



Report on emerging skills: Identifying future IT skill requirements

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OUTLINE



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

EXECUTIVE SUMMARY



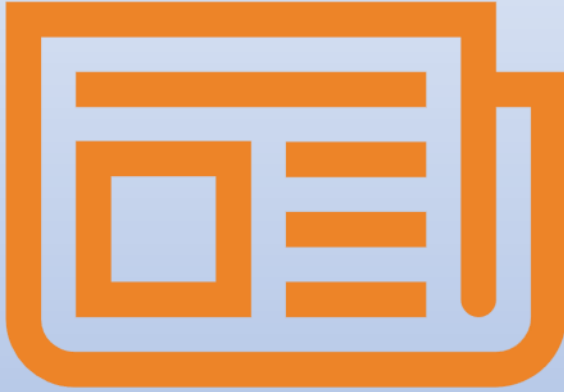
- What IT skills will be in demand in the future?
- Data collected from
 - GitHub, through webscraping & most importantly from StackOverFlow
- Data wrangled using
 - Python, Excel, IBM Cognos Analytics
- IT skills that will be in demand:
 - Languages: JavaScript, HTML/CSS & Python
 - Databases: PostgreSQL & MongoDB
 - Webframes: React.js & Vue.js
 - Platforms: Docker & AWS
- Full dashboard available at:
 - <https://tinyurl.com/4c9szz63>

INTRODUCTION



- IT is a rapidly changing field.
- To keep pace with the field, it is important to determine what IT skills will be required in the future.
- We ascertained this by collecting data from various sources.
- We performed computational analysis on this data to determine the answer.
- The results will be shown in this report.
- This report is for
 - Programmers (“coders”) trying to determine how to upskill.
 - Companies deciding what skills to look for when hiring
- Full details are available in the appendix and on the interactive [dashboard](#).

METHODOLOGY



- Data collected from



- Using GitHub Jobs API

- Data collected using Webscraping

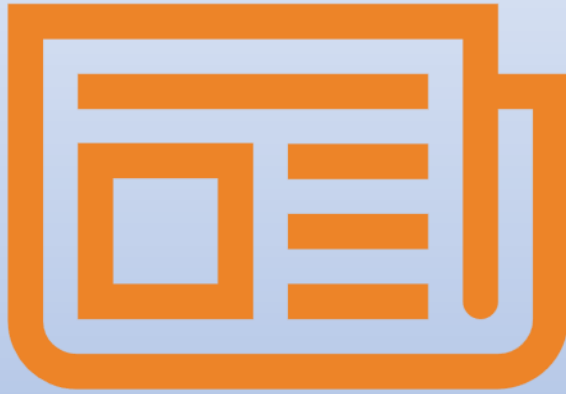
- Using BeautifulSoup

- Data accessed from



- Using SQL

METHODOLOGY



- StackOverFlow data is the most comprehensive
- After data wrangling, 11,398 respondents were analysed.
 - 154 duplicates were excluded
 - Missing compensation values were imputed with the median value
- Respondents from 135 unique countries.
- Data was wrangled and analysed



using Python (pandas, numpy, BeautifulSoup etc.)



using Microsoft Excel



Using IBM Cognos Analytics

RESULTS

- StackOverFlow Data revealed:
 - Median age: 31 years
 - Male ♂ (93.7%) / Female ♀ (6.3 %)
 - Normalized Annual Compensation: Median is \$100,000
 - There is a small positive correlation between age and compensation
 - More in the following slides
- Webscraping revealed:
 - The most highly paid languages are Swift, Python and C++ respectively.
- GitHub API revealed:
 - The most job openings are for C++, C and Java respectively.

PROGRAMMING LANGUAGE TRENDS

Current Year

NUMBER OF RESPONDENTS

0 2000 4000 6000 8000 10000

TOP LANGUAGES THIS YEAR

JavaScript

8687

HTML/CSS

7830

SQL

7106

Bash/Shell/Powershell

4642

Python

4542

Next Year

NUMBER OF RESPONDENTS

0 1000 2000 3000 4000 5000 6000 7000

TOP LANGUAGES NEXT YEAR

JavaScript

6630

HTML/CSS

5329

Python

5239

SQL

5012

TypeScript

3591

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript and HTML/CSS remains in the 1st and 2nd position respectively
- Python has overtaken SQL in position
- Typescript has appeared in the top 5 and Bash/Shell/Powershell has disappeared

Implications

- Coders will continue to need to know JavaScript & HTML/CSS
- Coders will need to learn Python if they do not yet know it
- Coders should learn Typescript in preference to Bash/Shell/Powershell

