Name – Avik Das
Date – 01/08/2025

Title - Current and Future technology trends within the developer community

IBM Data Analyst Capstone Project

OUTLINE

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

EXECUTIVE SUMMARY

- This project involved creating comprehensive dashboards using **IBM Cognos Analytics** to visualize key insights from survey data.
- The analysis focused on three main areas: **Current Technology Usage**, **Future Technology Trends**, and **Respondent Demographics**.
- Dashboards were structured into **three distinct tabs**, each representing one of these core areas, utilizing a 2x2 rectangle areas template.
- Key findings include the prevalence of **JavaScript**, **SQL**, and **HTML/CSS** in current technology usage and a high desire for these, alongside emerging technologies like Go and Rust.
- Demographic insights highlight the **25-34 age group as the largest segment** and a **Bachelor's degree as the most common formal education level** among respondents.

INTRODUCTION

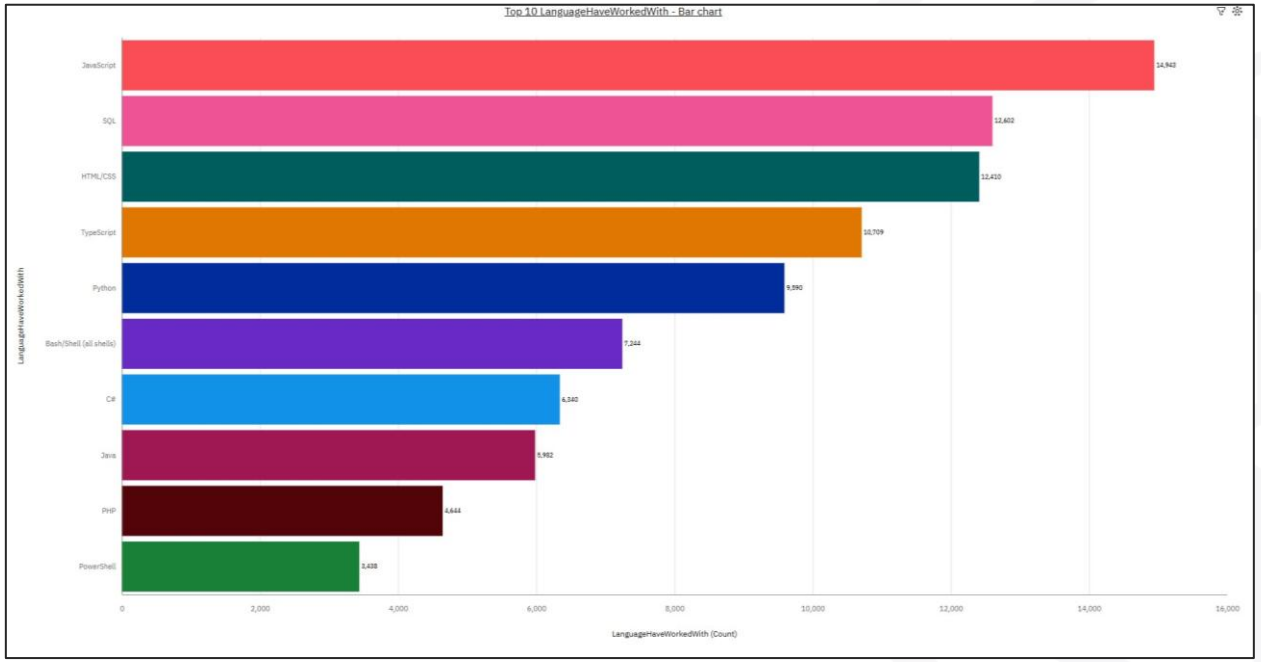
- This assignment aimed to develop skills in data visualization and dashboard creation using the **IBM Cognos Analytics** tool.
- The objective was to transform raw survey data into **actionable insights** presented through interactive dashboards.
- The primary dataset utilized for this project was "**survey_data_updated.csv**".
- The dashboard was designed with **three dedicated tabs** to systematically explore different facets of the data: current technology, future trends, and demographics.
- The visualizations were intended to reveal popular technologies currently in use, those desired by professionals, and the demographic characteristics of the survey respondents.

