TECHNOLOGY TRENDS AND ANALYSIS

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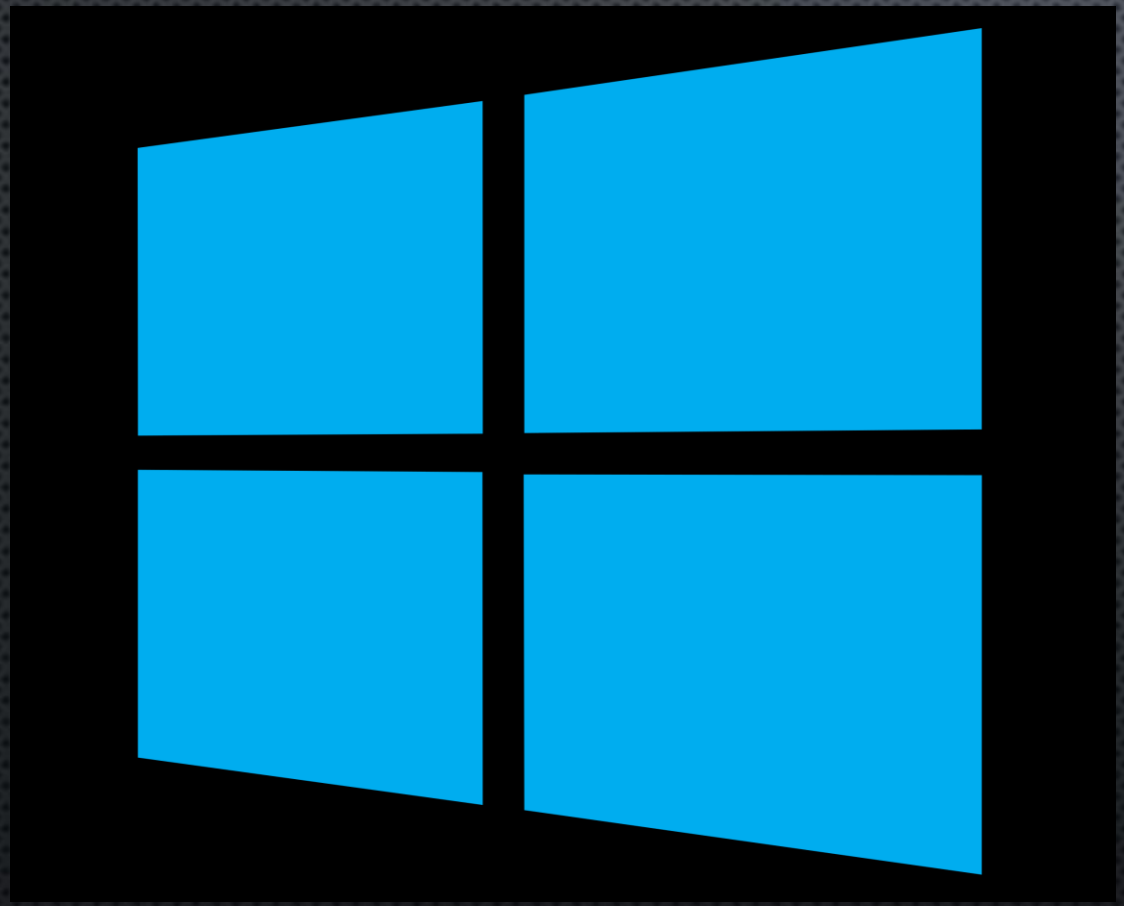
OUTLINE



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

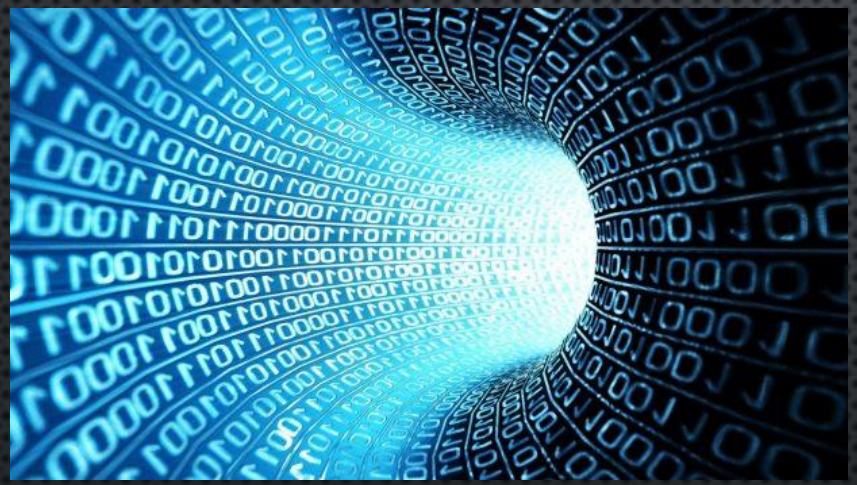
Executive Summary

- The relevant skills required for the IT and consulting fields are constantly changing.
- The importance of identifying future skills requirement is growing and to remain competitive these skills need to be identified as early as possible.
- This presentation will showcase current and future trends for Programming Languages, Databases, WebFrames and Platforms.
- The overall aim is to identify future trends and thus assisting in data driven decisions.

INTRODUCTION

- *This presentation is based on current and future trends in Programming Languages, Databases, WebFrames and Platforms from surveys done by IT professionals in various fields.*
- *The presentation will help identify future trends to aid in the ever changing global IT environment.*
- *Recommendations will be made based on the findings of the analysis of the surveys.*

METHODOLOGY



- Data Collection - API
- Data Collection - Webscraping
- Data Wrangling
- Exploratory Data Analysis
- Data Visualization
- Cognos Dashboard

Data Collection - API

- Data was collected using an API to obtain a modified data set pertaining to Job listings
- From the data set, Locations and number of listings were then extracted and stored in a *.xlsx* file
- The job listing provided various key data points such as:
    - Job title
    - Key Skills
    - Location
    - Salary

Data Collection - Webscraping

- The method of webscraping was used to obtain a table from the skill based network website.
- The data was then parsed using BeautifulSoup and set into a DataFrame.
- The data collected from the table included programming language and annual salary.
- The data was then stored in a .csv file format.

Data Wrangling

- The objectives for data wrangling were:
    - Identify duplicate values in the dataset.
    - Remove duplicate values from the dataset.
    - Identify missing values in the dataset.
    - Impute the missing values in the dataset.
    - Normalize data in the dataset.

- Duplicate value were identified and removed.
- Missing values were identified and replaced.
- Normalization of data were done for columns pertaining to Compensation Frequency and Compensation Total, a new columns was created to show the annual Compensation from the previously mentioned columns. This was done for comparison.

Exploratory Data Analysis

- The objectives for exploratory data analysis were:
  - Identify the distribution of data in the dataset.
  - Identify outliers in the dataset.
  - Remove outliers from the dataset.
  - Identify correlation between features in the dataset.

- Distribution chart and histograms were created to illustrate the distribution of the data.
- Outliers were identified using a box plot and then were removed.
- The correlation between Age and other variables were calculated.

Data Visualization

- Using SQL queries, data was extracted from an online database and then used to visualize the findings.

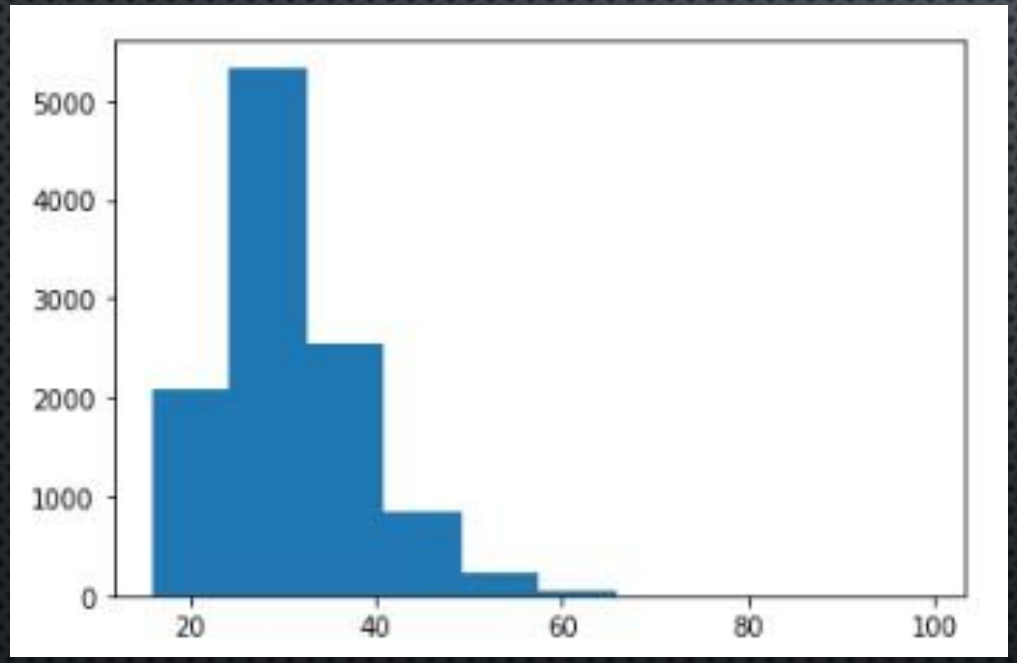
- The data was visualized using the following charts:
    - Histograms
    - Box plot
    - Scatter plot
    - Bubble plot
    - Pie chart
    - Stacked chart
    - Line plot
    - Bar chart

