IBM Data Analyst Capstone Project: Analysis on Emerging Technological Skills and Trends

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OUTLINE

EXECUTIVE SUMMARY

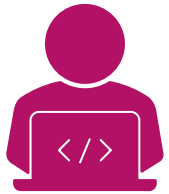
- Relevant skills required in the field of IT and business consulting are ever-changing and evolving.
- It is important to identify future skill requirements and trends to keep pace with changing technologies and remain competitive.
- This presentation will show current and future trends in Programming Languages, Databases, Platforms and WebFrames.
- Overall, the aim in identifying future skill requirements and trends is to help the firm make more informed datadriven hiring and budgetary decisions.

INTRODUCTION

- This presentation report uses data analytics to highlight current and projected trends in the need for skills related to programming languages, databases, platforms and web frames.
- The following inquiries were investigated using the data:
  1. Which programming languages are most in demand today?
  2. What are the most in-demand database skills?
  3. What popular IDEs or Web frames are there?
- The target audience for this research are IT professionals, HR managers, and anybody else with an interest in the IT sector who wants to learn about the top on-demand IT skills in their respective sectors that will also still be relevant in the future.

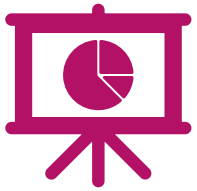
METHODOLOGY

Data in several formats, such as the number of jobs currently available for different technologies and for different places, were gathered using the Github jobs API on python.



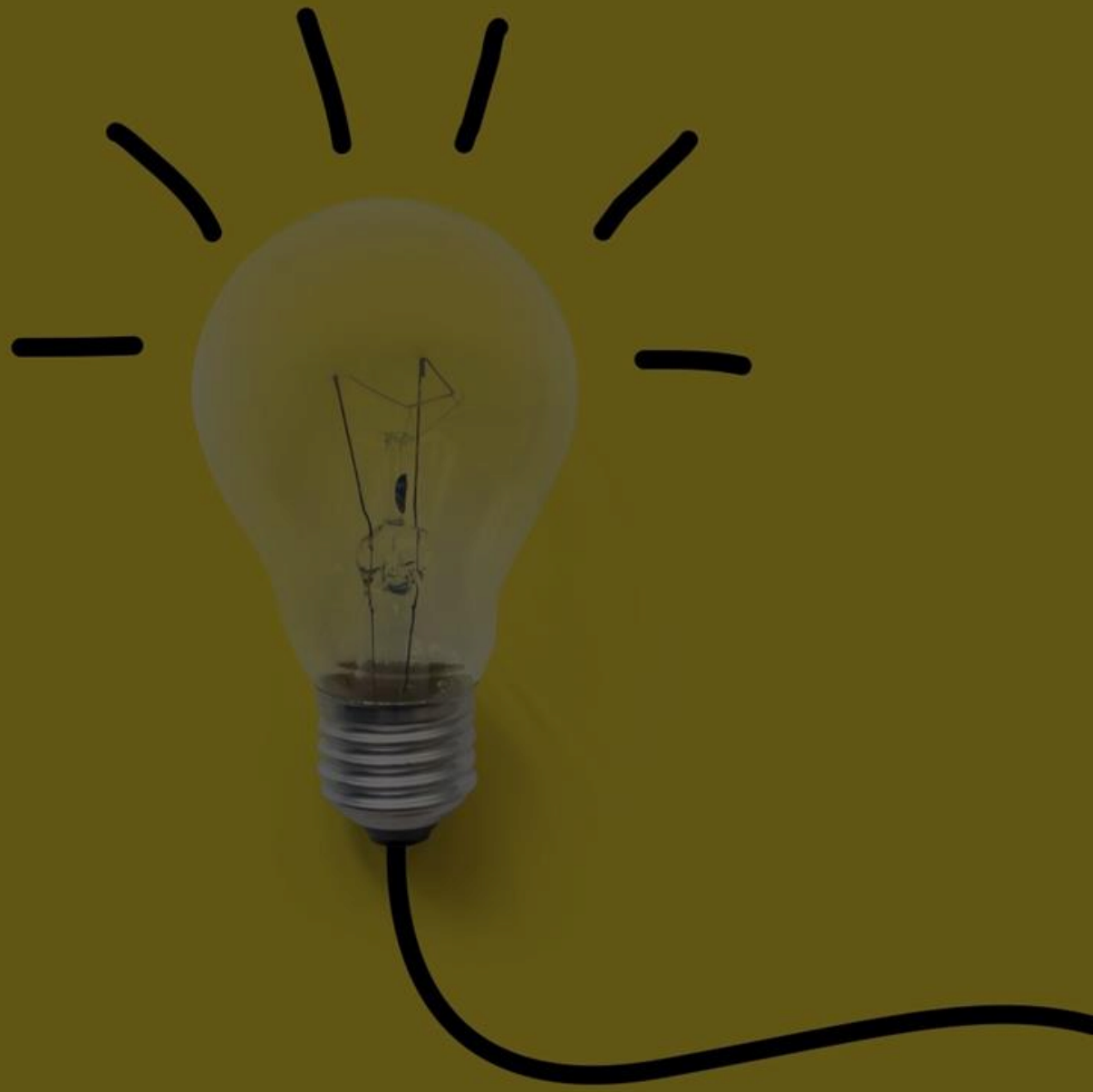
To obtain the names of the programming languages and their yearly wages, the IBM website was scraped. The dataset from a 2019 Stack Overflow developer survey was downloaded and saved.

