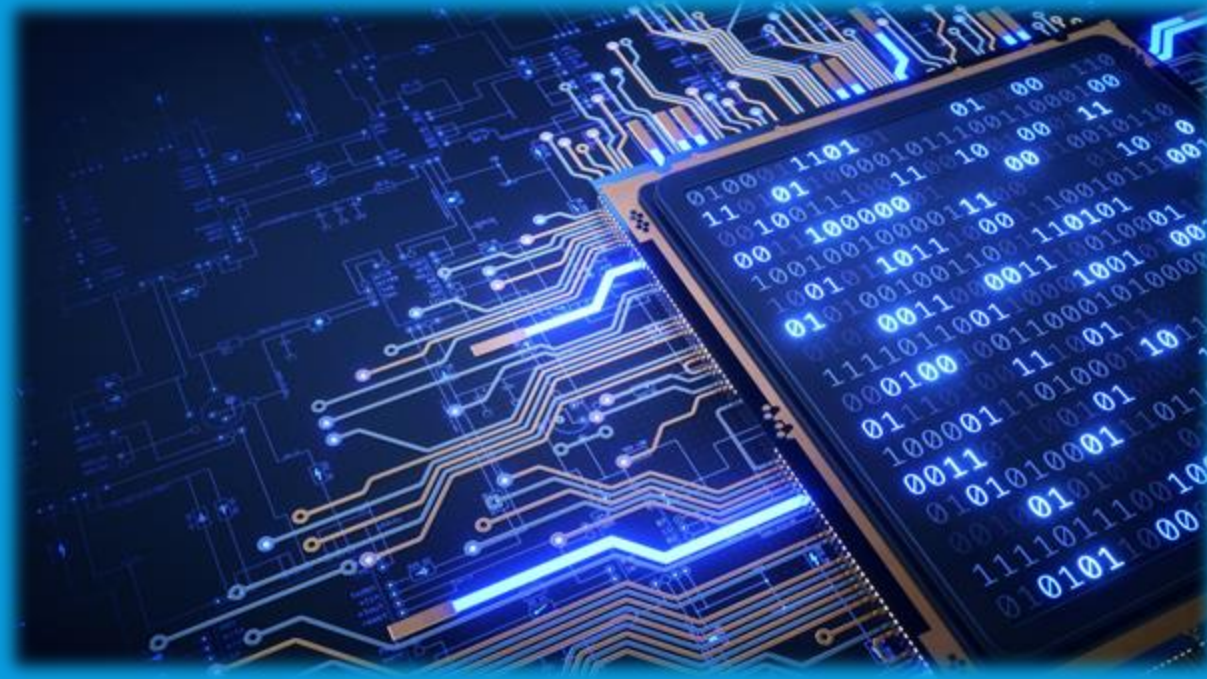


TECHNOLOGY TREND ANALYSIS

- 2019 STACK OVERFLOW DEVELOPER SURVEY

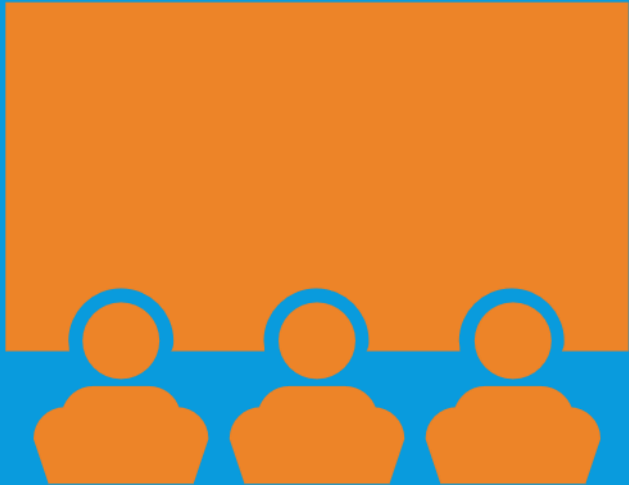


Xu Wang

30 May 2021



OUTLINE



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

EXECUTIVE SUMMARY



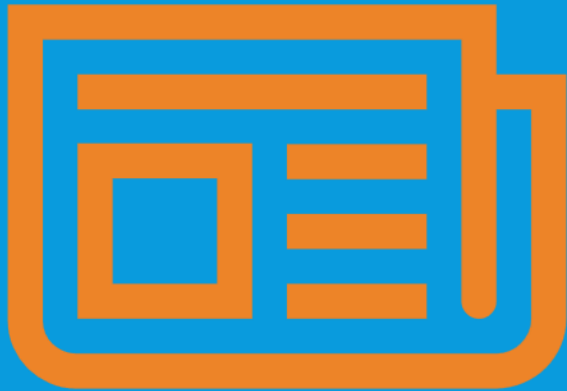
- Developer Survey shows everything from developers' favorite technologies to their job preferences
- Technologies are changing fast annually by comparing current & future trend of programming language, databases, platforms, webframe.
- New trends of technologies give implications
- Summary of respondents' 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*

