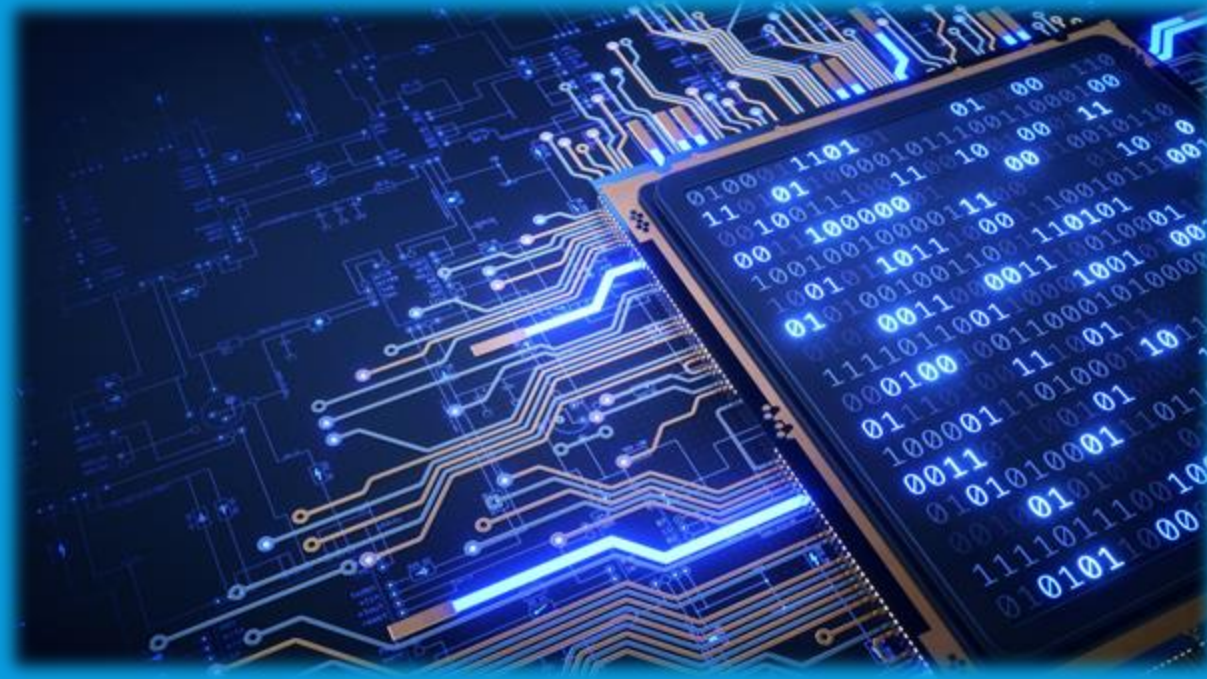


# TECHNOLOGY TREND ANALYSIS

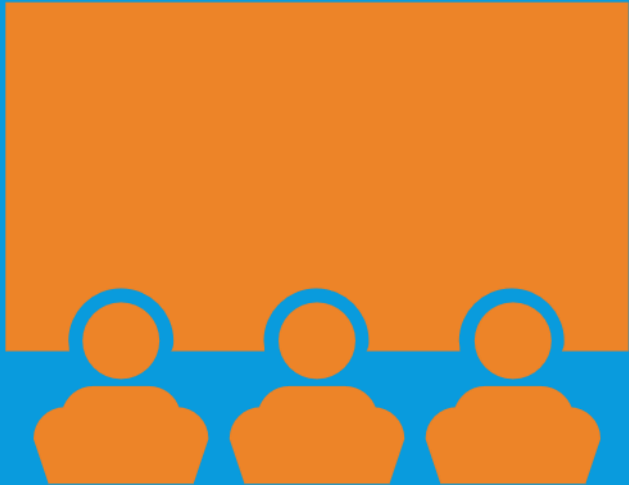
- 2019 STACK OVERFLOW DEVELOPER SURVEY



Xu Wang

30 May 2021

# OUTLINE



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

# EXECUTIVE SUMMARY



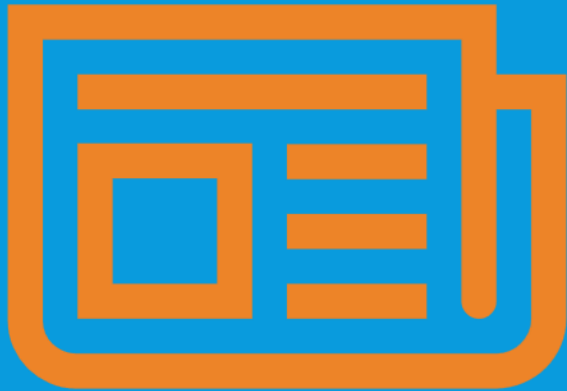
- Developer Survey shows everything from developers' favorite technologies to their job preferences
- Technologies are changing fast annually by comparing current & future trend of programming language, databases, platforms, webframe.
- New trends of technologies give implications
- Summary of respondents' demographics
- 1/10 of original data we analyze (around 11000 row of data)

# INTRODUCTION



- This report shows results of analyzing Stack Overflow 2019 developer survey
- The survey covers everything from developers' favorite technologies to their job preferences
- Stack Overflow's annual Developer Survey is the largest and most comprehensive survey of people who code around the world
- This report mainly focus on and gives implications about:
  - current technologies (i.e. programming language, databases, etc.)
  - future trend of technologies
  - respondents' demographics (i.e. gender, age, country, etc.)
  - related findings & implications

# METHODOLOGY



- Our report uses a randomised subset contains around 1/10th of the original data set. *Original data are from Stack Overflow, a popular website for developers, conducted an online survey of software professionals across the world. The actual survey data set has around 90,000 responses.*
- Within data wrangling phase, methodologies include finding & removing duplicates, finding & inputting missing values, normalizing data, etc.
- Phase of exploring data including data distributions analysis and handling the outliers, and to define possible correlations between important attributes.
- Data visualization, Dashboard are also utilized and helpful for our analysis, by using python modules, IBM-cogno, etc.

