

Analysis Stack Overflow Survey Data

PROGRAMMING LANGUAGE TRENDS
DATABASE TRENDS

Vyacheslav Kovalenko

© IBM Corporation. All rights reserved.



OUTLINE



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

EXECUTIVE SUMMARY

- Top 10 programming languages for the current year:
JavaScript, SQL, HTML/CSS, TypeScript, Python, Bash/Shell (all shells), C#, Java, PHP, PowerShell
- Top 10 programming language trends for the next year:
JavaScript, SQL, HTML/CSS, TypeScript, Python, Go, Rust, C#, Bash/Shell (all shells), Java
- Top 10 databases for the current year:
PostgreSQL, MySQL, SQLite, MongoDB, Microsoft SQL Server, Redis, MariaDB, Elasticsearch, Dynamodb, Oracle
- Top 10 databases trends for the next year :
PostgreSQL, Redis, SQLite, MySQL, MongoDB, Microsoft SQL Server, Elasticsearch, MariaDB, Dynamodb, Supabase



INTRODUCTION



- We have data from a survey of IT specialists
- Based on this data, it is necessary to find out trends in programming languages and database management systems
- The search result will be useful for educational institutions that will be able to adjust their training programs in a timely manner.



METHODOLOGY

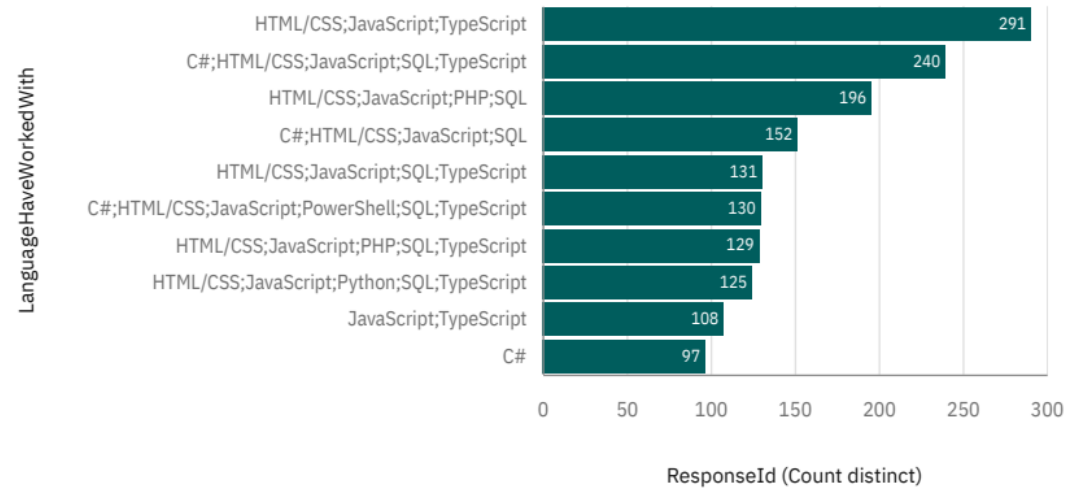


- We have data from a survey of 18,845 IT specialists ('surve_data_updated 5.csv') from the Stack Overflow website.
- Based on this data, it is necessary to find out trends in programming languages and database management systems.
- 'surve_data_updated 5.csv' was uploaded as a data source to IBM Cognos Analytics
- With the help of IBM Cognos Analytics, a dashboard with tabs and graphs was created to find appropriate solutions

PROGRAMMING LANGUAGE TRENDS

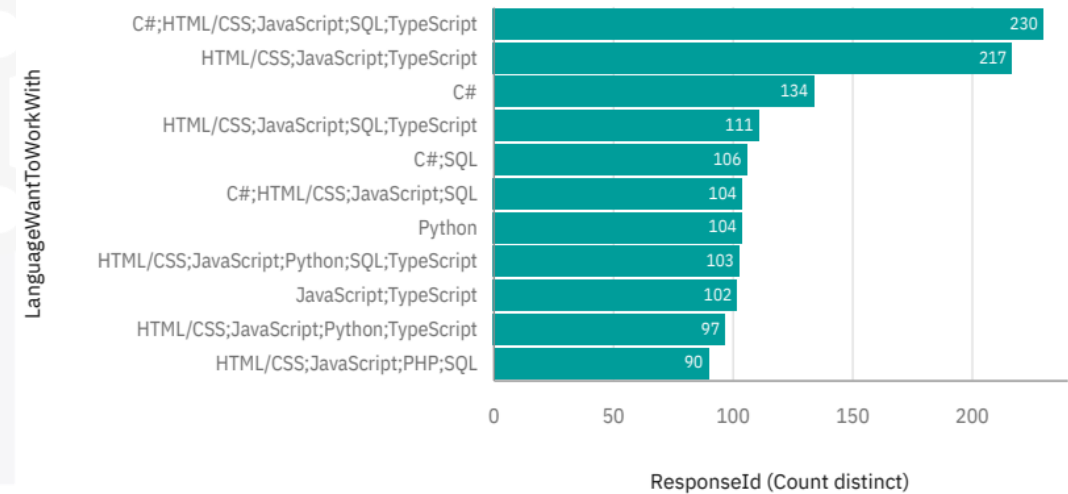
Current Year

Top 10 LanguageHaveWorkedWith



Next Year

Top 10 LanguageWantToWorkWith



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Top 10 programming languages for the current year:
JavaScript, SQL, HTML/CSS, TypeScript, Python, Bash/Shell (all shells), C#, Java, PHP, PowerShell
- Top 10 programming language trends for the next year:
JavaScript, SQL, HTML/CSS, TypeScript, Python, Go, Rust, C#, Bash/Shell (all shells), Java

