Technology Trends Analysis Report

Vinh Nguyen

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Executive Summary

- Skills required in the fields of IT are constantly changing and evolving.
- This research yields insights regarding the following:
  - Most widely used languages, databases, and other technologies at the time of data collection.
  - Attitude to programming languages, databases, and Web frames in the future.
  - Demographics survey for Gender and Country differences.
- These findings are important to help aspiring data developers and for firms to make more accurate business decisions.

Introduction

- The main purpose of this analysis is to keep up with the changing tools used in the IT industry.
- This practice is necessary to identify and hire future employees and train current employees in these tools to keep them up to date.
- The required data is collected from various sources -
  - Job postings
  - Training portals
  - Surveys

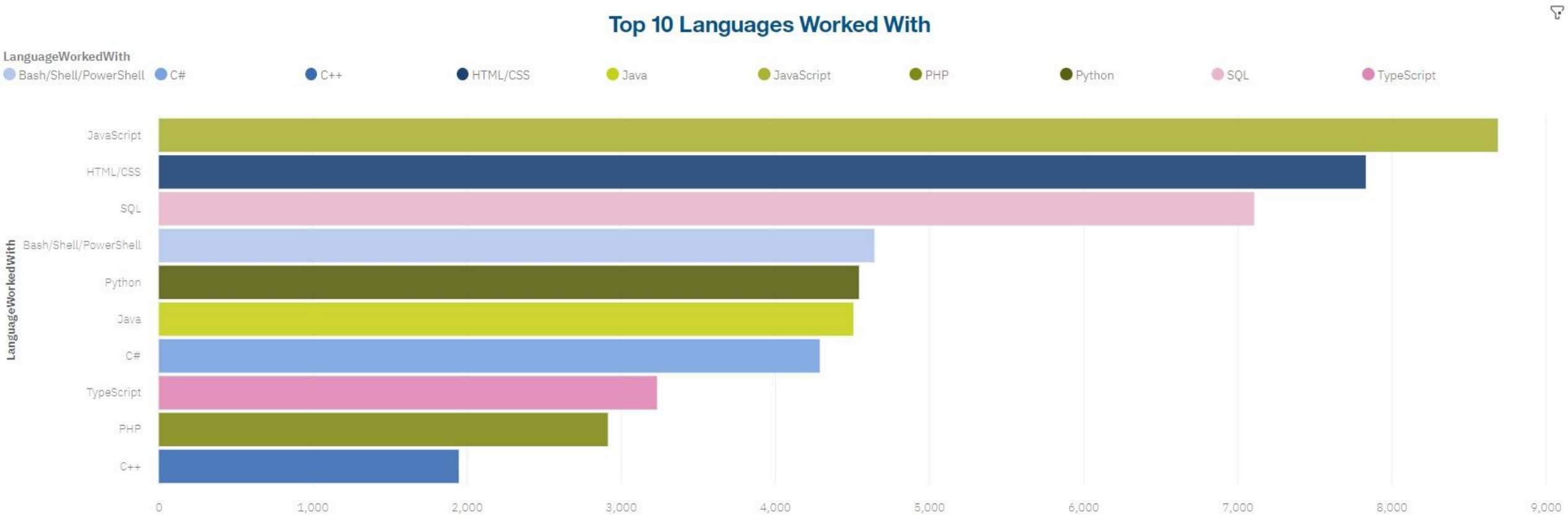
Data Sources

- The required data for analysis is collected from
  - GitHub jobs
  - Stack Overflow
  - The IBM website
- The information on the number of job postings for software tools was extracted by accessing GitHub Job APIs
- The information on the annual salaries of professionals working with software tools was accessed by web scrapping the IBM website.
- The required data set for this analysis comes from a survey conducted by Stack Overflow which they have open-sourced.

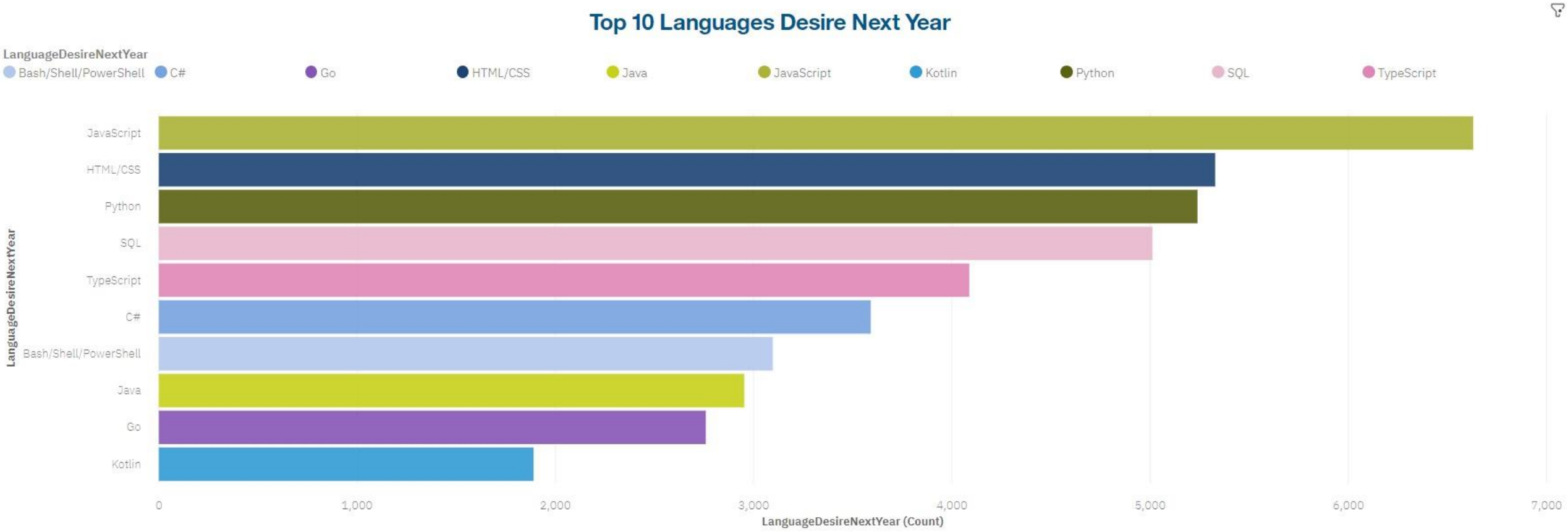
Methodology

- Once the data is collected, data wrangling is performed to -
  - Find missing values
  - Find duplicate values
  - Remove duplicates
  - Determine the missing values
  - Normalize the data
- After the data set is cleaned, an exploratory analysis is conducted to identify distribution of data, outliers in any fields and correlations between different fields.
- The data is visualized to view the distribution of data, relationship between different fields, comparison and composition of data.
- Finally dashboards are created to identify trends.

