

# Emerging Technology Skills

---

*Dimitrios Fortis*

February 8<sup>th</sup> of 2023

# OUTLINE

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



# ***EXECUTIVE SUMMARY***



- Company's Aim → Profitability & Customer satisfaction;
- How ? → Remain competitive by keeping up-to-date with the constantly changing technologies;
- Presentation's Aim → Find the technologies that have been used the most this year & identify future skill requirements;
- Presentation's key points → Current & Future Trends in Programming Languages, Databases, Platforms & Web Frames in the market;
- Key takeaways → Push Company to more informed and data-driven decision making.



# INTRODUCTION



- The Presentation's purpose will give insights to the responsible business' stakeholders, in effective decision making upon IT Consulting Services;
- Answering the right questions, namely which are the current and immerging technologies in the market will drive the company to identify future skill requirements, utterly making the provided services more effective and precise;
- Along the presentation, ideas and recommendations will be provided, based on the implementing Data Analysis techniques.

# METHODOLOGY

- Starting with a modified subset of the Stack Overflow dataset, the data were wrangled in order to remove duplicates, impute missing values & normalize them;
  - After that, the data underwent exploratory analysis in order to find the distribution of them, presence of outliers & determine the correlation between different columns in the dataset;
  - The third part was all about the visualization of the distribution the inter-relationship & the composition & comparison of data;
  - Finally, by utilizing two new files which were also modified subset of Stack Overflow dataset, a Dashboard was created through Cognos Dashboard Embedded (CDE), showing the 'Current Technology Usage', 'Future Technology Usage' & 'Demographics' in the three tabs, respectively.
- ❖ In the **Appendix** section a box-plot and a table of the participants' age and type of job, respectively is shown up, that was created through the Analysis process (Data collection through APIs and Web Scraping from Kaggle & GitHub)

# ***RESULTS***

© IBM Corporation. All rights reserved.