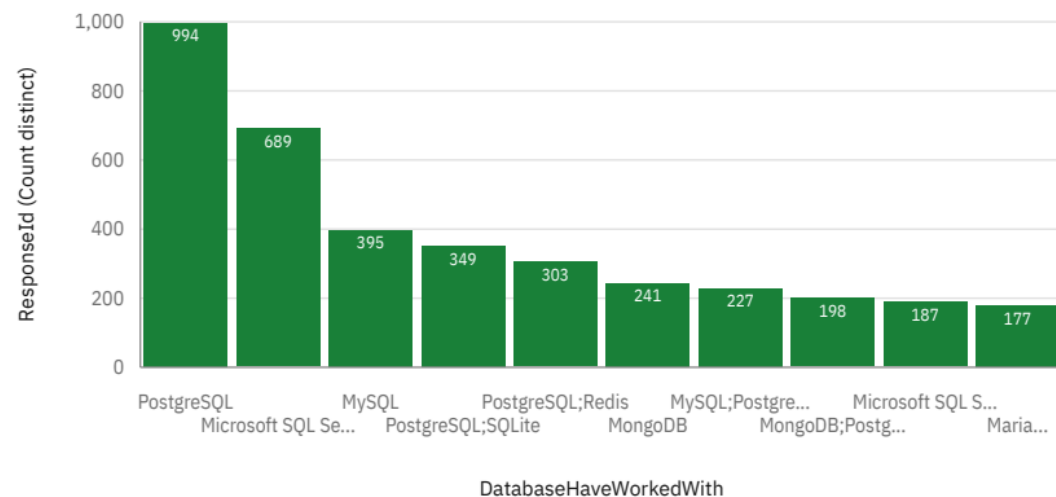
Implications

- The demand for Go and Rust training courses should increase next year

DATABASE TRENDS

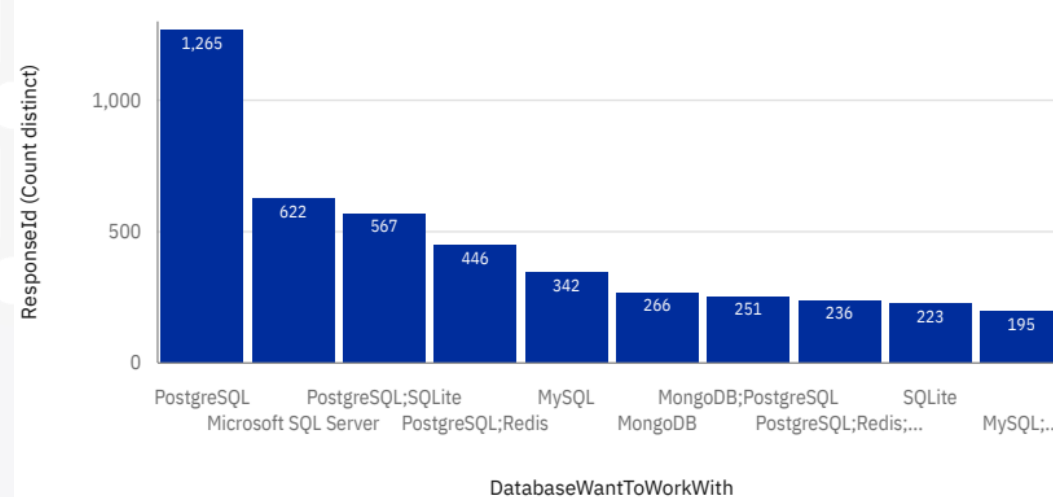
Current Year

Top 10 DatabaseHaveWorked



Next Year

Top 10 DatabaseWantToWorkWith



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Top 10 databases for the current year:
PostgreSQL, MySQL, SQLite, MongoDB, Microsoft SQL Server, Redis, MariaDB, Elasticsearch, Dynamodb, Oracle
- Top 10 databases trends for the next year :
PostgreSQL, Redis, SQLite, MySQL, MongoDB, Microsoft SQL Server, Elasticsearch, MariaDB, Dynamodb, Supabase

