Future skill requirements for IT consultants

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EXECUTIVE SUMMARY

1. **Programming Language Landscape**:
   - Dominance of JavaScript, HTML/CSS, and SQL continues.
   - Shift anticipated with Go and Kotlin emerging as key languages, while PHP declines.
2. **Database Preferences**:
   - PostgreSQL gaining traction due to flexibility and performance; expected to surpass MySQL next year.
   - Increasing demand for MongoDB reflects a trend toward NoSQL databases.
   - Elasticsearch's rise indicates a growing need for enhanced search capabilities.
3. **Implications for Stakeholders**:
   - Developers: Focus on learning Go and Kotlin for improved job prospects.
   - Companies: Invest in training for PostgreSQL and MongoDB to align with industry trends.
   - Development Teams: Update technology stacks to incorporate emerging languages and databases.
   - Data Roles: Prioritize Python for data-related tasks as it gains prominence over SQL.

INTRODUCTION

1. **Project Objective**:

- To identify future skill requirements for IT consultants to keep pace with changing technologies and remain competitive in the evolving IT landscape.

2. **Target Audience**:

- This report is designed for IT professionals, consultants, recruitment teams, and organizational leaders who are looking to understand emerging skills and trends in the industry.

3. **Key Takeaways for Readers**:

- Insights into the top programming languages and database skills currently in demand among IT professionals.
- Identification of popular integrated development environments (IDEs) that are essential for effective software development.
- Strategic recommendations to help professionals and organizations adapt to future technological shifts and enhance their competitiveness.

METHODOLOGY

1. Data Collection

- Data Source: Job postings, Training portals, Surveys
- Data Type: Structured (.csv files, excel sheets, and databases)
- Tools Used:
  - ✓ Collecting data by scraping the internet and using web APIs;
  - ✓ Querying databases using SQL
  - ✓ Manipulating data using Python's Pandas

2. Data Preprocessing

❖ Data Cleaning:

- ✓ Removed duplicates and irrelevant data
- ✓ Handled missing values using imputation techniques, removing nulls.

METHODOLOGY

❖ Data Transformation:
Normalized/Standardized numerical variables

3. Exploratory Data Analysis (EDA)

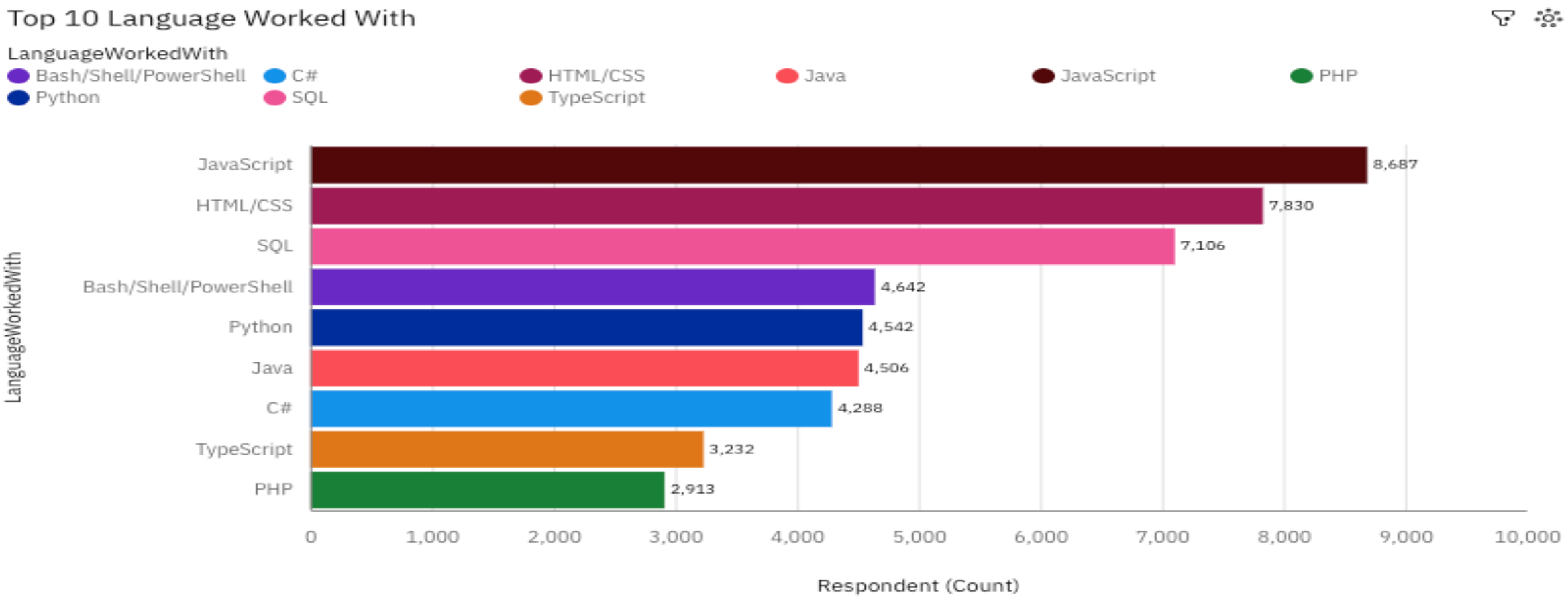
- Techniques Used:
  - ✓Univariate and Bivariate analysis (e.g., distribution plots, boxplots)
  - ✓Correlation Matrix to identify relationships between variables
  - ✓Visualizations: Created Graphs and Dashboard with Matplotlib, Seaborn, IBM Cognos Analytics