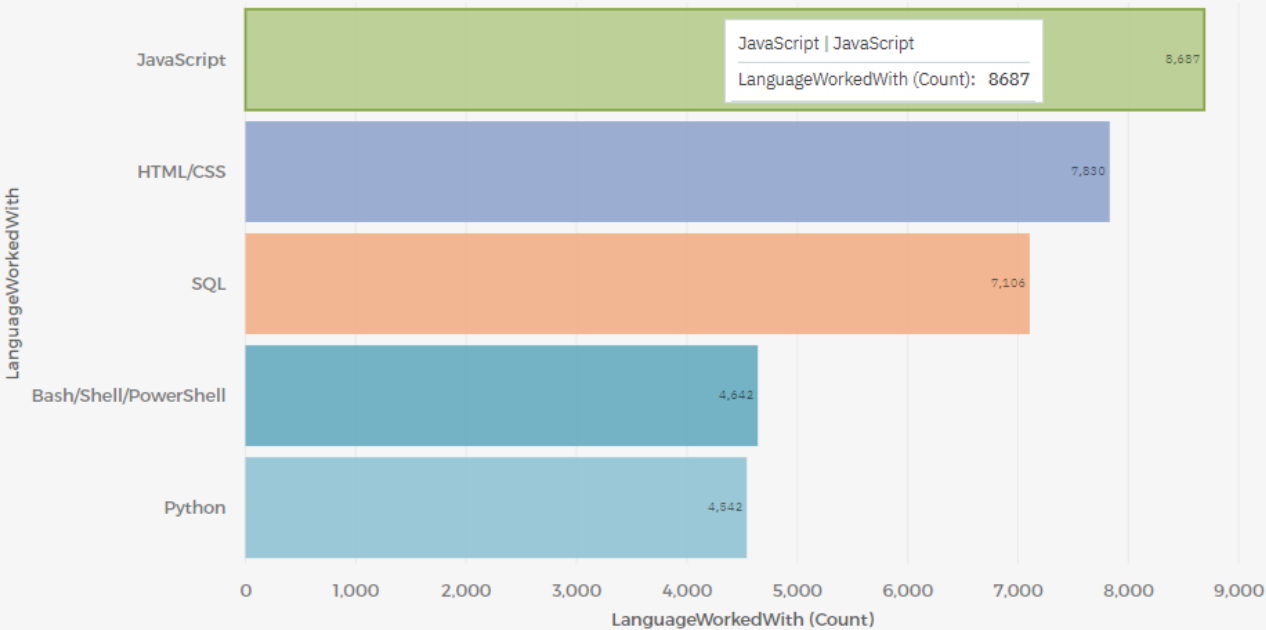


# PROGRAMMING LANGUAGE TRENDS

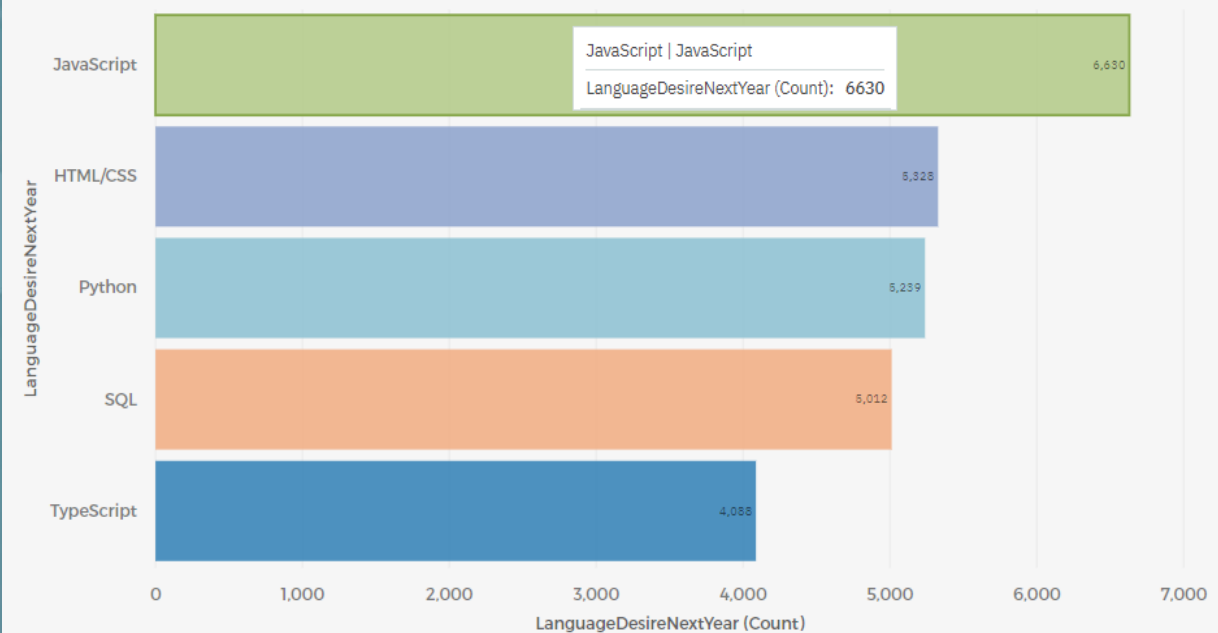
Current Year

Next Year

Top 5 Languages Worked With



Top 5 Languages Desire Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- *JavaScript & HTML/CSS* are the top two most popular programming languages for both this & the next year;
- *Python & TypeScript* is shown to gain the interest of the respondents;
- The interest in *SQL & Bash/ Shell/ PowerShell* has decreased.

## Implications

- Steady employment for individuals with *JavaScript & HTML/CSS* skills;
- More demand for individuals with *Python & TypeScript* skills;
- Less demand for individuals with *SQL & Bash/ Shell/ PowerShell* skills.

