



# TRENDING TECH SKILLS: A DATA ANALYSIS REPORT

Felipe Rocha Sebben  
December 5th, 2021

# OUTLINE

---



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

# EXECUTIVE SUMMARY

---



- Upcoming skills tend to replace established platforms
- Objective:
  - Analyze the top programming skills currently in demand
  - Identify trends for the upcoming years
- Methodology:
  - Quantitative analysis of job postings, training portals and surveys
- Results:
  - HTML/CSS, Bash/Shell/PowerShell, JavaScript, and C# are the most demanded programming languages
    - Python, and SQL may replace them as the top tier trending languages.
  - MySQL, Microsoft SQL Server, MongoDB, PostgreSQL, and Elasticsearch are the current top database skills
    - PostgreSQL and MongoDB tend to shuffle the ranking of trending technologies
- There is no single dominating language the tech market
- Remaining competitive will demand a wider skill set

# INTRODUCTION

---



- Exponential advancements in the IT sector have brought about development opportunities
  - Technological advancement requires adaptation
- The audience:
  - Tech companies
  - IT developers
- The problem:
  - To analyze *what* skills are most in demand today and whether they will remain relevant in the future
- Main questions:
  - What are the top programming languages in demand?
  - What are the top database skills in demand?

# METHODOLOGY

---



- Quantitative data analysis
- Sources:
  - GitHub Jobs API
  - Popular Programming Languages Survey
  - The 2019 Stack Overflow Developer Survey
- Data collection and visualization:
  - Python for data analysis process
  - IBM Cognos for dashboard design

# RESULTS

---

- Collection and storage of:
  - Job postings for a group of programming languages
  - Scraped of data on programming languages and their respective average annual salary
- Gathering, cleaning, and visualizing the data collected from Stack Overflow Survey
- Dashboard implementation divided into three categories:
  - Current Technology Usage
  - Future Technology Trend
  - Demographics

# RESULTS

---

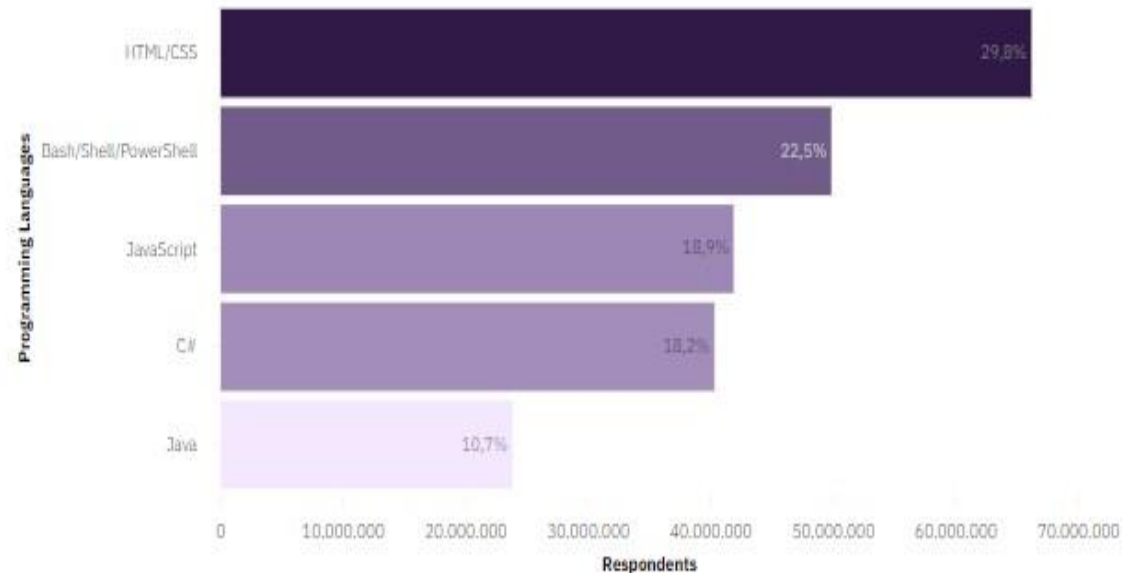
- Top programming languages in demand:
  - Top 5 - HTML/CSS, Bash/Shell/PowerShell, JavaScript, and C#
    - More than 80% of the responses
  - HTML/CSS lead the way with 29%
  - Java came last with 10 percent
- Top trending programming languages:
  - Top 5 - JavaScript, Python, HTML/CSS, SQL, and TypeScript
- The top database skills in demand:
  - Top 5 - MySQL, Microsoft SQL Server, MongoDB, PostgreSQL, and Elasticsearch.
    - Around 70% of the responses
  - MySQL lead the way with 19,5%
- Top trending database skills:
  - Top 5- PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch

# PROGRAMMING LANGUAGE TRENDS

Top 5 Programming Languages - Current Year

Programming La...

