Stack Overflow Developer Survey

Chinthala Harshitha

23/03/2025

Skills Network

IBM

OUTLINE

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

Skills Network

IBM

EXECUTIVE SUMMARY

This project analyses in-demand programming skills using data from the latest Stack Overflow Developer Survey.

Key Findings:

- **Top Programming Languages:** JavaScript, Python, C#, TypeScript, and widely used front-end technologies like HTML/CSS.
- **Trending Databases:** PostgreSQL, Microsoft SQL Server, and MySQL, with rising demand for PostgreSQL and MongoDB.
- **Popular IDEs & Platforms:** AWS, Microsoft Azure, and Google Cloud lead in cloud services, while React, Spring Boot, and ASP.NET are preferred for web development.

INTRODUCTION

- In today's fast-evolving tech industry, staying updated with in-demand programming skills is crucial for developers, businesses, and educators.
- This project explores the latest trends in programming languages, databases, and development platforms using data from the **Stack Overflow Developer Survey.**
- By analyzing real-world data, we identify the most sought-after technologies, helping professionals make informed decisions about learning, hiring, and technology adoption.

METHODOLOGY

1. Collecting Data from Multiple Sources
   Web Scraping
   APIs
   Request Library
2. Data Wrangling
3. Exploratory Data Analysis
   Analyzing data distribution
   Handling outliers
   Identifying correlations
4. Data Visualization
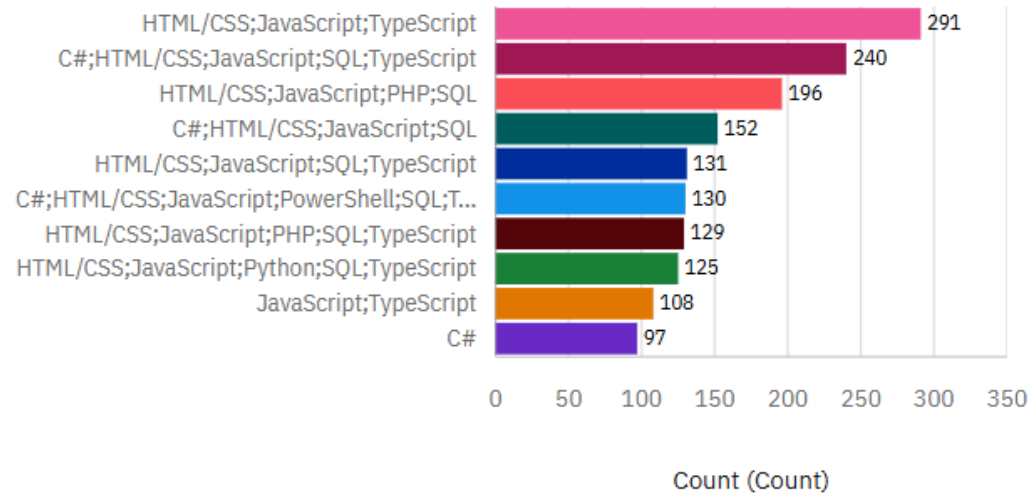   Highlighting data distribution, relationships, and comparisons
5. Dashboards