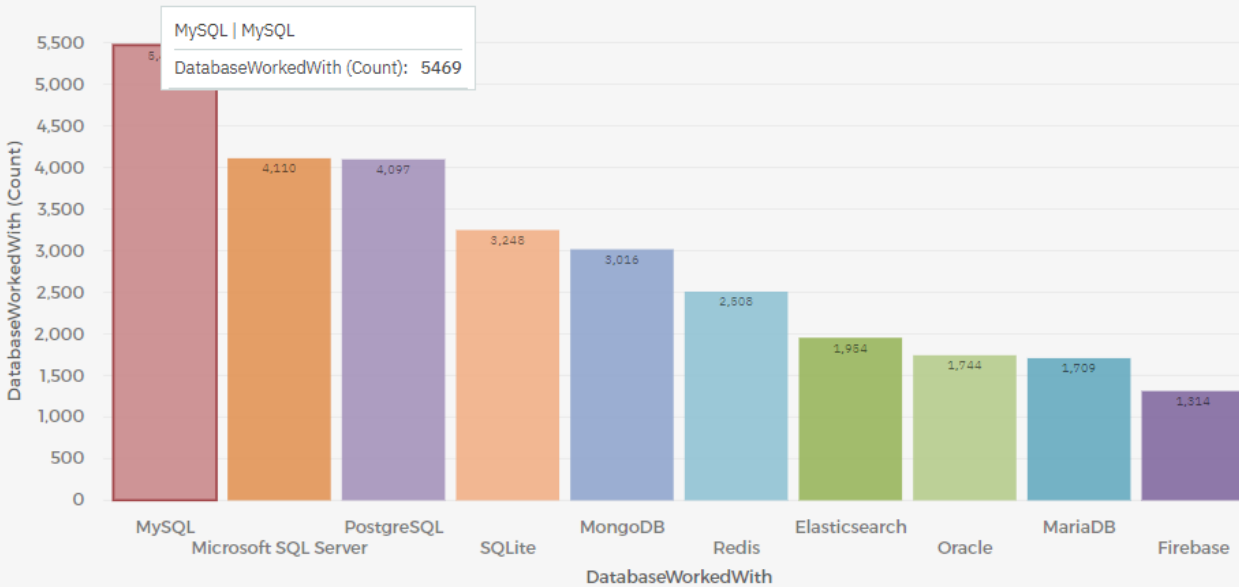


# DATABASE TRENDS

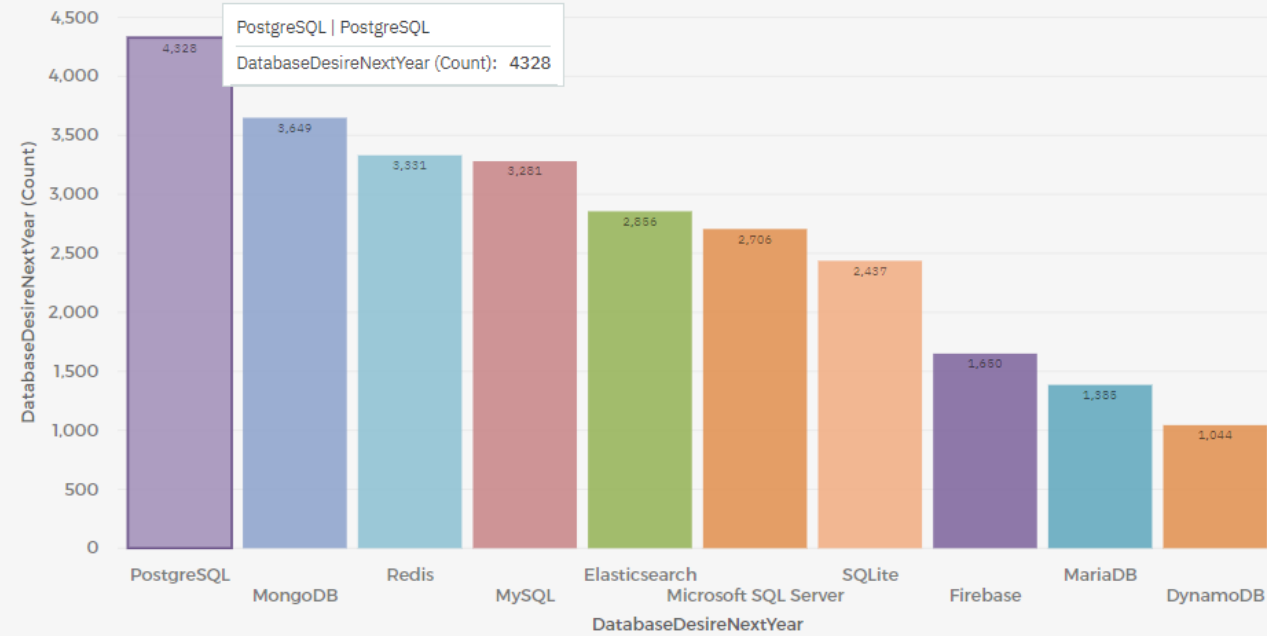
Current Year

Next Year

Top 10 Databases Worked With



Top 10 Databases Desire Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- *PostgreSQL & MongoDB* is shown to gain the interest of the respondents;
- *MySQL's, Microsoft SQL Server's & SQLite's* interest is decreasing among the respondents;
- The interest in *Redis/ Elasticsearch* is increasing for the next year.

## Implications

- More demand for individuals with *PostgreSQL & MongoDB* skills;
- Less demand for individuals with *MySQL, Microsoft SQL Server & SQLite* skills.
- More demand for individuals with *Redis/ Elasticsearch* skills.

