



Findings about Software Technology Trends

Teo Kwee Kim

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OUTLINE



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EXECUTIVE SUMMARY



1. Popular Programming Languages and Databases For Current vs. Future
2. Gender Gaps in Software Development Field
3. Technologies Gaps in Countries

INTRODUCTION



About:

Data analysis on Stack Overflow Developer Survey about the trends in developer's favorite technologies varied by countries and genders

Purpose:

1. What are the top programming languages in demand?
2. What are the top database skills in demand?
3. What are the popular IDEs?

Target Audience:

Software Developers, Software Engineering Manager/Lead, Human Resource

METHODOLOGY



1. Sources for Data Collection

- The 2019 Stack Overflow Developer Survey Results
- Github Job Postings
- Annual Salary for Programming Languages

2. Data Cleaning

3. Data Mining and Analysis

4. Data Visualization

5. Presentation

RESULTS

The gathered results are shown in the table below:

Respondent		LanguageWorkedWith	LanguageDesireNextYear	DatabaseWorkedWith	DatabaseDesireNextYear
0	4	C;C++;C#;Python;SQL	C;C#;JavaScript;SQL	MySQL;SQLite	MySQL;SQLite
1	9	Bash/Shell/PowerShell;C#;HTML/CSS;JavaScript;P...	Bash/Shell/PowerShell;C;HTML/CSS;JavaScript;Ru...	DynamoDB;PostgreSQL;SQLite	PostgreSQL;Redis;SQLite
2	13	Bash/Shell/PowerShell;HTML/CSS;JavaScript;PHP;...	Bash/Shell/PowerShell;HTML/CSS;JavaScript;Rust...	Couchbase;DynamoDB;Firebase;MySQL	Firebase;MySQL;Redis
3	16	Bash/Shell/PowerShell;C#;HTML/CSS;JavaScript;T...	C#;HTML/CSS;JavaScript;TypeScript;WebAssembly;...	MongoDB;Microsoft SQL Server;MySQL	Elasticsearch;MongoDB;Microsoft SQL Server;SQLite
4	17	Bash/Shell/PowerShell;HTML/CSS;JavaScript;Type...	Bash/Shell/PowerShell;HTML/CSS;Java;JavaScript...	MongoDB;PostgreSQL	Elasticsearch;Firebase;MongoDB;PostgreSQL
...
11547	25136	C#;F#;HTML/CSS;Java;JavaScript;SQL	C#;F#;JavaScript;SQL;TypeScript;WebAssembly	Microsoft SQL Server	Microsoft SQL Server
11548	25137	HTML/CSS;JavaScript;PHP;SQL	HTML/CSS;JavaScript;PHP;SQL	MySQL	MariaDB;MongoDB;MySQL
11549	25138	Assembly;Bash/Shell/PowerShell;C;C++;C#;Java;J...	C#;Java	PostgreSQL	NaN
11550	25141	Bash/Shell/PowerShell;C++;C#;HTML/CSS;Java;Jav...	C++;C#;F#	Microsoft SQL Server;Redis	Elasticsearch;MongoDB;Microsoft SQL Server;Redis
11551	25142	Bash/Shell/PowerShell;C;C++;Go;HTML/CSS;PHP;Py...	Bash/Shell/PowerShell;C;C++;Python;R	PostgreSQL	PostgreSQL

