



# Software Language Trends- Retrospect and Prospect

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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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- Objective
  - Determine Top Programming Languages in Demand
  - Distinguish Top Database Skills in Demand
  - Identify Most Popular IDEs
- Data Source
  - Stack Overflow Online Survey
  - GitHub Job API
- Results
  - Most popular language and database skills are JavaScript and MySQL
  - JavaScript and PostgreSQL are the most sought-after skills by programmers
  - Windows and Linux remain the most common OS adopted

# INTRODUCTION

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- Coding skills can come in handy in a broad range of industries and are thus in high demand [1]
- Stack Overflow has been surveying developers annually since 2011 to learn what industry professionals are using and what they want to learn
- In this study, a subset of the 2019 survey (11,398 data entries) is analyzed to decipher trends on technology usage and draw insights for future action
- Target Audience: human resource professionals, developers (current and aspiring), educators, policy makers

# METHODOLOGY

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- Data Source:
  - Job postings on Github
  - Stack Overflow Annual Survey 2019
- Web Scraping
  - Gather job postings on Github to explore industry demand for respective languages
- Data Wrangling
  - Data is screened for duplicates and missing values using python Pandas library
  - Duplicates are dropped while missing values (work location) are imputed based on the mode
- Exploratory Data Analysis and Visualization
  - Conduct EDA and data visualization using python Seaborn and IBM Cognos