# ***DASHBOARD***

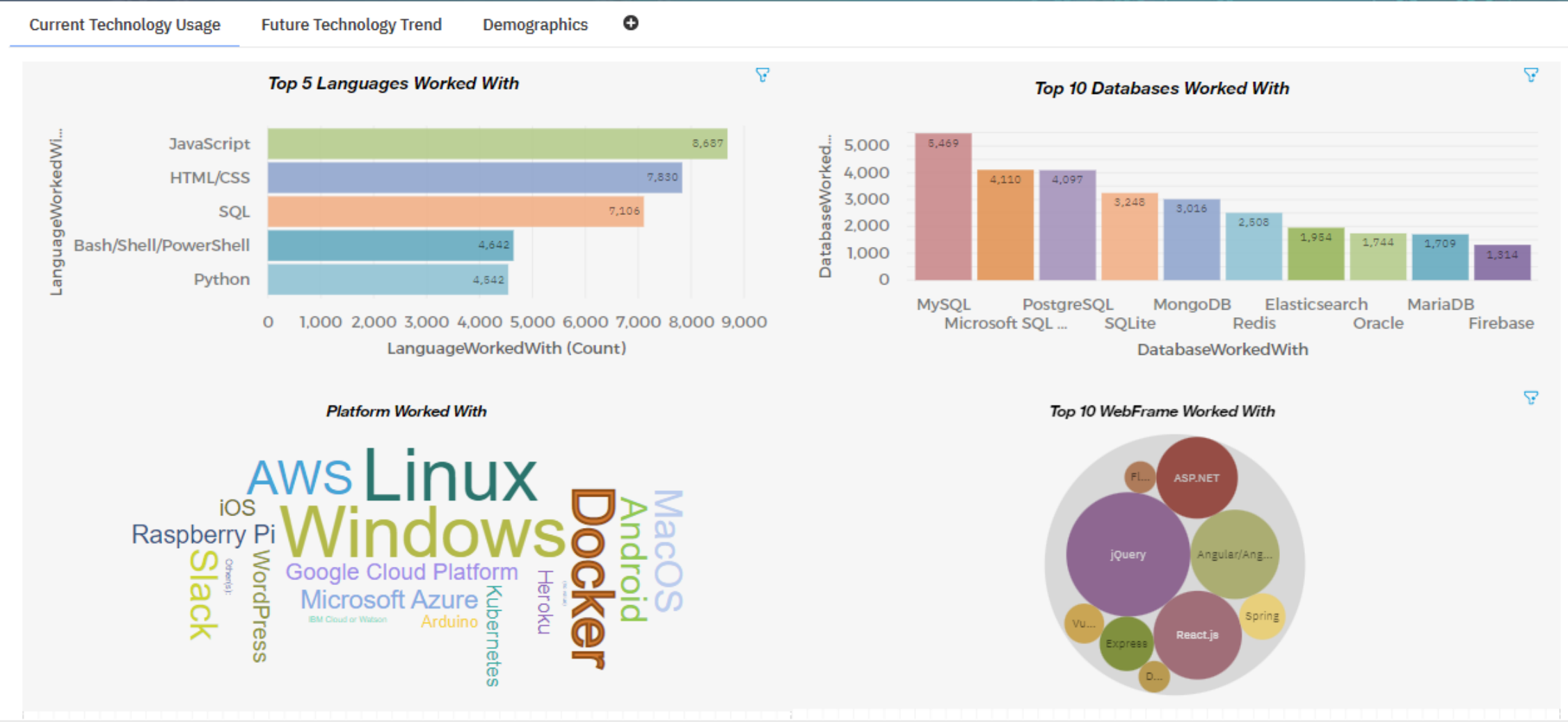


You can be redirected to the official dashboard through the following link:

<https://dataplatform.cloud.ibm.com/dashboards/f631466a-282a-407a-96fb-864849e8edca/view/533cd90c6eb708e55ce0c0e407cf2f037534225ce1bb835682d77b490c312397f33b1098c8281d53d3110d37a0ec415a9b>



