Stack Overflow Developer Survey 2024

By Deep Mangroliya

Date: 19th August, 2025

Outline

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

Executive Summary

- Top programming languages in demand:
  - **JavaScript, HTML/CSS, Python, SQL, TypeScript**
- Top database skills in demand:
  - **PostgreSQL, MySQL, SQLite, Microsoft SQL Server, MongoDB**
- Popular Platforms:
  - **Visual Studio Code, IntelliJ IDEA, Notepad++, Vim, Android Studio**
- Popular Web Frames:
  - **Node.js, React.js, jQuery, Next.js, Express.js**
- Future Technology Trend:
  - **Python** takes the 1st place, followed by **JavaScript**, and **SQL.**
  - **Top 5 places in Languages remains unchanged.**
  - **Redis** is in the top 5 most desired databases surpassing Microsoft SQL Server's place**.**

Introduction

- The 2024 Developer Survey provides fresh insights into the state of programming and technology.
- The survey explores developer preferences across languages, tools, and workplace experiences.
- Conducted by Stack Overflow, it gathered responses from over 65,000 developers worldwide.
- Covering topics such as favorite programming languages, emerging technologies, and workplace challenges, it reflects today's evolving tech landscape.
- Findings highlight JavaScript, HTML, and Python as top languages, the growing adoption of Rust, and the popularity of embedded platforms like Raspberry Pi and Arduino.
- The report also captures developer perspectives on AI and emphasizes that technical debt remains a major source of frustration.

Methodology

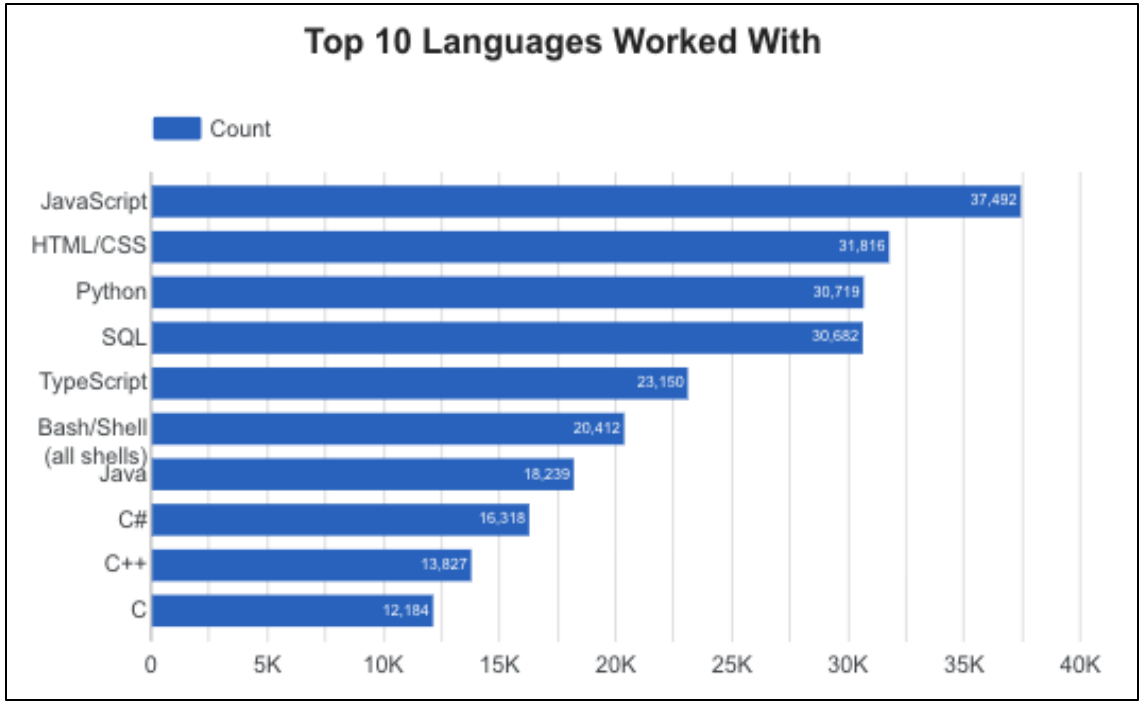
- Data is based on the survey conducted by Stack Overflow from January 23 to February 14, 2024, and involved over 65,000 software developers worldwide.
- Familiarization with this dataset was achieved through completing IBM labs on Coursera, which covered topics such as Web Scraping, Dataset Exploration, Data Wrangling, Exploratory Data Analysis, and Data Visualization.
- Data analysis and visualization was conducted via Looker Studio.

