# Emerging Tech Skills and
# In-Demand Programming Languages

A Data-Driven Analysis  IT and Business Consulting Report

# OUTLINE

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

# EXECUTIVE SUMMARY

Project Objective:
*Identify the most in-demand programming skills and emerging tech trends to guide workforce development.*

Programming Languages

- Trends: Python and JavaScript are the current top languages that maintain their supremacy, while C++ and C show an increase in interest.
- Insight: Developers are prioritizing fundamental languages (Python, JavaScript, C++) and tools for automation, scripting, and full-stack development.

Databases

- Future trends: PostgreSQL remains dominant, but there is growing interest in NoSQL solutions like MongoDB, Redis, and Supabase.
- Insight: The shift towards cloud-native and NoSQL databases reflects increasing demand for scalability and flexibility in database management.

Business Impact and Recommendations

- Upskill employees in Python, JavaScript, and TypeScript for full-stack development.
- Adopt PostgreSQL and NoSQL databases for scalability and cloud-first solutions.
- Invest in modern front-end technologies like React, Next.js, and Vue.js to align with market demand.

# INTRODUCTION

Purpose:

*analyze current and future technology trends in programming languages, databases, web frameworks, and web services. By leveraging insights from developer surveys, job postings, and training platforms*

Target Audience:

- Business and IT Leaders: To align hiring strategies with technology trends.
- HR and Talent Acquisition Teams: To identify skills most sought after in the market.
- Developers and Engineers: To understand which skills to focus on for career growth.
- Training and Education Providers: To tailor learning programs based on industry needs.

This report provides **data-backed insights** to help:

- Stay competitive: Adapt to evolving tech landscapes and industry demands.
- Make Informed Decisions: Guide investments in hiring, training, and upskilling.
- Optimize Workforce Development: Ensure employees are equipped with the right skills for future projects.
- Identify Market Trends: Spot emerging languages, databases, and tools to adopt early.

# METHODOLOGY
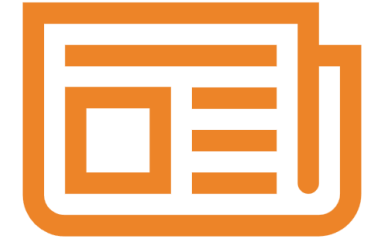
## Data Sources

- Developer Surveys (Stack Overflow Developer Survey)
- Job Postings
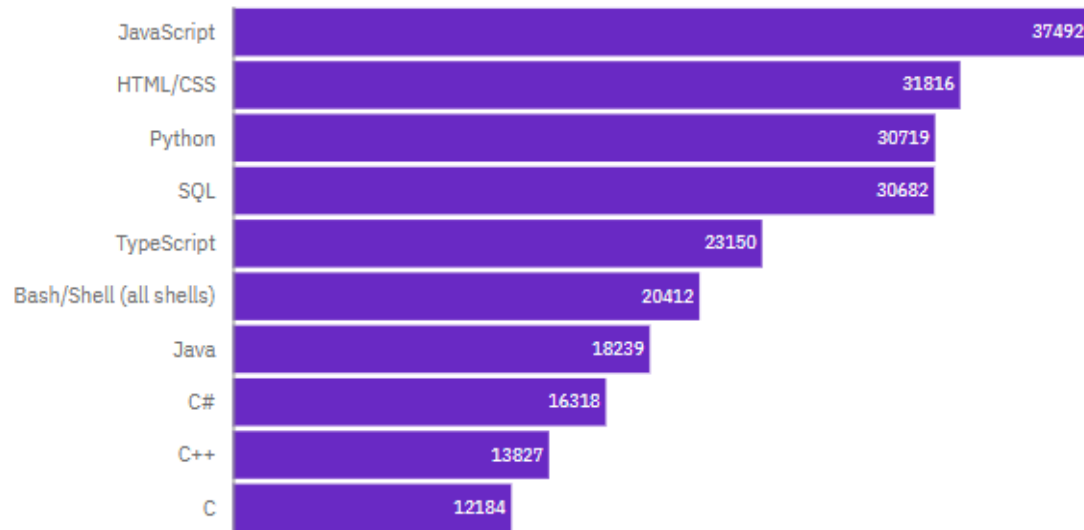- Training Platforms