11398 rows × 5 columns

PROGRAMMING LANGUAGE TRENDS

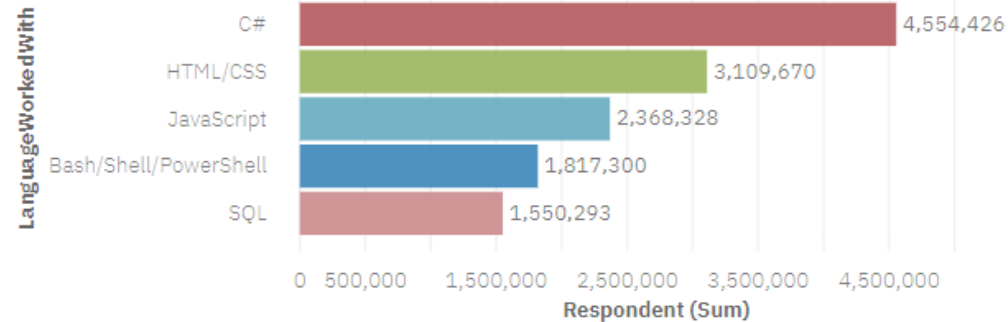
Current Year

Next Year

Top 5 Languages Respondents Have Worked With

LanguageWorkedWith

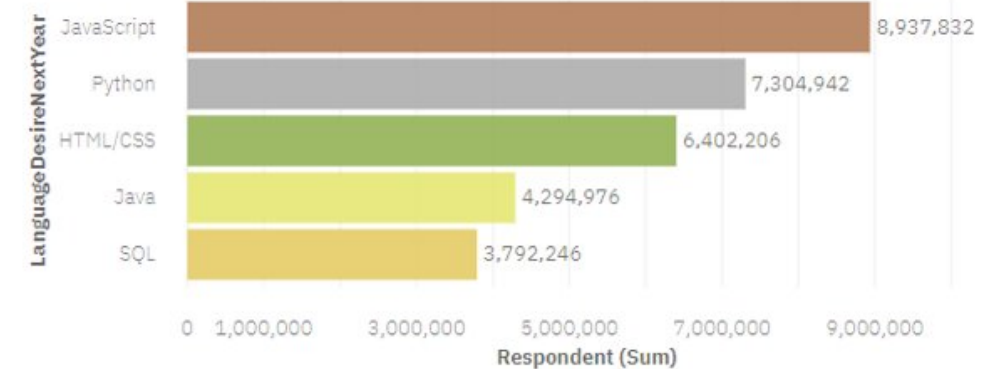
● Bash/Shell/PowerShell ● C# ● HTML/CSS
● JavaScript ● SQL



Top 5 Languages Respondents Wish to Learn

LanguageDesireNextYear

● HTML/CSS ● Java ● JavaScript ● Python ● SQL



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

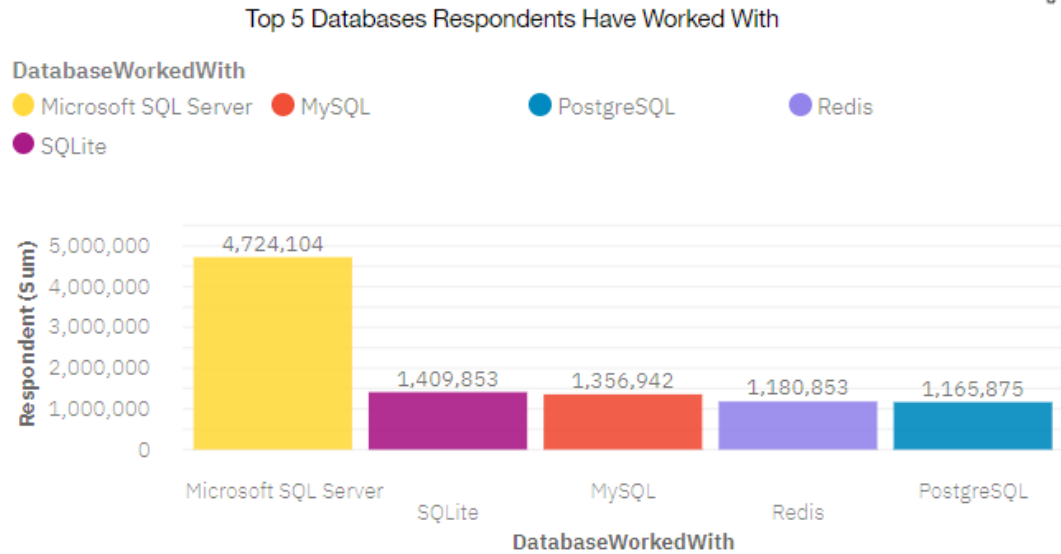
- C#, HTML/CSS and Javascript are the top 3 languages that software developers have worked with.
- Python becomes one of the top preferred languages to be mastered in future.
- Knowledge in SQL still high in demand for future.

