



ANALYSIS IN CURRENT & FUTURE TECHNOLOGY TRENDS

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EXECUTIVE SUMMARY



- ▶ **JavaScript** ranked as the top programming language
 - ▶ Remain its position for desired language for next year
 - ▶ Most recommended programming language
- ▶ **HTML/CSS, SQL** and **Python** are also some of the preferred skills to learn as they ranked at high positions for current and future year
- ▶ **PostgreSQL, MongoDB** and **MySQL** are among the top database skills desired
 - ▶ Ranked within top 5 for current and future year
- ▶ **PostgreSQL** and **MongoDB** are more recommend as these two ranked the highest for database skills to learn in future year

INTRODUCTION



- This report is about collecting data from various sources to identify, analyze and visualize trends for current and future year report based on emerging skills.
- This report can be a reference for college students, data analysts, IT or business consulting services firms that desire to keep pace with the changing technologies and to remain competitive in the job market.
- A reader will be able to identify future skill requirements particularly based on top programming languages and database skills in demand through this report.

METHODOLOGY



- ▶ Various data sources were used in collecting data for this project
 - ▶ Stack Overflow Developer 2019 Survey
 - ▶ GitHub Job Postings
 - ▶ Programming Languages Annual Salary
- ▶ Data is collected by applying web scraping on internet websites and accessing APIs
 - ▶ various format such as .csv files, excel sheets and databases
- ▶ When the data is ready, statistical techniques are applied to analyze the data
- ▶ A dashboard is then created using IBM Cognos Analytics

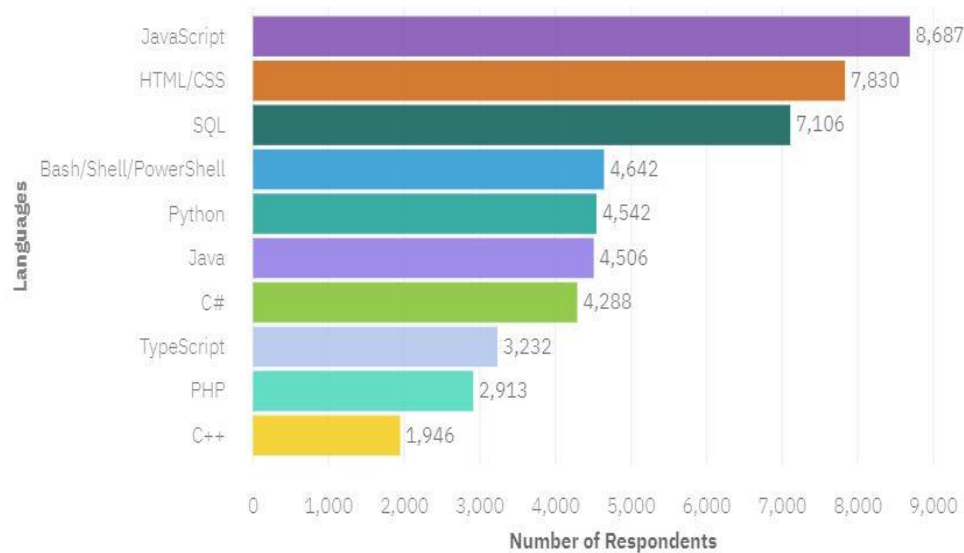
RESULTS



PROGRAMMING LANGUAGE TRENDS

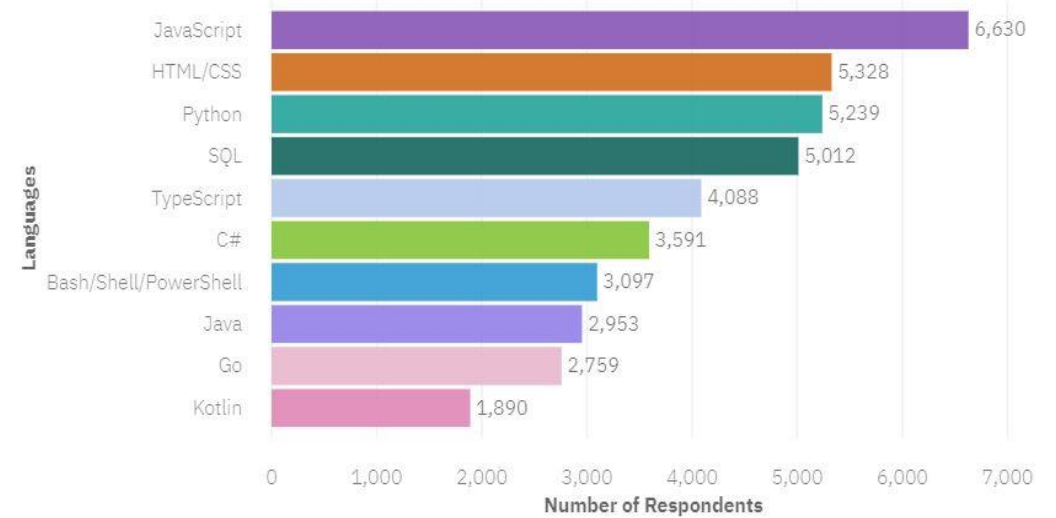
Current Year

Top 10 Languages Worked With



Next Year

Top 10 Languages Desired for Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- ▶ **JavaScript** ranked the highest programming language for current year and remain its position as top 1 for the next year
- ▶ **Bash/Shell/PowerShell** ranked number 4 at current year but move to number 7 in languages desired for next year
- ▶ The demand for **Python** is increasing as it ranked from number 5 in current year to number 3 as the language desired for next year