*\*The dataset can be downloaded as csv file from here. [https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m1\\_survey\\_data.csv](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m1_survey_data.csv)*

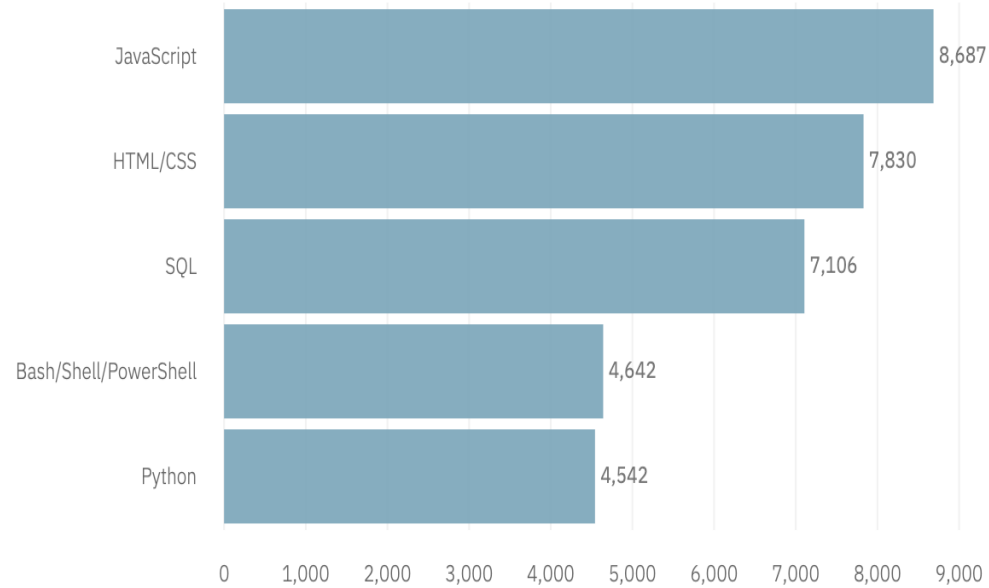
# RESULTS

- Current Technologies:
  - Top 5, 10 Programming Language Worked With
  - Top 5, 10 Databases Worked With
  - Platforms
  - WebFrame
- Future Trend Technologies:
  - Top 5, 10 Programming Language Desire to use next year
  - Top 5, 10 Databases Desire to use next year
  - Platforms
  - WebFrame
- Demographics of Survey respondents:
  - Gender
  - Age
  - Country
  - Education level, etc.

# PROGRAMMING LANGUAGE TRENDS

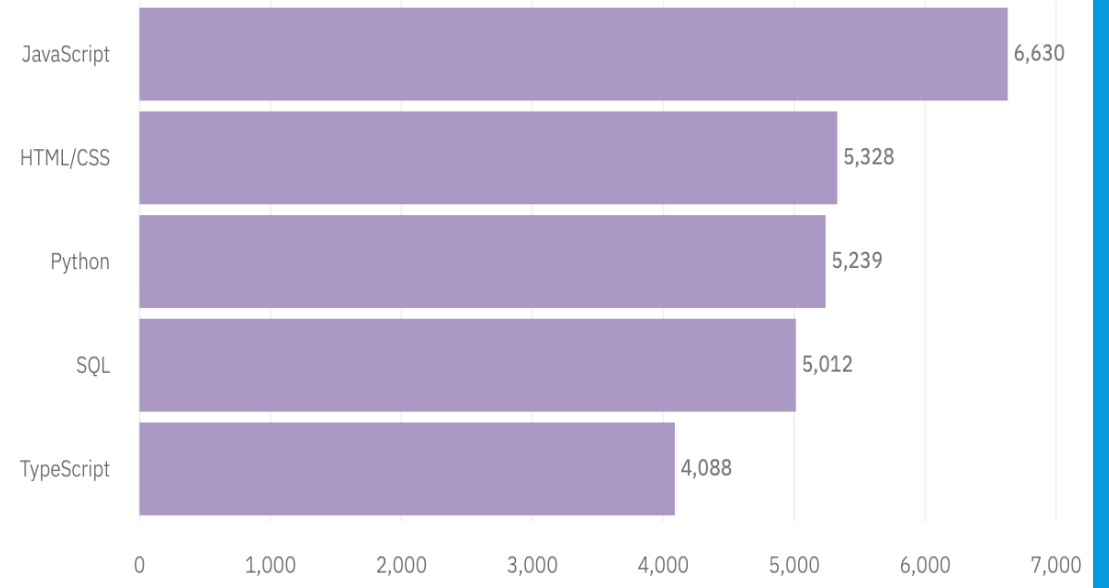
## Current Year

Bar Chart of Top 5 Languages Worked With



## Next Year

Bar Chart of Top 5 Language Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- JavaScript, HTML stay still rank 1st, 2nd, but quantities of desire to use decreased.
- SQL has fallen from rank 3rd to 4th.
- Python, TypeScript have risen in the ranks (3rd, 5th).