Cognos Dashboard

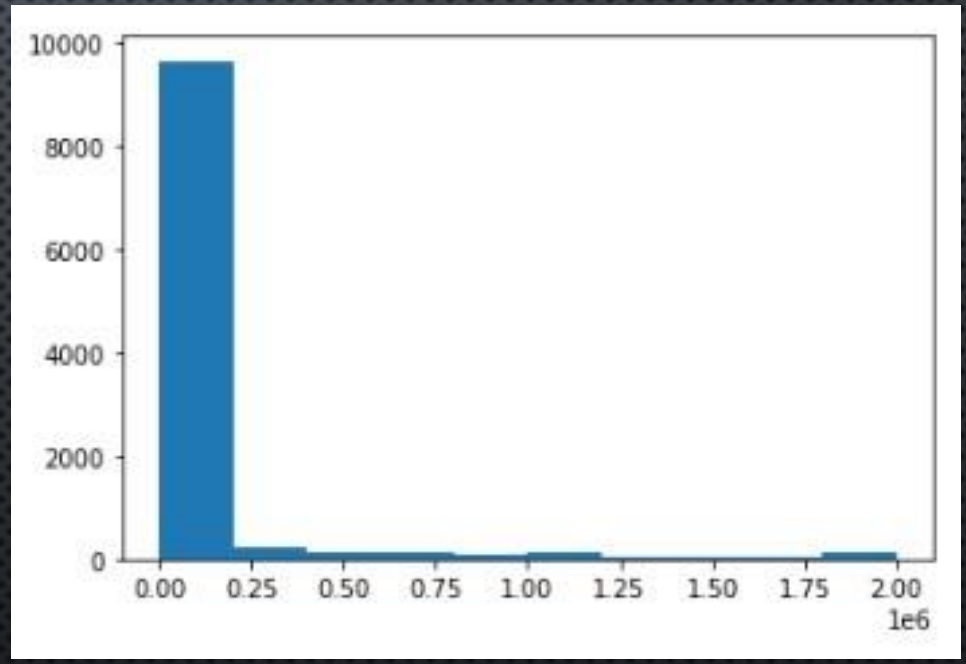
- A Cognos dashboard was created and various charts were generated to illustrate the relationships.
- Current trends were visualized for Programming language, Platform, Databases and Webframes.
- Future trends were visualized for Programming language, Platform, Databases and Webframes.
- Demographic data was also visualized for Programming language, Platform, Databases and Webframes, based on gender for comparison.

RESULTS

Exploratory Data Analysis

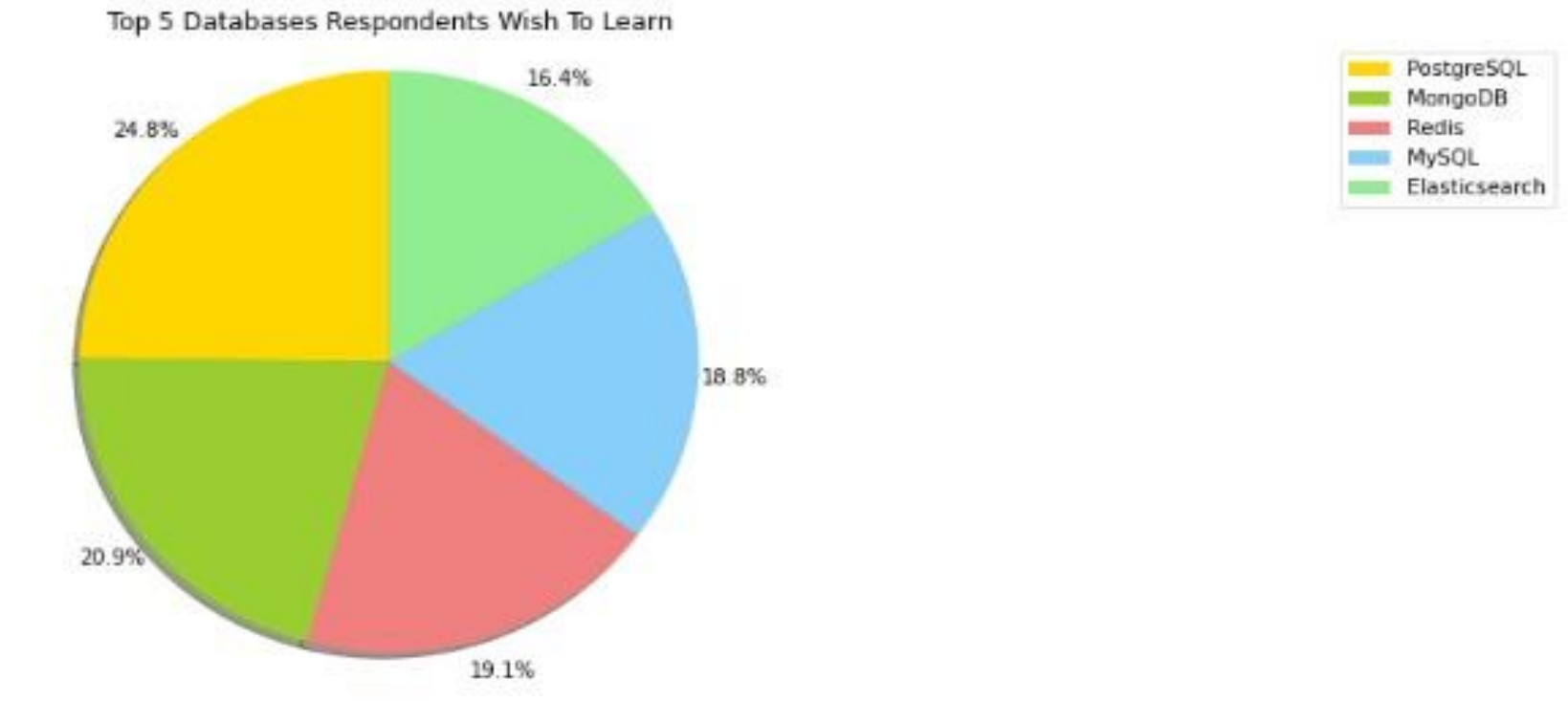


Age distribution chart, showing majority of participants are aged between 20 and 40.



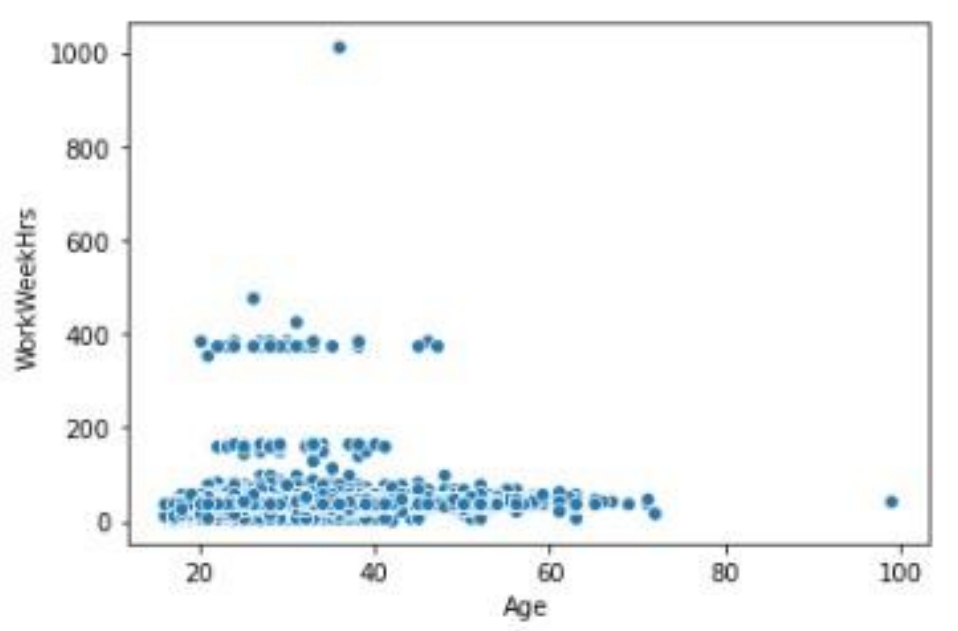
Compensation distribution, showing majority of participants earned between $0 and $250,000 annually.

