Future Demands for Emerging Skills in the IT Industry

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March 10, 2024

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EXECUTIVE SUMMARY

- **The Project**: spearheaded by IBM, leverages Python library, Jupyter Notebook, and IBM Cognos Analytics to develop comprehensive data dashboards. These tools are instrumental in uncovering and analyzing the top emerging skills within the ever-evolving landscape of the technology industry.
- **Analyzing Trends**: Current and Future Perspectives in the IT sector
  - Current Technology Usage
  - Future Technology Trend
  - Demographics in IT industry
- This project aims to identify and analyze the most popular programming languages in the IT industry.
- the project will investigate the database technologies that are currently in high demand among IT professionals.
- The last part of the project investigates the composition of the IT workforce in terms of gender.

INTRODUCTION

- **Dataset for this project** is from https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/
- **How to analyze data to identify trends**
  - Use various charts, graphs (bar chart, columns, treemap, histograms, scatter plots, box plots, heatmaps, bubble plots…)
- **Visualize the top trends:**
  - Top 10 Programming Languages
  - Top 10 Database skills
  - Top 10 Web Development Frameworks
- **Tools used for this project:**
  - Python Library
  - Jupyter Notebook
  - Jobs API
  - IBM Cognos Analytics
  - GitHub

METHODOLOGY

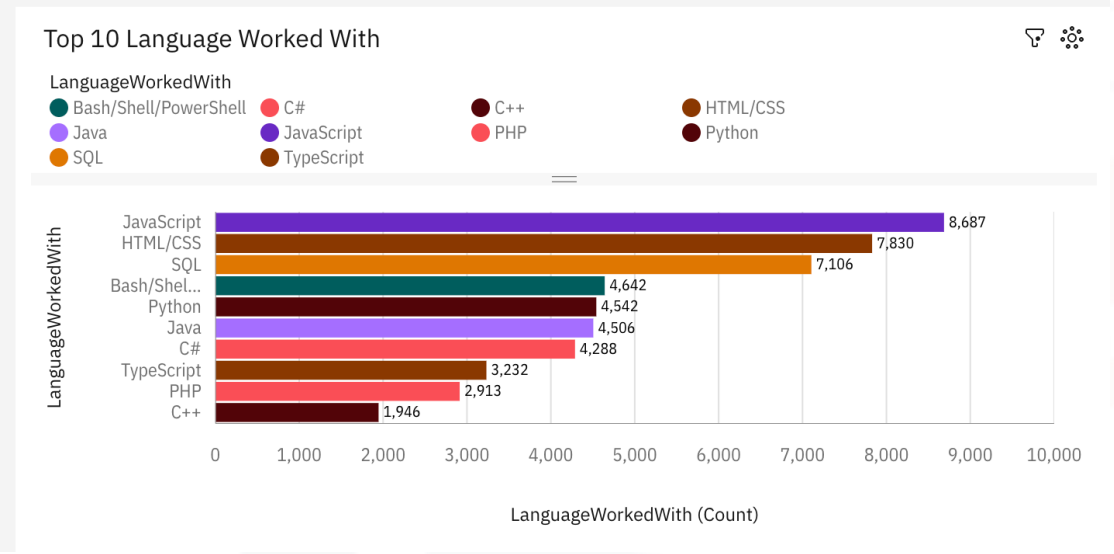
- Data source: Two data used are Demographics and Technologies-Normalised
- Using Jobs API to collect data
- Using Python in Jupyter Notebook for:
  - Data Cleaning
  - Data Wrangling
  - Exploratory Data
  - Data Visualization
- Using IBM Cognos Analytics for
  - Building Dashboard for Data Visualization
- Using GitHub to upload and store the file