Implications

- The demand for Redis and Supabase training courses should increase next year

DASHBOARD

Building a dashboard with IBM Cognos Analytics



**IBM®
COGNOS®
ANALYTICS**

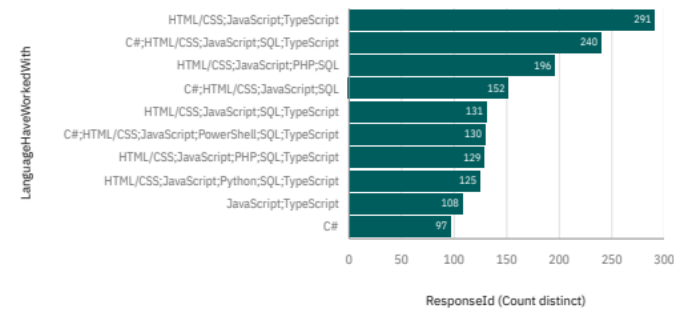


DASHBOARD TAB 1

07.11.2025, 19:57

Current Technology Usage

Top 10 LanguageHaveWorkedWith

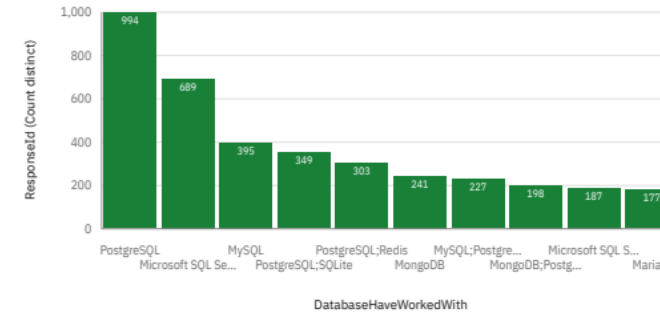


Top 10 PlatformHaveWorkedWith



Stack Overflow

Top 10 DatabaseHaveWorked



Top 10 WebFrameHaveWorkedWith

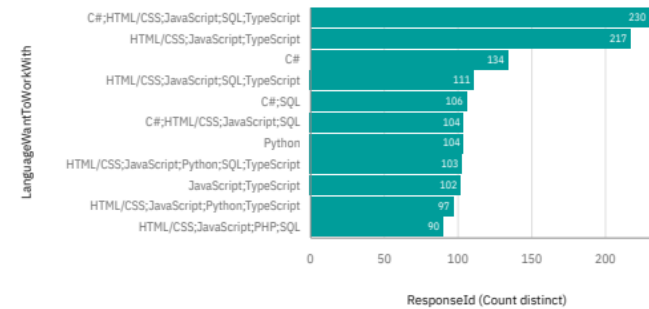


DASHBOARD TAB 2

07.11.2025, 19:57

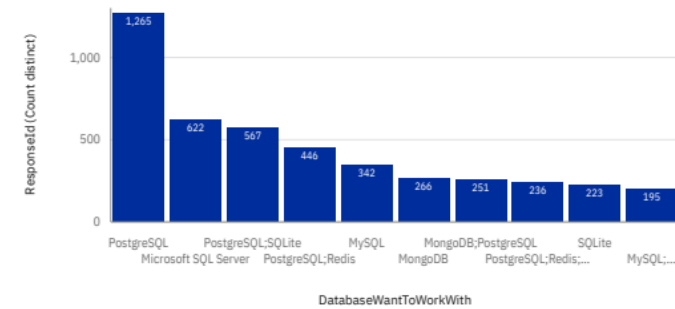
Future Technology Trend

Top 10 LanguageWantToWorkWith

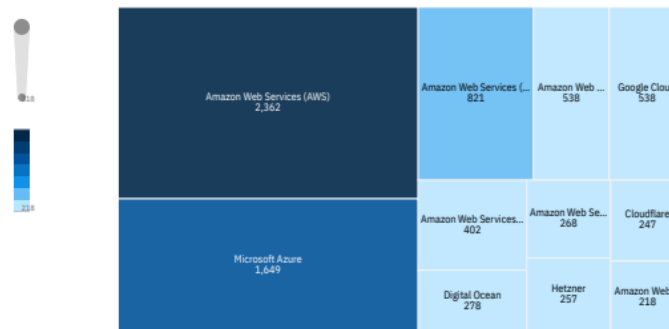


Stack Overflow

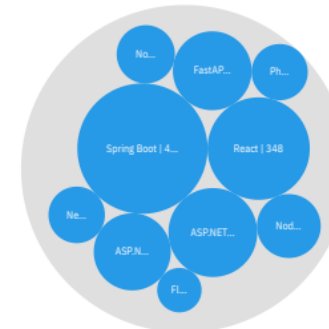
Top 10 DatabaseWantToWorkWith



Top 10 PlatformWantToWorkWith



Top 10 WebframeWantToWorkWith

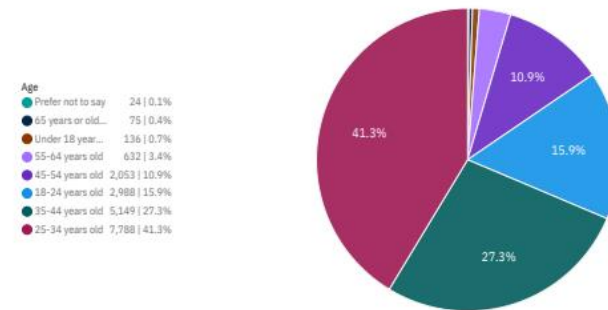


DASHBOARD TAB 3

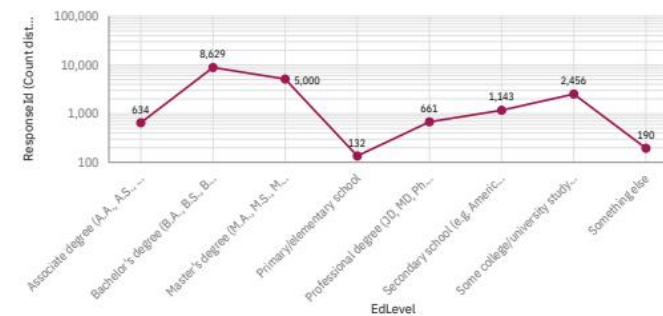
07.11.2025, 19:57

Demographics

Respondent distribution by Age

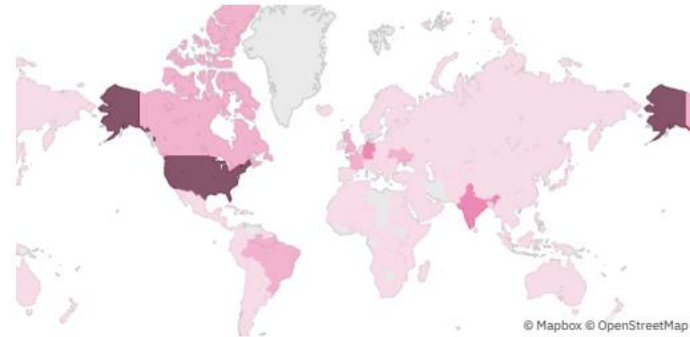


Respondent distribution by Formal Education Level

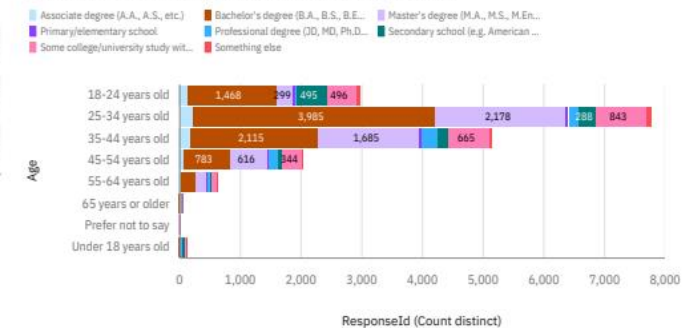


Stack Overflow

Respondent Count by Country



Respondent Count by Age, classified by Education Level



DISCUSSION



OVERALL FINDINGS & IMPLICATIONS

Findings

- Top 10 programming languages for the current year:
JavaScript, SQL, HTML/CSS, TypeScript, Python, Bash/Shell (all shells), C#, Java, PHP, PowerShell
- Top 10 programming language trends for the next year:
JavaScript, SQL, HTML/CSS, TypeScript, Python, Go, Rust, C#, Bash/Shell (all shells), Java
- Top 10 databases for the current year:
PostgreSQL, MySQL, SQLite, MongoDB, Microsoft SQL Server, Redis, MariaDB, Elasticsearch, Dynamodb, Oracle
- Top 10 databases trends for the next year :
PostgreSQL, Redis, SQLite, MySQL, MongoDB, Microsoft SQL Server, Elasticsearch, MariaDB, Dynamodb, Supabase

