IBM Data Analyst Capstone Project

Part 1

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EXECUTIVE SUMMARY

- The survey gathered 65,437 responses from 185 countries, with 48,019 of these responses used for aggregated salary data. JavaScript is the most commonly used programming language, cited by 62.3% of respondents. PostgreSQL holds its position as the most popular database for the second consecutive year, used by 49% of developers. This year, 76% of respondents are using or planning to use AI tools in their development process, which marks an increase from last year. The proportion of hybrid developers remains stable at 42%, while the percentage of developers working on-site has risen to 20%.

INTRODUCTION

Welcome to our presentation on the data analysis of the 2024 Stack Overflow Developer Survey results. This survey offers an extensive overview of current trends and preferences within the developer community. Our analysis will examine various elements including the popularity of programming languages, database usage, and the integration of AI tools in development processes.

METHODOLOGY

- The survey received 65,437 responses from 185 countries, with salary data from 48,019 responses. Conducted between May 19 and June 20, 2024, it had a median completion time of nearly 21 minutes. Participants were recruited via Stack Overflow channels, including onsite messages, blog posts, emails, banner ads, and social media. Salaries were converted to USD using the June 11, 2024 exchange rate, and multi-select questions were shown as percentages of total unique responses.

RESULTS

- The survey garnered 65,437 responses from 185 countries, with 48,019 responses utilized for aggregated salary data.
- JavaScript continues to be the most widely used programming language, reported by 62.3% of participants. PostgreSQL remains the leading database for the second consecutive year, employed by 49% of developers.
- This year, 76% of respondents are either using or planning to incorporate AI tools into their development processes, reflecting an increase from last year.
- The proportion of hybrid developers has remained stable at 42%, while the percentage of developers working in-person has risen to 20%.
- Furthermore, 93% of respondents visit Stack Overflow at least several times per month, if not multiple times per day.