RESULTS

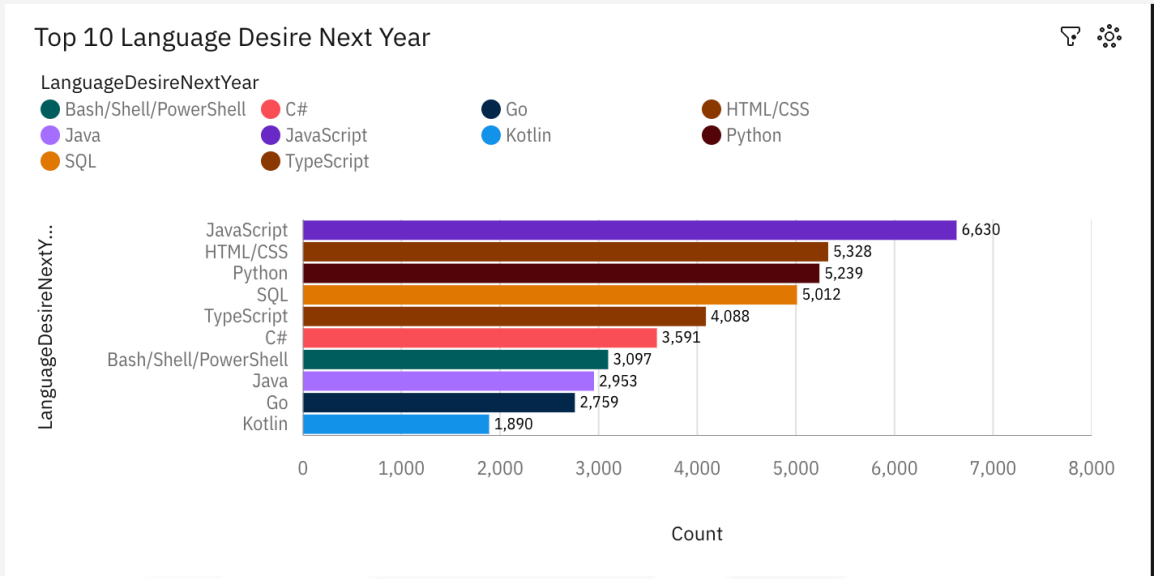
1. The **survey-data-technologies-normalized** will show:
   - Programming Language Trends
   - Database Skills Trends
2. **Demographics Data** is filtered with:
   - NoValue or null is cleaned
   - Gender: man and woman only
3. **Demographics data** will present:
   - Respondent classified by Gender
   - Respondent Count for Countries
   - Respondent Count by Age
   - Respondent Count by Gender, classified by Formal Education Level

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

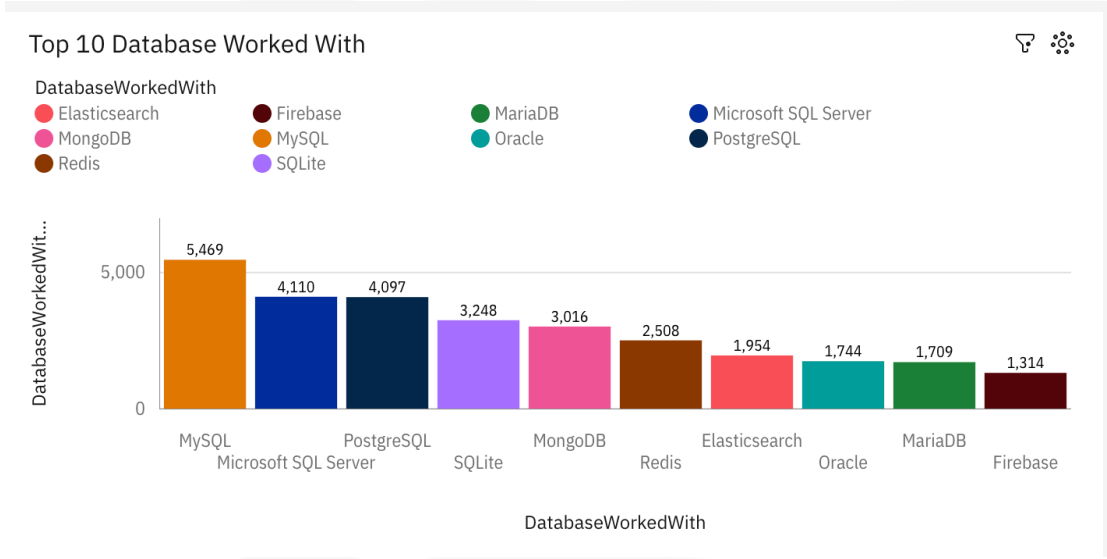
- JavaScript emerges as the most sought-after programming language for both present and future demands.
- There is a notable surge in interest for Python.
- The landscape of programming languages is undergoing significant shifts.
- The top five languages include JavaScript, Python, HTML/CSS,SQL, TypeScript

Implications

- JavaScript remains the predominant and extensively utilized programming language within the IT industry.
- Python has emerged as a sought-after and essential skill in the IT sector.
- The top five most coveted skills include JavaScript, Python, HTML/CSS,SQL, TypeScript
- There has been a notable shift in the desired skills for programming languages.

