Stack Overflow

2019 Developer Survey

Technology Trends

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EXECUTIVE SUMMARY

The following slides summarize key findings from an analysis of data collected as part of the 2019 Stack Overflow Developer Survey and reveal insights regarding:

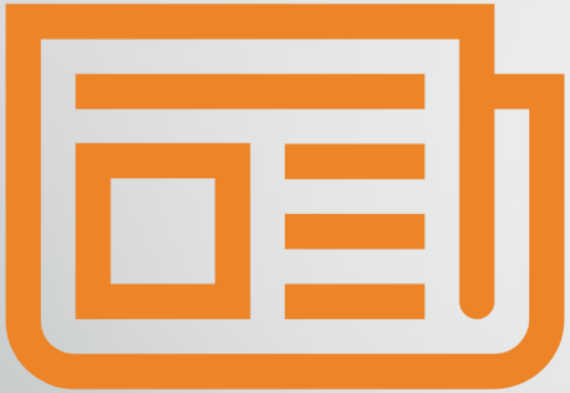
- Most popular languages, databases, platforms and webframes developers are currently using
- The languages, databases, platforms and webframes developers most want to learn
- Demographic trends among respondents by age, gender, country and education level

These trends have implications for current and aspiring developers, recruiters, educators, and policy makers.

INTRODUCTION

- This report analyzes data from the 2019 Stack Overflow Developer Survey to highlight current and future technology usage and trends among developers.
- The analysis identifies the most in demand skills as well as demographic skew among respondents.
- This information is helpful for students, educators, IT industry professionals, recruiters and policy makers who are making decisions regarding skills training and outreach.

METHODOLOGY



Data Source: 2019 Stack Overflow Developer Survey

https://insights.stackoverflow.com/survey/

A subset of the data (provided by IBM) was loaded and cleaned using SQL and Python's pandas library.

https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m1_survey_data.csv

Analysis and Visualization:

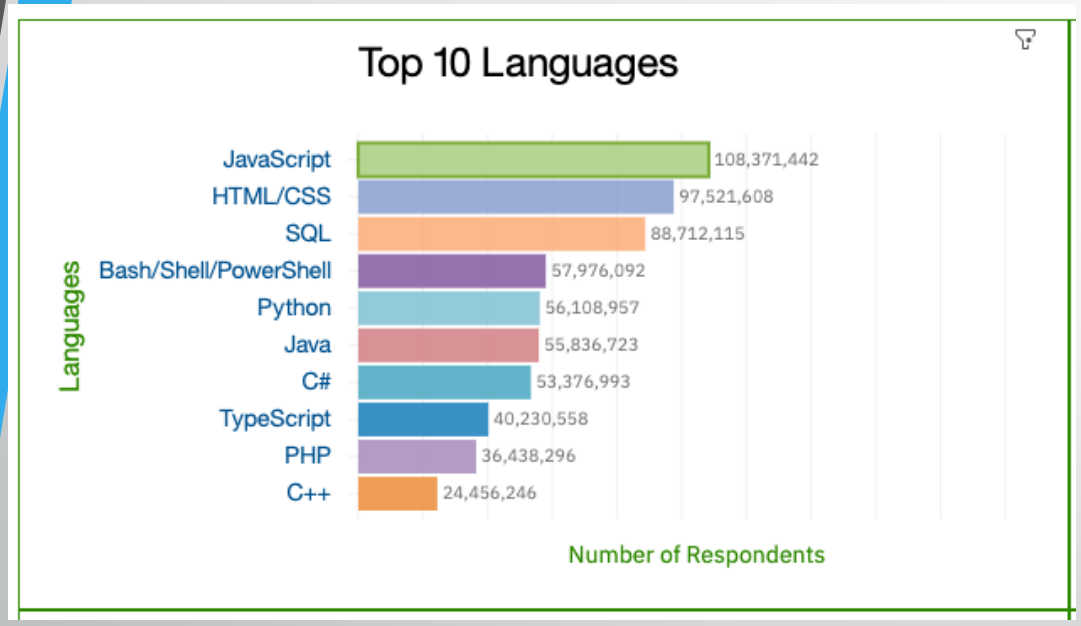
- The data was cleaned by removing duplicate values, imputing null values, and normalizing values.
- Exploratory data analysis was made using pandas and matplotlib in Python.
- Interactive Dashboard was prepared using Cognos Analytics.