## Implications

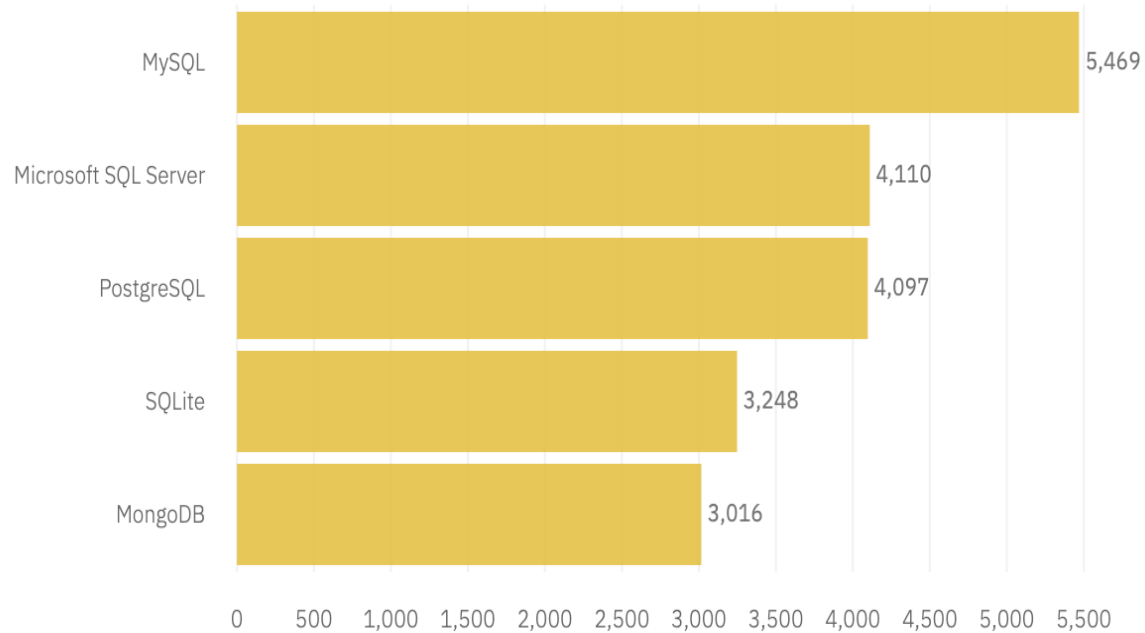
- Downside trend of JavaScript, Html, SQL.
- Python, TypeScript become more popular and having fast-growing trend in future.
- Quick riser may have strong points to job preferences, ease of use and learn, simple structure, etc.



# DATABASE TRENDS

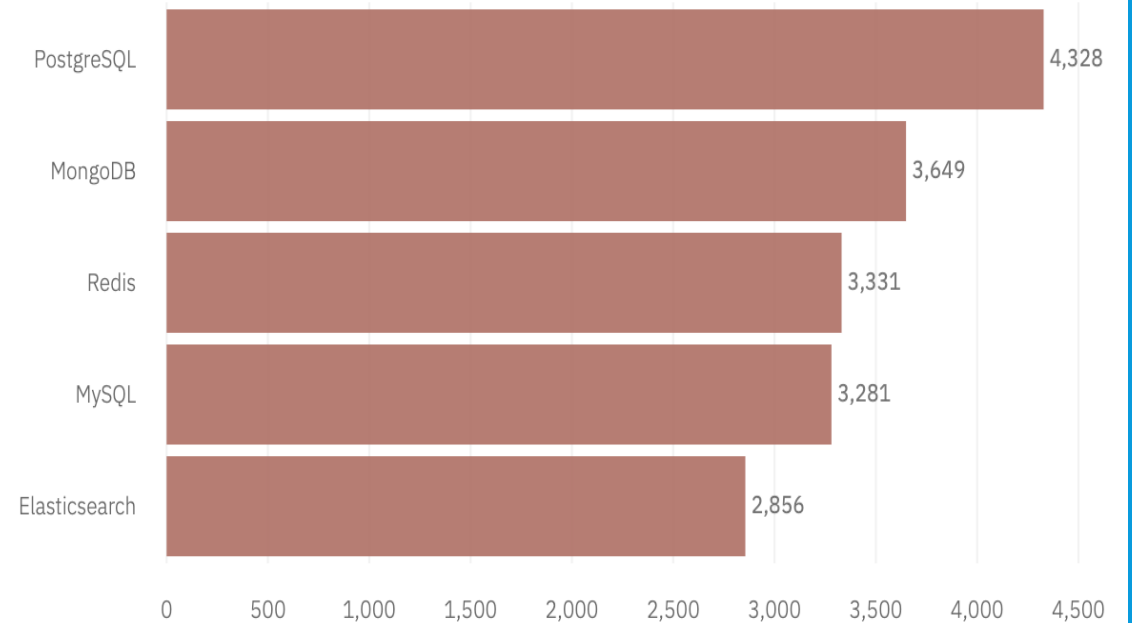
## Current Year

Bar Chart of Top 5 Database Worked With



## Next Year

Bar Chart of Top 5 Databases Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- MySQL has an obvious decrease from rank 1st down to 4th.
- Microsoft SQL Server, SQLite decreased much as well.
- PostgreSQL, MongoDB, Redis, Elasticsearch have great risen as 1st, 2nd, 3rd and 5th.

## Implications

- Some SQL databases become unpopular, such as Microsoft SQL, SQLite and even MySQL.
- PostgreSQL, MongoDB, Redis, Elasticsearch may have better upgrades or some strong points to users, therefore their ranks risen significantly.

