



# IBM DATA ANALYSIS CAPSTONE

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# OUTLINE

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

# EXECUTIVE SUMMARY

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- My intention is to provide insight on the popularity of various computer languages and database systems
- ...by analyzing a diverse dataset and gleaning information from a global survey of programmers
  - I will measure current 'actual' data
  - ...and couple it with future 'intentional' aspirations
- I have sought to discover correlation between various fields
  - I tried to choose larger survey grouping to compare, to provide more widely applicable guidance.

# INTRODUCTION

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- We'll look at how data from various fields of programmer related info lines up with others
- If there's any interesting indicators that groups have in common, we'll dive a bit deeper to see how many people or programs it applies to, or how much money can be made by making certain decisions

# METHODOLOGY

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- Made use of a number of tools to perform analyses including:
  - IBM Cognos
  - MS Excel
  - SQL
  - Python & libraries including:
    - pandas, numpy, seaborn, matplotlib, plotly
- Some flaws in the data were compensated for by:
  - Removing extreme outliers
  - Removing rows with missing necessary information
  - Averaging null values where appropriate

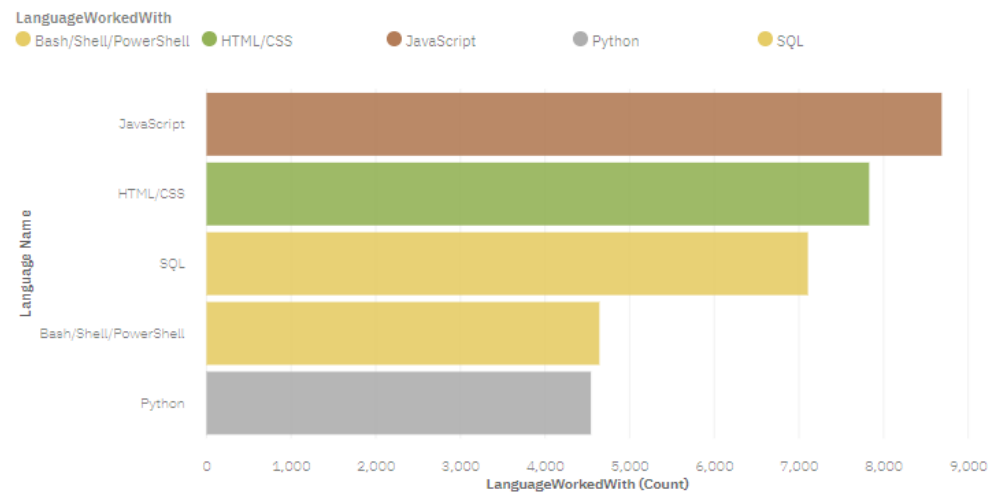
# RESULTS

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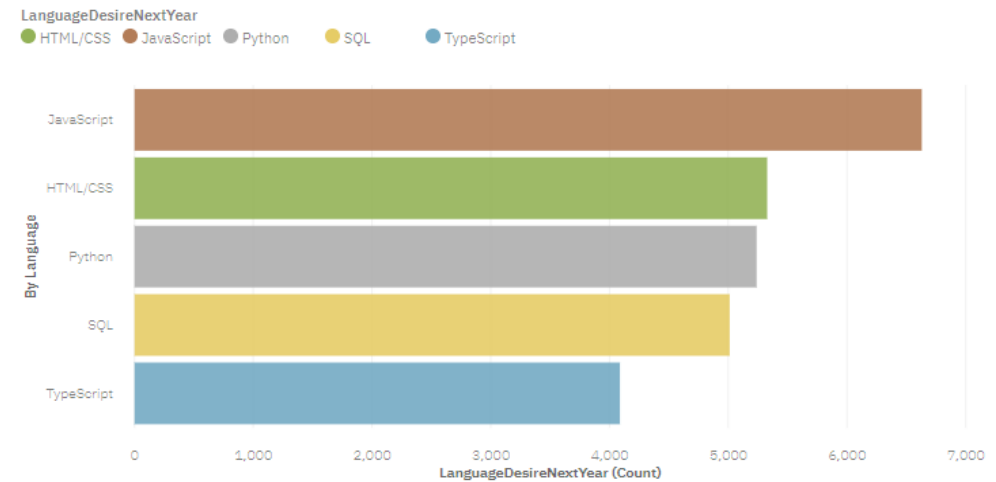


# PROGRAMMING LANGUAGE TRENDS

## Current Year



## Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- JS/HTML/CSS have a 'comfortable lead' on the rest
- SQL (or it's variants) has been around 'forever'
- Is anyone surprised to see Python everywhere at this point?