Programming language trends this year



Programming language trends next year



Programming language trends – Findings & implications

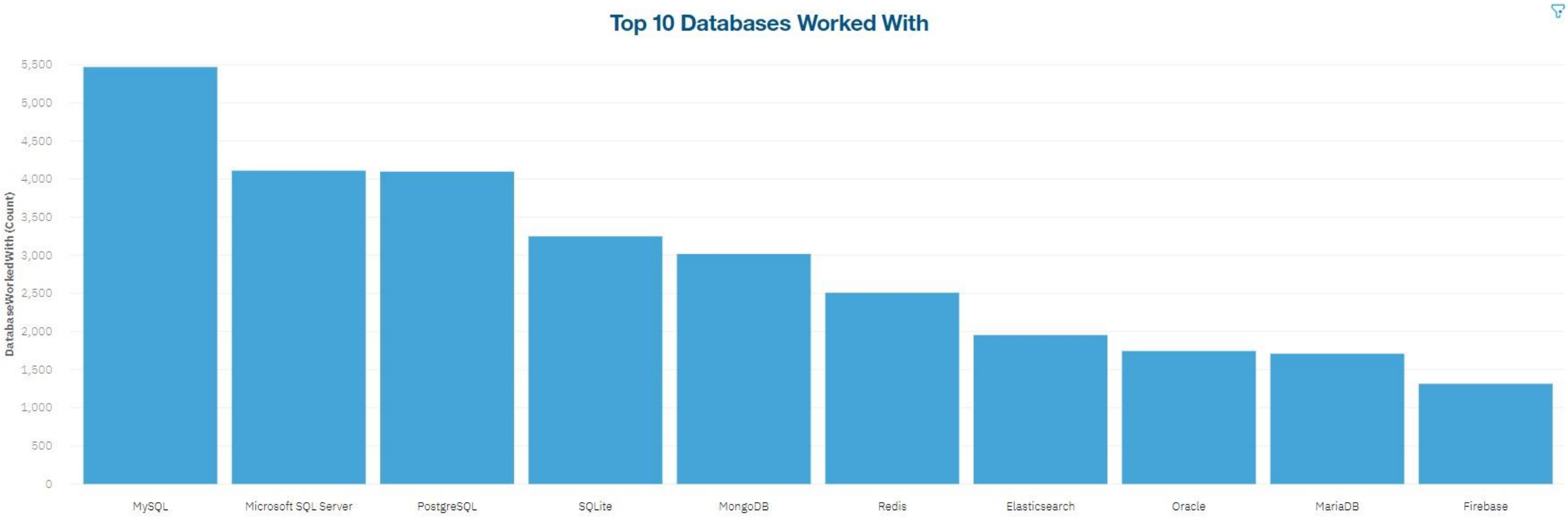
Findings

- JavaScript and HTML/CSS are the most popular programming languages in 2019 and likely to remain so in the next year.
- Python will become more popular in the upcoming year.
- Bash/Shell/PowerShell and Typescript will likely lose interest in the future.

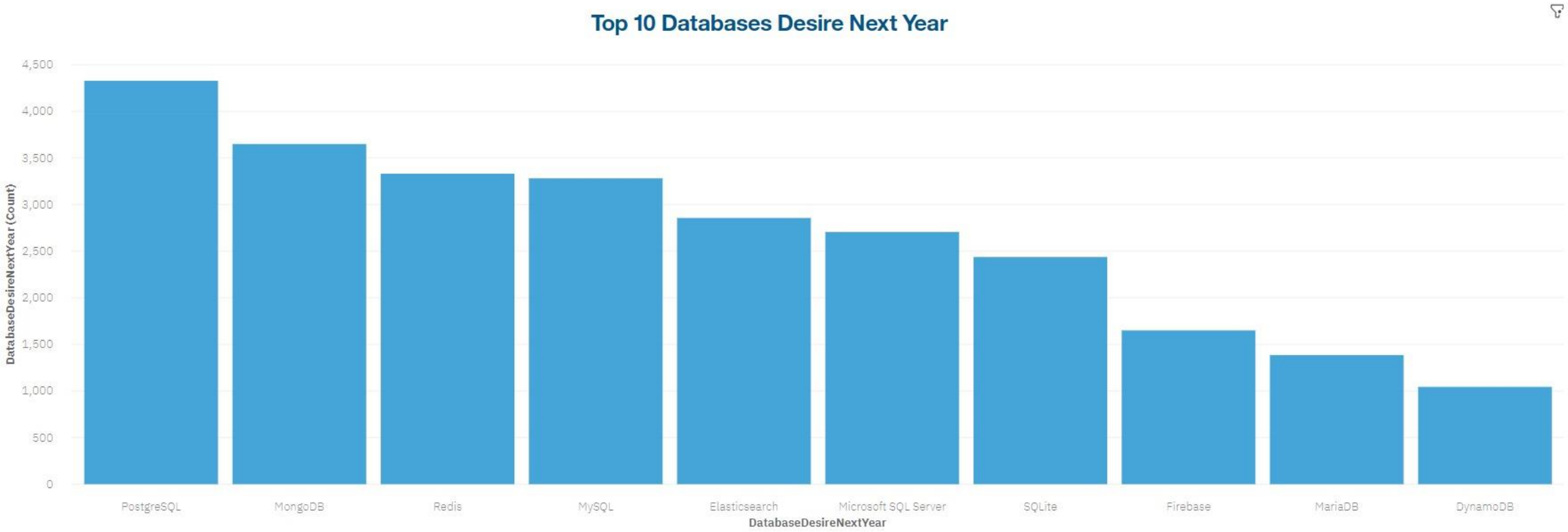
Implications

- Hired more JavaScript and HTML/CSS skilled employees as web development remain in demand.
- Hiring and training professionals in python can help the company keep up with market trends.
- SQL remain in demand for Big data storage and queries.