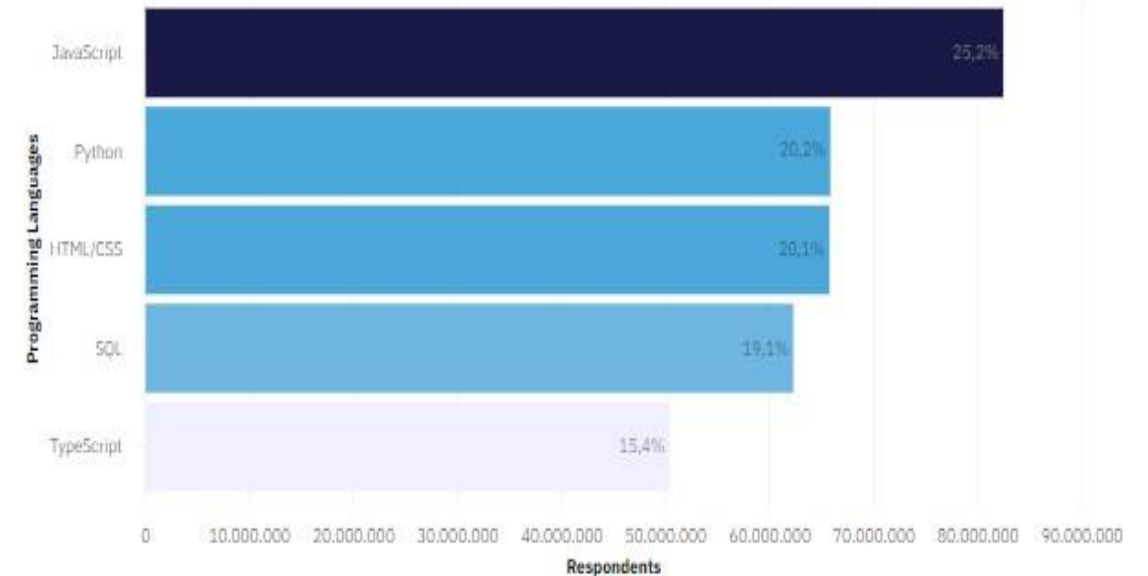
23,826,440 66,151,570



Top 5 Programming Languages - Next Year

Respondents (Su...

50,369,647 82,435,603





# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

---

## Findings

- No single dominant language
- Rise of SQL
- Emergence of Python
- Decline of command shells
- Ongoing relevance of web-oriented languages