IBM

PROGRAMMING LANGUAGE TRENDS

Current Year

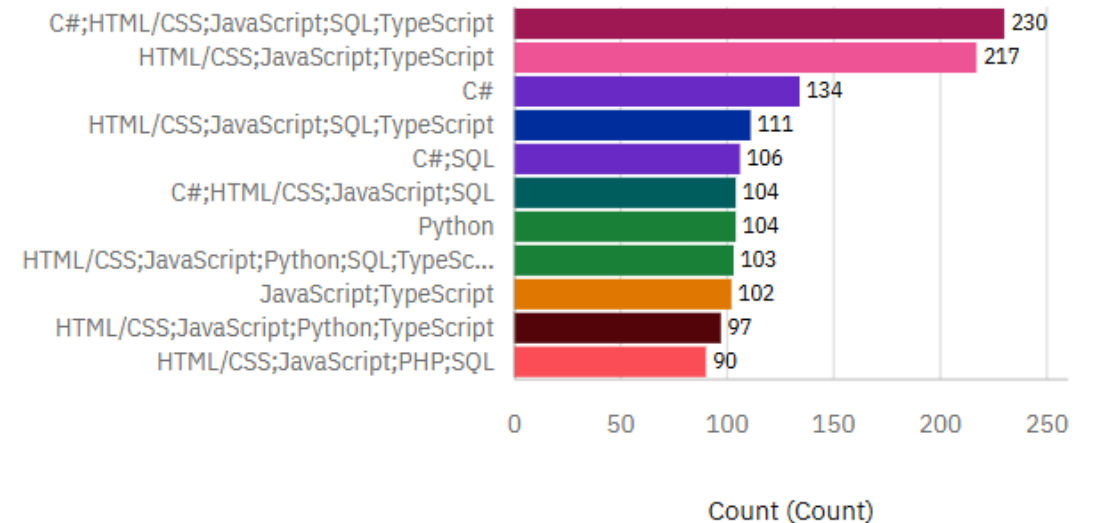Top 10 LanguageHaveWorkedWith

Language	Count
HTML/CSS;JavaScript;TypeScript	291
C#;HTML/CSS;JavaScript;SQL;TypeScript	240
HTML/CSS;JavaScript;PHP;SQL	196
C#;HTML/CSS;JavaScript;SQL	152
HTML/CSS;JavaScript;SQL;TypeScript	131
C#;HTML/CSS;JavaScript;PowerShell;SQL;T...	130
HTML/CSS;JavaScript;PHP;SQL;TypeScript	129
HTML/CSS;JavaScript;Python;SQL;TypeScript	125
JavaScript;TypeScript	108
C#	97

Count (Count)

Next Year

Top 10 LanguageWantToWorkWith

Language	Count
C#;HTML/CSS;JavaScript;SQL;TypeScript	230
HTML/CSS;JavaScript;TypeScript	217
C#	134
HTML/CSS;JavaScript;SQL;TypeScript	111
C#;SQL	106
C#;HTML/CSS;JavaScript;SQL	104
Python	104
HTML/CSS;JavaScript;Python;SQL;TypeSc...	103
JavaScript;TypeScript	102
HTML/CSS;JavaScript;Python;TypeScript	97
HTML/CSS;JavaScript;PHP;SQL	90

Count (Count)

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- HTML/CSS, JavaScript, and TypeScript are the most commonly worked-with languages.
- There is a strong correlation between languages developers have worked with and the ones they want to work with.
- Python and SQL appear among the top choices for languages developers want to work with.
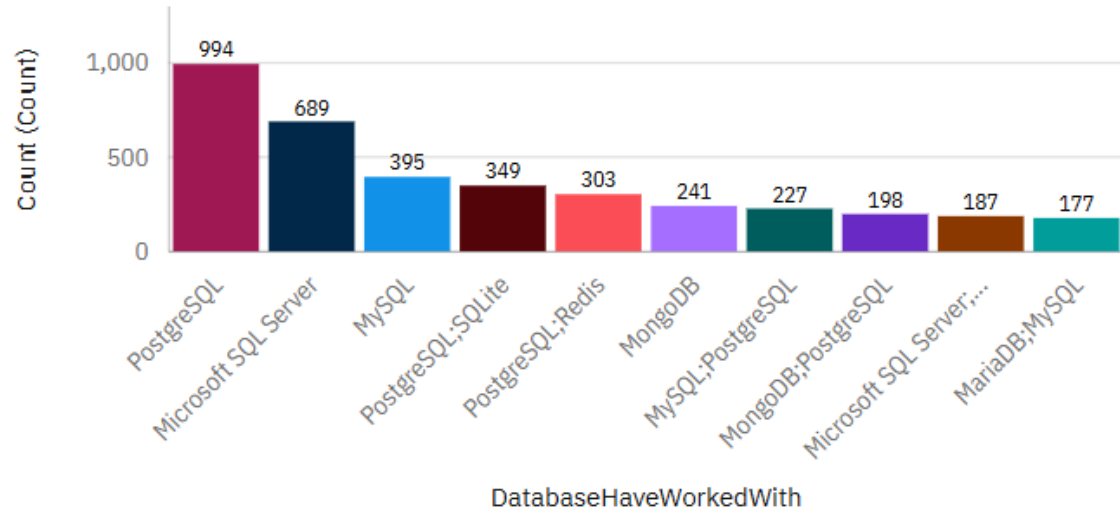
Implications