Database trends this year



Database trends next year



Database trends – Findings & implications

Findings

- MySQL is the most widely used database
- Increasing number of professionals want to work with PostgreSQL and MongoDB

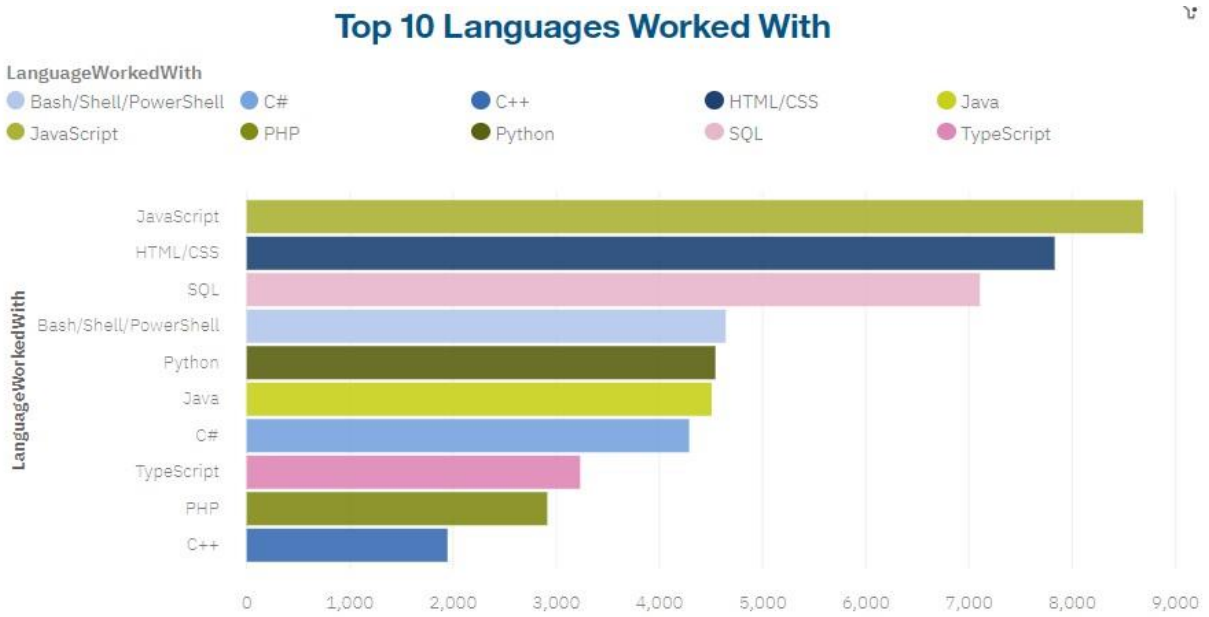
Implications

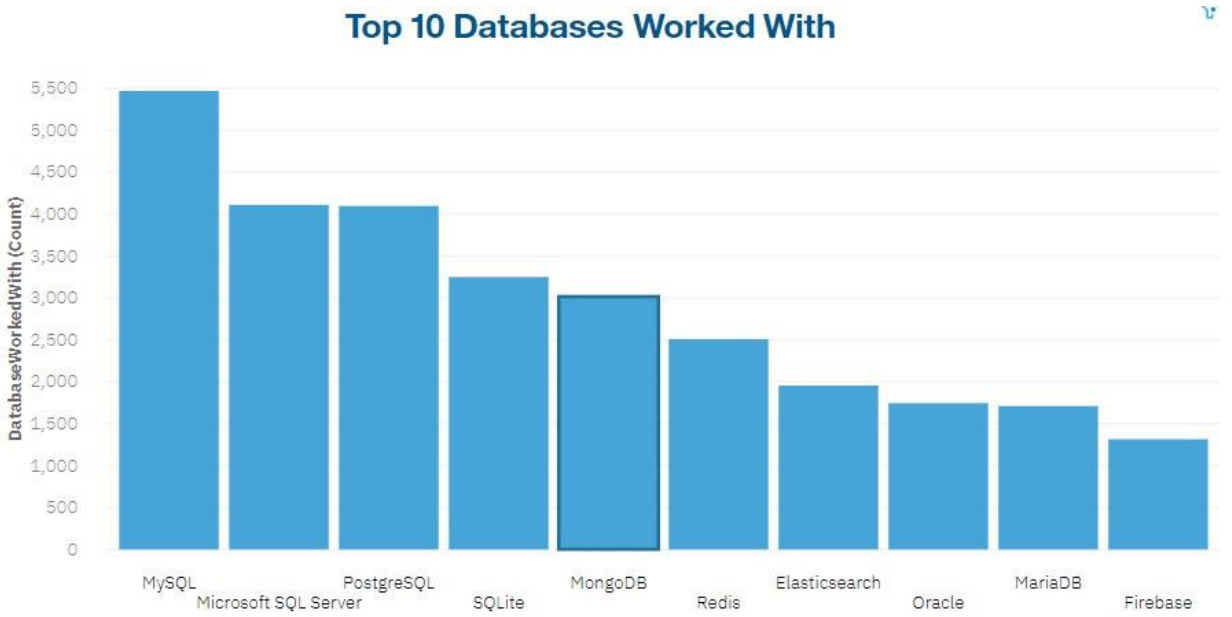
- Hiring and training employees in MySQL will remain as it is, since most employees already work with MySQL.
- Hiring and training employees in PostgreSQL and MongoDB must be a priority henceforth.