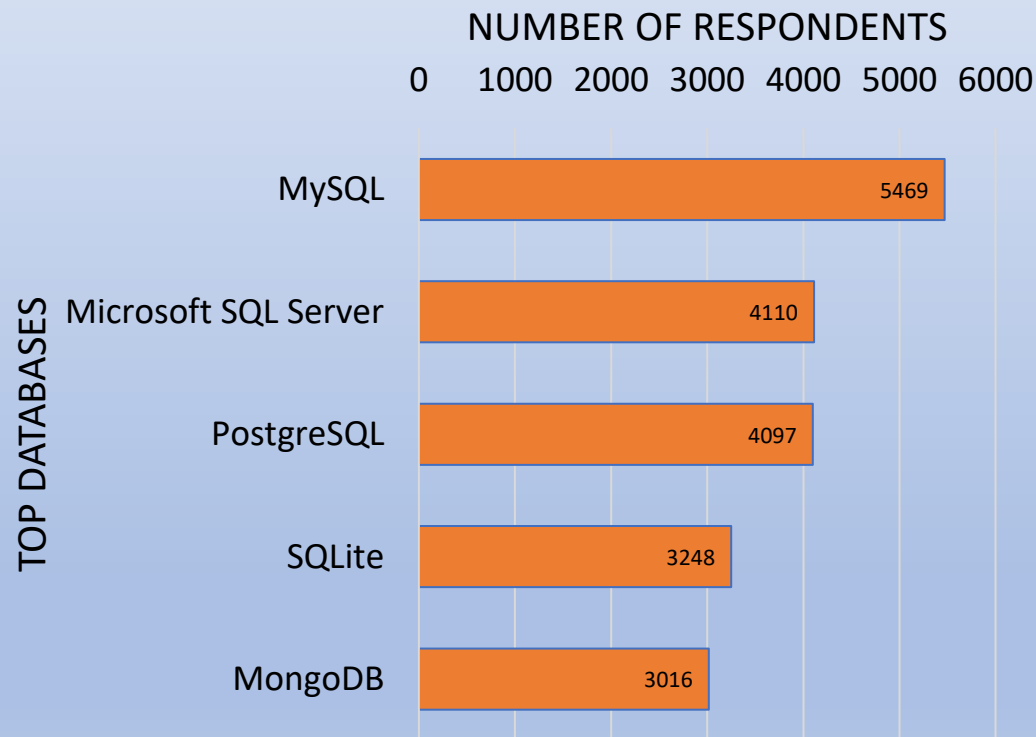
Python

- Python is, increasingly, the top language used in academic science.
 - Because it is easy to write
 - And has good performance
- As such, there will be an increasing influx of graduates with skills in python flooding the market in the future.

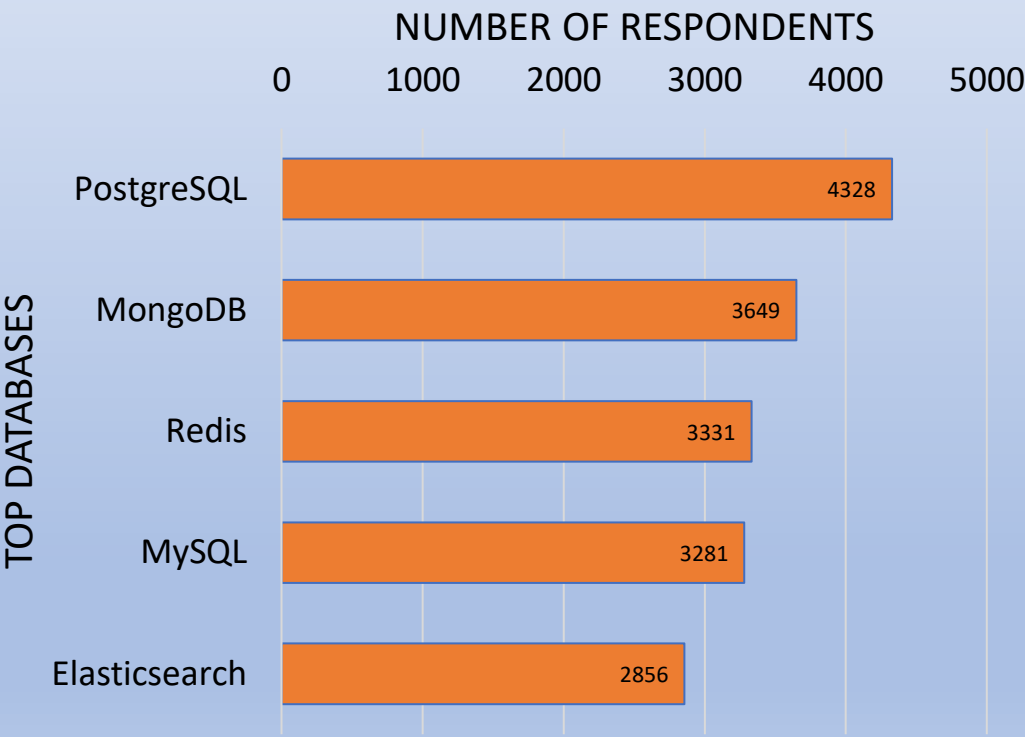


DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL has taken top position from MySQL
- MongoDB has taken second position from Microsoft SQL server
- Microsoft SQL server has disappeared from the top 5 whereas Elasticsearch has appeared

Implications

- Skill in PostgreSQL will be in high demand in the future
- Skill in MongoDB will also be in high demand
- Skill in Elasticsearch will be valued over skill with Microsoft SQL server

DASHBOARD



Click here for the online interactive dashboard:

<https://tinyurl.com/4c9szz63>

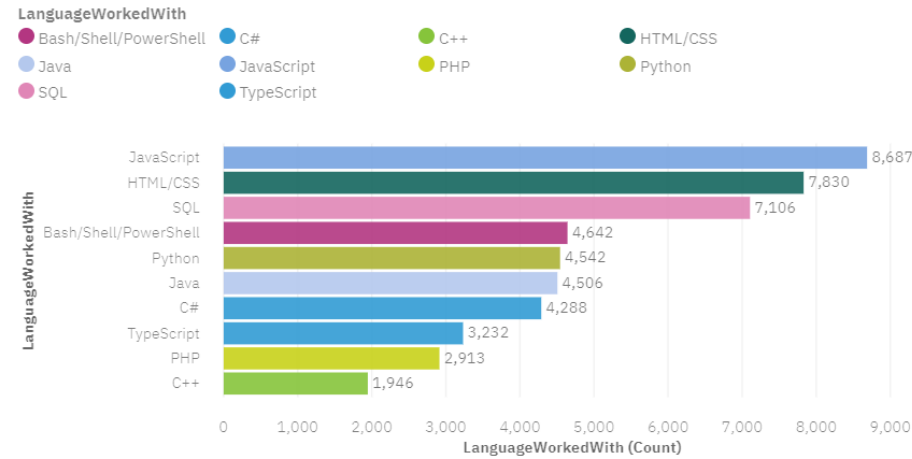
Current Technology Usage

Current Technology Usage

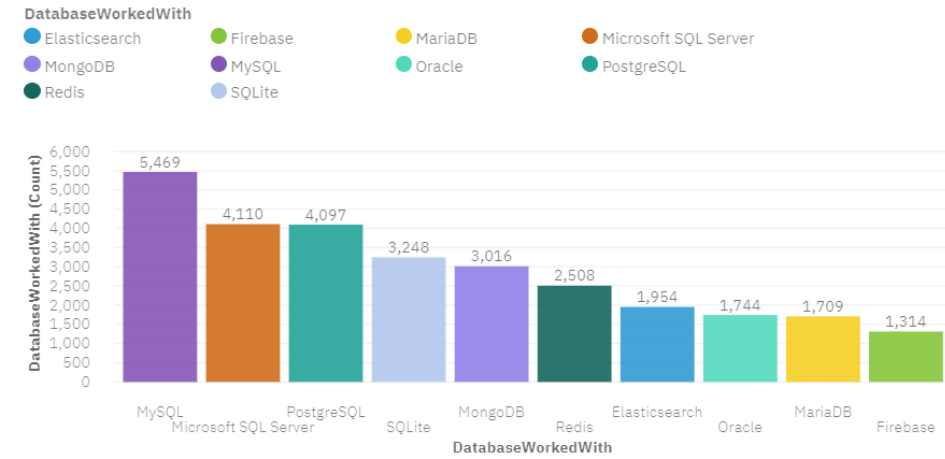
Future Technology Trend

Demographics

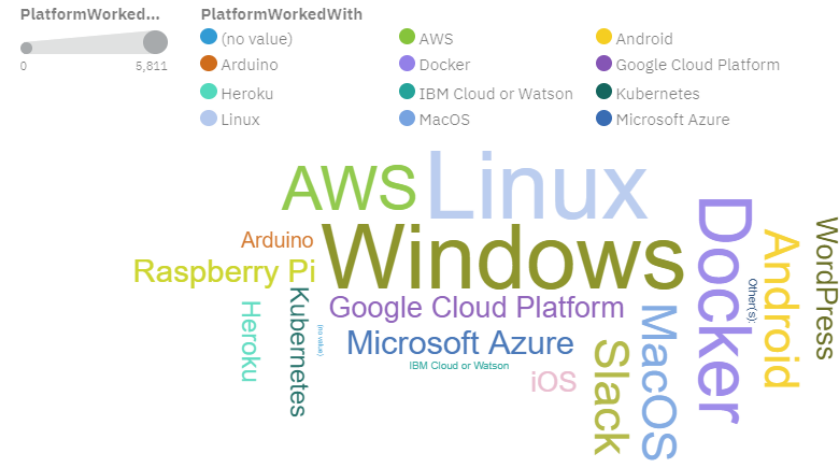
Top 10 Languages Worked With



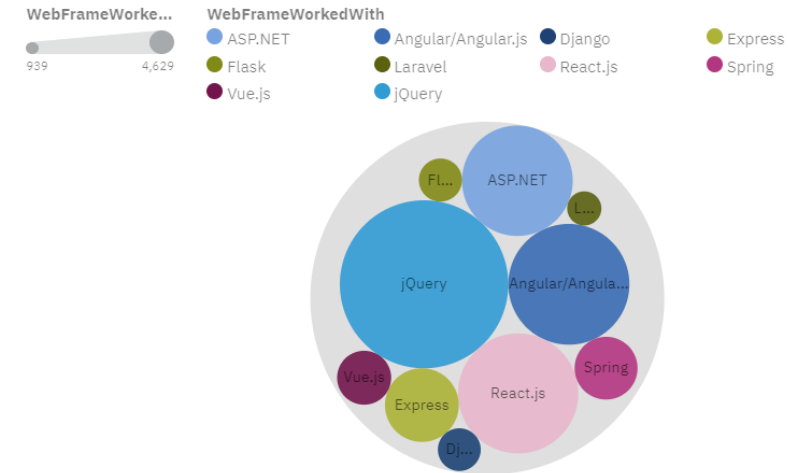
Top 10 Databases Worked With



Platforms Worked With



Top 10 Web Frameworks Worked With



Future Technology Trend

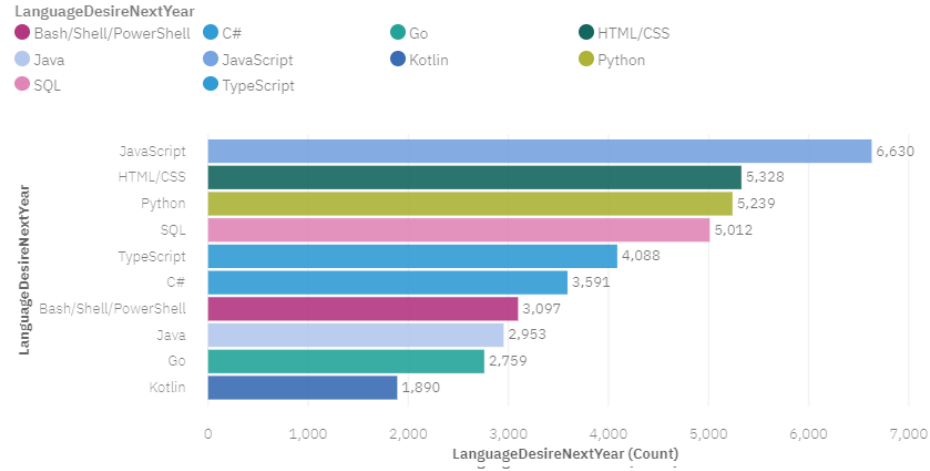
Current Technology Usage

Future Technology Trend

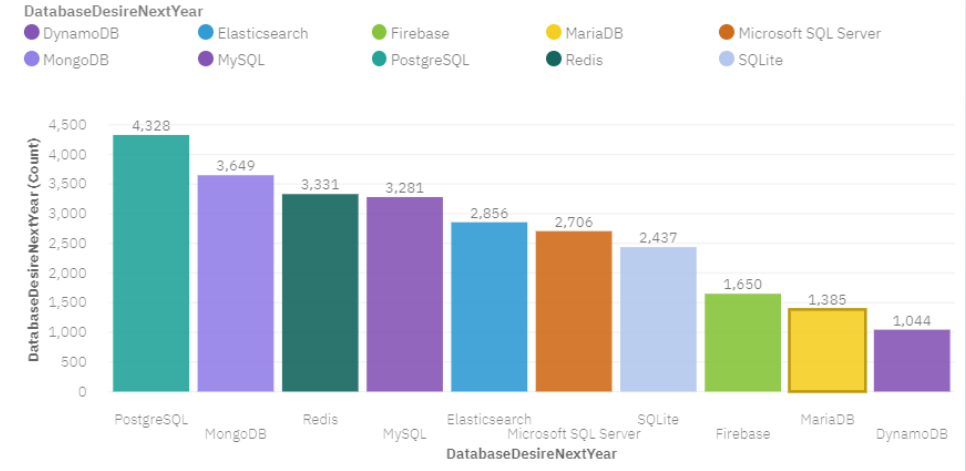
Demographics



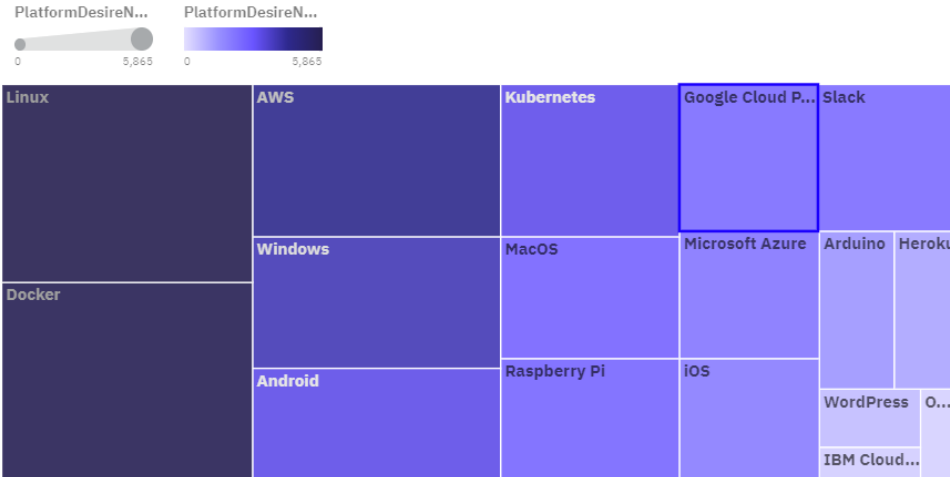
Top 10 Languages Desired Next Year



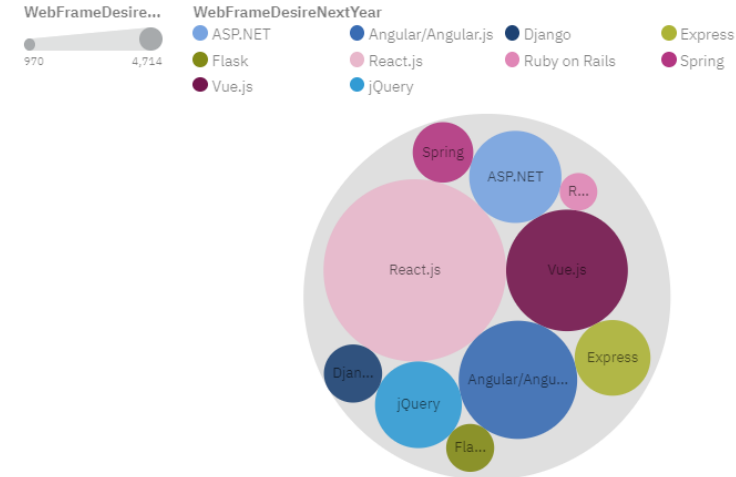
Top 10 Databases Desired Next Year



Platforms Desired Next Year



Top 10 Web Frameworks Desired Next Year



Demographics

Current Technology Usage