DATABASE TRENDS

Current Year



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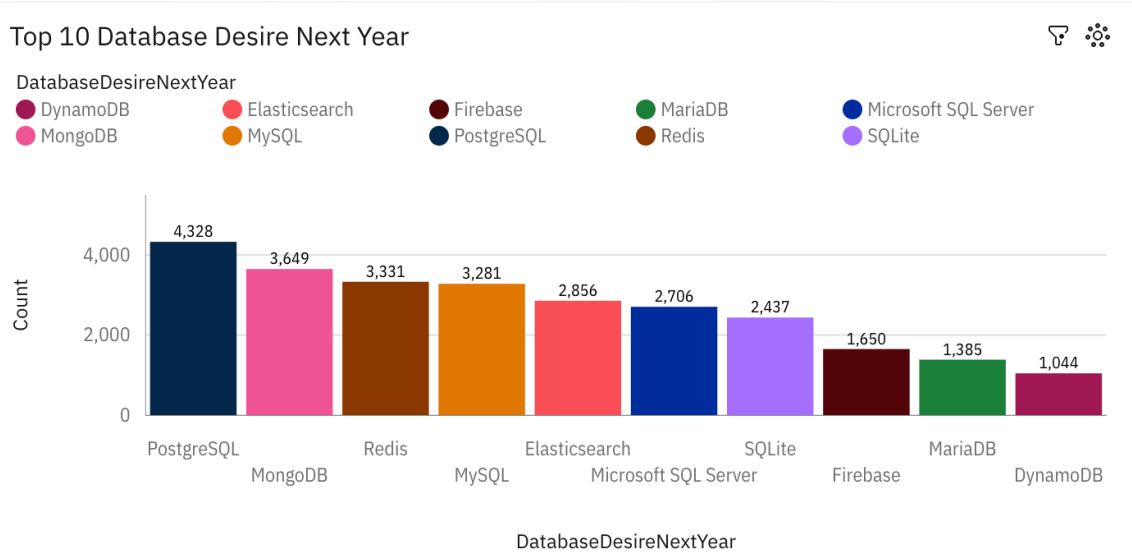


DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

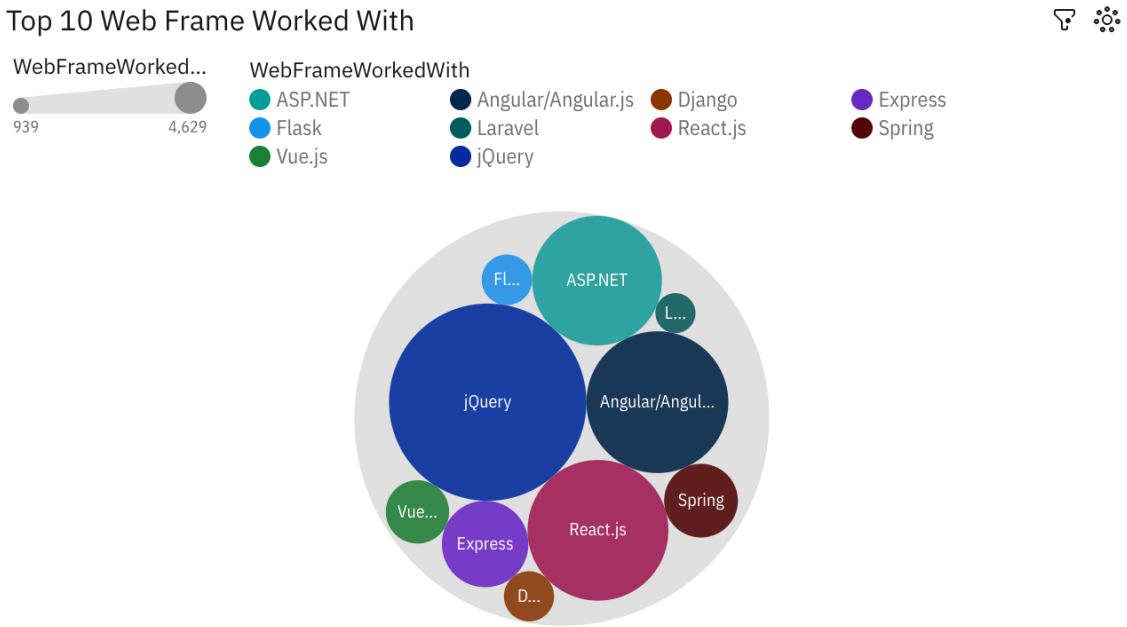
- PostgreSQL, MongoDB, and Redis have emerged as the most sought-after databases.
- MongoDB, Redis, and Elasticsearch are experiencing a rising trend in popularity, with approximately 10,000 more respondents showing interest.
- Conversely, Oracle Database has seen a decline in popularity and demand.
- There has been a significant surge in the demand for database skills, particularly for MongoDB and DynamoDB