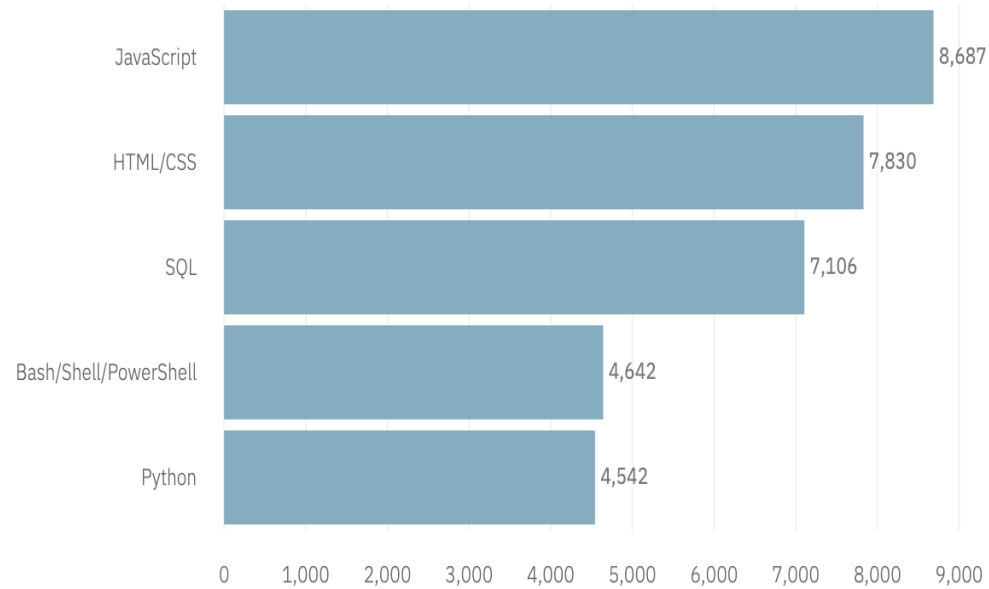
RESULTS

- 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

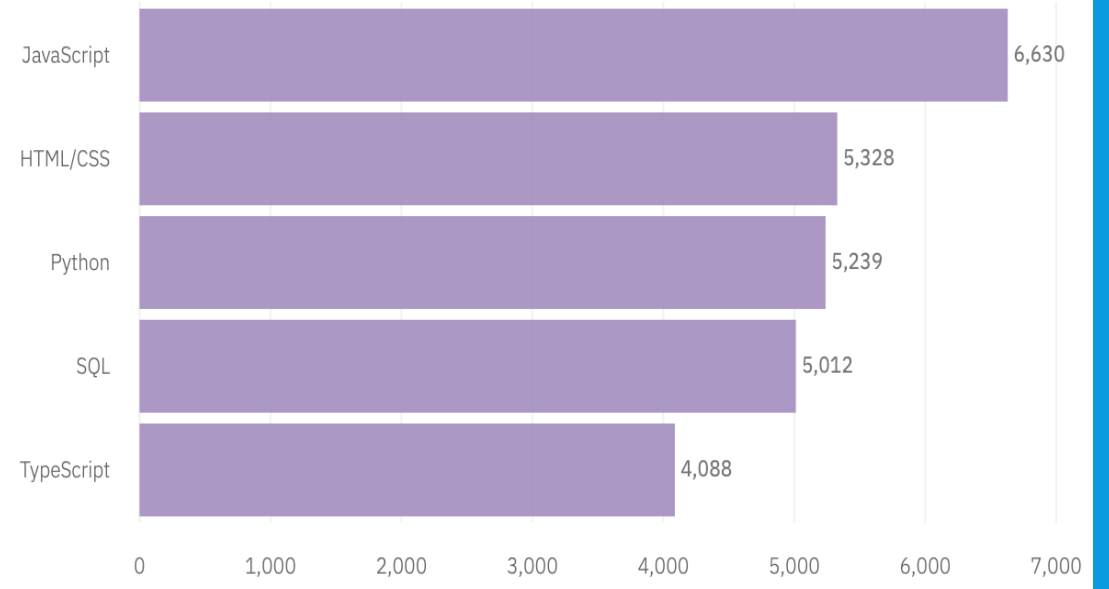
Current Year

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).