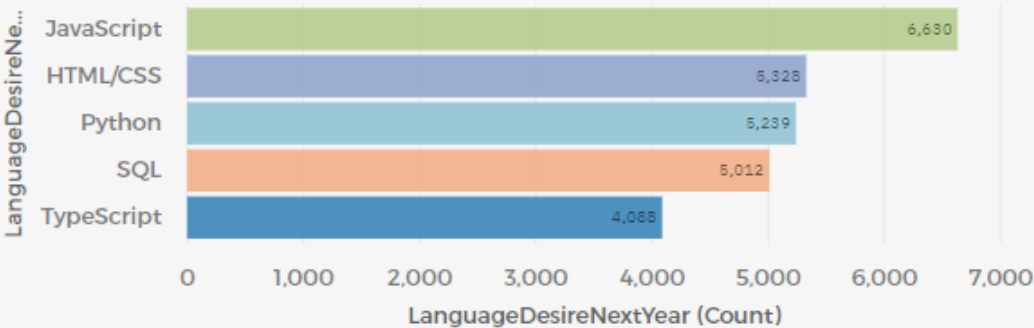
# DASHBOARD TAB 1



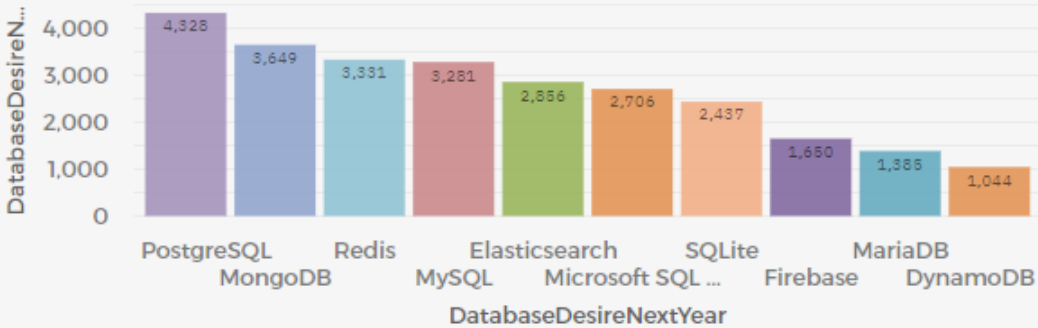
# DASHBOARD TAB 2

Current Technology Usage   **Future Technology Trend**   Demographics   +

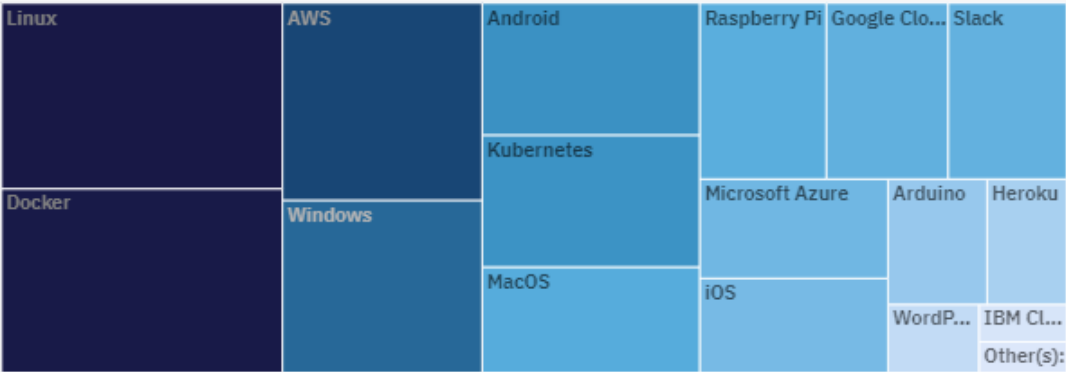
Top 5 Languages Desire Next Year



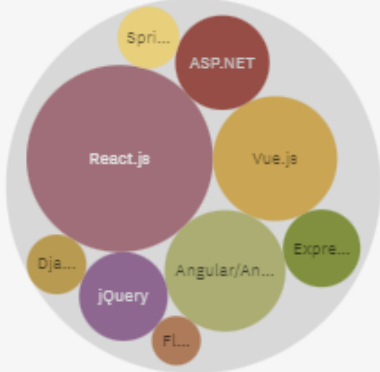
Top 10 Databases Desire Next Year



Platform Desire Next Year



Top 10 WebFrame Desire Next Year



# DASHBOARD TAB 3

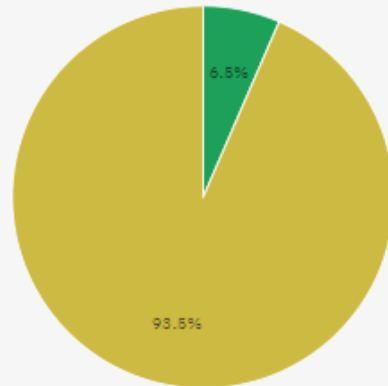
Current Technology Usage

Future Technology Trend

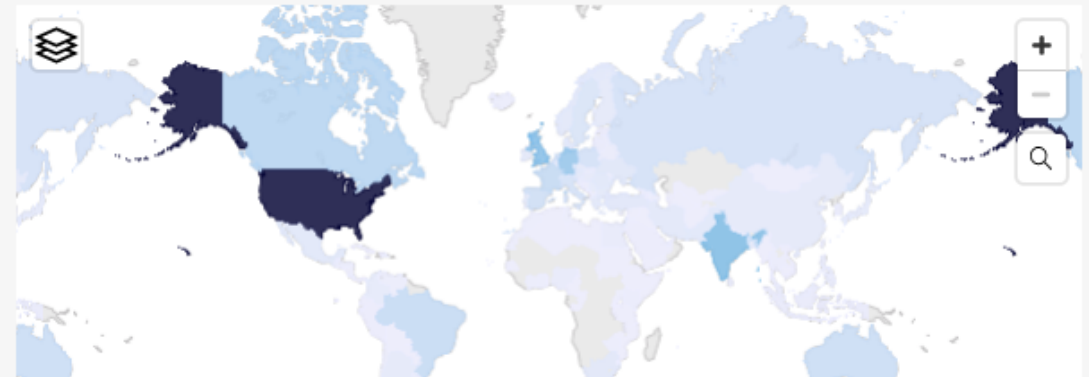
Demographics



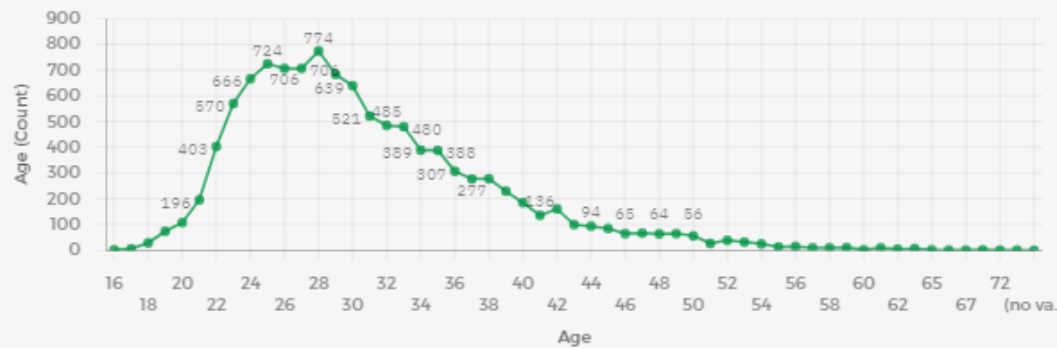
Respondents classified by Gender



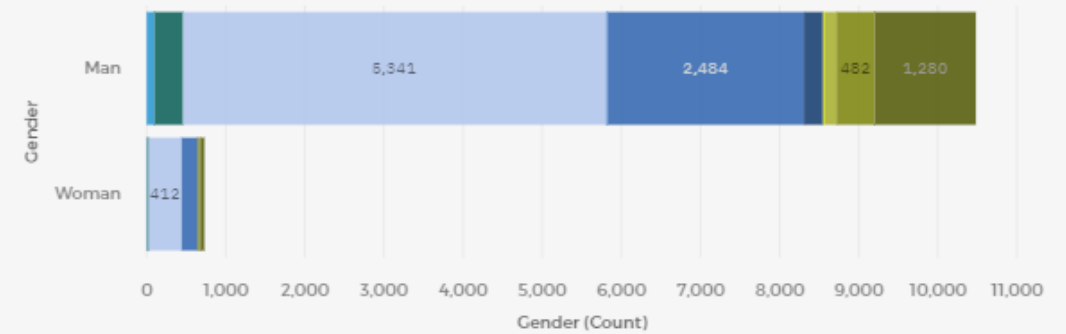
Respondents Count for Countries



Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level





# ***DISCUSSION***



# OVERALL FINDINGS & IMPLICATIONS

## Findings

- Programming Languages: *Python & TypeScript* is shown to gain the interest of the respondents;
- Databases: *PostgreSQL, MongoDB, Redis & Elasticsearch* are gaining more interest;
- Platforms: Interest for *Slack & Windows* is decreasing, opposing to an increase in *Docker, AWS & Android* skills;
- WebFrames: *Vue.js* is gaining developers' interest as well as *React.js*.

## Implications

- Steady employment of individuals with *JavaScript & HTML/CSS* skills but also *Python & TypeScript* skills will be great among the candidates;
- More demand for individuals with *PostgreSQL, MongoDB, Redis & Elasticsearch* skills;
- *Linux, Docker, AWS & Android* skills will be necessary among the future candidates;
- Steady employment of individuals with *ASP.NET* skills but also *Vue.js & React.js* skills will be necessary among the candidates.

# CONCLUSION

## Recommendations:

- ✓ Offering **educational programs** to the staff that is already established into the company;
- ✓ Providing them with the **adequate tools** to upscale their knowledge in the up-to-date technologies;
- ✓ Making rearrangements & prioritizing **technologies** that are “on demand”;
- ✓ **Hiring additional staff**, with the adequate skills wherever it is believed that is needed.