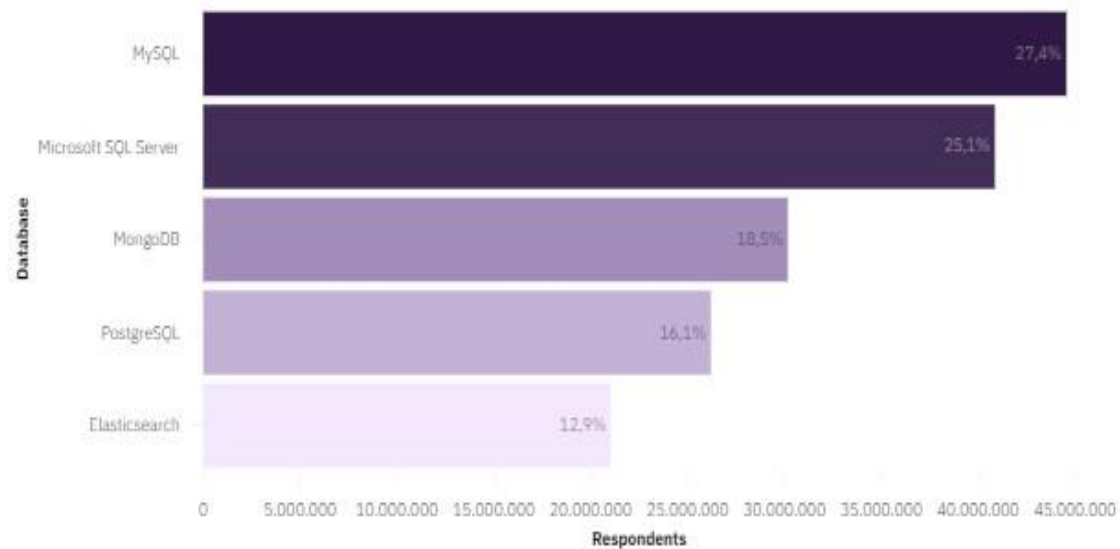
## Implications

- Diversification > Concentration
- Increasing importance of RDMBS
- Python – better choice for general purpose language
- HTML and JavaScript remain fundamental skills

# DATABASE TRENDS

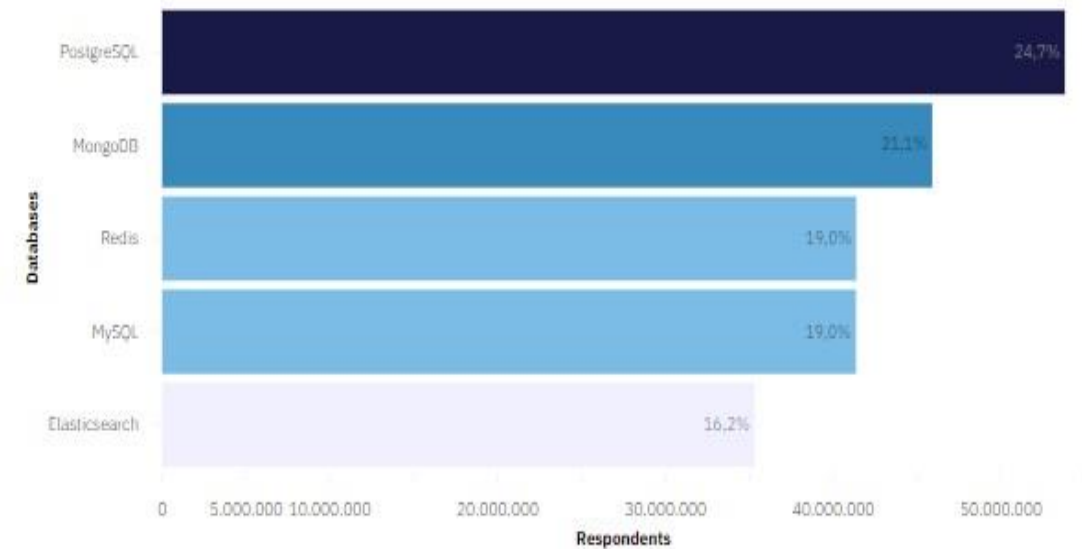
Top 5 Databases - Current Year

Respondents (Su...  
21,039,200 44,551,379



Top 5 Databases - Next Year

Respondents (Su...  
35,214,757 53,804,386



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

---

## Findings

- No dominant skill
- 3 SQL database language on top 5
- Importance of NoSQL (MongoDB)
- Emergence of search engines (Elasticsearch)

## Implications

- Pragmatism over narrower choices
- SQL database skills will demand more resources
- Importance of balanced approach towards SQL/NoSQL databases