DATA VISUALIZATION

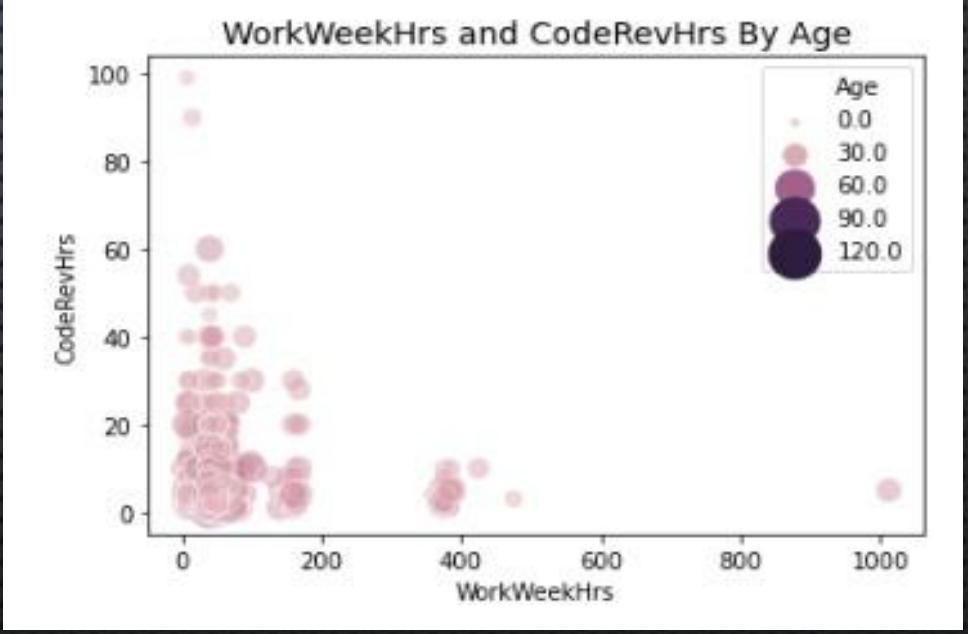


Pie Chart, showing the top 5 Databases respondents wish to learn. It indicates that PostgreSQL is the most desired Database.

DATA VISUALIZATION



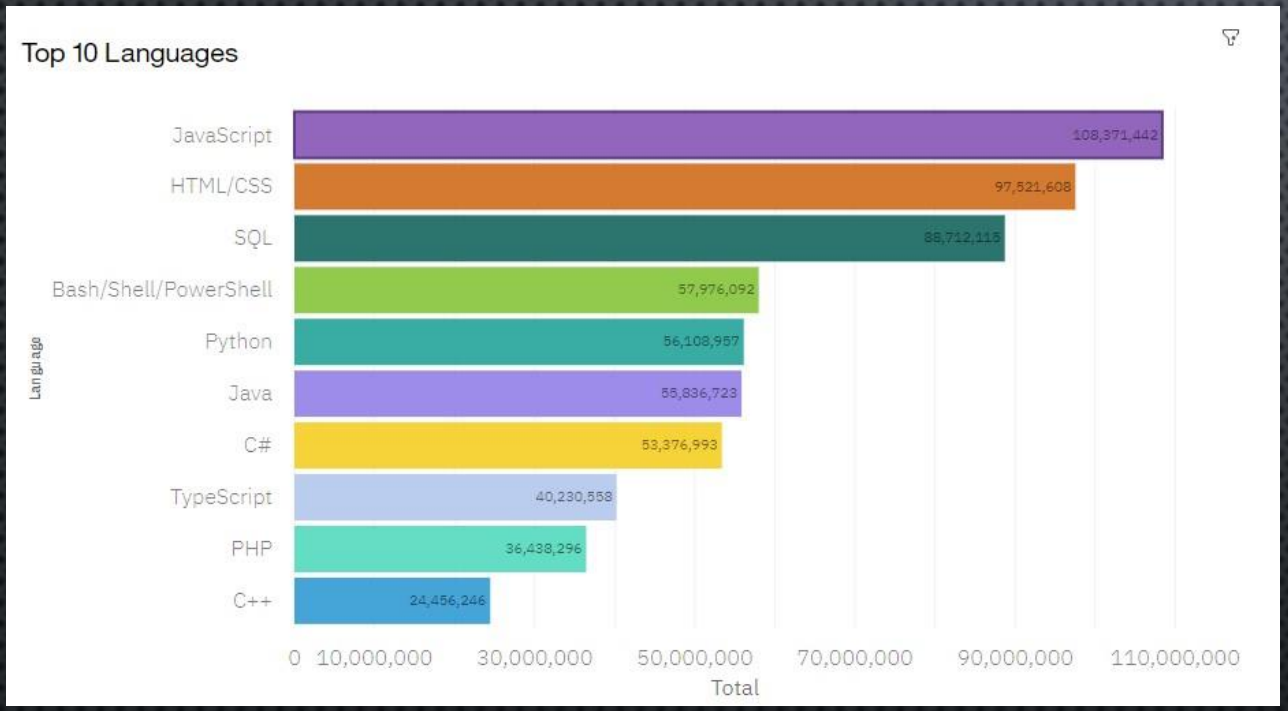
Scatter plot, showing Work hours per week for each Age group. There is no clear trend.



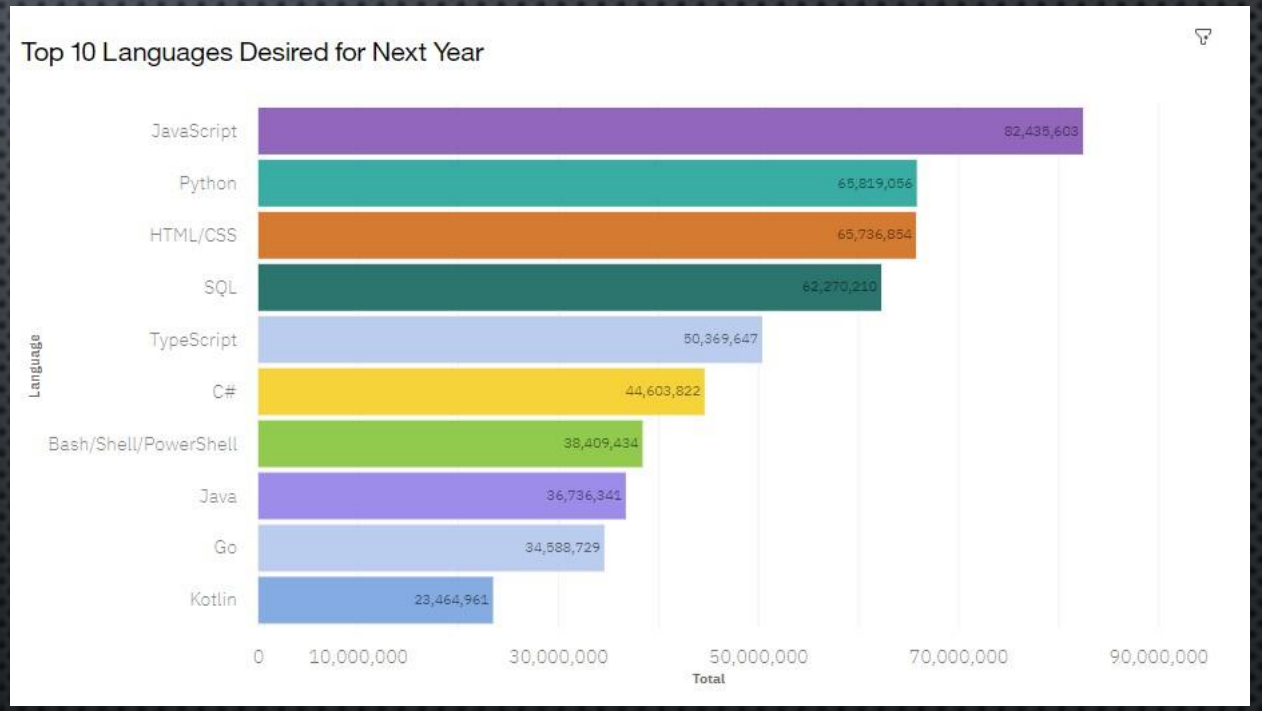
Bubble plot, showing Code review hours compared to Work hours per week. Age is used to determine the size.

PROGRAMMING LANGUAGE

Current Year



Next year



The top 10 programming languages for current and future trends are shown above. JavaScript remains the top programming language, but Python moved up to the 2nd most desired language.