Python was used to clean and analyze the data. To assess the distribution of data, the presence of outliers, and the correlation between various columns in the dataset, an exploratory data analysis was carried out.



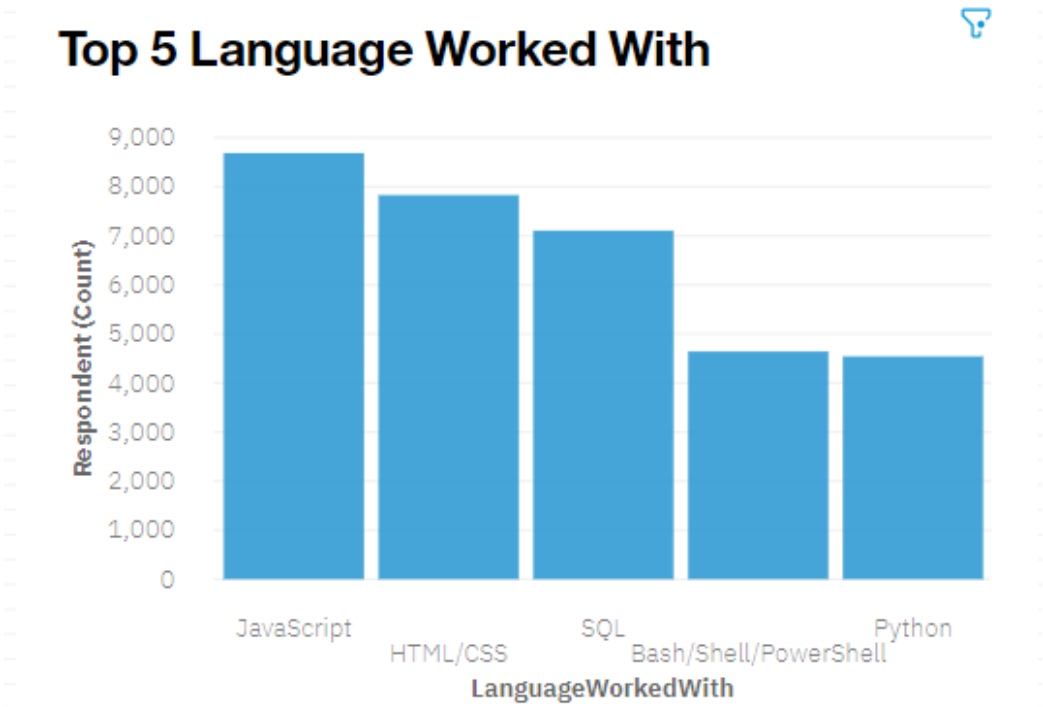
Charts, graphs, and dashboards were created using Python and Cognos analytics to visualize the data. All the python analyses were carried out on Jupyter notebook through visual studio.