Implications

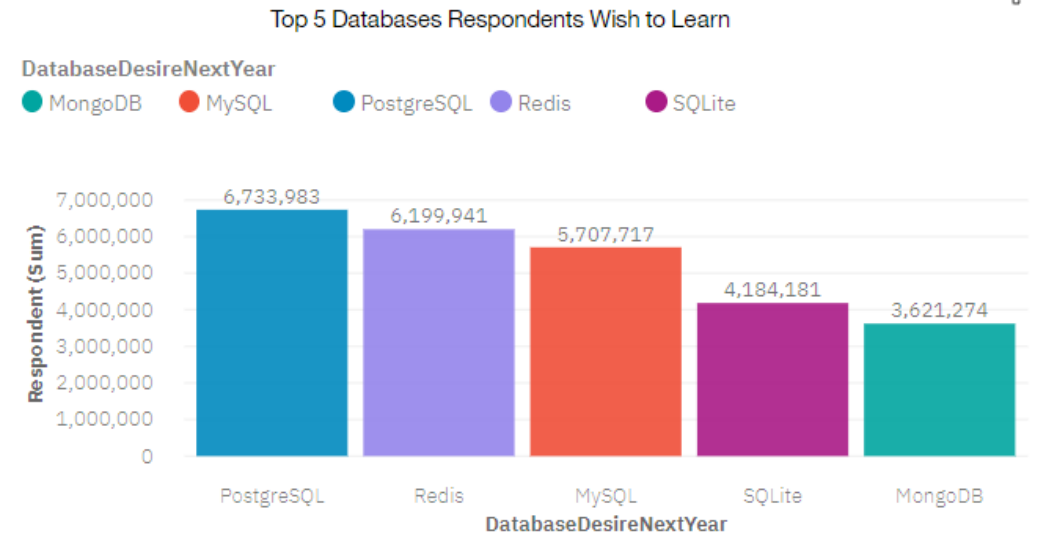
- Website development is still high in demand for future.
- Python is the fastest-growing major programming language for Artificial intelligence / Machine learning fields.
- Data analytics / big data fields would require expertise in SQL.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL and Redis started rising this year.
- Microsoft SQL Server is edged out from the list.
- MongoDB is another upcoming favorite database.

Implications

- Open source databases are preferable as they are highly efficient, especially with large databases.
- PostgreSQL is preferred by companies compared to Microsoft SQL Server because it is a free open source object-relational database system.
- MongoDB is rising as it is a NoSQL database which store big data of all kinds (structured/unstructured).

DASHBOARD



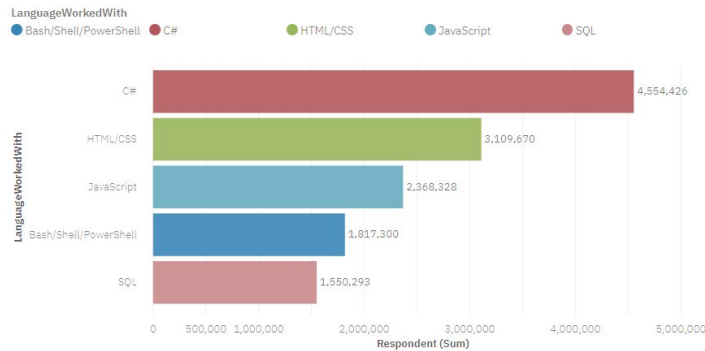
Dashboard link:

<https://eu-de.dataplatform.cloud.ibm.com/dashboards/41485732-dca5-4393-bef3-0124bdae1286/view/5764e72e3c953df463cfcce4079a7a007c63225db7bbd100898c7b4908637997f0601294c8274a0fd8190630a6b9115dca>