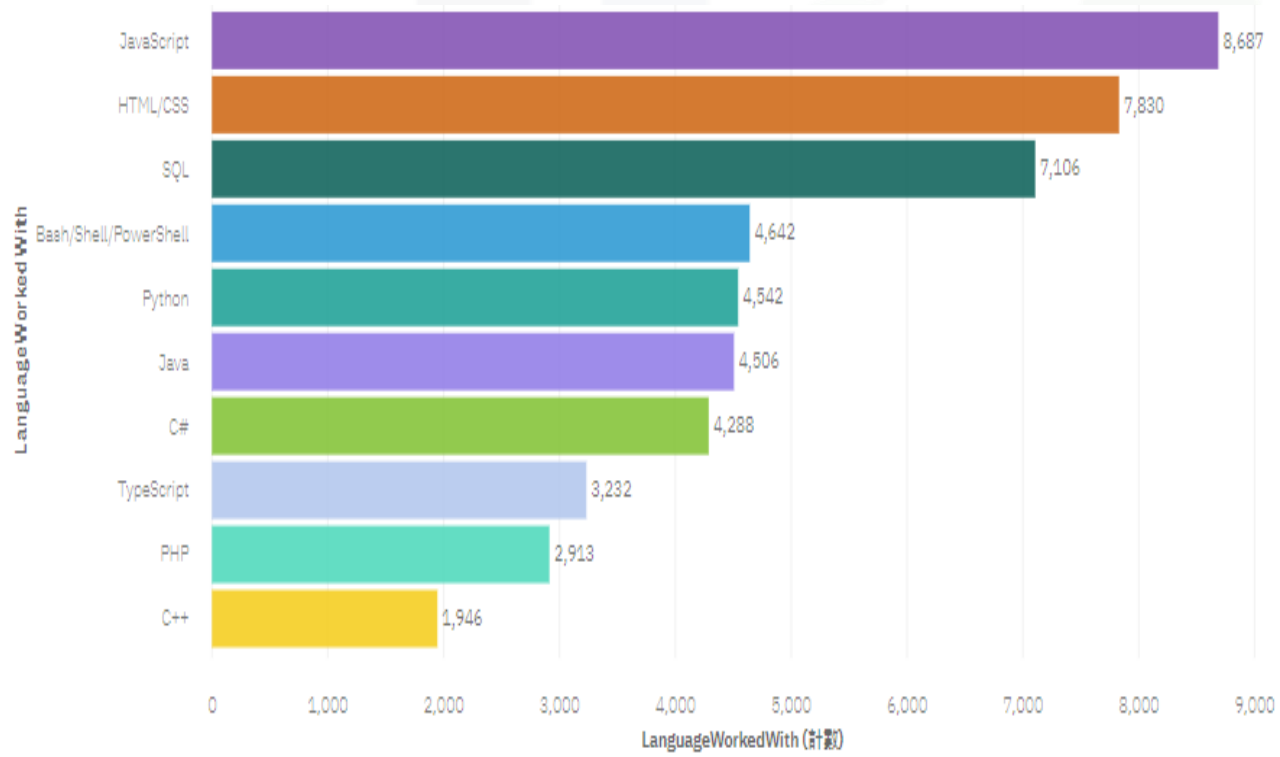
# RESULTS

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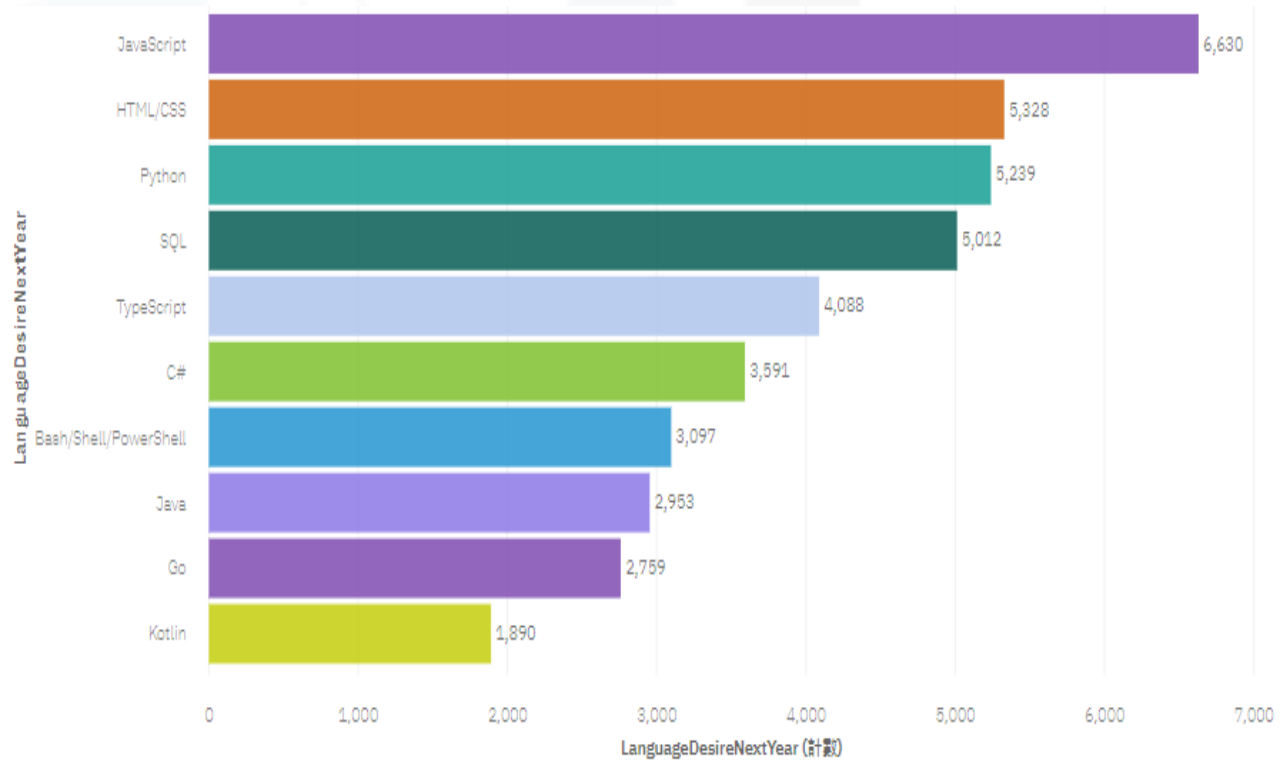