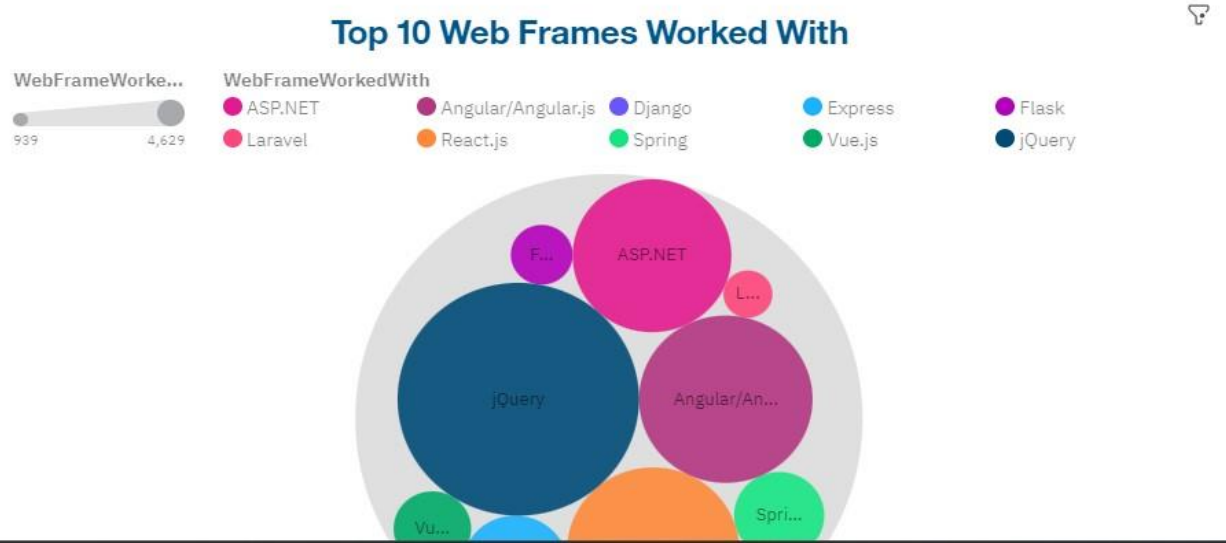
Dashboard

- The Cognos Dashboard summarizes the whole survey data into three tabs:
  1. Technology Usage Trend
  2. Future Technology Demand
  3. Demographics
- Cognos Dashboard Link