Results

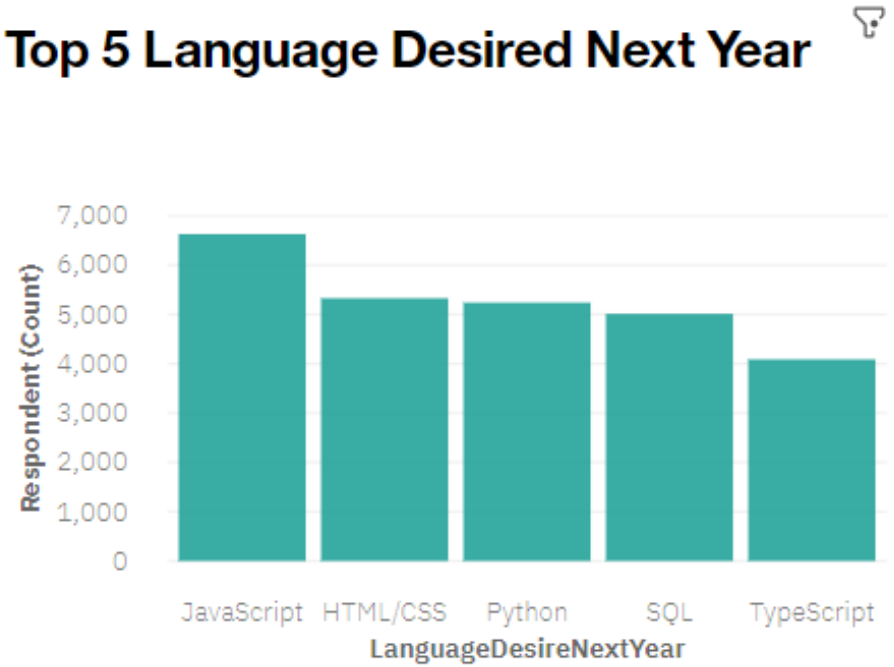


PROGRAMMING LANGUAGE TRENDS

- Current year



- Next year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

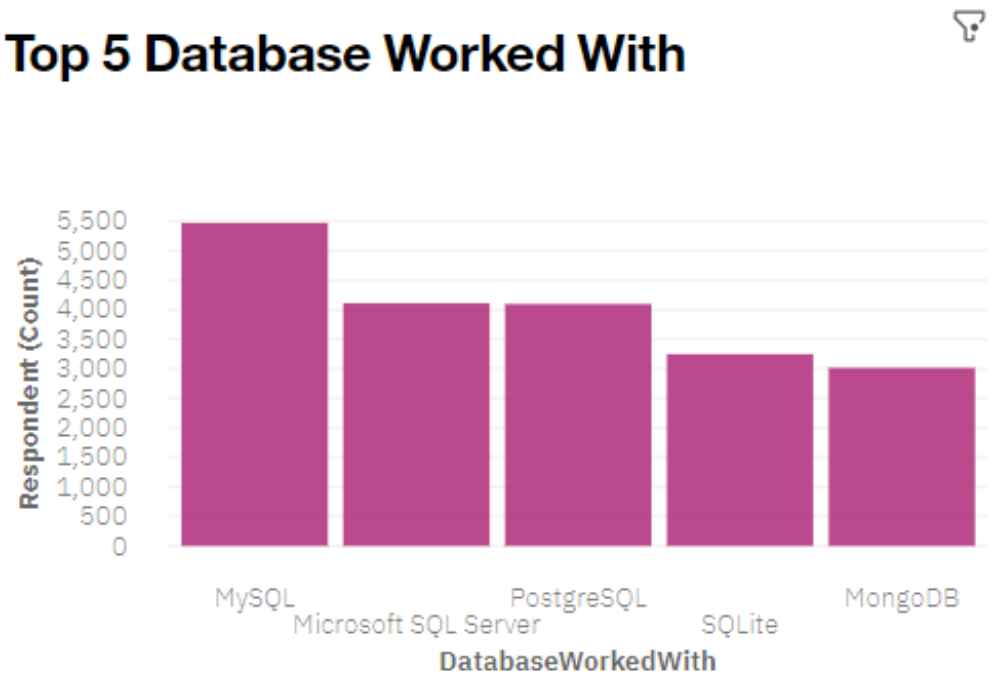
- JavaScript and HTML/CSS continue to be the top two most popular programming languages for this year and next.
- Python and TypeScript have gained more interest for next year.
- Whereas interest in SQL and Bash/Shell/PowerShell has decreased.

Implications

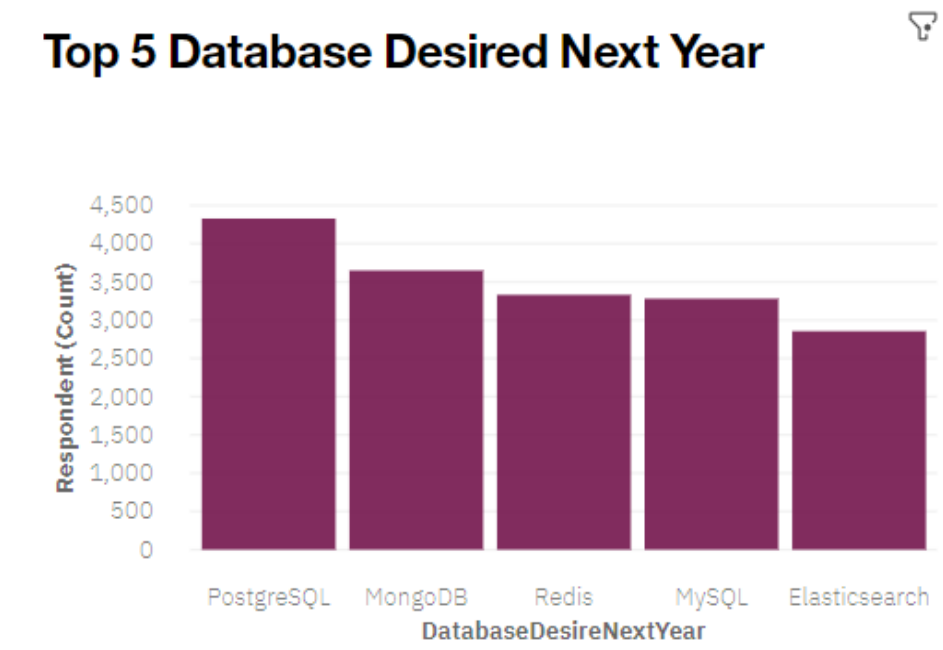
- The results of this analysis unequivocally imply that the largest number of respondents are oriented towards web design.
- The rapid advancement of AI technology increases respondents' interest in Python with its vast number of libraries.
- SQL is still the most relevant language for data professionals.