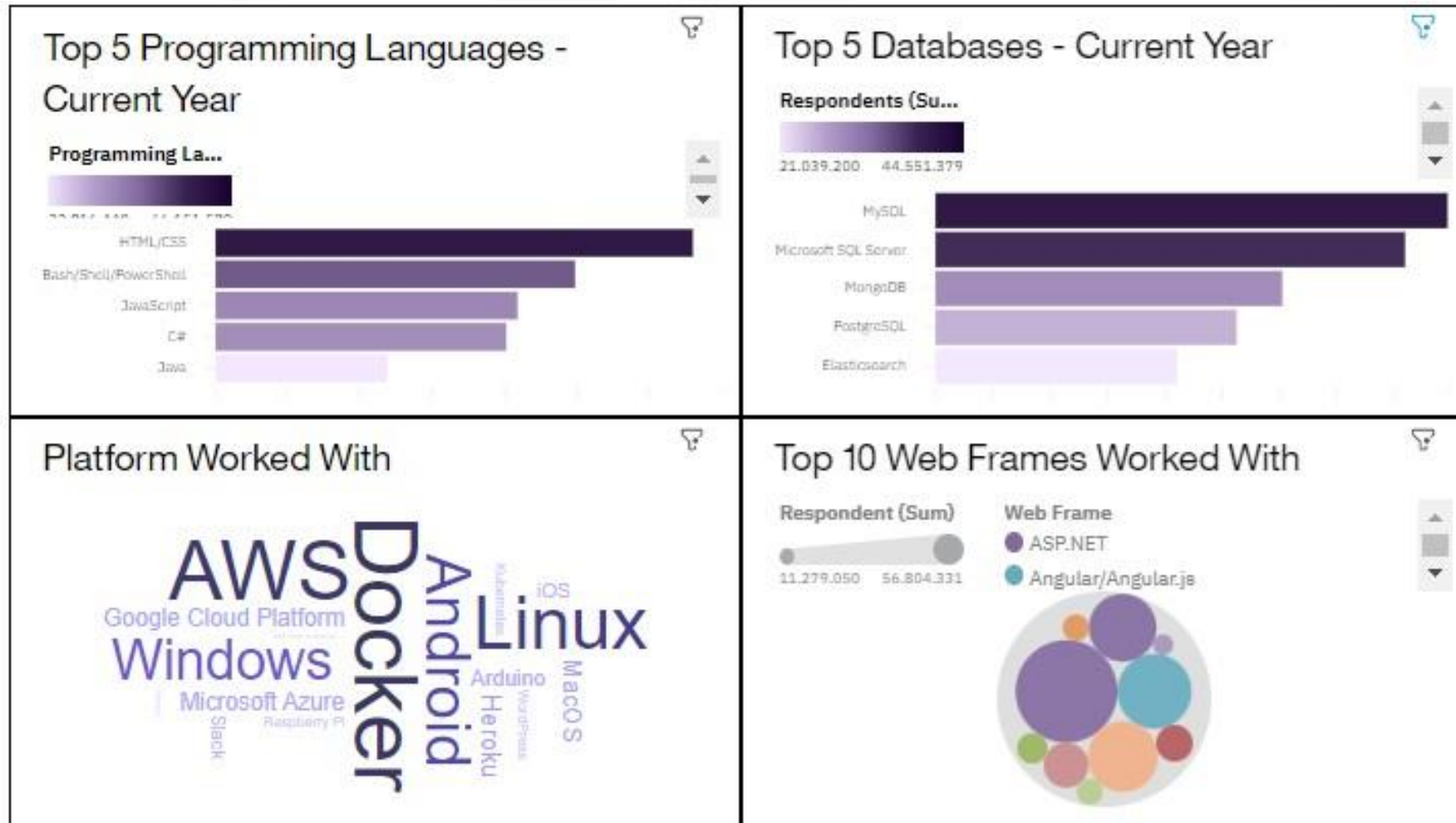
# DASHBOARD

---

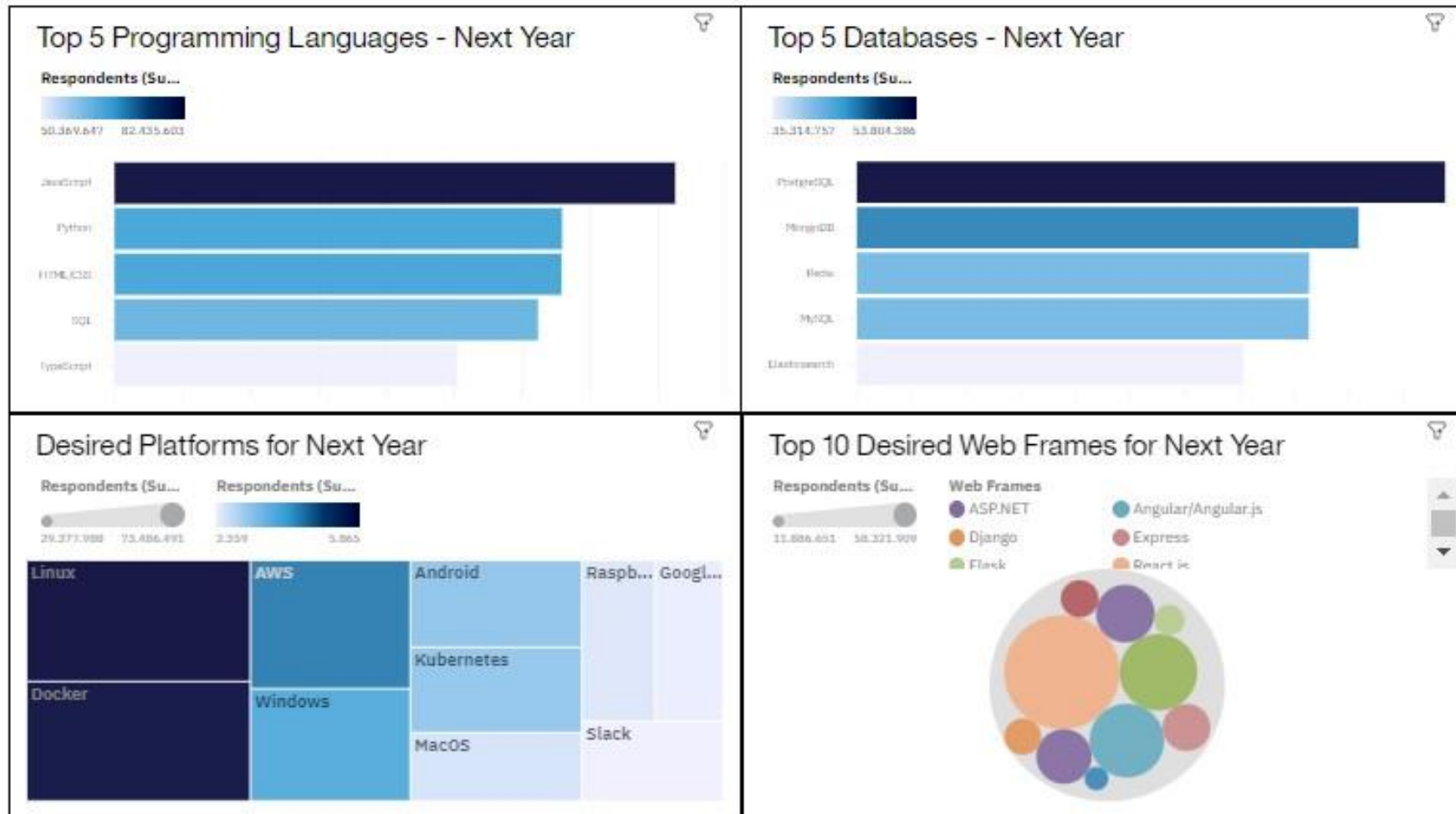


<https://dataplatform.cloud.ibm.com/dashboards/fbc83418-1029-480e-a447-ff4f9d0d72db/view/0e14c20e1af50cf510cdc0e4079c24502f3e730bb5bb8b51858c7b490d617097f06b14c3c87b4b5ed3180136f1e51358ce>