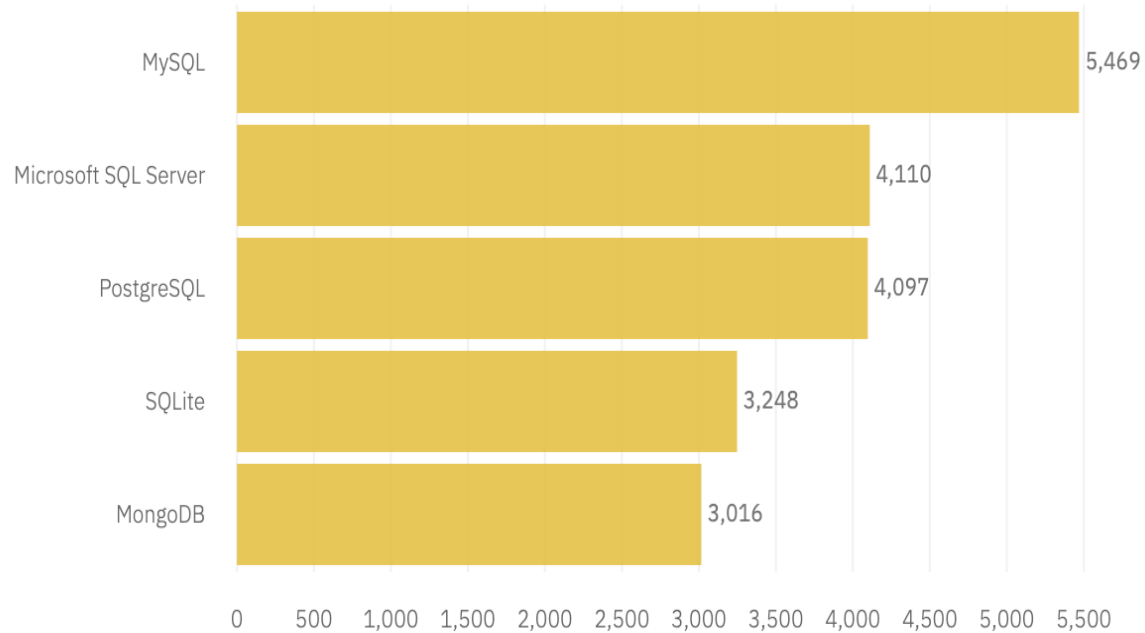
Implications

- 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

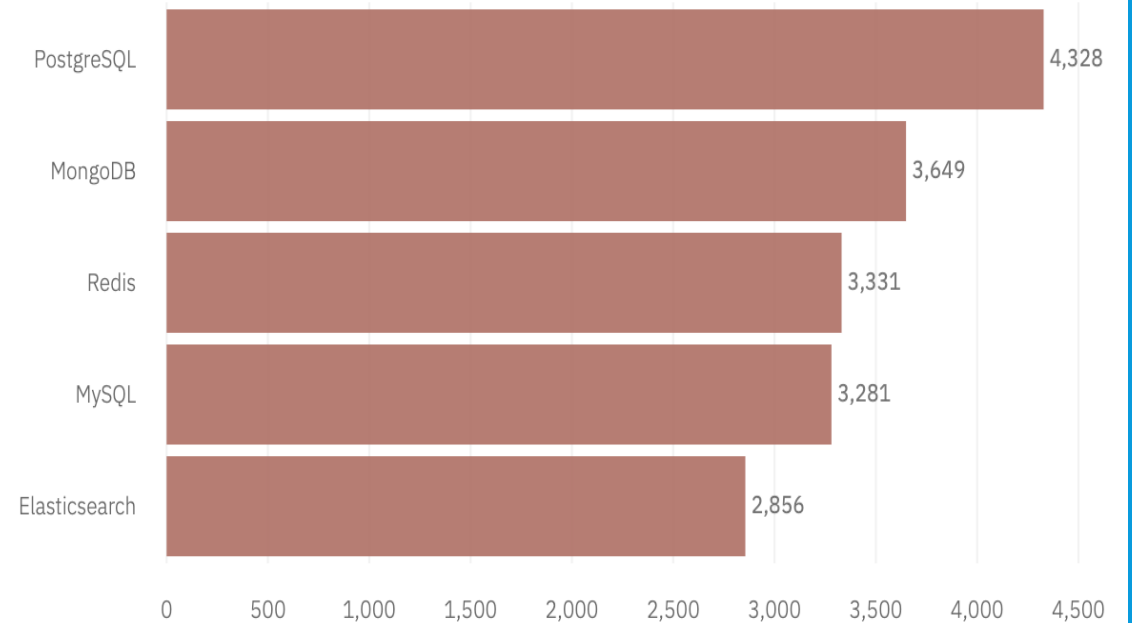
Current Year

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.

