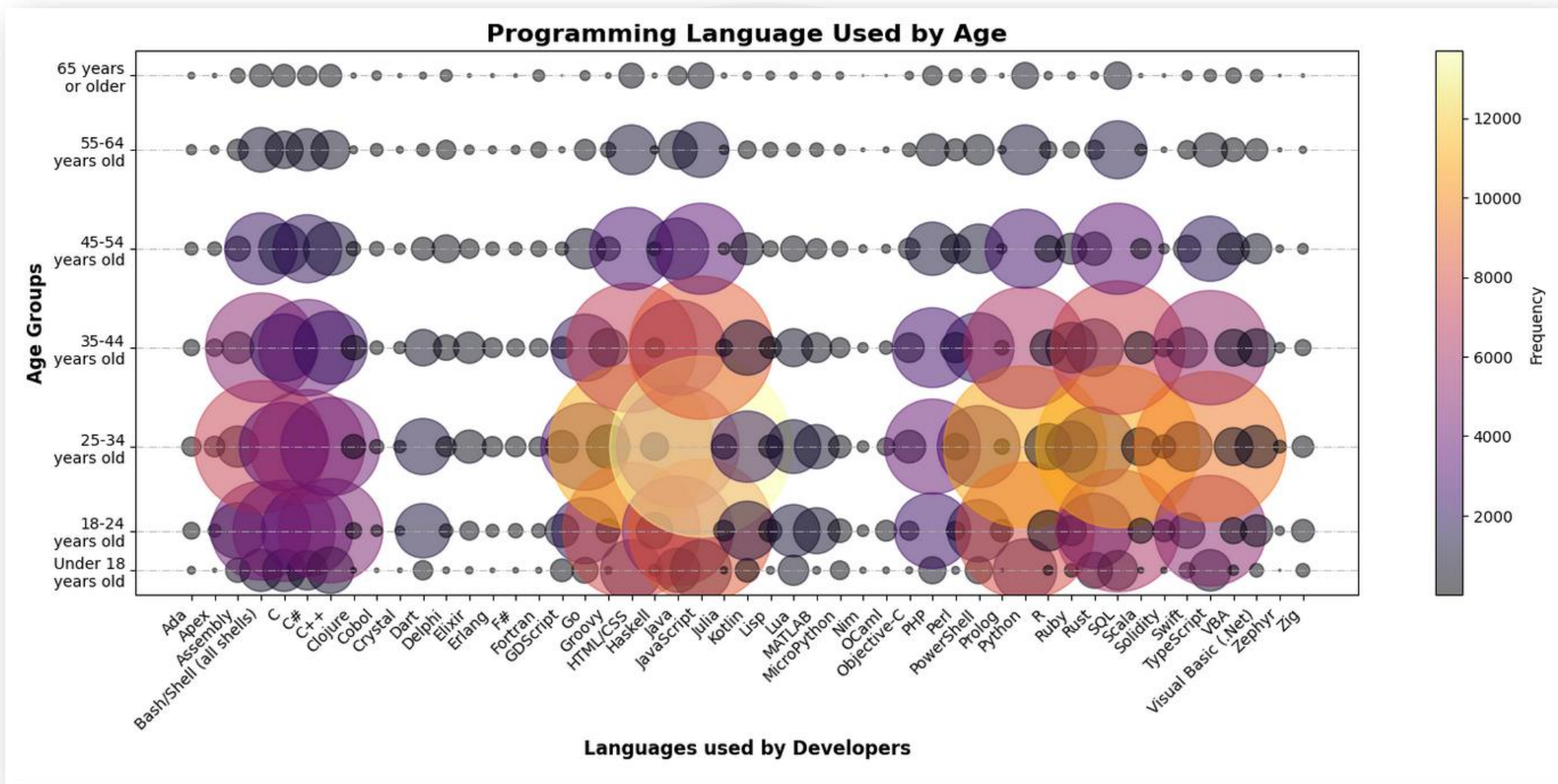6. Job Satisfaction vs Years of Coding Professionally