Implications

- The demand for Go and Rust programming languages training courses should increase next year
- The demand for Redis and Supabase databases training courses should increase next year



CONCLUSION



- The IT world is constantly changing and does not stand still.
- To increase efficiency, educational institutions need to take into account trends in IT
- The demand for Go and Rust programming languages training courses should increase next year
- The demand for Redis and Supabase databases training courses should increase next year

APPENDIX

We have data from a survey of 18,845 IT specialists ('surve_data_updated 5.csv') from the Stack Overflow website. It turned out that the data on languages and databases are composite - the respondents answered one question with several answers. Therefore, a deeper analysis of this data is needed, which was done with the help of JupiterLab. The composite data was parsed and graphs were built based on this data.



APPENDIX

```
df[['LanguageHaveWorkedWith','LanguageWantToWorkWith','DatabaseHaveWorkedWith','DatabaseWantToWorkWith']].head()
```

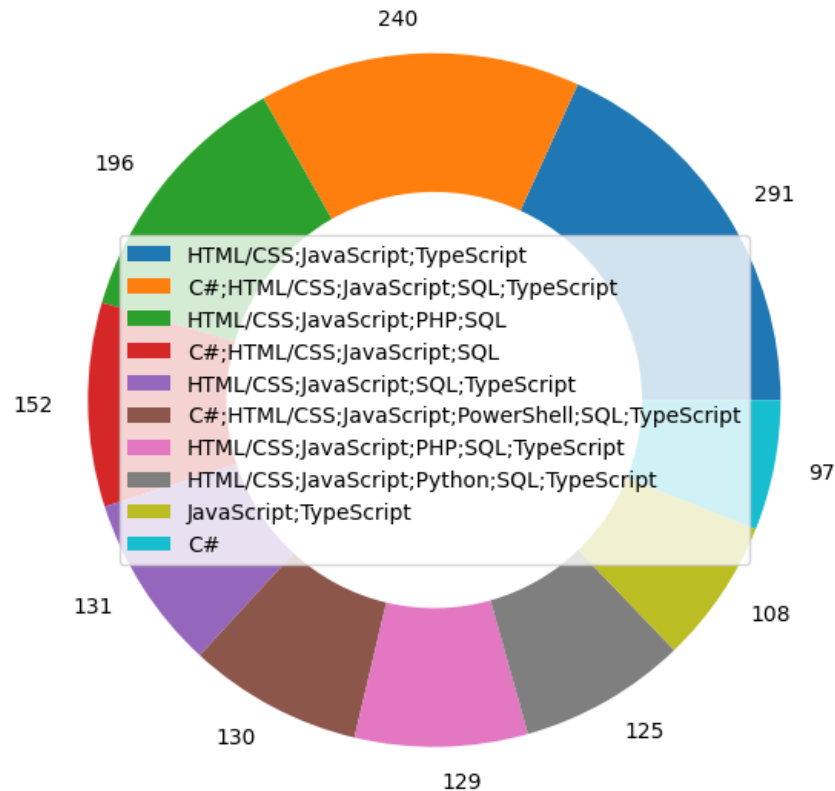
	LanguageHaveWorkedWith	LanguageWantToWorkWith	DatabaseHaveWorkedWith	DatabaseWantToWorkWith
0	Bash/Shell (all shells);Go;HTML/CSS;Java;JavaS...	Bash/Shell (all shells);Go;HTML/CSS;Java;JavaS...	Dynamodb;MongoDB;PostgreSQL	PostgreSQL
1	C#	C#	Firebase Realtime Database	Firebase Realtime Database
2	HTML/CSS;JavaScript;TypeScript	HTML/CSS;JavaScript;TypeScript	MongoDB;MySQL;PostgreSQL;Redis	MongoDB;MySQL;PostgreSQL;Redis
3	JavaScript;Python;Ruby	C#;Crystal;Java;JavaScript;Python;Ruby	Elasticsearch;MongoDB;PostgreSQL;SQLite	Elasticsearch;MongoDB;PostgreSQL;SQLite
4	C;C#;C++;Delphi;HTML/CSS;Java;JavaScript;Power...	C#;HTML/CSS;JavaScript;PowerShell;Rust;SQL;Typ...	Microsoft Access;Microsoft SQL Server;PostgreS...	Microsoft SQL Server;PostgreSQL;SQLite