RESULTS

1. Current Year Programming Language Trends:
   - Top three languages: JavaScript, HTML/CSS, and SQL, accounting for 49.5% of responses.
   - Least popular languages: TypeScript and PHP.
2. Predicted Trends for Next Year:
   - JavaScript and HTML/CSS expected to remain top languages.
   - PHP likely to drop off the list; emerging languages Go and Kotlin predicted to rise.
   - Python projected to overtake SQL as the third most preferred language.
3. Database Trends:
   - Top Databases: MySQL (5469 respondents), MS SQL Server (4110), PostgreSQL (4097).
   - Least Popular Databases: MariaDB (1709) and Firebase (1314).
4. Next Year's Desired Databases:
   - PostgreSQL expected to lead with 4328 respondents expressing interest.
   - MongoDB projected to rise to 2nd place (3649 respondents).
   - Elasticsearch shows significant growth from 1954 to 2856 respondents.
   - Firebase is expected to remain one of the least favored databases.

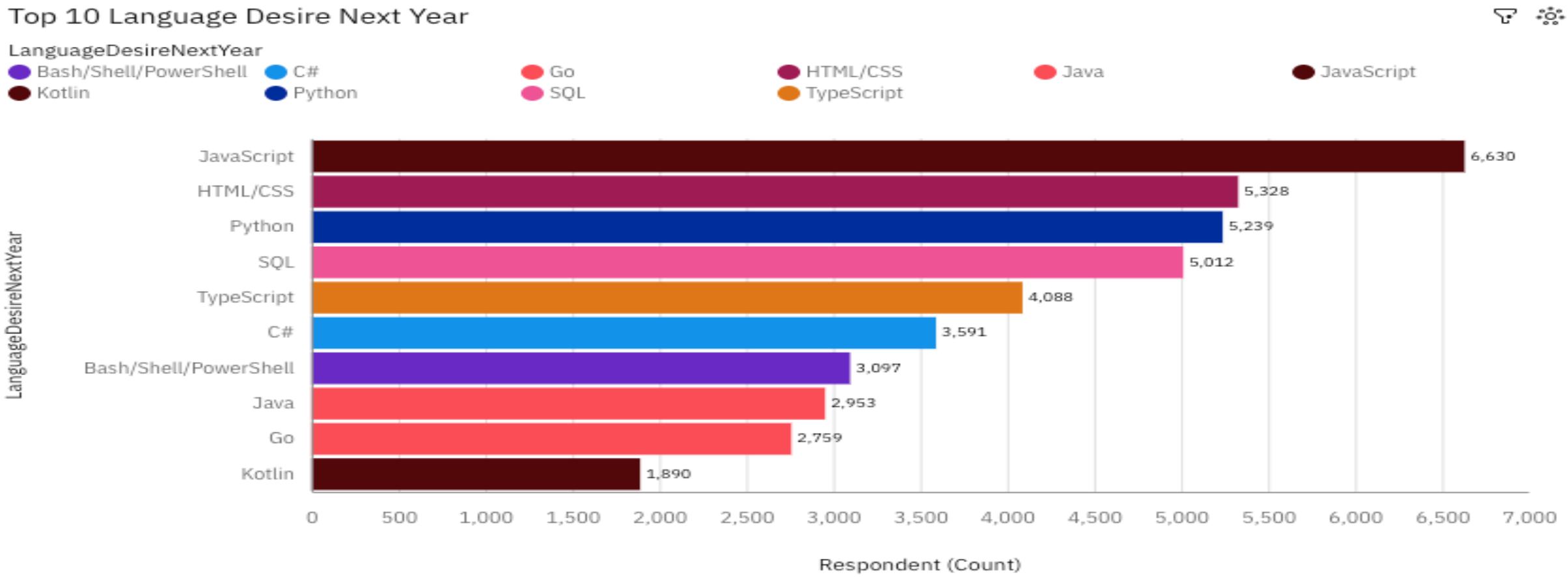
PROGRAMMING LANGUAGE TRENDS

Current Year



PROGRAMMING LANGUAGE TRENDS

Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS

1. Current Year Programming Language Trends:

- The top three programming languages that IT professionals worked with this year are JavaScript, HTML/CSS, and SQL, accounting for almost 49.5% of all responses.
- TypeScript and PHP were the least popular languages.