PROGRAMMING LANGUAGE TRENDS

Current Year
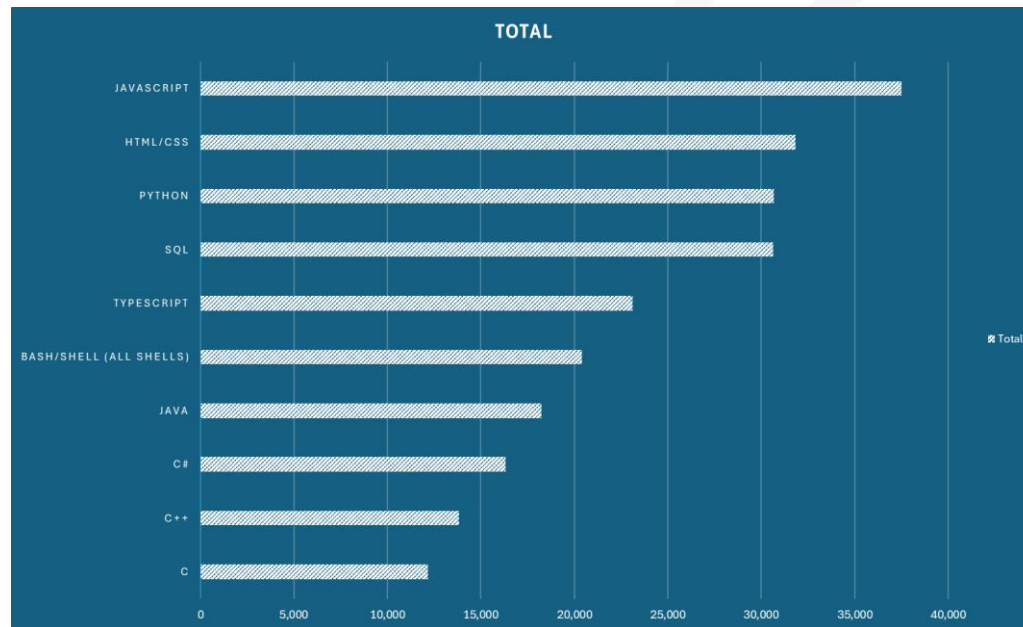
Next Year
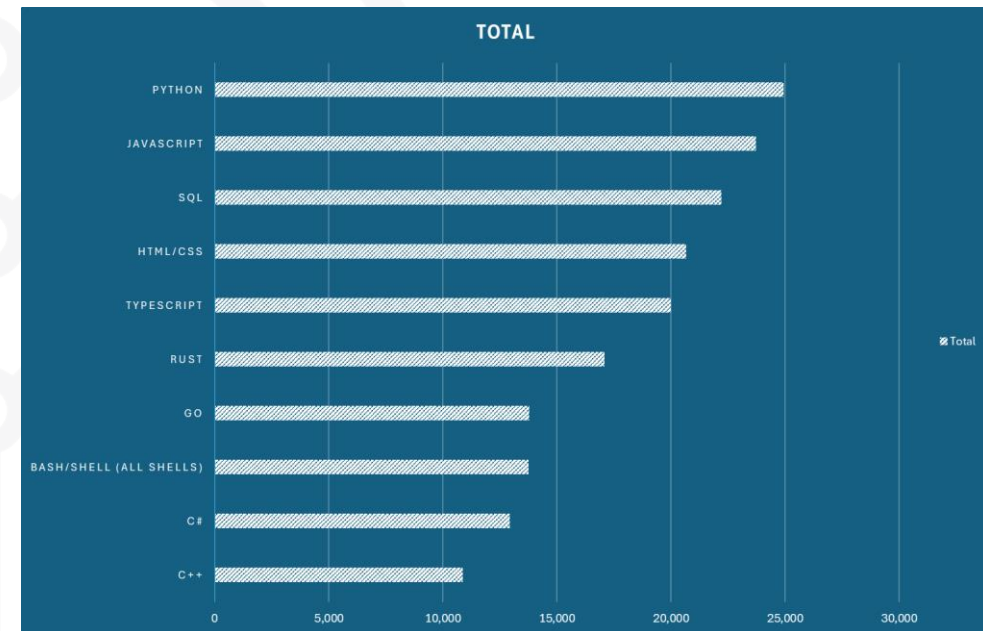
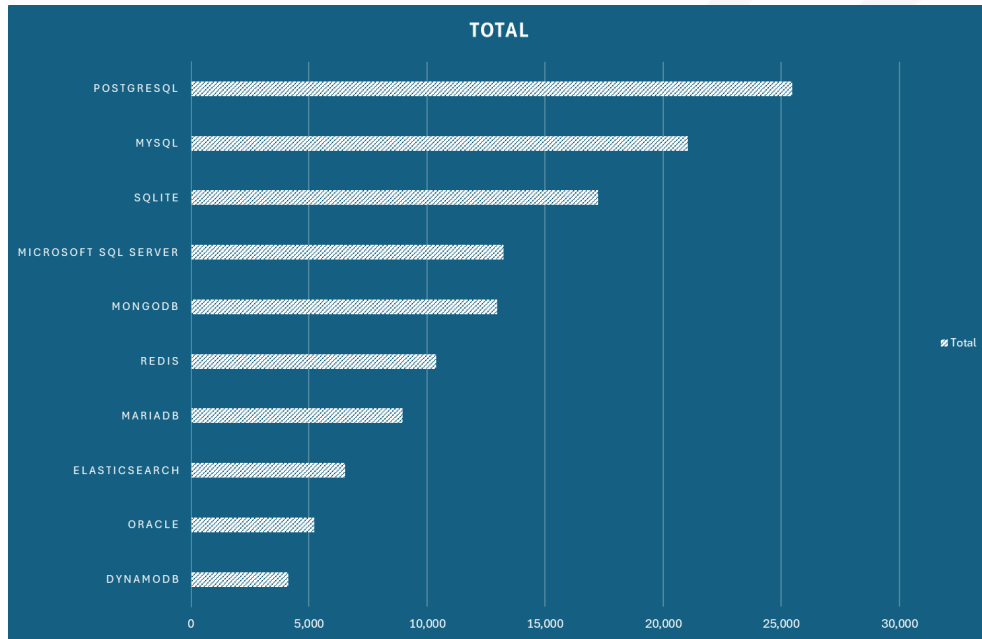# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript is used by 62.3% of respondents, making it the most widely used programming language.

- Python and SQL are also commonly used, with 51% of developers working with each.

- Rust has an admiration score of 83%, making it a highly regarded programming language.

- The prevalence of JavaScript underscores its continued significance as an essential skill for web developers and those engaged in front-end projects.

- The widespread use of Python and SQL reflects their versatility and critical role in various domains, including data science, web development, and database management.

