

Comparative Analysis of Developer Surveys: StackOverflow 2017 vs 2024

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Introduction

This paper presents a basic analysis and comparison between the 2017 and 2024 Stack Overflow Developer Surveys. This includes trends in programming languages, job roles, and the most popular fields. The results show an increase in the usage of Python, the continued dominance of JavaScript, and the emergence of more roles in the data science field.

Goals

- Importance of Stack Overflow surveys.
- Why choosing 2017 and 2024 surveys for comparison?
- Goals: languages, tools, database systems, job roles, and more skills.

Methodology

Datasets

- Stack Overflow Developer Survey 2017 (Udacity).
- Stack Overflow Developer Survey 2024 (Kaggle).

Tools

Python, Jupyter Notebook, Pandas, Matplotlib.

Steps

1. Data Cleaning: handling nulls and unused fields.
2. Basic Analysis: exploring rows and columns with Pandas.
3. Visualization and Comparison: charts with Matplotlib.

Results

Programming Languages

The analysis indicates significant growth in AI and data science languages over the last 7 years. Web development remains strong with HTML, CSS, and JavaScript.

Job Roles

- Growth in web jobs (back-end, front-end, full-stack) and AI.
- Data science and engineering jobs are stable.
- Decline in some roles like software and mobile developers.

Top 10 Famous Languages and Information

10. C Language



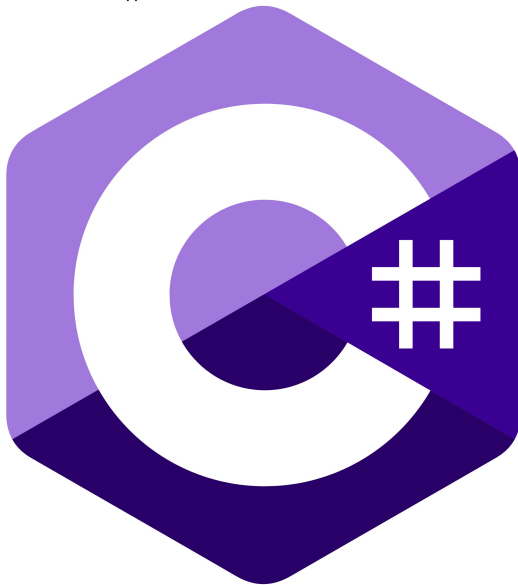
General-purpose language created in 1970 by Dennis Ritchie. Known as the “mother” of most programming languages, widely used in low-level and system programming.

9. C++



Extension of C with OOP features. Used in video games, ML, servers, and software engineering.

8. C#



Created by Microsoft in 2000. Popular for Windows apps, games, and back-end web.

7. Java



Released in 1995 by Sun Microsystems. Still popular for Android apps, back-end, and enterprise.

6. Bash / Shell



Languages used in command-line environments. Important for Git, DevOps, and security.

5. TypeScript



Introduced in 2012 by Microsoft. Enhances JavaScript and gained wide adoption in web dev.

4. Python



Versatile and beginner-friendly, used in data science, AI, web dev, and more.

3. SQL



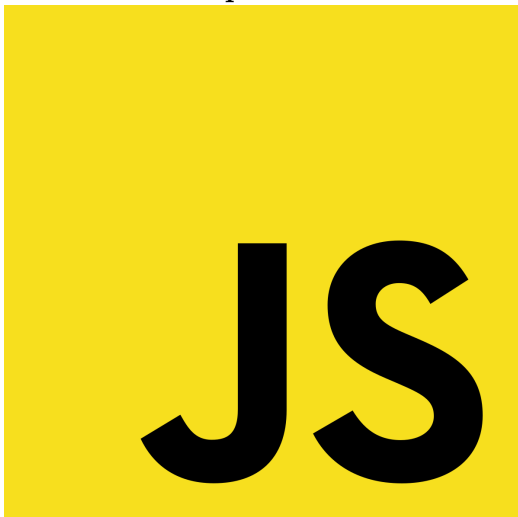
Query language for relational databases. Essential for analysis and backend systems.

2. HTML/CSS



Markup and styling languages that are the foundation of the web.