RESULTS

The following graphs show some key trends in technology use among developers who responded to the survey, most importantly, a move towards open source, cross platform and multi-language compatible technologies with growing emphasis on unstructured data and web-based data collection.

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

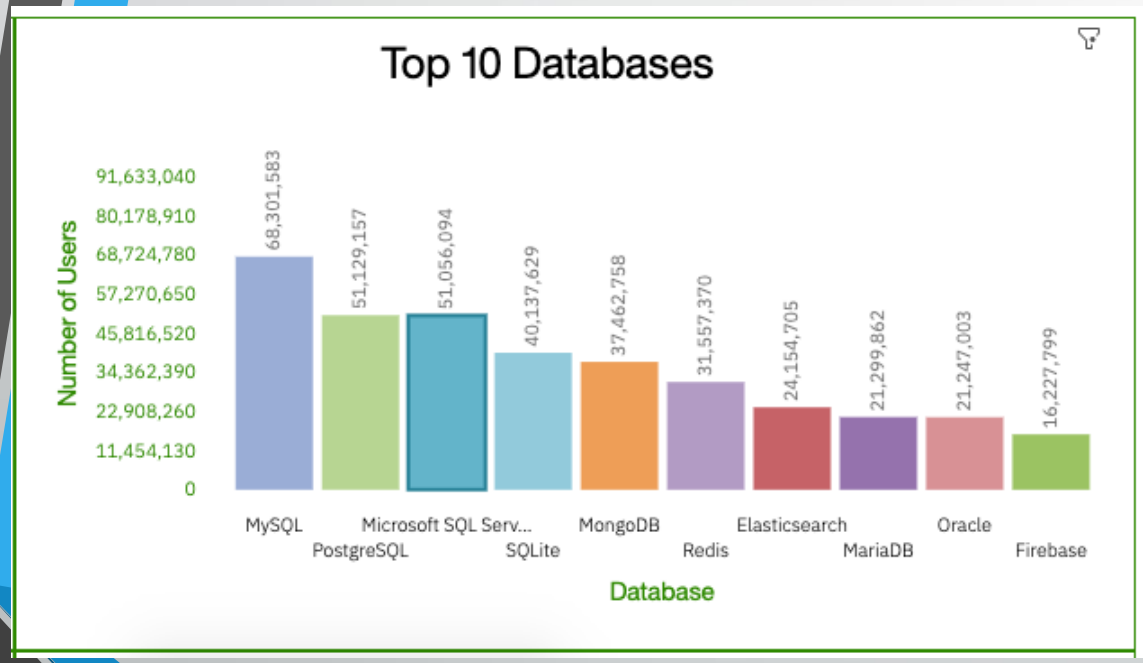
- Javascript is most used language and tops the list of what to learn next
- Python is a popular language that shows growing demand
- HTML and SQL are currently popular and also high on the list of what to learn next