Programming Language Trends - Findings & Implications

Findings

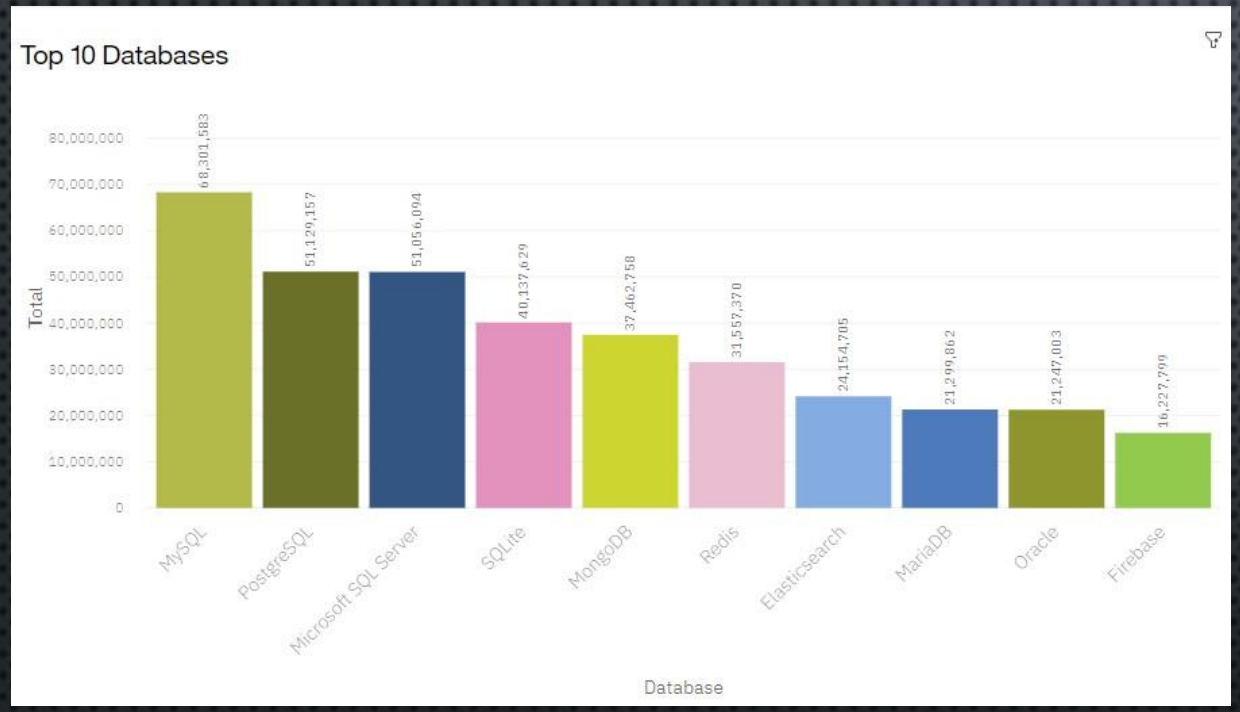
- JavaScript, HTML/CSS and SQL are the current top 3 this year.
- Python and TypeScript are desired for next year.
- PowerShell is losing interest.

Implications

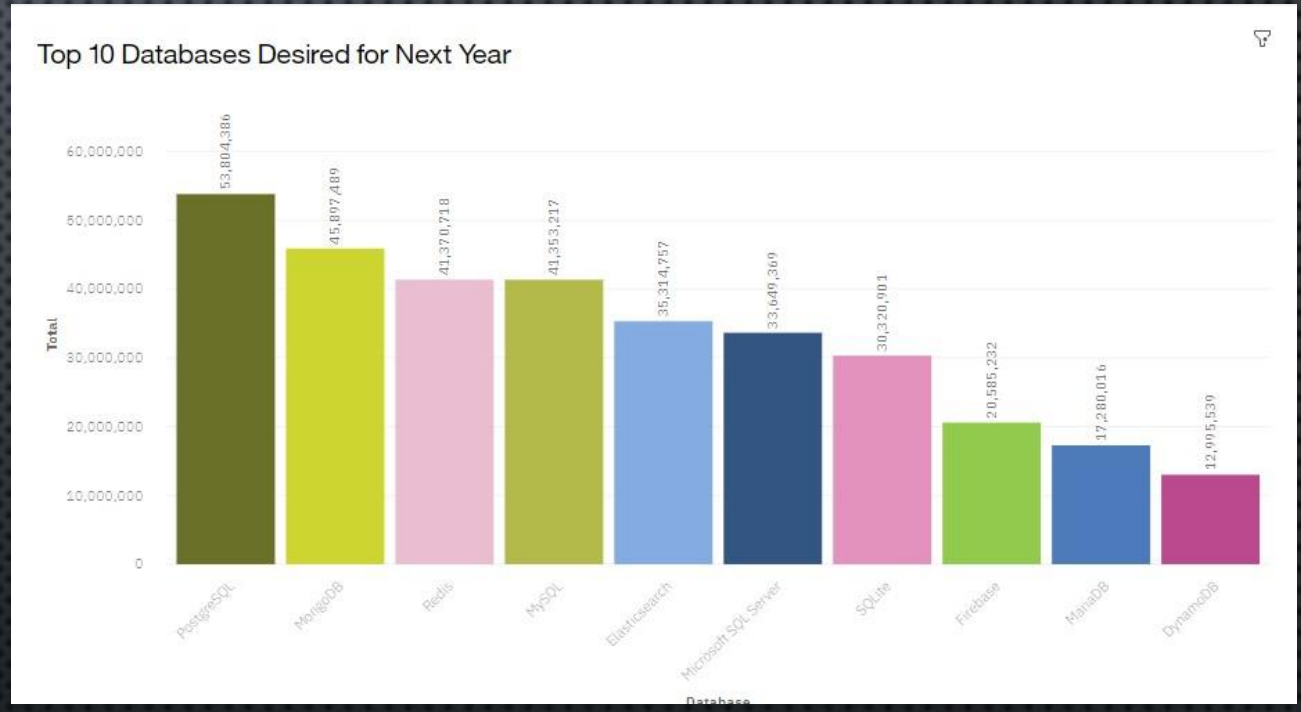
- Web Development is in high demand.
- With the continuous rise of Big Data, SQL remains prevalent.
- AI and Machine Learning's emergence results in higher demand for Python.

DATABASE

Current Year



Next year



The top 10 Databases for current and future trends are shown above. MySQL is the current top, but the top desired databases are PostgreSQL, MongoDB and Redis.

Database Trends - Findings & Implications

Findings

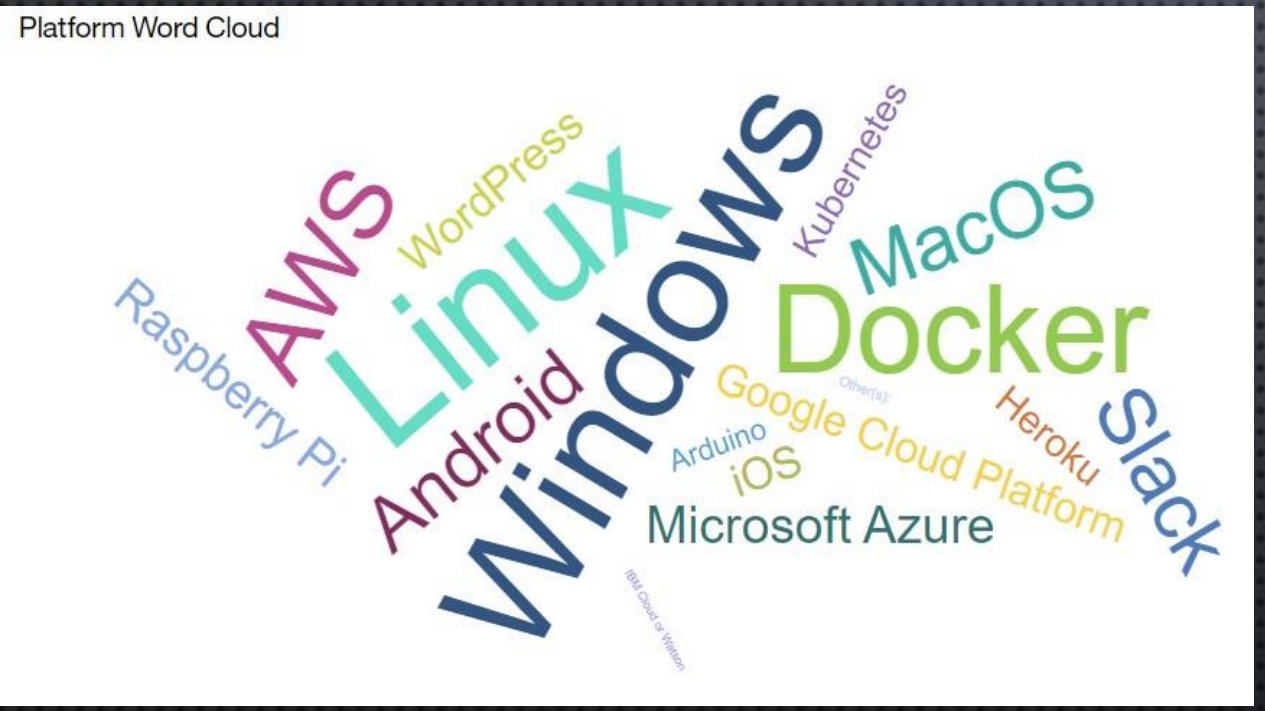
- MySQL, PostgreSQL and Microsoft SQL Server are the top 3.
- Postegre, MongoDB and Redis are the most desired.
- Elasticsearch has seen a rise in demand.