2. Predicted Trends for Next Year:

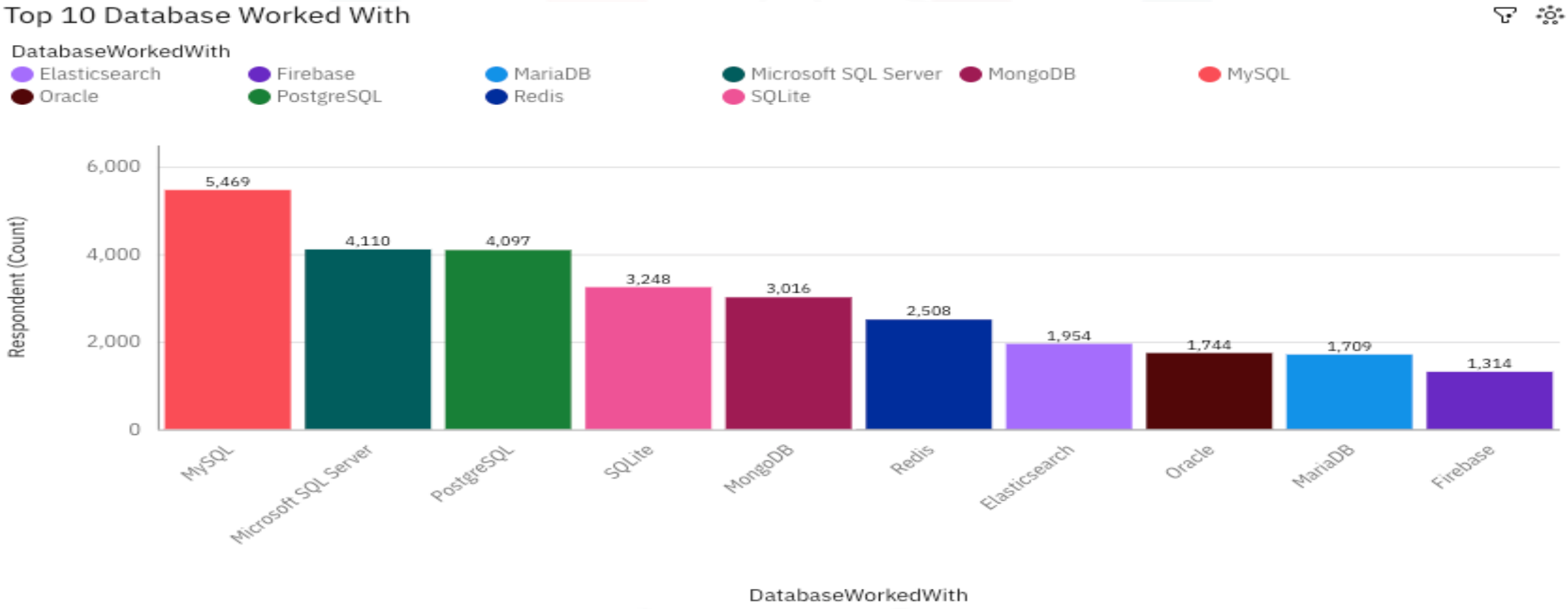
- JavaScript and HTML/CSS are expected to remain the top two preferred languages.
- PHP is predicted to drop off the list entirely, replaced by emerging languages like Go and Kotlin.
- Python is projected to take SQL's current third spot, pushing SQL down the ranks.

PROGRAMMING LANGUAGE TRENDS - IMPLICATIONS

- For IT Professionals: Developers should focus on learning Go and Kotlin, as these languages are gaining popularity. Staying ahead in these emerging technologies can help improve job prospects.
- For Companies: Investing in training or hiring developers skilled in Go and Kotlin will be beneficial as demand for these languages grows, especially for backend development and mobile applications.
- For Development Teams: The decline of PHP and rise of Go and Kotlin suggests that teams may need to update their technology stack. This might involve moving away from older PHP projects and adopting these newer languages to ensure scalability and efficiency.
- For Data Roles: With Python gaining ground over SQL, data analysts and engineers should prioritize Python for tasks related to data analysis, machine learning, and automation.