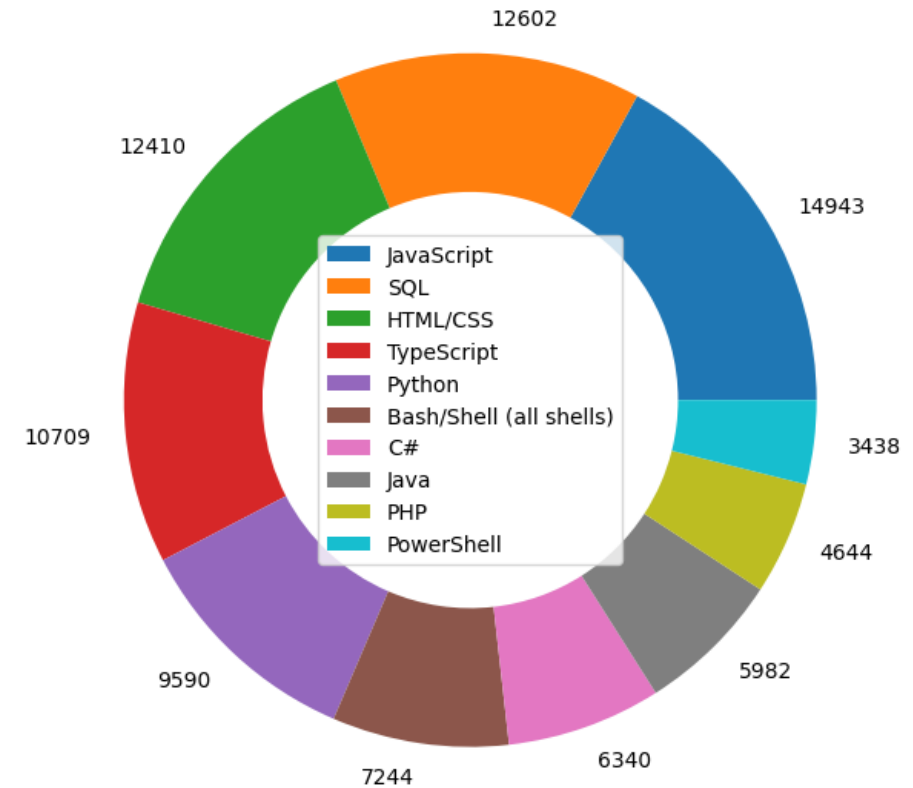
APPENDIX

Top 10 dataLangs(`LanguageHaveWorkedWith`) that respondents have worked with

BEFORE PARSING `LanguageHaveWorkedWith`



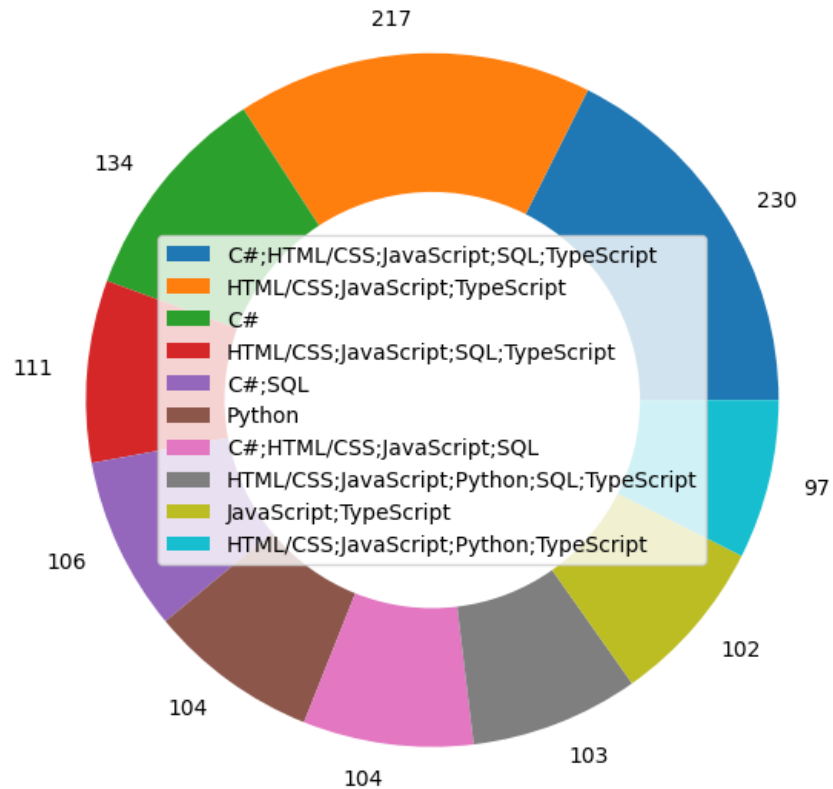
AFTER PARSING `LanguageHaveWorkedWith`



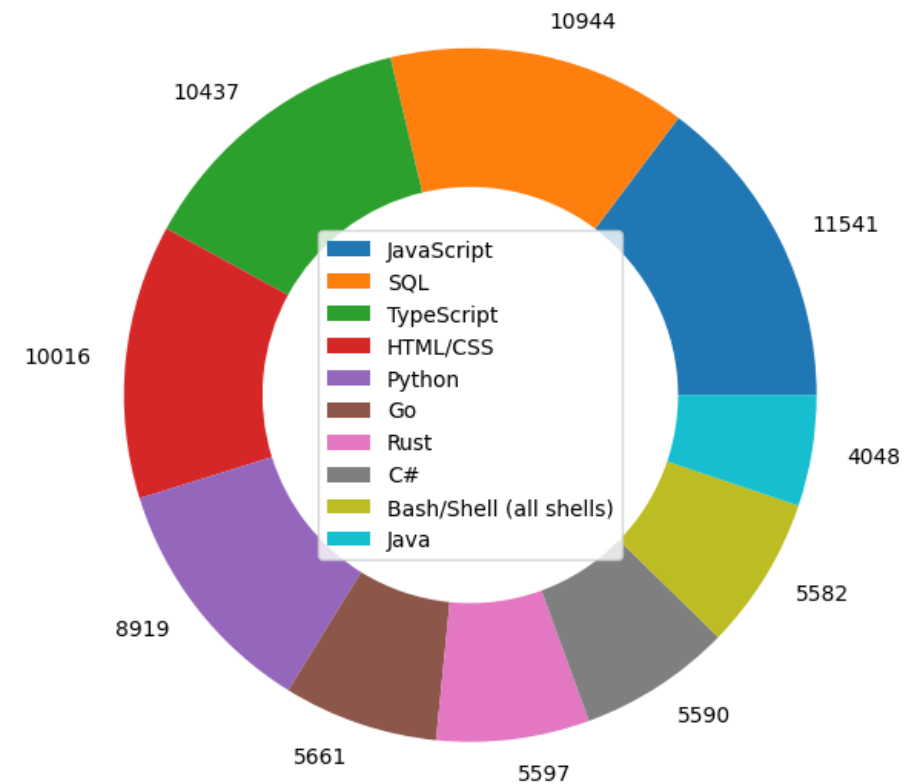
APPENDIX

Top 10 languages(`LanguageWantToWorkWith`) that respondents wish to learn next year