DATABASE TRENDS

- Current year



- Next year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Interest in MySQL, Microsoft SQL Server and SQLite has decreased for next year.
- Interest in PostgreSQL and MongoDB have increased compared to the current year.
- There is gained interest in Redis and Elasticsearch for next year.

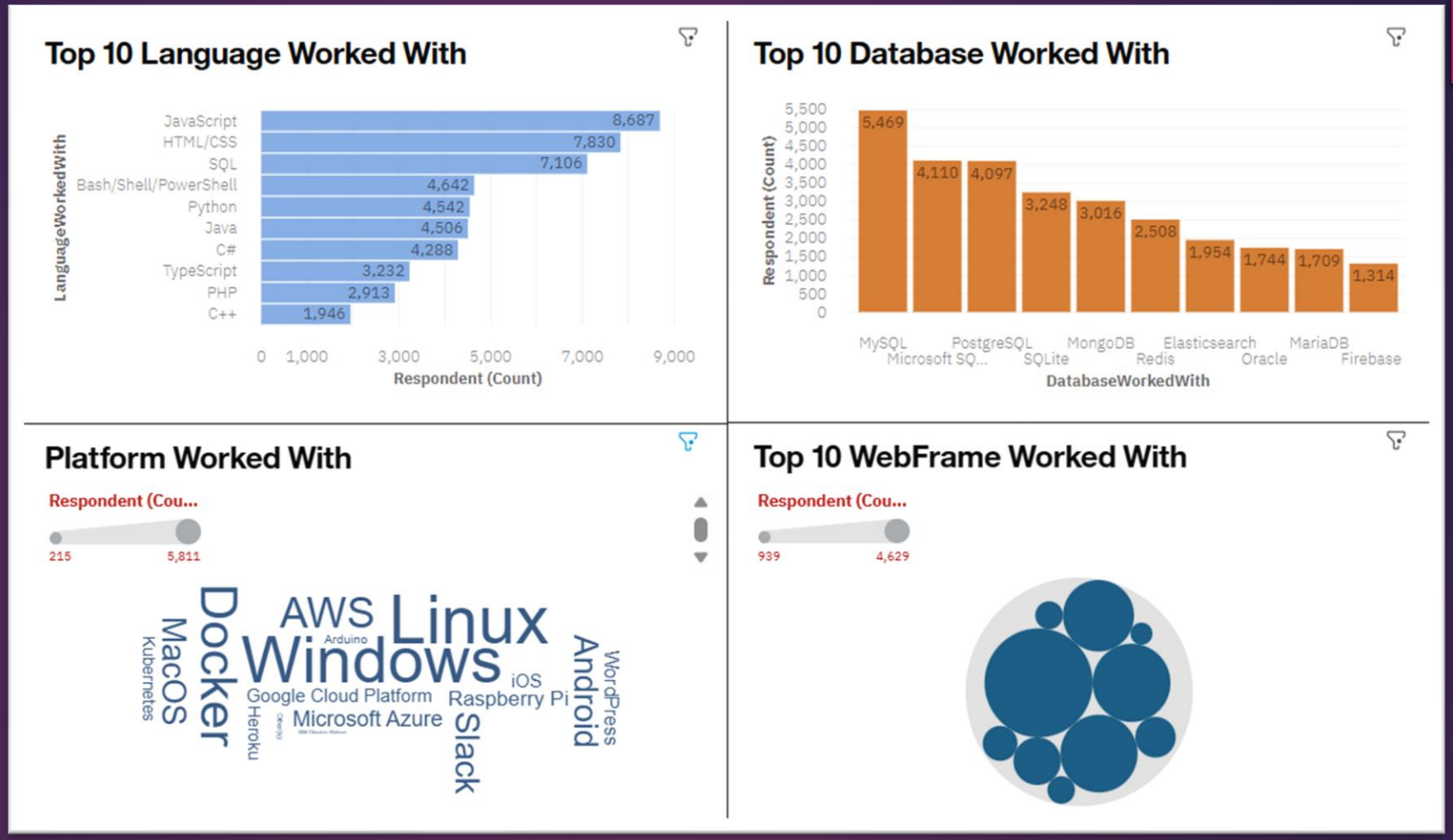
Implications

- SQL is still a top tool to watch out for data specialists.
- Companies still prefer Open source databases.
- Oracle SQL was not among the top 5. It is losing relevance as time passes.