METHODOLOGY

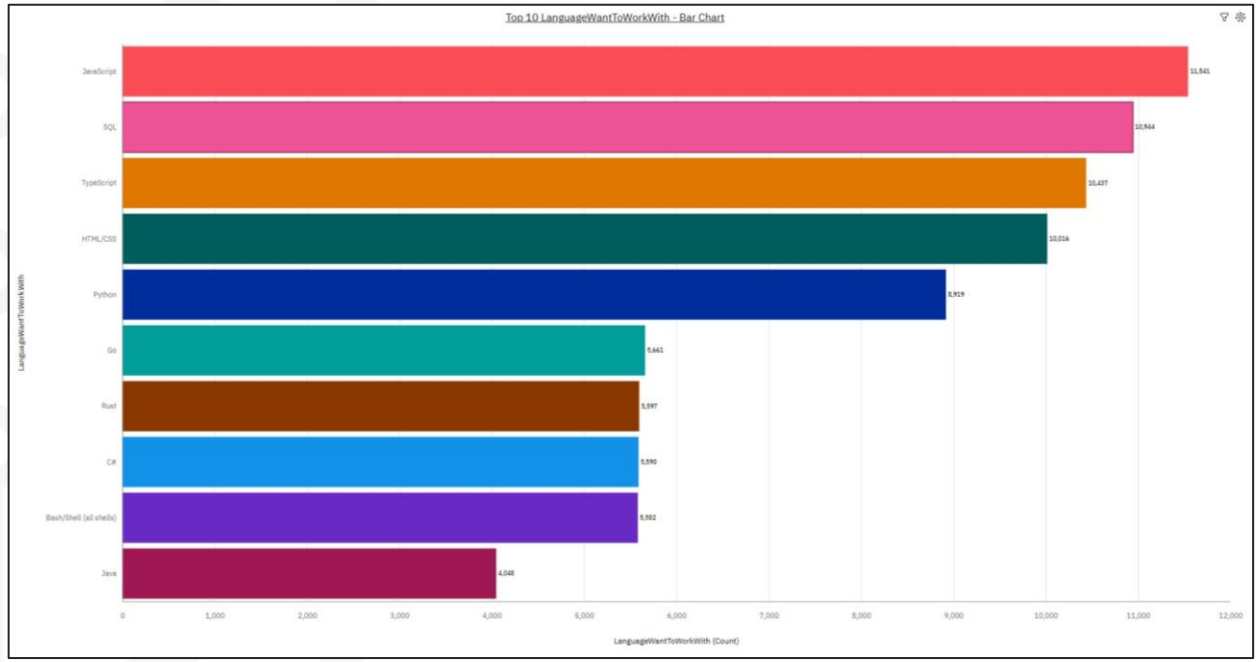
- The project was executed using the free trial version of **IBM Cognos Analytics**, a robust business intelligence tool.
- The initial step involved **uploading the "survey_data_updated.csv" dataset** as a data asset within Cognos Analytics.
- Three separate dashboard tabs were created: "Current Technology Usage," "Future Technology Trend," and "Demographics," each employing a **2x2 rectangle areas tabbed template**.
- A diverse range of chart types was employed for visualization, including **Bar charts, Column charts, Word clouds, Hierarchy bubble charts, Tree map charts, Pie charts, Map charts, Line charts, and Stacked bar charts**.
- Specific metrics were captured for each panel, such as **Top 10 Languages/Databases/Platforms/Web Frames** (both current and desired), **Respondent distribution by Age**, **Respondent Count by Country**, and **Formal Education Level**.

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings :-

• **JavaScript (14,943)**, **SQL (12,602)**, and **HTML/CSS (12,410)** are the most frequently reported programming languages that respondents have worked with.

• For future work, **JavaScript (11,541)**, **SQL (10,944)**, and **TypeScript (10,437)** are the most desired languages, indicating a strong continued interest in these core technologies.

• There is also notable interest in emerging languages for future work, with **Go (5,661)** and **Rust (5,597)** appearing prominently among the top desired languages.