## Collection Methods

- APIs & Web Scraping
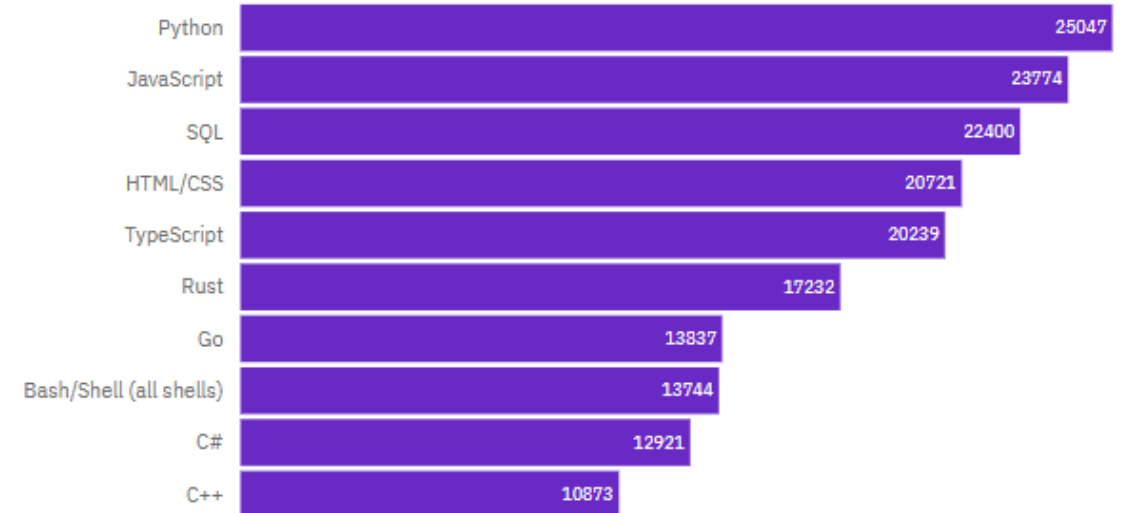- Structured Datasets (CSV/Excel from surveys & reports)

## Key Data Wrangling Steps

- Managing duplicates
- Handling missing values
- Anomalies correction
- Outliers Detection

# PROGRAMMING LANGUAGE TRENDS

**Current trend**

| Language | Value |
|---|---|
| JavaScript | 37492 |
| HTML/CSS | 31816 |
| Python | 30719 |
| SQL | 30682 |
| TypeScript | 23150 |
| Bash/Shell (all shells) | 20412 |
| Java | 18239 |
| C# | 16318 |
| C++ | 13827 |
| C | 12184 |

**Future trend**

| Language | Value |
|---|---|
| Python | 25047 |
| JavaScript | 23774 |
| SQL | 22400 |
| HTML/CSS | 20721 |
| TypeScript | 20239 |
| Rust | 17232 |
| Go | 13837 |
| Bash/Shell (all shells) | 13744 |
| C# | 12921 |
| C++ | 10873 |

# FINDINGS AND IMPLICATIONS

## Findings

### Current Trends:

- JavaScript, HTML/CSS, and Python dominate the developer landscape, highlighting their widespread adoption for web development, scripting, and data analysis.

- SQL remains highly relevant, showcasing the continuous demand for database management expertise.

- Lower-ranked languages like C, C++, and C# suggest they are more niche or industry-specific.

### Future Trends:

- Python leads future aspirations, driven by its versatility in AI, machine learning, and data science.

- Interest in Rust and Go suggests developers' focus on performance, scalability, and system-level programming.

- A consistent demand for JavaScript and TypeScript reflects the enduring importance of web and app development frameworks.

## Implications

### Training and Upskilling Initiatives:

- Python: Its dominance in future trends indicates a shift toward AI, machine learning, and data analytics. The organization should invest in Python training for its consultants to maintain its expertise.