- Companies should continue investing in technologies like JavaScript, TypeScript, and C#, as they are popular and widely used by developers.

- Developers prefer to continue working with familiar languages, so transitioning to new technologies may require strategic learning incentives
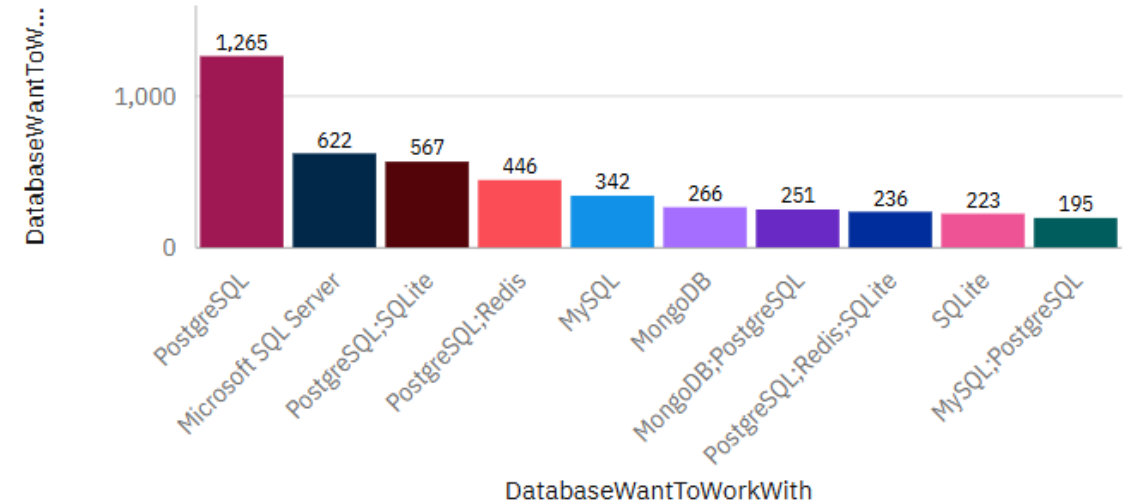
IBM

DATABASE TRENDS

Current Year

Next Year

Top 10 DatabaseHaveWorkedWith

Top 10 DatabaseWantToWorkWith

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings:

- PostgreSQL is the most worked with and most desired database.
- Microsoft SQL Server has a high count in both lists, indicating continued industry demand.
- The combination of PostgreSQL and Redis is becoming more appealing

Implications:

- Developers should consider upskilling in PostgreSQL to meet market demand.
- Professionals with Microsoft SQL Server skills will continue to find opportunities.
- Learning combinations like PostgreSQL + Redis can enhance employability.
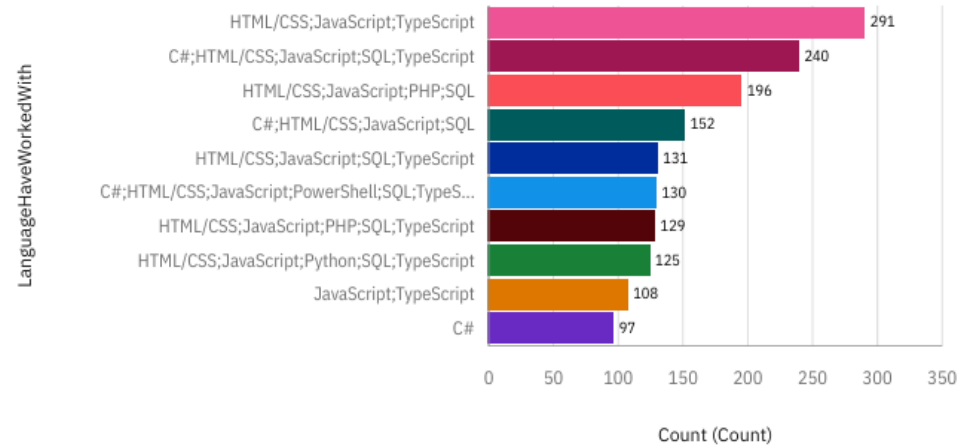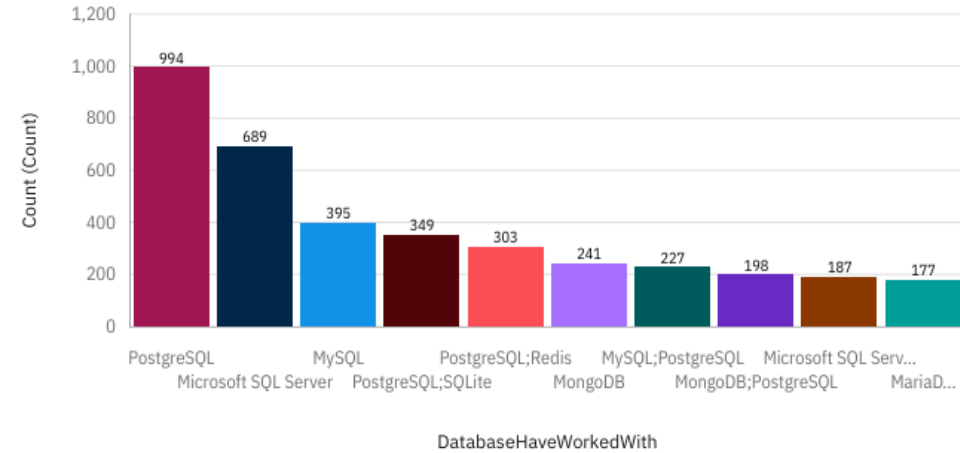
Skills Network

IBM

DASHBOARD

Current Technology Usage

Top 10 LanguageHaveWorkedWith

LanguageHaveWorkedWith	Count
HTML/CSS;JavaScript;TypeScript	291
C#;HTML/CSS;JavaScript;SQL;TypeScript	240
HTML/CSS;JavaScript;PHP;SQL	196
C#;HTML/CSS;JavaScript;SQL	152
HTML/CSS;JavaScript;SQL;TypeScript	131
C#;HTML/CSS;JavaScript;PowerShell;SQL;TypeS...	130
HTML/CSS;JavaScript;PHP;SQL;TypeScript	129
HTML/CSS;JavaScript;Python;SQL;TypeScript	125
JavaScript;TypeScript	108
C#	97

Top 10 DatabaseHaveWorkedWith

DatabaseHaveWorkedWith	Count
PostgreSQL	994
Microsoft SQL Server	689
MySQL	395
PostgreSQL;SQLite	349
PostgreSQL;Redis	303
MongoDB	241
MySQL;PostgreSQL	227
MongoDB;PostgreSQL	198
Microsoft SQL Serv...	187
MariaD...	177

Top 10 PlatformHaveWorkedWith

Microsoft Azure
Amazon Web Services (AWS)
Amazon Web Services (AWS);Microsoft Azure
Amazon Web Services (AWS);Google Cloud
Google Cloud