Implications

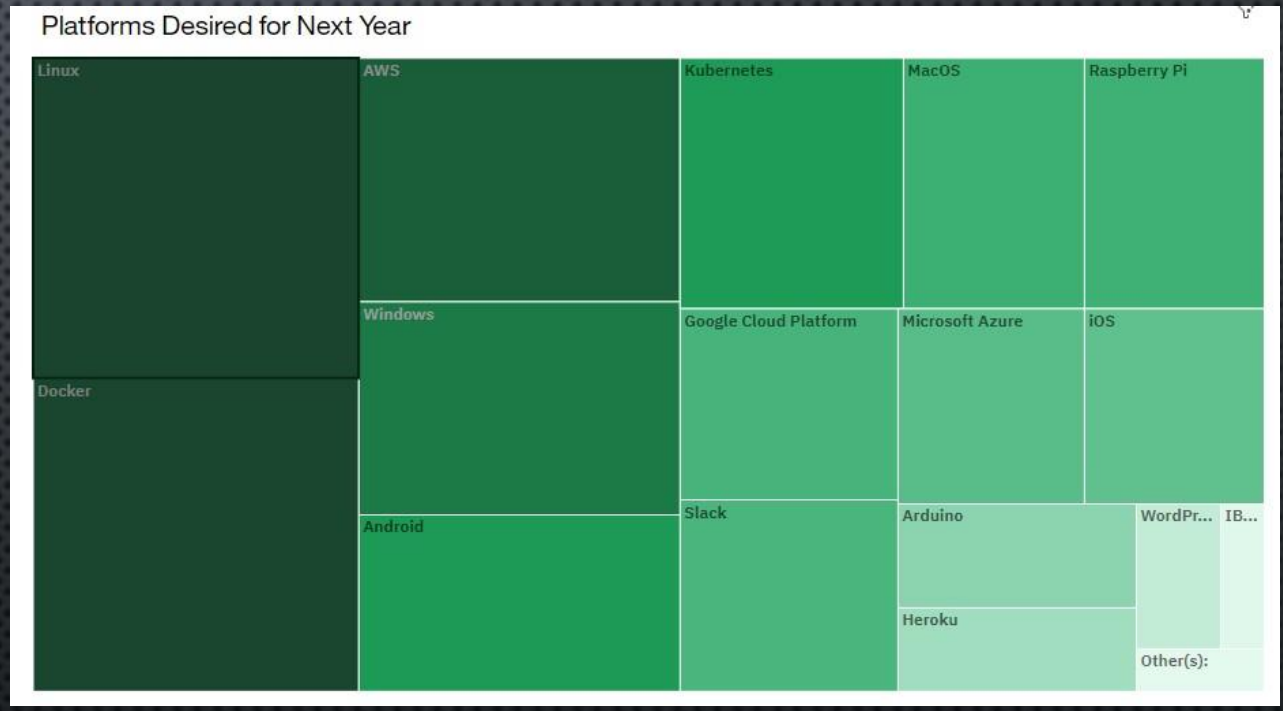
- Open-source databases are still most popular.
- NO-SQL will make an impact for storing non-relational data
- Redis stores abstract data types.