- Rust and Go: Their rising demand suggests increased interest in high-performance, system-level programming. The firm can position itself as a leader by offering specialized services and training in these languages.
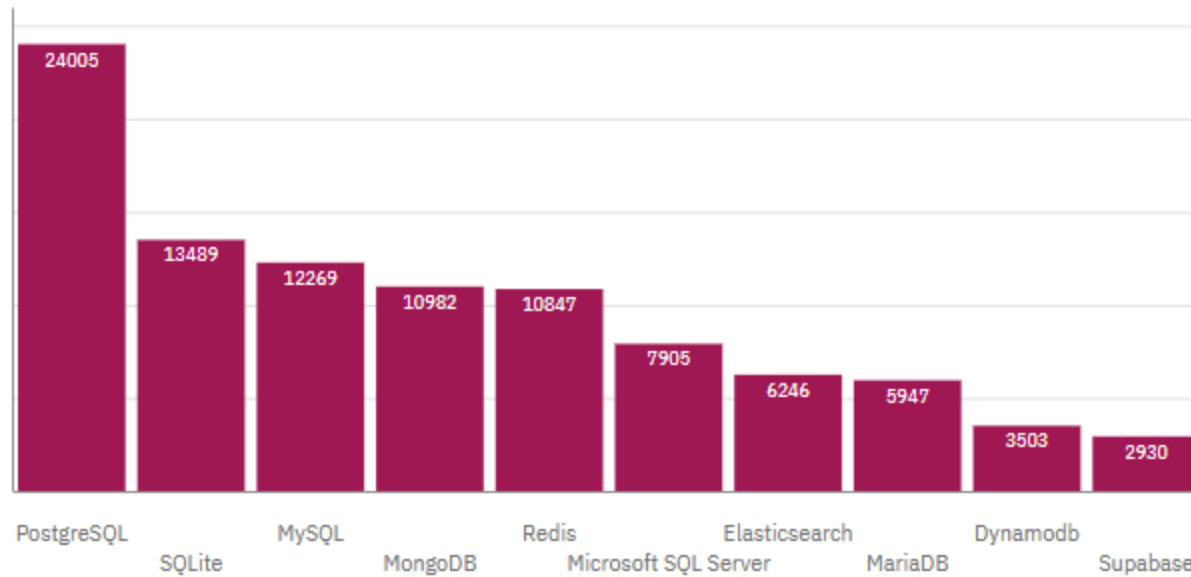
### Adapting Internal Tech Stack:

- Popularity of JavaScript, TypeScript, and SQL signals their continued relevance. Modernizing internal systems to use these tools ensures compatibility with global trends and prepares the organization to meet client demands.
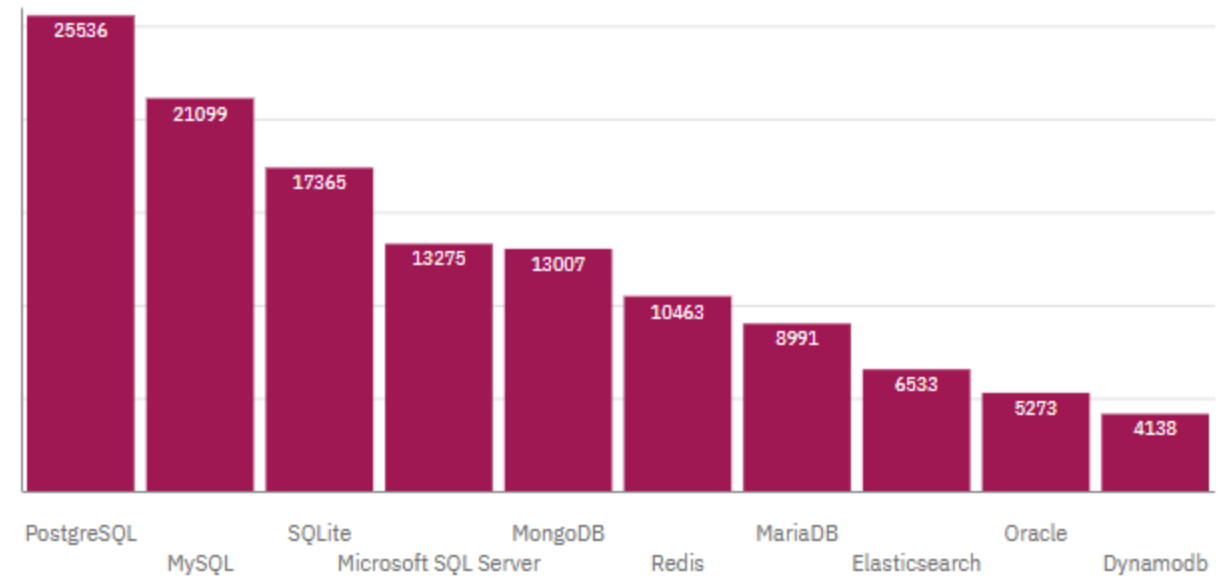
### Service Offerings Expansion:

- Incorporating the latest skills into the service catalog, such as Python-based AI solutions and Rust/Go-based scalable systems, can attract forward-thinking clients.

