IBM DATA ANALYST CAPSTONE PROJECT:

ANALYSIS OF KEY COMPETENCIES AND TRENDS IN EMERGING TECHNOLOGY

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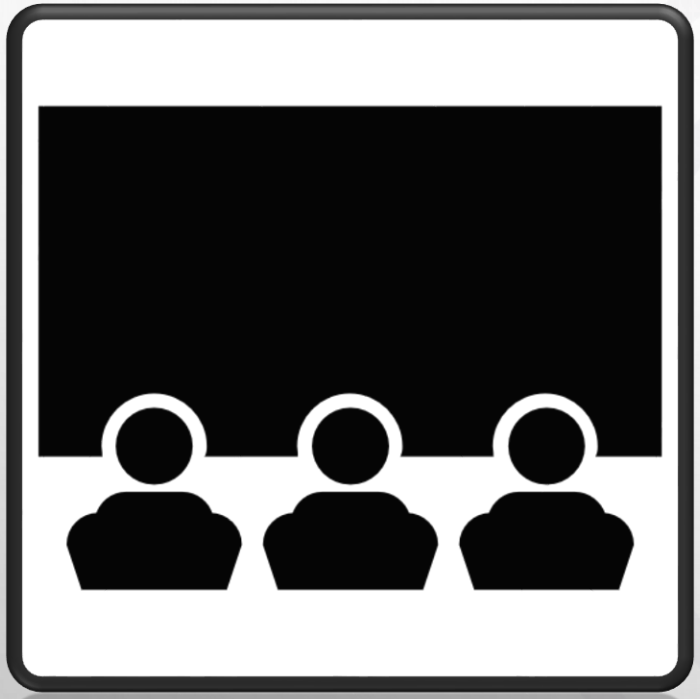
MAY 20, 2025

PART 1

Skills Network

IBM

OUTLINE



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EXECUTIVE SUMMARY

In a world where technology is booming, it is essential to have an overview of current trends in technical skills such as programming languages among others, and their projection into the future.

For this analysis, data has been collected through:

- Stack Overfow 2024 survey with more than 36,000 respondents (.csv file)
- IBM web table (web scraping, .csv file)
- Job offers collected from Githunb (.xlsx file)

The findings demonstrate that:

- Javascript, SQL, CSS are the most popular languages and C# has a tendency to become more popular due to the rise of mobile app.
- The most used databases are headed by PostgreSQL and
- This is what it seems will be maintained in the future.

On the other hand, of those surveyed, almost half are between 25 and 34 years old with not necessarily higher education.

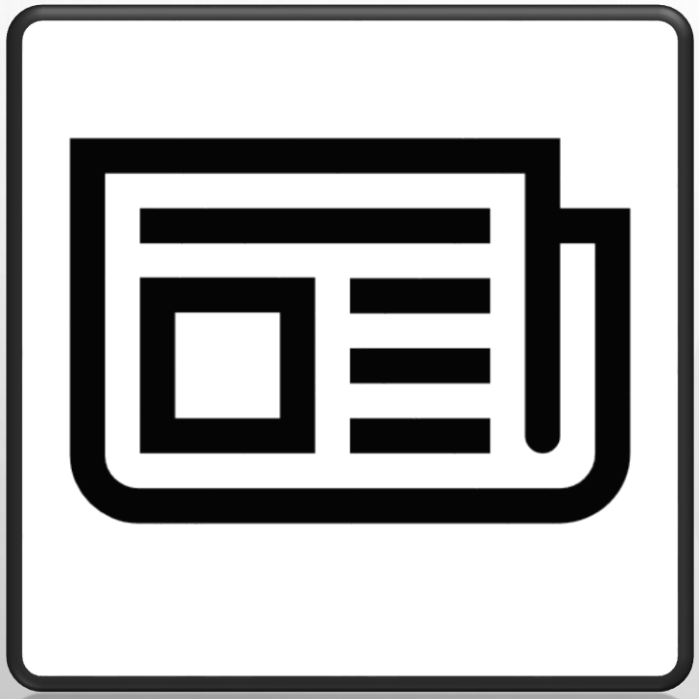
INTRODUCTION

We will know the current trends and projected on the IT sector responding questions like:

- What are the programming languages most demanded currently and what is the trend of their demand in the future?
- What are the most required skills?
- And the most used databases?

We will also obtain information about the profiles of the respondents.

METHODOLOGY



The currently available jobs for different technologies or locations have been collected using the Github Jobs API via Python.

The names of the programming languages and their annual salaries were obtained from the IBM website through web scrapping.