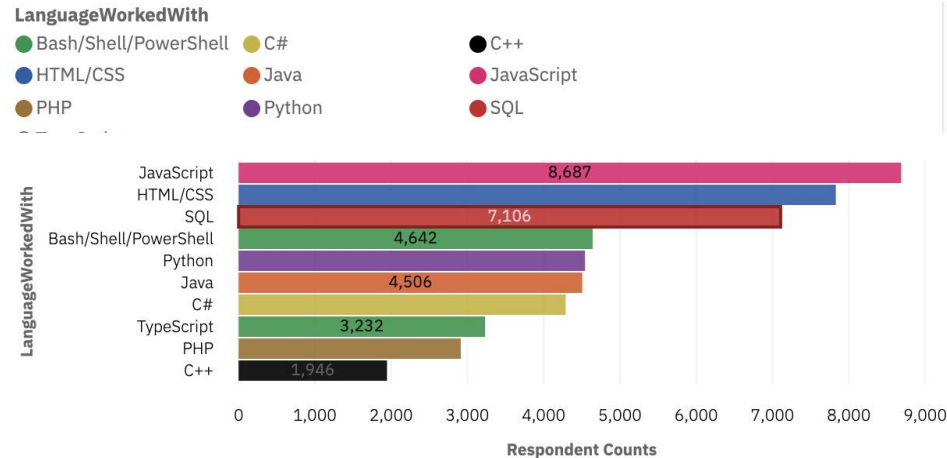
# DASHBOARD



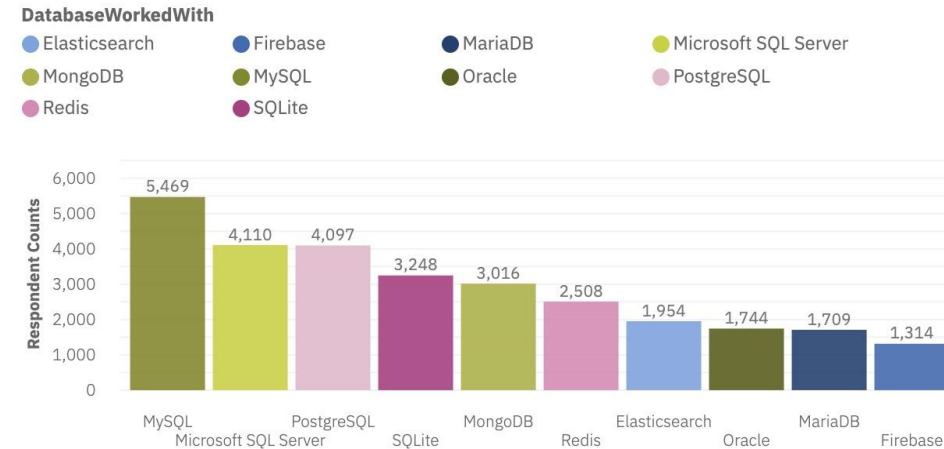
<https://dataplatfrom.cloud.ibm.com/dashboards/ed356011-f6d5-4034-8a76-fcc7c3886bb2/view/631ae21a1eb303e213f3bde407c82c057f627755b4bb8004d6d07b4907642097f06816c2c87b1809d8140736f6e9130fc8>