# TOP 10 PROGRAMMING LANGUAGES

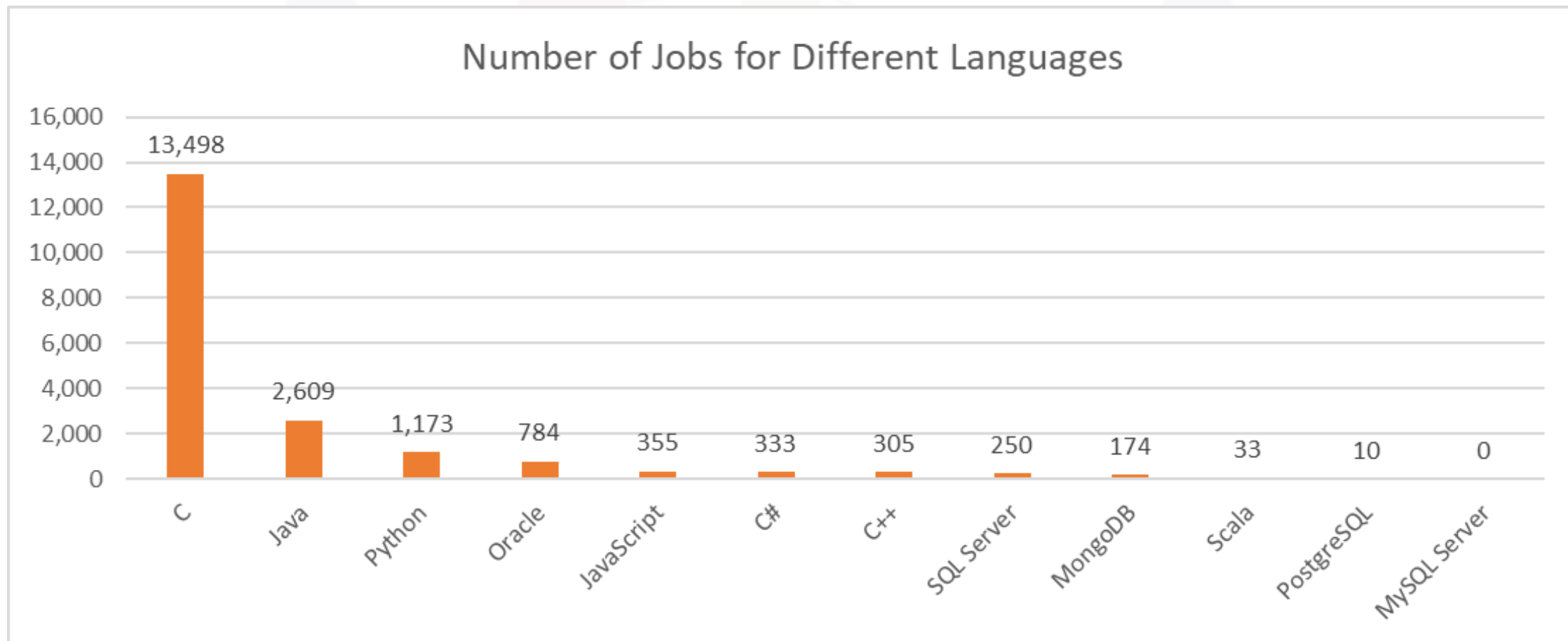
Year 2019



Year 2020



# JOB POSTINGS – By Language





# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

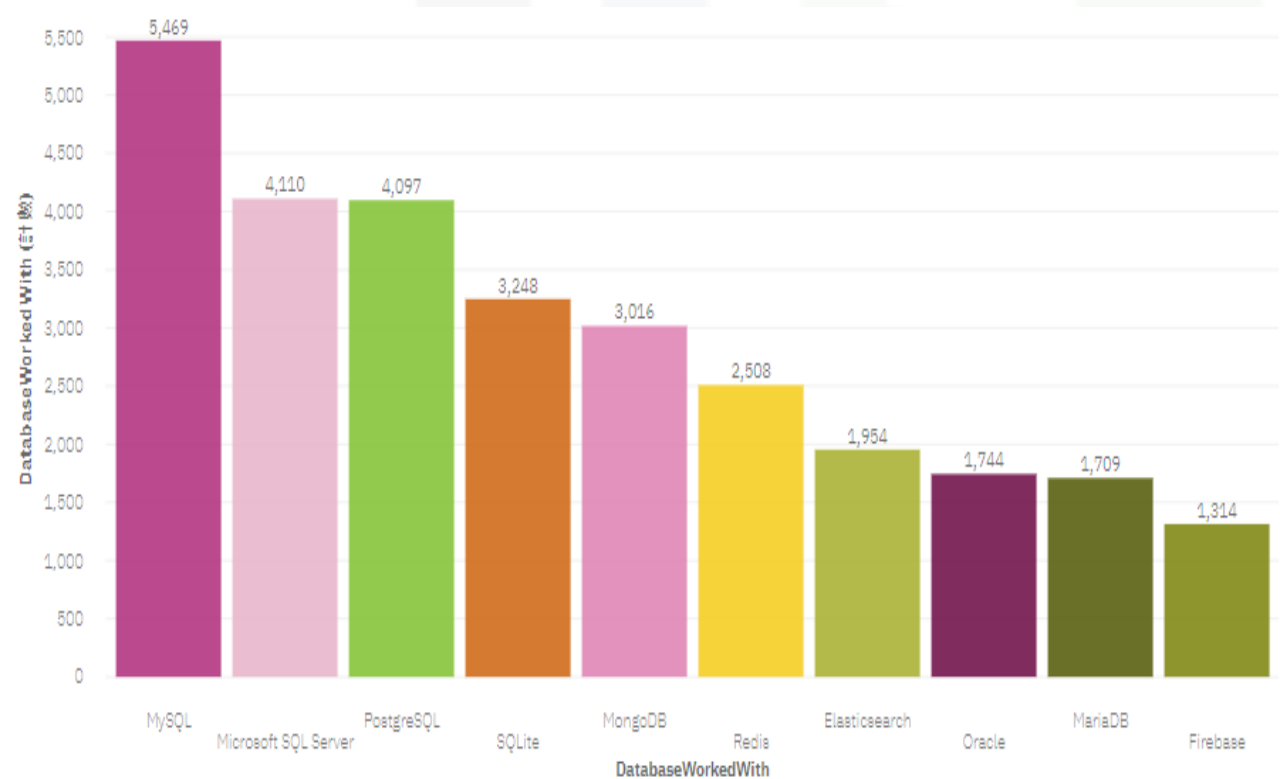
- Many jobs requiring C language exists, but relatively few programmers have the skill
- Languages like JavaScript and HTML/CSS are the most popular and highly sought-after
- Both Python and SQL are popular and increasingly getting attention