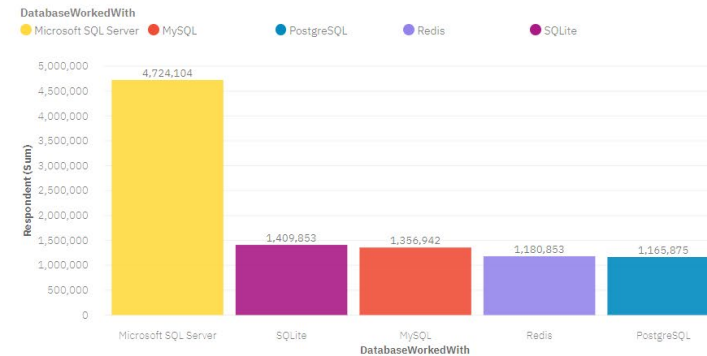
DASHBOARD TAB 1

Current Technology Used

Top 5 Languages Respondents Have Worked With



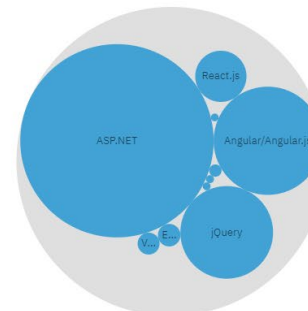
Top 5 Databases Respondents Have Worked With



Platforms Respondents Have Worked With

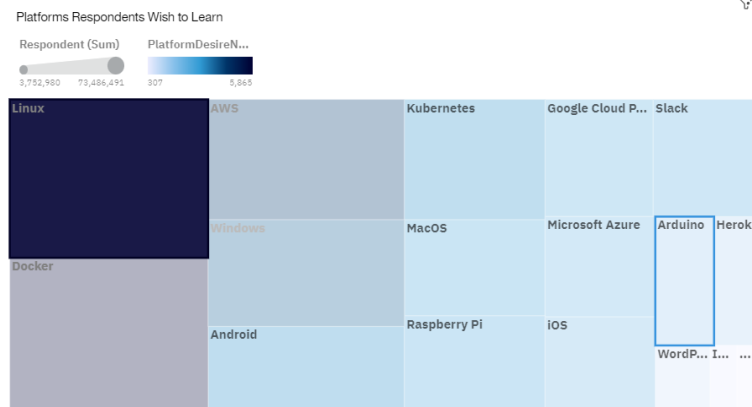
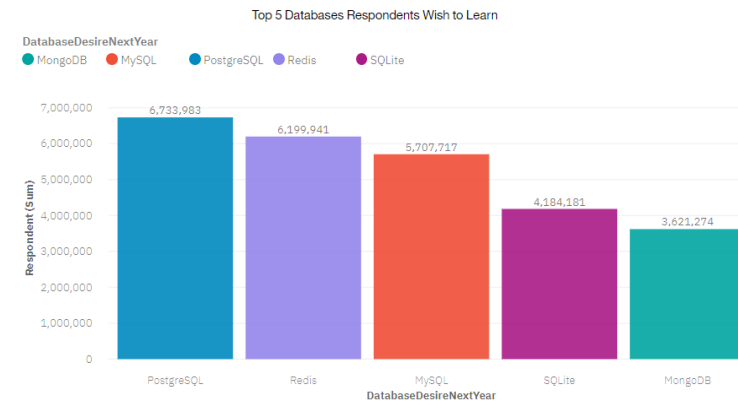
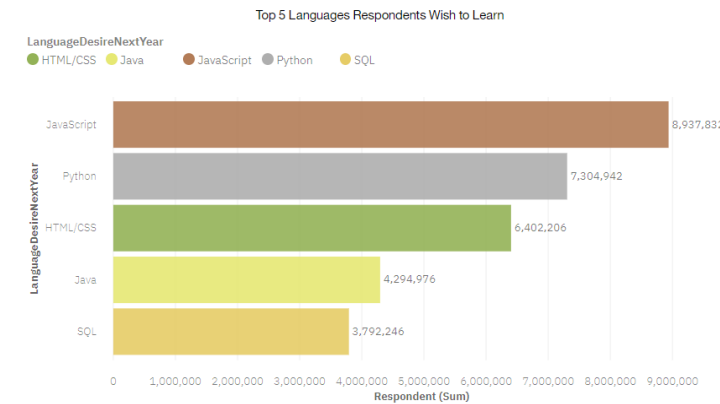