## Implications

- Studying full-stack webdev will probably lead to many career opportunities
- Odds are SQL(s) have a future
- Ease of use + General utility = a safe bet

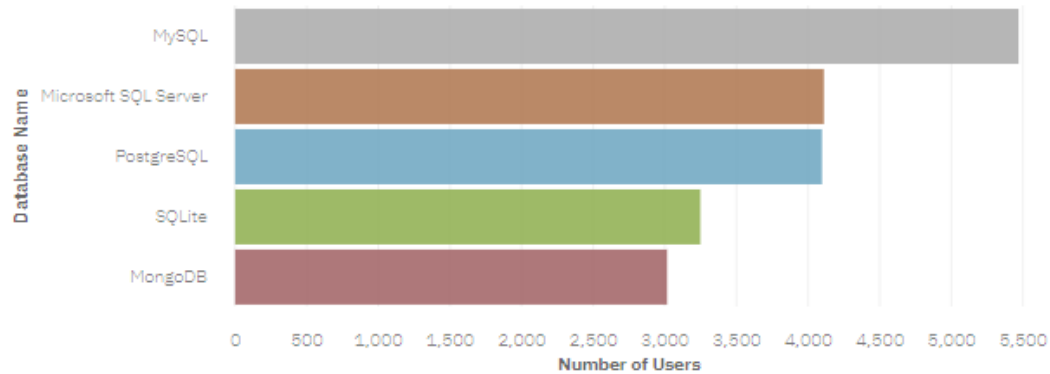


# DATABASE TRENDS

## Current Year

DatabaseWorkedWith

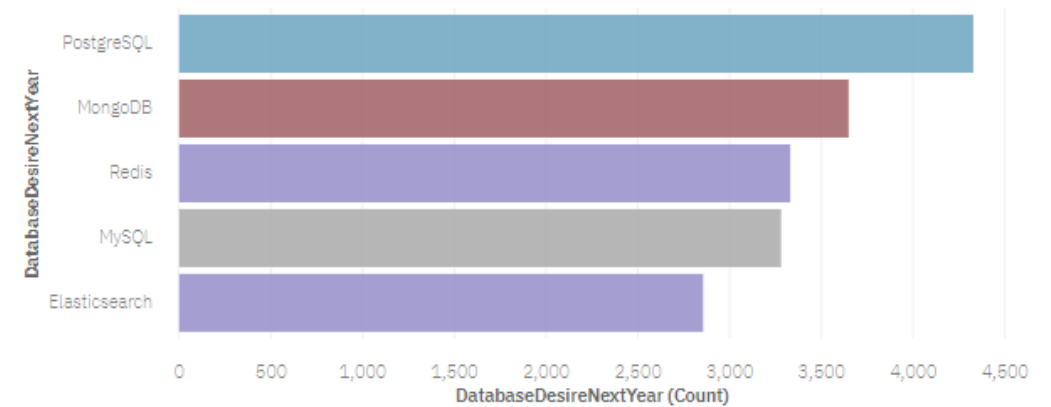
Microsoft SQL Server MongoDB MySQL PostgreSQL SQLite



## Next Year

DatabaseDesireNextYear

Elasticsearch MongoDB MySQL PostgreSQL Redis



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- NoSQL databases are increasing in popularity
- *MS SQL* may be in decline, due to cost, or other Microsoft options like Azure eclipsing it

## Implications

- RDBMSs may be used in more operations than 'just' data storage (AI & ML)
- Open-source, or 'free' appears to be a popular choice