Implications

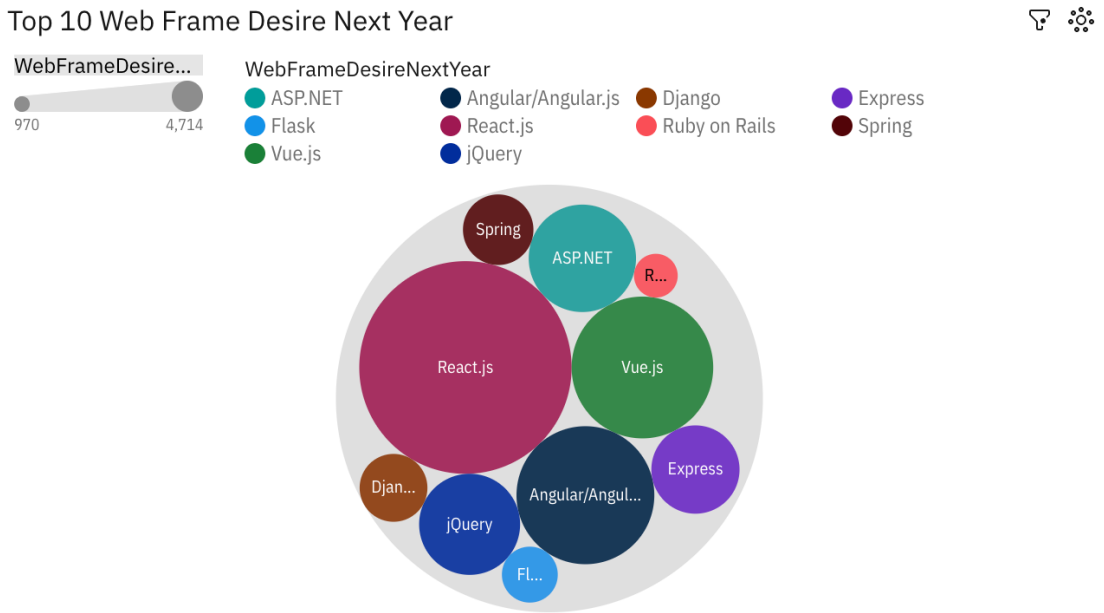
- PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch are among the preferred and widely utilized databases in various applications.
- MongoDB, Redis, and Elasticsearch have introduced new and improved functionalities or services, enhancing their appeal to users.
- Oracle Database is recommended to be avoided due to potential drawbacks.
- Further research may be necessary regarding the usage of DynamoDB to fully understand its implications and benefits

Web Development Frameworks TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- The usage of jQuery among users has significantly decreased over time.
- React.js and Vue.js have experienced a remarkable surge in popularity as desired integrated development environments (IDEs), compared to the current web frameworks employed.
- This shift is visually depicted in the hierarchy bubble chart.