Top 10 WebframeHaveWorkedWith

Spring Boot, React, ASP.NET, Node, Express, FastA, Ne...
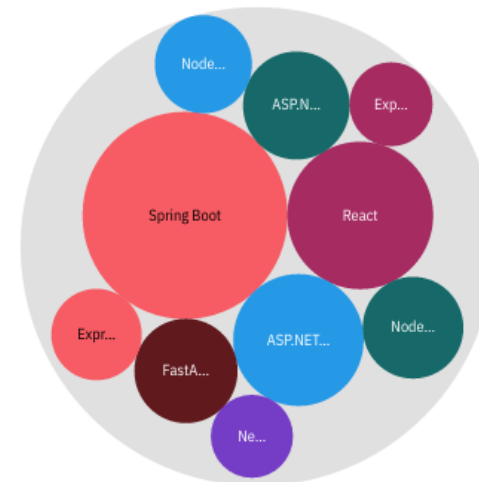
Future Technology Trend

Top 10 LanguageWantToWorkWith

Horizontal bar chart — LanguageWantToWorkWith vs Count (Count):

LanguageWantToWorkWith	Count
C#;HTML/CSS;JavaScript;SQL;TypeScript	230
HTML/CSS;JavaScript;TypeScript	217
C#	134
HTML/CSS;JavaScript;SQL;TypeScript	111
C#;SQL	106
C#;HTML/CSS;JavaScript;SQL	104
Python	104
HTML/CSS;JavaScript;Python;SQL;TypeScript	103
JavaScript;TypeScript	102
HTML/CSS;JavaScript;Python;TypeScript	97
HTML/CSS;JavaScript;PHP;SQL	90

Top 10 DatabaseWantToWorkWith

Bar chart — DatabaseWantToWorkWith (Count):

DatabaseWantToWorkWith	Count
PostgreSQL	1,265
Microsoft SQL Server	622
PostgreSQL;SQLite	567
PostgreSQL;Redis	446
MySQL	342
MongoDB	266
MongoDB;PostgreSQL	251
PostgreSQL;Redis;...	236
SQLite	223
MySQL;...	195

Top 10 PlatformWantToWorkWith

PlatformWantToW... 218 — 2,362
PlatformWantToW... 218 — 2,362

Treemap: Amazon Web Services (AWS); Microsoft Azure; Amazon Web Services (AWS);Microsoft ...; Amazon Web ...; Google Cloud; Amazon ...; Digital Ocean; Hetzner; Ama...; Amazon Web Ser...; Cloudflare
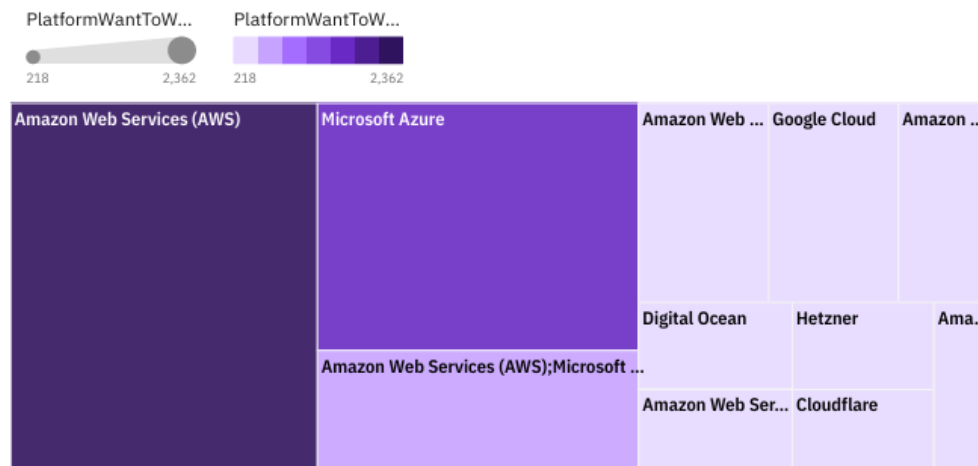
Top 10 WebframeWantToWorkWith