## Implications

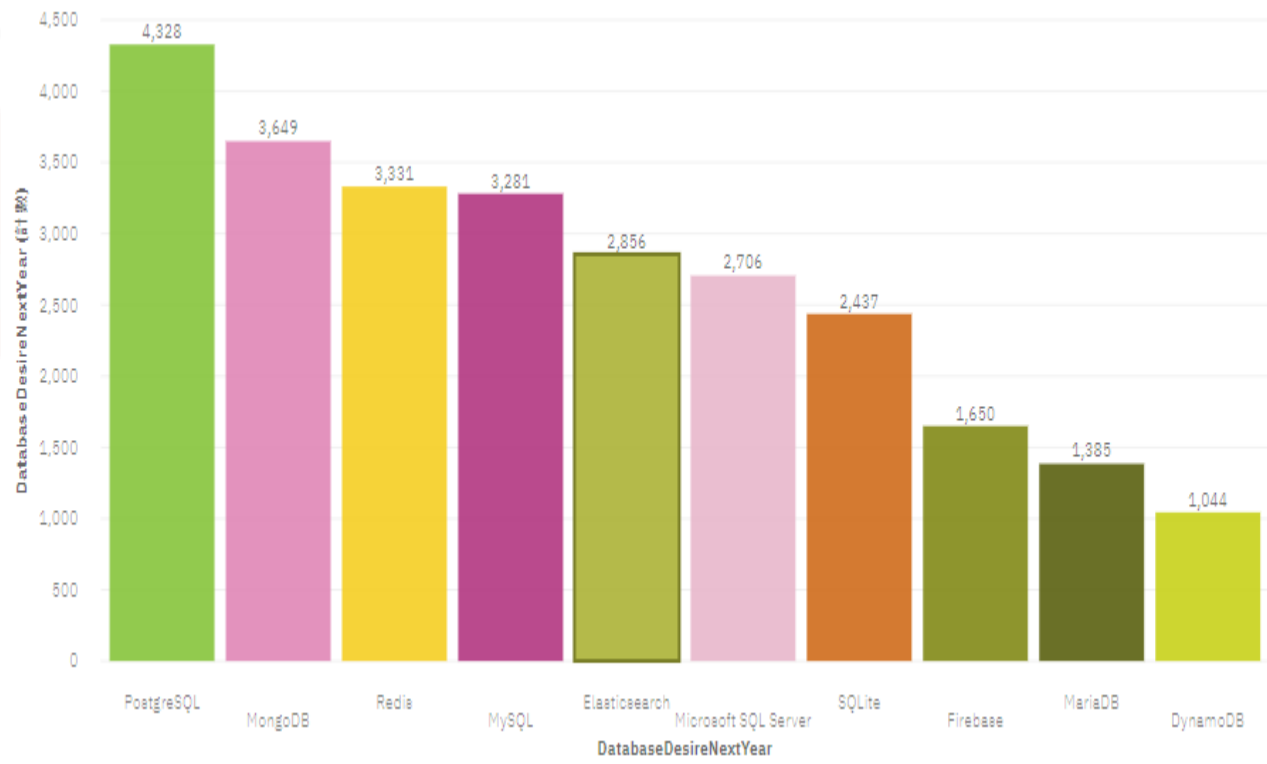
- Public/private job training sessions can be provided to bridge the gap; firms can also provide on-job training
- The demand for web-application related job roles is strong and entry into this field is not overly difficult
- Decision making is becoming data driven, creating the need for free but handy analytics tools

# TOP 10 DATABASES

Year 2019



Year 2020



# DATABASE TRENDS- FINDINGS & IMPLICATIONS

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## Findings

- MySQL ranks 1<sup>st</sup> in 2019 but dropped to 4<sup>th</sup> place in 2020
- PostgreSQL and Mongo DB is highly popular and gaining more users
- Microsoft SQL dropped from 2<sup>nd</sup> place in 2019 to 6<sup>th</sup> place in 2020