# CURRENT TECHNOLOGY USAGE

## Top 10 Language Worked With



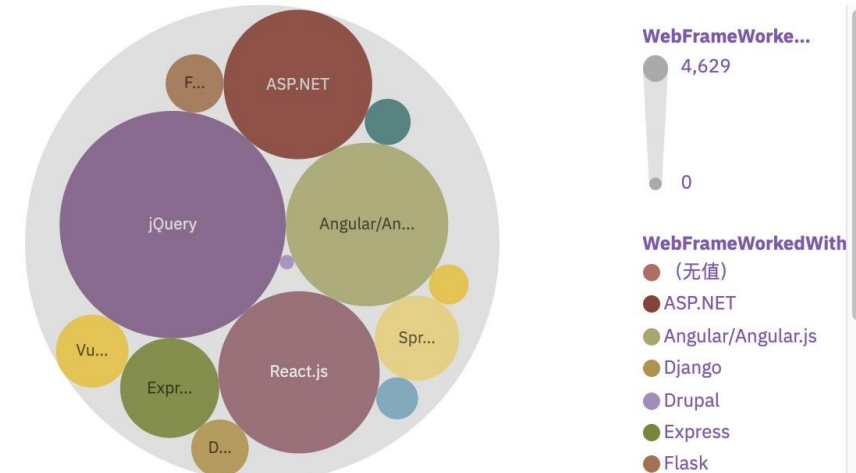
## Top 10 Databases Worked With



## Platform Worked With

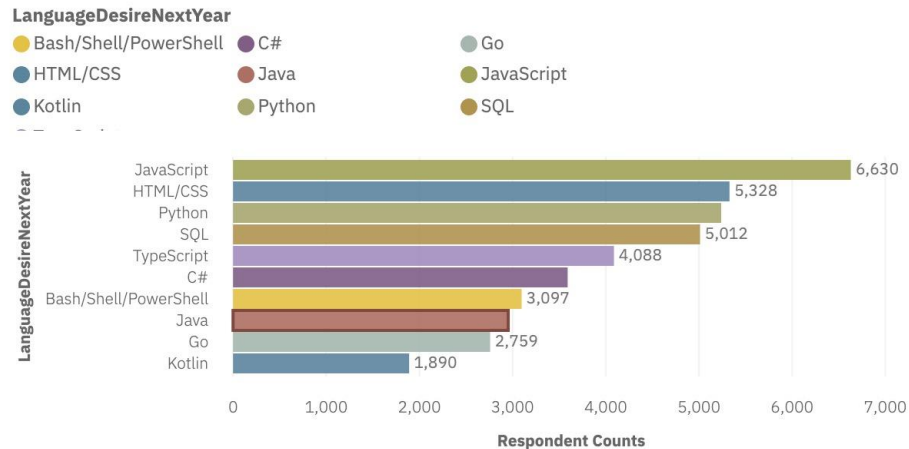


## Top 10 WebFrame Worked With

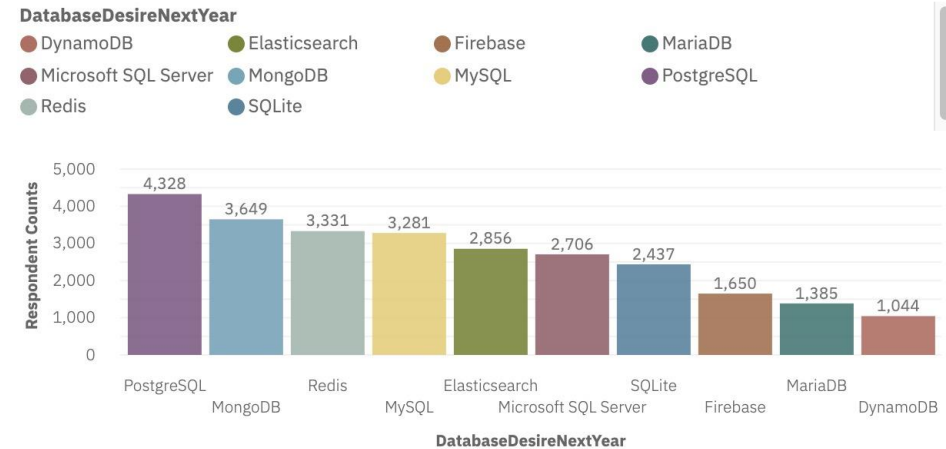


# FUTURE TECHNOLOGY TREND

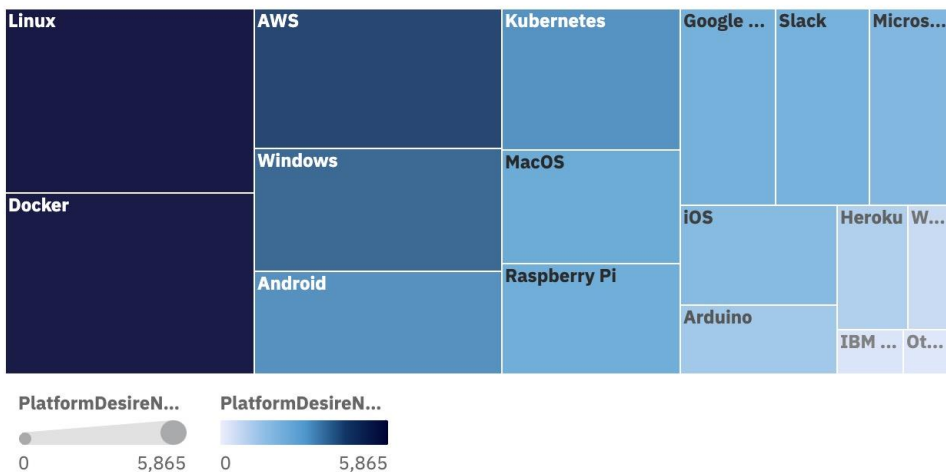
## Top 10 Language Desire New Year



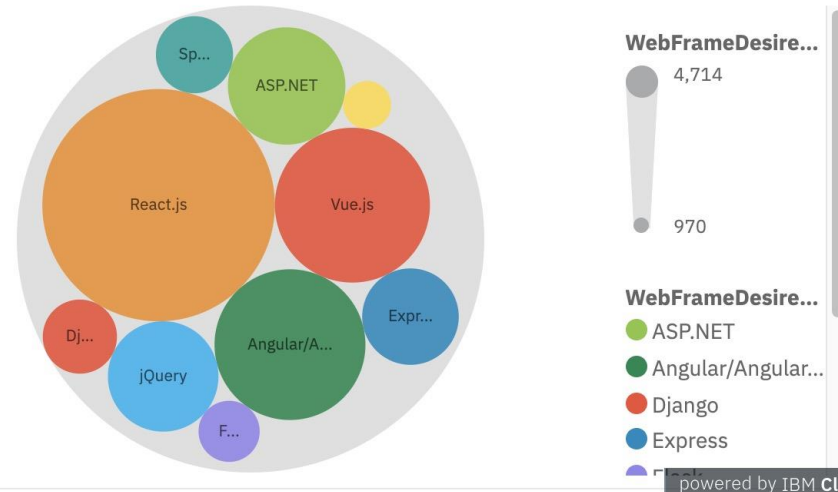
## Top 10 Databases Desire Next Year



## Tree Map of Platform Desire Next Year

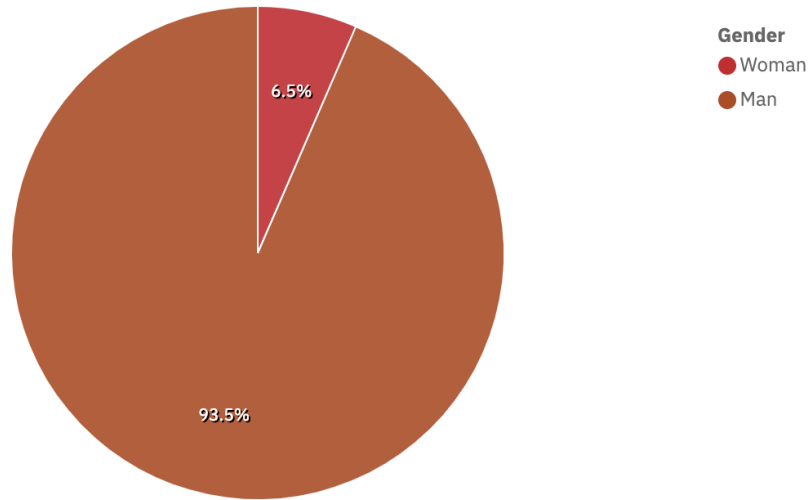


## Top 10 WebFrameDesireNextYear

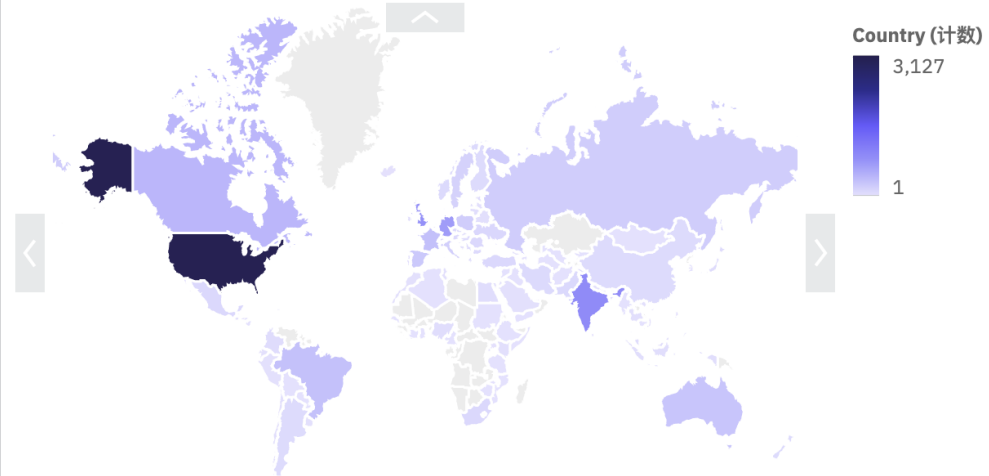


# DEMOGRAPHICS

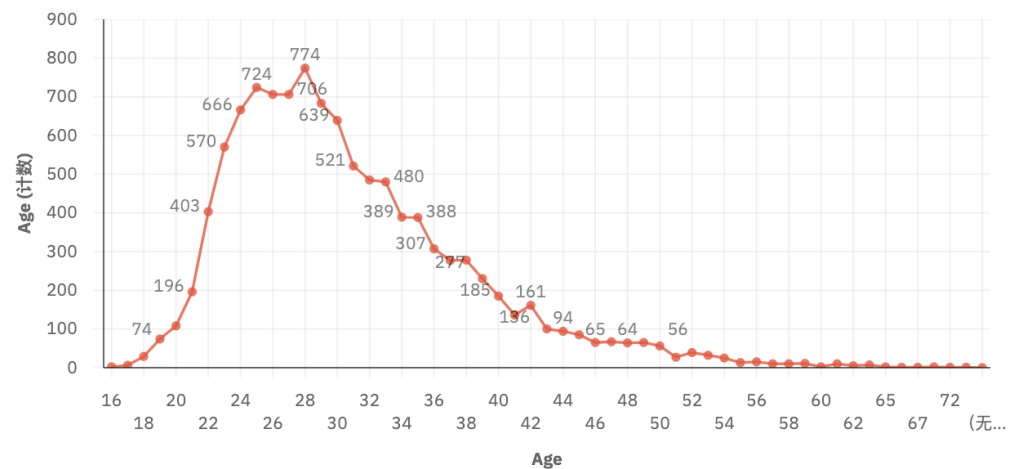
Respondent classified by Gender



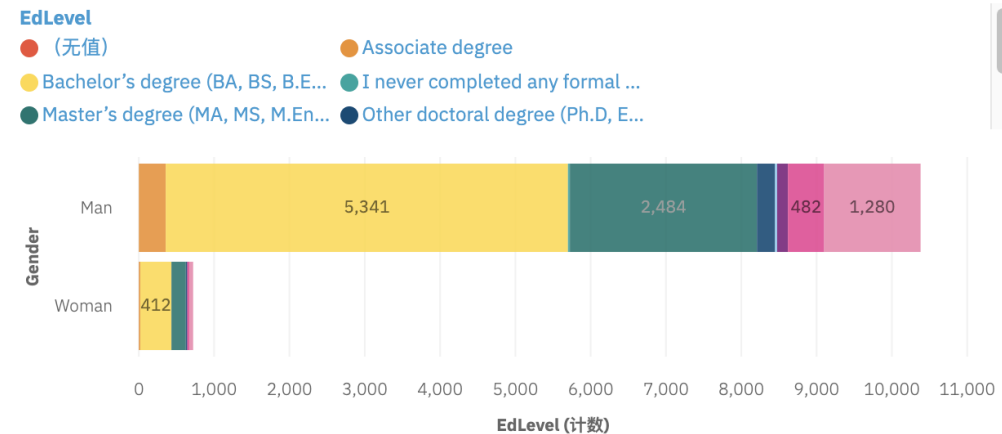
Respondent Count for Countries



Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level



# DISCUSSION



- Comparing the ranks of current & future trend, what & why differences occur?
- What developers prefer more?
- Is it possible the results represent all developers want?

# OVERALL FINDINGS & IMPLICATIONS

## Findings

- JavaScript is the most commonly used programming language, but Python, Go, Kotlin have risen fast.
- Databases i.e. PostgreSQL, MongoDB, Redis, Elasticsearch rise in ranks replaces MySQL, Microsoft SQL.
- Windows Platforms has fallen from rank 1st to 4th, Linux and Docker become most popular platforms.