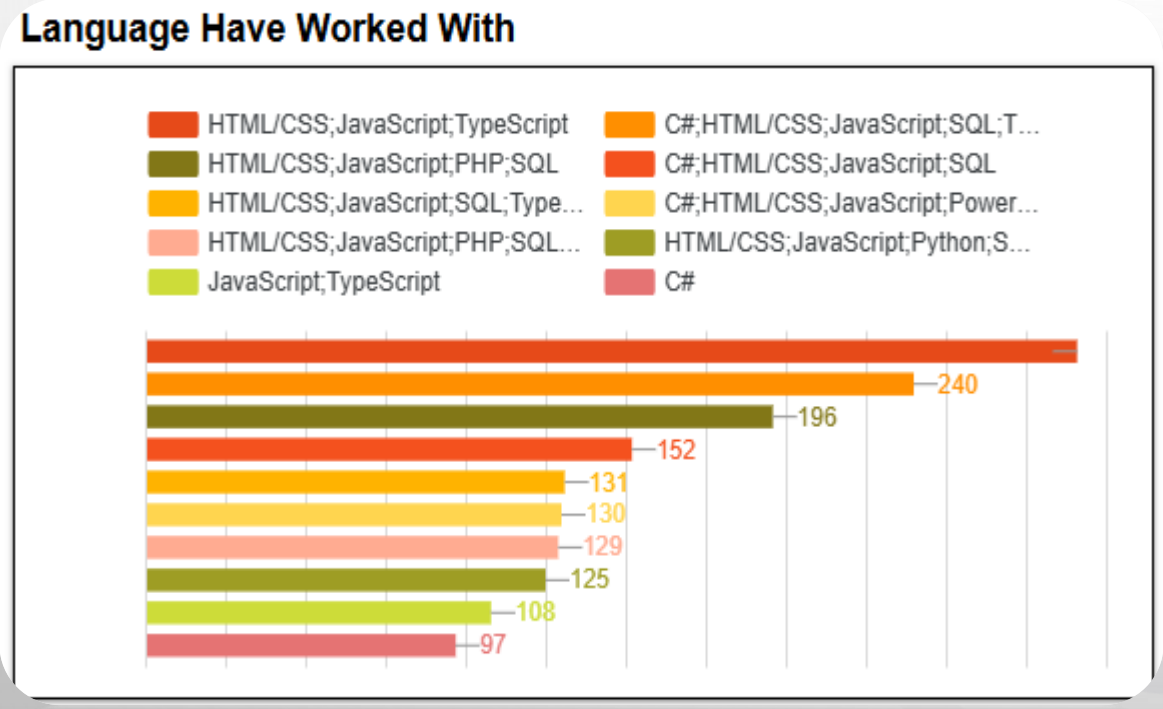
The file referring to the 2024 Starck Overflow survey was downloaded and saved as a csv file.

Data processing and presentation:

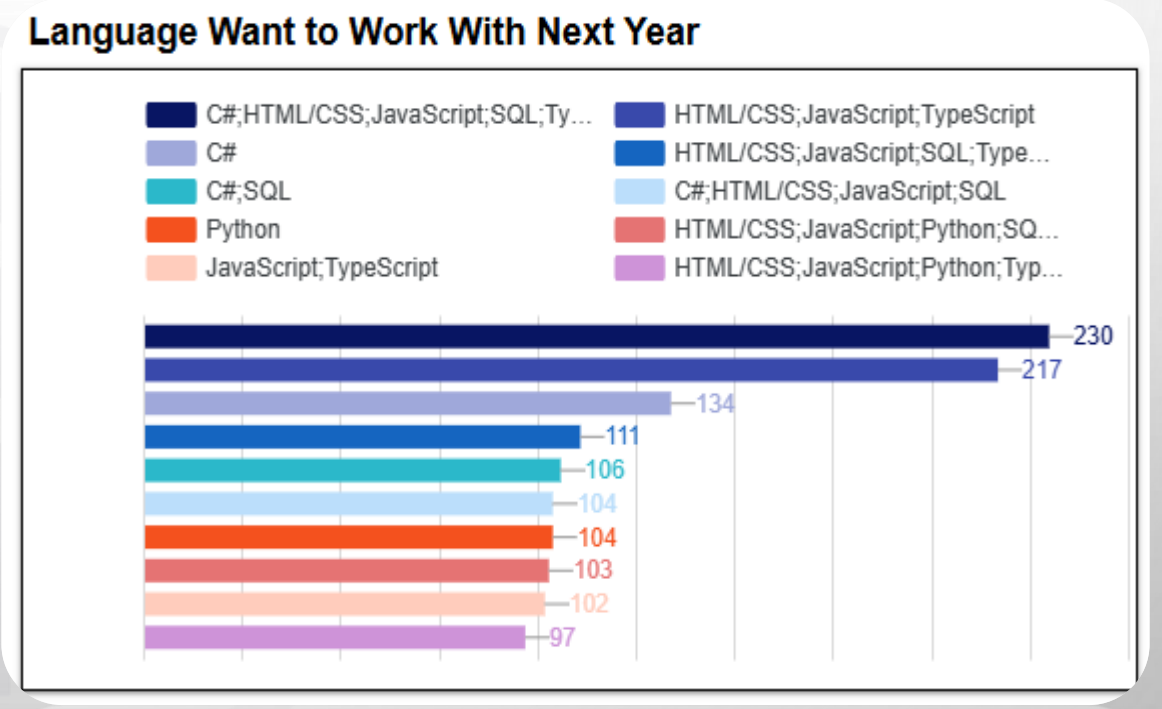
Python is used to clean and treat (outliers, correlations, etc.) the data set in Jupiter Notebook. After an exploratory analysis, analytical graphs were also created with Python although the dashboard was created using Google Studio.