# DATABASE TRENDS



**Current trend**

PostgreSQL 24005, SQLite 13489, MySQL 12269, MongoDB 10982, Redis 10847, Microsoft SQL Server 7905, Elasticsearch 6246, MariaDB 5947, Dynamodb 3503, Supabase 2930

**Future trend**

PostgreSQL 25536, MySQL 21099, SQLite 17365, Microsoft SQL Server 13275, MongoDB 13007, Redis 10463, MariaDB 8991, Elasticsearch 6533, Oracle 5273, Dynamodb 4138

# FINDINGS AND IMPLICATIONS

## Findings

Current Trends:

- PostgreSQL is the most widely used database, followed by SQLite and MySQL.
- Relational databases (PostgreSQL, MySQL, SQLite) dominate the current landscape, signaling a continued focus on structured data.
- NoSQL databases like MongoDB and Redis have significant usage but remain behind in popularity.
- Emerging databases such as DynamoDB and Supabase have lower adoption rates.

Future Trends:

- PostgreSQL remains the leader in future trends, with even higher projected adoption, reflecting its versatility and scalability for modern applications.
- SQLite and MySQL continue to be highly sought after, underscoring their simplicity and effectiveness for lightweight applications.
- MongoDB sees a slight increase, indicating a growing interest in NoSQL for unstructured or semi-structured data.
- New entrants like Redis and MariaDB gain traction, reflecting increased interest in performance optimization and open-source database solutions.

## Implications

Training and Upskilling Initiatives:

- Emphasize PostgreSQL, MySQL, and SQLite in internal training programs to align with both current and future demands.
- Include NoSQL databases like MongoDB and Redis in upskilling initiatives to prepare for specific use cases such as big data, caching, and real-time analytics.

Adopting emerging databases:

- Prepare internal teams for serverless architectures by exploring DynamoDB and distributed database solutions.
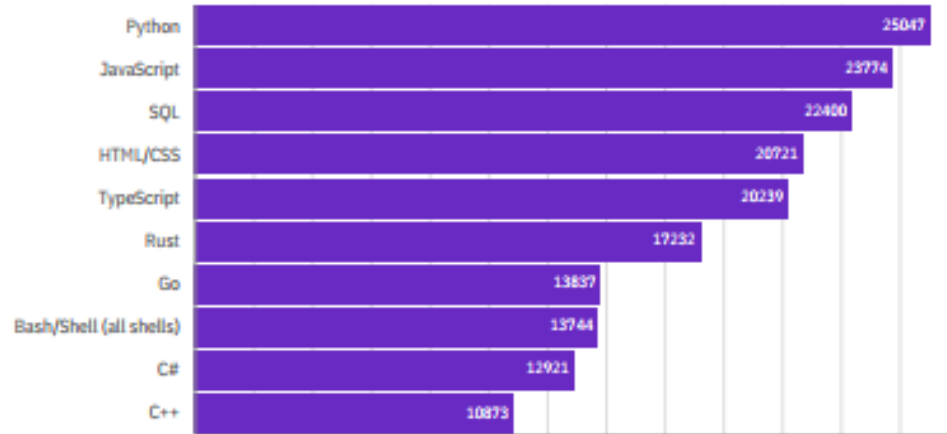
Database selection:

- Recommend PostgreSQL as the primary database for clients due to its robustness and adaptability.
- For lightweight applications, suggest SQLite or MySQL.
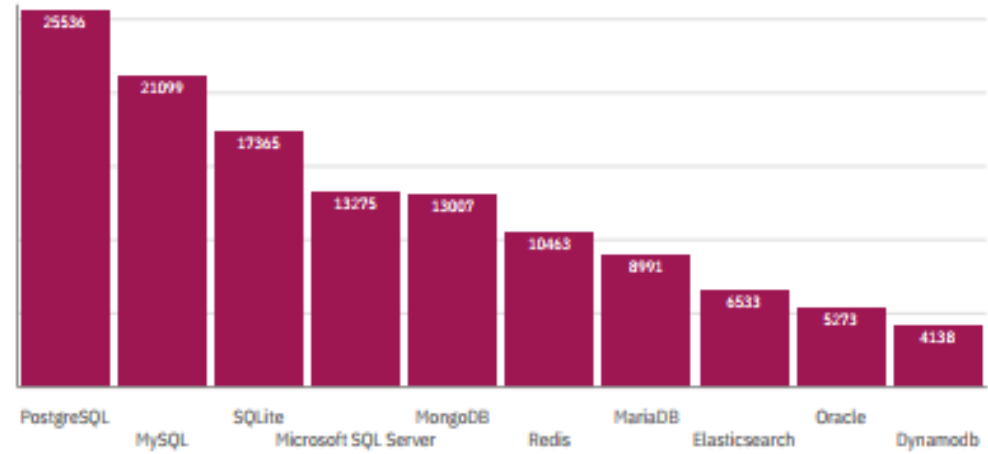- For projects involving unstructured data or high-performance caching, introduce MongoDB or Redis.

# DASHBOARD

# Current Technology Usage

## Top 10 Language have worked with

| Language | Count |
|---|---|
| Python | 25047 |
| JavaScript | 23774 |
| SQL | 22400 |
| HTML/CSS | 20721 |
| TypeScript | 20239 |
| Rust | 17232 |
| Go | 13837 |
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| C# | 12921 |
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## Top 10 Database have worked with

| Database | Count |
|---|---|
| PostgreSQL | 25536 |
| MySQL | 21099 |
| SQLite | 17365 |
| Microsoft SQL Server | 13275 |
| MongoDB | 13007 |
| Redis | 10463 |
| MariaDB | 8991 |
| Elasticsearch | 6533 |
| Oracle | 5273 |
| Dynamodb | 4138 |

## Top 10 Platform have worked with

Amazon Web Services (AWS)
Google Cloud
Firebase
Microsoft Azure
Cloudflare  Digital Ocean
Vercel

## Top 10 WebFrame have worked with

Node.js | 19772
React | 19167
ASP...
Next...
Vue...
jQuery...
A...
Expr...
Ang...
FL...

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# Future Technology Trend

## Top 10 Language want to work with

| Language | Value |
|---|---|
| JavaScript | 37492 |
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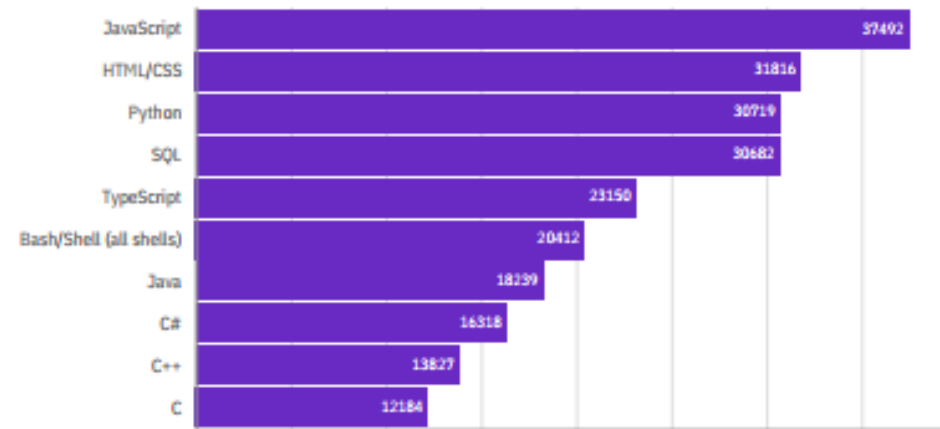
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| SQLite | 13489 |
| MySQL | 12269 |
| MongoDB | 10982 |
| Redis | 10847 |
| Microsoft SQL Server | 7905 |
| Elasticsearch | 6246 |
| MariaDB | 5947 |
| Dynamodb | 3503 |
| Supabase | 2930 |
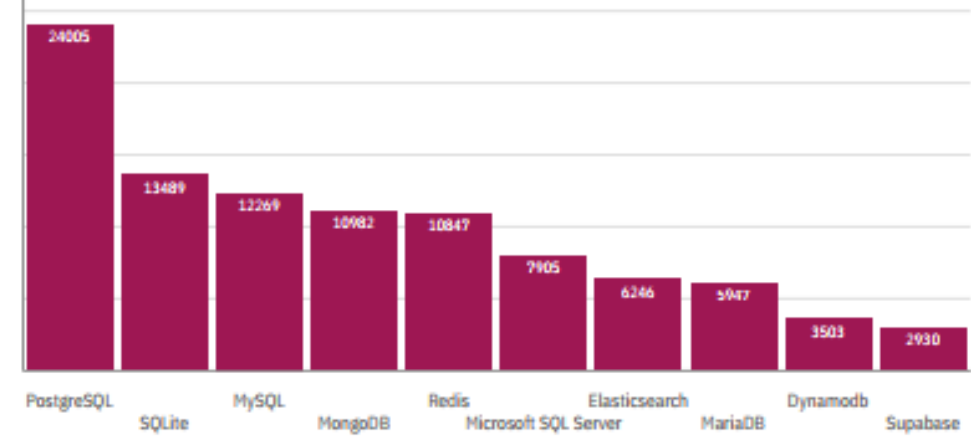
## Top 10 Platform want to work with