- React.js replaces JQuery as rank 1st of WebFrames.
- 93.5% of respondents are male.
- Most respondents are from north America with bachelor or above education level. between age 20 to 45.

## Implications

- Some programming languages, databases, platforms and webframes become more popular and more developers desire to use at work.
- Some still stay at mainstream positions i.e. JavaScript language, MySQL database, Windows platform however their quantities of respondents desire to use decrease.
- The changes imply better upgrades and advantages respondents may demand to.
- High-educated, from developed countries, young and middle-age men still are the main component of developers in the survey.

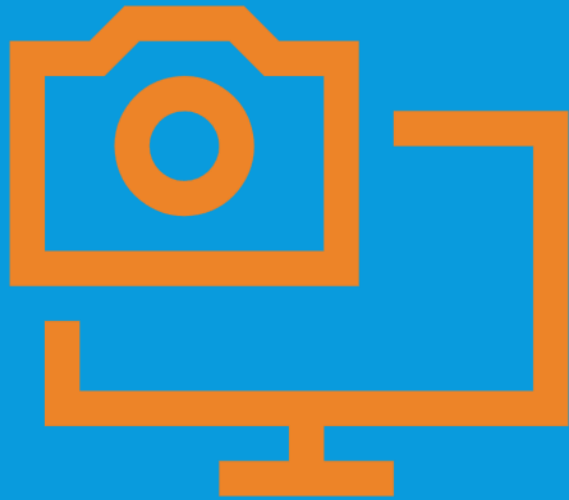


# CONCLUSION



- Technologies especially like programming language, databases, platforms, webframes, are changing fast and variously.
- New trends of technologies imply developers' prefer to :
  - upgrade advantages of technical tools
  - more convenience to use and learn at work
  - simpler structure
  - strong compatibility
- Most of respondents are high-educated level, full-time employees and have computer-related majors. They are willing to approach, learn and try new technologies.
- Above implications & conclusions will not fully represent overall worldwide developers' preferences, as only 1/10 of data we analyze (around 11000 row of data).