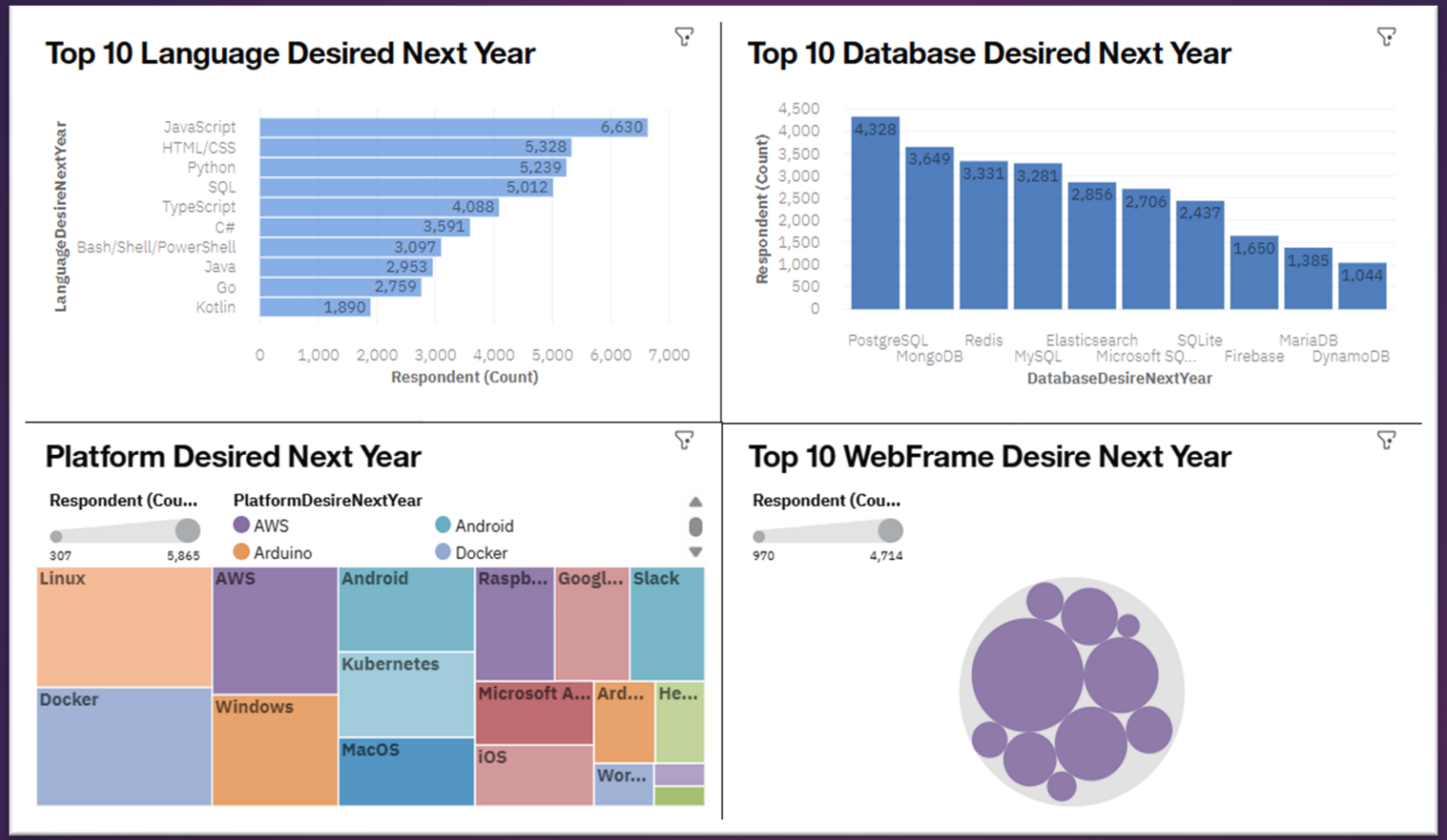
DASHBOARD

The permanent link of the Cognos dashboard:

https://dataplatform.cloud.ibm.com/dashboards/62b6eb59-cfa9-4eaa-b4a1-897722c501e8/view/5569b81b60800bce13fecce4079d7d537d64710fe0bbd65783d17b490f317497f06c1796c82e4e5cdb165335a5ed1658cb