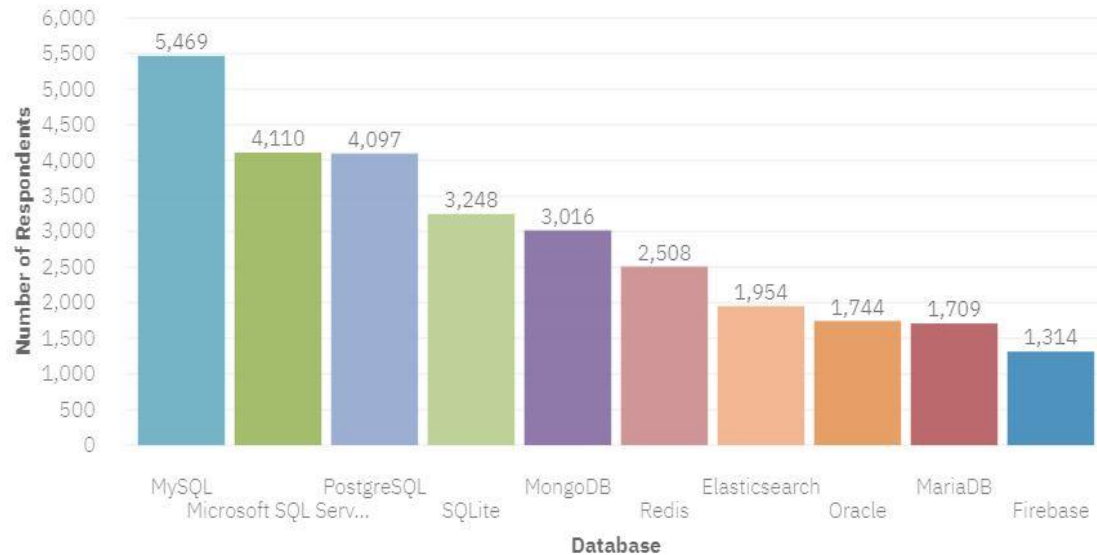
Implications

- ▶ **JavaScript** is the most recommended programming language to learn according to the trend
- ▶ This followed by **HTML/CSS, SQL, Python** and other languages
- ▶ Having knowledge on two or more programming language is preferred as the trends on the skills demand are keep changing

DATABASE TRENDS

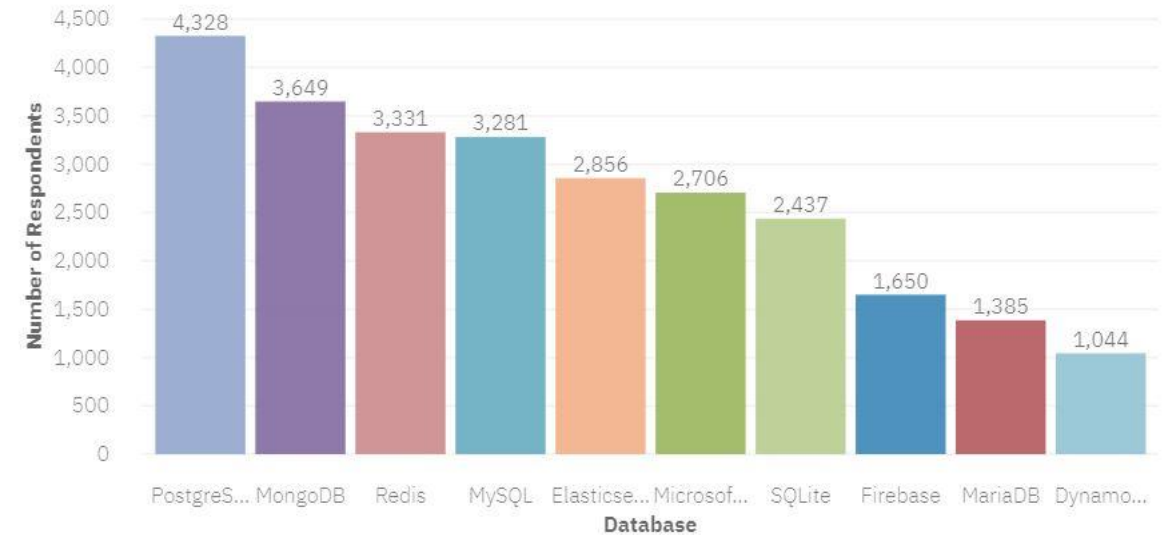
Current Year

Top 10 Databases Worked With



Next Year

Top 10 Database Desired for Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- ▶ Only **MySQL**, **PostgreSQL** and **MongoDB** remained in the top database skills desired to learn for next year
- ▶ The demand for **PostgreSQL** and **MongoDB** increased to become top 1 and top 2 respectively for the database skills needed on next year
- ▶ **Microsoft SQL Server** is at the top 2 database skills for current year but is not included in the top 10 skills desired next year

Implications

- ▶ Priorities may be put on **PostgreSQL** and **MongoDB** as the database skills to master on future year
- ▶ Although **MySQL** is not ranked as top 1 skills desired for next year, but it is still in the top 4 and thus this may imply that it could still be able to make effective contribution to the job
- ▶ Trends for database skills are changing at a very fast rate, it is recommended to know two or more database skills to remain competitive in the job market

DASHBOARD

IBM COGNOS LINK:

[https://dataplatform.cloud.ibm.com/dashboards/
b2115bdb-9f5b-496b-9291-
0c28ee692339/view/731fd7081ba269ef40eab1e40
79b240f7d32775fe7bb820686d67b490d612097a860
4692c87b4b5b8c190763f6ee4008cc](https://dataplatform.cloud.ibm.com/dashboards/b2115bdb-9f5b-496b-9291-0c28ee692339/view/731fd7081ba269ef40eab1e4079b240f7d32775fe7bb820686d67b490d612097a8604692c87b4b5b8c190763f6ee4008cc)

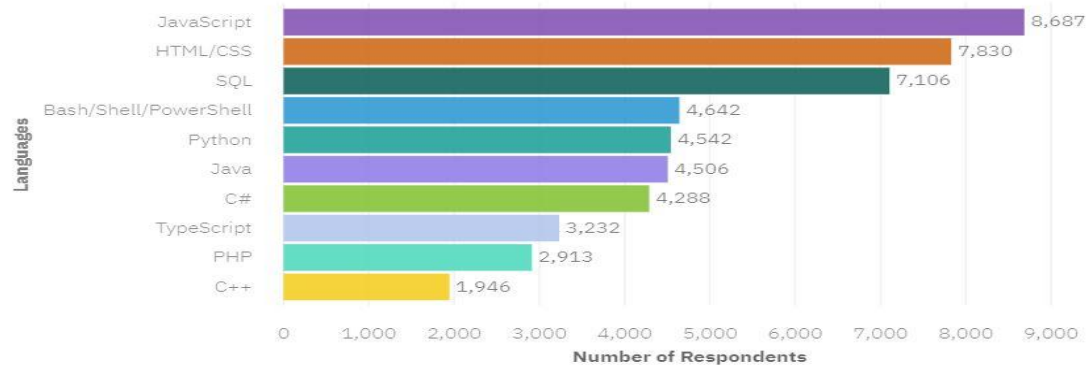
TAB#1 : CURRENT TECHNOLOGY USAGE

Current Technology Usage

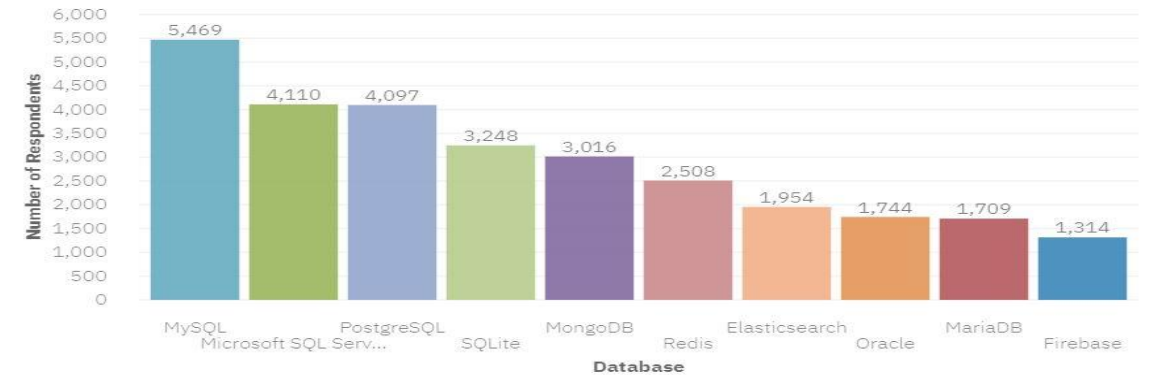
Future Technology Trend

Demographics

Top 10 Languages Worked With



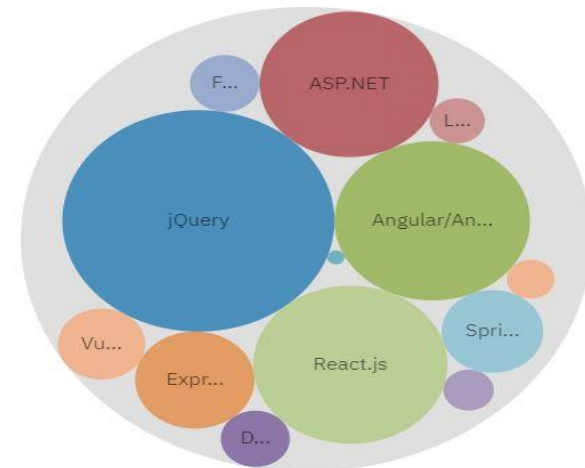