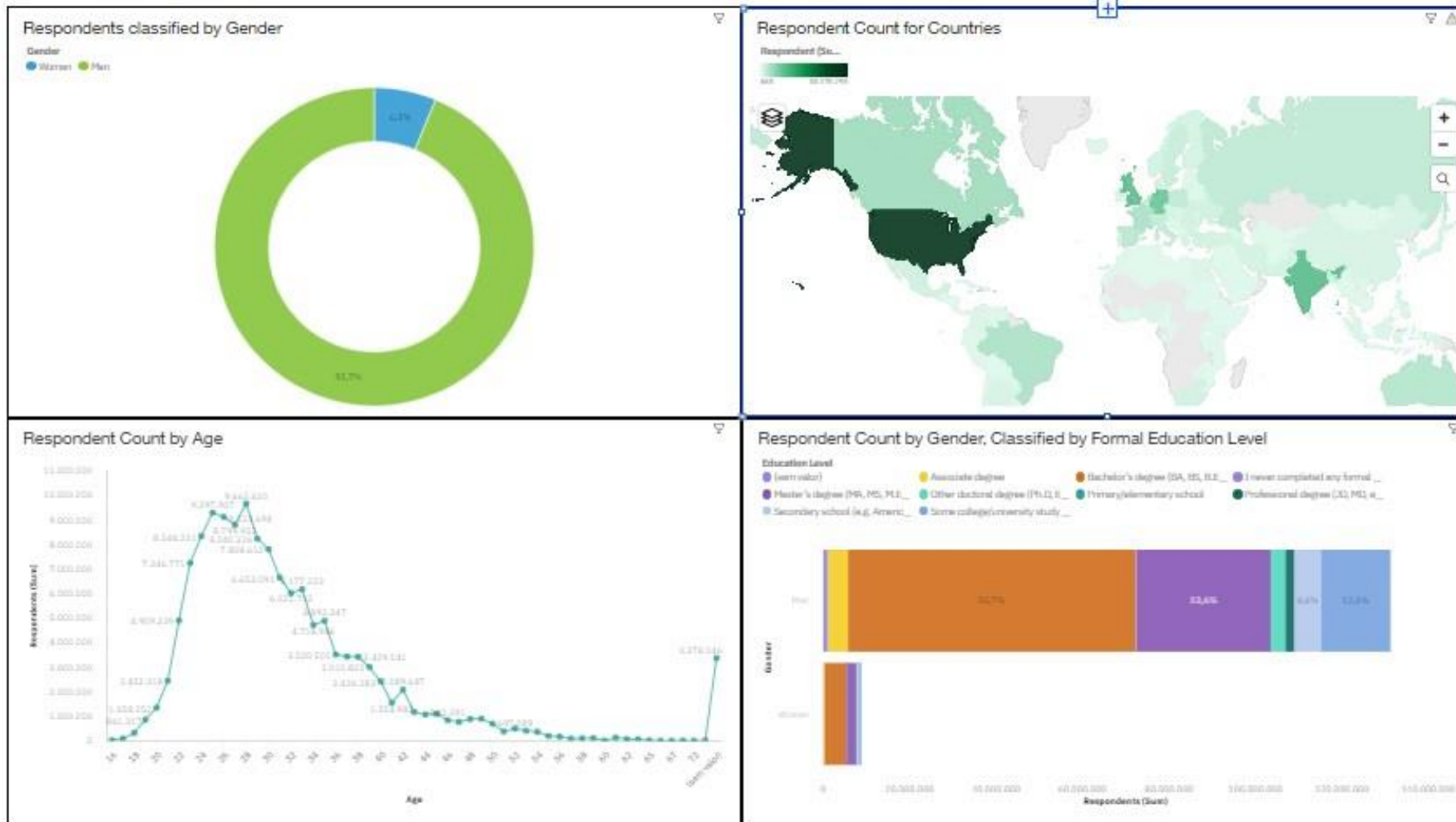
# DASHBOARD TAB 1



# DASHBOARD TAB 2



# DASHBOARD TAB 3



# DISCUSSION – Programming Languages today

---



- A competitive firm must consider investing on HTML/CSS, Bash/Shell/PowerShell, JavaScript, and C#.
- Even if well-known languages such as Python are mentioned, results display the importance of command shells and web-oriented languages such as JavaScript and HTML.
- Still, there is no single dominating language.
  - Enterprises should focus on developing a toolset of languages that comprise the main IT areas.
  - Web development and management programs



# DISCUSSION – Programming Languages in the future

---



- JavaScript and HTML/CSS will remain important
- Python and SQL stand out as emerging languages
- Reflects increasing volume of databases found in structured language.
- Relative decline of Bash/Shell/PowerShell
- No single prevailing language
- Companies should:
  - Allocate less resources on management programs
  - Identify emerging languages (SQL)
  - Maintain important ones – JavaScript and HTML
  - Consider incorporating Python as a general programming language

# DISCUSSION – Database skills today and in the future

---



- Today:
  - RDBMSs and SQL are essential
  - NoSQL databases are also relevant
- Increasing importance of PostgreSQL and MongoDB
  - Firms should balance investment between SQL and NoSQL databases
- Increasing relevance of search engines such as Elasticsearch
- Overall, firms must invest in a wider set of database skills

# OVERALL FINDINGS & IMPLICATIONS

---

## Findings

- Web-oriented languages will remain important
- Python and SQL tend to replace management programs
- SQL will only gain importance as a database
- NoSQL will also increase in importance
- Search engines are also on the rise

## Implications

- Advanced web tools (JavaScript) are important to remain competitive
- Python and SQL will be part of further technological development
- Increasing relevance of databases require investing in SQL and NoSQL
- Investing in Elasticsearch may assist on web development

# CONCLUSION

---



- Resource allocation is a constant dilemma of every IT firm
- Web-oriented skills will remain on the rise
- Python and SQL languages rise as Bash/Shell/PowerShell usage decreases.
- MySQL, Microsoft SQL Server, MongoDB, PostgreSQL, and Elasticsearch ranked at the top.
  - PostgreSQL and MongoDB lead the way as the main SQL and NoSQL database skills.
- Human resources are scarce
- Importance of developing a wide, pragmatic toolset