- The strong appreciation for Rust indicates a growing interest in its application for system-level programming and performance-critical operations.
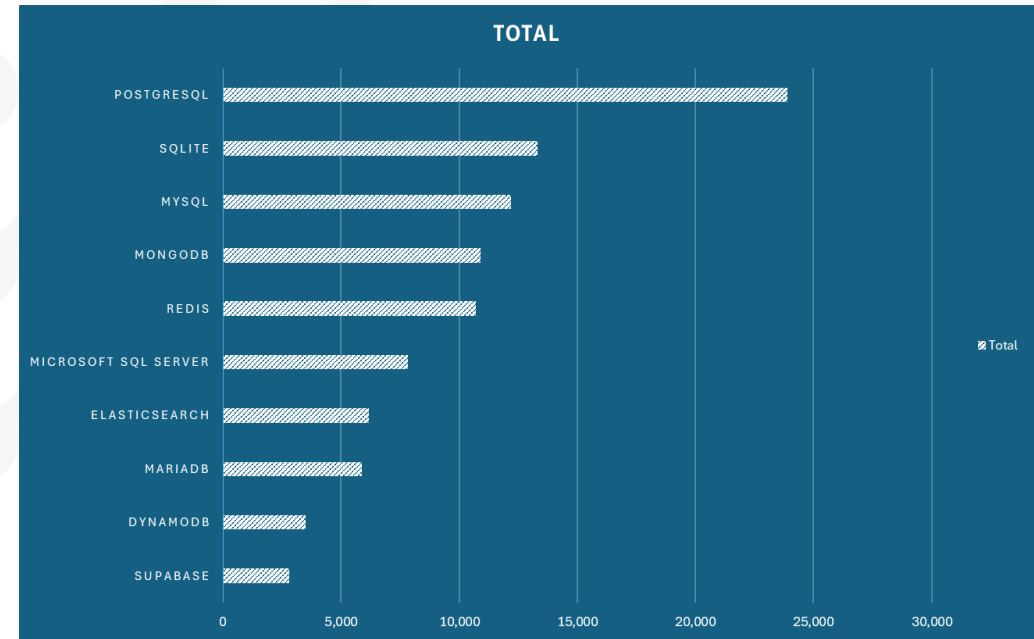
DATABASE TRENDS

Current Year

TOTAL

POSTGRESQL	
MYSQL	
SQLITE	
MICROSOFT SQL SERVER	
MONGODB	
REDIS	
MARIADB	
ELASTICSEARCH	
ORACLE	
DYNAMODB	

0   5,000   10,000   15,000   20,000   25,000   30,000

Next Year

TOTAL

POSTGRESQL	
SQLITE	
MYSQL	
MONGODB	
REDIS	
MICROSOFT SQL SERVER	
ELASTICSEARCH	
MARIADB	
DYNAMODB	
SUPABASE	

0   5,000   10,000   15,000   20,000   25,000   30,000

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL remains the most popular database, utilized by 49% of developers, maintaining its top position for the second consecutive year. MySQL and SQLite are also extensively used, with 40.3% and 33.1% of developers employing them, respectively. Newer databases such as Supabase and DuckDB are gaining traction, with 4% and 1.4% of developers opting for their use, respectively.

Implications

- The continued use of PostgreSQL indicates that it will remain an important skill for developers, and companies may prioritize PostgreSQL proficiency in their hiring processes.

- The widespread use of MySQL and SQLite shows their versatility and significance in various applications, from web development to embedded systems.

- The increasing interest in newer databases like Supabase and DuckDB reflects a trend towards exploring innovative database solutions.
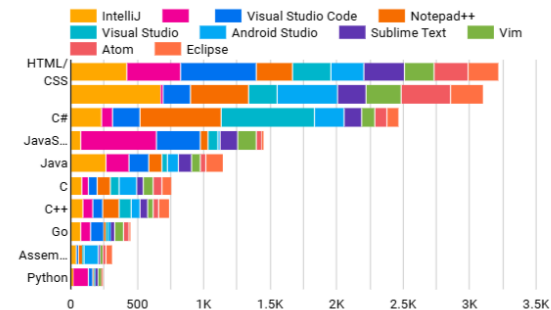
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DASHBOARD

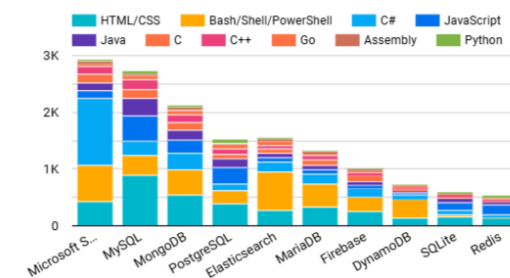ibm_da/Dashboards-ThinkPad.pdf at main · delgreen/ibm_da