Top 10 Databases Worked With



Platform Worked With



Top 10 Web Frame Worked With



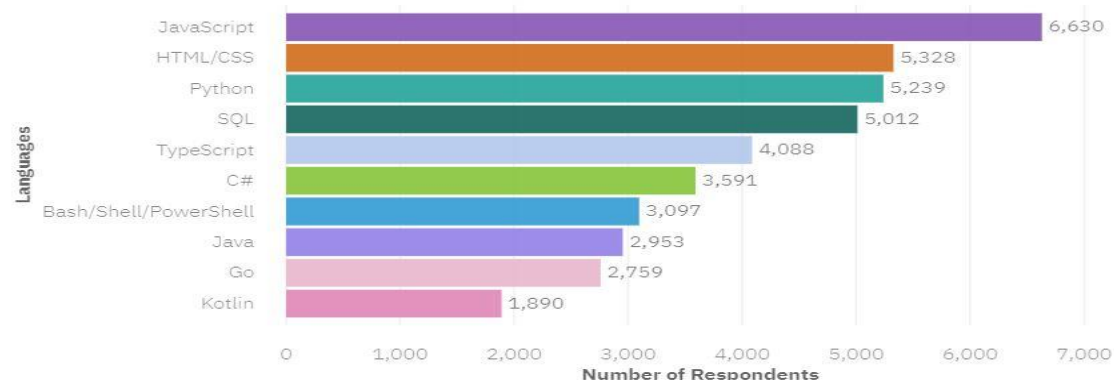
TAB#2: FUTURE TECHNOLOGY TREND

Current Technology Usage

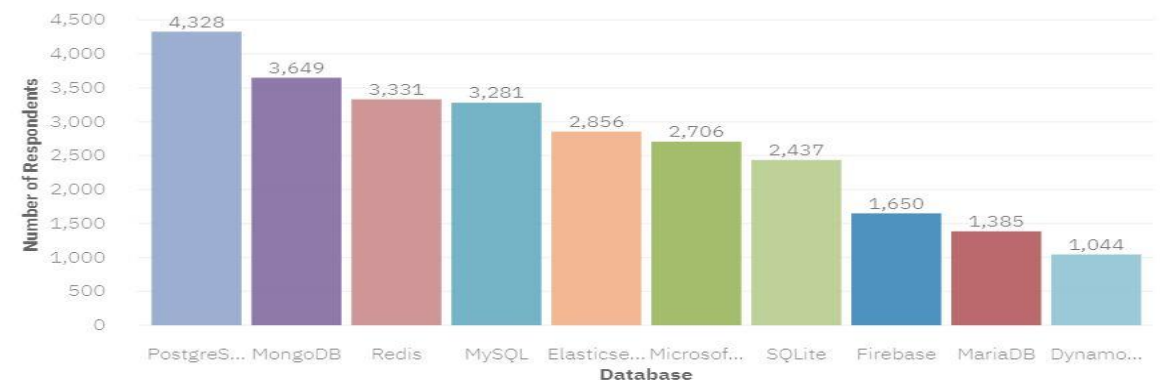
Future Technology Trend

Demographics

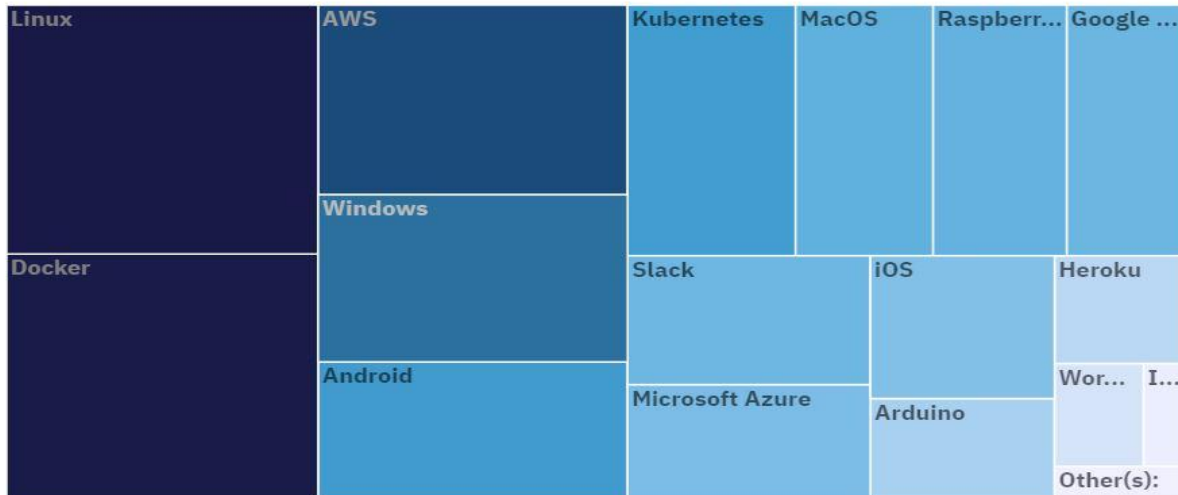
Top 10 Languages Desired for Next Year



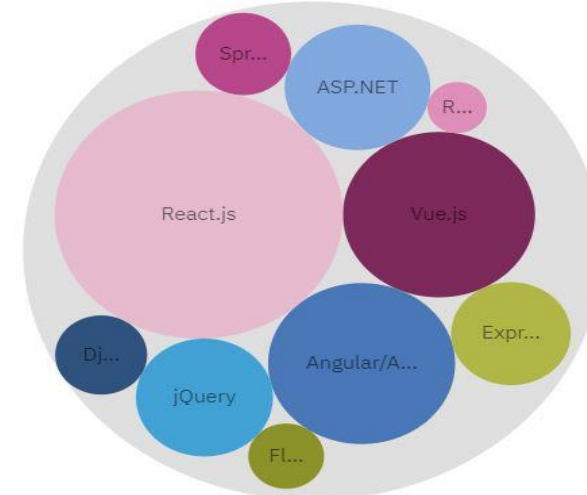
Top 10 Database Desired for Next Year



Platform Desire Next Year



Top 10 Web Frame Desire Next Year



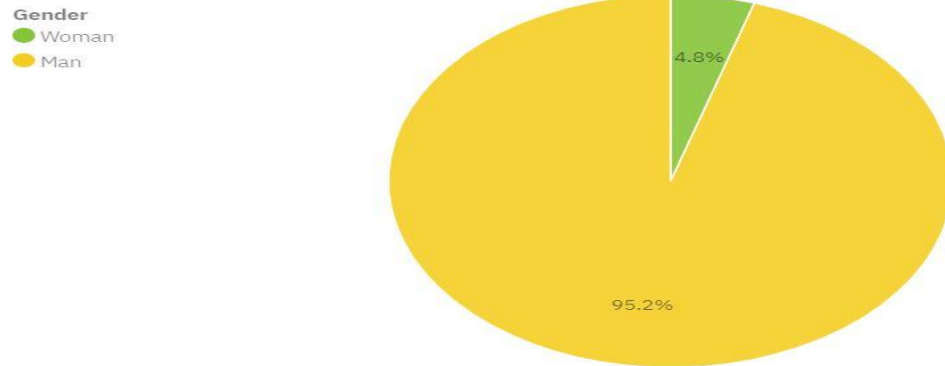
TAB#3: DEMOGRAPHICS

Current Technology Usage

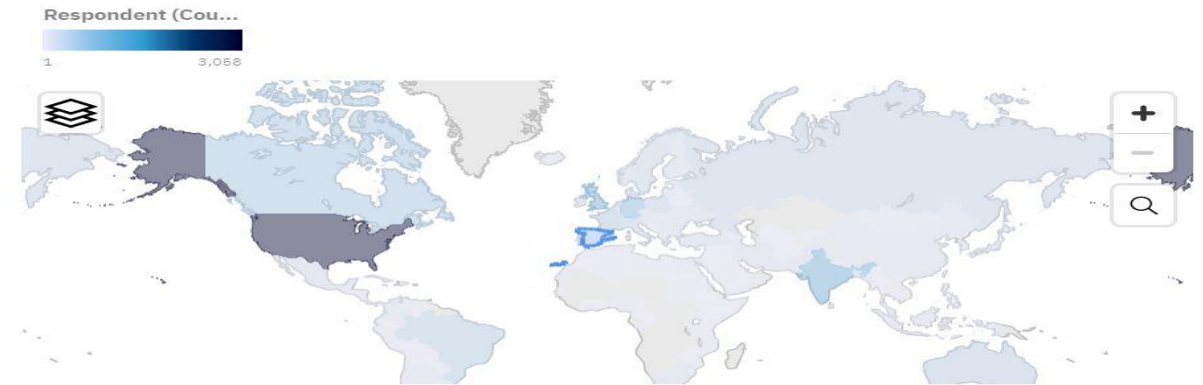
Future Technology Trend