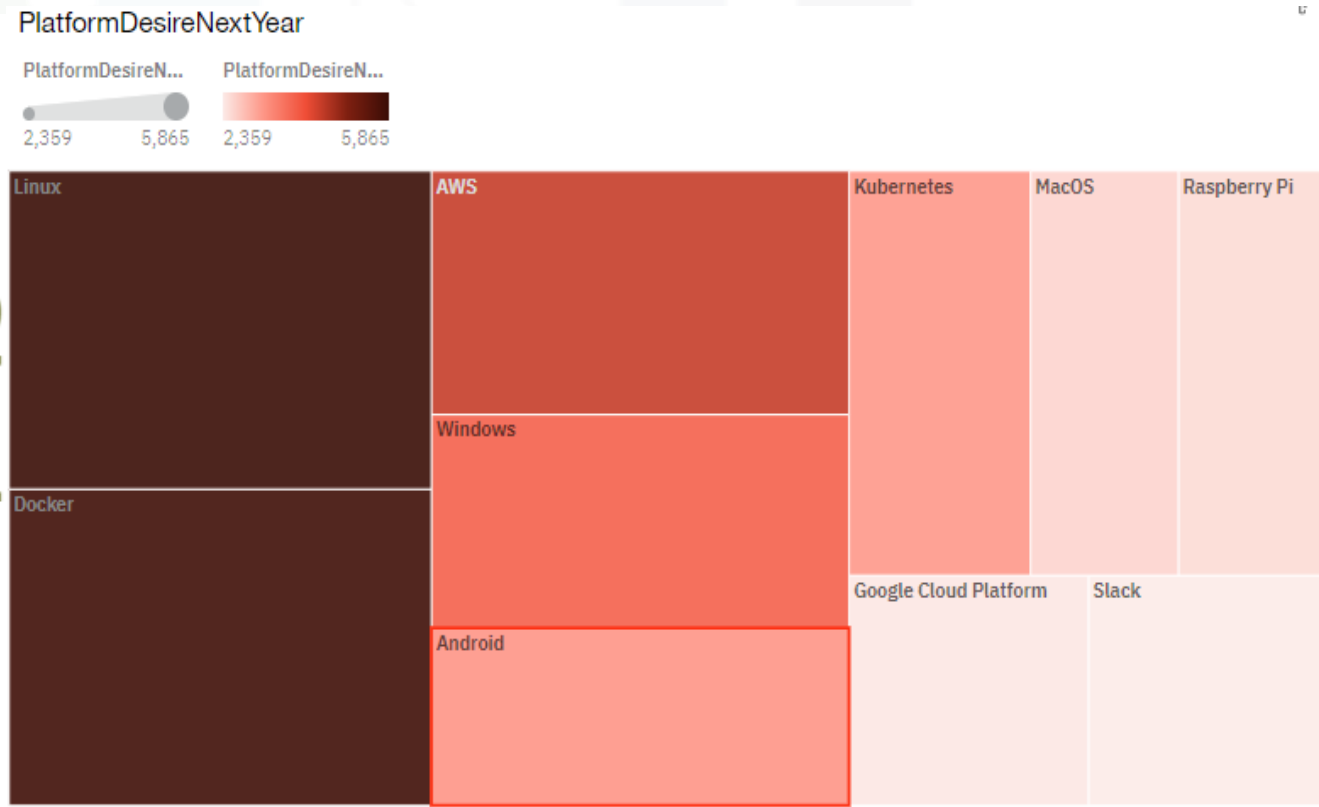
## Implications

- It seems DBs with NoSQL features are out-competing relational DBs
- MSFT should:
  - Study if users are moving to other DBs because no difference in performance, but free
  - Analyze strength/weakness of their DB
  - Provide improvement or reposition product

# OS Platform TRENDS

Year 2019

Year 2020



# Platform TRENDS- FINDINGS & IMPLICATIONS

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## Findings

- Linux, AWS and Docker are becoming more desired than Windows

## Implications

- While Linux has long been a nemesis, AWS And Docker may become next new threat to MSFT

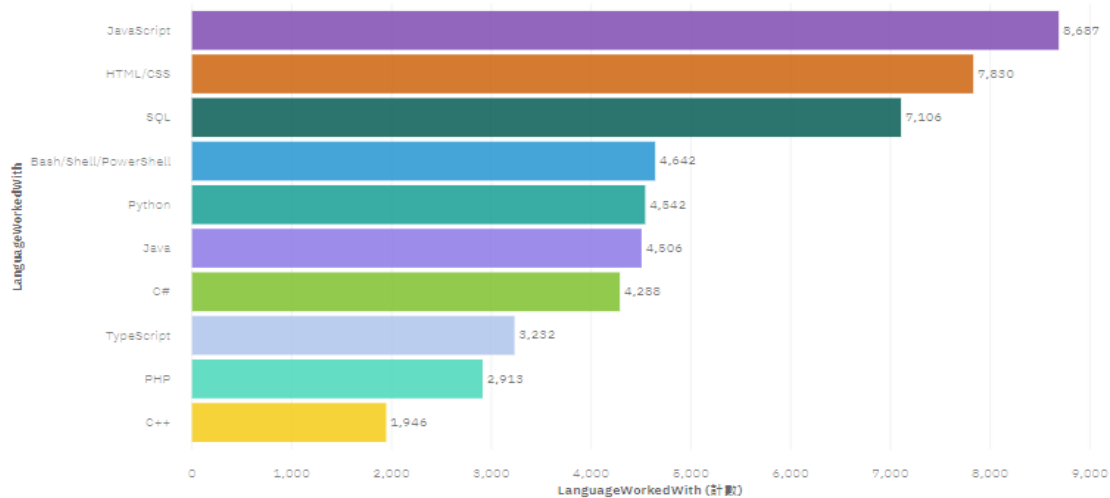
# DASHBOARD

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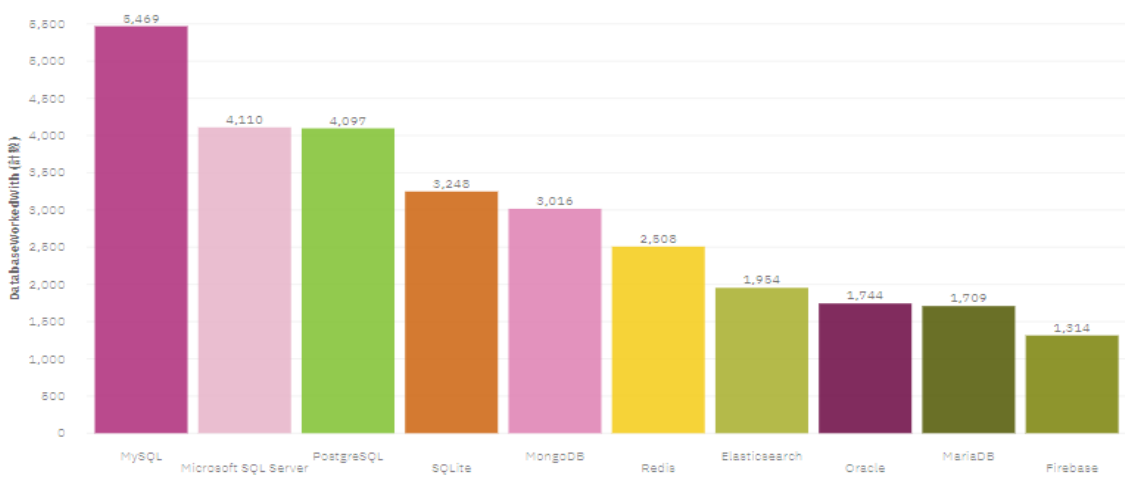