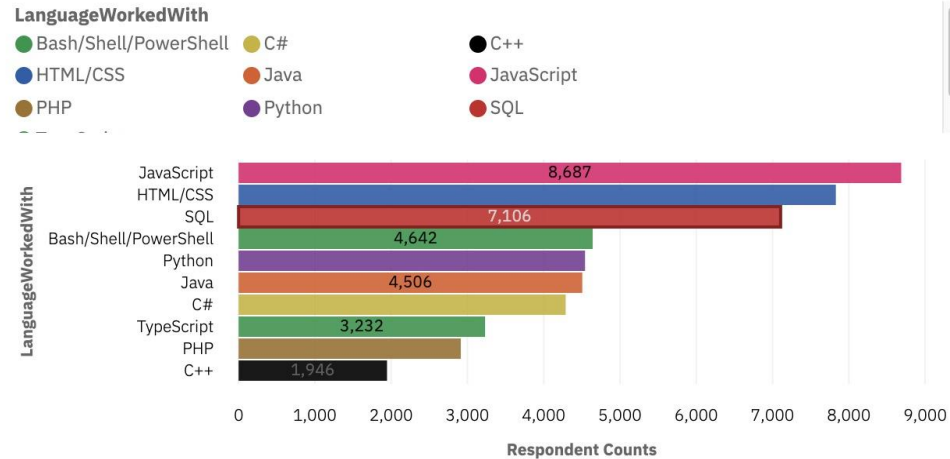
DASHBOARD



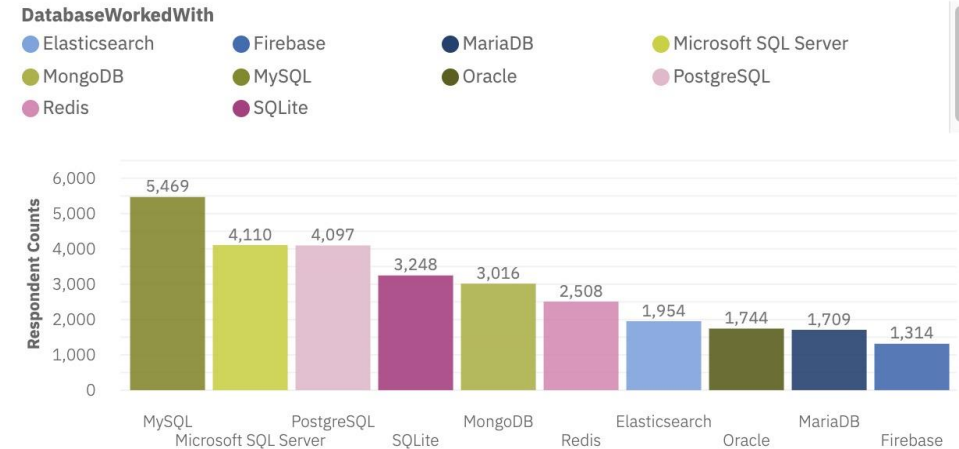
<https://dataplatfrom.cloud.ibm.com/dashboards/ed356011-f6d5-4034-8a76-fcc7c3886bb2/view/631ae21a1eb303e213f3bde407c82c057f627755b4bb8004d6d07b4907642097f06816c2c87b1809d8140736f6e9130fc8>