Demographics

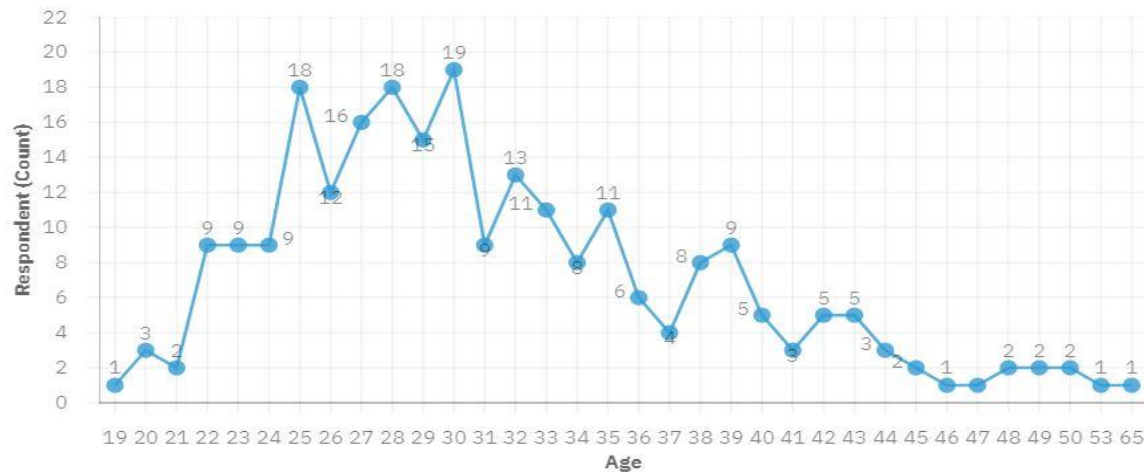
Respondent classified by Gender



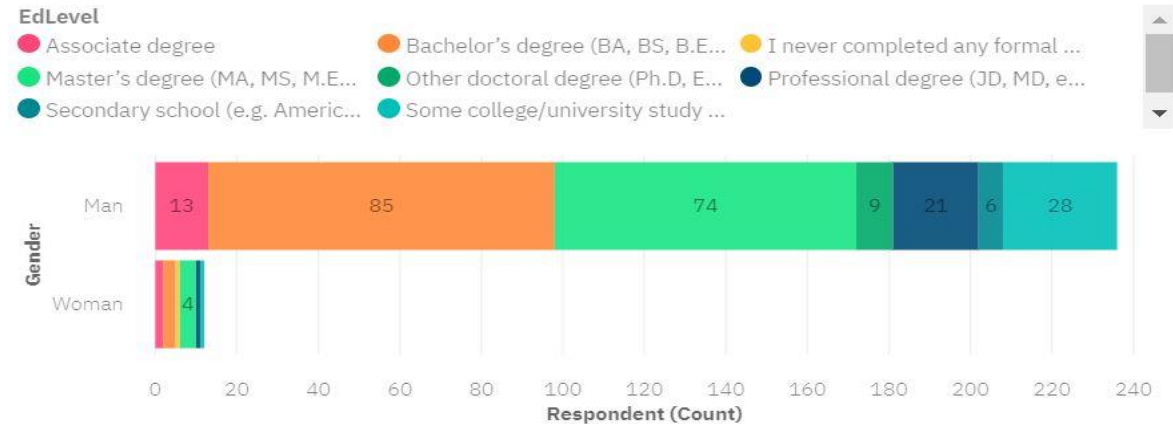
Respondent Count for Countries



Respondent Count by Age



Respondent Count by Gender classified by Formal Education Level



DISCUSSION



OVERALL FINDINGS & IMPLICATIONS

Findings

- ▶ **JavaScript** as the most desired language for current and future year
- ▶ **HTML/CSS, SQL** and **Python** continue to remain among the top 5 languages for future year
- ▶ **PostgreSQL** and **MongoDB** are becoming more desirable database skills to learn on future year
- ▶ Platforms like Docker and AWS are growing