Implications :-

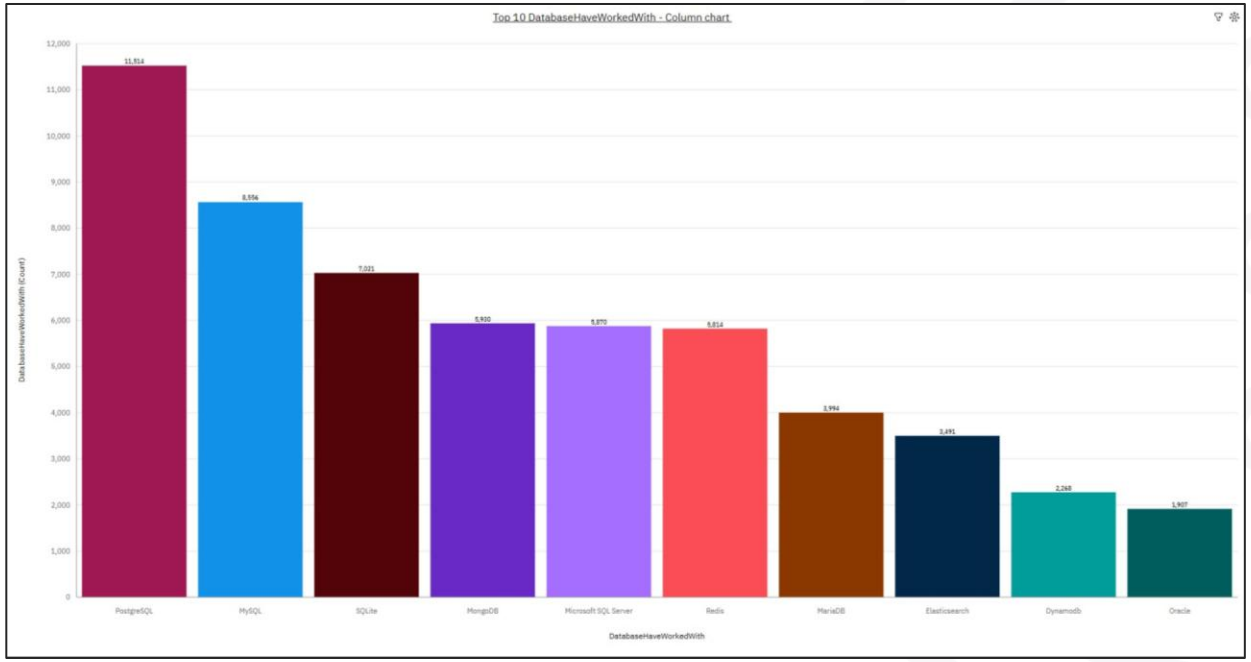
• The consistent high usage and desire for **JavaScript**, **SQL**, and **HTML/CSS** highlight their foundational role and continued relevance in the software development ecosystem, signifying a persistent demand for these skills.

• The significant interest in languages like **Go** and **Rust** signals a potential shift or diversification in future skill requirements, suggesting that professionals and educational programs should consider integrating these newer technologies.

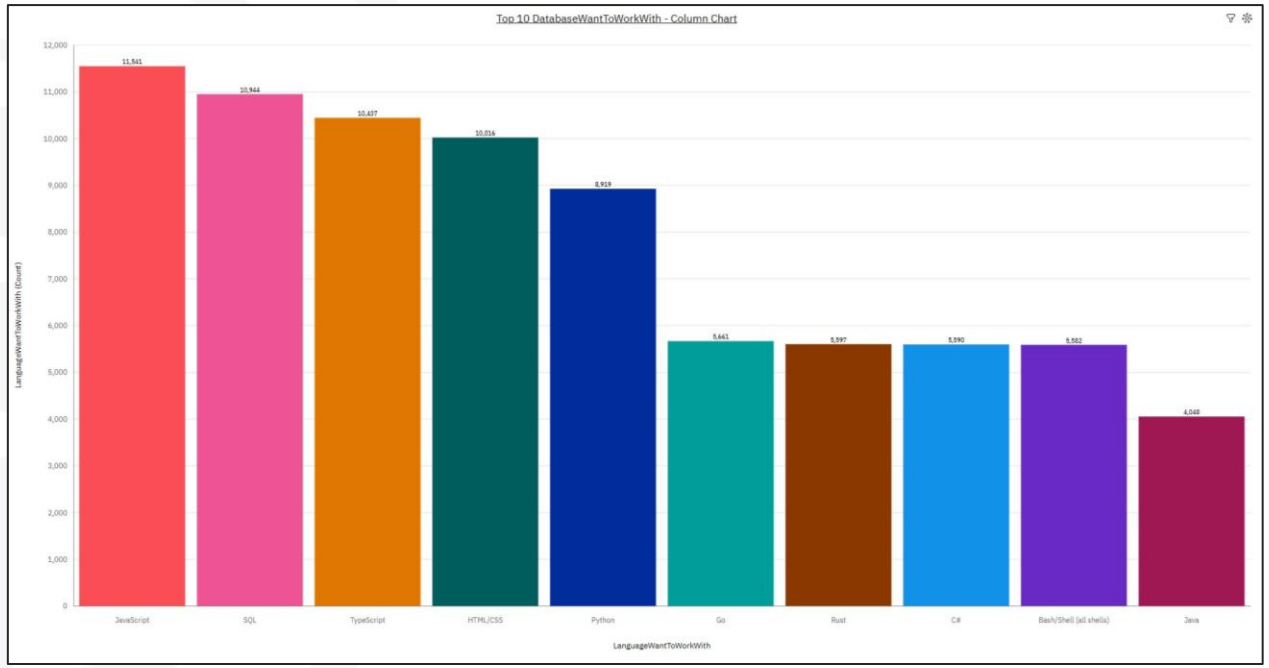
• These trends imply that maintaining proficiency in widely adopted languages while also exploring and learning modern, in-demand technologies will be crucial for career growth and adaptability within the programming field.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings -

- **PostgreSQL** is the most frequently reported database that respondents **have worked with**, totaling **11,514** instances.
- **MySQL** is the second most common database respondents **have worked with**, with **8,556** reported instances.
- Beyond the top two, **SQLite (7,021), MongoDB (5,930), and Microsoft SQL Server (5,870)** are also highly prevalent databases among respondents.

Implications

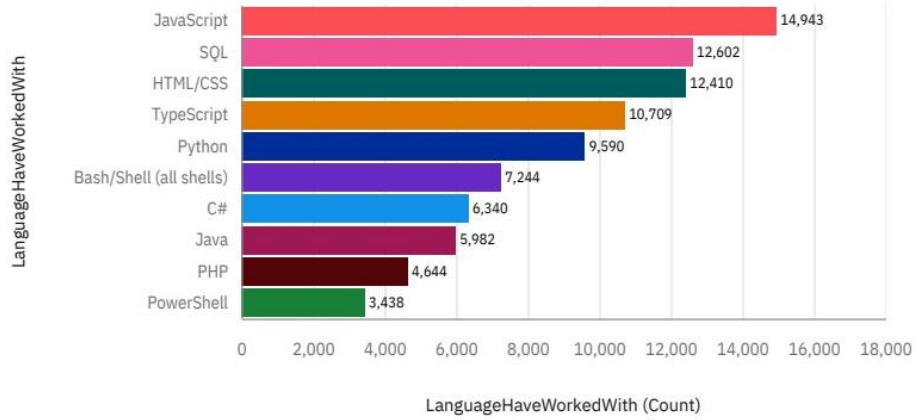
- The high current usage of **PostgreSQL** and **MySQL** suggests these databases are foundational in many existing systems, indicating a strong current demand for related skills in the job market.
- The presence of various other databases like SQLite, MongoDB, and Microsoft SQL Server implies that professionals may need **versatile database skills** to navigate different project requirements and organizational infrastructures.
- Given their established prevalence, **maintenance, optimization, and migration skills** related to these commonly used databases will likely remain critical for professionals in the foreseeable future.