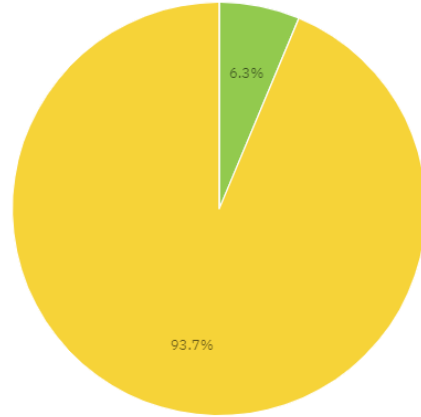
Future Technology Trend

Demographics



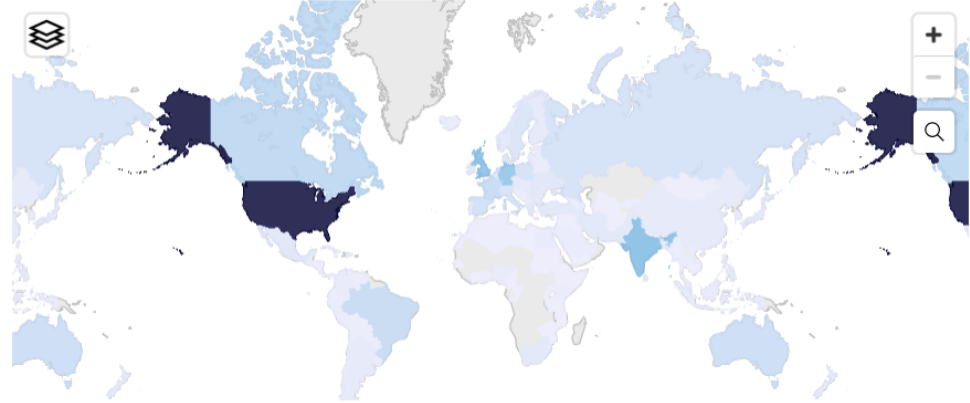
Respondent classified by Gender

Gender
● Woman ● Man

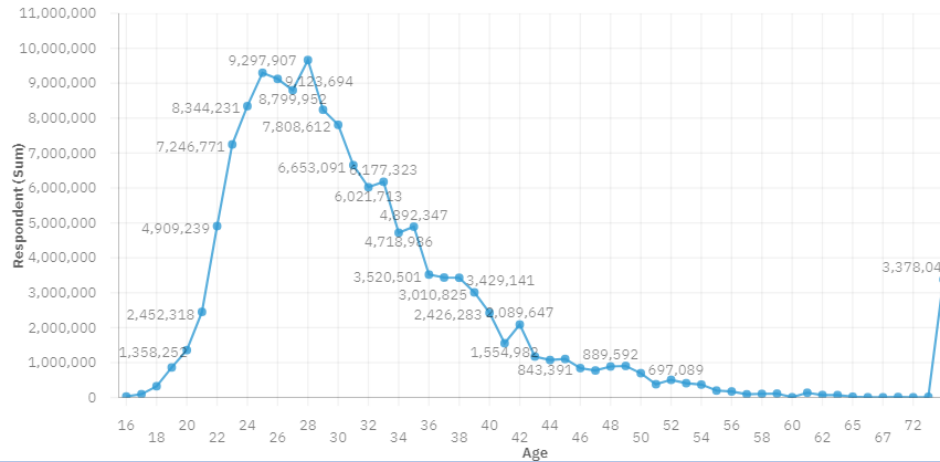


Respondent Count for Countries

Respondent (Sum)
865 38,170,293

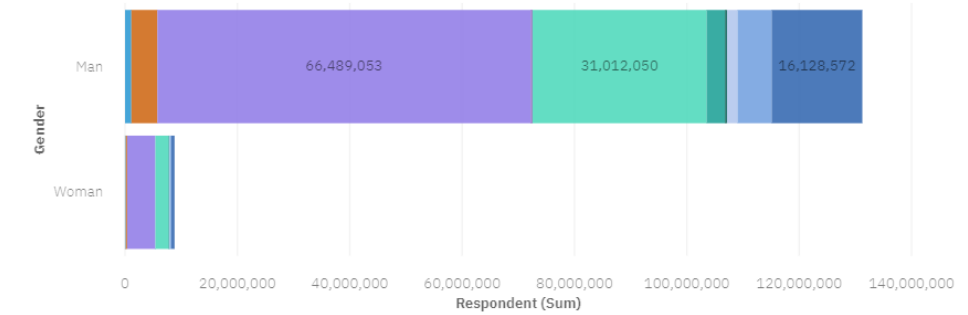


Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level

EdLevel
● (no value) ● Associate degree ● Bachelor's degree (BA, BS, B.E...
● I never completed any formal ... ● Master's degree (MA, MS, M.E... ● Other doctoral degree (Ph.D, E...
● Primary/elementary school ● Professional degree (JD, MD, e... ● Secondary school (e.g. Americ...



DISCUSSION

- From the dashboard we include the following interesting findings:
 - Linux & Windows are the most popular platforms. Docker & AWS will be more important next year.
 - ASP.Net, Angular/Angular.js and Django are the most popular webframes. React.js & Vue.js will be more important next year.
 - There are considerably more ♂ male (93.7%) than ♀ female coders (6.3%)
 - Majority of coders are between 23 to 30 years of age.
 - The majority of coders either have a Bachelor's degree or a Master's degree.

OVERALL FINDINGS & IMPLICATIONS

Findings

- Languages
 - JavaScript & HTML/CSS still important; Python becoming more important
- Databases
 - PostgreSQL & MongoDB will be in high demand
- Webframes
 - React.js & Vue.js will be important
- Platforms
 - Docker & AWS will be important

Implications

- Important to skill up in JavaScript & HTML/CSS and especially **Python**
- Important to skill up in **PostgreSQL & MongoDB**
- Important to learn **React.js & Vue.js**
- Important to know how to use **Docker & AWS**.