CURRENT TECHNOLOGY USAGE

Top 10 Language Worked With



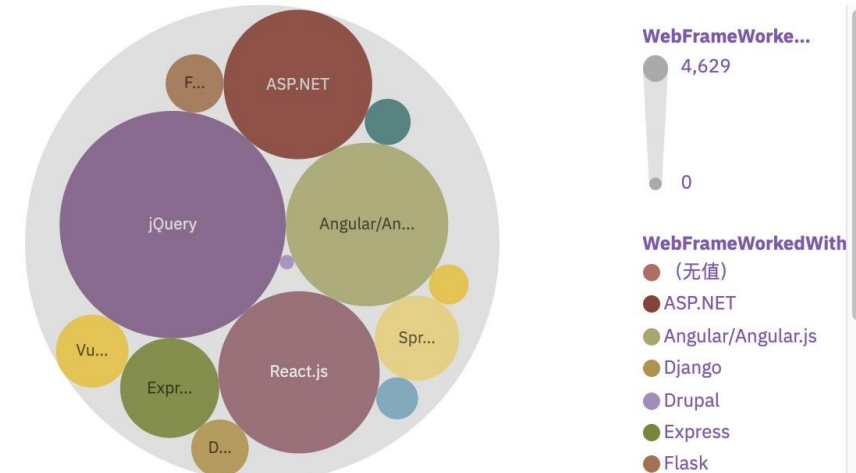
Top 10 Databases Worked With



Platform Worked With

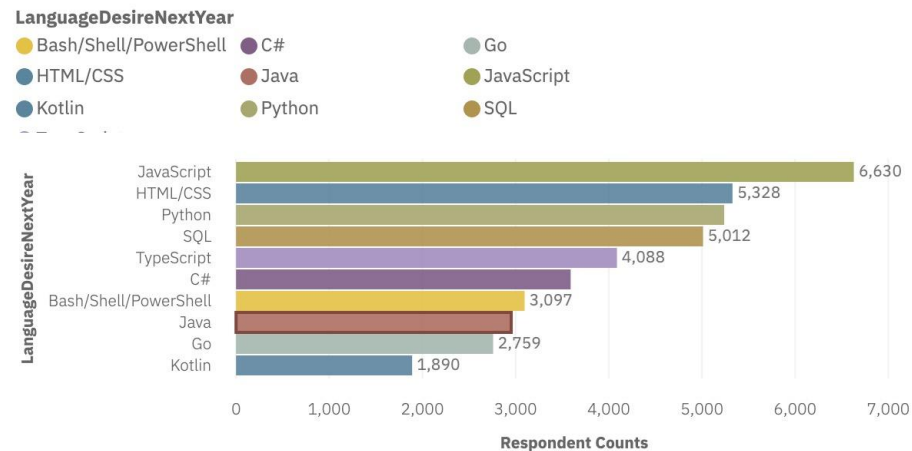


Top 10 WebFrame Worked With

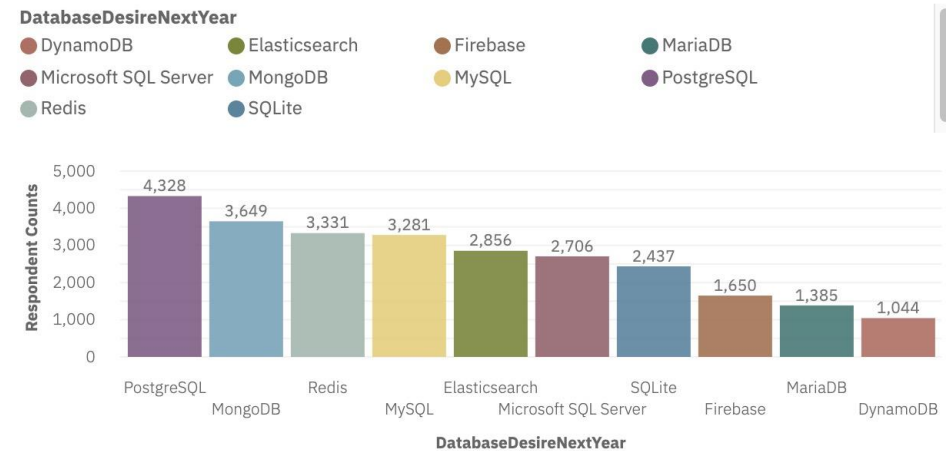


FUTURE TECHNOLOGY TREND

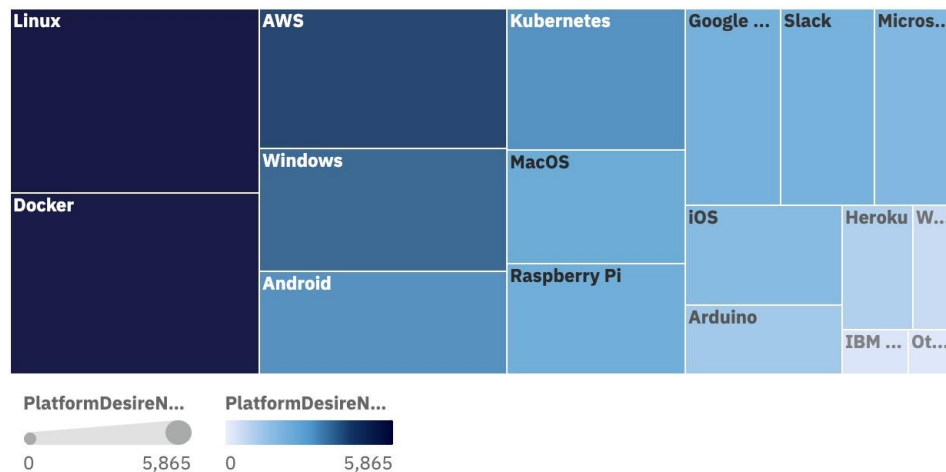
Top 10 Language Desire New Year



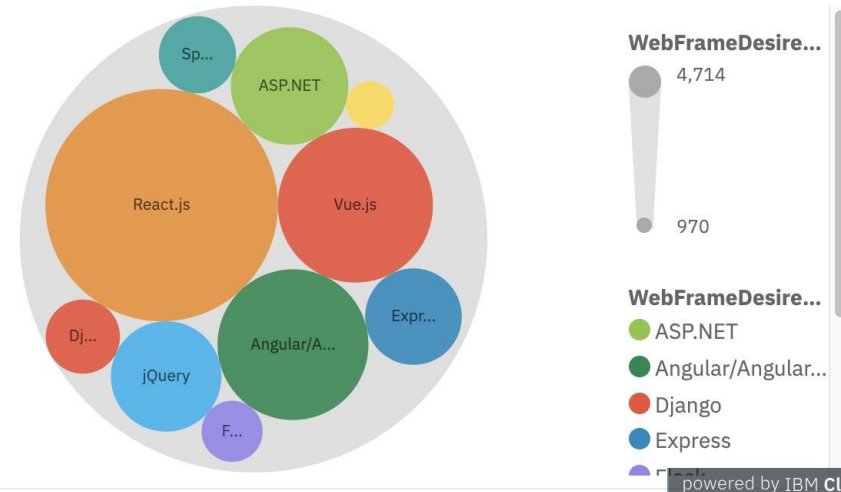
Top 10 Databases Desire Next Year



Tree Map of Platform Desire Next Year