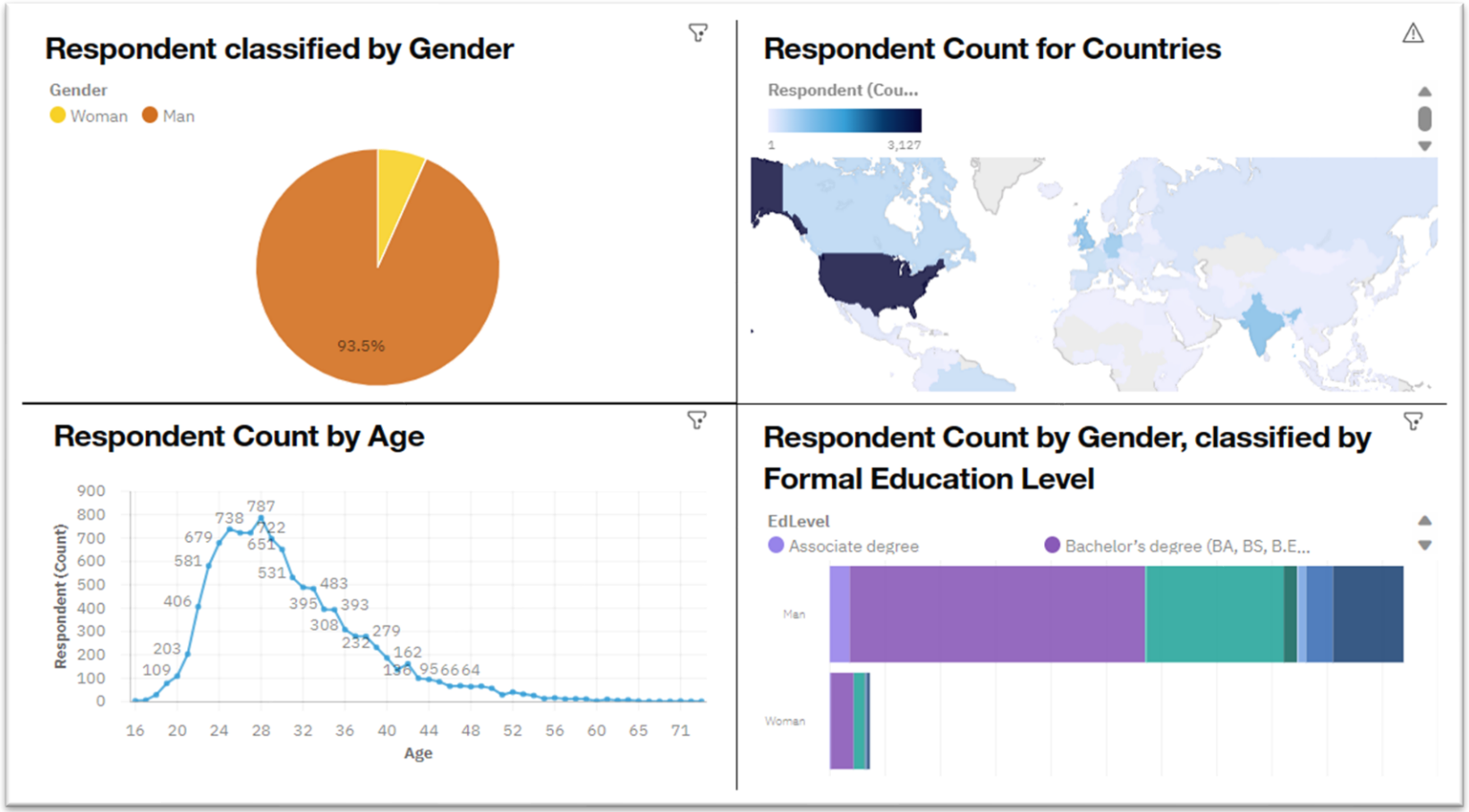


DASHBOARD TAB 1



DASHBOARD TAB 2

DASHBOARD TAB 3



DISCUSSION

- Technology trends now and future.
- Training and upskilling workers.
- Female participation in Technology field.
- Bridging divide of technology gap in developing countries.
- Eliminate age and education discrimination in employment.

OVERALL FINDINGS & IMPLICATIONS

Findings

- Java Script, HTML/CSS and in the future retains the leading interest among users of software technologies.
- A significantly increased interest is being shown for Python in the future.
- With Databases, the situation is more dynamic. PostgreSQL, MongoDB and Redis are much more attractive for the future than MySQL and Microsoft SQL Server.
- In the field of Web Frameworks, JQuery fatigue is evident, as there is growing interest in React.js, and especially Vue.js
- The result obtained from the demographic structure of the respondents in terms of gender is striking.Only 6.5% of respondents in the field of software technologies are women.