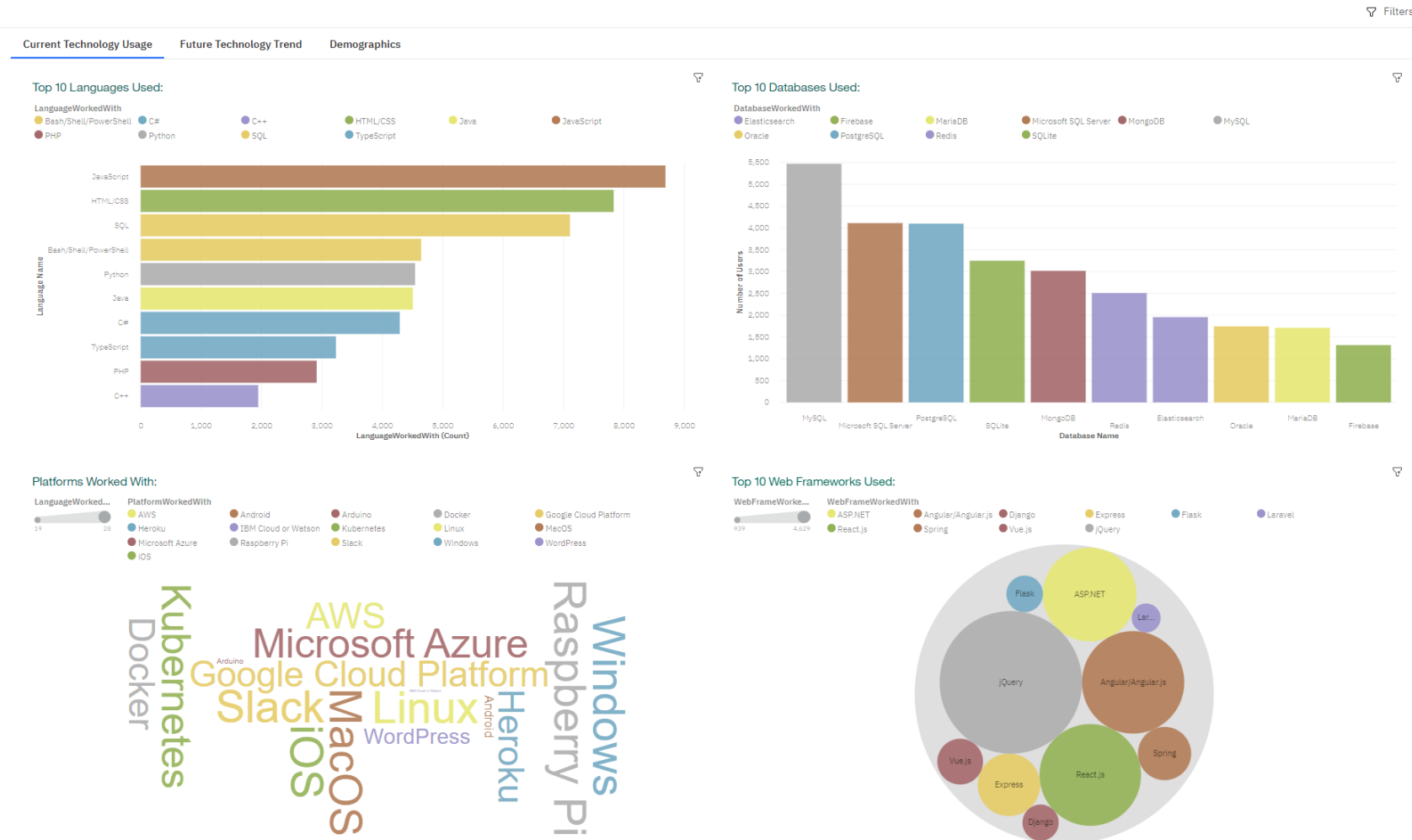
# DASHBOARD

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