Implications

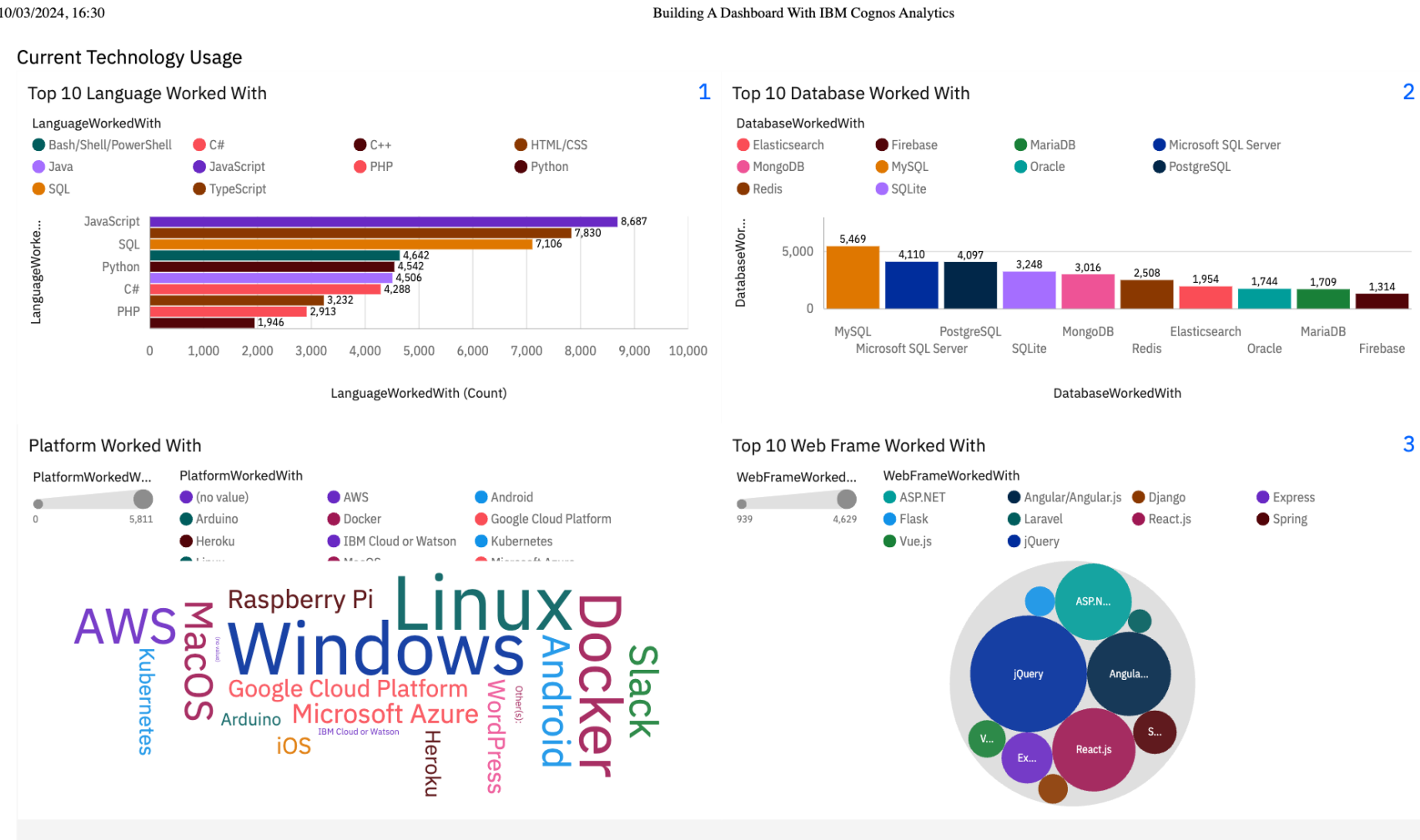
- There is a noticeable trend towards adopting superior web frameworks like React.js or Vue.js among users.
- jQuery may be perceived as lacking in certain functionalities compared to its