PROGRAMMING LANGUAGE TRENDS

TOP 10 CURRENT YEAR



TOP 10 NEXT YEAR



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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS

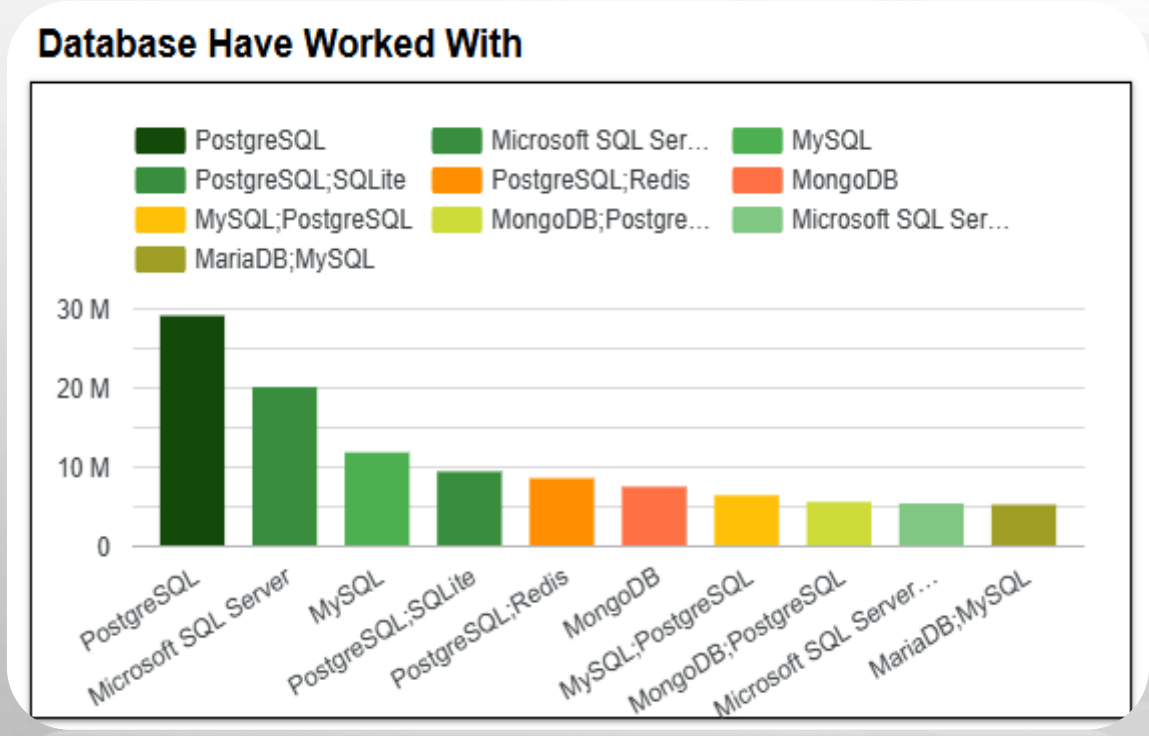
- Javascript, HTML/CSS, SQL, are the most used languages with a tendency to remain.
- C# will be more in demand in the coming years.
- Python is growing in popularity.

IMPLICATIONS

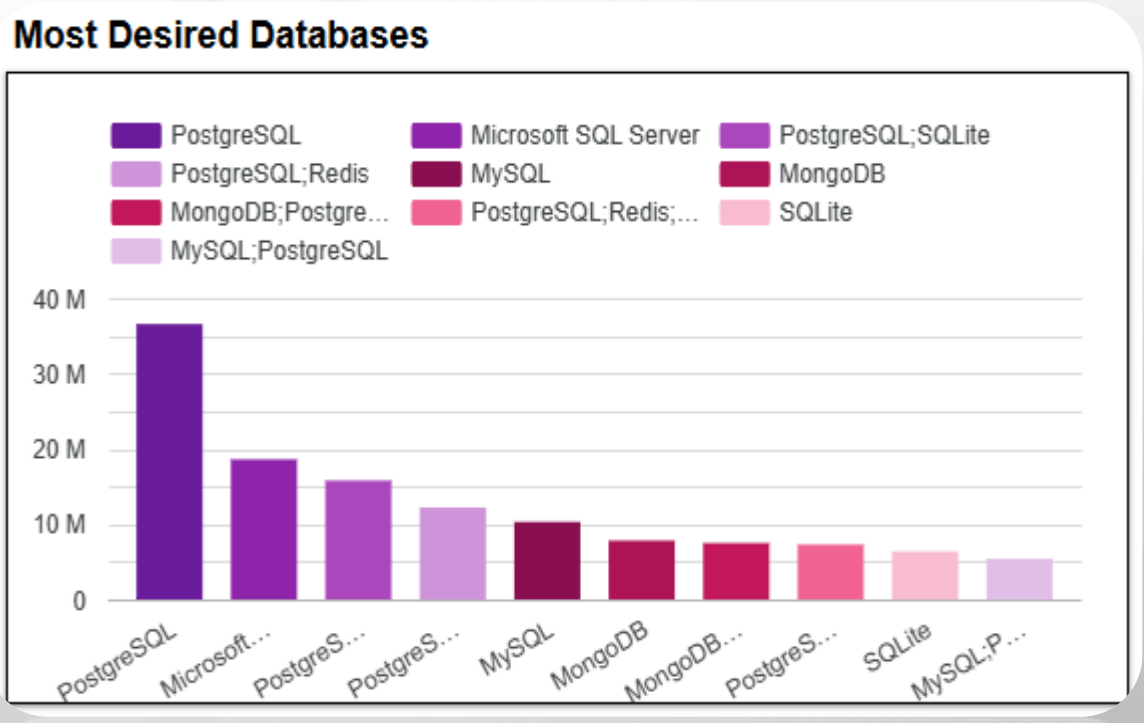
- The technological skill in greatest demand focuses on web development.
- SQL is important for data science as well as business analysis, which is why it remains relevant.
- Python, being necessary for machine learning skills, will grow in demand.