Amazon Web Services (AWS), Google Cloud, Firebase, Vercel, Microsoft Azure, Cloudflare, Digital Ocean, Supabase, Netlify, Hetzner
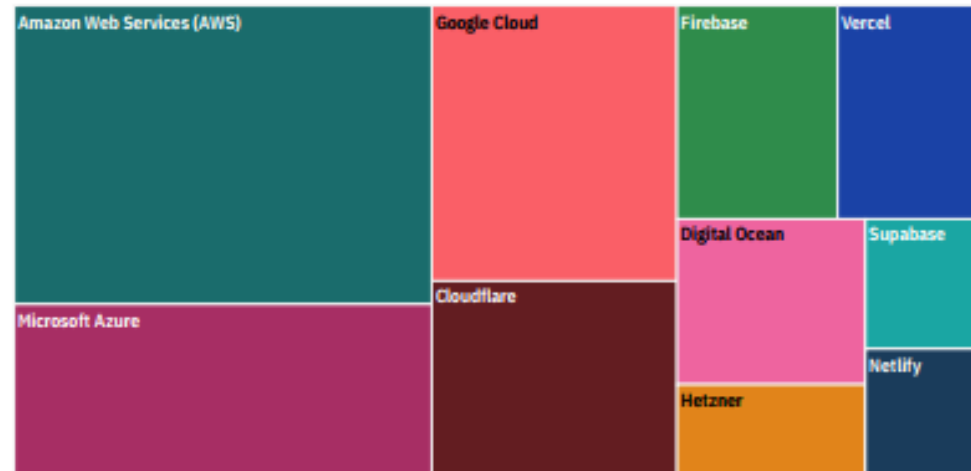
## Top 10 WebFrame want to work with

React | 15404, Node.js | 14735, Vue.js, Ex..., Sv..., Sp..., ASP..., NextJs..., Ang..., Dj...