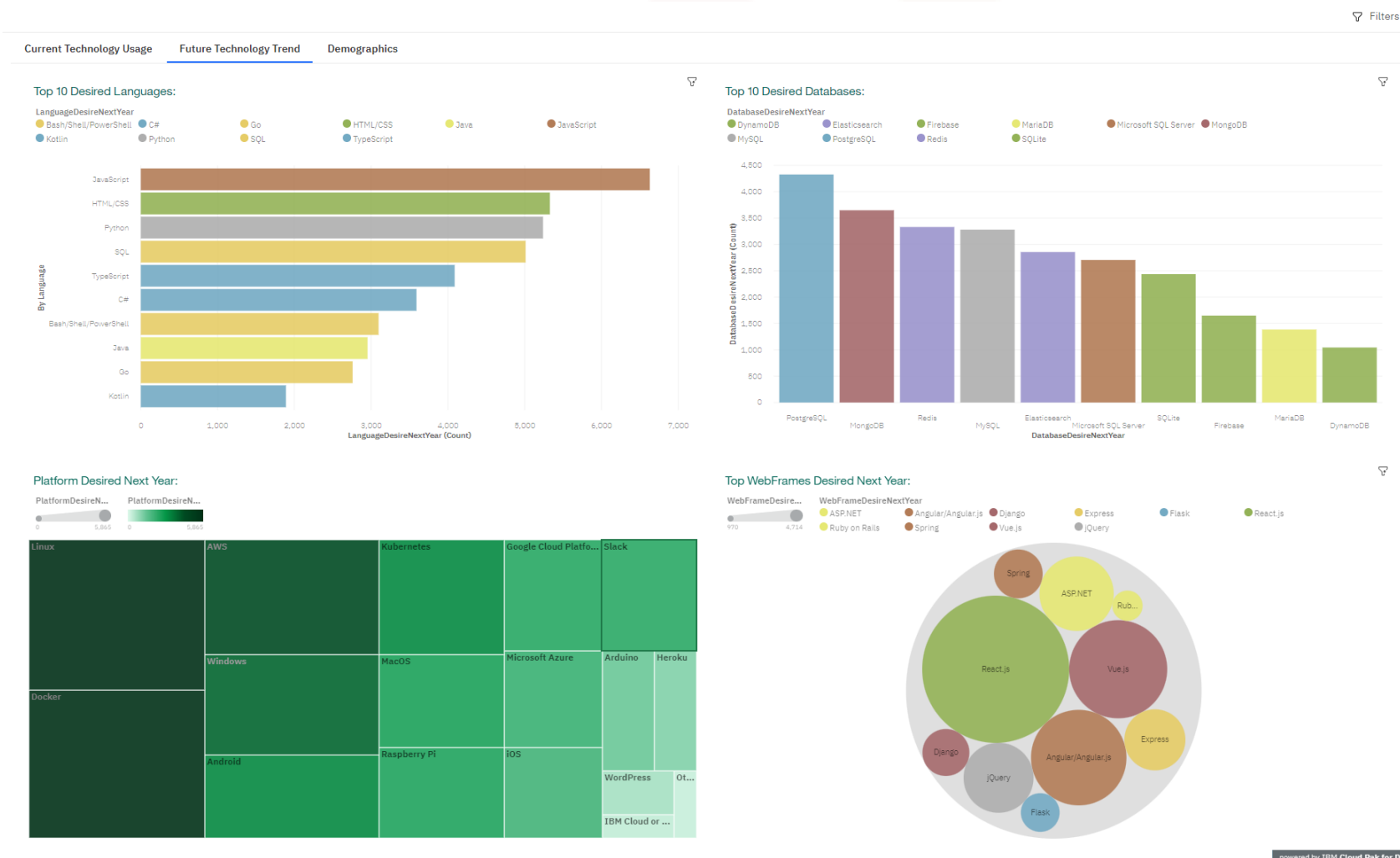


[Hyperlink to Dashboard](#)