DATABASE TRENDS

TOP 10 CURRENT YEAR



TOP 10 NEXT YEAR



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DATABASE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS

- PostgreSQL, Microsoft SQL and MySQL are the most used databases today.
- MongoDB falls somewhere in between. it is ideal for applications with dynamic and unstructured data, while PostgreSQL is preferred for systems that require complex relationships and robust transactions.
- The most used platforms with AWS, Azure or Google Cloud.

IMPLICATIONS

- SQL remains an essential tool for data professionals.
- companies continue to opt for open-source databases.
- MongoDB will remain on the same line in the future.

DASHBOARD

Link a dashboard:

https://lookerstudio.google.com/s/ulsfYrombS8

DASHBOARD TAB 1

Stack Overflow survey

Current use of technology

Language Have Worked With

Database Have Worked With

Plataform Have Worked With

Webframe Have Worked With

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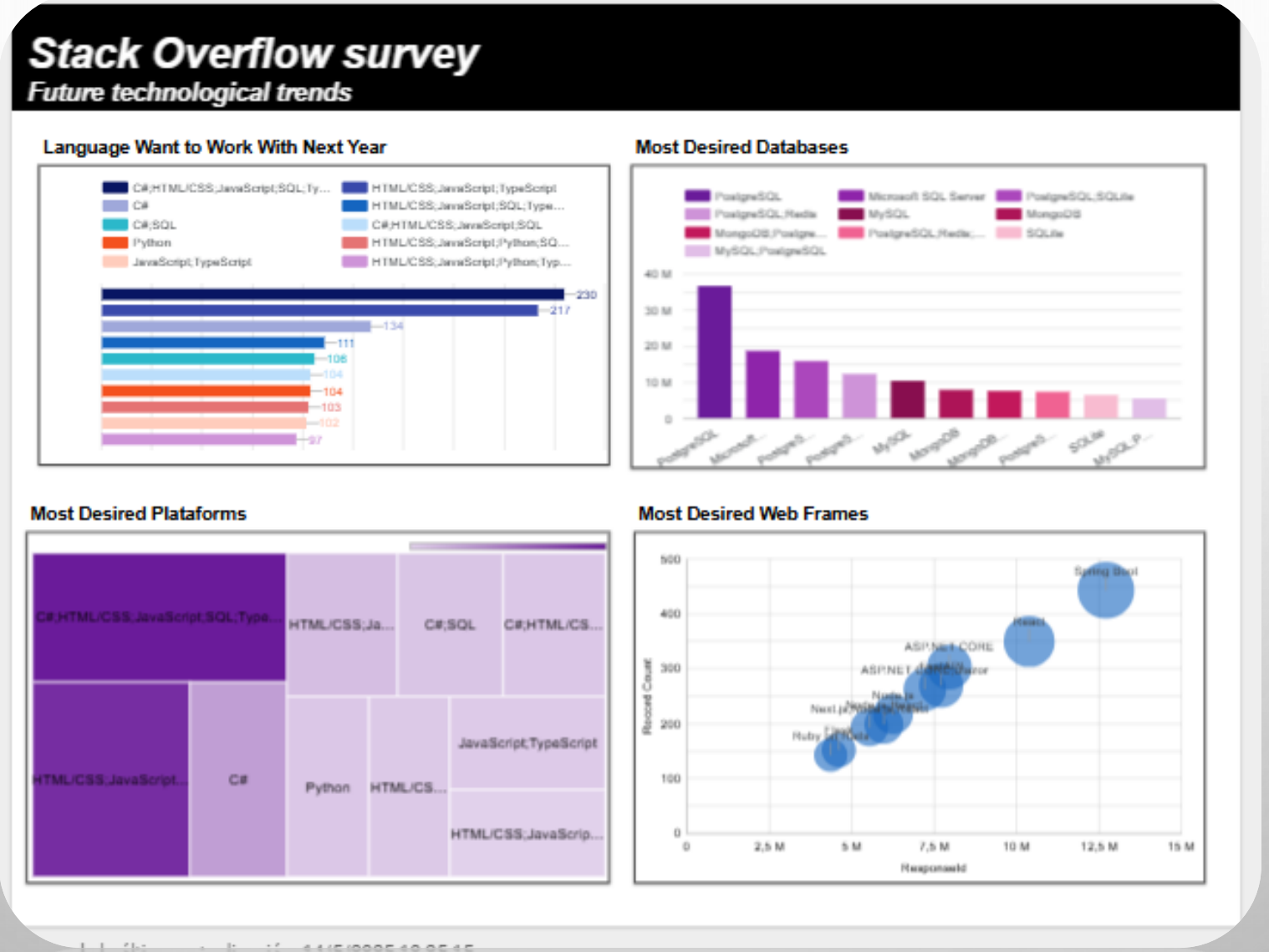
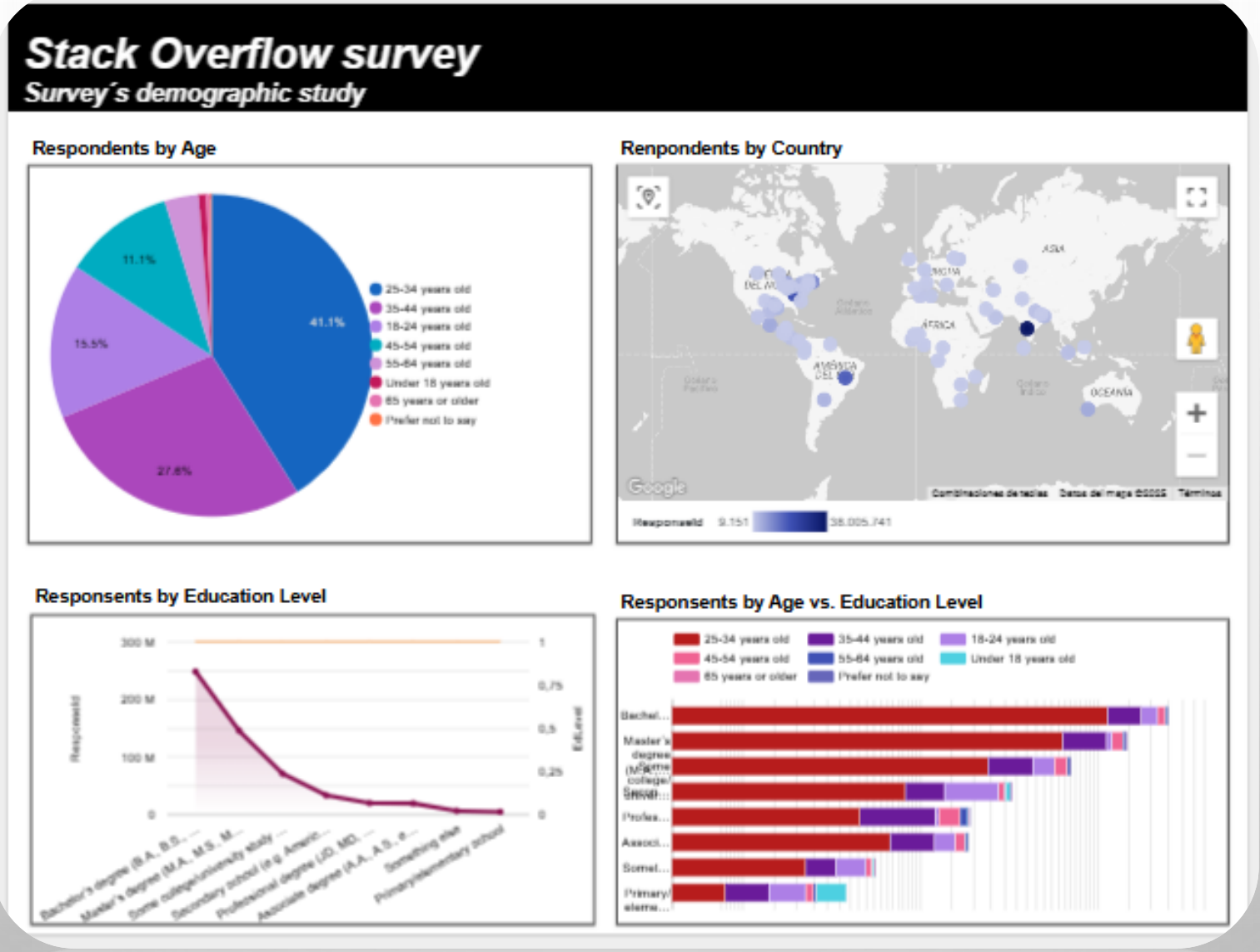
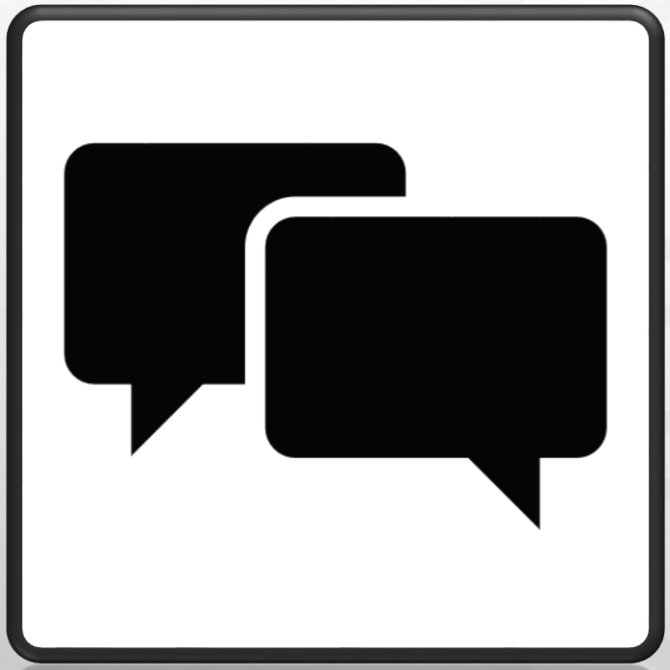
DASHBOARD TAB 2