Bubble chart: No..., FastAPI, Ph..., Spring Boot, React, Ne..., ASP.N..., ASP.NET..., Nod..., Fl...
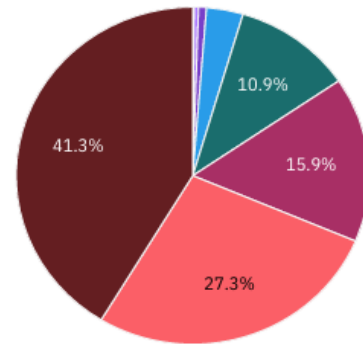
Skills

IBM
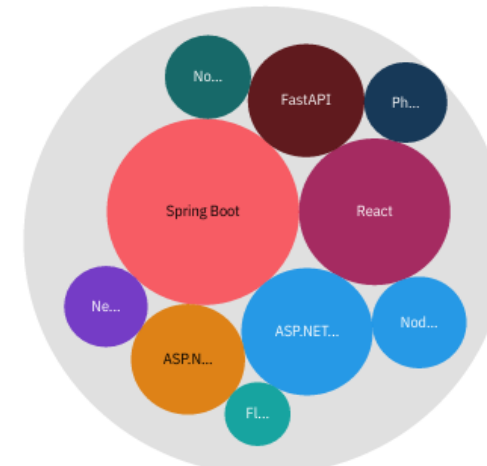
Demographics

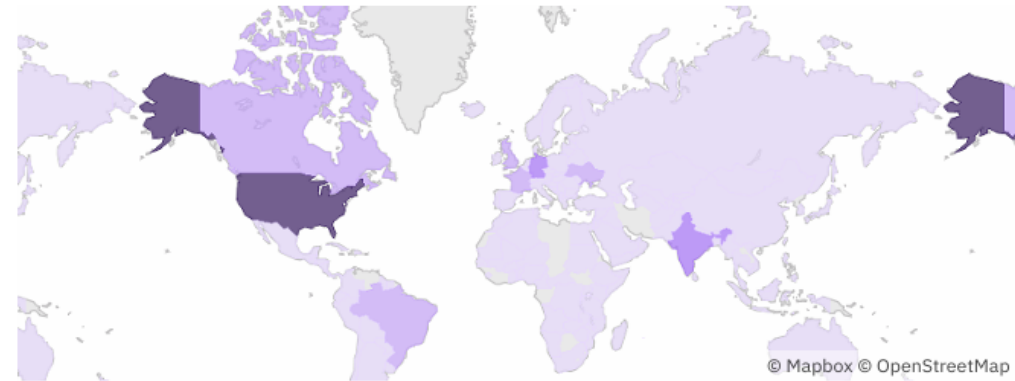### Respondent distribution by Age

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
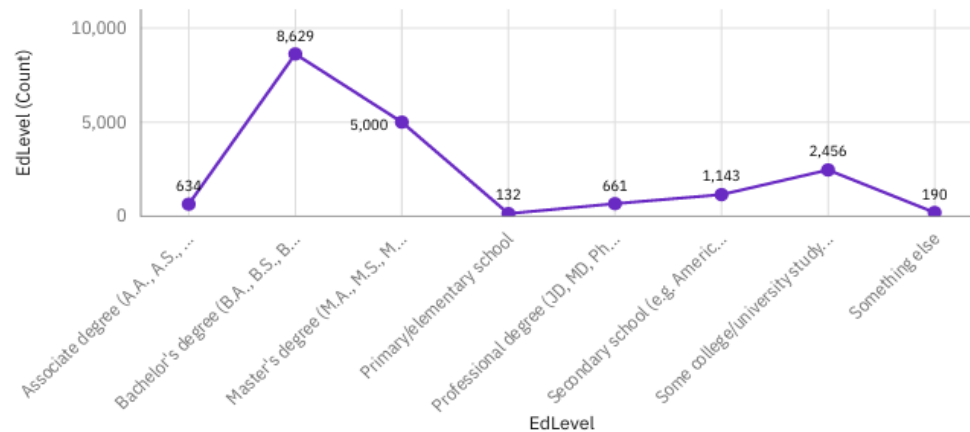- 35-44 years old
- 25-34 years old
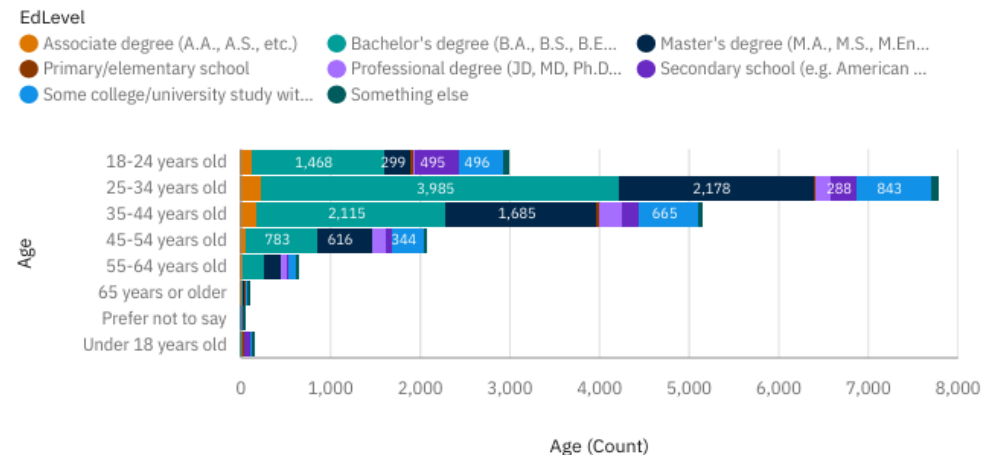

Respondent Count by Country

Country (Count)

1   3,441

© Mapbox © OpenStreetMap

Respondent distribution by Formal Education Level

Respondent Count by Age, classified by Education Level

EdLevel
- Associate degree (A.A., A.S., etc.)
- Bachelor's degree (B.A., B.S., B.E...
- Master's degree (M.A., M.S., M.En...
- Primary/elementary school
- Professional degree (JD, MD, Ph.D...
- Secondary school (e.g. American ...
- Some college/university study wit...
- Something else

Skills

IBM

DISCUSSION

OVERALL FINDINGS & IMPLICATIONS

Findings

- Python is highly desired among developers, indicating a growing interest in data science and machine learning.

- PostgreSQL and MongoDB are the most sought-after databases, reflecting the demand for robust and scalable database solutions.

- The majority of developers are aged 25-34 years old, with a significant number also in the 35-44 age group.

- Most developers hold a Bachelor's degree, followed by those with a Master's degree.

Implications

- Organizations should invest in training programs for Python and PostgreSQL to meet the growing demand for data-driven technologies.

- Companies should consider adopting MongoDB for projects requiring flexible, NoSQL database solutions.