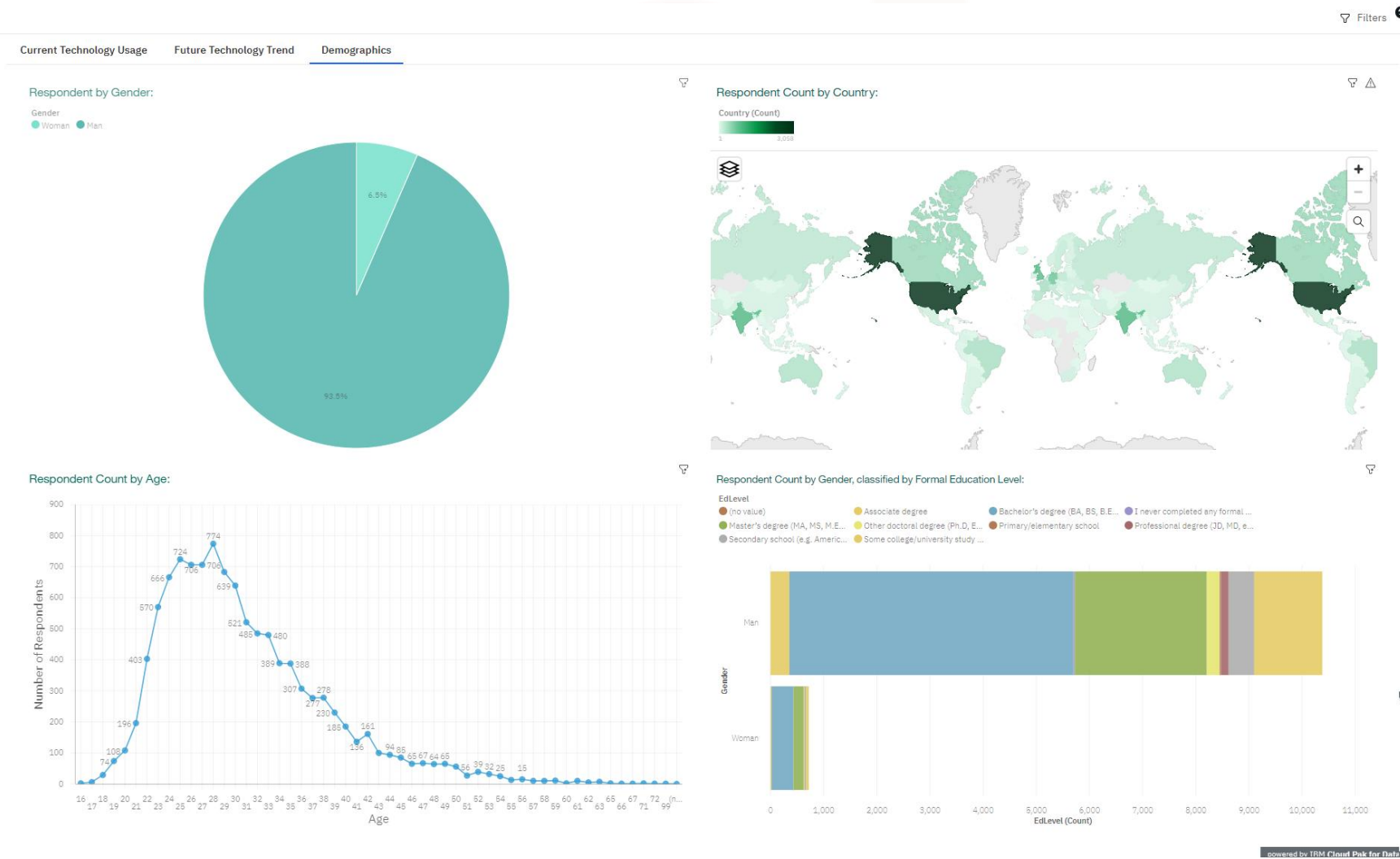
# DASHBOARD TAB 1



# DASHBOARD TAB 2



# DASHBOARD TAB 3



# DISCUSSION

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- To me, the most interesting data is on Dashboard 3. It continues to be a male-dominated field, but the wide diversity of ages and education levels in the field inspires hope for more involvement globally

# OVERALL FINDINGS & IMPLICATIONS

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## Findings

- JavaScript is, and probably will remain very popular
- 'Programming' languages like ones in the "C" family aren't in the top 5
- Respondents were predominantly men from the US, UK & India

## Implications

- Learning JS and its offshoots might not be "can't miss", but should be decent languages to study
- Pursue "harder" languages only if you're passionate about how you can use them
- Results may be skewed to members of these groups