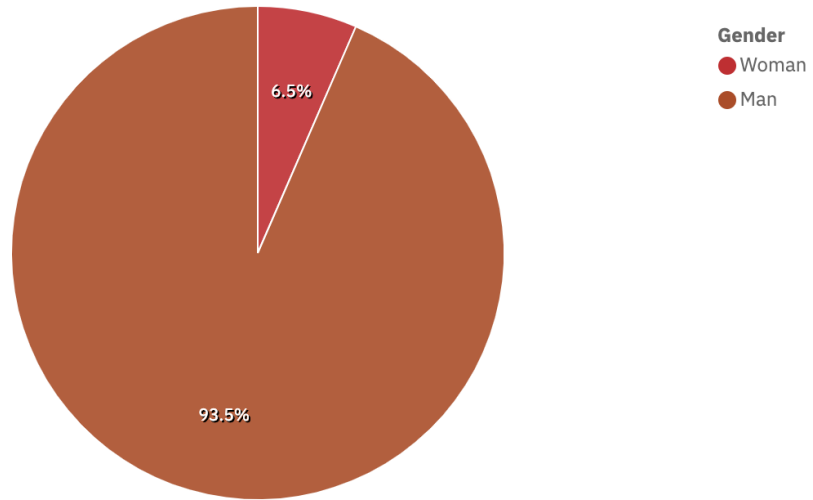


Top 10 WebFrameDesireNextYear

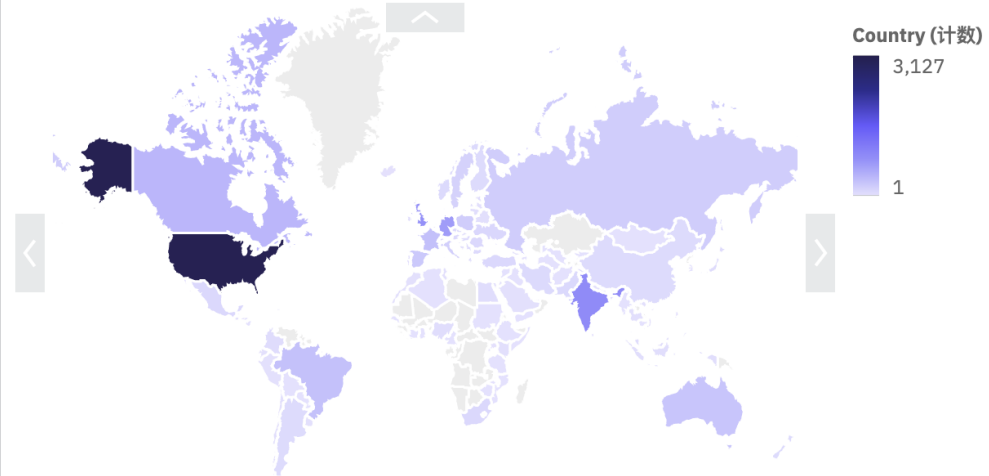


DEMOGRAPHICS

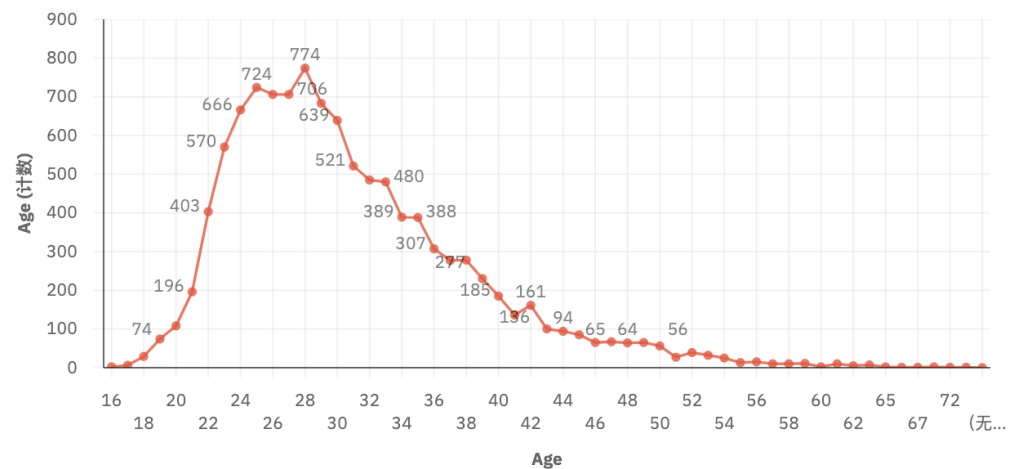
Respondent classified by Gender



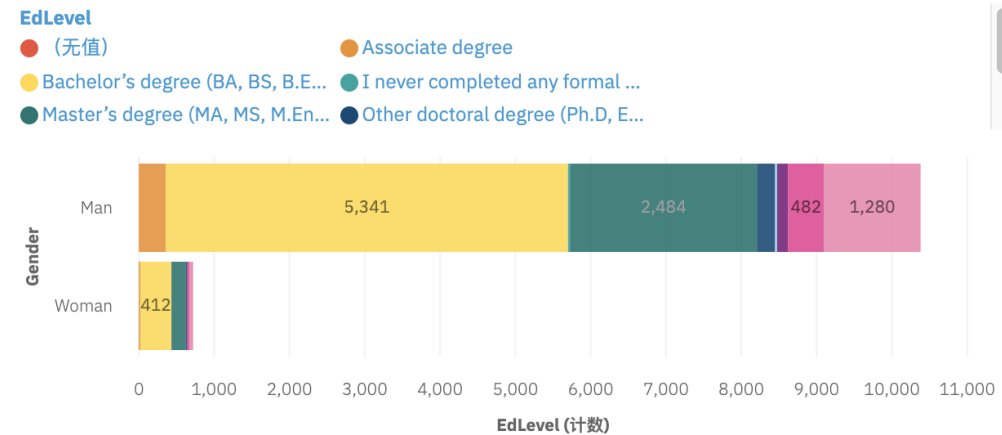
Respondent Count for Countries



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

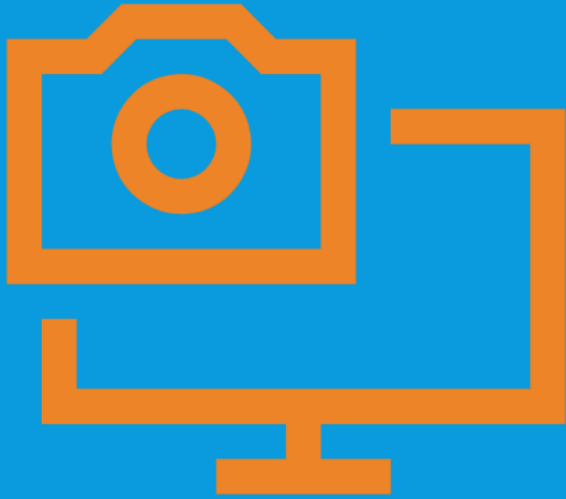
- Some programming languages, databases, platforms and webframes become more popular and more developers desire to use at work.