competitors in the web framework arena.
- Consequently, jQuery could potentially be excluded from the updated requirements for new technological skills

DASHBOARD

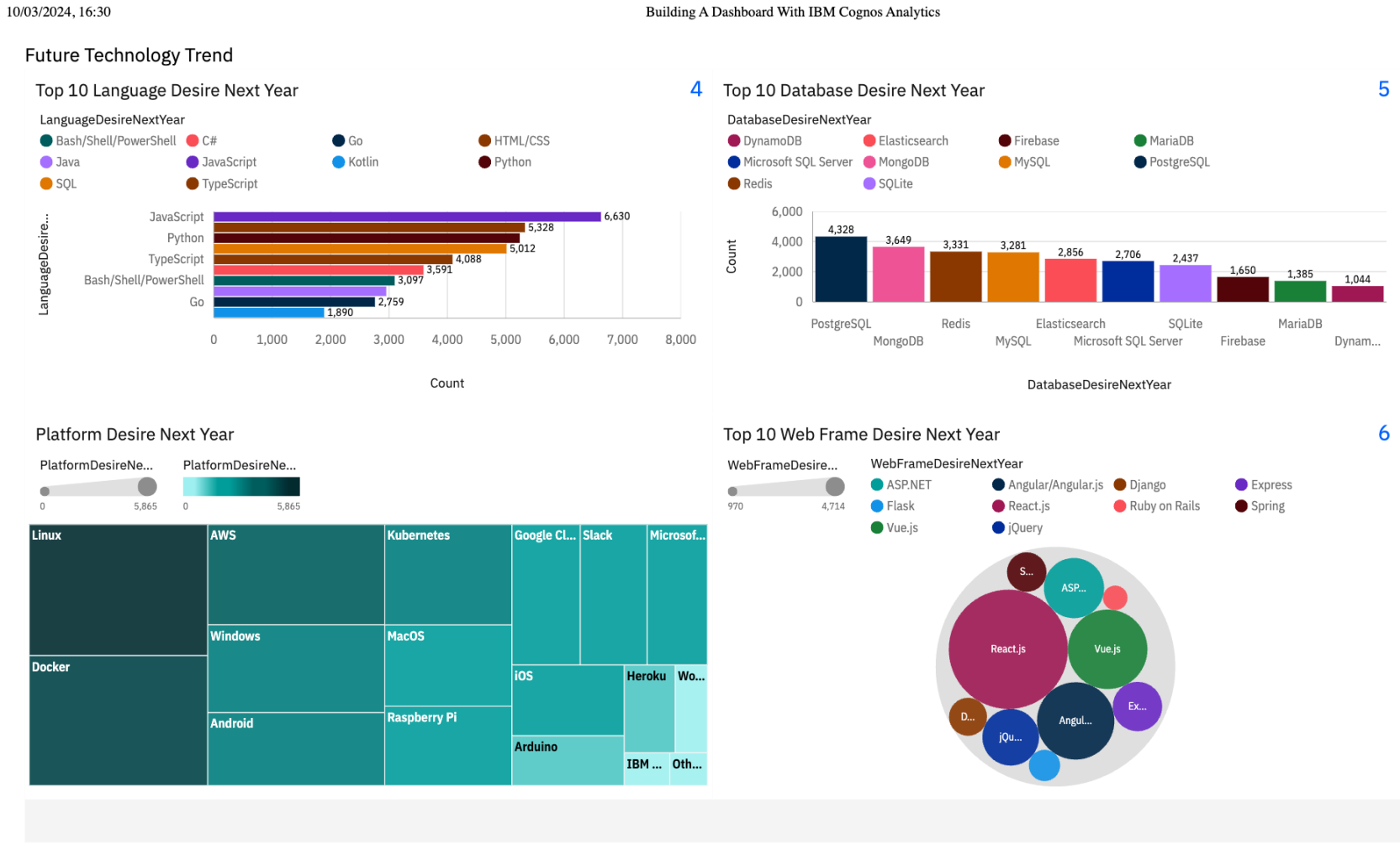
The GitHub link of the Cognos dashboard:

<https://github.com/Haley-ng/IBM-Data-Analyst-Professional/blob/main/IBM%20Data%20Analyst%20Capstone%20Project/Building%20A%20Dashboard%20With%20IBM%20Cognos%20Analytics_Huyen.pdf>

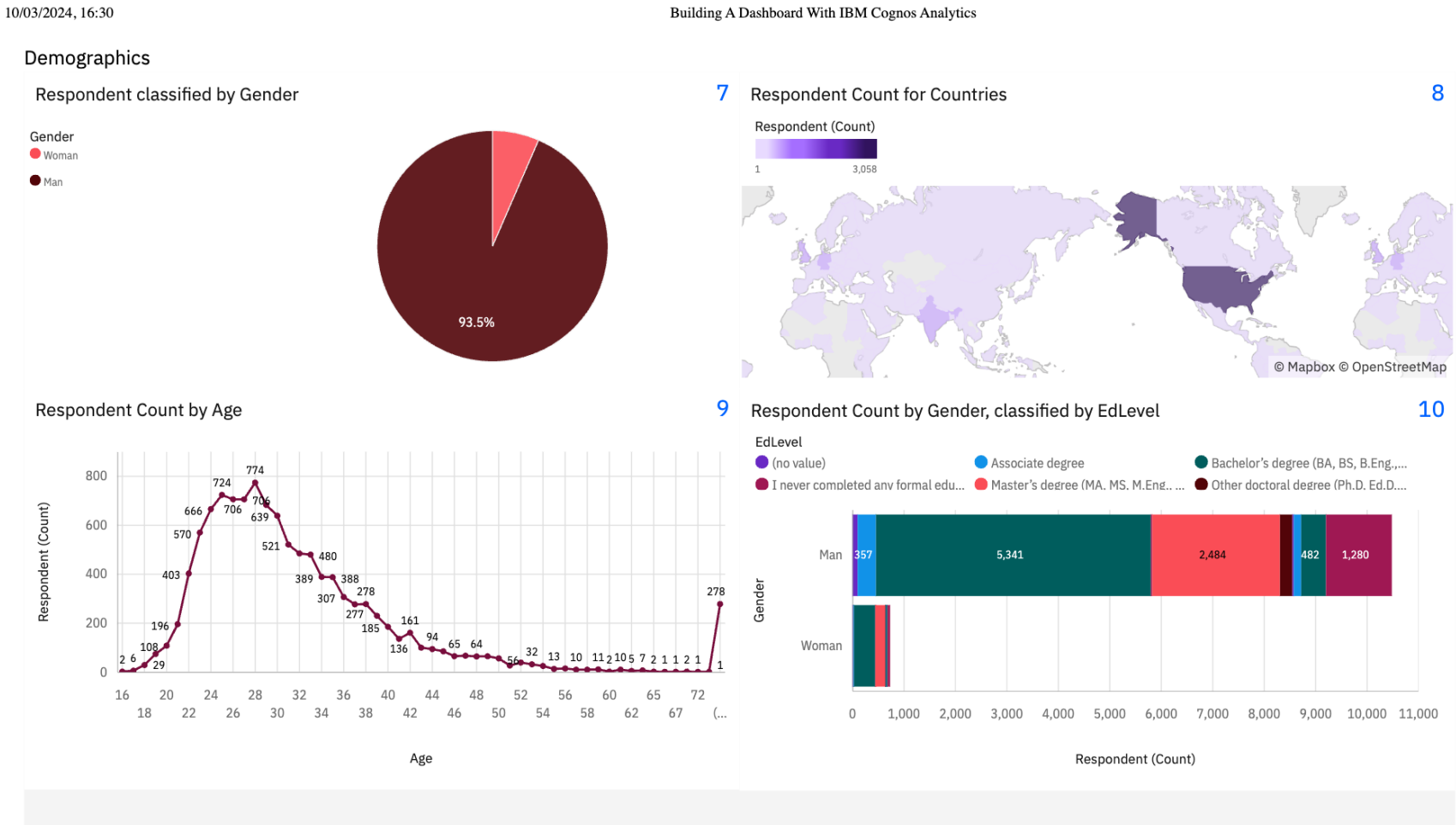
DASHBOARD TAB 1



DASHBOARD TAB 2



DASHBOARD TAB 3



DISCUSSION

- **In terms of future skill requirements and recommendations, it's crucial to understand the must-have skills and desired competencies within the industry.**
- Among the top programming languages gaining traction for future desirability are JavaScript, Python, HTML/CSS, SQL, and TypeScript.
- These languages are increasingly becoming the new standard in the IT industry. Regarding database skills, PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch are emerging as sought-after options, surpassing current popular databases in terms of demand.
- As for popular Integrated Development Environments (IDEs), React.js, Angular/Angular.js, Vue.js, jQuery, and ASP.net are among the favored choices among developers.

OVERALL FINDINGS & IMPLICATIONS

Findings

- The landscape of desired programming languages, databases, and IDEs is experiencing significant shifts.
- JavaScript, Python, HTML/CSS, SQL, and TypeScript emerge as the new coveted programming languages.
- PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch are now the desired databases.
- In terms of IDEs, React.js, Angular/Angular.js, Vue.js, jQuery, and ASP.net have gained popularity.
- These trends indicate a notable change in preferences for next year's programming languages, databases, and IDEs

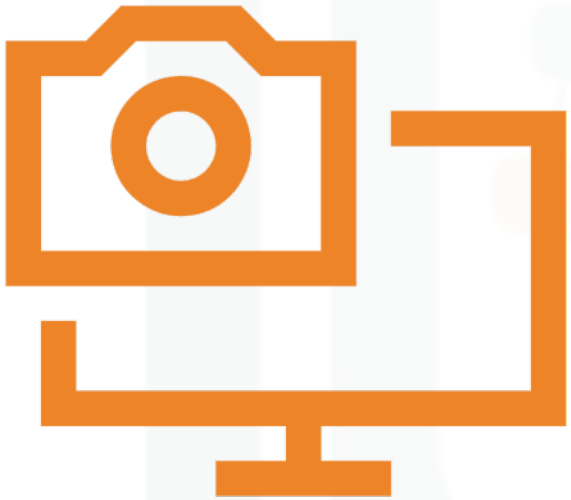
Implications

- Future skill requirements encompass various domains within the IT industry, including programming languages, databases, and IDEs.
- In terms of programming languages, JavaScript, Python, HTML/CSS, SQL, and TypeScript are identified as essential skills.
- For databases, PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch are highly sought after.
- Additionally, IDEs such as React.js, Angular/Angular.js, Vue.js, jQuery, and ASP.net are widely utilized.
- Furthermore, there is a growing interest in databases like DynamoDB.
- The evolving landscape of technology necessitates a dynamic approach to skill acquisition, reflecting the ongoing development and redefinition of current technologies to maintain competitiveness in the IT industry.