BEFORE PARSING `LanguageWantToWorkWith`



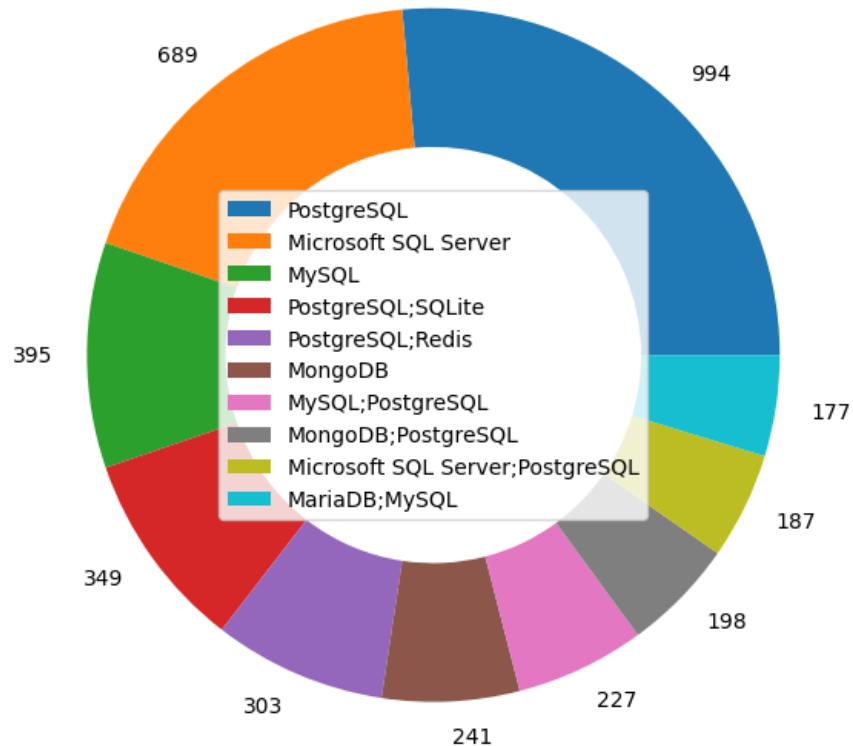
AFTER PARSING `LanguageWantToWorkWith`



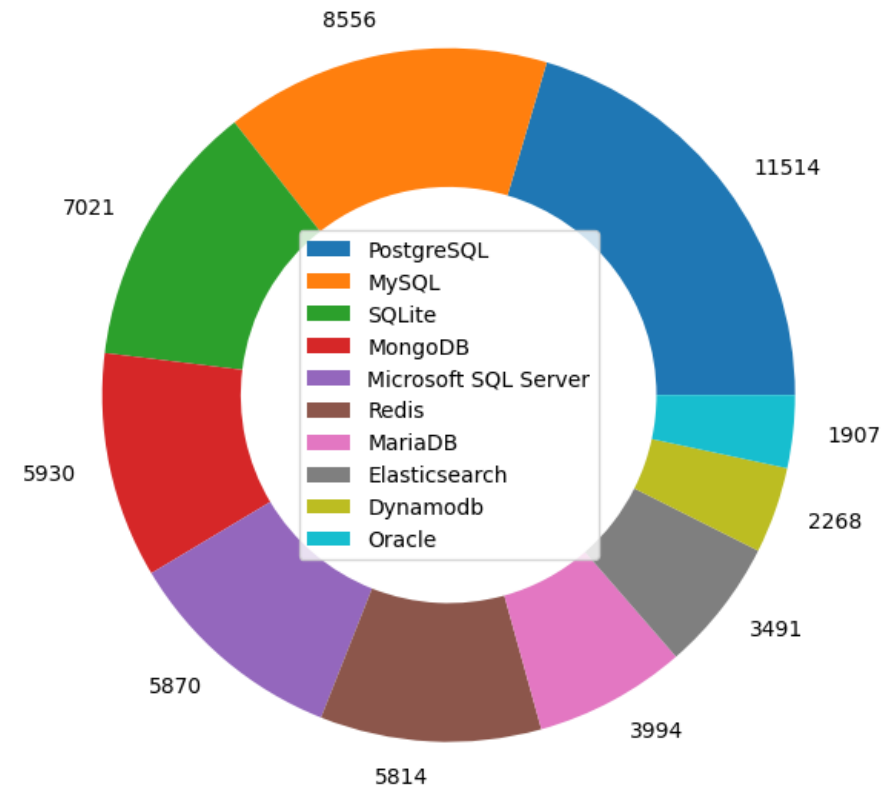
APPENDIX

Top 10 databases(`DatabaseHaveWorkedWith`) that respondents have worked with