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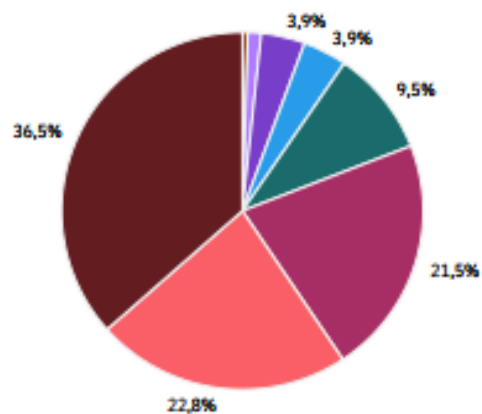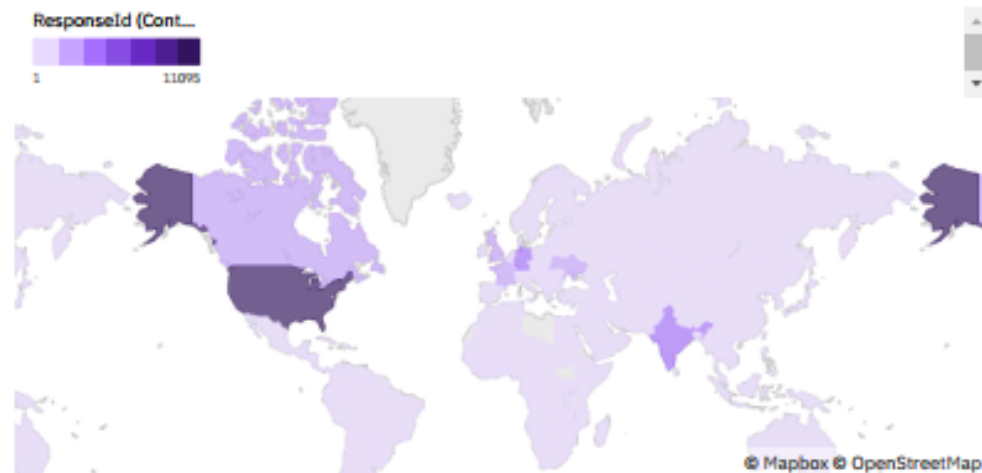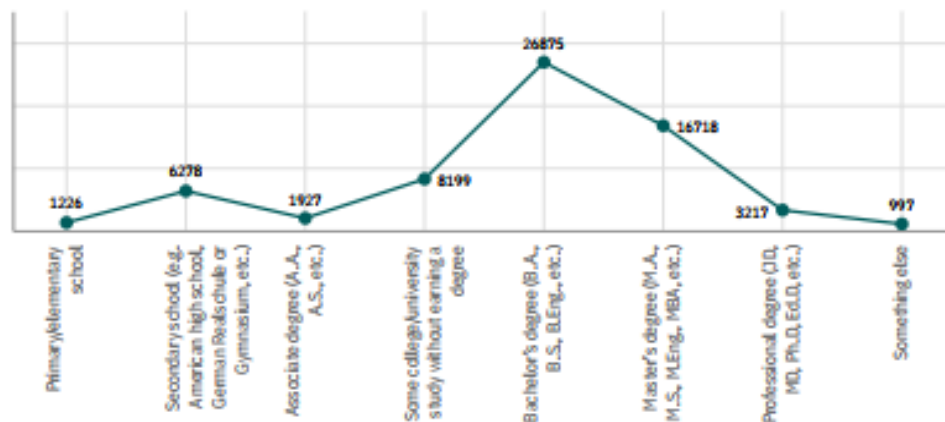
# Demographics

## Respondent distribution by Age



**Age**
- Prefer not to say
- 65 years or older
- Under 18 years old
- 55-64 years old
- 45-54 years old
- 18-24 years old
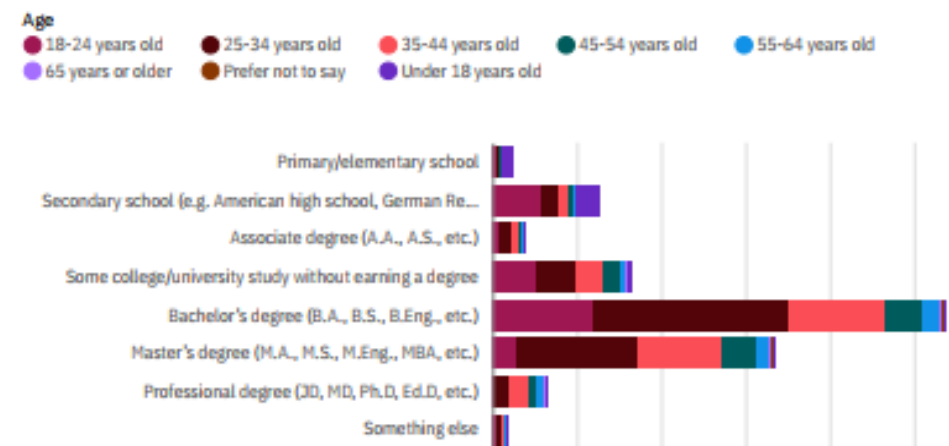- 35-44 years old
- 25-34 years old