Implications

- ▶ Preferable to have knowledge on multiple languages and database skills to remain competitive in the job market
- ▶ Only one skill will not always reign supreme as the trend on the skills requirement are changing fast
- ▶ Track and do research on the trends regularly to identify the preferred languages and database skills at the time to keep pace with the changing technologies
- ▶ Shift to faster app deployments and cloud services in future

CONCLUSION

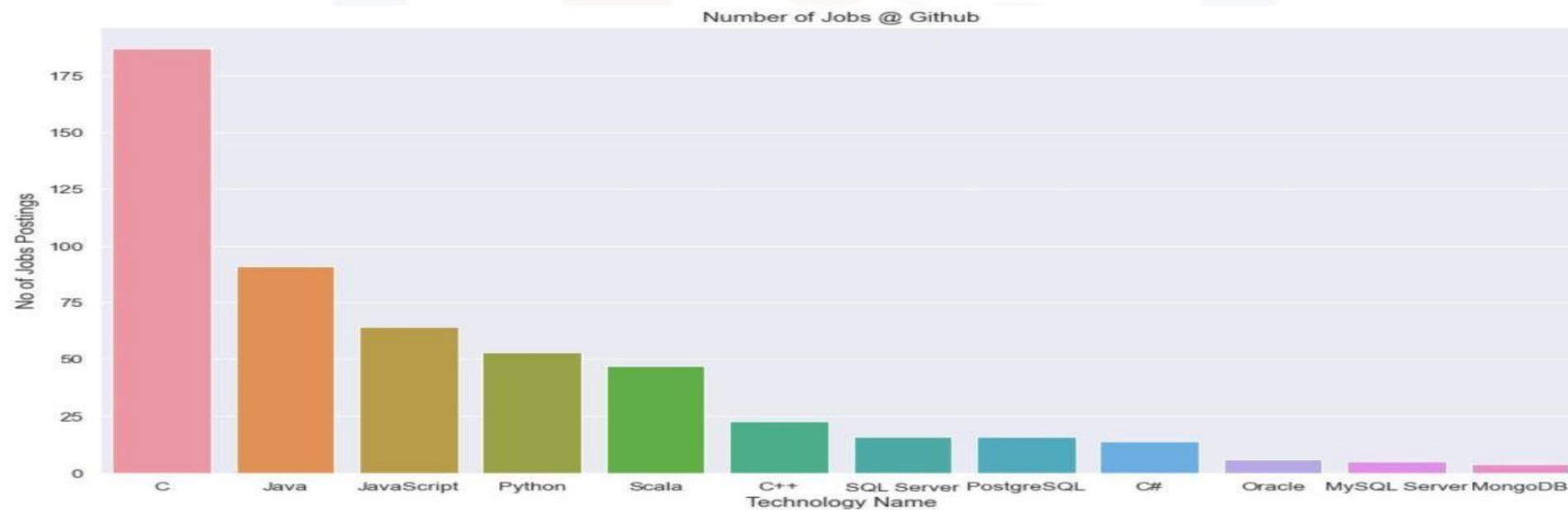


- ▶ Upon completion of this report, the collected data has been analyzed and visualized so that the future skill requirements particularly based on top programming languages and database skills in demand are identified
- ▶ **JavaScript** is the top programming languages in current and desired for future year
- ▶ **PostgreSQL** is the top upcoming database skills desired to learn for the future year
- ▶ In future, incorporate machine learning to predict trends and salaries
- ▶ One should learn multiple language and database skills and always be updated with the current trend of skills requirements
 - ▶ to keep pace with the changing technologies and to remain competitive in the job market