Results

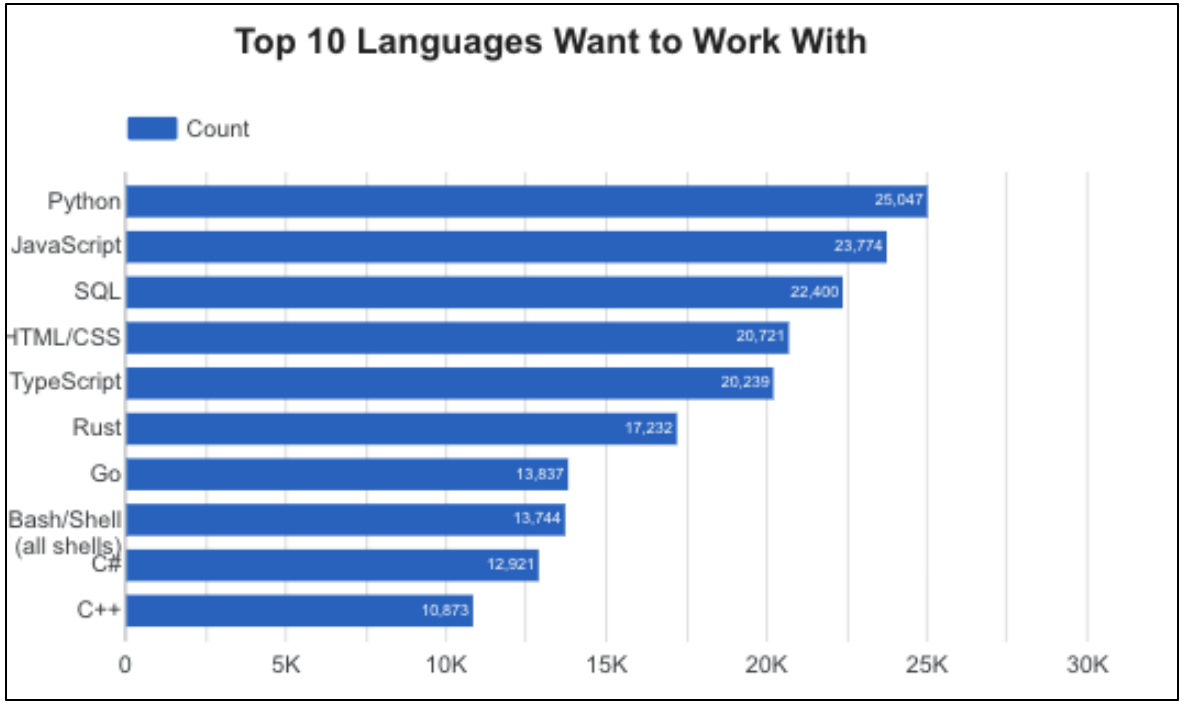
- **Python has emerged as the most desired language to learn**, ranking first in the "Want to Work With" category (25,047 responses), while continuing to hold a strong position in current usage (30,719 responses).
- **JavaScript remains the most widely used programming language** overall, with nearly 37,500 developers actively working with it.
- **React has become the leading web framework developers want to work with**, surpassing alternatives like Node.js and Vue.js, while jQuery still retains a large base in current usage.
- **Education levels remain consistent across the professional developer community**: the majority hold at least a bachelor's degree, with master's degrees being the second most common, followed by respondents with some college/university experience but no degree.
- **The developer workforce is relatively young**, with nearly three-quarters of professional respondents under the age of 35, reinforcing the strong pipeline of early-career talent in the industry.