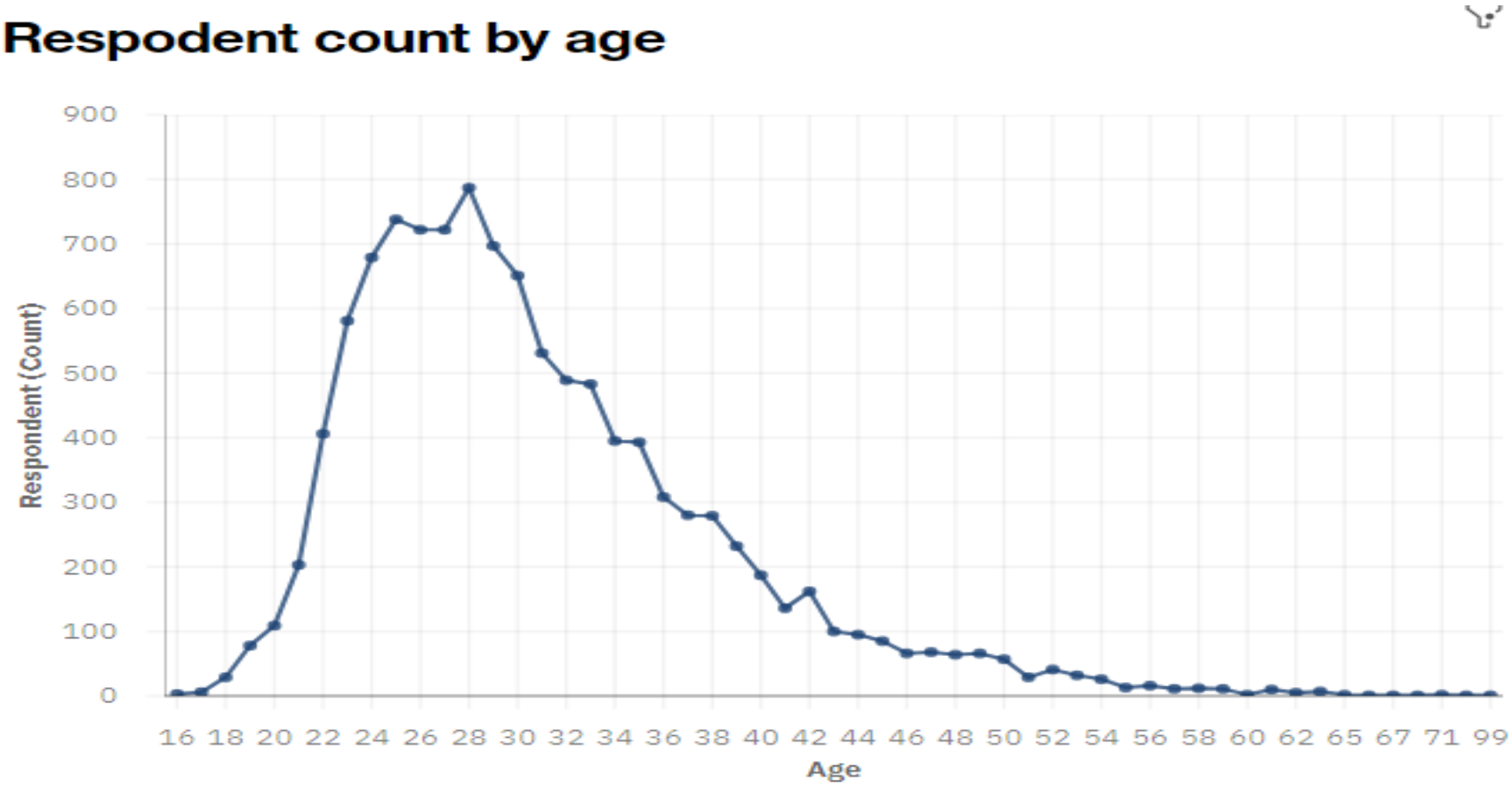
Implications

- Most of the respondents are oriented towards WEB software technologies, and they will maintain the same interest in the future.
- The analysis indicates a growing interest in interpreted programming languages.
- Interest in open source software for databases is also growing significantly.