# APPENDIX

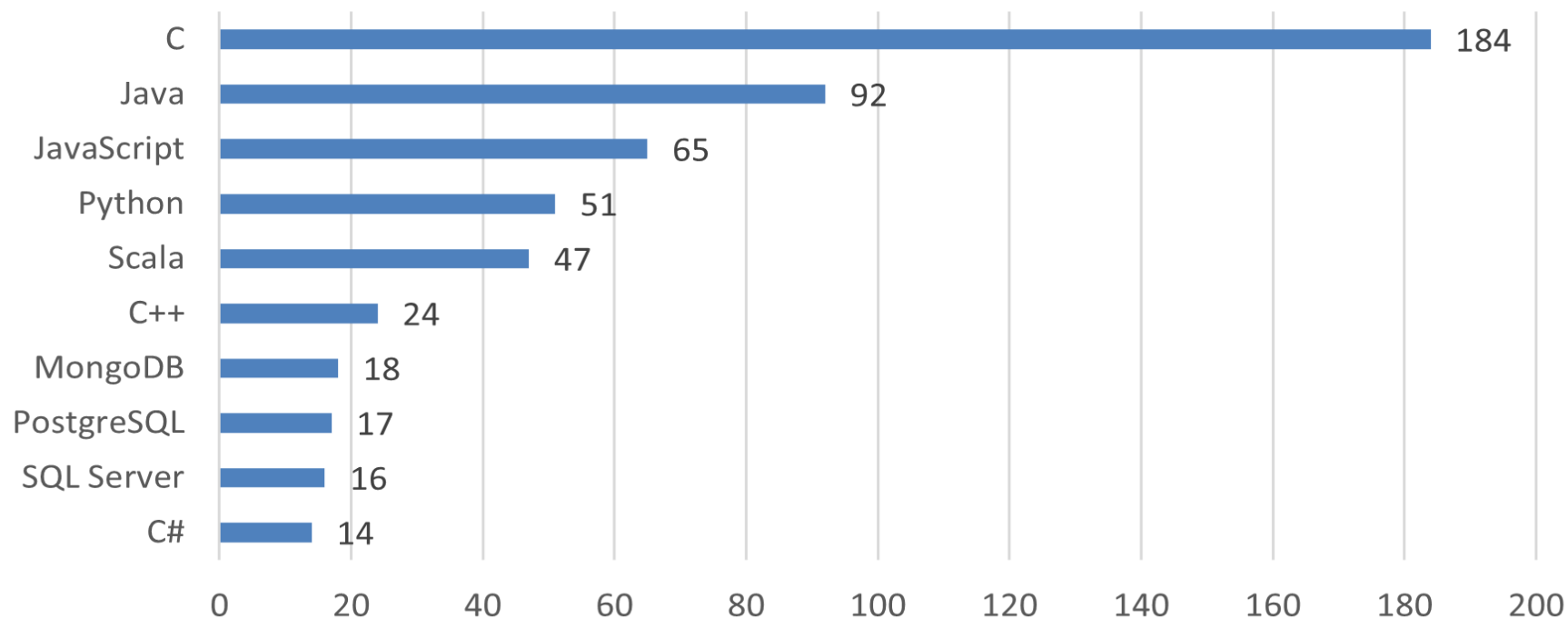
---



- Sources:
- GitHub Job Postings API:
  - <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/module%201/datasets/githubposting.json>
- Survey on programming languages and average annual salary:
  - [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)
- 2019 Stack Overflow Survey:
  - [https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m1\\_survey\\_data.csv?utm\\_medium=Exinfluencer&utm\\_source=Exinfluencer&utm\\_content=000026UJ&utm\\_term=10006555&utm\\_id=NA-SkillsNetwork-Channel-SkillsNetworkCoursesIBMDA0321ENSkillsNetwork21426264-2021-01-01](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m1_survey_data.csv?utm_medium=Exinfluencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id=NA-SkillsNetwork-Channel-SkillsNetworkCoursesIBMDA0321ENSkillsNetwork21426264-2021-01-01)

# GITHUB JOB POSTINGS

**Top 10 GitHub Technologies Ranked by Job Postings**



# POPULAR LANGUAGES