Dashboard – Current technology usage

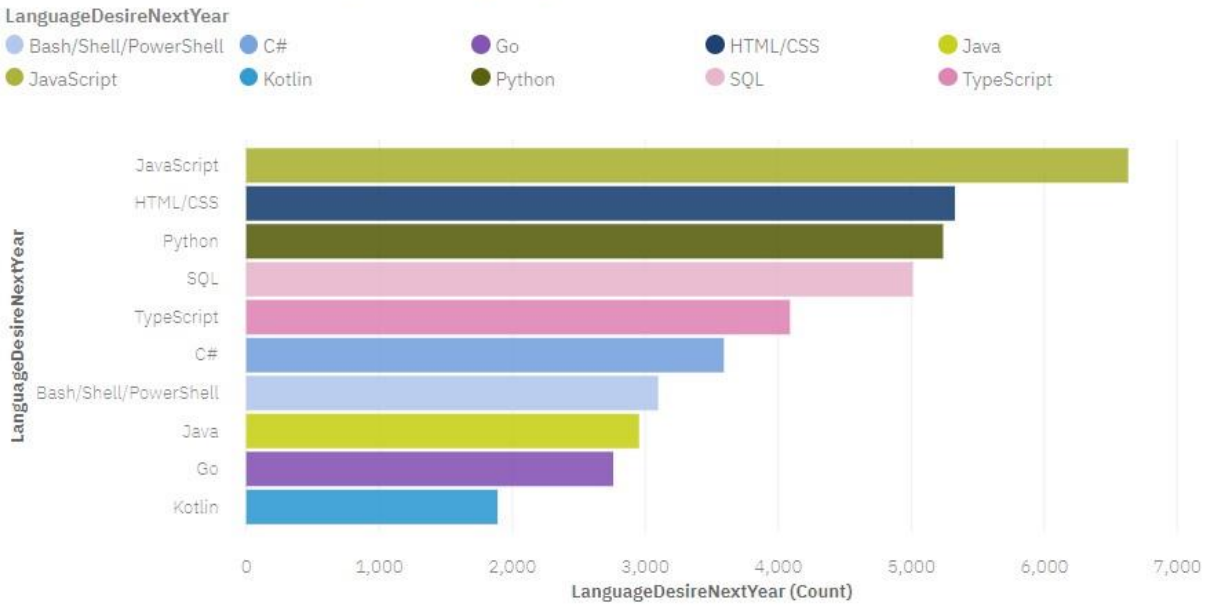




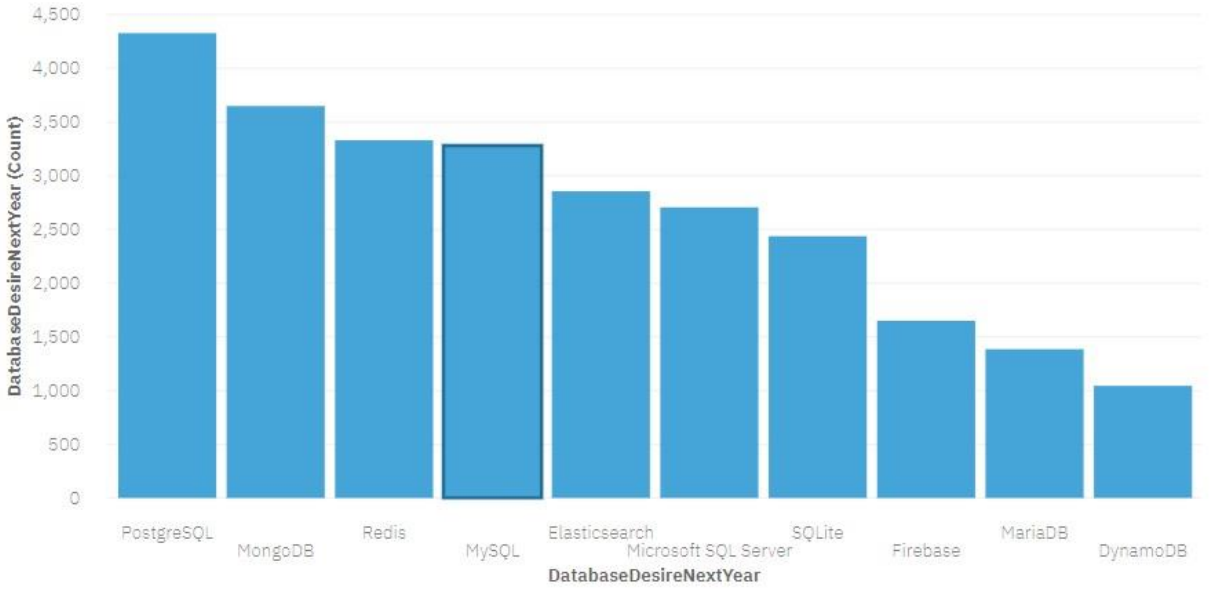


Dashboard – Future technology trend

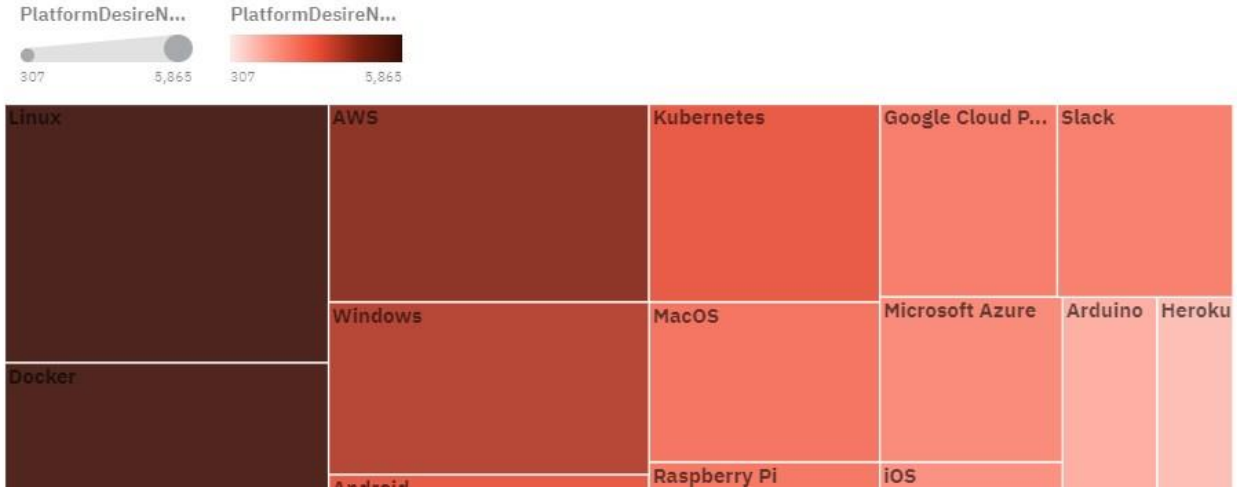
Top 10 Languages Desire Next Year



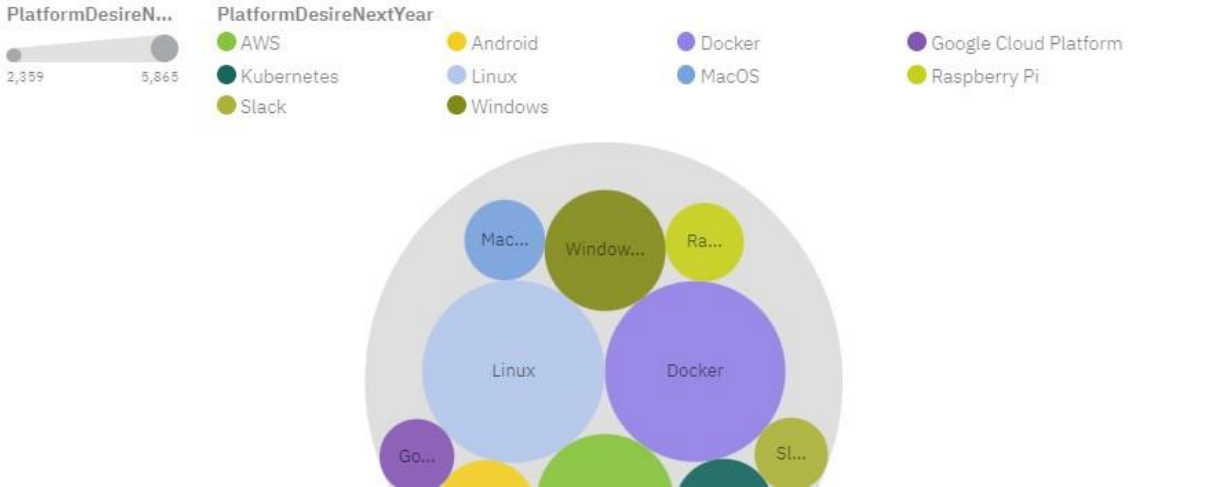
Top 10 Databases Desire Next Year



Platform Desire Next Year

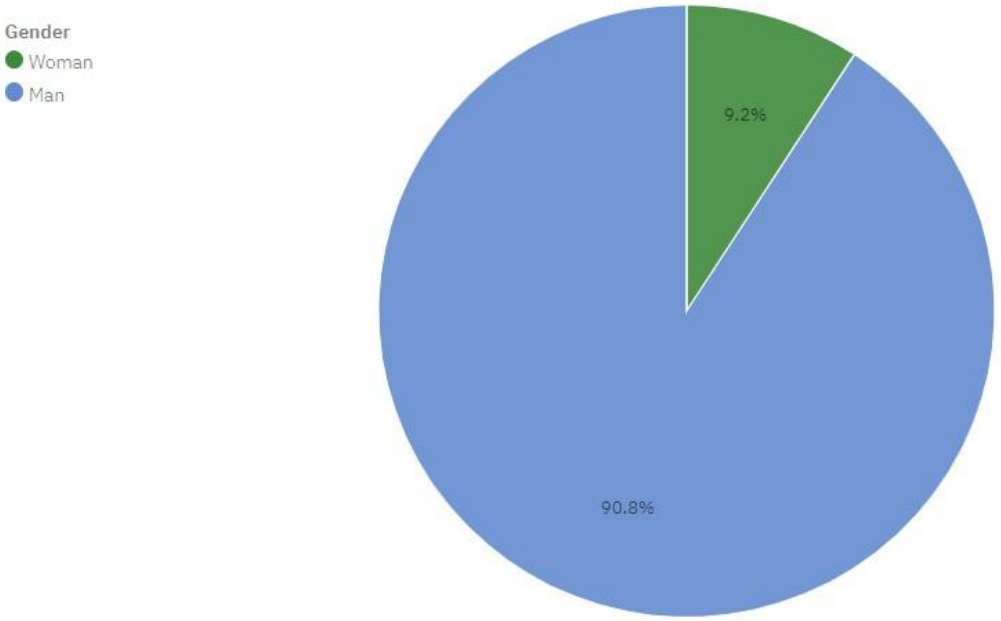


Top 10 Web Frames Desire Next Year

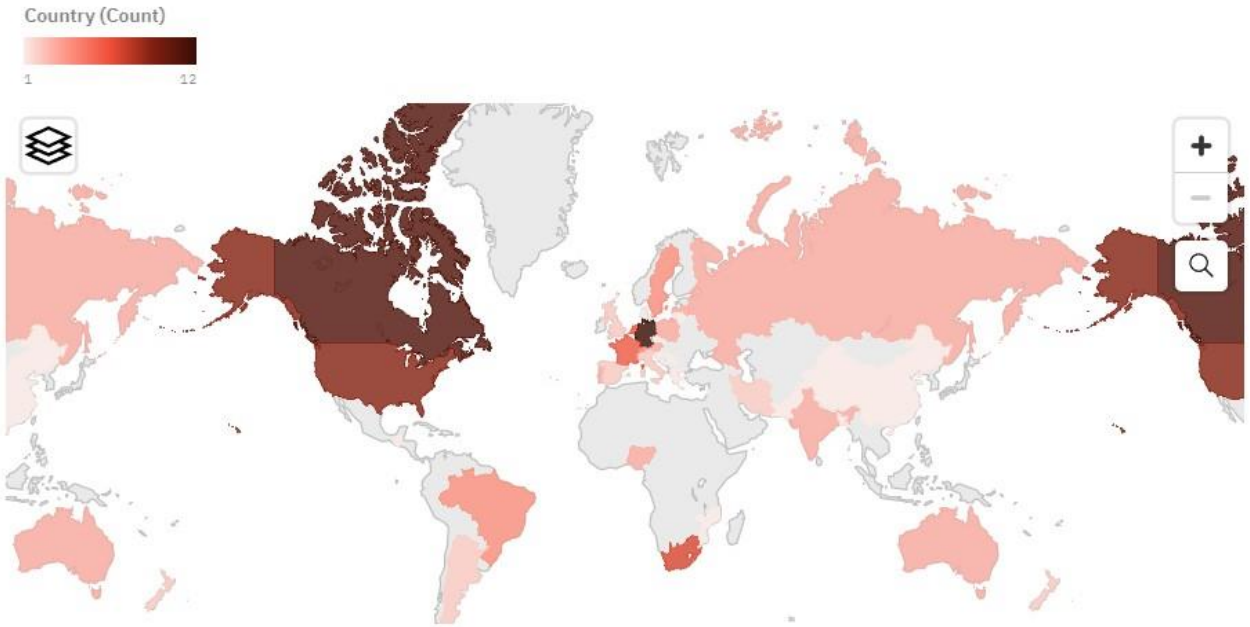


Dashboard – Demographics

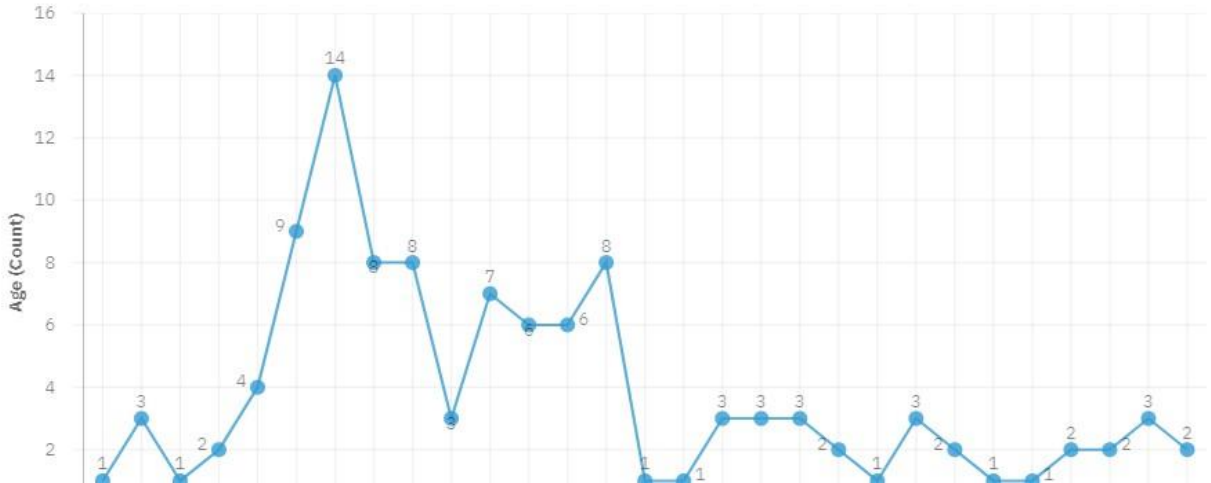
Respondent classified by Gender



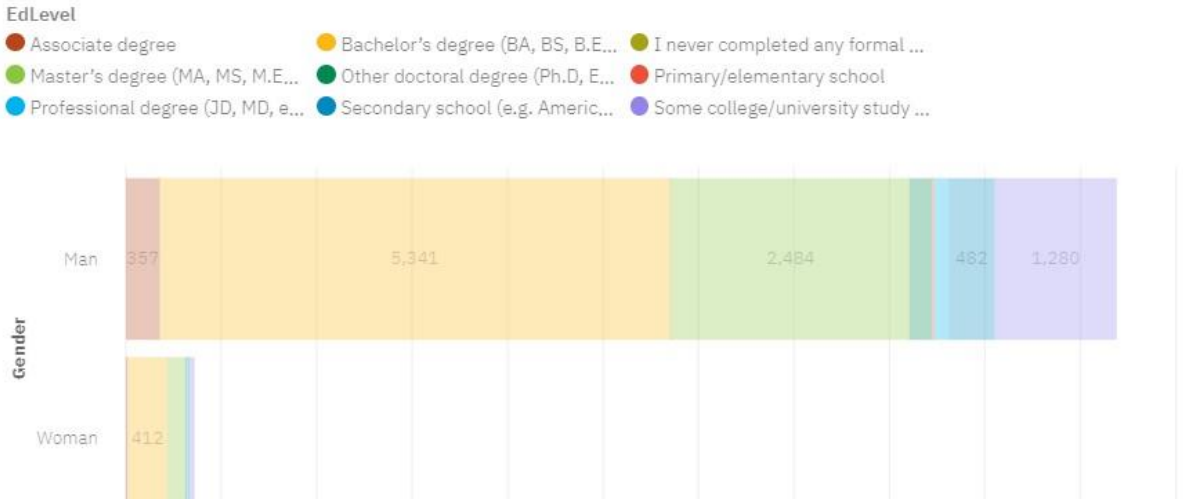
Respondent Count for Countries



Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level



Discussion

The findings yield insight into the following questions:

- What type of technologies and programming languages are top in demand and in upcoming year?
- What type of databases are becoming more popular, relational or object-oriented database?
- What is the developer demographics look like? Is there any gender discrimination

Overall findings and implications

Findings

- JavaScript, HTML/CSS and MySQL remain the most in demand tools and so in upcoming year.
- Python is gaining more interest in the future.
- My SQL remains the more in demand database at the time of survey and likely to remain so in the upcoming year.
- NoSQL databases like MongoDB gain more interests in the upcoming year over the other databases.
- A severe higher gender representation gap is seen in the demographics, in which men are slightly dominant over women.

Implications

- Current developers are picking up Typescript in addition to JavaScript and HTML/CSS, which is making web development high in demand.
- With the growing trend in AI and web development, data experts should continue to enhance SQL with the NoSQL database programs.
- Businesses required to adopt the changes according to the development and technology's usage demand.
- Policy makers and educational sectors should act together to minimize the gender representation gap for the betterment of employment.