APPENDIX

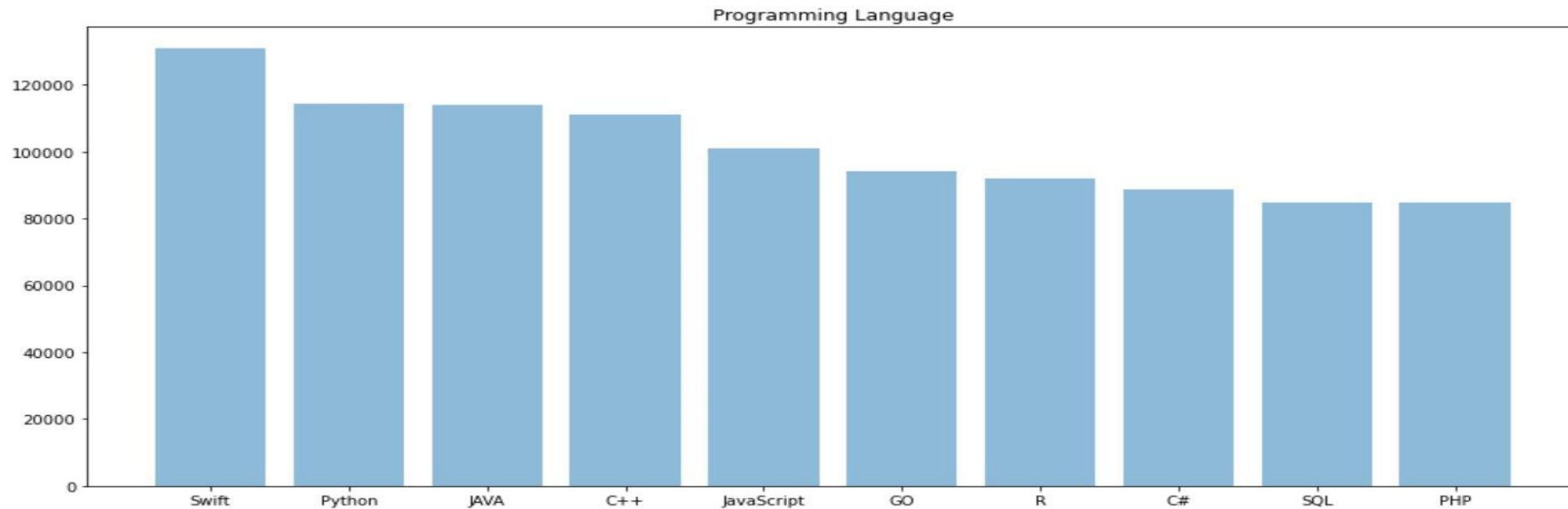


GITHUB JOB POSTINGS



- ▶ Job postings data collected using GitHub API in “github-job-postings.xlsx”
- ▶ C programming has the highest number of jobs posting with amount of 190