PLATFORM

Current Year



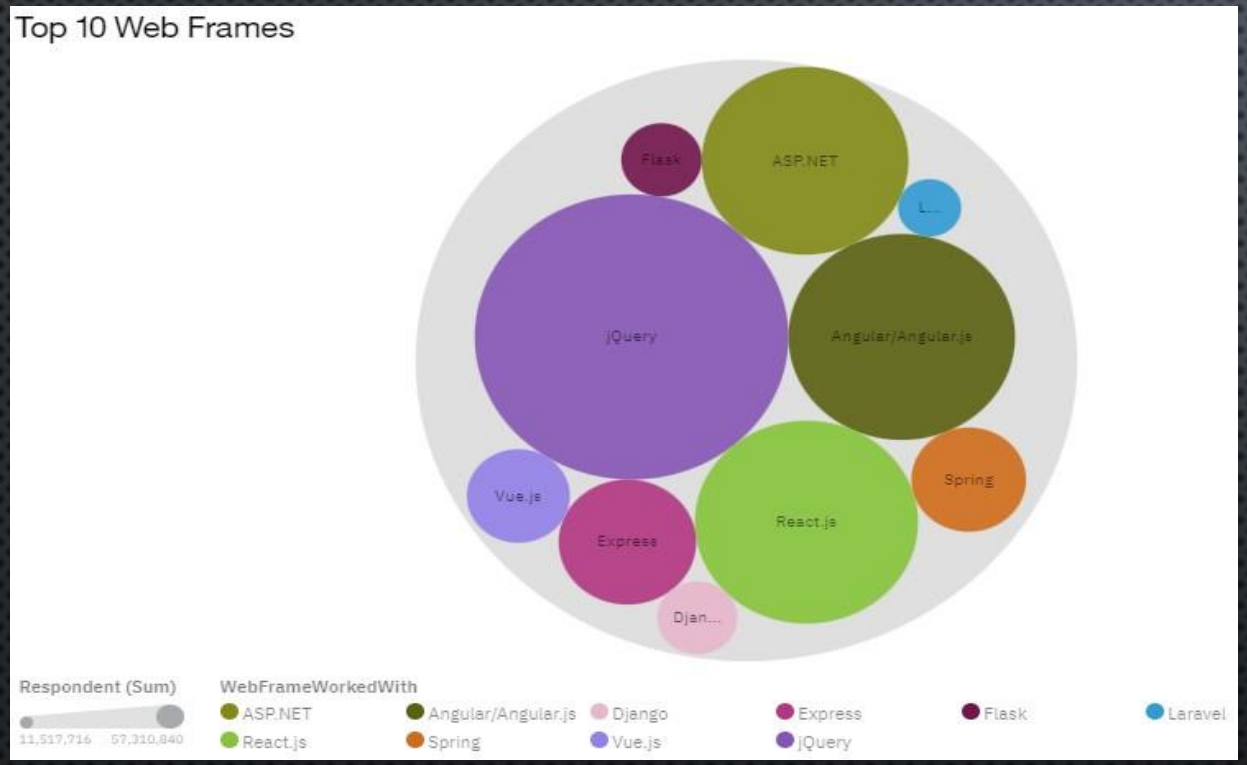
Next year



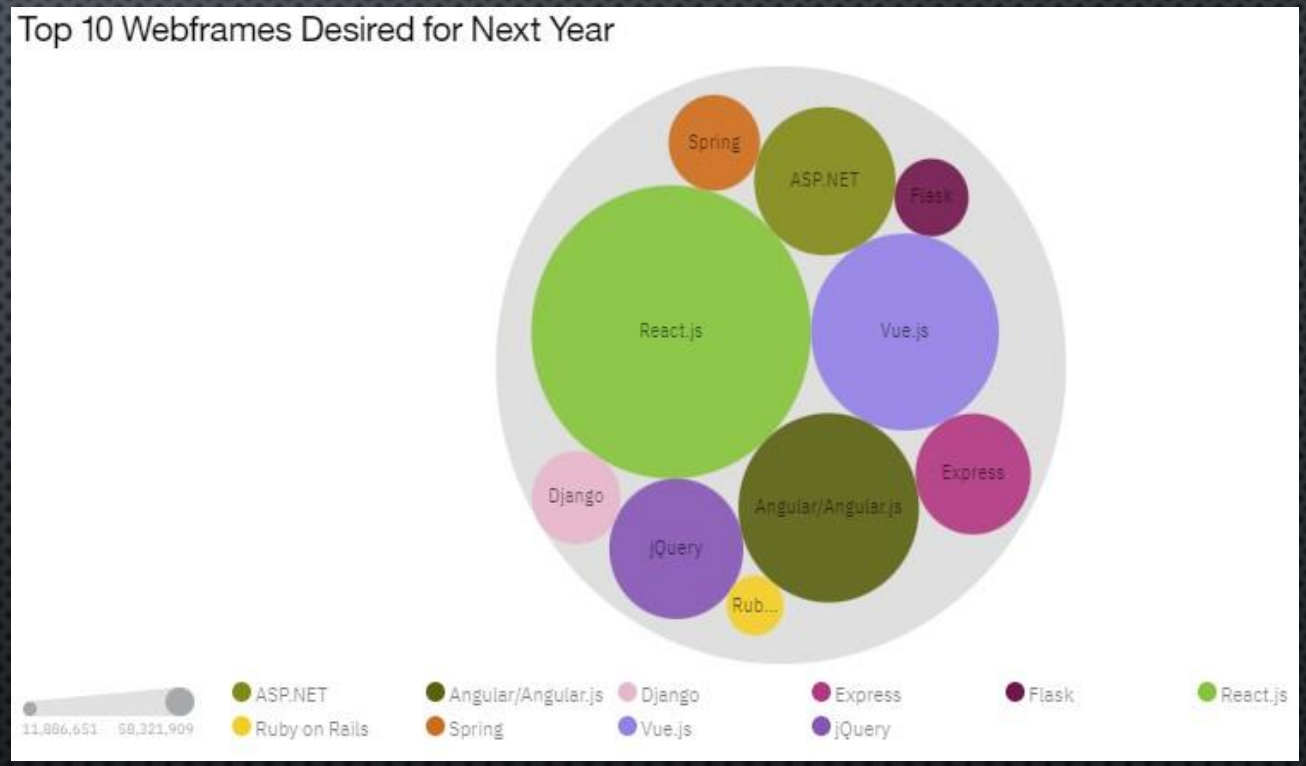
The top 10 Platforms for current and future trends are shown above. Windows is the current top, but the top desired platforms are Linux, Docker, Windows, Android and AWS.

WEBFRAMES

Current Year



Next year

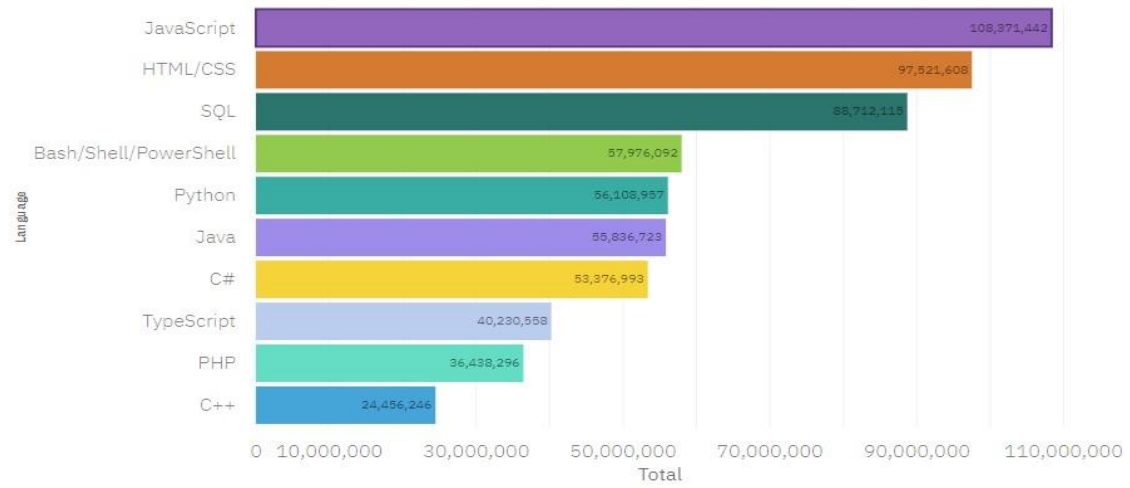


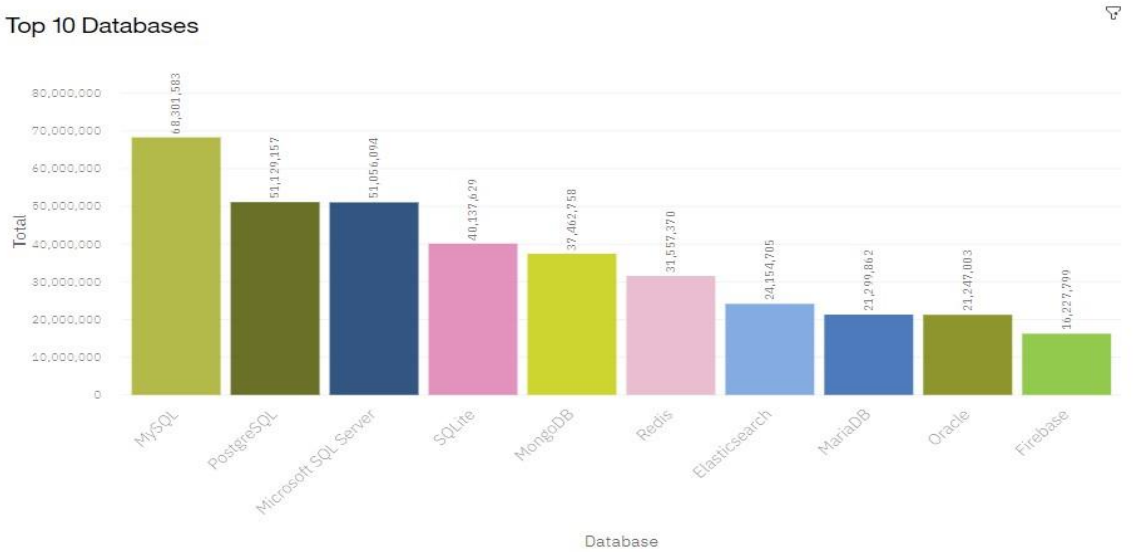
The top 10 WebFrames for current and future trends are shown above. jQuery is the current top, but the top desired WebFrames are React.js, Vue.js and Angular.js.

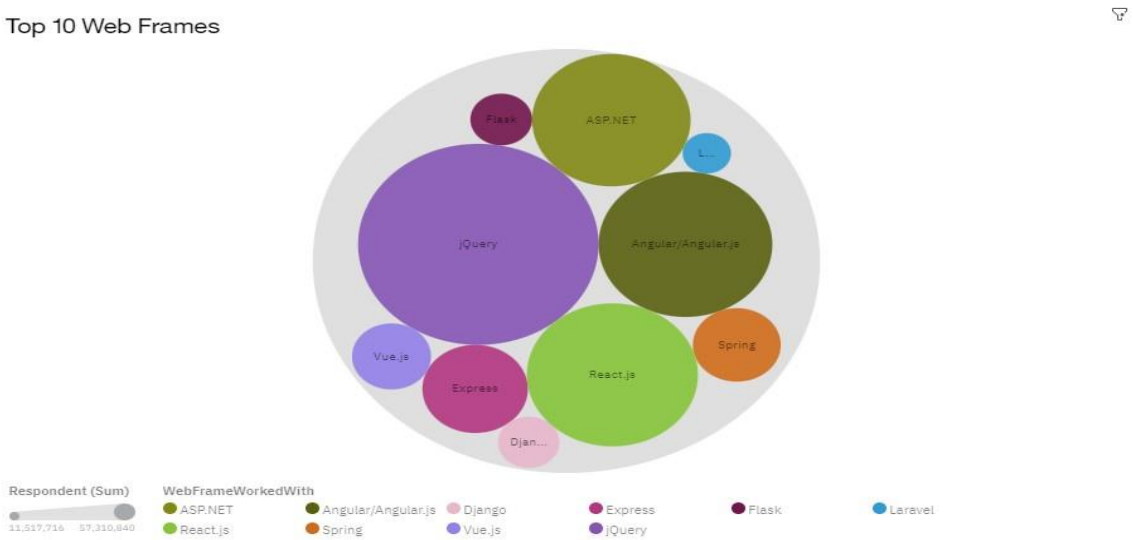
DASHBOARD

https://eu-de.dataplatform.cloud.ibm.com/dashboards/b2ff3522-7744-442d-b058-0153c10210c4/view/7c02c42031e322f563b6d4e407992d0e29342154b0bbd20483817b490a312597a93b1090c82a420e8845016bfbec135e98