Top 10 WebFrame Respondents Have Worked With



DASHBOARD TAB 2

Future Technology Used

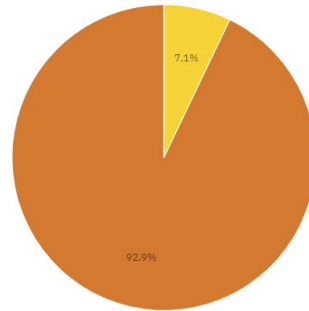


DASHBOARD TAB 3

Demographics

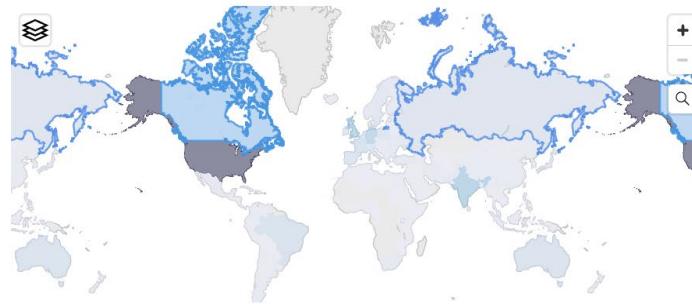
Respondents Classified By Gender

Gender
Woman Man

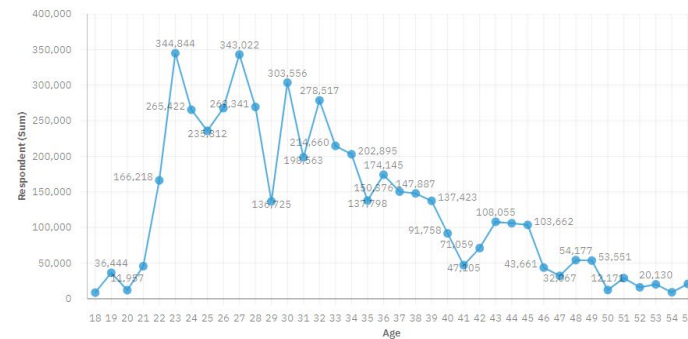


Respondent Count by Countries

Respondent (Sum)
0 35,170,293

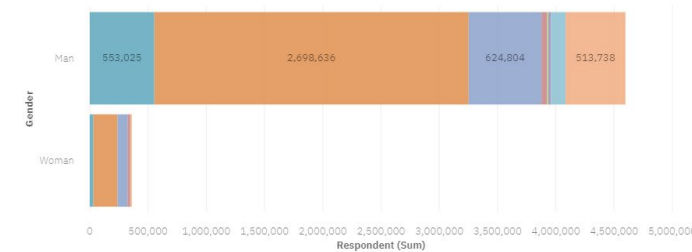


Respondent Count By Age



Respondent Count by Gender, classified by Formal Education Level

EdLevel
Associate degree Bachelor's degree (BA, BS, B.E., ...) Master's degree (MA, MS, M.E., ...) Other doctoral degree (Ph.D, E., ...) Primary/elementary school Professional degree (JD, MD, e., ...) Secondary school (e.g. American high school) Some college/university study ...



DISCUSSION



- The demand for the required skills in software technology for upcoming jobs.
- Increase women participation in software development fields.
- Provide trainings to the existing software developers who wish to learn new technologies.
- Enable more online courses for people who are interested to dive into software development or switch career.

OVERALL FINDINGS & IMPLICATIONS

Findings

- Fast changing technologies introduced every year.
- Many software technology expertise are from countries such as USA, India and Germany.
- Gender gaps in technology jobs.
- Many people started to learn programming since young eg. Age 16.

Implications

- Companies need to adapt to new technologies rapidly.
- More online courses or sharing need to be shared with other countries in order to create more software professionals.
- Technology determines the direction of the future, and women need equal opportunity to shape that direction. Companies must ensure that sexism is avoided in the hiring process and in the workplace, and to continue building great initiatives to bridge the gender divide all over the world.
- The current generation of children will need to be literate in technology in order to be competitive in the future job market as most jobs require the knowledge of basic IT skills.