Implications

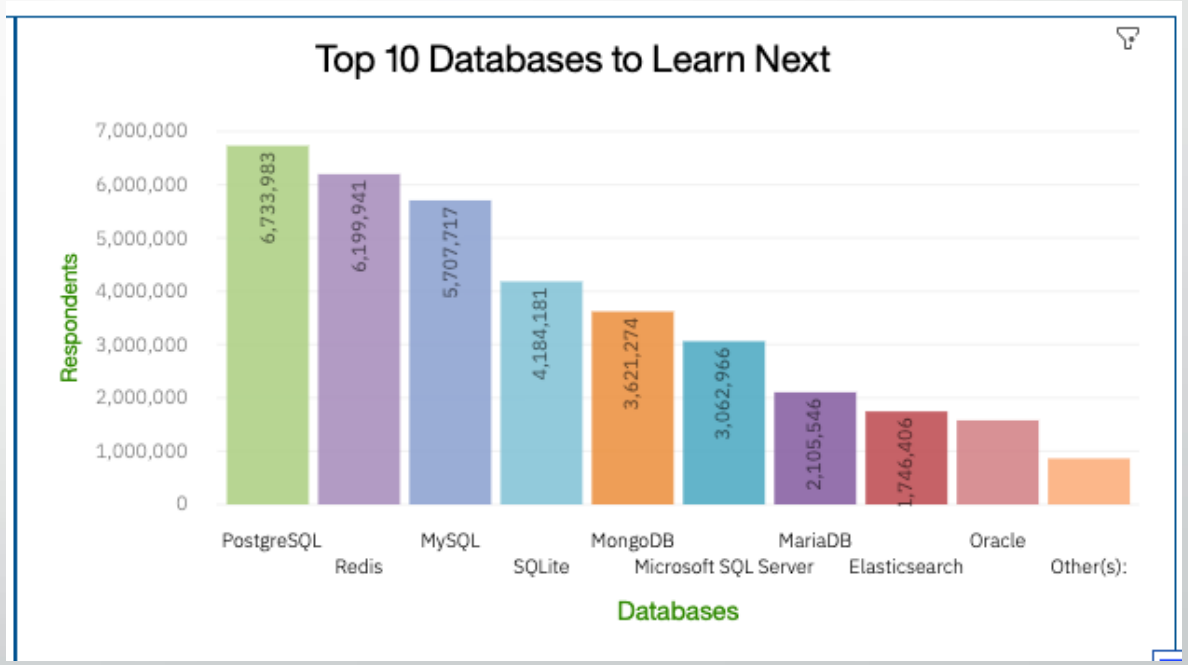
- Web applications are a primary focus among developers
- Flexible, open-source code that works across platforms is gaining in popularity
- Developers still need a solid foundation in relational databases but data collection from the web is growing

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL and PostgreSQL are the top SQL databases used
- MongoDB and Redis are the top two databases developers are interested in learning
- Developers are moving away from Microsoft Sequel Server

Implications

- The industry is moving toward databases compatible with multiple programming languages
- Less structured data collected from the web and cloud computing are changing database needs
- Industry professionals prefer open-source databases