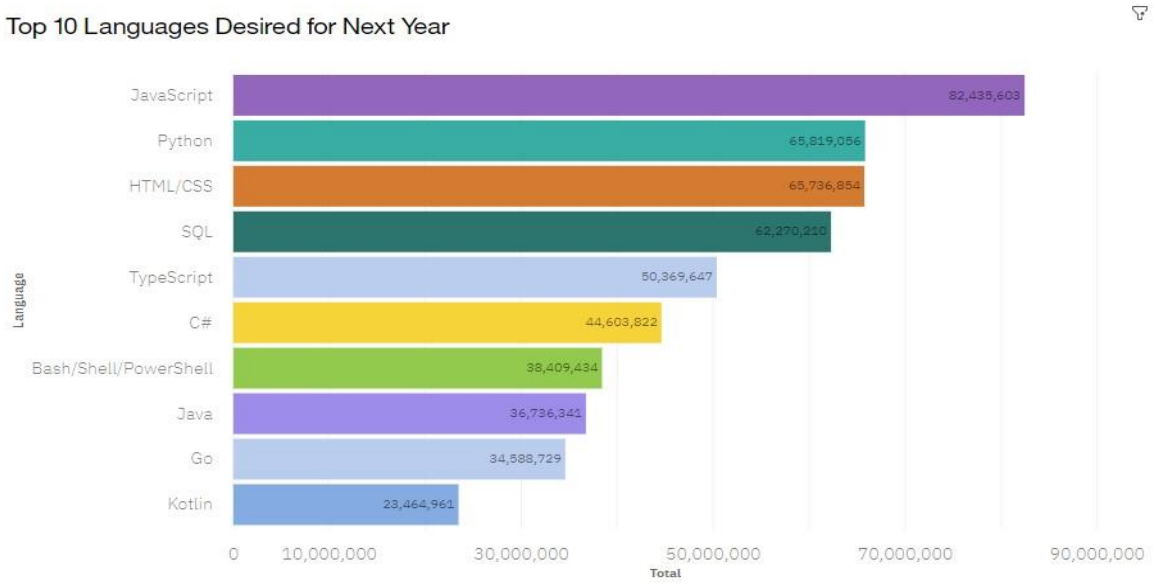
DASHBOARD TAB 1

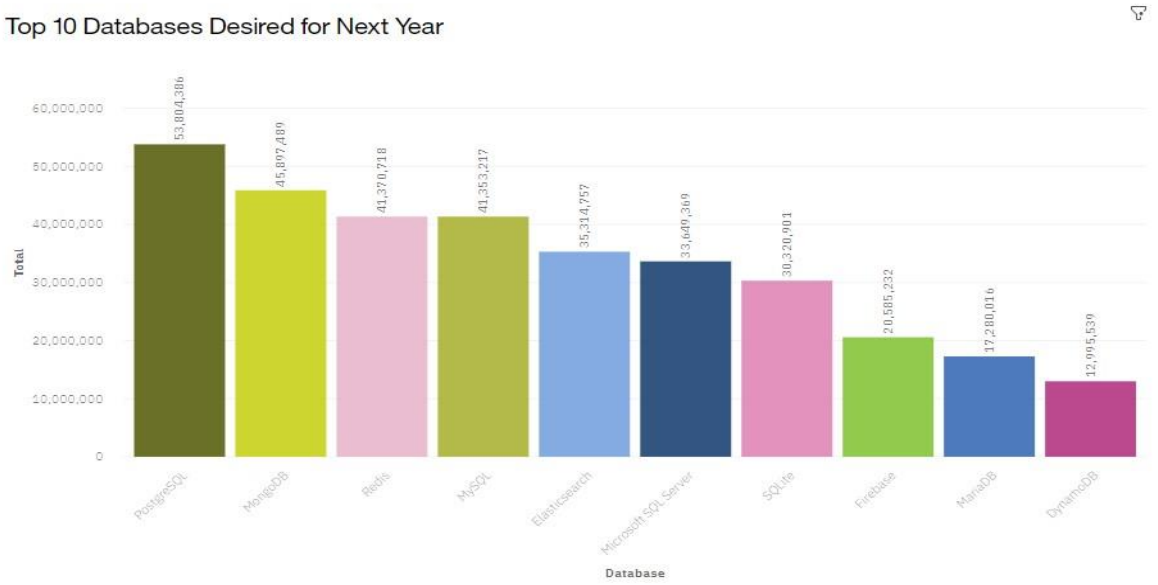


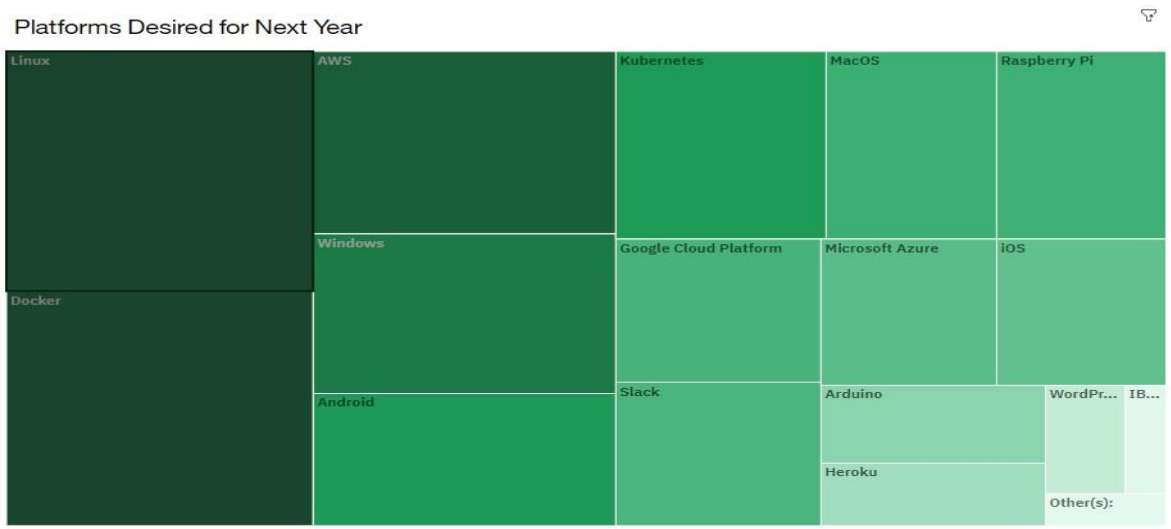


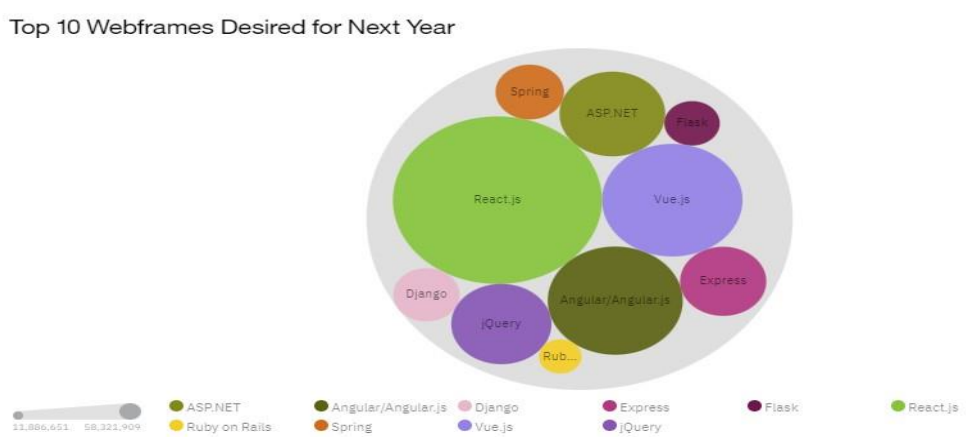


DASHBOARD TAB 2

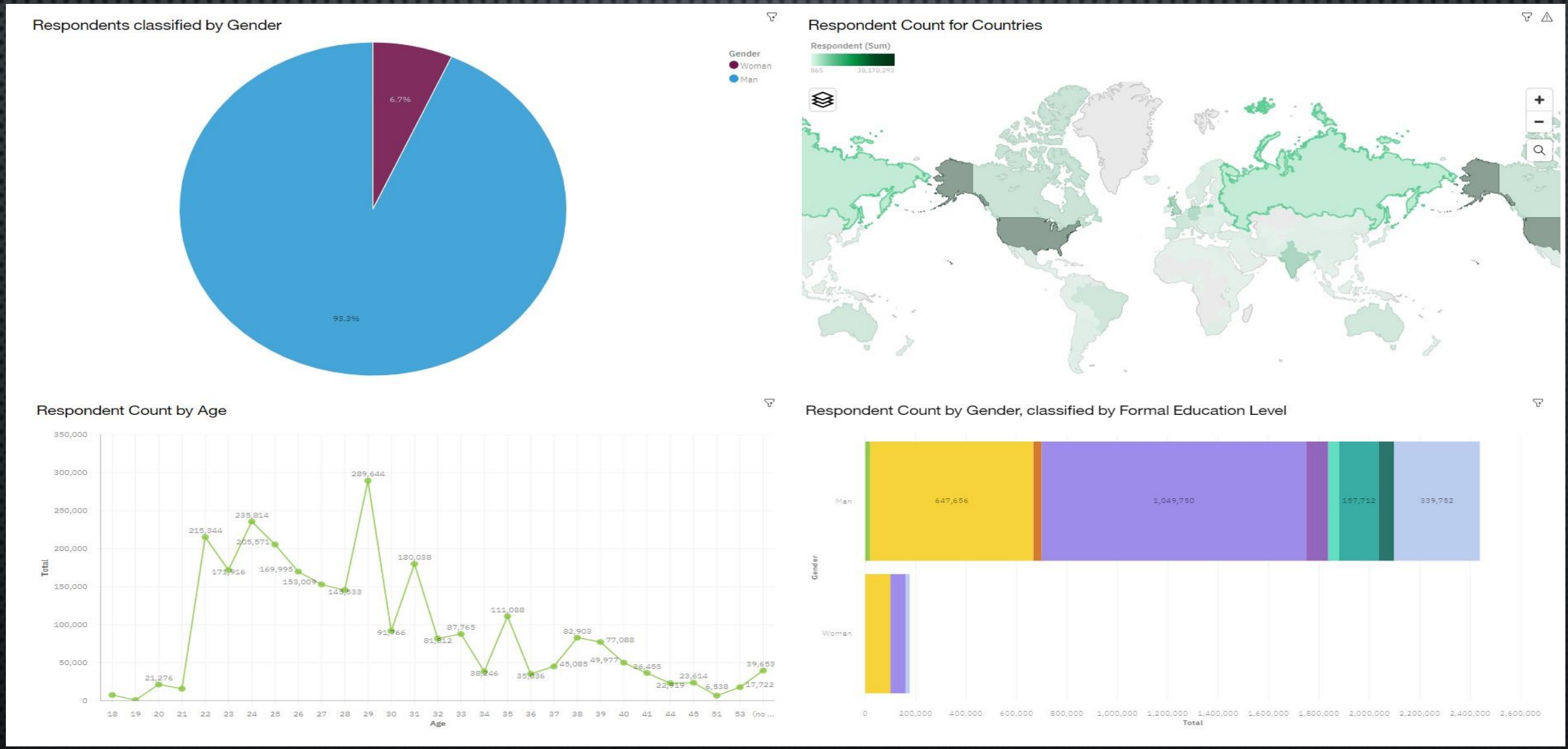








DASHBOARD TAB 3



DISCUSSION

Overall Findings & Implications

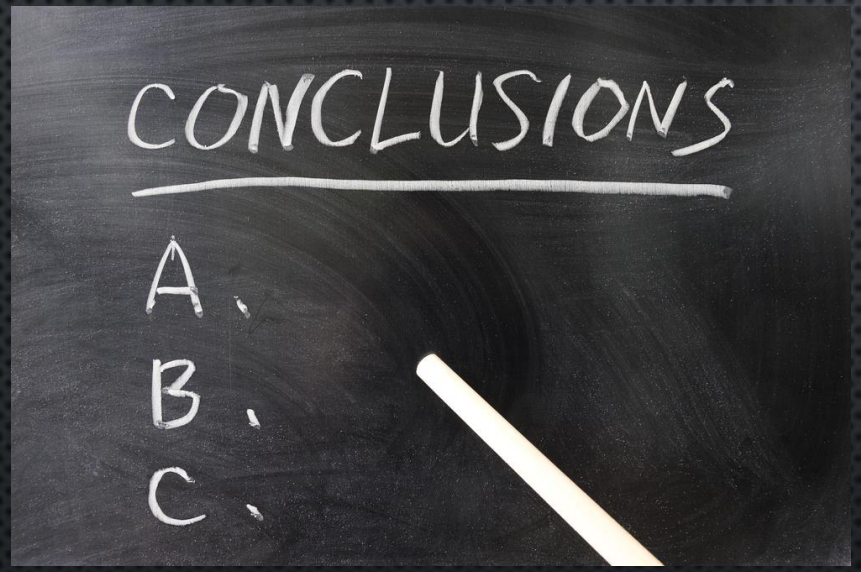
Findings

- Programming Languages – Python continues to grow year by year, Typescript is also gaining momentum.
- Databases – PostgreSQL, MongoDB and Redis are gaining interest.
- Platforms – Windows is dropping significantly and AWS is gaining.
- WebFrames - React.js is continuing to grow and Vue.js is also gaining interest.
- Inequality in Technology field for Women.

Implications

- Companies need to remain flexible and adapt quickly to rapid change