CONCLUSION



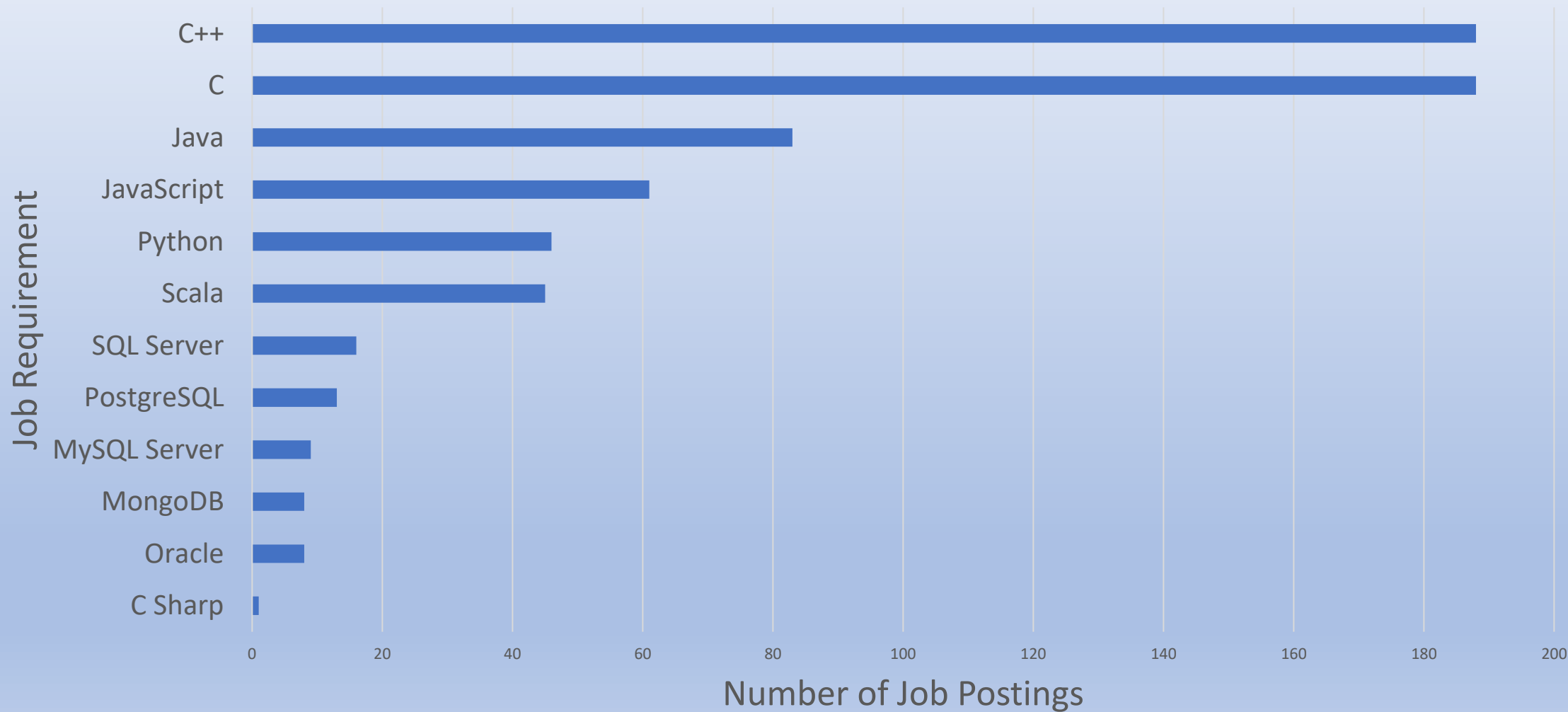
- In the future we will need:
 - Programmers skilled in:
 - JavaScript, HTML/CSS & Python
 - PostgreSQL & MongoDB
 - React.js & Vue.js
 - Docker & AWS
 - 💡 Female programmers to address gender imbalance
- *Thank you for your time and attention.*