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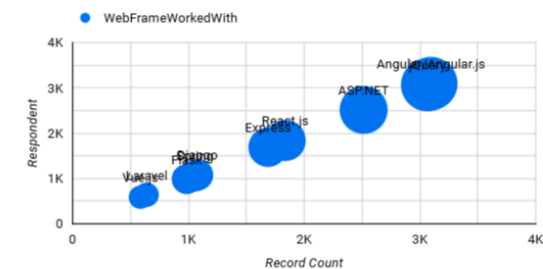
DASHBOARD TAB 1

DASHBOARD TAB 2

Future Technology Trend
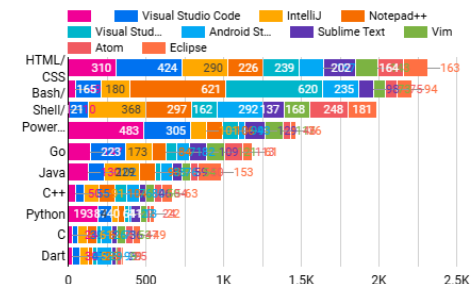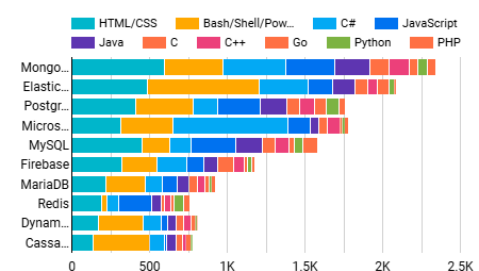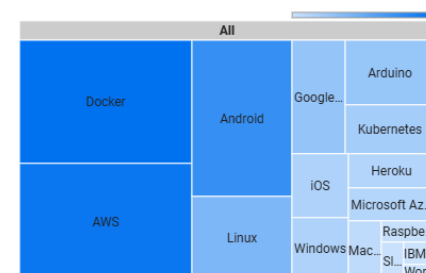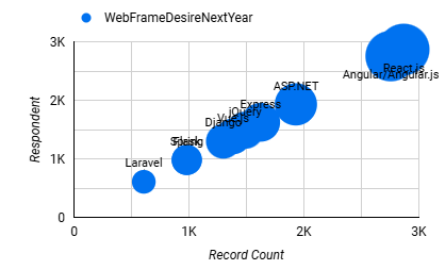
DASHBOARD TAB 3
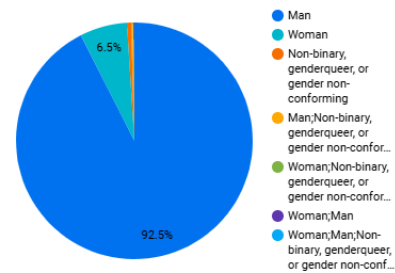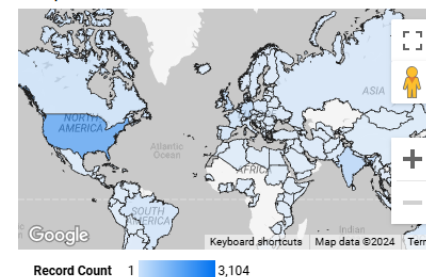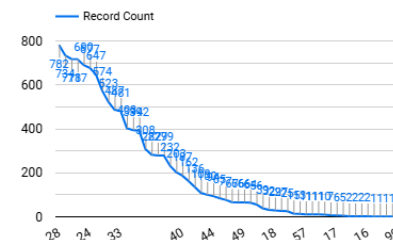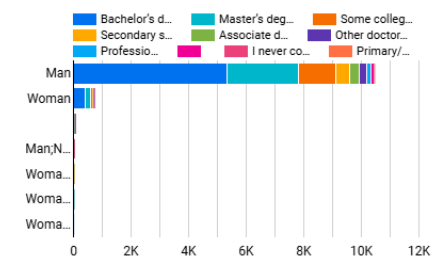
OVERALL FINDINGS & IMPLICATIONS

Findings

- JavaScript is used by 62.3% of respondents, making it the most popular programming language.

- 76% of respondents are using or planning to use AI tools in their development process this year, which is an increase from last year.

- The proportion of hybrid developers has remained consistent at 42%.

Implications

- The prominence of JavaScript implies its continued importance as a key skill for web developers, particularly those engaged in front-end projects. The increasing adoption of AI tools points towards a trend of incorporating more integrated AI solutions within the development process. Additionally, the steady number of hybrid developers coupled with a rise in on-site work preferences indicates a shift in work dynamics.

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CONCLUSION

The 2024 Stack Overflow Developer Survey presents significant insights into the contemporary landscape of the developer community. These results furnish a thorough understanding of emerging trends and changes within the developer sector, informing future advancements and decision-making processes in the technology industry.