DASHBOARD

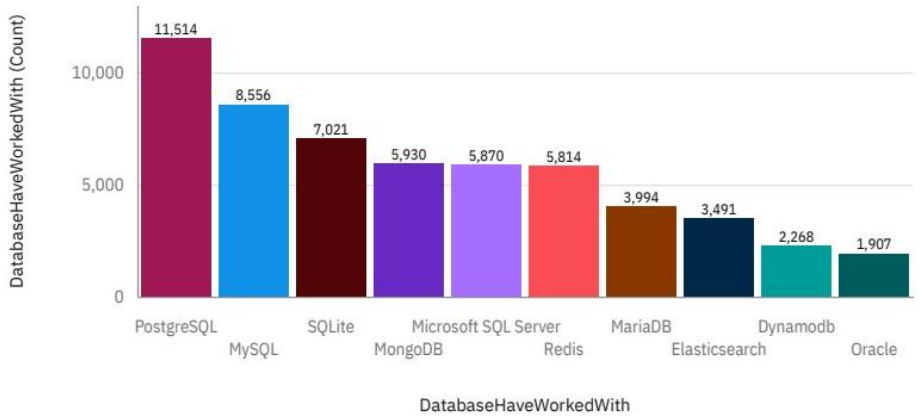
DASHBOARD TAB 1

Current
Technology Usage

Top 10 LanguageHaveWorkedWith - Bar chart

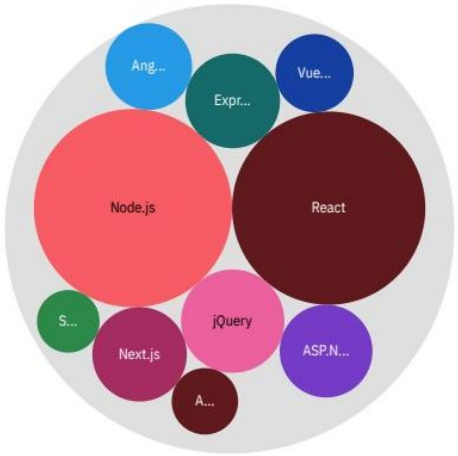


Top 10 DatabaseHaveWorkedWith - Column chart



Top 10 PlatformHaveWorkedWith - Word cloud chart

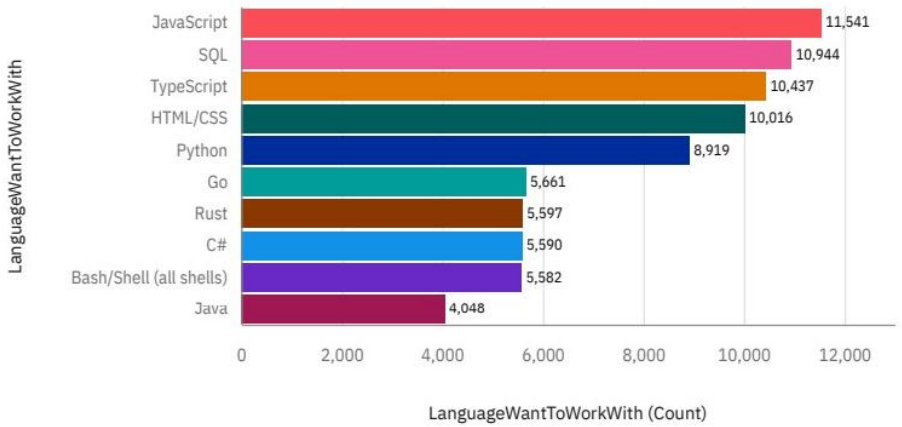
Top 10 WebFrameHaveWorkedWith - Hierarchy bubble chart