1. JavaScript



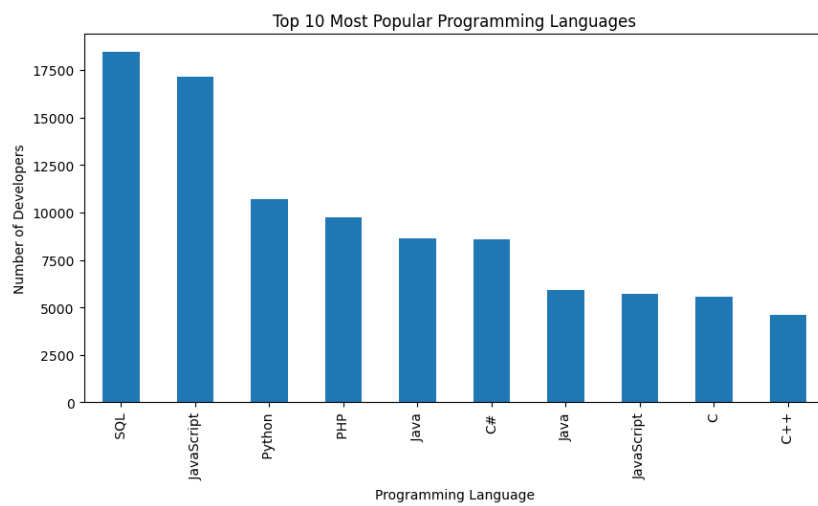
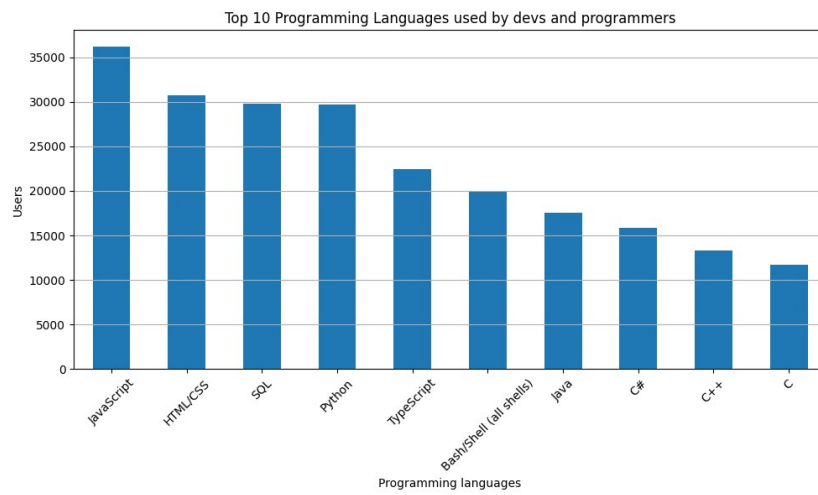
The language of the web. Interactive, flexible, and essential for modern

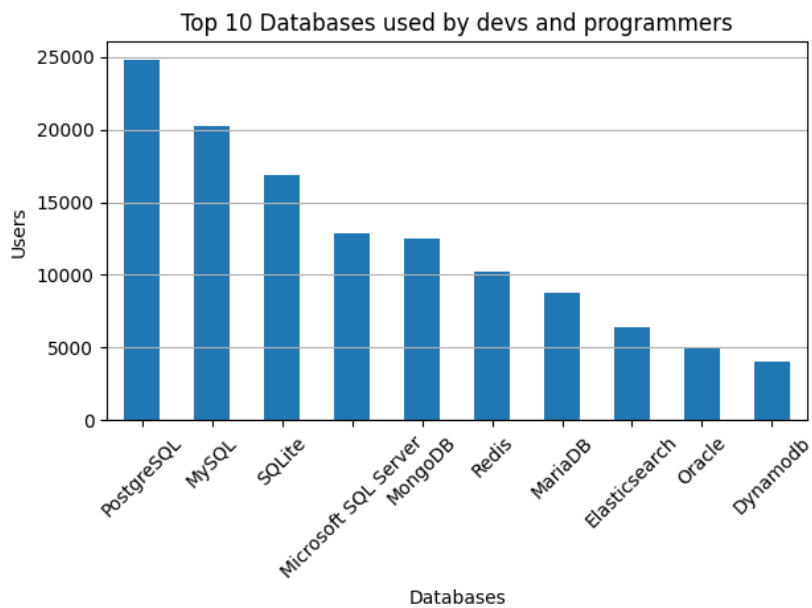
applications.

Summary

- JavaScript: $\sim 36\text{k}$ users in 2024 vs $\sim 17\text{k}$ in 2017 (+110%).
- HTML/CSS: 17k (2017) \rightarrow 31k (2024) (+80%). TypeScript entered top 5.
- Python tripled: 10k (2017) \rightarrow 29k (2024) (+175%).
- SQL steady: 18k \rightarrow 30k (+62%).
- Java stable: 17.5k \rightarrow 17k.
- PHP dropped from top 10 by 2024.
- Bash/Shell rose sharply with DevOps growth.

Visuals





```

DevType
Developer, full-stack      17667
Developer, back-end       9576
Student                   4894
Developer, front-end      3197
Developer, desktop or enterprise applications  2408
Other (please specify):   2309
Developer, mobile         1935
Developer, embedded applications or devices   1580
Engineering manager       1238
Academic researcher       1178
Data engineer             1083
DevOps specialist         987
Data scientist or machine learning specialist  983
Research & Development role 899
Senior Executive (C-Suite, VP, etc.)         810
Name: count, dtype: int64

```

Resources

Source Code

- <https://github.com/Saad711T/Stackoverflow-2024-Survey-Analysis>
- <https://github.com/Saad711T/Udacity-IntroductionToDataScience>

Data

- <https://www.kaggle.com/datasets/berkayalan/stack-overflow-annual-developer->
- <https://survey.stackoverflow.co/2017>