# CONCLUSION

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- Most of my conclusions were summated in the previous slide, so instead, I'd rather suggest some lines of further inquiry
  - Use a multi-line chart to track year-over-year gains and losses (A language might slip relative to another, while still gaining users overall)
  - Compare languages used by developers to employer demand \*(see slides 19 & 20)
  - Compare "last year's" future data vs this year's actual results

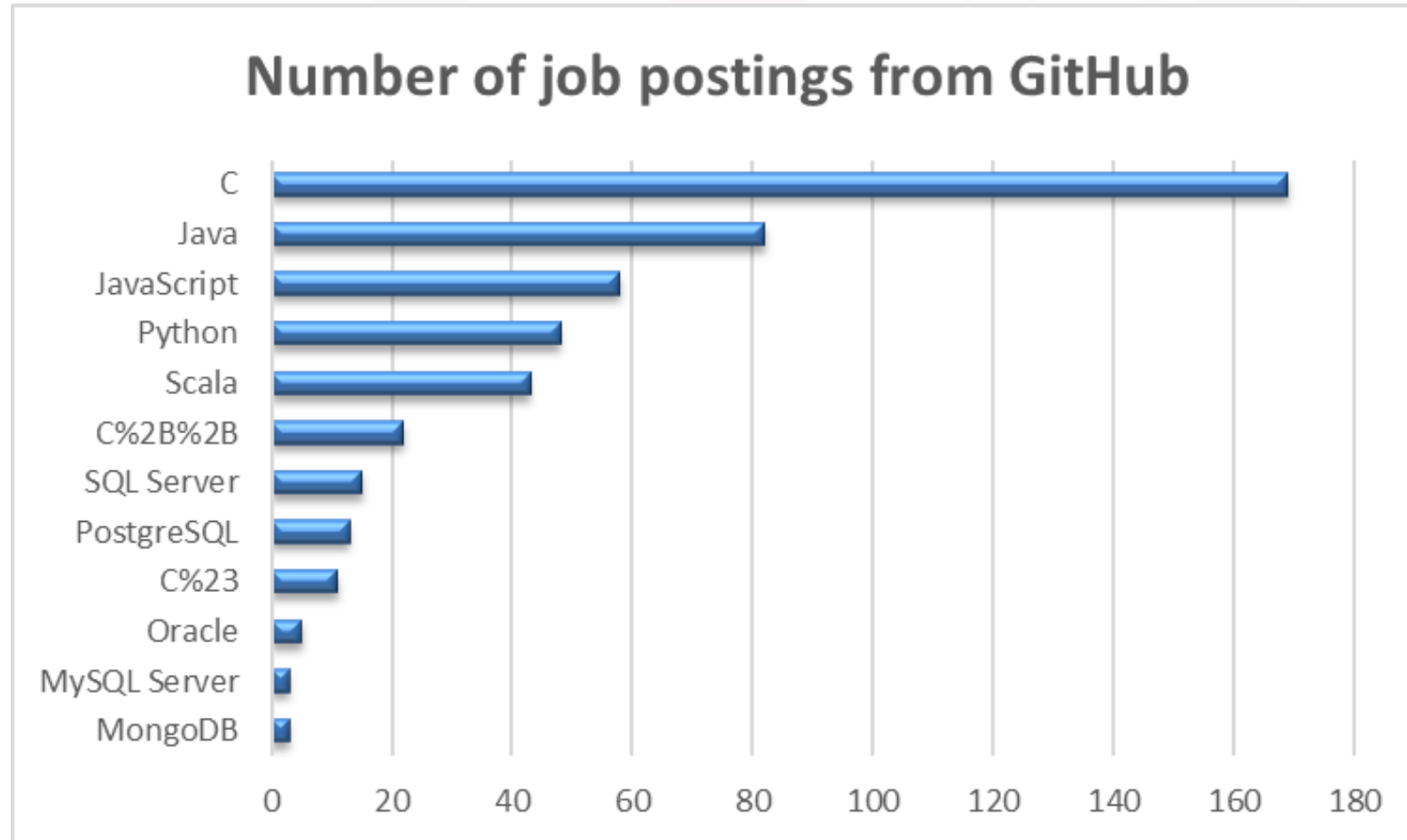
# APPENDIX

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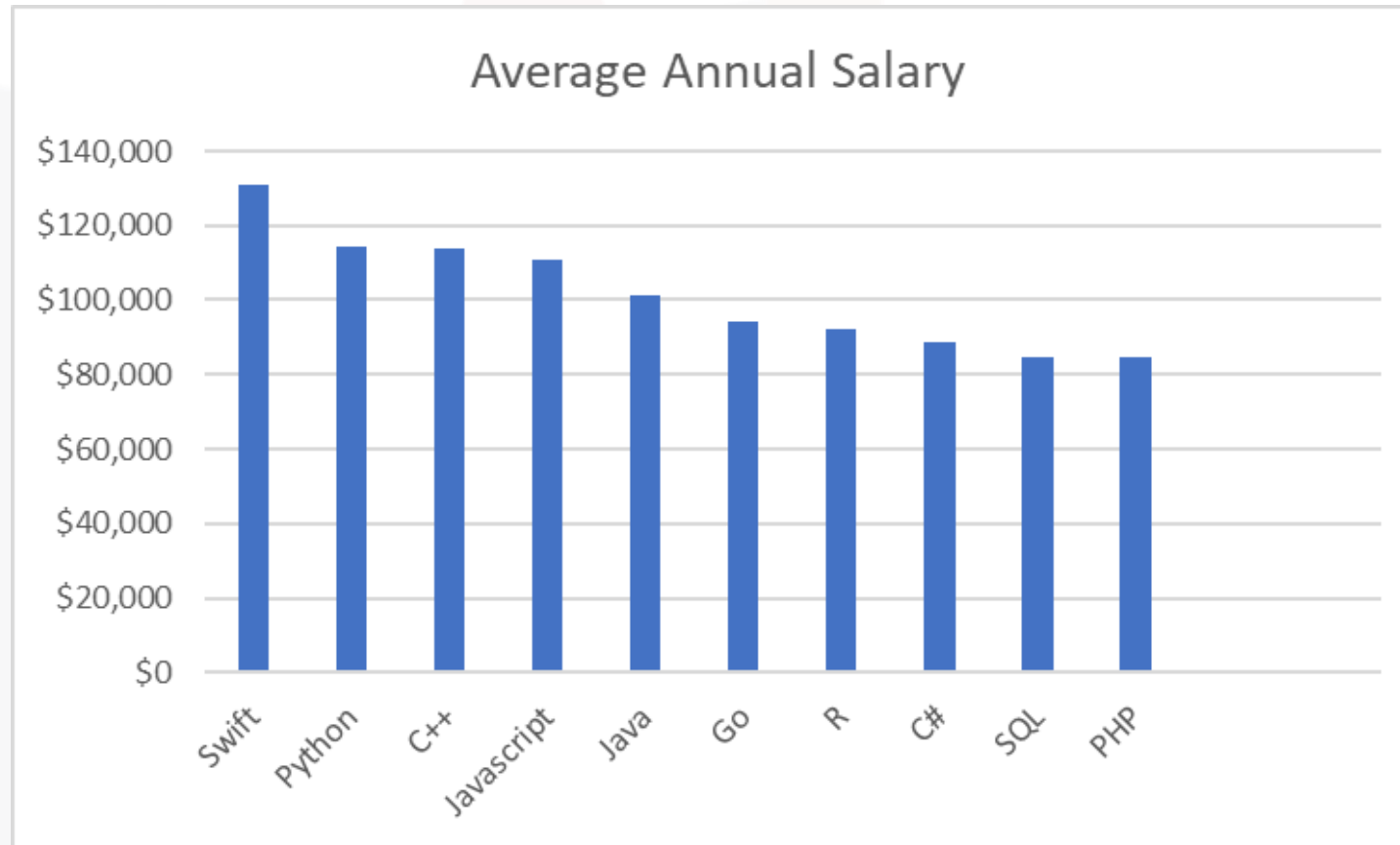


- ^1 <https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/> under a ODbL: Open Database License.

# JOB POSTINGS



# POPULAR LANGUAGES



“popular-languages” bar chart in descending order by income.