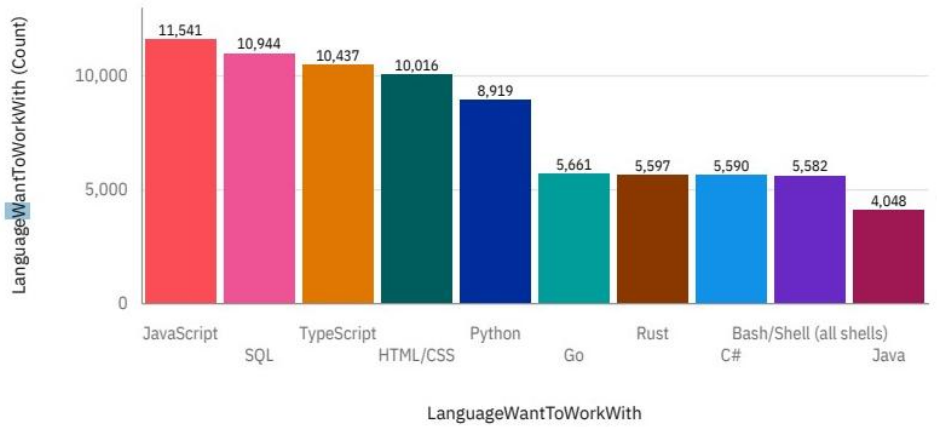
DASHBOARD TAB 2

Future
Technology Trend

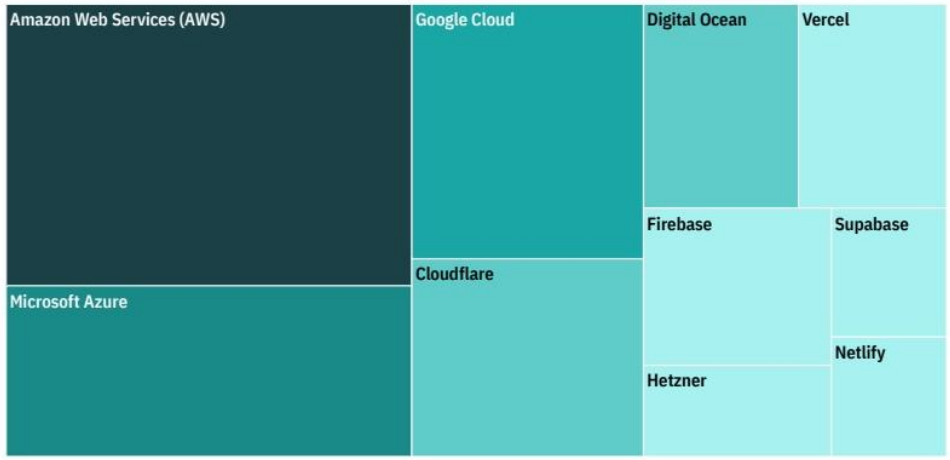
Top 10 LanguageWantToWorkWith - Bar Chart



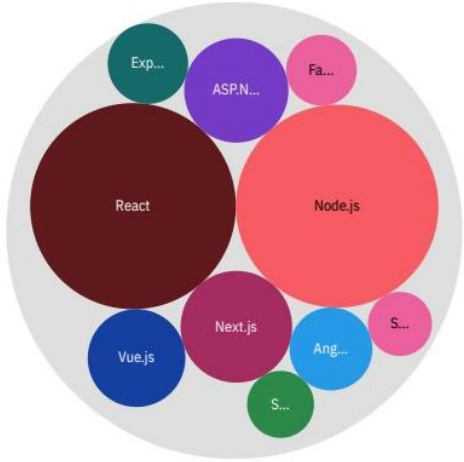
Top 10 DatabaseWantToWorkWith - Column Chart



Top 10 PlatformWantToWorkWith - Tree map chart



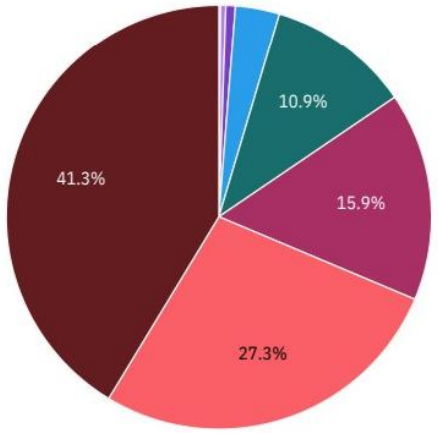
Top 10 WebframeWantToWorkWith - Hierarchy Bubble Chart