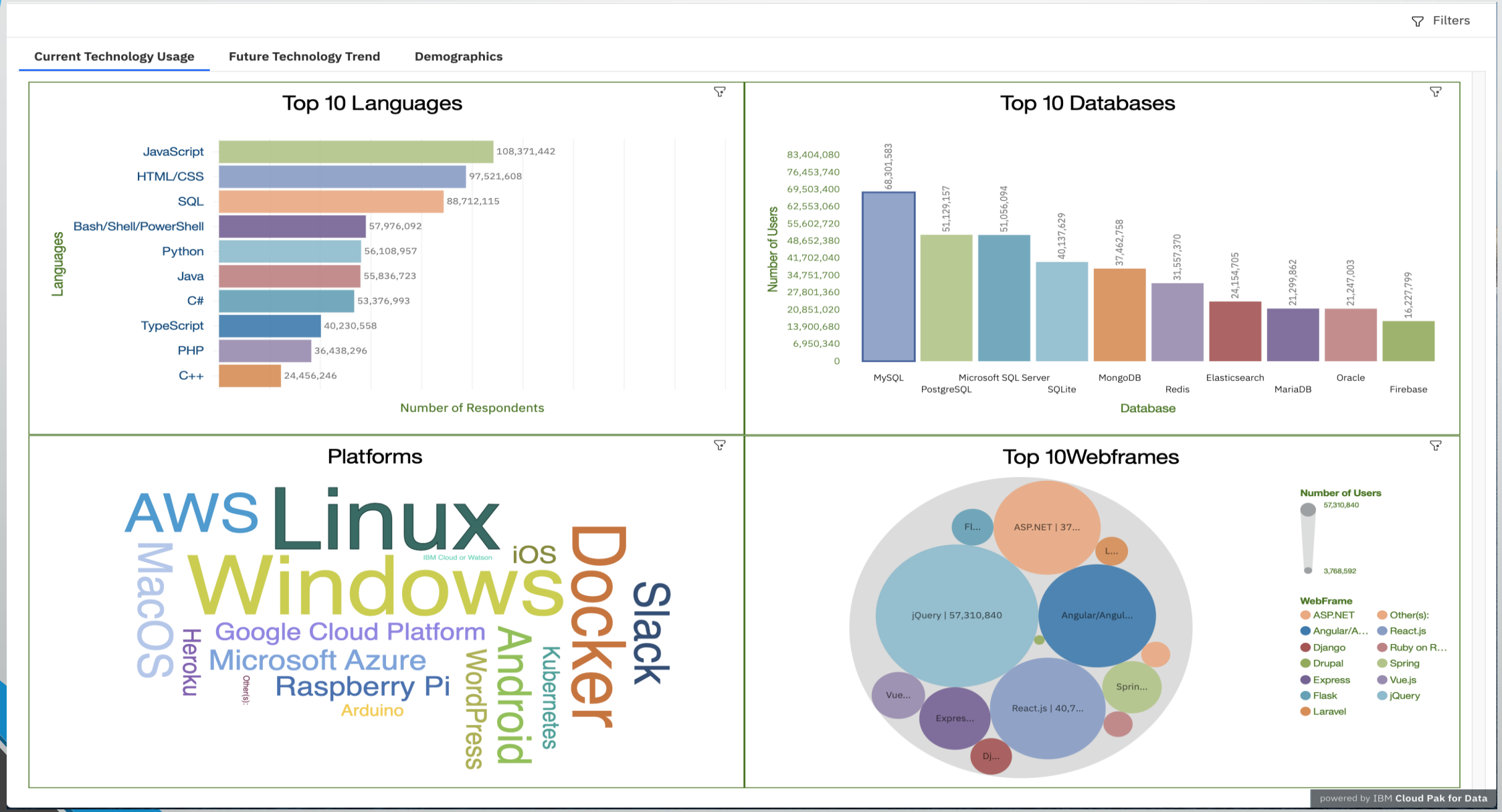
DASHBOARD

The following link contains the full, interactive Cognos dashboard summarizing current technology usage, future technology trends, and demographics of the survey respondents:

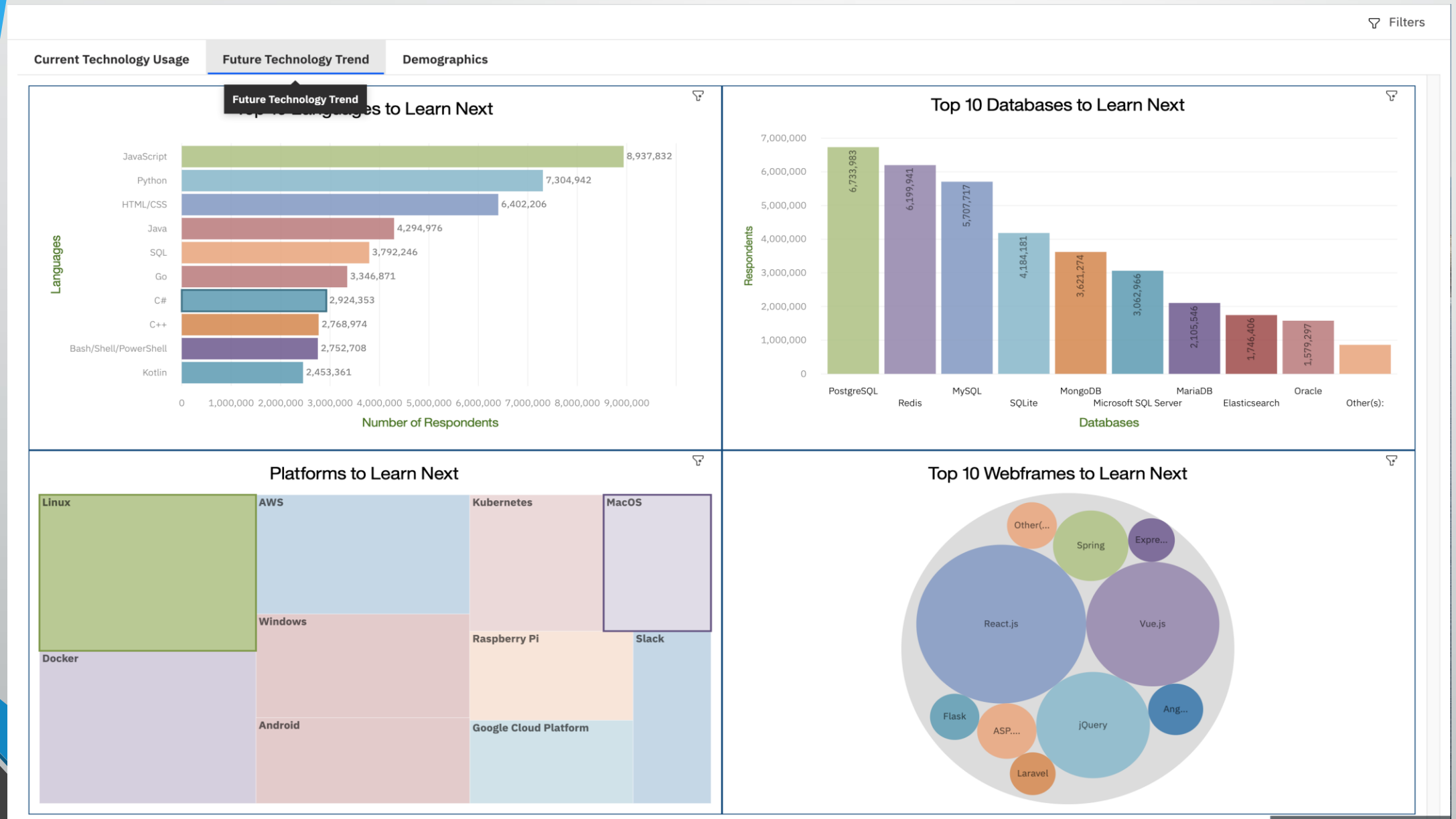
Click here to open Dashboard link

Screenshots included on the following slides.

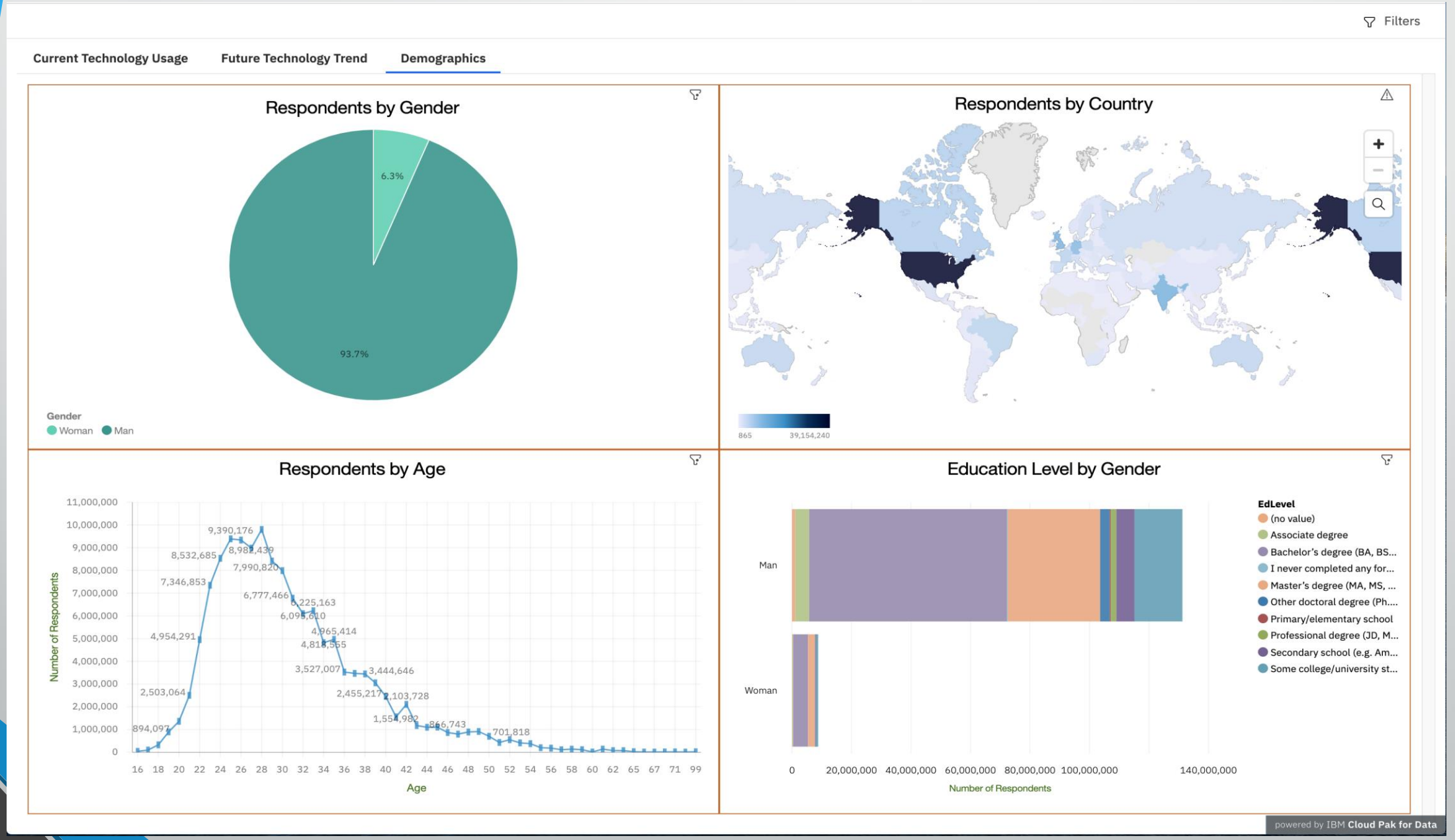
CURRENT TECHNOLOGY USAGE at time of survey