APPENDIX

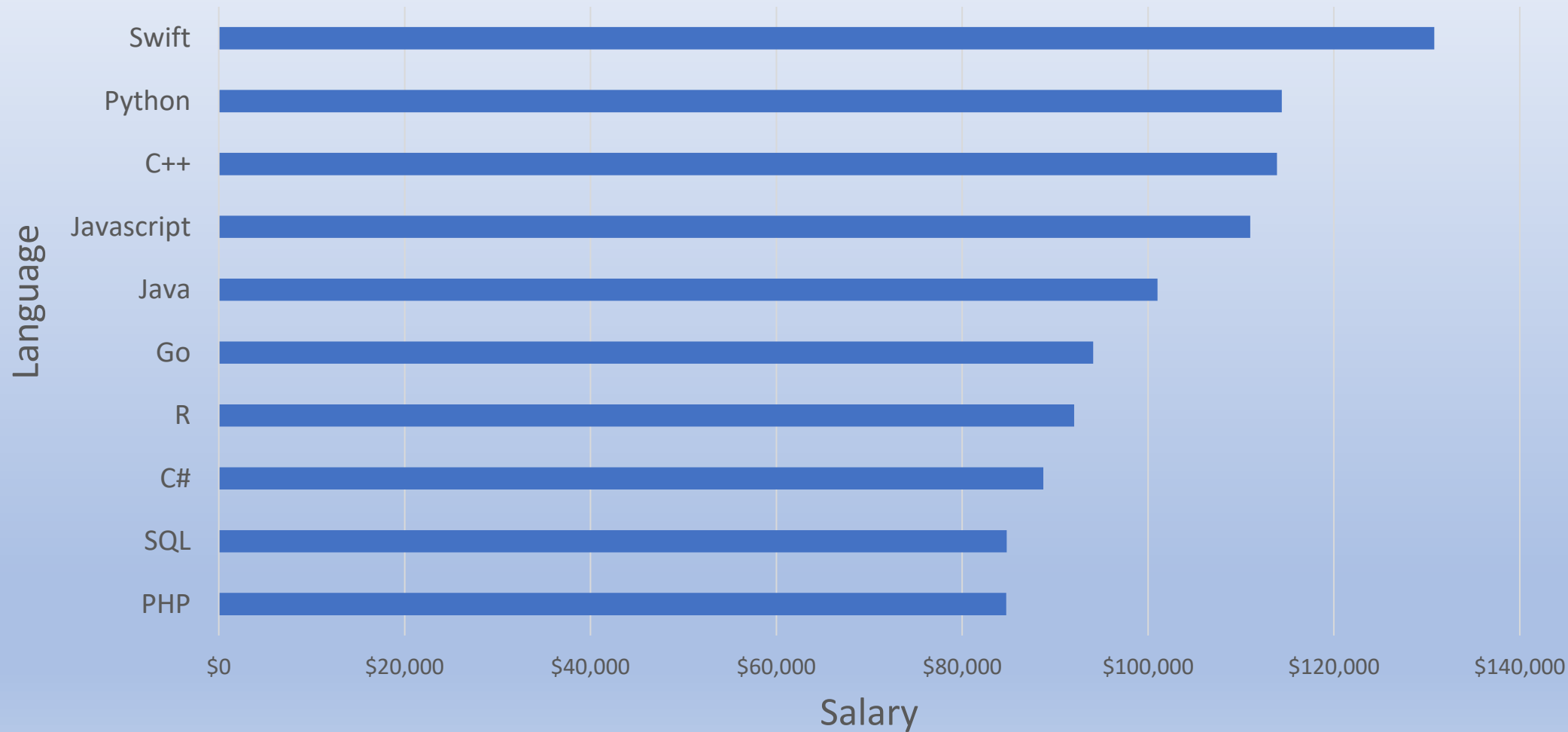


- Here we provide relevant additional charts, or tables created during the analysis phase.