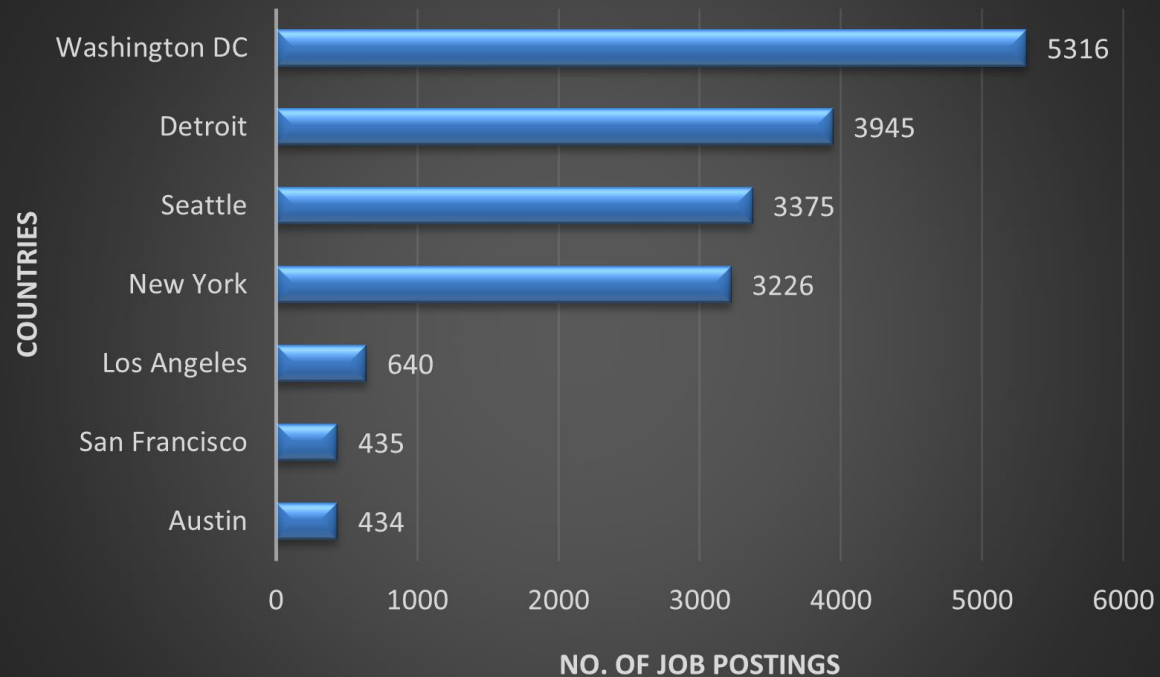




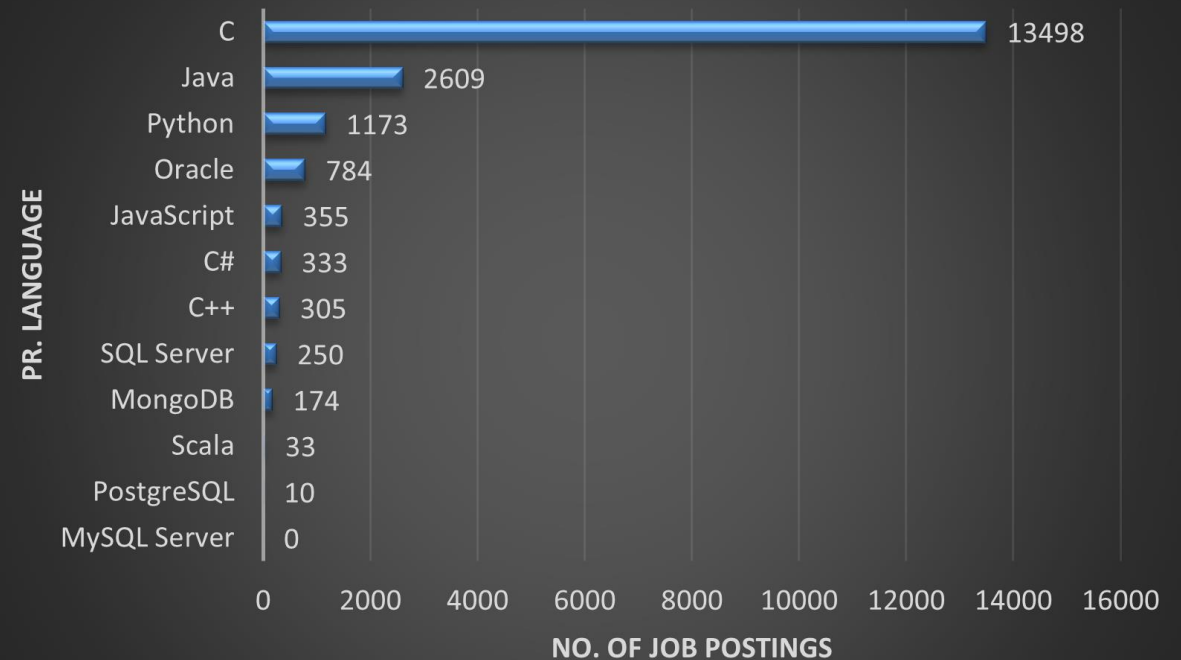
# ***APPENDIX***

# JOB POSTINGS (using APIs)

No. of Job Postings per State



No. of Job Postings per Pr. Language



# POPULAR LANGUAGES (using Web Scraping)

## Average Annual Salary per Pr. Language





# Resources & References

## Resources

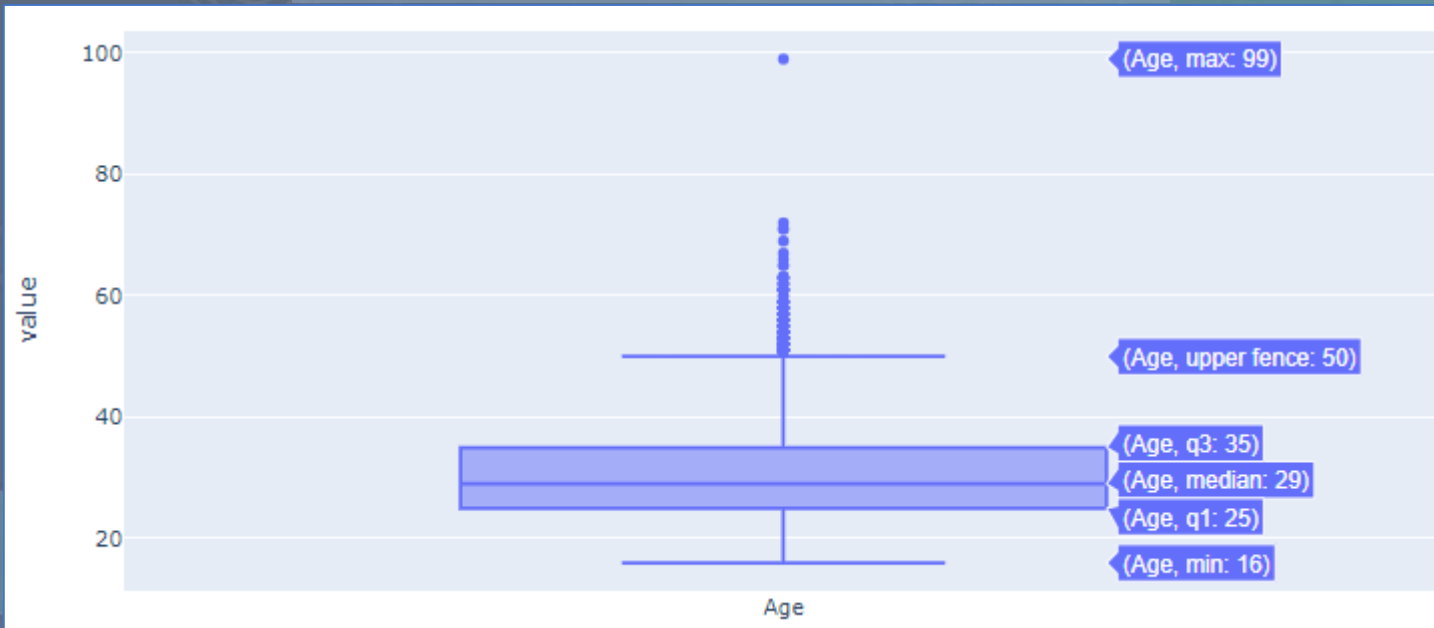
- <https://www.kaggle.com/promptcloud/jobs-on-naukricom>
- <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/module%201/Accessing%20Data%20Using%20APIs/jobs.json>
- [https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming\\_Languages.html](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html)
- [https://stackoverflow.blog/2019/04/09/the-2019-stackoverflow-developer-survey-results-are-in/?utm\\_medium=Exinfluencer&utm\\_source=Exinfluencer&utm\\_content=000026UJ&utm\\_term=10006555&utm\\_id=NA-SkillsNetwork-wwwcourseraorg-SkillsNetworkCoursesIBMDA0321ENSkillsNetwork21426264-2022-01-01](https://stackoverflow.blog/2019/04/09/the-2019-stackoverflow-developer-survey-results-are-in/?utm_medium=Exinfluencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id=NA-SkillsNetwork-wwwcourseraorg-SkillsNetworkCoursesIBMDA0321ENSkillsNetwork21426264-2022-01-01)

## Image references

- <https://www.istockphoto.com/de/fotos/data-analysis>
- <https://lovepik.com/image-400059759/data-analysis.html>

# Additional Material

## Age of participants (Box Plot)



## No. of respondents per Type of Job

	DevType	count
0	Developer, full-stack	6928
1	Developer, back-end	6290
2	Developer, front-end	3920
3	Developer, desktop or enterprise applications	2575
4	Developer, mobile	1959