- Some still stay at mainstream positions i.e. JavaScript language, MySQL database, Windows platform however their quantities of respondents desire to use decrease.
- The changes 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

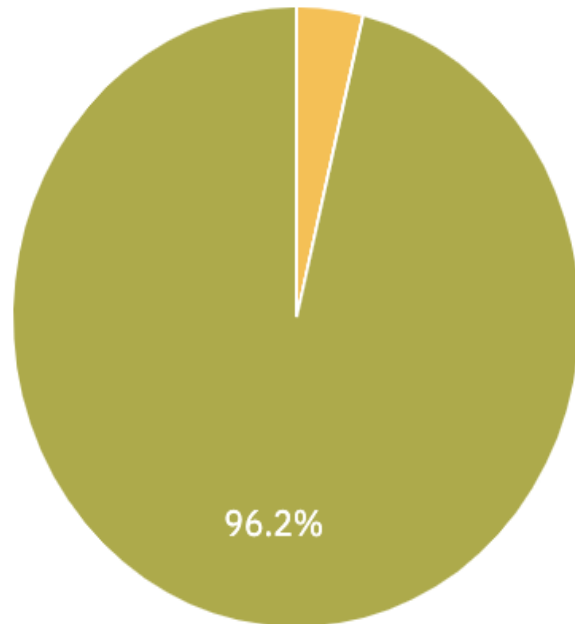


- Demographics
- Github jobs posting
- Popular languages

APPENDIX - DEMOGRAPHICS (EMPLOYMENT AND UNDERGRADUATE MAJOR DISTRIBUTION)