BEFORE PARSING `DatabaseHaveWorkedWith`



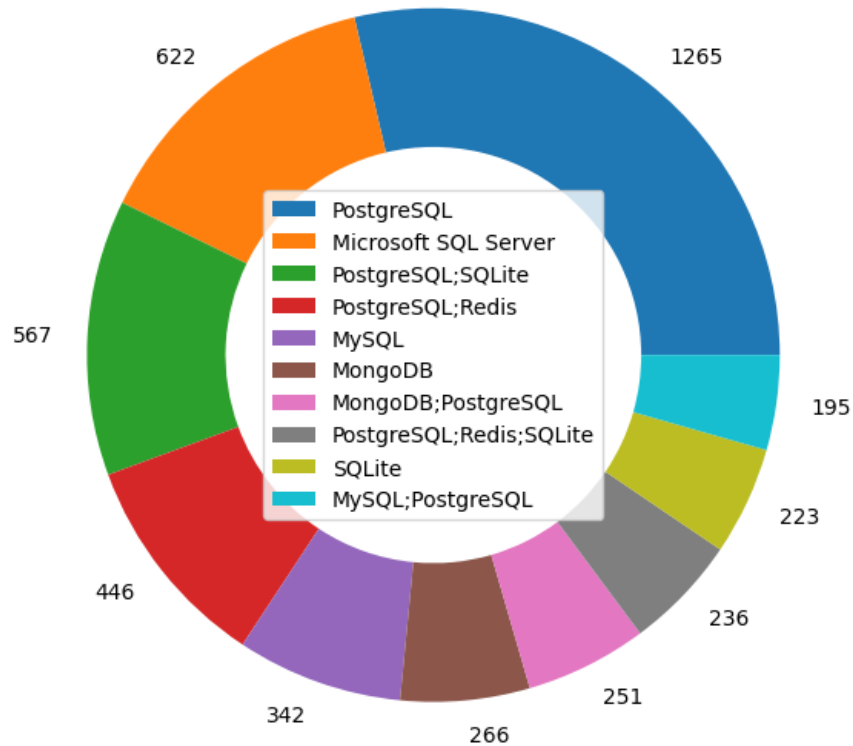
AFTER PARSING `DatabaseHaveWorkedWith`



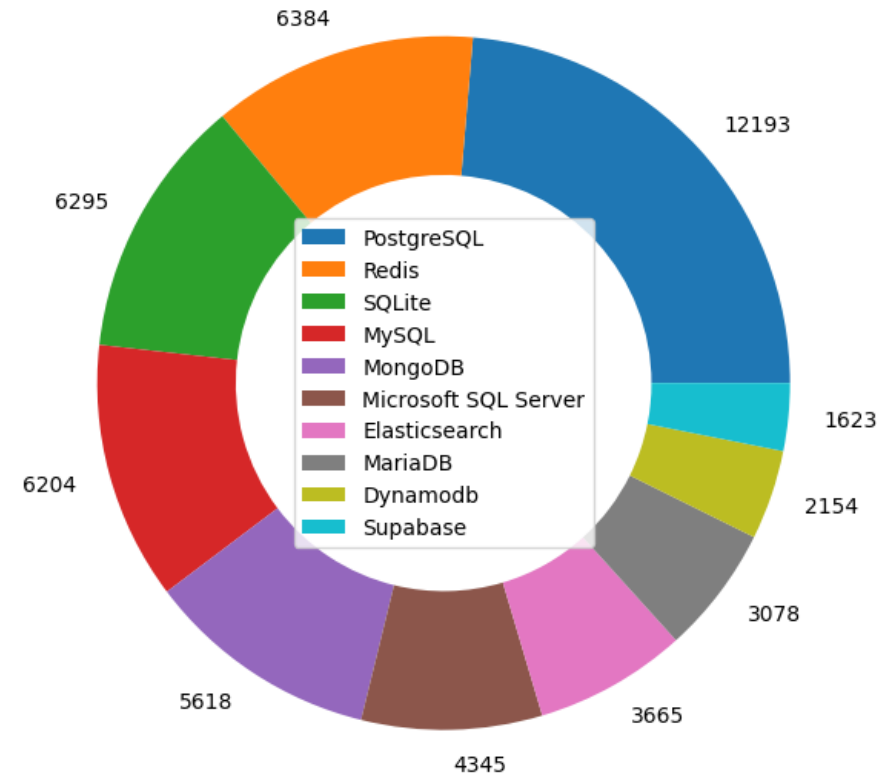
APPENDIX