36,5%
3,9%
3,9%
9,5%
21,5%
22,8%

## Respondent Count by Country



ResponseId (Cont...
1    11095

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## Respondent distribution by Formal Education Level



1226
6278
1927
8199
26875
16718
3217
997

Primary/elementary school
Secondary school (e.g. American high school, German Realschule or Gymnasium, etc.)
Associate degree (A.A., A.S., etc.)
Some college/university study without earning a degree
Bachelor's degree (B.A., B.S., B.Eng., etc.)
Master's degree (M.A., M.S., M.Eng., MBA, etc.)
Professional degree (JD, MD, Ph.D, Ed.D, etc.)
Something else

## Respondent Count by Age, classified by Education Level

**Age**
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65 years or older
- Prefer not to say
- Under 18 years old



Primary/elementary school
Secondary school (e.g. American high school, German Re...
Associate degree (A.A., A.S., etc.)
Some college/university study without earning a degree
Bachelor's degree (B.A., B.S., B.Eng., etc.)
Master's degree (M.A., M.S., M.Eng., MBA, etc.)
Professional degree (JD, MD, Ph.D, Ed.D, etc.)
Something else

# DISCUSSION

**Key Takeaways**

- Python, JavaScript, and SQL dominate the current and future landscape.

- PostgreSQL is consistently the most popular database.

- Cloud platforms (AWS, Azure, Google Cloud) remain dominant.

- React and Node.js continue to be highly relevant for web development.

- The majority of respondents are young professionals with a formal education background.

# OVERALL FINDINGS

Programming Language Trends:
- Python, JavaScript, and SQL are the most widely used languages today, with Python leading.
- Future preferences show JavaScript, HTML/CSS, and Python continuing to be in high demand.
- The rise of TypeScript and Rust suggests a growing preference for strongly-typed and performance-efficient languages.

Database Preferences:
- PostgreSQL dominates both current and future usage, indicating its reliability and scalability.
- NoSQL solutions like MongoDB and Redis continue to gain traction.
- Emerging interest in Supabase suggests a shift toward developer-friendly, open-source alternatives.

Platform Adoption:
- Cloud platforms (AWS, Azure, Google Cloud) remain the backbone of modern development.
- Emerging interest in Vercel and Supabase suggests an increasing preference for serverless and developer-friendly deployment solutions.

Web Frameworks:
- Node.js and React lead current usage, reinforcing JavaScript's dominance in web development.
- Future trends show Next.js and Vue.js gaining popularity, indicating a shift towards modern, performant front-end frameworks.

Demographic Insights:
- The majority of developers fall between 25-34 years old, indicating a workforce with a mix of early and mid-career professionals.
- Higher education (bachelor's & master's degrees) is the norm, emphasizing the importance of formal education in tech careers.
- A diverse global respondent base suggests a strong international tech community.

# OVERALL IMPLICATIONS

**Implications**

- Continued Dominance of JavaScript & Python: their stronghold across both present and future preferences means businesses and educational institutions should prioritize these languages.
- Cloud & Serverless growth: the rising interest in platforms like Vercel and Supabase reflects the increasing adoption of serverless architectures and simplified DevOps workflows.
- Modern Web development evolution: the shift towards Next.js and Vue.js suggests a demand for better performance, SEO, and developer experience.
- Growing importance of Open-Source and developer experience: the traction of PostgreSQL, Supabase, and Rust signals a trend toward developer-first, open-source, and performance-driven solutions.
- Shaping workforce strategies: companies should tailor their recruitment and training efforts toward young professionals with formal education, ensuring alignment with industry preferences.

# CONCLUSIONS

- JavaScript and Python remain dominant in both current and future programming preferences, reinforcing their importance in software development.

- PostgreSQL leads database usage, with NoSQL solutions like MongoDB and Redis gaining traction.

- Cloud computing remains essential, with AWS, Azure, and Google Cloud being the top platforms.

- React and Node.js continue to dominate web development, while Next.js and Vue.js show increasing popularity.

- Developers prefer open-source, developer-friendly tools, as seen in the growing interest in Rust, Supabase, and Vercel.

- The tech workforce is young and highly educated, indicating the need for continuous learning and skill development.

- Businesses should focus on modern web frameworks, cloud adoption, and developer-friendly technologies to stay competitive.