FUTURE TECHNOLOGY TRENDS



DEMOGRAPHICS



DISCUSSION

The information highlighted in the dashboard can help answer questions about:

- Which kinds of developer technologies are most in demand
- Which technologies prospective developers should study
- Which technologies educators should plan to teach
- Whether there are representation gaps such as gender imbalance in the development field

KEY FINDINGS & IMPLICATIONS

Findings

- Interest in Python is strong and increasing while Javascript, HTML and SQL stay popular
- SQL remains central to the field but databases like MongoDB and Redis are becoming more important to developers.
- Windows and Linux are the most in use platforms now, with Docker and AWS up and coming.
- Demographics: Women developers are vastly outnumbered by men.

Implications

- Training opportunities are needed for Python, Javascript, HTML and SQL
- Changes in data collection mean higher demand for knowledge of noSQL databases that can handle less structured web data and cloud computing
- Companies may want to invest in web based and cloud computing compatible platforms and look for employees that can use them
- Educators, employers and policy makers should focus on outreach and training opportunities to help minimize the gender gap.

CONCLUSION

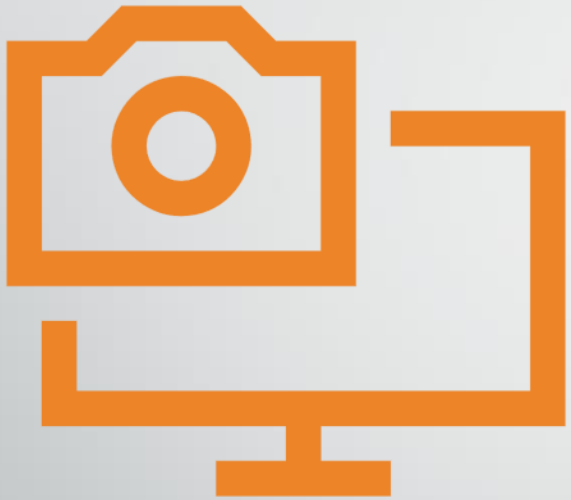
A subset of data collected from the 2019 Stack Overflow Developer Survey was analyzed to look for trends in technology usage.

The findings gave evidence of a move toward open source, cross platform and multi-language compatible technologies to be used with cloud computing and less structured data collected from the web in addition to relational database models.