CONCLUSION

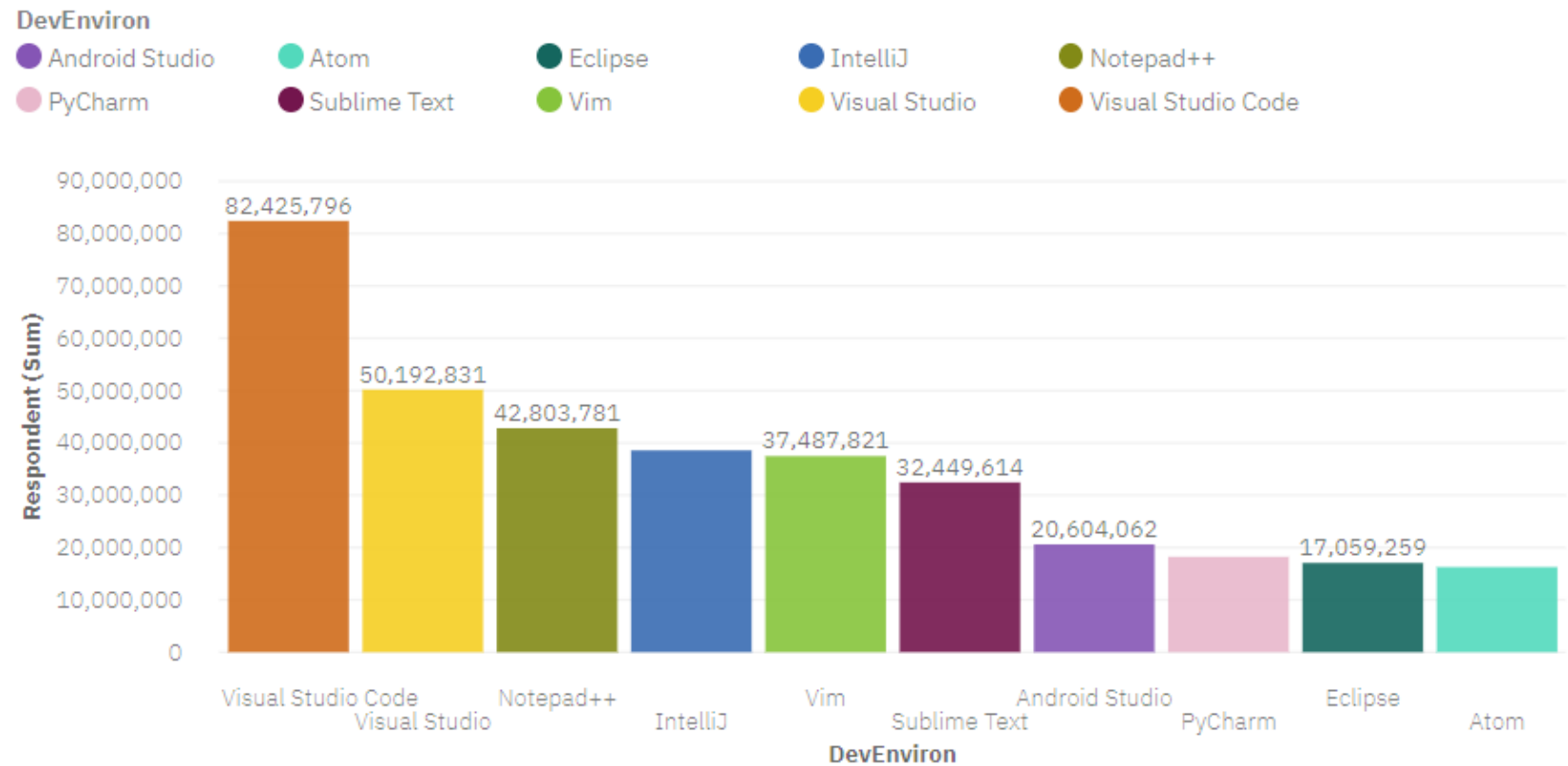


1. Adapt to new technologies rapidly as there are fast changing technologies happen every year.
2. Enable more online resources for learning purposes all over the world.
3. Empower women pursuing software engineering roles.