CONCLUSION

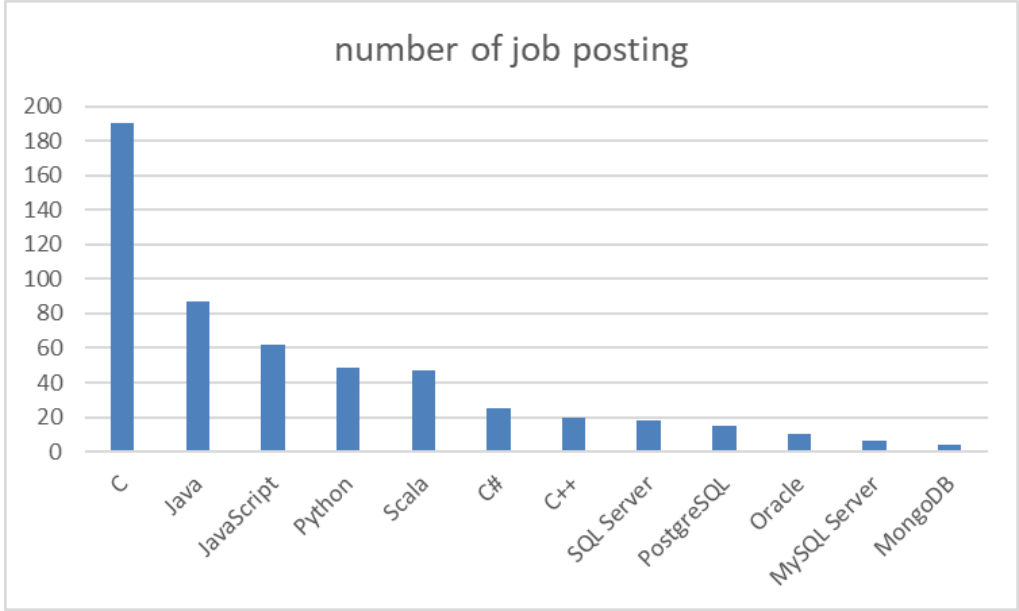
- It is expedient to stay updated in the Tech sector as the trends keep changing over time.
- The general technological development and the needs of innovation are a generator for changes and advancement in software technologies.
- Software technologies need to expand their boundaries by eliminating age, gender and racial discrimination, as well as by including a growing number of countries of the world in the programming community.

APPENDIX

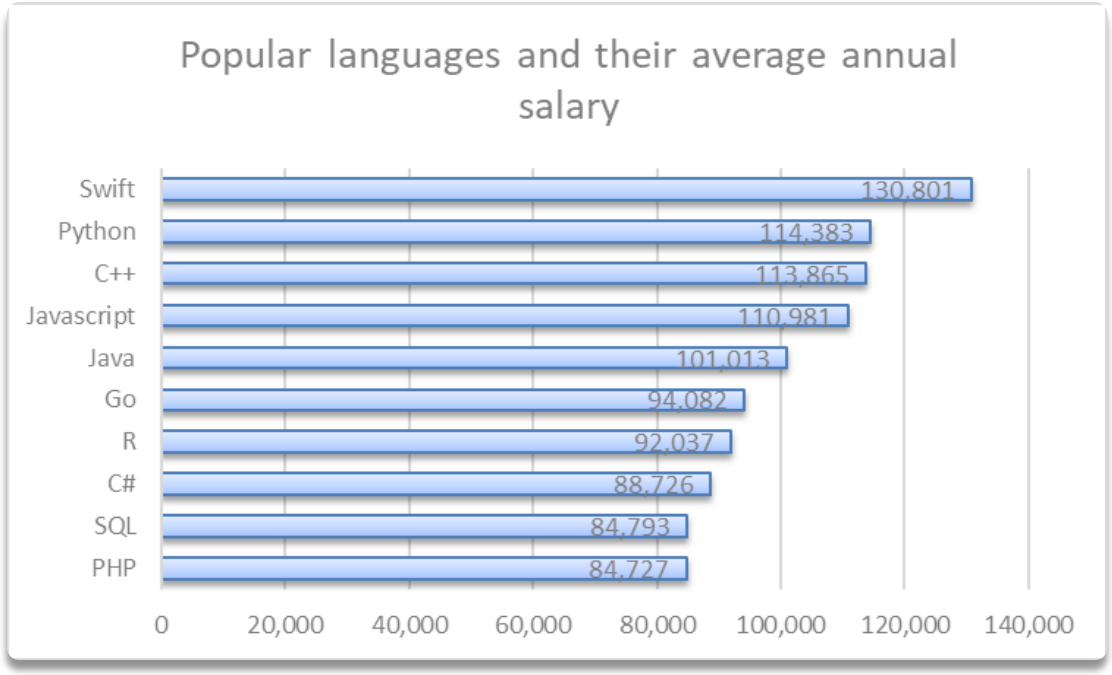

Respodent count by age
Respondent (Count)
900
800
700
600
500
400
300
200
100
0
16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 65 67 71 99
Age

JOB POSTINGS

Bar chart presenting the job posting data collected using Github Job API.



POPULAR LANGUAGES



Bar chart displaying popular languages and their average annual salary. The data was collected through web scraping the Github jobs data and saved in a csv file.