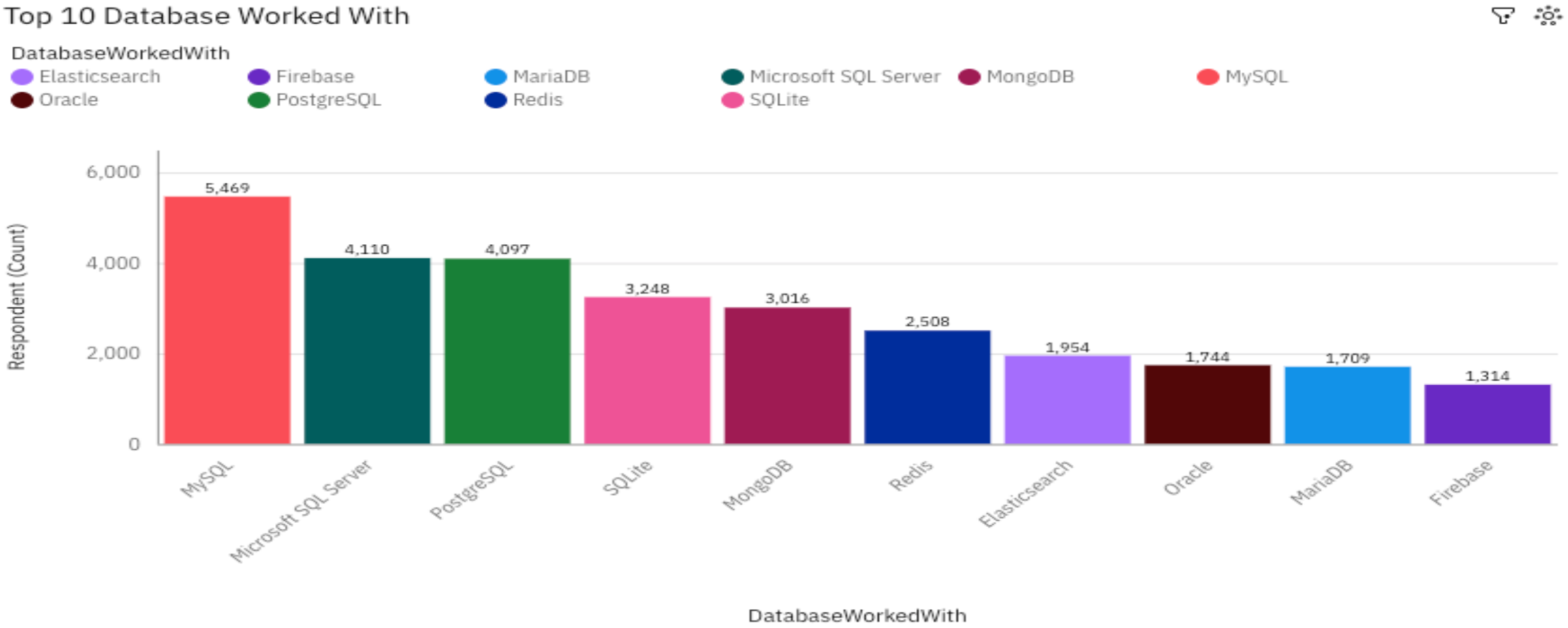
DATABASE TRENDS

Current Year



DATABASE TRENDS

Next Year



DATABASE TRENDS - FINDINGS

1. Top 3 Databases Worked With:

MySQL leads with 5469 respondents, MS SQL Server follows with 4110 respondents, PostgreSQL is close behind with 4097 respondents.

2. Least Popular Databases:

MariaDB and Firebase are at the bottom, with 1709 and 1314 respondents, respectively.

3 . Next Year’s Desired Databases:

- PostgreSQL is projected to take the top spot, with 4328 respondents expressing interest.
- MongoDB rises to 2nd place, with 3649 respondents.
- Elasticsearch shows a notable increase in interest, growing from 1954 to 2856 respondents, while Firebase remains the least favored but switches places with MariaDB .

DATABASE TRENDS - IMPLICATIONS

- PostgreSQL is expected to become the most desired database, indicating its growing reputation for flexibility and performance. Companies might need to focus on supporting PostgreSQL in their infrastructure.
- MongoDB's rise to 2nd place reflects a growing demand for NoSQL databases, especially for handling unstructured data.
- As MySQL and MS SQL Server drop in preference, organizations using these databases may face challenges in finding developers excited to work with these technologies, possibly leading to long-term migration strategies.
- Elasticsearch is gaining popularity, making it important for businesses focused on search functionalities to prioritize Elasticsearch expertise and adoption.
- Developers should consider upskilling in these databases to align with future industry demands

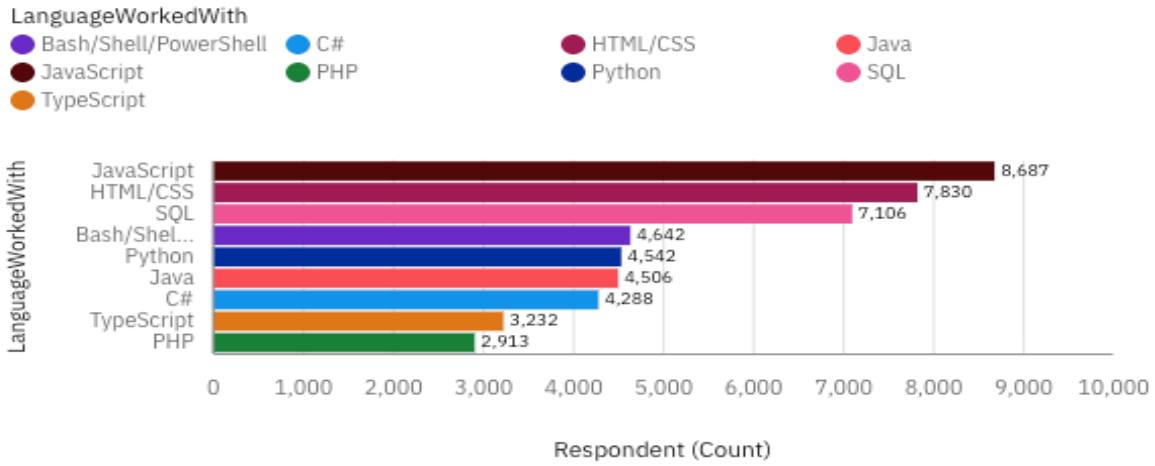
DASHBOARD

Please refer to the following Github link:

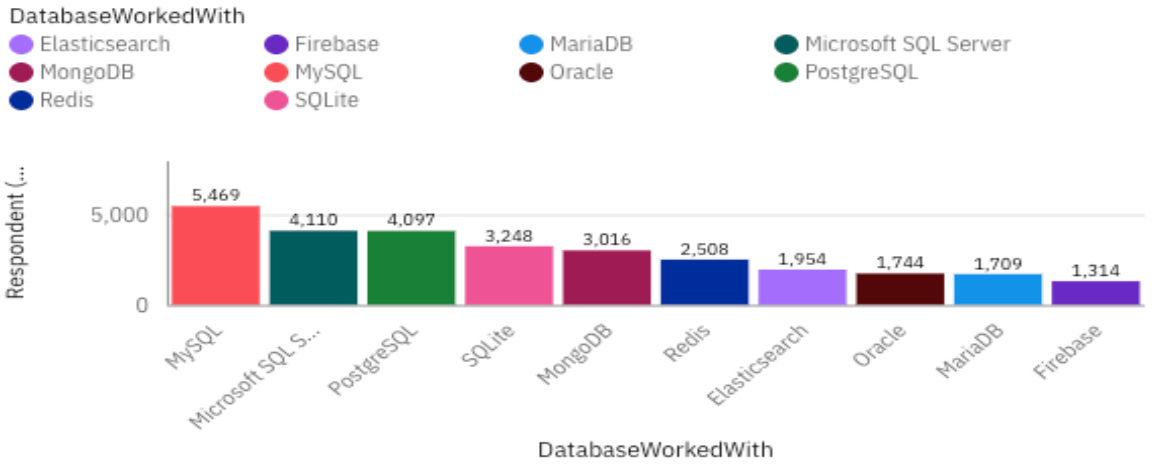
https://github.com/LinhLe211/IBM-Ceritificate-Final-Project/blob/main/Final%20Project%20Dashboard.pdf