- Companies should tailor their recruitment strategies to target mid-career professionals (25-44 years old) who form the largest segment of the developer population.
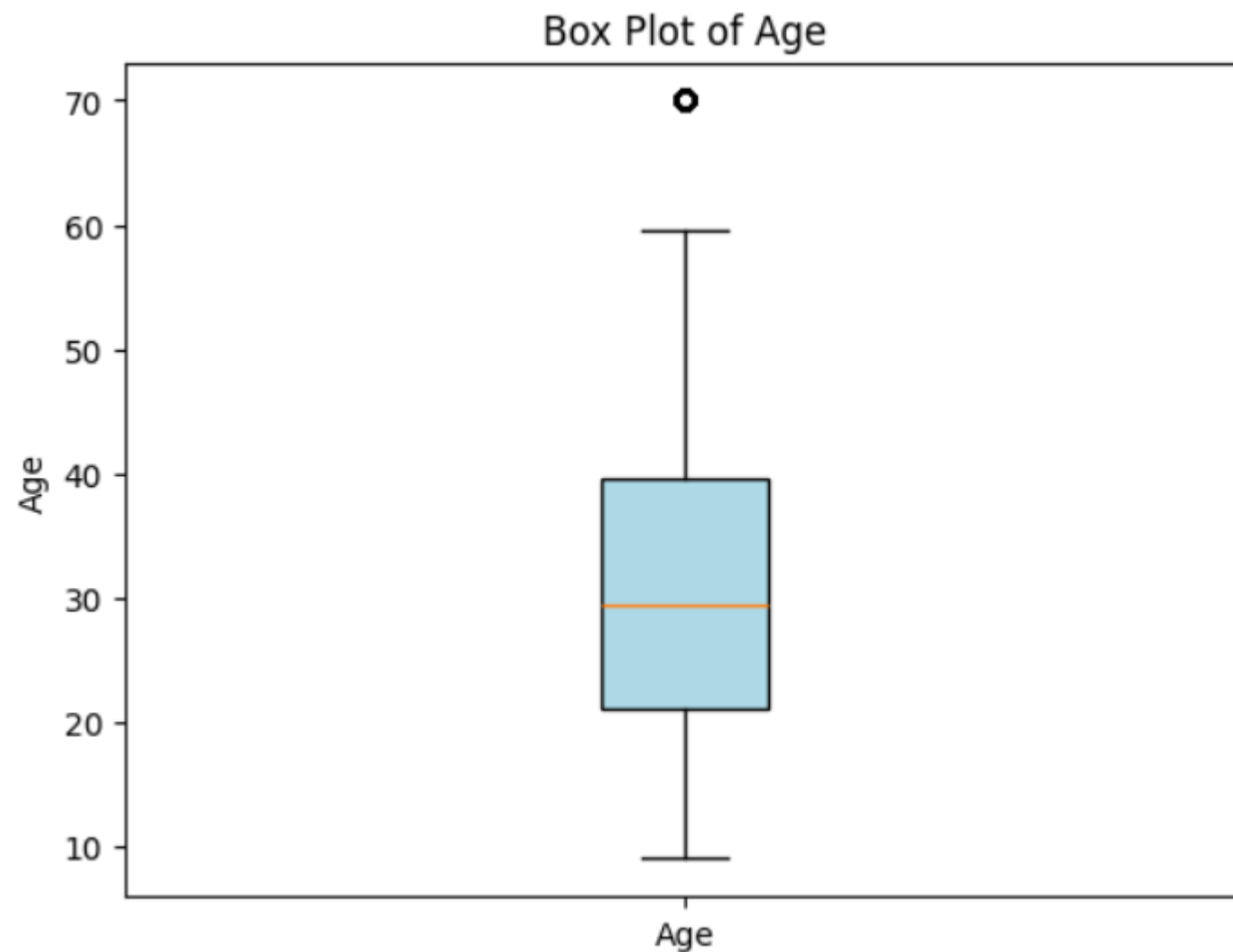
CONCLUSION

- The survey highlights a strong demand for Python, PostgreSQL, and MongoDB, reflecting the industry's shift toward data-driven and scalable solutions.

- The majority of developers are aged 25-34 and hold Bachelor's degrees, indicating that mid-career professionals with formal education are the backbone of the tech workforce.

- Companies should prioritize training in Python and cloud platforms (AWS, Azure) while targeting recruitment efforts toward mid-career professionals to stay competitive in the evolving tech landscape.

APPENDIX

Age Distribution Boxplot

JOB POSTINGS

Job Postings across Locations

POPULAR LANGUAGES

Popular Languages

A horizontal bar chart titled "Popular Languages" showing Average Annual Salary by Language.

Language	Average Annual Salary
Swift	~$130,000.00
Python	~$114,000.00
C++	~$113,000.00
Javascript	~$110,000.00
Java	~$101,000.00
Go	~$94,000.00
R	~$92,000.00
C#	~$89,000.00
SQL	~$84,000.00
PHP	~$84,000.00

X-axis: Average Annual Salary ($0.00, $20,000.00, $40,000.00, $60,000.00, $80,000.00, $1,00,000.00, $1,20,000.00, $1,40,000.00)

Y-axis: Language

Skills Network

IBM