# APPENDIX

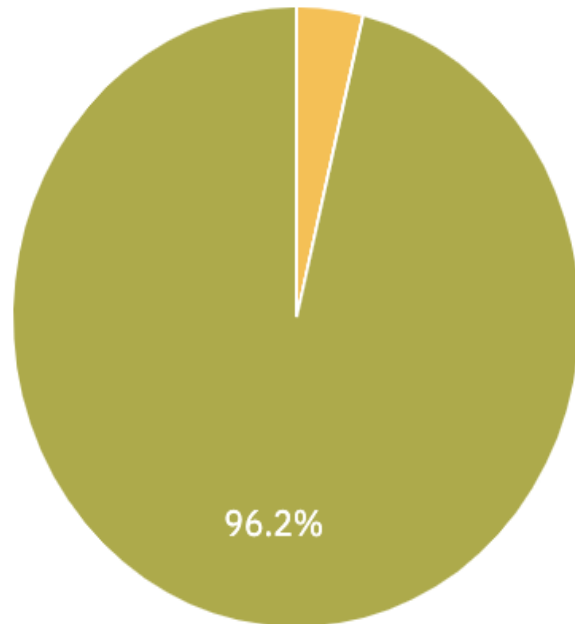


- Demographics
- Github jobs posting
- Popular languages

# APPENDIX - DEMOGRAPHICS (EMPLOYMENT AND UNDERGRADUATE MAJOR DISTRIBUTION)

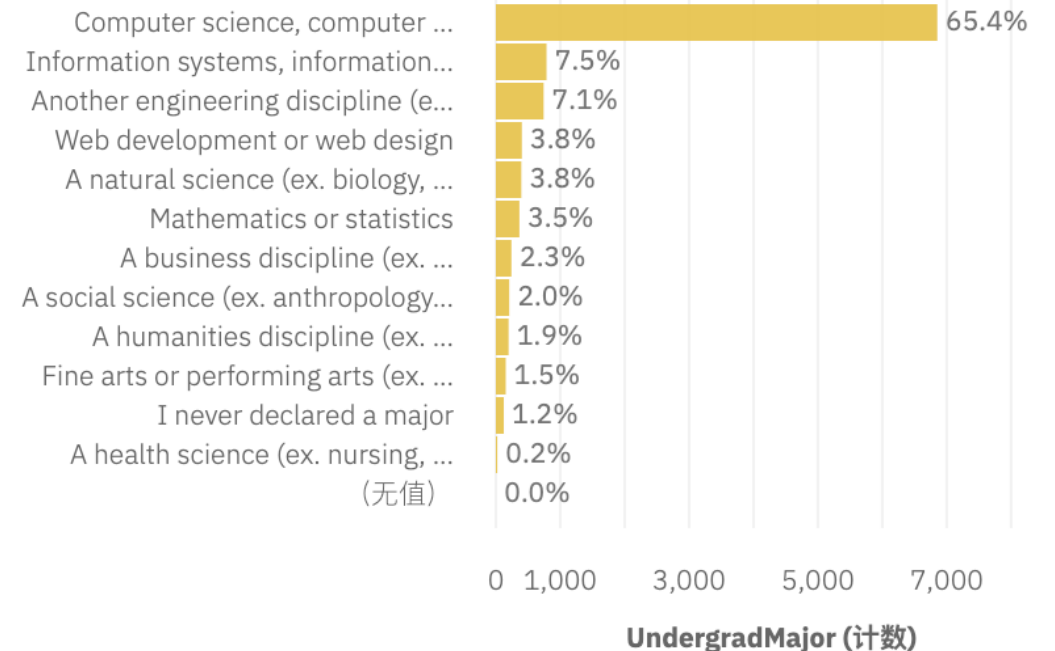
## Employment

● Employed part-time ● Employed full-time



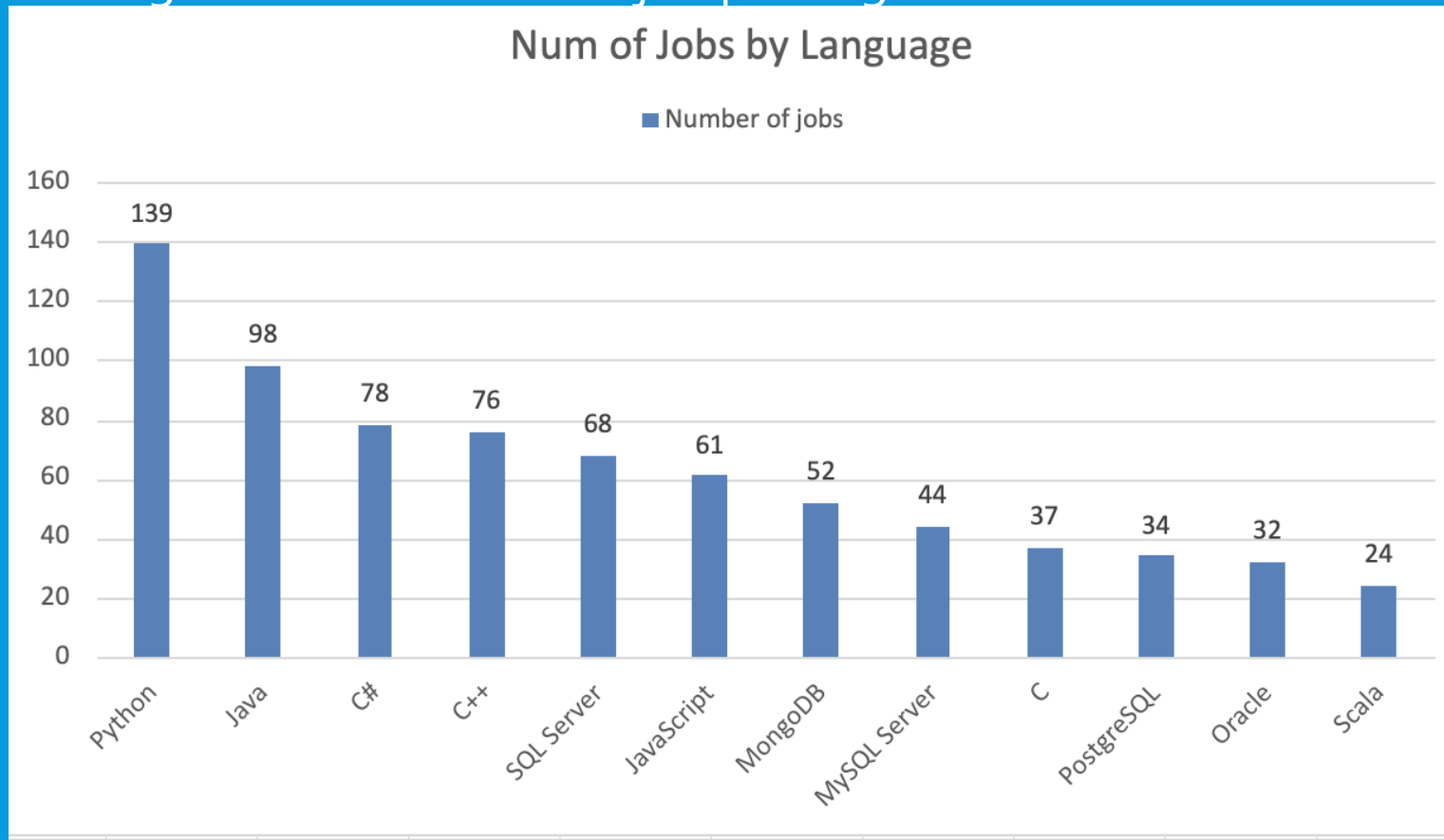
## Undergrad\_Major

UndergradMajor



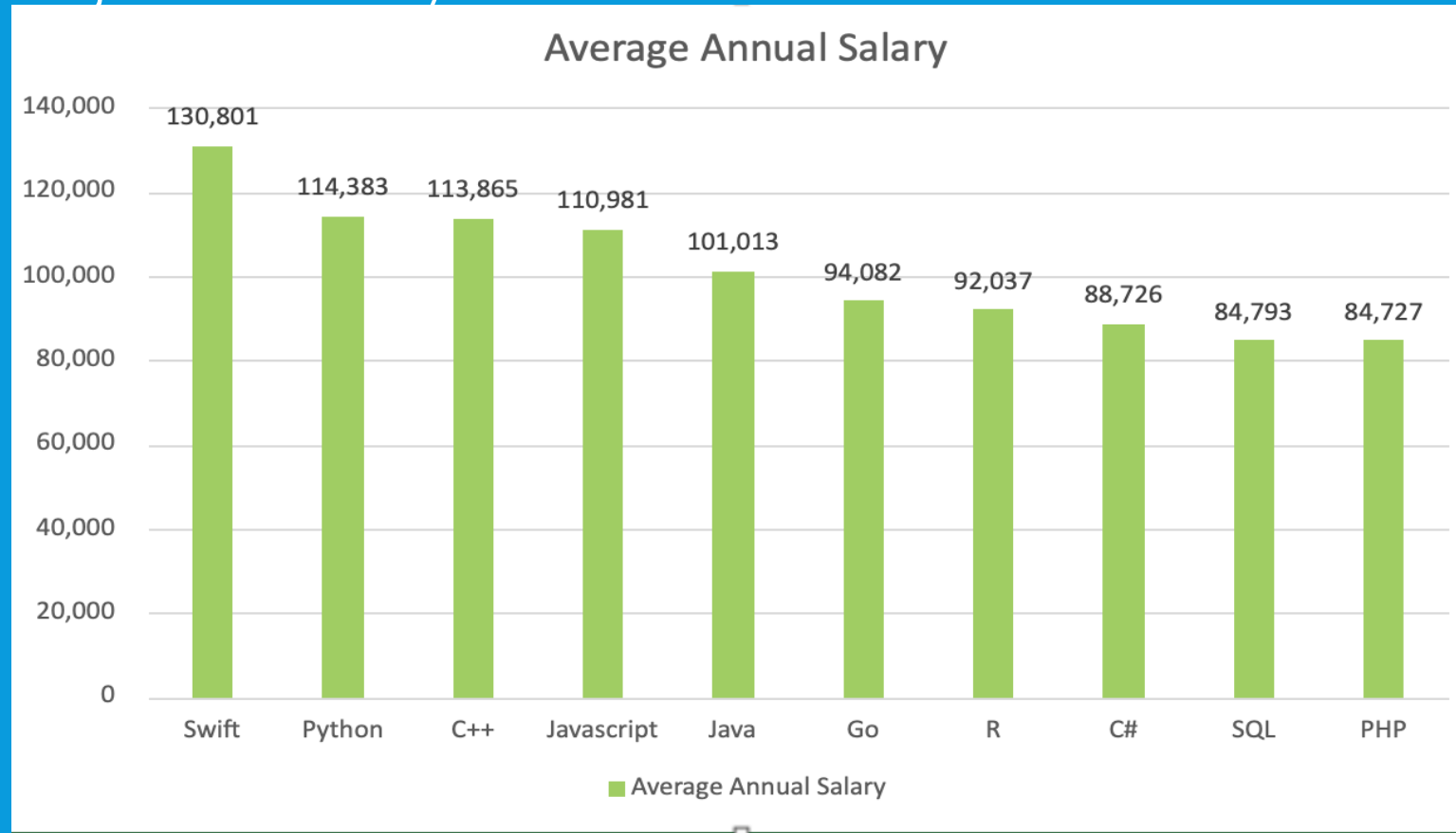
# GITHUB JOB POSTINGS

In Module 1 you have collected the job postings data using GitHub API in a file named "github-job-postings.xlsx". Present that data using a bar chart here. Order the bar chart in the descending order of number of job postings.



# POPULAR LANGUAGES

In Module 1 you have collected the job postings data using web scraping in a file named “popular-languages.csv”. Present that data using a bar chart here. Order the bar chart in the descending order of salary.





THANK YOU!