Programming Language Trends

- 2024



- The Future



Programming Language Trends

Findings

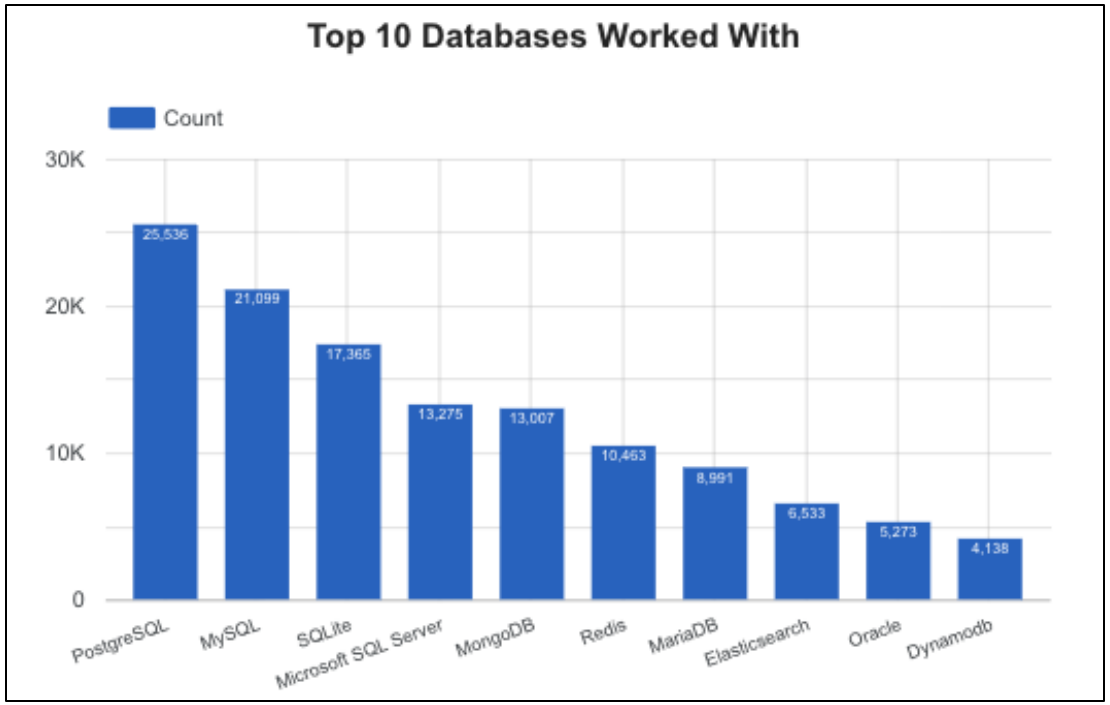
- JavaScript remains the most widely used programming language, with nearly 37,500 developers actively working with it.
- HTML/CSS follows closely, continuing to be a core technology in web development.
- Python ranks third in usage and is the **most desired language to learn**, ahead of Java and C#.
- SQL maintains a strong position, both in current usage and as one of the top languages developers want to work with.

Implications

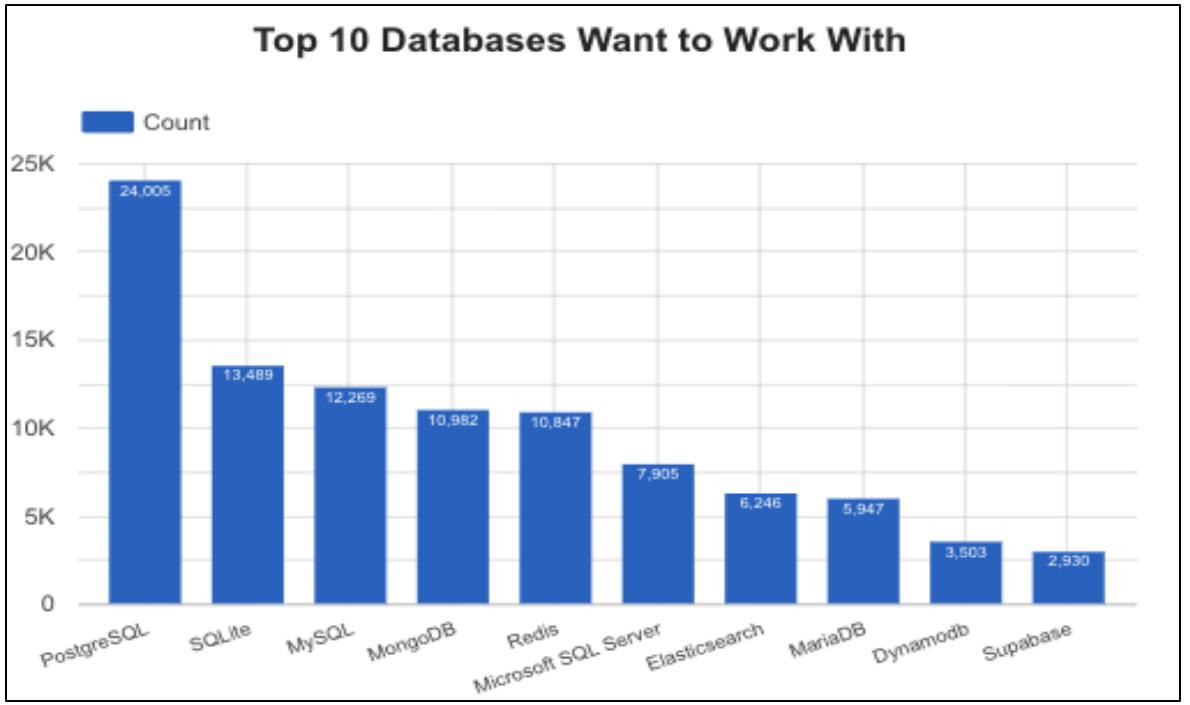
- The sustained dominance of JavaScript and HTML/CSS reflects their **critical role in building modern web applications**, making them essential skills for developers.
- Python's dual position—**high current usage and the top language developers aspire to learn**—underscores its versatility, spanning domains from **data science to automation and AI development**.
- SQL's consistent presence highlights the **centrality of data querying and management** across both web and enterprise systems.
- Developers aiming for long-term career resilience should prioritize **JavaScript, Python, and SQL** while keeping pace with emerging languages like **Rust and Go**, which are gaining traction among developers.