DASHBOARD TAB 1

Top 10 Language Worked With

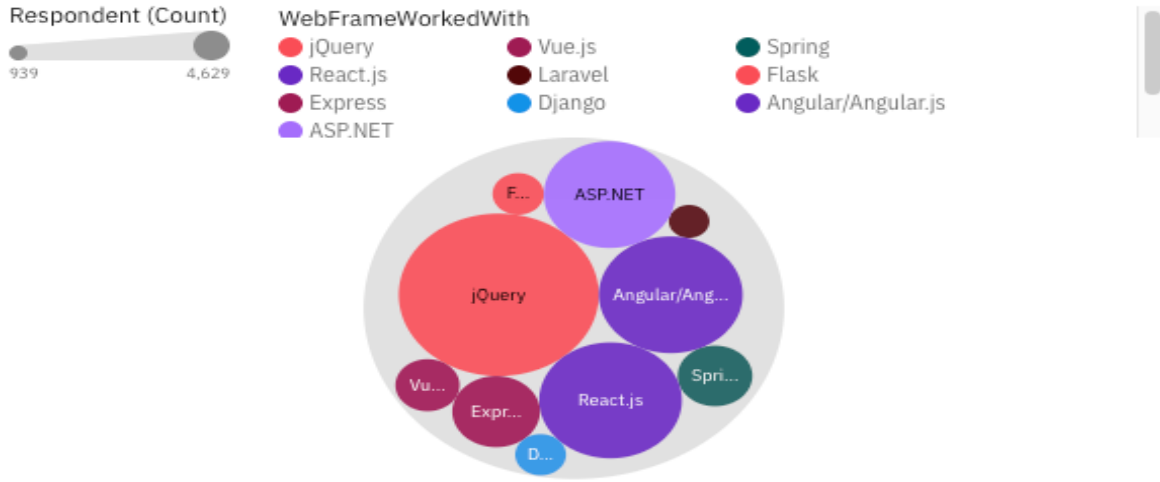


Top 10 Database Worked With



Platform Worked With

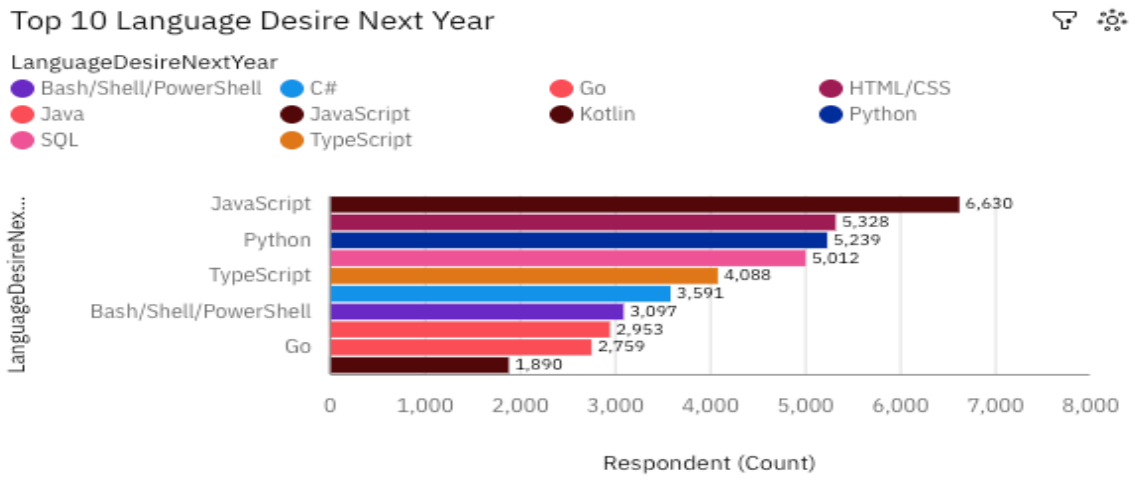
Top 10 WebFrame Worked With

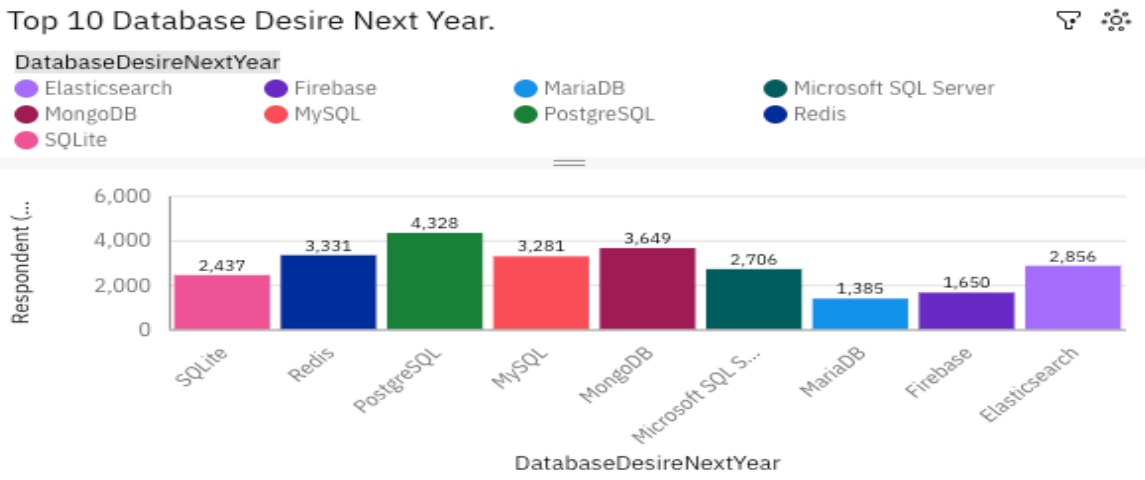


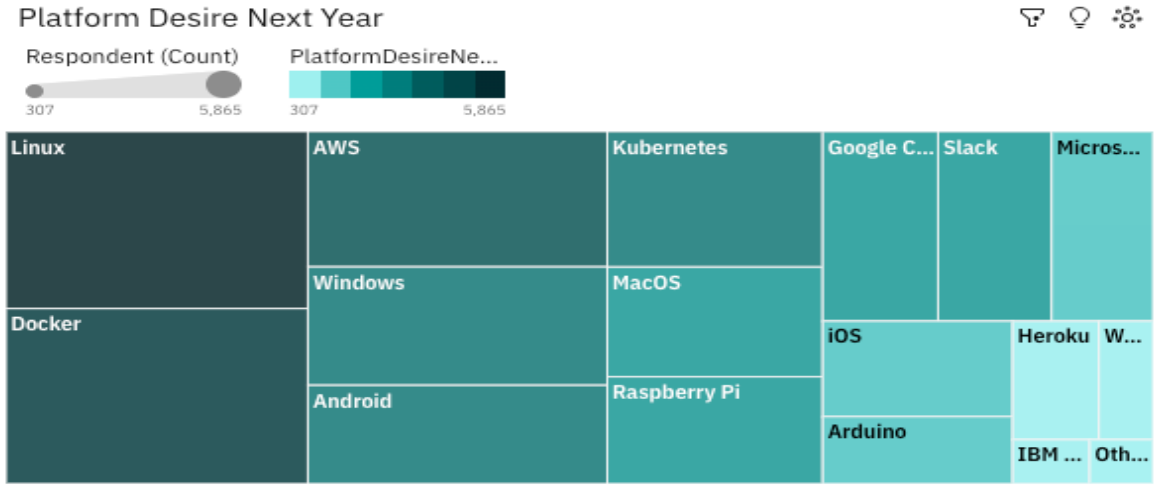
IBM Developer

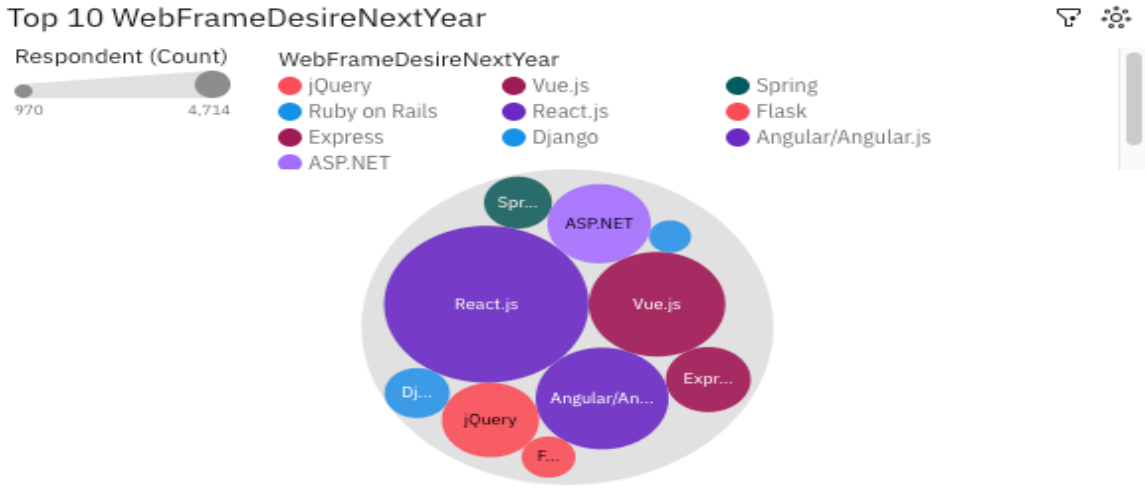
SKILLS NETWORK

DASHBOARD TAB 2

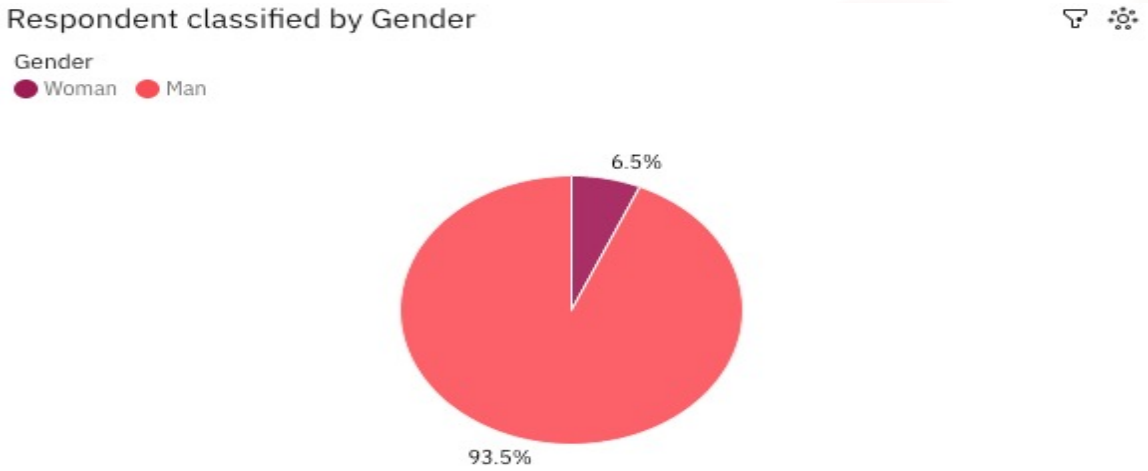


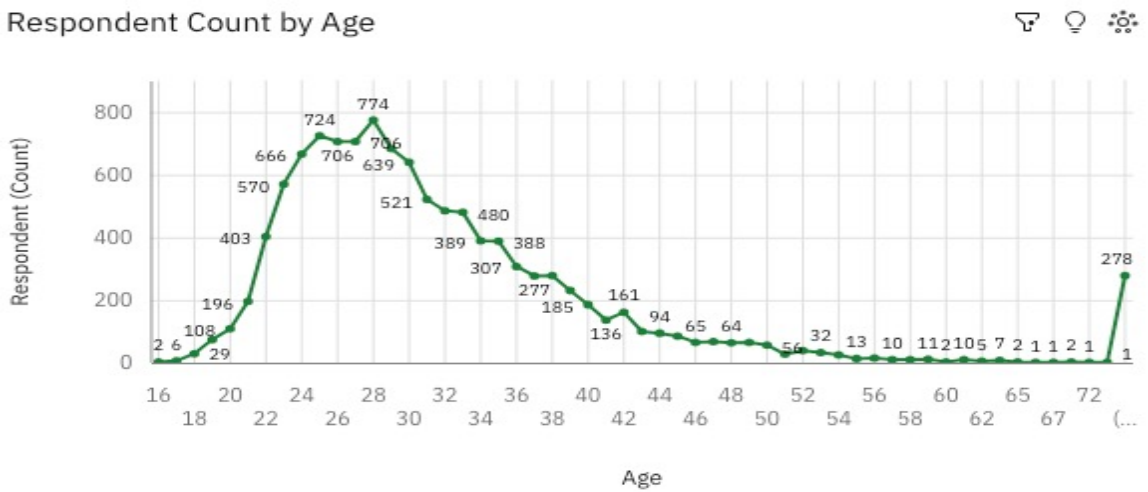


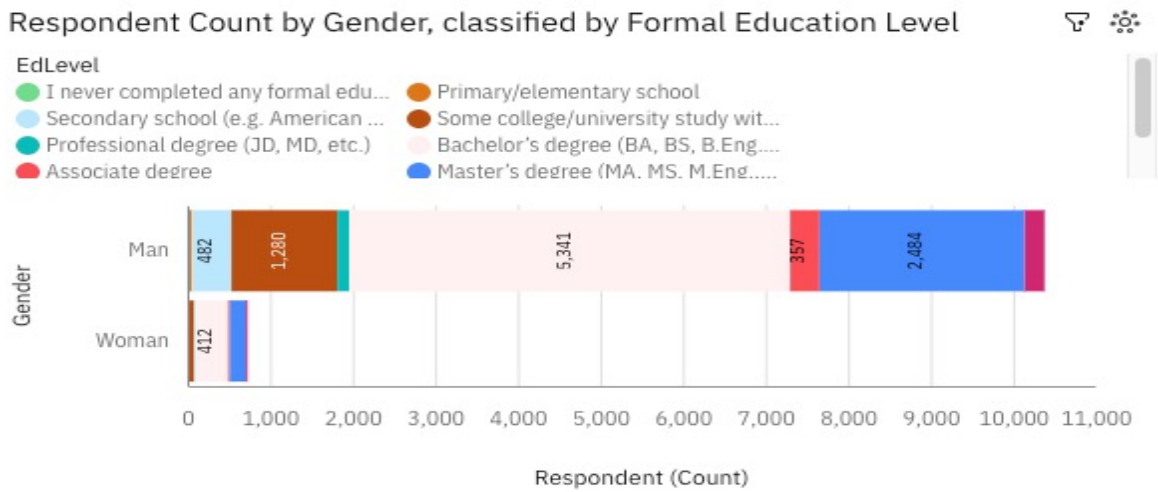




DASHBOARD TAB 3







IBM Developer

SKILLS NETWORK

DISCUSSION

- The analysis heavily relies on job postings, which may not capture all relevant skills, particularly emerging ones not yet widely advertised.
- Despite cleaning efforts, inaccuracies or biases in the dataset may affect results.
- Rapid tech changes may render some identified skills obsolete.
- Conduct studies over time to track evolving skill demands for more dynamic insights.

OVERALL FINDINGS & IMPLICATIONS

Findings regarding Programming Languages:

- JavaScript and HTML/CSS remain top choices, while Python's rise reflects growing demand for data science and web development.
- The decline of PHP signals a shift towards more modern and versatile languages like Go and Kotlin, indicating a need for developers to adapt.

Implications for Developers:

- Emphasis on continuous learning in JavaScript, HTML/CSS, and Python to stay relevant in the job market.
- Organizations should adjust hiring and training to align with emerging languages to remain competitive.

OVERALL FINDINGS & IMPLICATIONS

Finding regarding Database Preferences:

- PostgreSQL's ascent signifies a demand for powerful, flexible databases; MongoDB's popularity highlights the shift towards NoSQL for handling unstructured data.
- The decline of MySQL and MS SQL Server suggests a need for companies to evaluate their database strategies and consider migrations.