DASHBOARD TAB 3



DISCUSSION



What´s the importance of developing technological skills to adapt to a digital environment?

Are advanced degrees like master's degrees or doctorates really necessary to be successful in the industry?

In what age ranges or areas has there been a greater response?

More and more organizations prefer cloud solutions instead of physical infrastructure.

OVERALL FINDINGS & IMPLICATIONS

FINDINGS

- The majority of the sector is made up of people under 45 years of age and with countries like the USA, Germany and India leading the way.
- The current preferences for databases and programming languages are maintained over time without major variations.
- The increase in demand for mobile developers has boosted the popularity of C# among programmers.

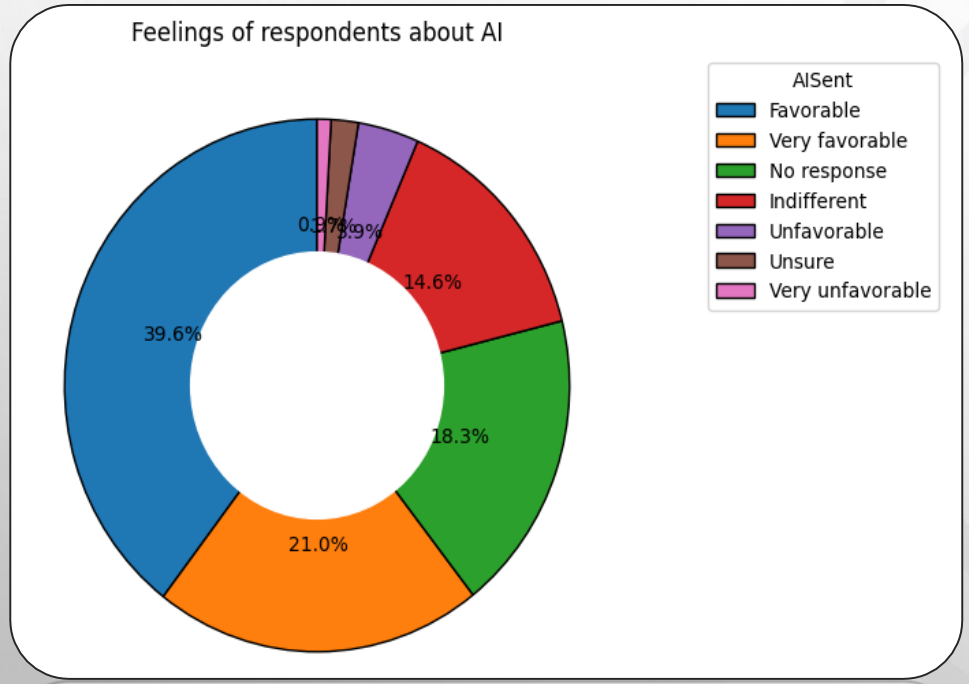
IMPLICATIONS

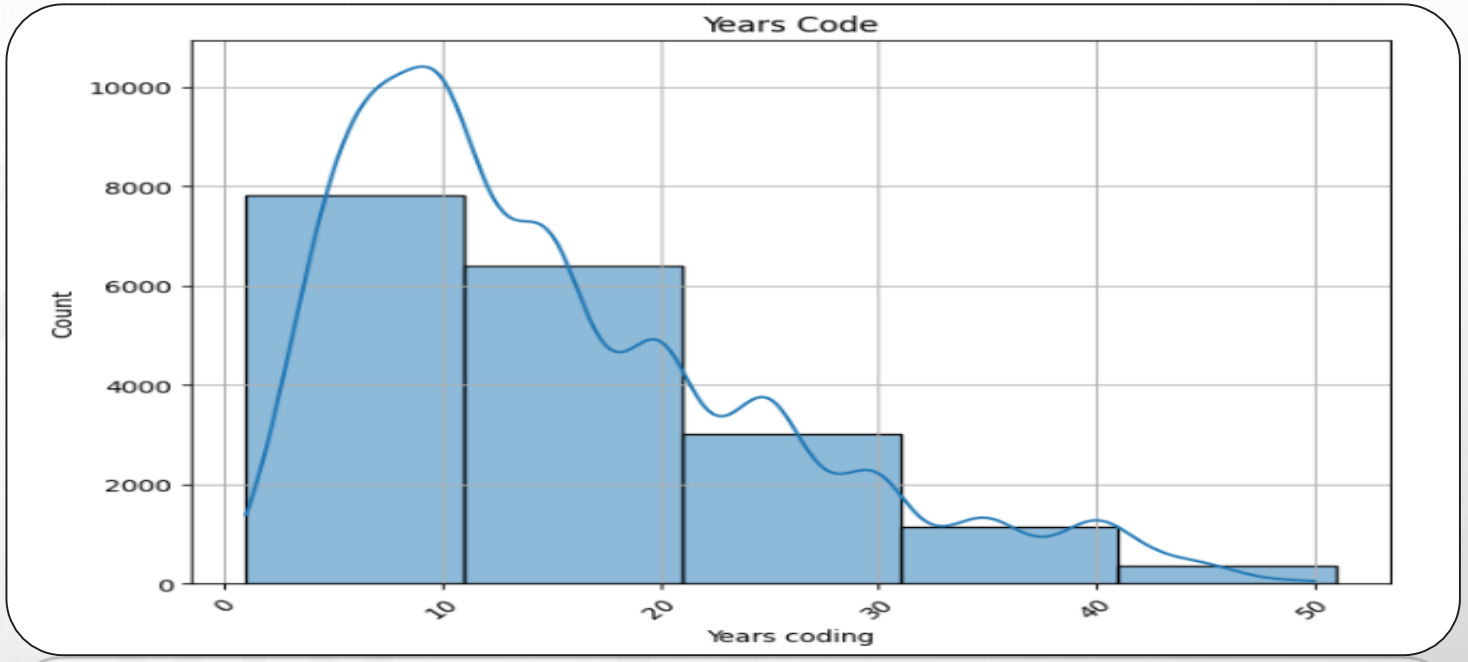
- Competitiveness in the it sector requires keeping up with changing technologies and developing skills in both SQL and NoSQL databases.
- A good knowledge base in the most in-demand languages is essential to develop.
- There are many ramifications within the sector that make it attractive for the future work of future generations.

CONCLUSION

- It is essential to stay up to date in the technology sector, as trends are constantly evolving.
- It is a continuous learning process with growing interest among the young active population.
- Having a solid foundation in programming logic will help you adapt to new tools.
- The use of AI is being well accepted as a supportive complement.