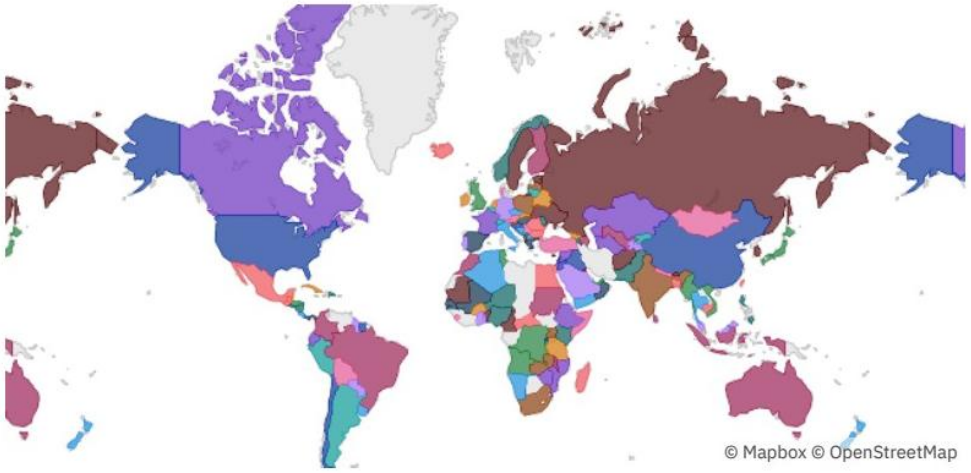
DASHBOARD TAB 3

Demographics

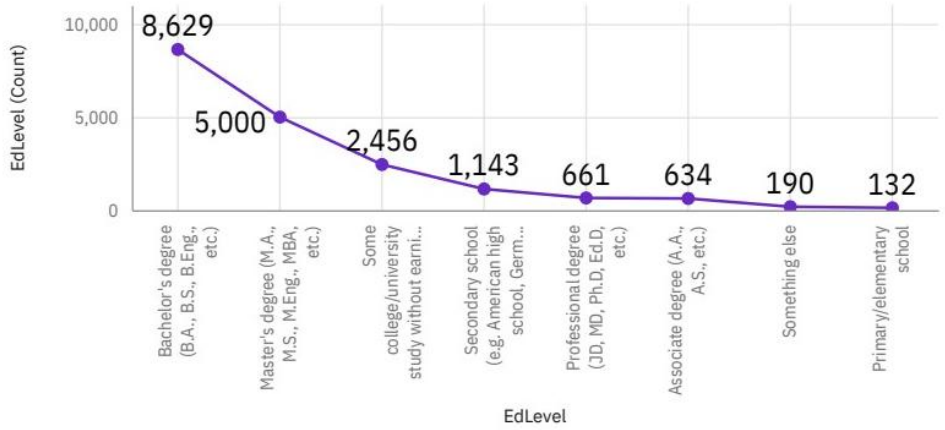
Respondent distribution by Age - Pie Chart



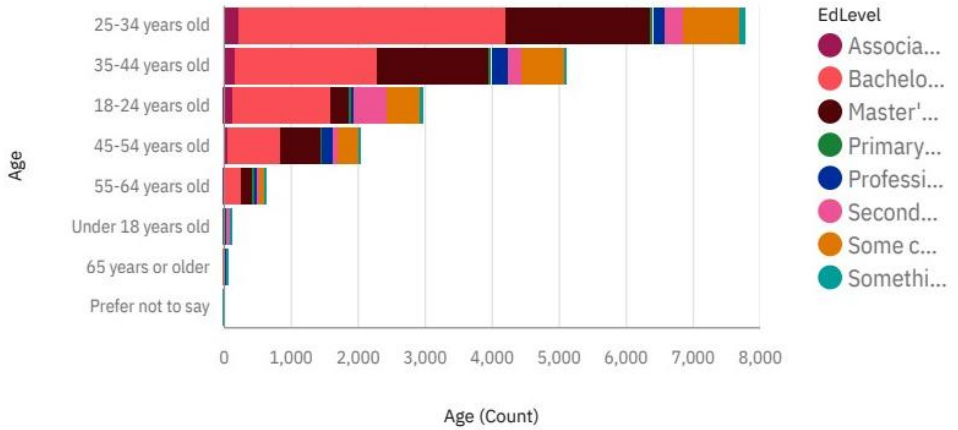
Respondent Count by Country - Map Chart



Respondent distribution by Formal Education Level - Line Chart



Respondent Count by Age, classified by Education Level - Stacked bar chart



DISCUSSION

OVERALL FINDINGS & IMPLICATIONS

Findings :-

- **JavaScript**, **SQL**, and **HTML/CSS** are consistently reported as the most widely used programming languages, while **Amazon Web Services (AWS), Microsoft Azure**, and **Google Cloud** are the dominant platforms among respondents.
- For future technology trends, there is a continued high desire for **JavaScript**, **SQL**, and **TypeScript**, but also a significant interest in emerging languages such as **Go** and **Rust**.
- Demographically, the **25-34 years old age group constitutes the largest segment (41.3%)** of respondents, and a **Bachelor's degree is the most prevalent formal education level**, reported by 8,629 individuals.

Implications :-

- The enduring popularity of established technologies like JavaScript, SQL, and **leading cloud platforms** highlights their foundational role and continued demand for related skills in the current and future tech landscape.
- The growing interest in newer languages like **Go** and **Rust** signals potential areas for skill development and investment, suggesting that professionals and educational institutions should consider their increasing relevance.
- Understanding the dominant demographic profile, including age and education levels, can inform **targeted recruitment, talent retention, and professional development programs** within the technology industry.

CONCLUSION

- The comprehensive dashboards successfully provide **clear and insightful visualizations** of current technology usage, future technology trends, and key respondent demographics. Utilizing **IBM Cognos Analytics** proved effective in creating a structured and visually appealing representation of complex survey data.
- The analysis highlights a strong continued demand for established technologies like **JavaScript** and **SQL**, while also signaling a growing interest in newer languages like Go and Rust.
- Understanding the demographic profile, particularly the dominant age and education levels, can inform **targeted training programs and recruitment strategies**.
- The completed dashboard serves as a valuable resource for stakeholders seeking to understand the **evolving technology landscape** and the characteristics of the professional workforce.