APPENDIX

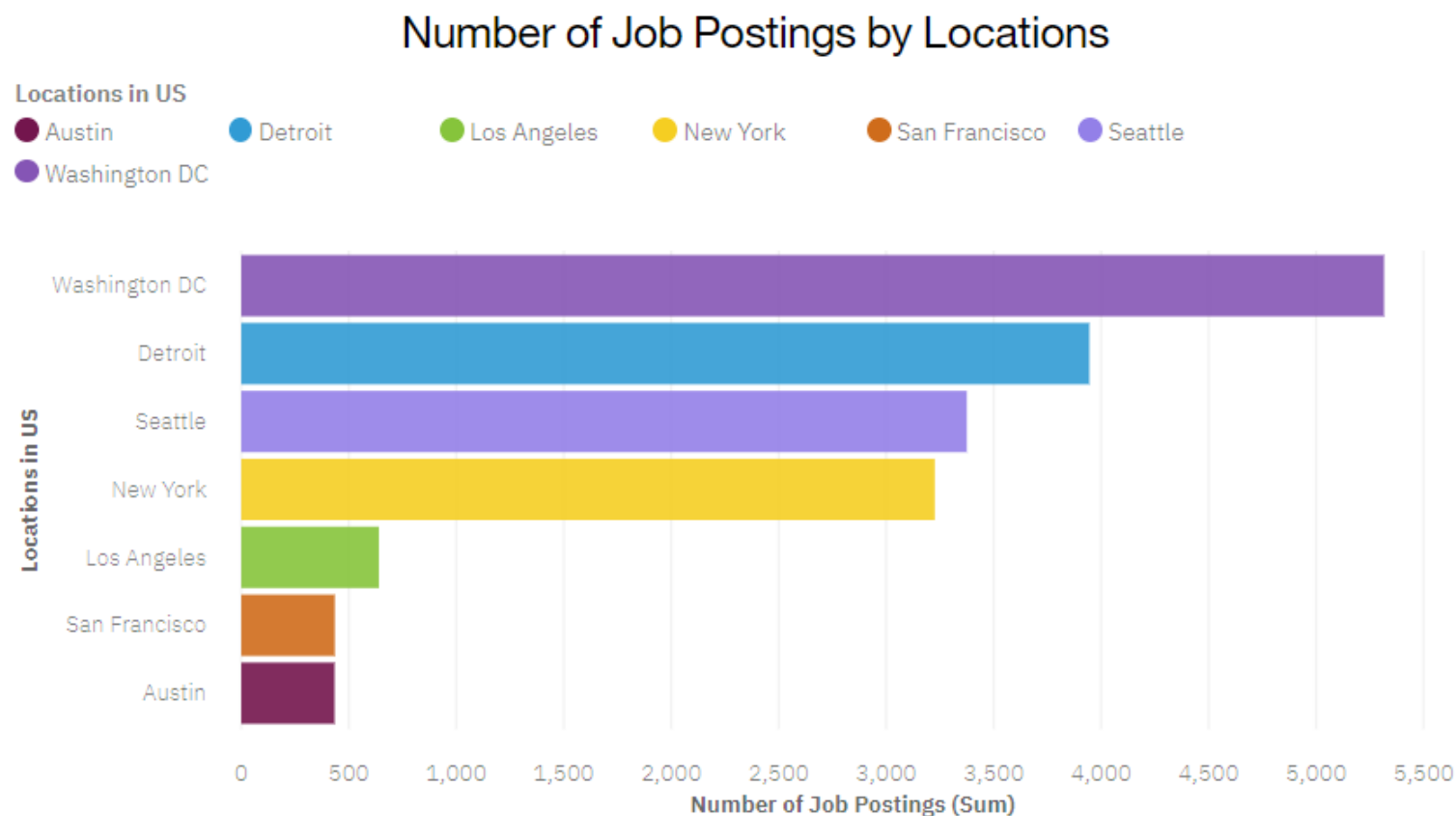


Top 10 Dev Environments Respondents Used



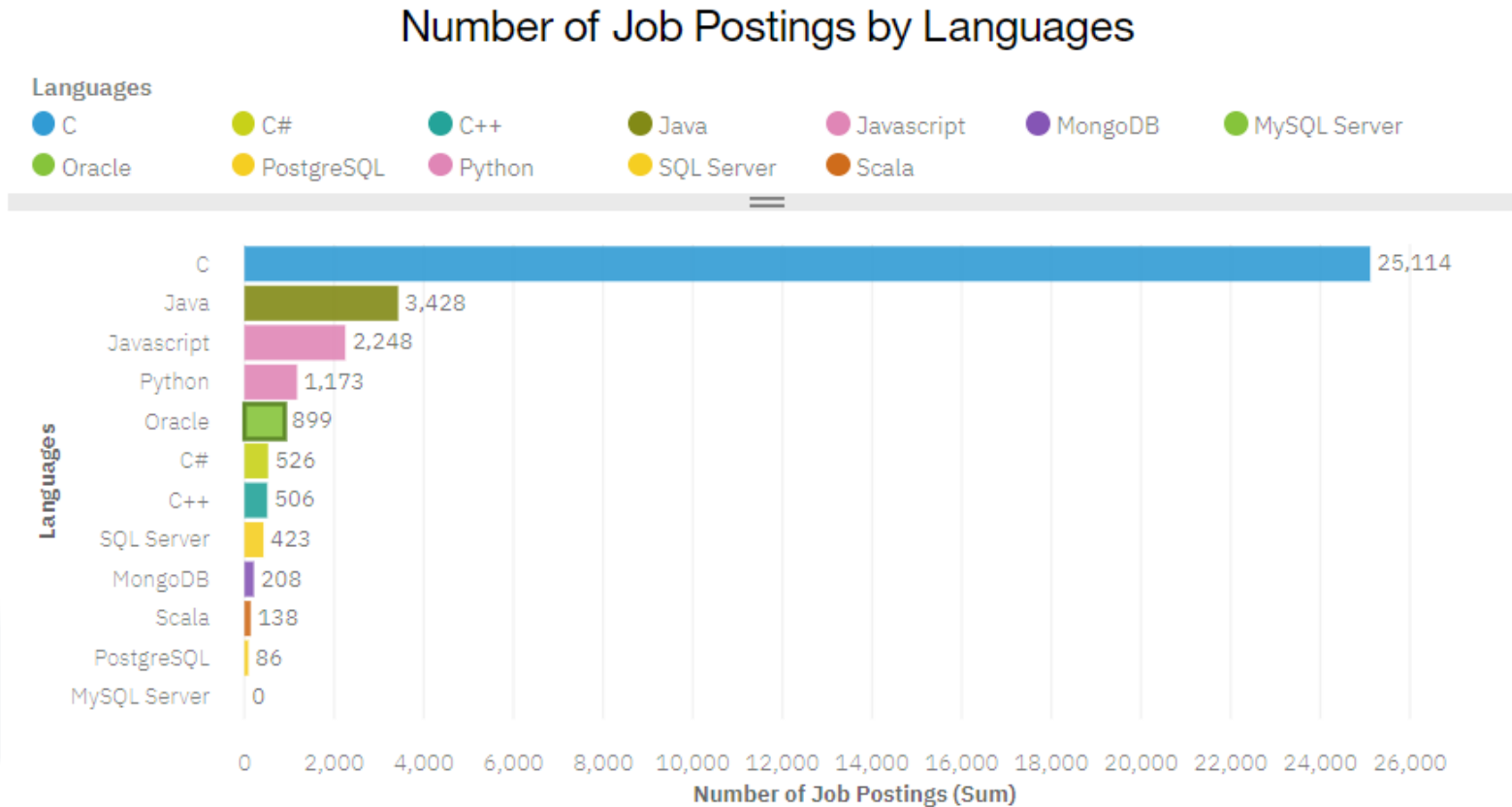
JOB POSTINGS

Number of Job Postings by Locations



JOB POSTINGS

Number of Job Postings by Languages



POPULAR LANGUAGES

Average Annual Salary by Languages