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JOB POSTINGS

Top 10 Job Postings

Job Title	Number of Job Postings
Sales Executive	119
PHP Developer	117
Business Development Executive	117
Business Development Manager	98
Java Developer	80
Software Engineer	80
Android Developer	77
Graphic Designer	77
Content Writer	74
Sales Manager	71

Number of Job Postings

POPULAR LANGUAGES

Top 10 Most Mentioned Programming Languages in Job Postings

LANGUAGES USED BY DIFFERENT AGE GROUPS

Programming Language Used by Age

DESIRED DATABASE ACCORDING TO JOB SATISFACTION LEVEL

Desired Database according Job Satisfaction level

IDE USAGE ACROSS AGE GROUPS
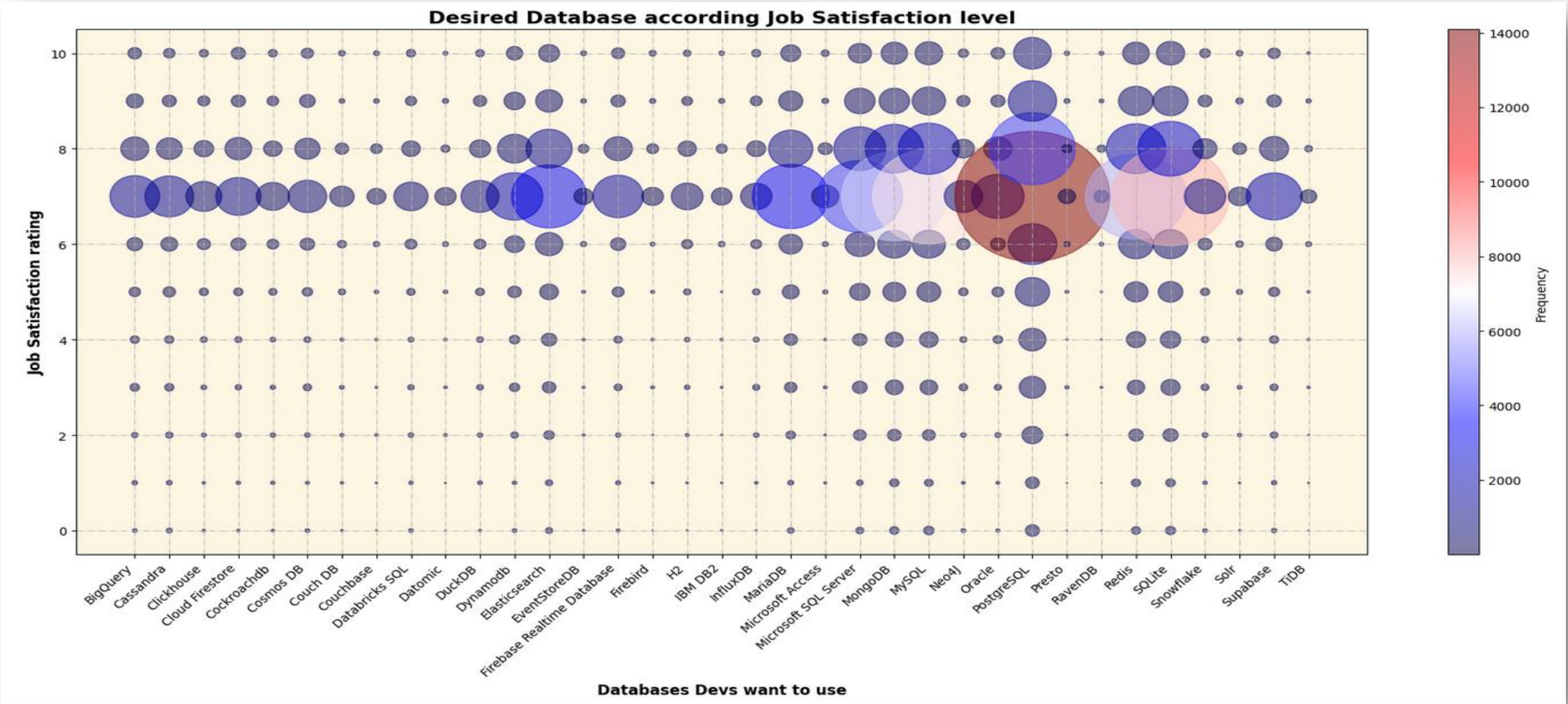
Development Environment usage across Age Groups
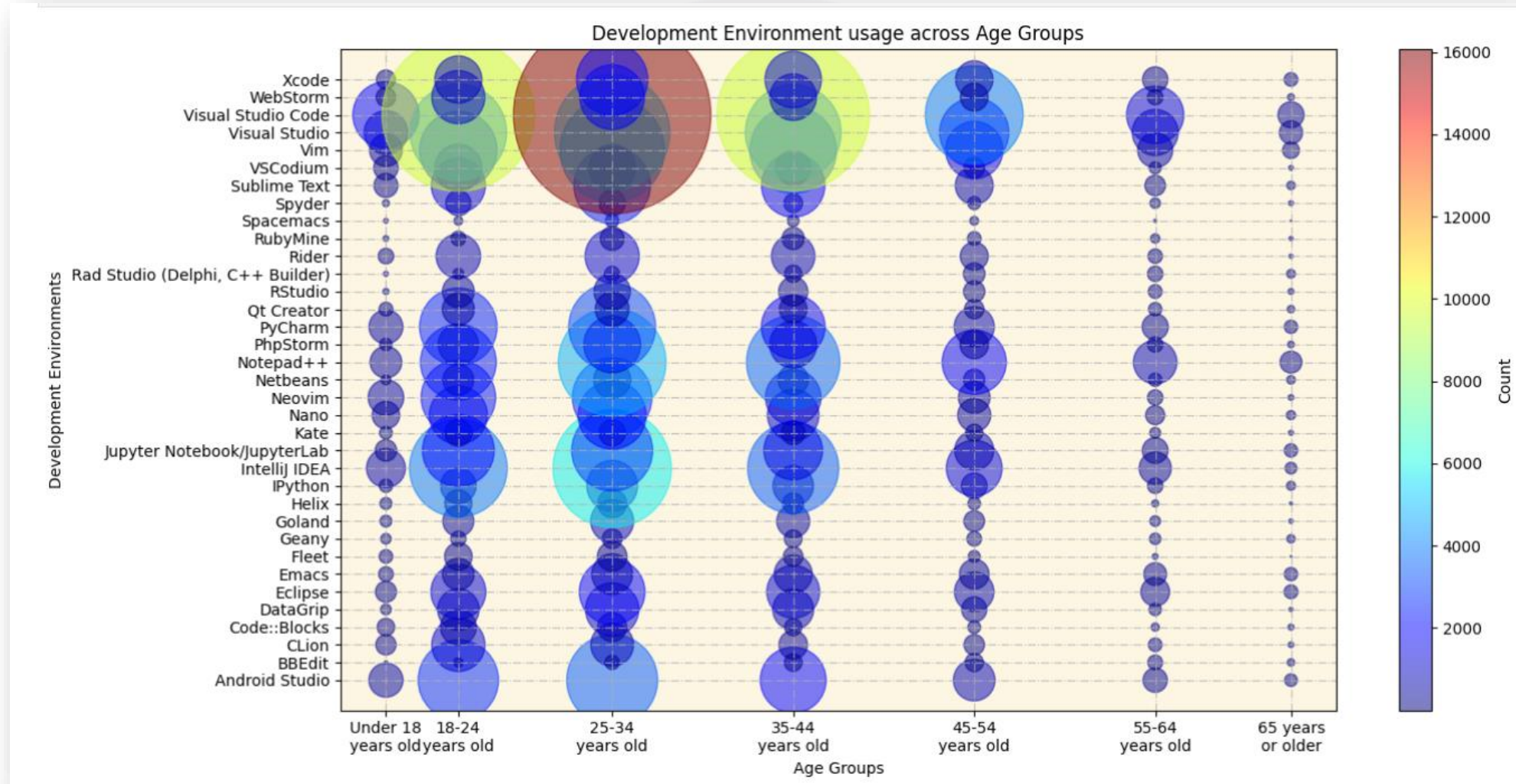
JOB SATISFACTION VS YEARS OF PROFESSIONAL CODING

Job Satisfaction by Years of Professional Coding