APPENDIX

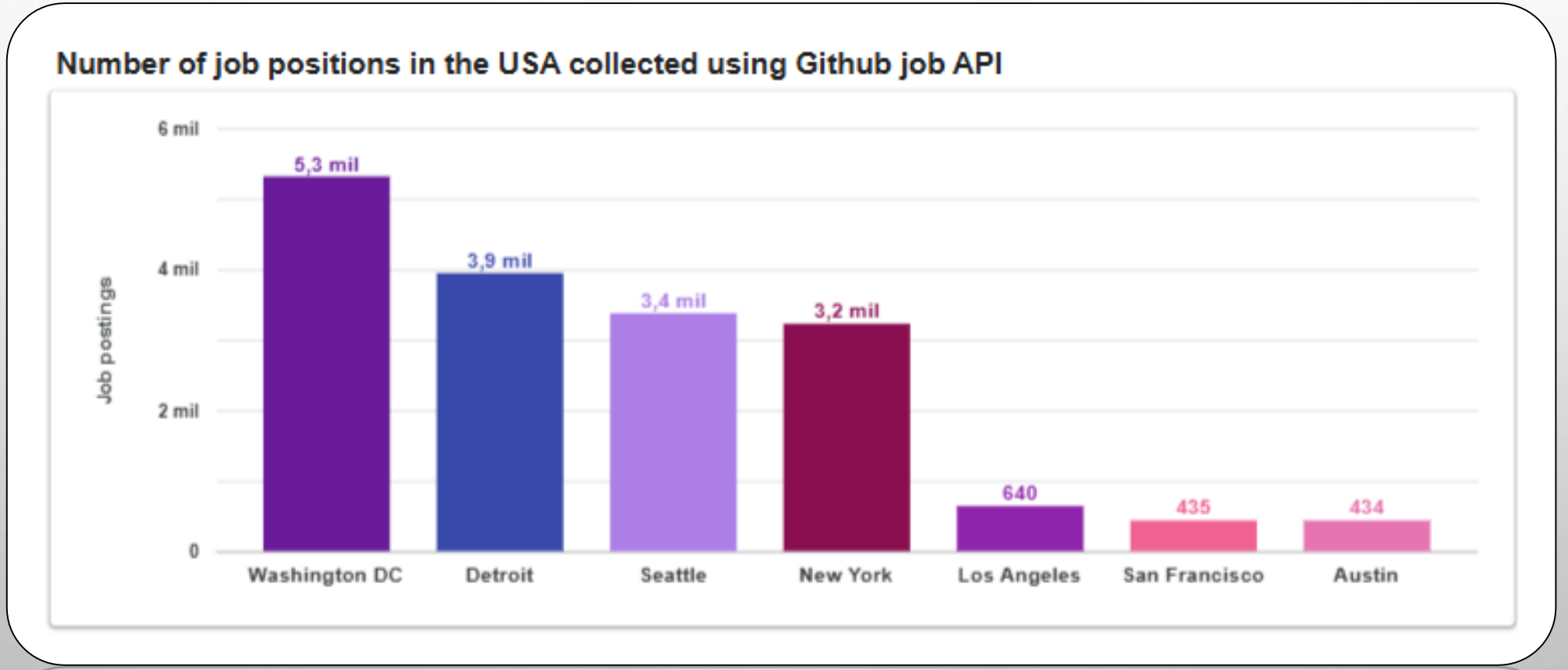
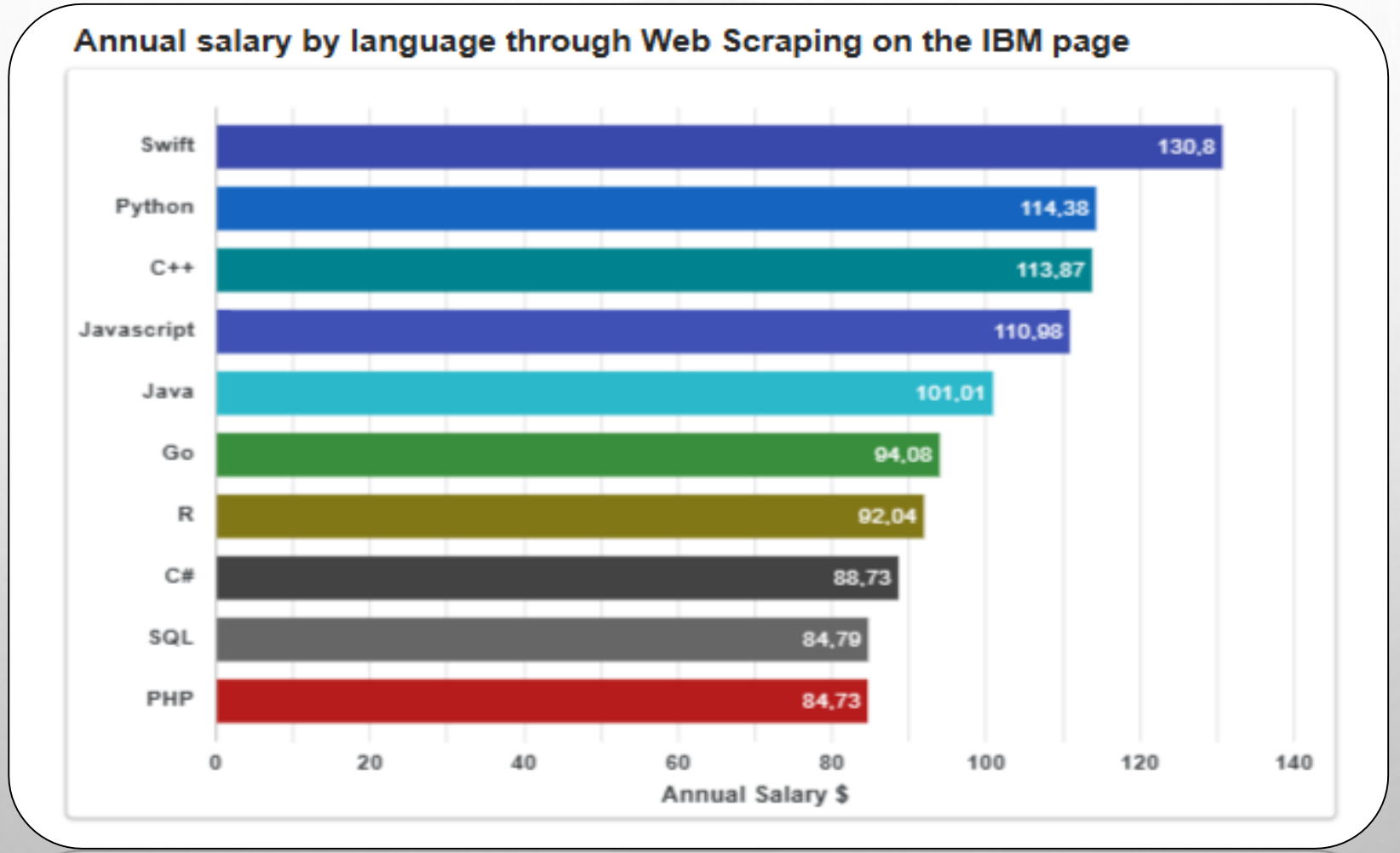




TOP 5

```
Employment
Employed, full-time                                                    12664
Independent contractor, freelancer, or self-employed                    1958
Employed, full-time;Independent contractor, freelancer, or self-employed 1770
Student, full-time;Employed, part-time                                   320
Employed, part-time                                                      295
Name: count, dtype: int64
```

JOB POSTINGS



POPULAR LANGUAGES