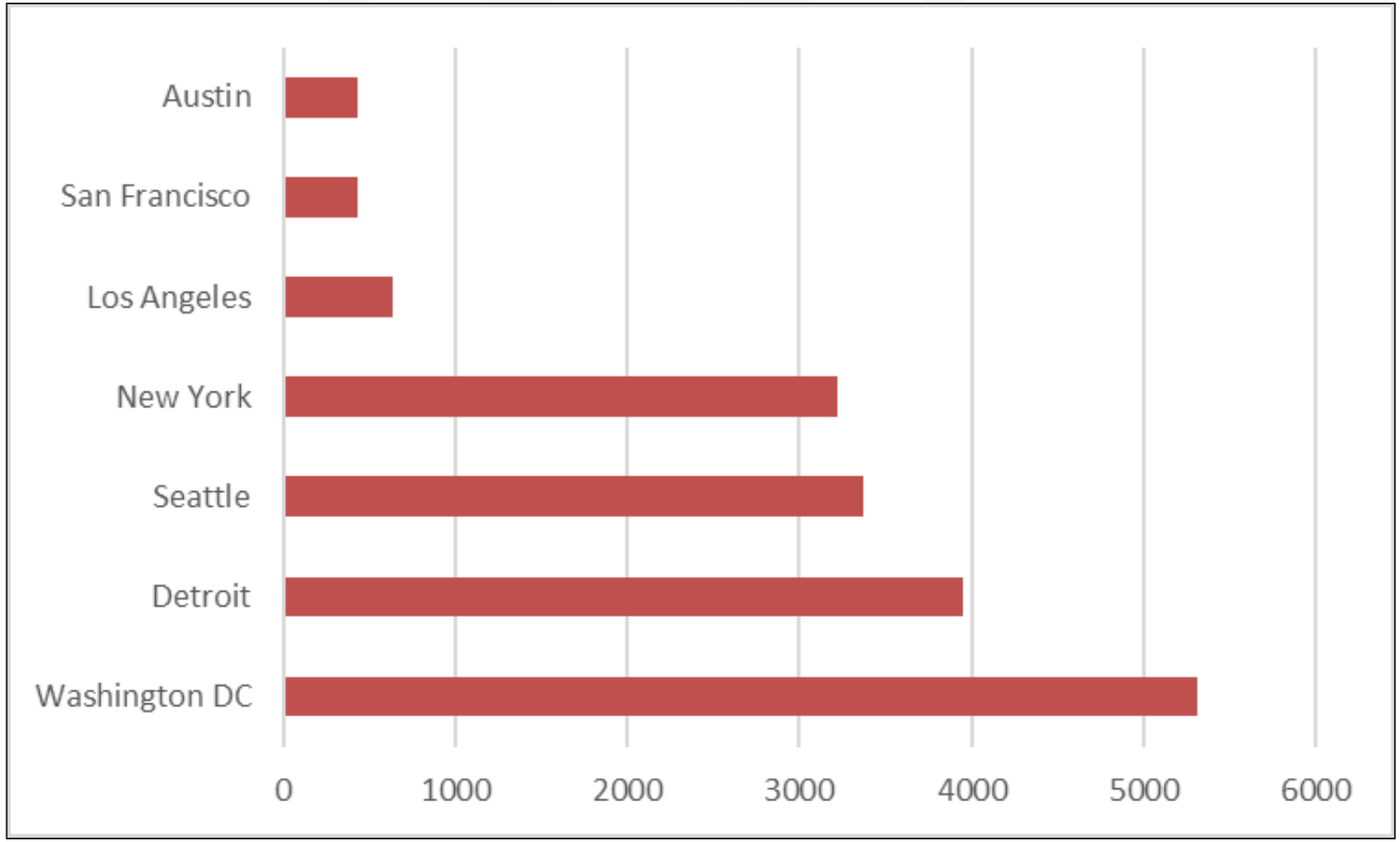
APPENDIX

GitHub Link (for Dashboard PDF) - https://github.com/Avik-Das-567/IBM-Data-Analyst-Capstone-Project/blob/main/Dashboard%20(IBM%20Data%20Analyst%20Capstone).pdf

Dashboard Link (IBM Cognos Analytics) - https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FDashboard_30-07-2025&action=view&mode=dashboard&subView=model000001985c9529a5_00000004

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.