Database Trends

- 2024



- The Future



Database Trends

Findings

- **PostgreSQL is the most widely used database** among respondents, with over 25,000 developers actively working with it.
- **MySQL follows closely**, remaining one of the most popular relational database management systems (RDBMS).
- **SQLite and Microsoft SQL Server** also show strong adoption, with significant developer usage.
- **MongoDB ranks as the leading NoSQL database**, ahead of Redis, DynamoDB, and Elasticsearch.

Implications

- The dominance of **PostgreSQL and MySQL** underscores the **continued importance of relational databases** in powering applications across industries.
- The consistent presence of **SQL Server** and **SQLite** reflects their relevance in both enterprise-grade systems and lightweight applications.
- The strong adoption of **MongoDB** highlights the **shift towards NoSQL databases**, driven by demand for flexibility, scalability, and handling unstructured or semi-structured data.
- The **variety of databases in active use** emphasizes that developers are increasingly choosing **the right database for the right problem**, balancing relational integrity with NoSQL flexibility depending on application needs.

Dashboard

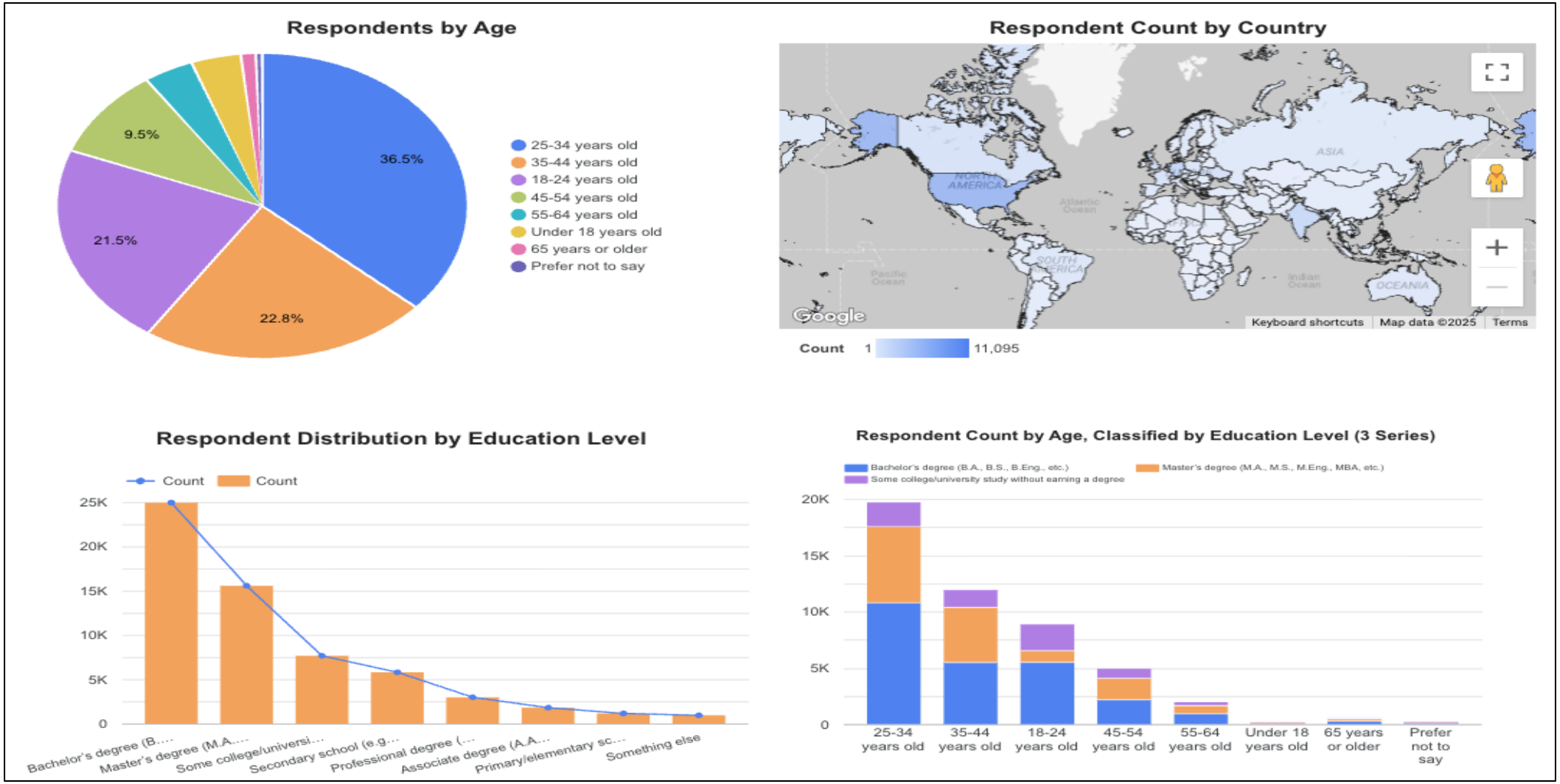
- You can find the complete dashboard on the link provided below: -