Implications for Organizations:

- Companies should invest in PostgreSQL and MongoDB to support modern applications and data needs.
- Developers must upskill in these databases to enhance their employability and meet organizational needs.

CONCLUSION

❖ **Key Findings**:

- The programming language landscape is evolving, with JavaScript and HTML/CSS maintaining their positions, while new players like Go and Kotlin gain popularity.
- PostgreSQL and MongoDB are set to dominate database preferences, reflecting industry shifts toward flexibility and NoSQL solutions.

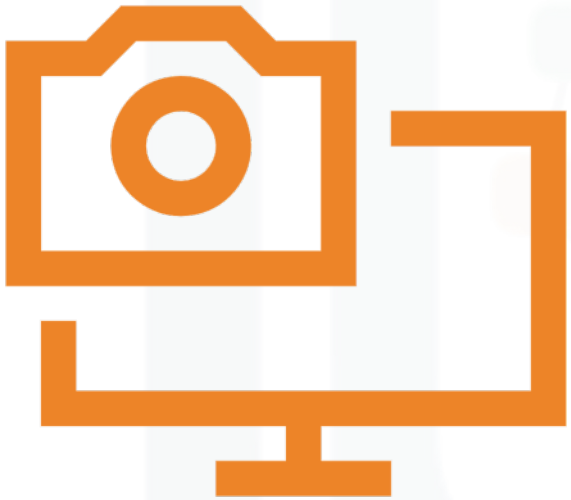
❖ **Strategic Recommendations**:

- Developers and IT professionals should focus on upskilling in emerging languages and databases to stay competitive.
- Companies must adapt their training programs and technology stacks to embrace these changes for long-term success.

❖**Future Outlook**:

- Continuous monitoring of language and database trends is essential for organizations to remain agile and meet the demands of a rapidly changing technological landscape.

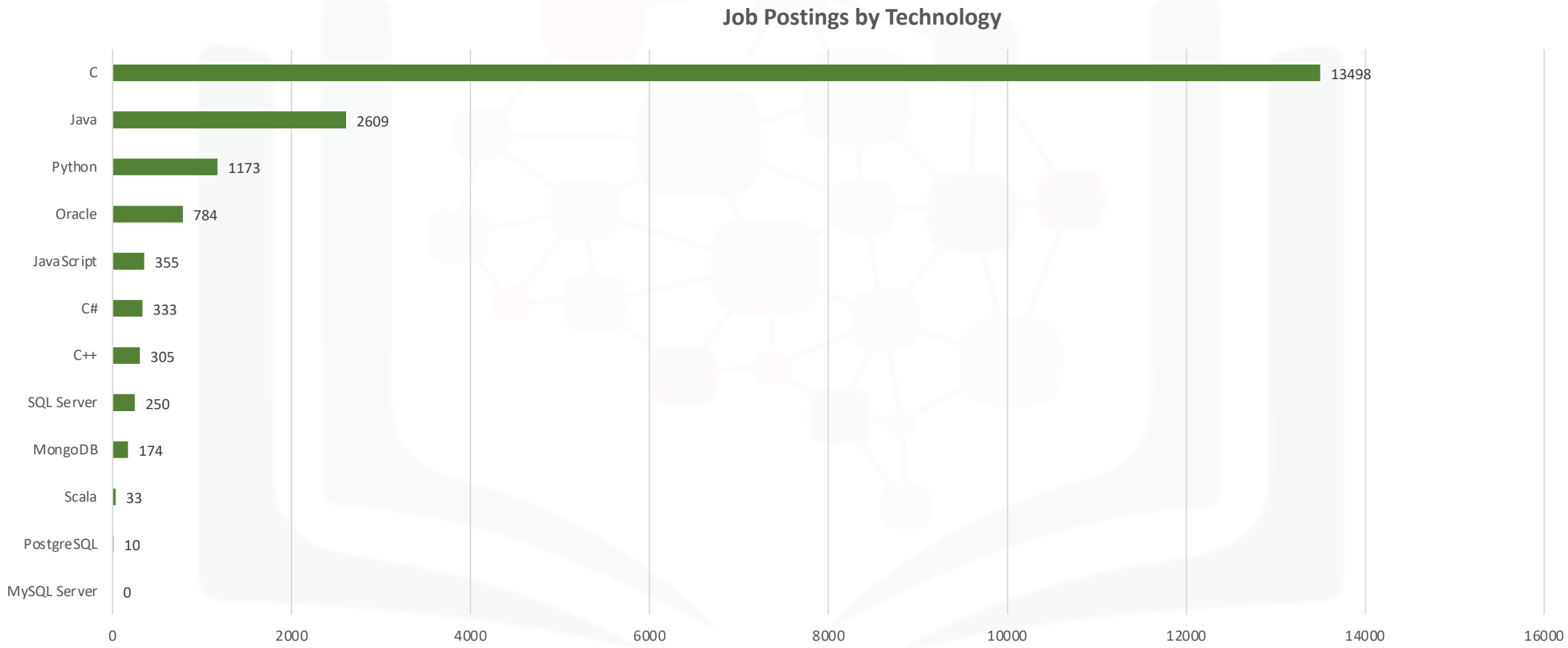
APPENDIX



Additional Charts:

1. Job postings by Technology
2. Annual Average Salary by Programming Language

JOB POSTINGS



POPULAR LANGUAGES