- Employees need to be trained in the mentioned Programming Languages, Databases, Platforms and WebFrames to remain competitive.
- The technology field needs to encourage more women to join the field.
- Job Hirings might be impacted by the constantly changing IT Fields.

CONCLUSION

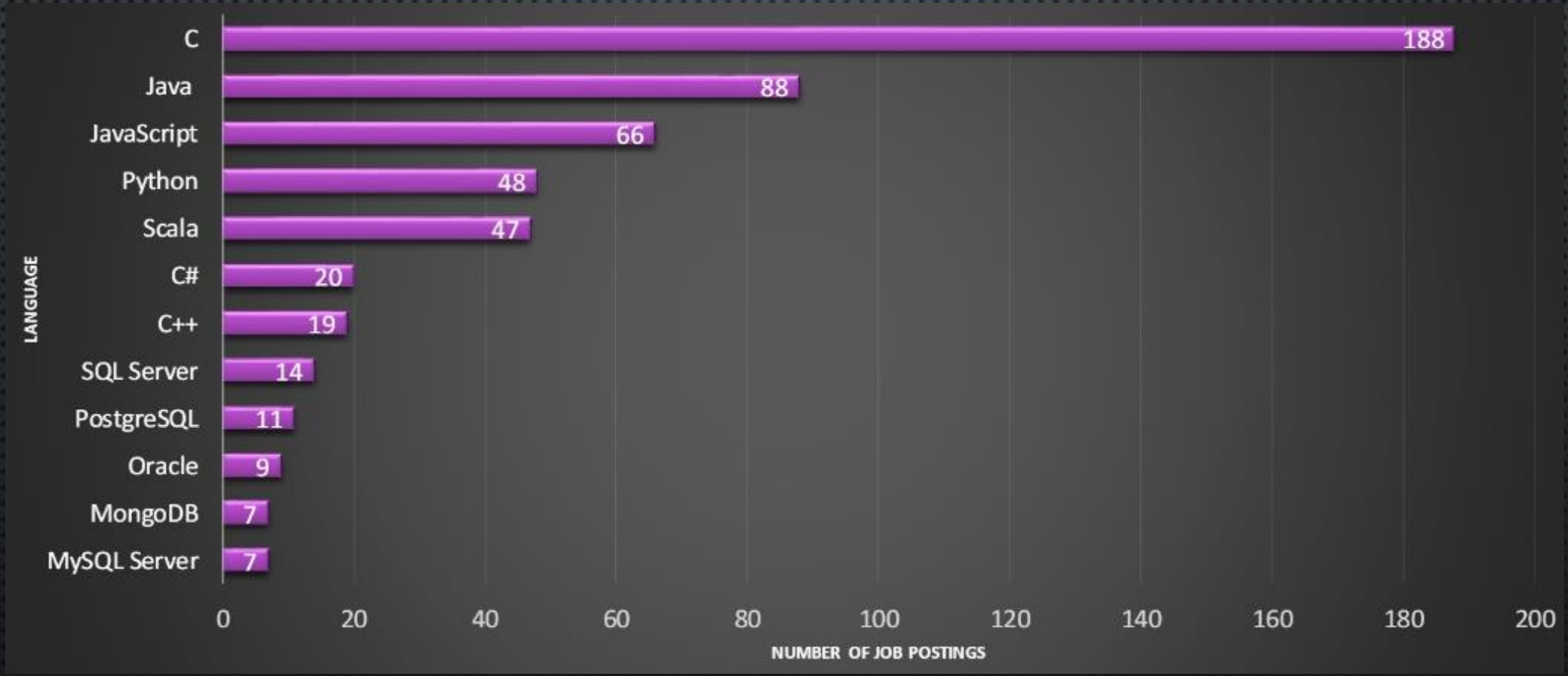


- New budgets might be needed to fill the gaps for growing trends.
- Employees might need to be trained in the growing technology trends
- Python, PostegreSQL, Linux and React.js are most popular in their respective fields

APPENDIX

- Include any relevant additional charts, or tables that you may have created during the analysis phase.

GITHUB JOB POSTINGS



POPULAR LANGUAGES

RESOURCES

- M5_SURVEY_DATA_DEMOGRAPHICS.CSV AND M5_SURVEY_DATA_TECHNOLOGIES_NORMALISED.CSV
- HTTPS://JOBS.GITHUB.COM/API
- PYTHON
- COGNOS
- JUPYTER NOTEBOOK