Top 10 databases(`DatabaseWantToWorkWith`) that respondents wish to learn next year

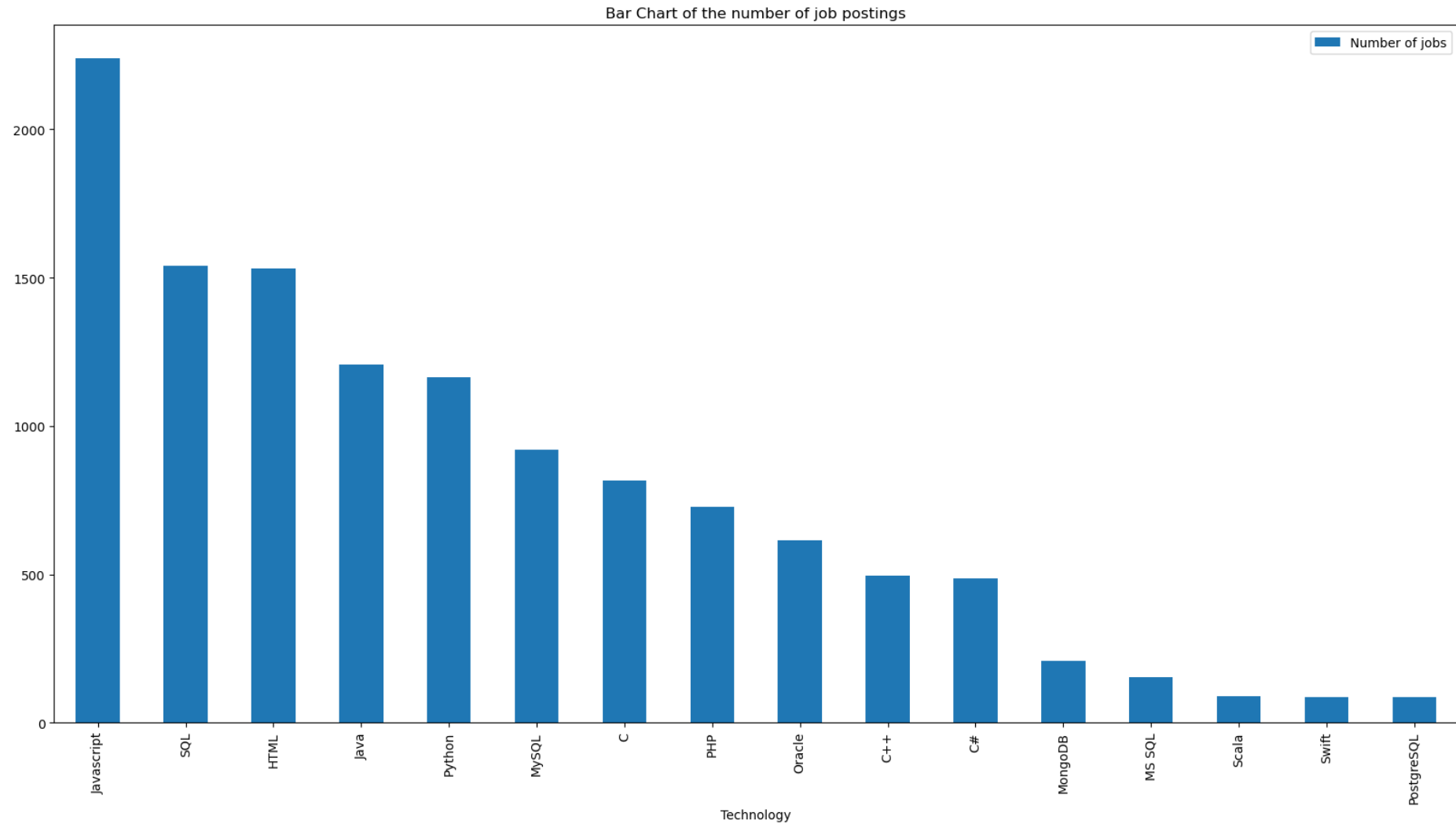
BEFORE PARSING `DatabaseWantToWorkWith`



AFTER PARSING `DatabaseWantToWorkWith`



JOB POSTINGS



POPULAR LANGUAGES