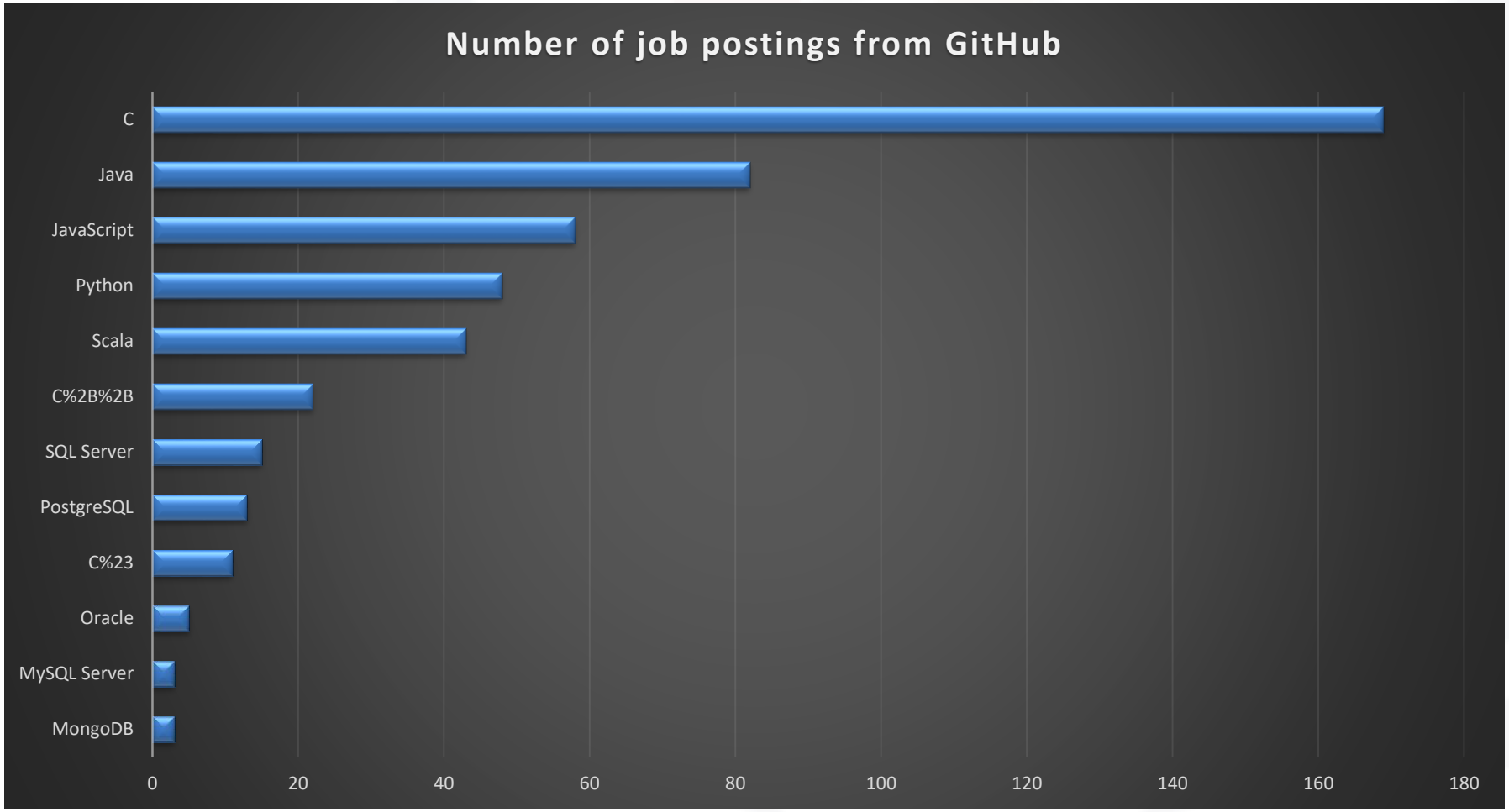
Conclusion

- All in all the analysis indicates the following tools to be the most in demand software applications –
  - Programming languages -
    - JavaScript
    - HTML/CSS
    - Python
  - Databases -
    - PostgreSQL
    - MongoDB
    - MySQL
  - Software Platforms -
    - Windows
    - Linux
    - Docker
  - Web Frameworks -
    1. JQuery
    2. React
    3. AngularJS

Appendix

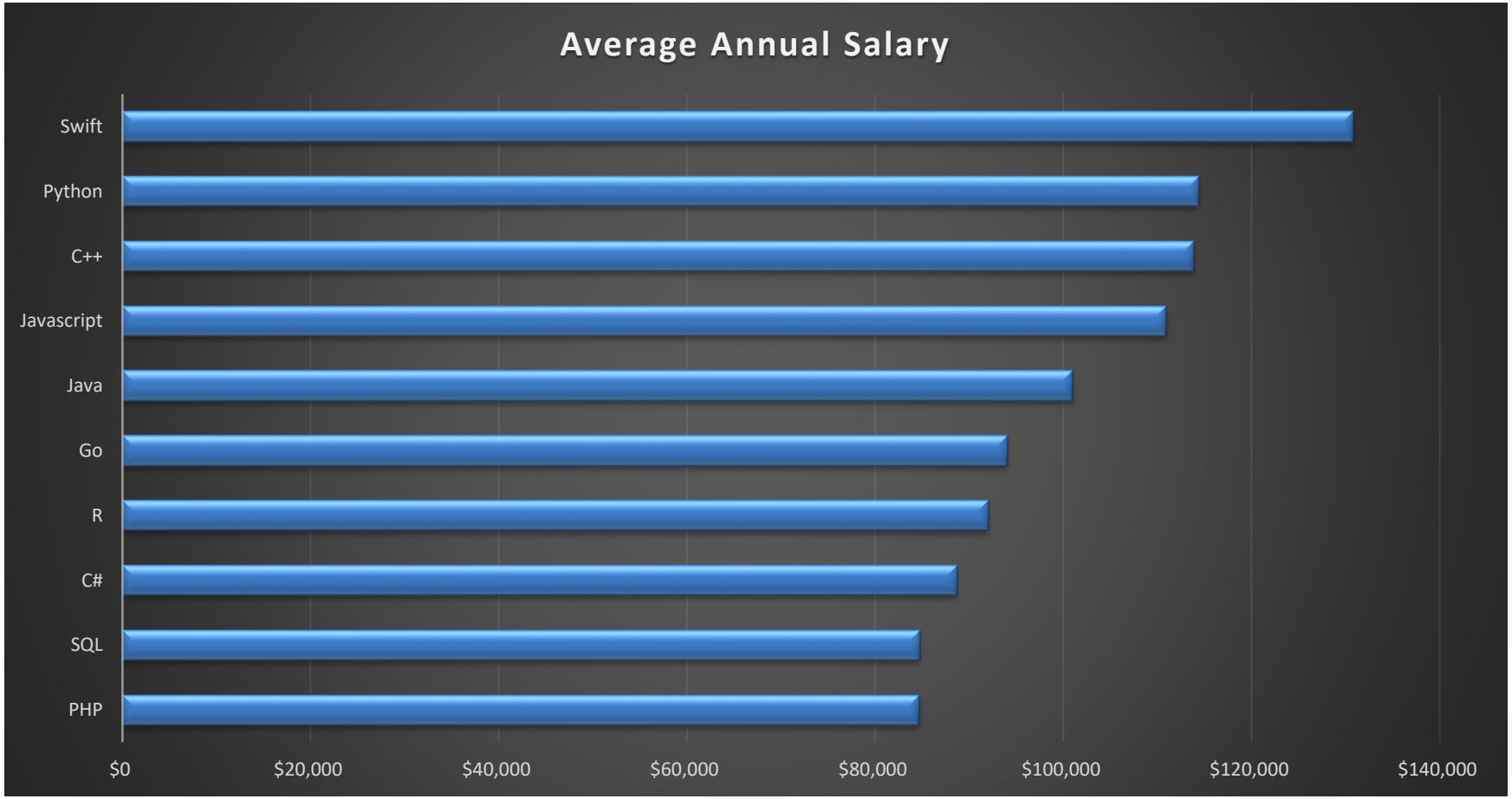
- Some interesting, worth-nothing observations from the GitHub job postings and the popular languages dataset.

GitHub job postings



- GitHub job postings data has something to add
- The number of job postings for C and Java are the highest, although C wasn't in the top 5 programming languages in the analysis.

Popular programming languages



- From the popular programming languages data, we see that professionals who work with Swift, python and C++ are the highest paid
- This piece of information is interesting as Swift and C++ weren't in the top 5 programming languages in the conducted analysis.