Link: Click here

Current Technology Usage

Future Technology Usage

Demographics



Discussion

- The dominance of **JavaScript and HTML/CSS** as the most widely used languages, coupled with the strong adoption of **PostgreSQL and MySQL** as leading database systems, reinforces the **central role of web development in today's programming landscape**.
- These trends highlight the continued importance of **client-side scripting and styling**, as well as the **backbone role of relational databases** in application development.
- The data also opens up discussions around the **growing adoption of frameworks like React and Next.js**, which are shaping modern front-end development practices.
- Collectively, these findings point to an **evolving web ecosystem**, where developers must balance **front-end proficiency, database expertise, and adaptability to emerging tools** to stay competitive.

Concluding Remarks

Findings

- **Technology Trends:** The dominance of **JavaScript and HTML/CSS** confirms their foundational role in web development, while **Python's strong adoption and high demand** reflect its versatility across domains.
- **Data Management:** The prominence of **PostgreSQL and MySQL**, alongside significant usage of **SQL Server and MongoDB**, highlights the enduring importance of both relational and NoSQL databases in modern software systems.
- **Diversity of Tools:** The broad distribution of programming languages, frameworks, and database systems demonstrates the **multi-faceted nature of today's developer ecosystem**, where no single tool fits all use cases.

Implications

- **Web Dominance:** The widespread use of **JavaScript and HTML/CSS** emphasizes the centrality of web development in the programming landscape, reinforcing the growing importance of digital-first experiences.
- **Database Diversity:** The combination of **relational (PostgreSQL, MySQL, SQL Server)** and **NoSQL (MongoDB, Redis, DynamoDB)** solutions shows the need for **adaptable and context-driven database strategies**, where scalability, flexibility, and performance guide decision-making.
- **Industry Standardization with Innovation:** While established tools like **JavaScript, PostgreSQL, and MySQL** indicate a degree of industry standardization, the rising interest in languages such as **Rust and Go**, and frameworks like **React and Next.js**, points to continuous innovation and evolving best practices within the developer community.

Conclusion

- The findings emphasize the **dynamic and evolving nature of the programming landscape**, highlighting how technology continues to drive innovation across industries.
- To thrive in this environment, developers must maintain a **keen understanding of diverse programming languages**, alongside **proficiency in both relational and NoSQL database systems**, to effectively address the varied demands of modern applications.
- Ultimately, success in software development will depend on the ability to **adapt to emerging tools and frameworks** while leveraging proven technologies to ensure **scalability, performance, and long-term impact**.

Appendix

- **Survey Context**
  - Source: 2024 Stack Overflow Developer Survey (65,000+ respondents).
  - Focus: Programming languages, databases, web frameworks, demographics.
- **Key Data Highlights**
  - **Languages (Most Used):** JavaScript (37K), HTML/CSS (32K), Python (31K), SQL (31K).
  - **Languages (Most Desired):** Python (25K), JavaScript (24K), SQL (22K).
  - **Databases (Most Used):** PostgreSQL (26K), MySQL (21K), SQLite (17K).
  - **Databases (Most Desired):** PostgreSQL (24K), SQLite (13K), MySQL (12K).
- **Frameworks:**
  - Most used – Node.js, React, jQuery.
  - Most desired – React, Node.js, Next.js.
- **Demographics**
  - ~75% of professional developers are **under 35**.
  - Majority hold a **bachelor's degree**, followed by master's.