APPENDIX

Top 10 Languages Used

Row Labels	Count of Language Users
JavaScript	37,492
HTML/CSS	31,816
Python	30,683
SQL	30,639
TypeScript	23,107
Bash/Shell (all shells)	20,412
Java	18,239
C#	16,318
C++	13,827
C	12,184
Grand Total	**234,717**

Top 10 Databases Used

Row Labels	Count of Databases Users
PostgreSQL	25,469
MySQL	21,045
SQLite	17,236
Microsoft SQL Server	13,227
MongoDB	12,958
Redis	10,377
MariaDB	8,950
Elasticsearch	6,533
Oracle	5,211
Dynamodb	4,138
Grand Total	**125,144**

Top 10 Platforms Used

Row Labels	Count of Platform Users
Amazon Web Services (AWS)	22,191
Microsoft Azure	12,758
Google Cloud	11,572
Cloudflare	6,974
Firebase	6,443
Digital Ocean	5,409
Vercel	5,211
Heroku	3,759
Netlify	3,138
VMware	2,834
Grand Total	**80,289**

Top 10 Web Frameworks Used

Row Labels	Count of Web Framework Users
Node.js	19,734
React	19,111
jQuery	10,352
Next.js	8,644
Express	8,614
Angular	8,306
ASP.NET CORE	8,187
Vue.js	7,362
ASP.NET	6,265
Flask	6,245
Grand Total	**102,820**

APPENDIX

Future Technology Trends

Top 10 Languages Desired for the Next Year

Row Labels	Count of Language Users Next Year
Python	24,929
JavaScript	23,709
SQL	22,200
HTML/CSS	20,657
TypeScript	20,000
Rust	17,075
Go	13,782
Bash/Shell (all shells)	13,744
C#	12,921
C++	10,873
Grand Total	**179,890**

Top 10 Databases Desired for the Next Year

Row Labels	Count of Database Users Next Year
PostgreSQL	23,904
SQLite	13,322
MySQL	12,191
MongoDB	10,911
Redis	10,712
Microsoft SQL Server	7,836
Elasticsearch	6,191
MariaDB	5,874
Dynamodb	3,503
Supabase	2,796
Grand Total	**97,240**

Desired Platforms for the Next Year

Row Labels	Count of Platform Users Next Year
Amazon Web Services (AWS)	18,040
Microsoft Azure	10,233
Google Cloud	9,772
Cloudflare	6,881
Firebase	4,952
Digital Ocean	4,507
Vercel	4,466
Hetzner	2,416
Supabase	2,180
Netlify	2,140
Grand Total	**65,587**

Top 10 Web Frameworks Desired for the Next Year

Row Labels	Count of Web Framework Users Next Year
React	15,105
Node.js	14,558
Next.js	8,391
Vue.js	7,016
ASP.NET CORE	6,905
Angular	6,364
Express	5,577
Svelte	5,007
Django	4,973
FastAPI	4,875
Grand Total	**78,771**

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APPENDIX

Demographics

Top 10 Countries by User Count

Row Labels	Count of Users in Country
United States of America	11,095.00
NA	6,507.00
Germany	4,947.00
India	4,231.00
United Kingdom of Great Britain and Northern Ireland	3,224.00
Ukraine	2,672.00
France	2,110.00
Canada	2,104.00
Poland	1,534.00
Netherlands	1,449.00
Grand Total	**39,873.00**

Top 10 Industries by User Count

Row Labels	Count of Users by Industry
NA	36,579.00
Software Development	11,918.00
Other:	3,077.00
Fintech	1,641.00
Internet, Telecomm or Information Service	1,629.00
Banking/Financial Services	1,371.00
Healthcare	1,277.00
Manufacturing	1,265.00
Retail and Consumer Services	1,264.00
Government	962.00
Grand Total	**60,983.00**

Top 10 Ages by User Count

Row Labels	Count of Users by Age
25-34 years old	23,911.00
35-44 years old	14,942.00
18-24 years old	14,098.00
45-54 years old	6,249.00
55-64 years old	2,575.00
Under 18 years old	2,568.00
65 years or older	772.00
Prefer not to say	322.00
Grand Total	**65,437.00**

JOB POSTINGS

Total

City	
Washington DC	
Detroit	
Seattle	
Houston	
New York	
Boston	
Baltimore	
Dallas	
New Orleons	
Los Angeles	
San Francisco	
Austin	
Philadelphia	

■ Total

0   1,000   2,000   3,000   4,000   5,000   6,000

POPULAR LANGUAGES