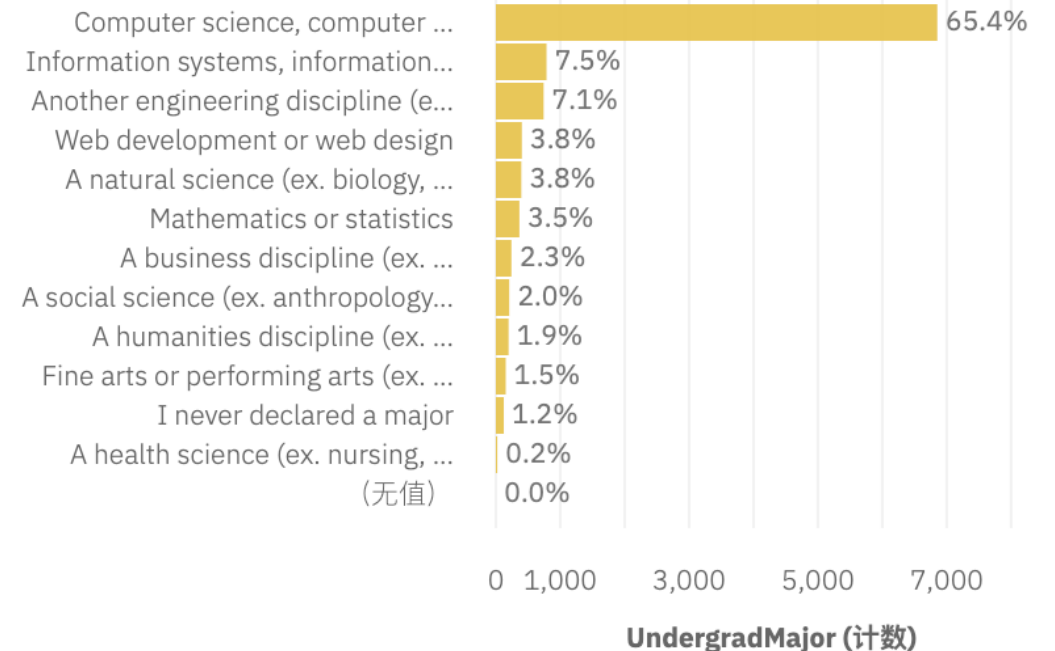
Employment

● Employed part-time ● Employed full-time



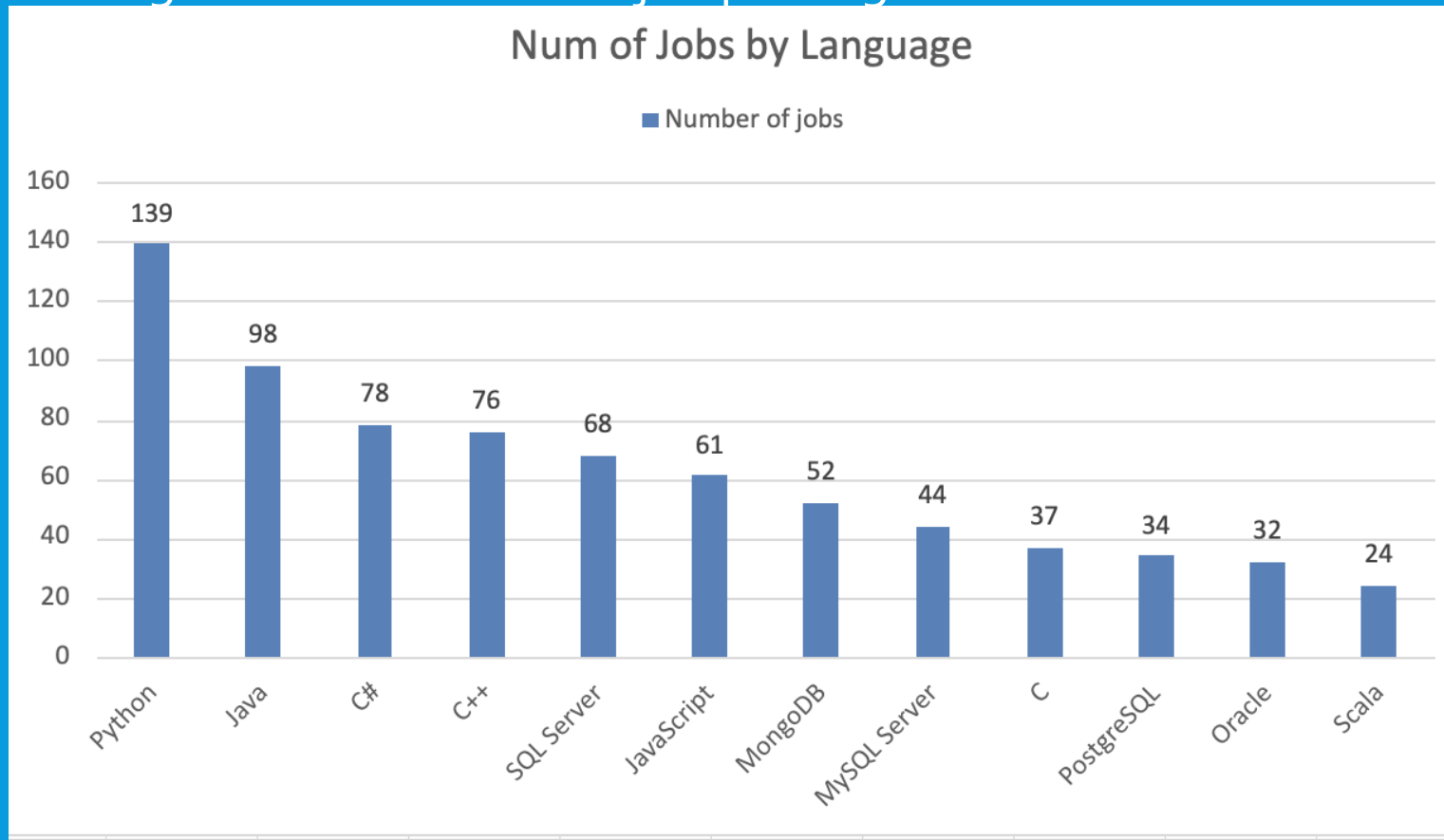
Undergrad_Major

UndergradMajor



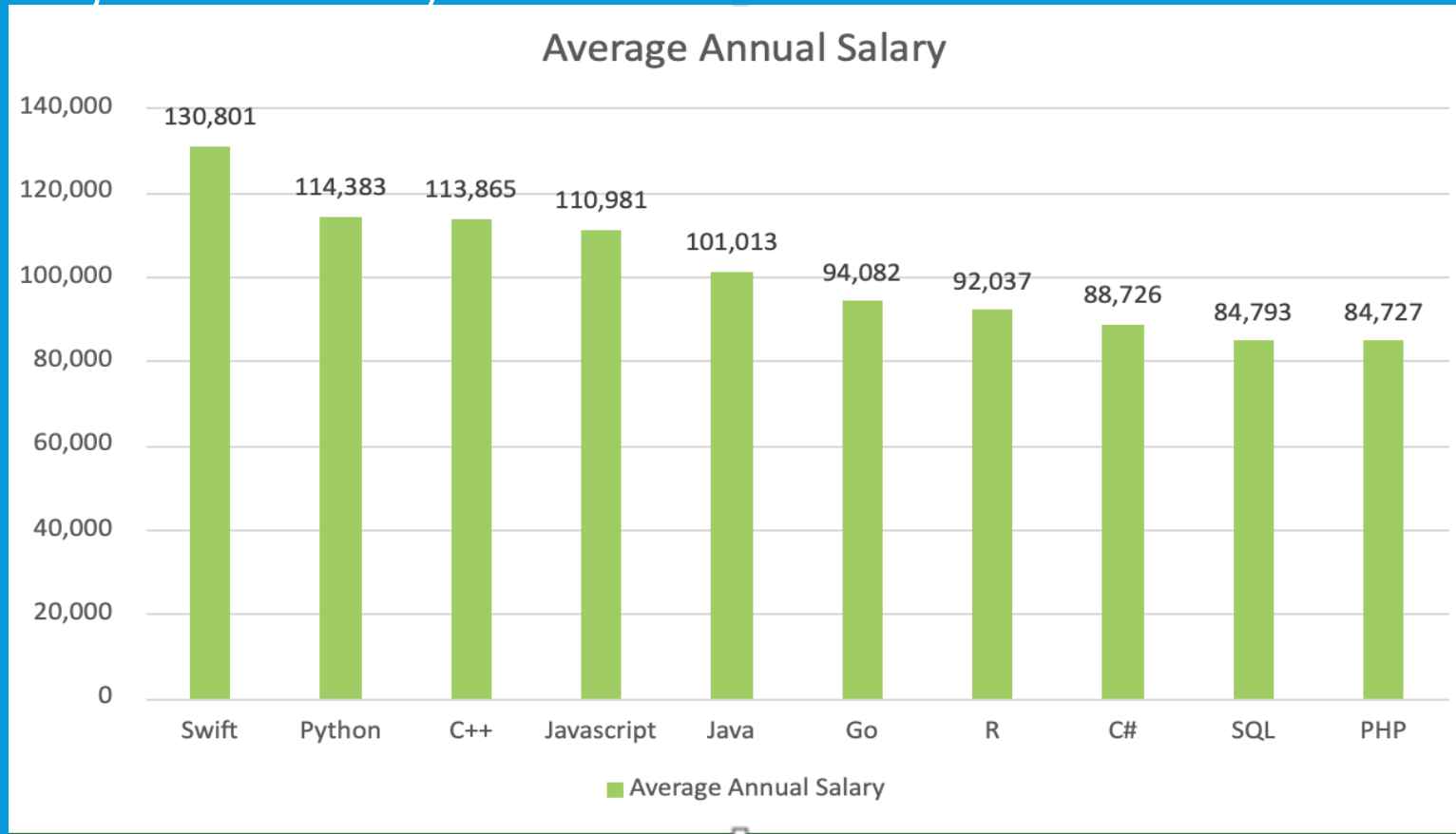
GITHUB JOB POSTINGS

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!