CONCLUSION

- To ensure impartial data analysis, the open-source data obtained from Stack Overflow can be replicated and scrutinized, mitigating any potential biases.
- As the technological landscape evolves, the skills utilized in the current year exhibit a discernible shift in trends, necessitating adjustments in skill requirements to maintain competitiveness.
- This transformation is particularly evident in programming languages and databases, highlighting the need for updated skill sets.
- Consequently, the revised requirements encompass the following: Programming Languages: JavaScript, Python, HTML/CSS, SQL, TypeScript Databases: PostgreSQL, MongoDB, Redis, MySQL, Elasticsearch Integrated Development Environments (IDEs): React.js, Angular/Angular.js, Vue.js, jQuery, ASP.net

APPENDIX

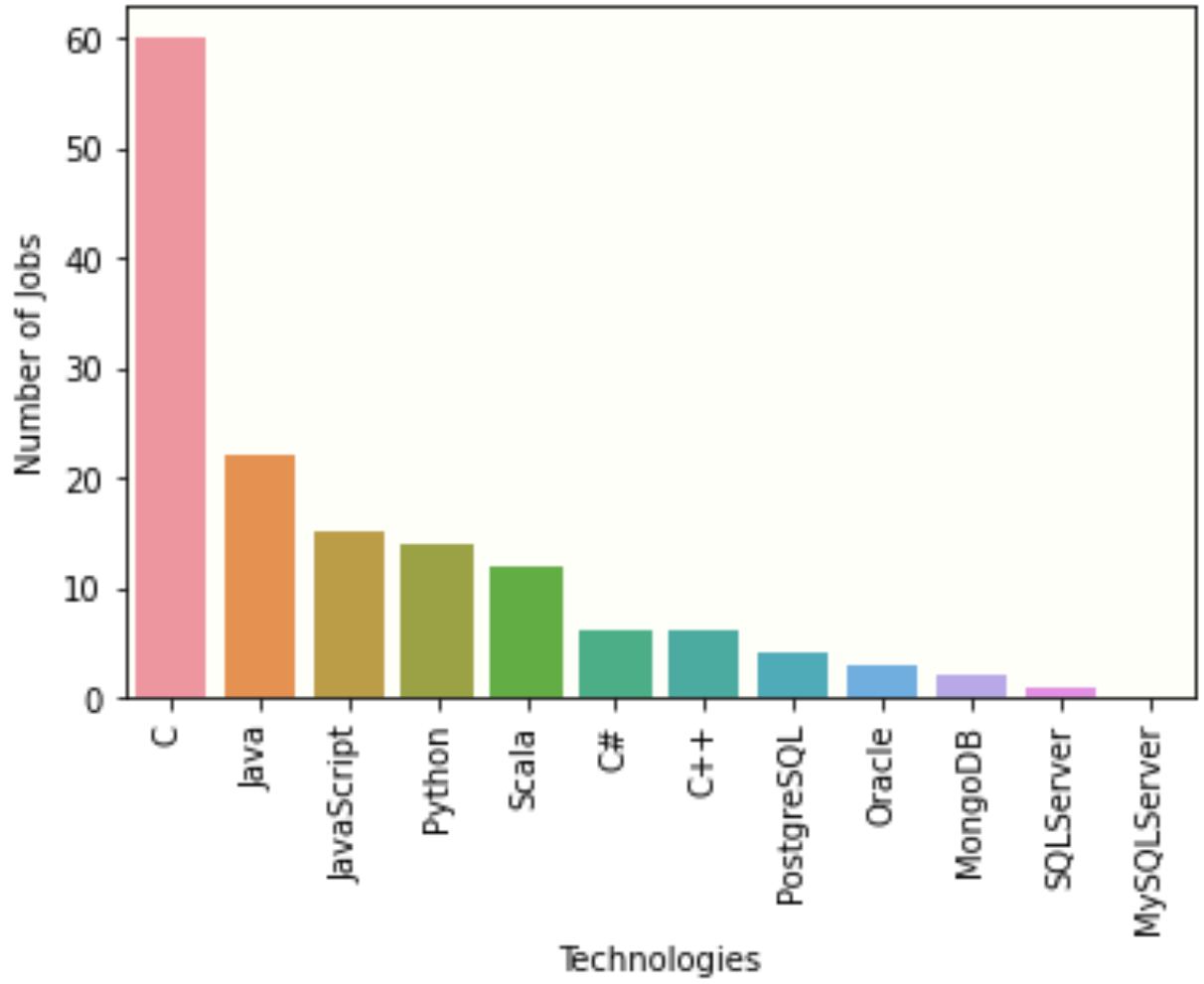


- *popular-languages.csv table*

Language	Average Annual Salary
Python	$114,383
Java	$101,013
R	$92,037
Javascript	$110,981
Swift	$130,801
C++	$113,865
C#	$88,726
PHP	$84,727
SQL	$84,793
Go	$94,082

JOB POSTINGS

In Module 1 you have collected the job posting data using Job API in a file named “job-postings.xlsx”. Present that data using a bar chart here. Order the bar chart in the descending order of the 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.