The demographics analysis revealed an opportunity for training and recruitment to reduce the gender imbalance by bringing more women into the field

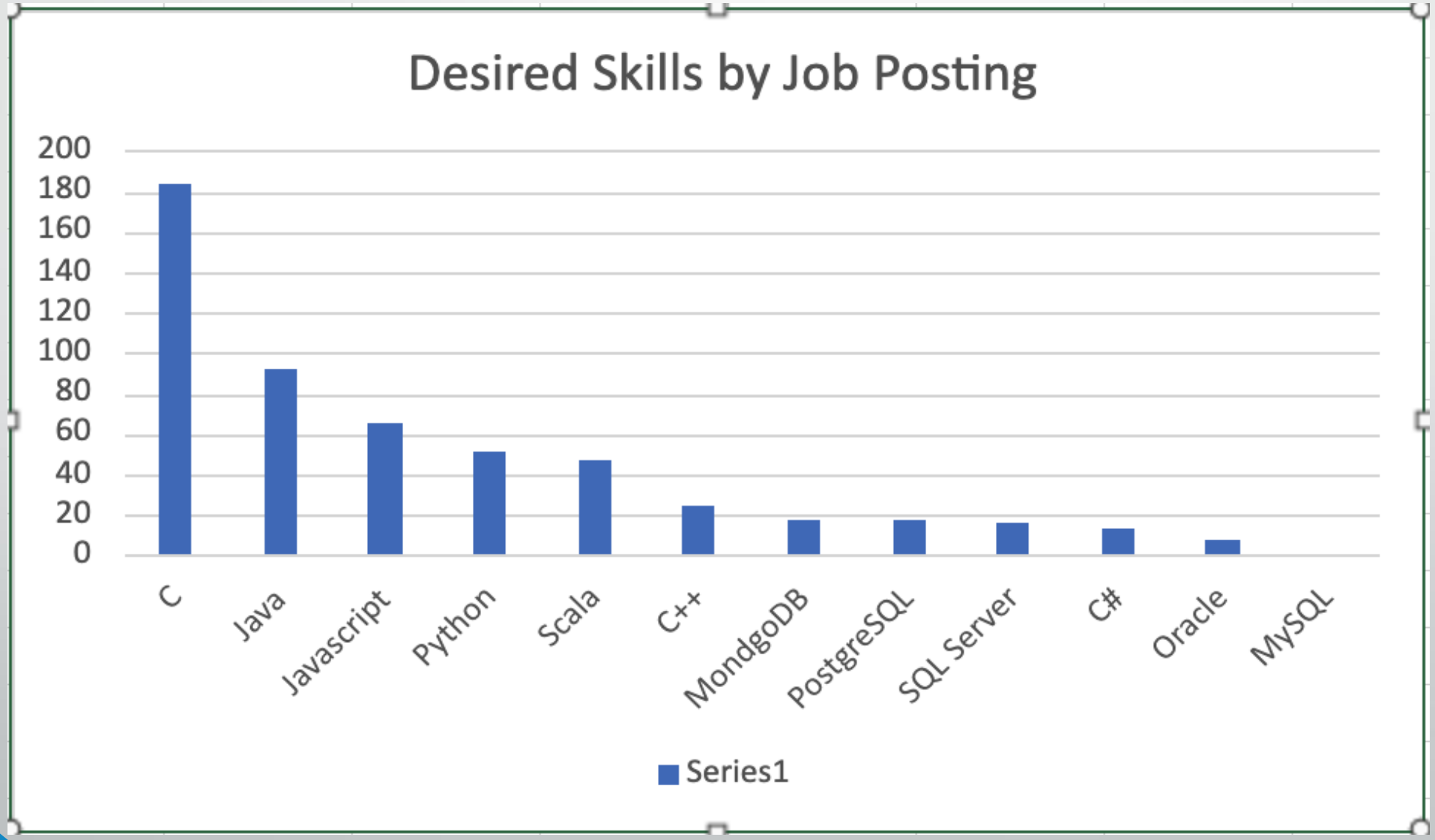
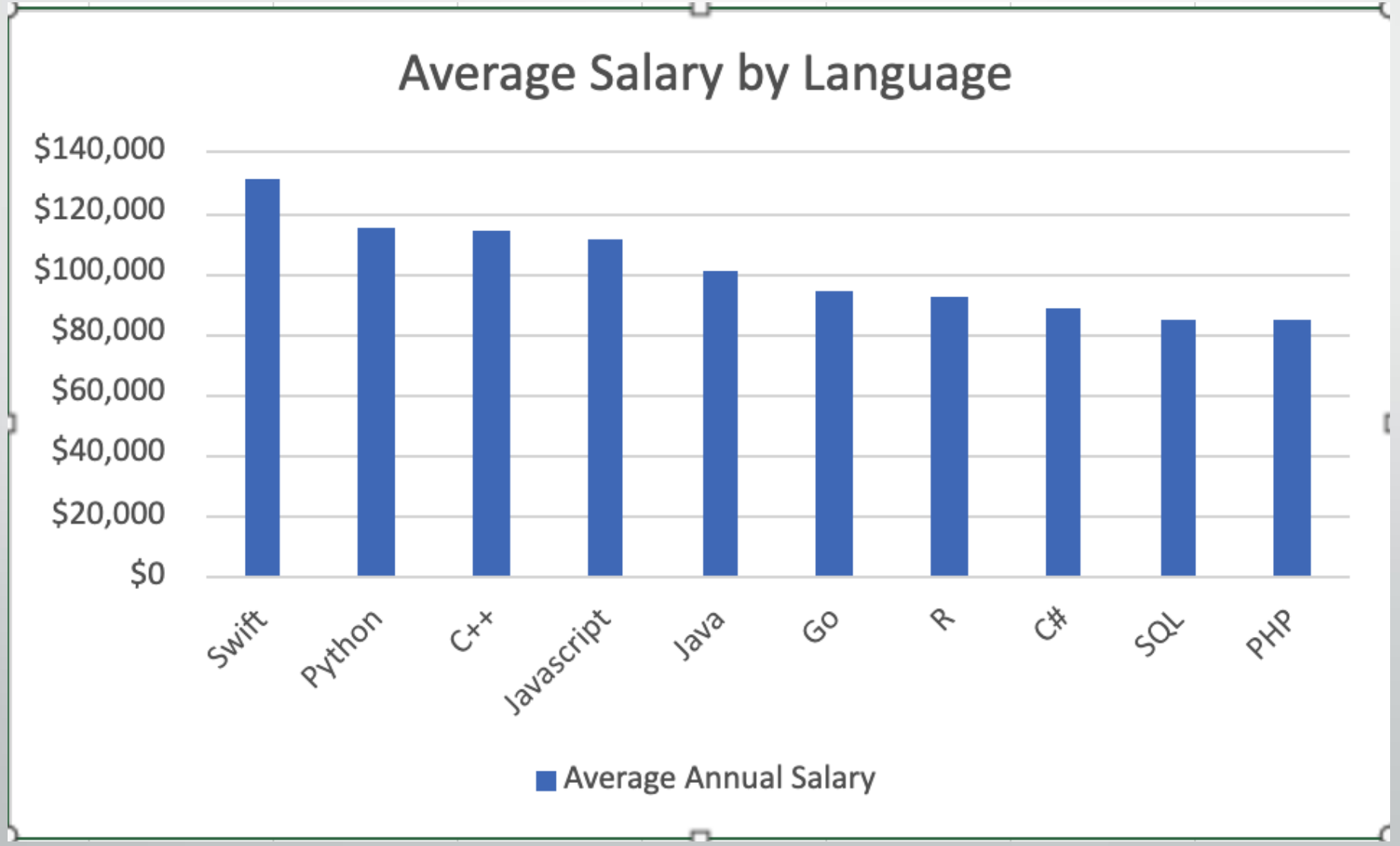
These insights are helpful for current and prospective developers, educators and companies determining which technologies to invest in.

APPENDIX



- Stack Overflow's most recent Developer Survey for 2021
- IBM Cognos Analytics Dashboard Creator

JOB POSTINGS



POPULAR LANGUAGES