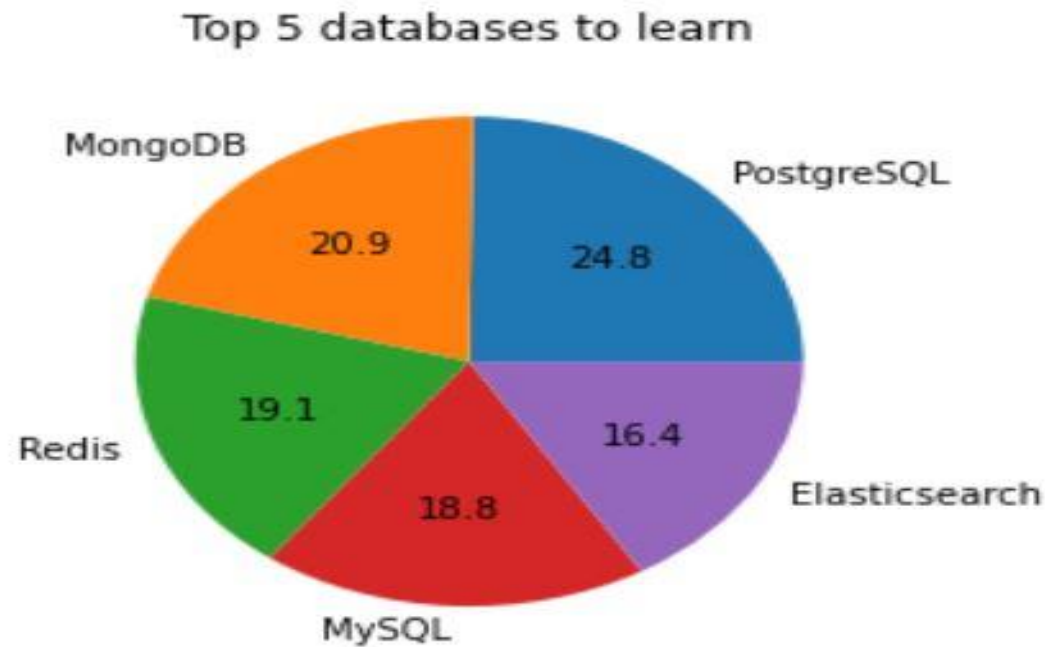
POPULAR LANGUAGES



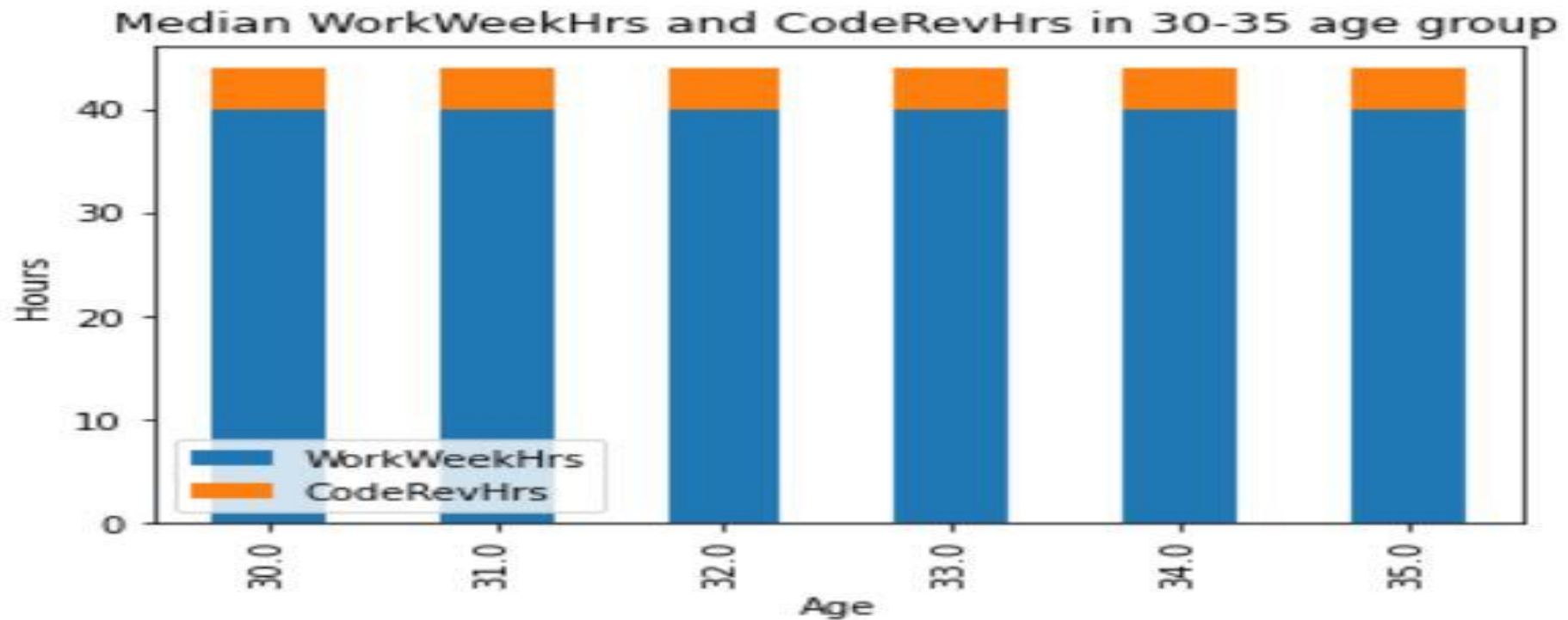
- ▶ Job postings data collected using web scraping in “popular-languages.csv”
- ▶ Swift language has the highest average annual salary with \$130,801

Visualizing composition of data: Pie Charts

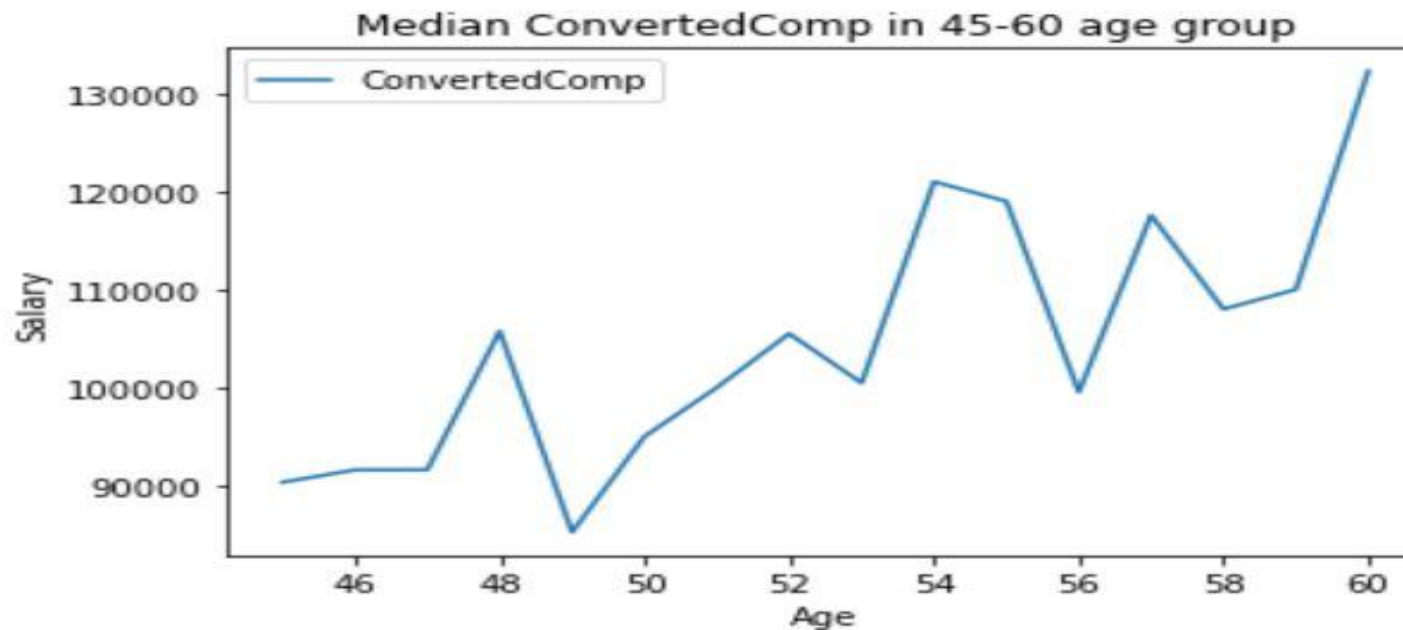
Pie chart of the top 5 databases that “respondents” wish to learn next year



Visualizing composition of data: Stacked Charts



Visualizing comparison of data: Line Chart



ADDITIONAL RESOURCES



- ▶ Documentation for the GitHub Jobs API can be found at <https://jobs.github.com/api>
- ▶ Data scrap from: <https://jobs.github.com/positions.json>
- ▶ Dataset taken from: <https://www.kaggle.com/kyanyoga/sample-sales-data> under **CC0: Public Domain license**
- ▶ Database file: https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m4_survey_data.sqlite
- ▶ https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.htm



*Thank
you*