# Current Technology Usage

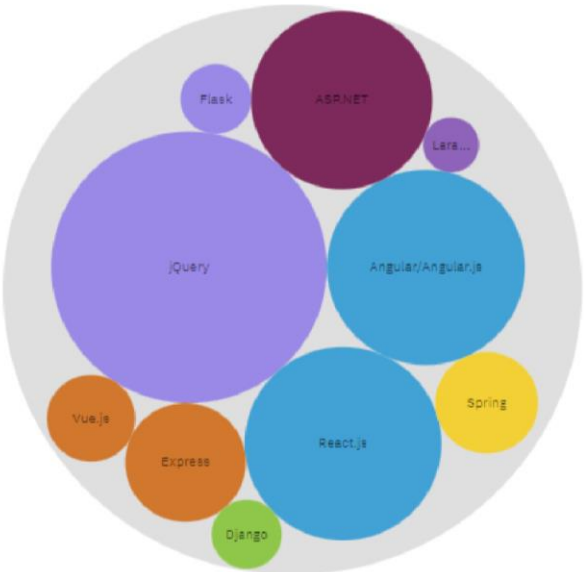
Top 10 LanguageWorkedWith



Top 10 DatabaseWorkedWith

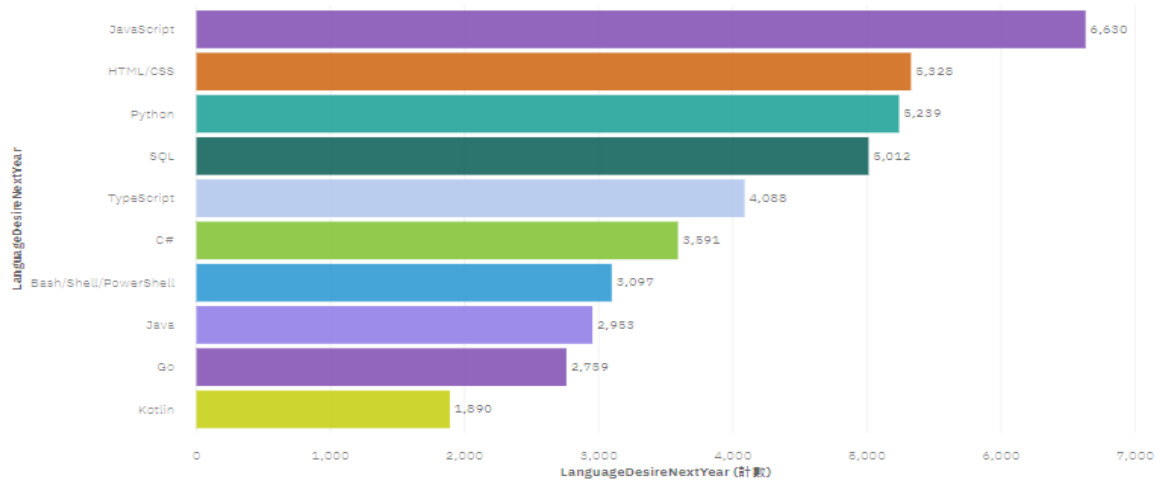


Top 10 WebFrameWorkedWith

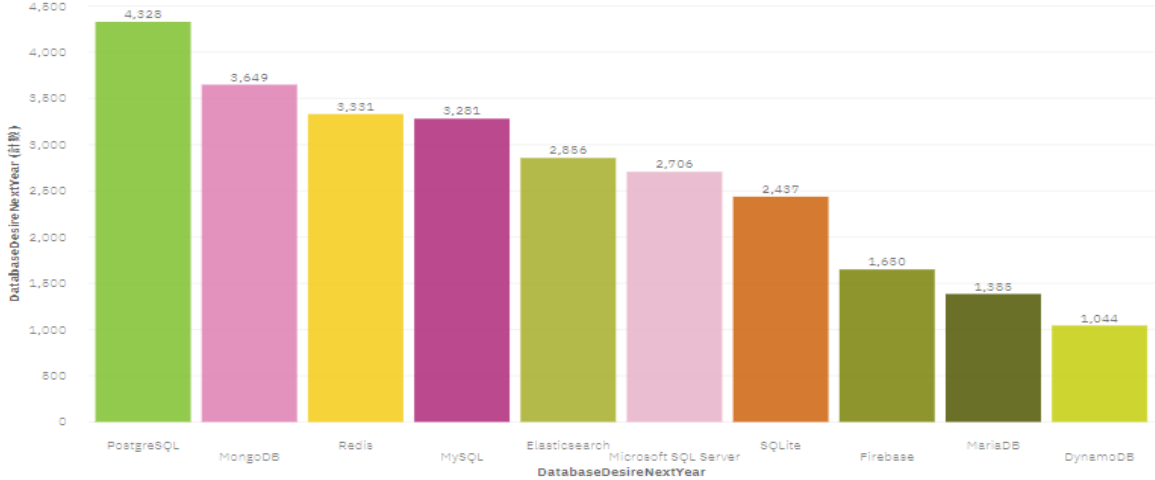


# Future Technology Trend

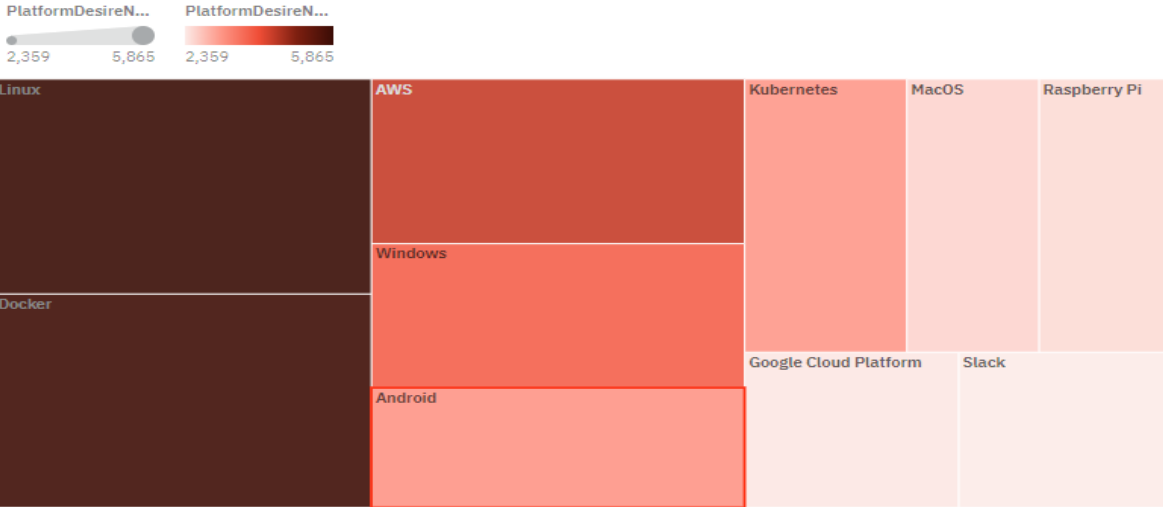
Top 10 LanguageDesireNextYear



Top 10 DatabaseDesireNextYear



PlatformDesireNextYear



Top 10 WebFrameDesireNextYear

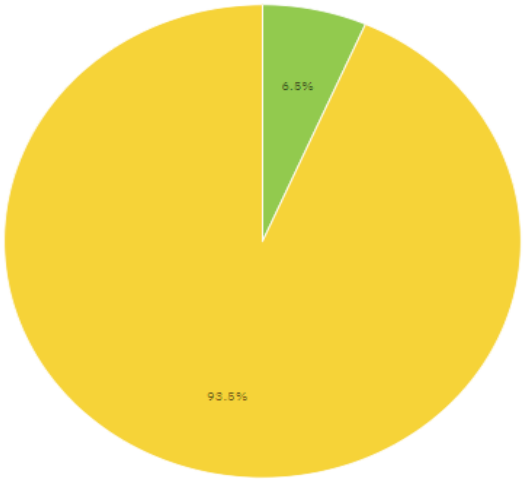




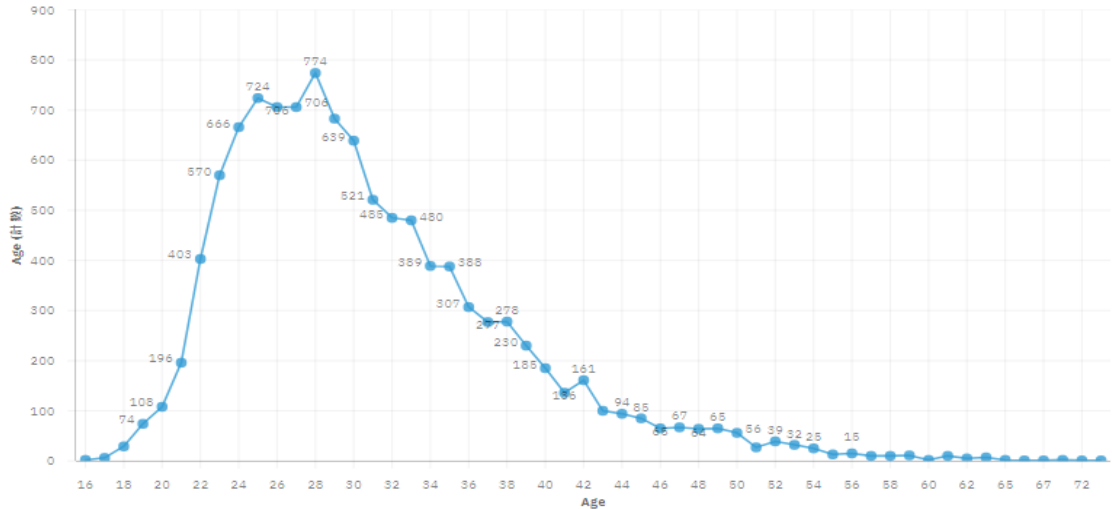
# Demographics

Respondent classified by Gender

Gender  
● Woman ● Man

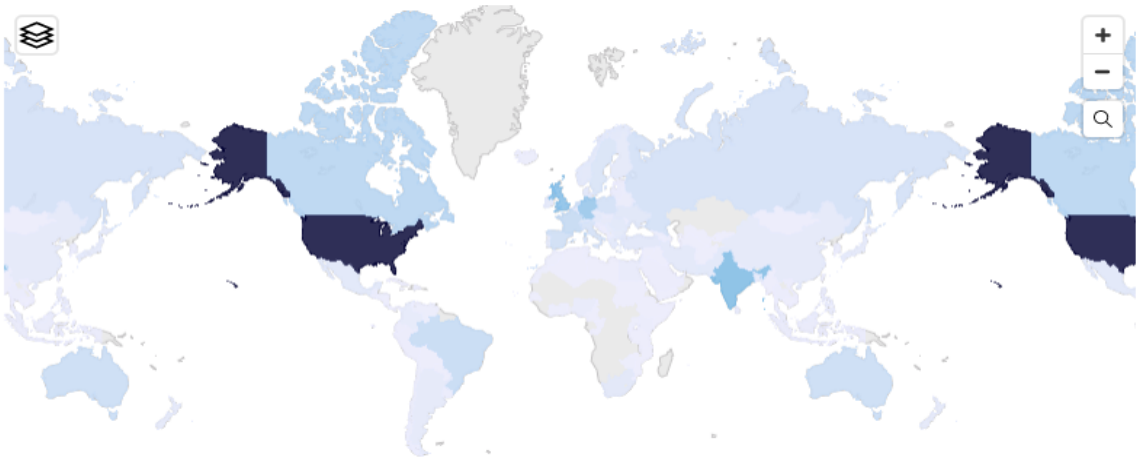


Respondent Count by Age



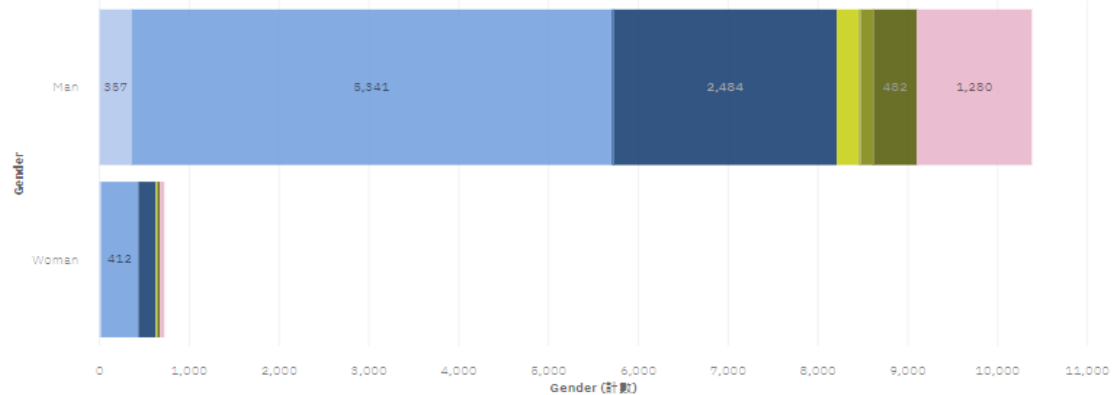
Respondent Count for Countries

Country (計数)  
1 3,058



Respondent Count by Gender, classified by Formal Education Level

EdLevel  
● Associate degree ● Bachelor's degree (BA, BS, B.E...) ● I never completed any formal e... ● Master's degree (MA, MS, M.En...  
● Other doctoral degree (Ph.D, E... ● Primary/elementary school ● Professional degree (JD, MD, e... ● Secondary school (e.g. Americ...  
● Some college/university study ...



# DISCUSSION

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# OVERALL FINDINGS & IMPLICATIONS

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## Findings

- Both Python and SQL are popular and increasingly getting programmers' attention
- Many jobs requiring C language exists, but relatively few programmers have the skill
- PostgreSQL is right behind Microsoft SQL and more desired
- Great tech usage gap exist between genders and across countries

## Implications

- Decision making is becoming data driven, creating the need for free but handy analytics tools
- There is a demand gap for programmers skilled in C
- Microsoft needs to enhance their SQL tool compatibility and performance to compete with free SQL tools
- Employers can promote equal opportunity culture when hiring; governments can improve infrastructure and provide education to close gap

# CONCLUSION

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- Analysis reveal interesting shift in tech usage trends in terms of language, databases and OS
- Corporations and use these insights as direction for future improvement
- Likewise, government agencies and educators and take these findings into consideration when planning policy