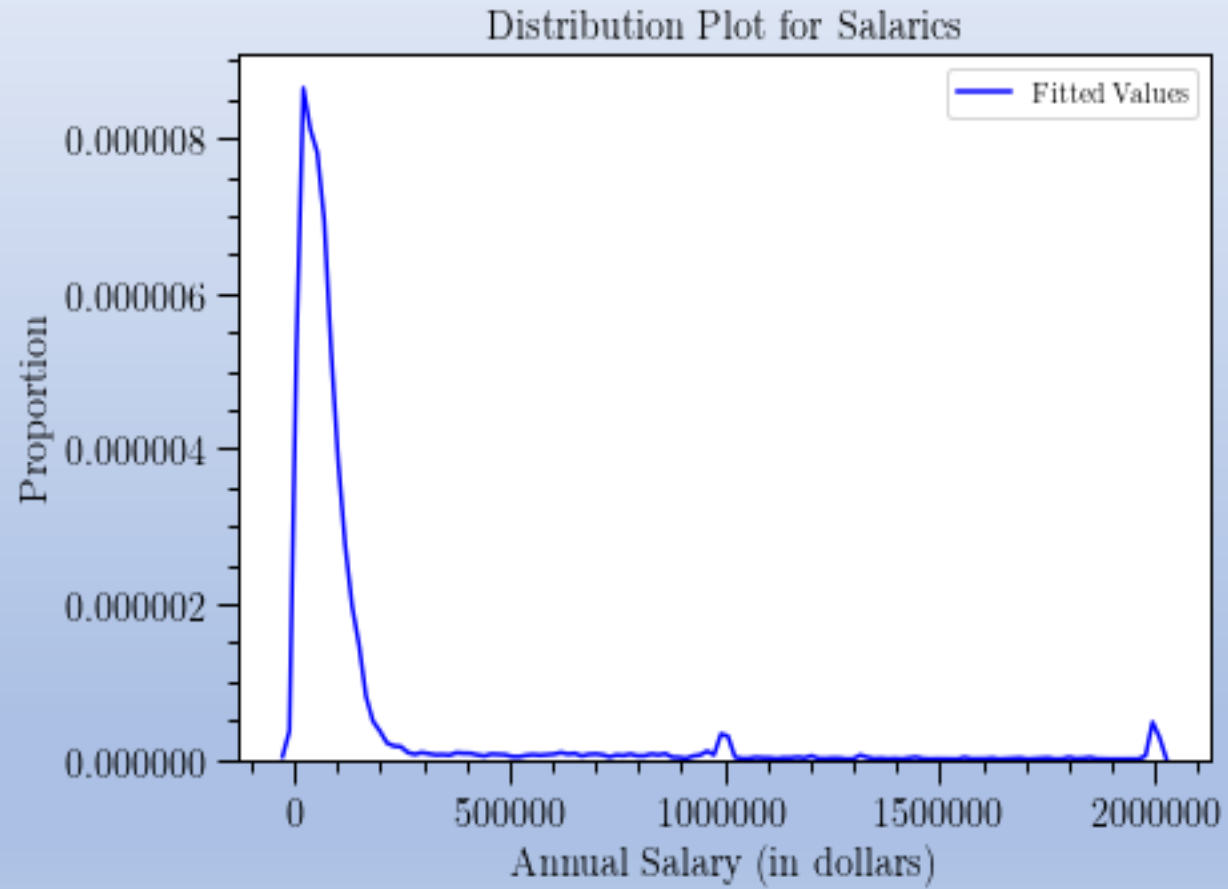
GITHUB JOB POSTINGS



POPULAR LANGUAGES



Salaries



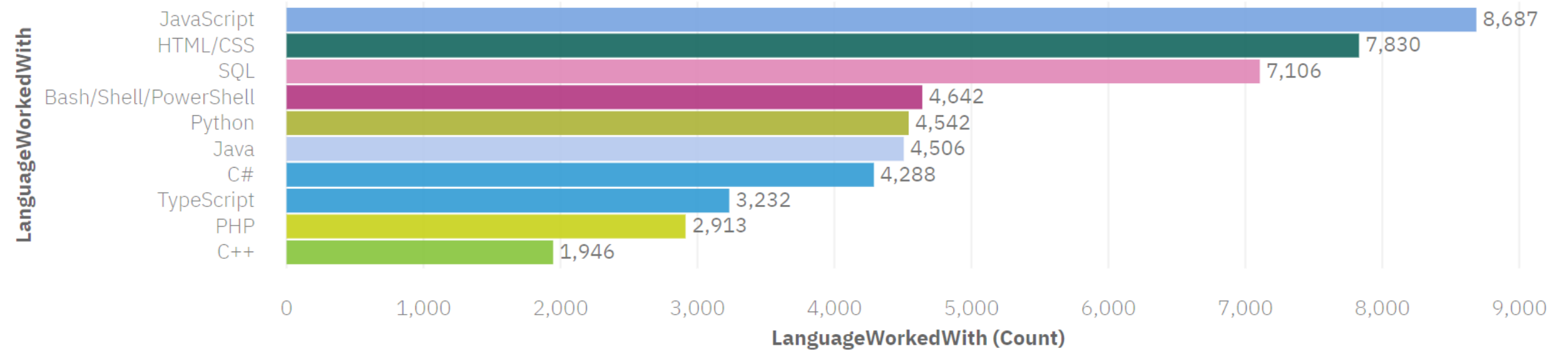
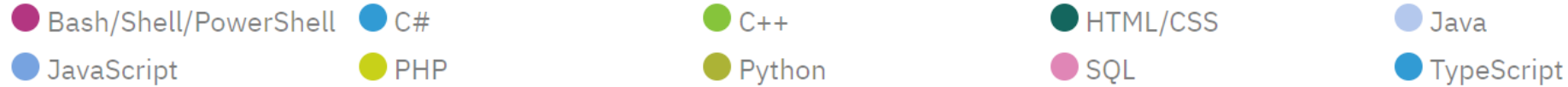
More...

- Also provided are...
- Each of the individual panels from the three dashboard tabs
- So that they can be perused at leisure

DASHBOARD TAB 1, Panel 1

Top 10 Languages Worked With

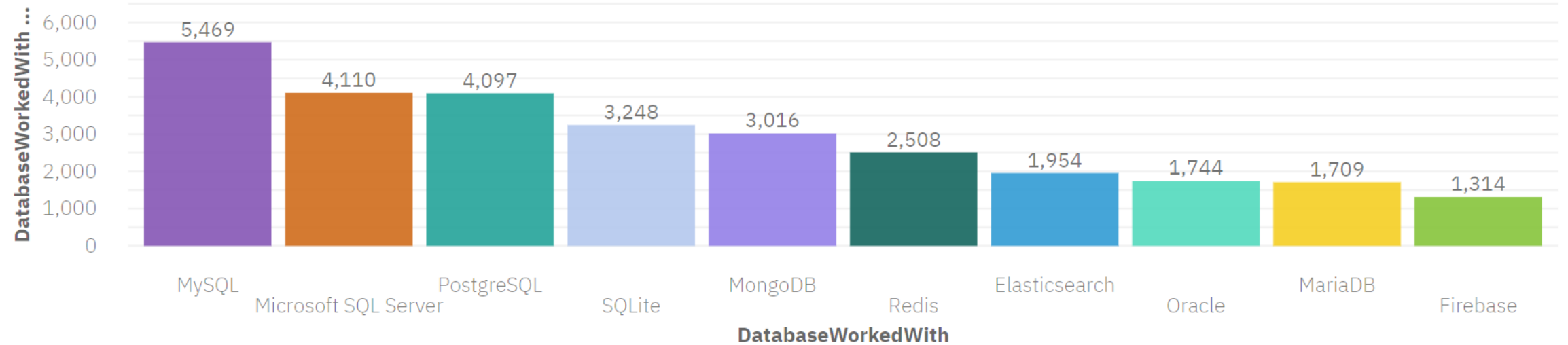
LanguageWorkedWith



DASHBOARD TAB 1, Panel 2

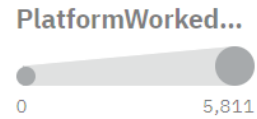
Top 10 Databases Worked With

DatabaseWorkedWith



DASHBOARD TAB 1, Panel 3

Platforms Worked With



PlatformWorkedWith

(no value)

Heroku

Other(s):

AWS

IBM Cloud or Watson

Raspberry Pi

Android

Kubernetes

Slack

Arduino

Linux

Windows

Docker

MacOS

WordPress

Google Cloud Platform

Microsoft Azure

iOS



DASHBOARD TAB 1, Panel 4

Top 10 Web Frameworks Worked With



WebFrameWorke...



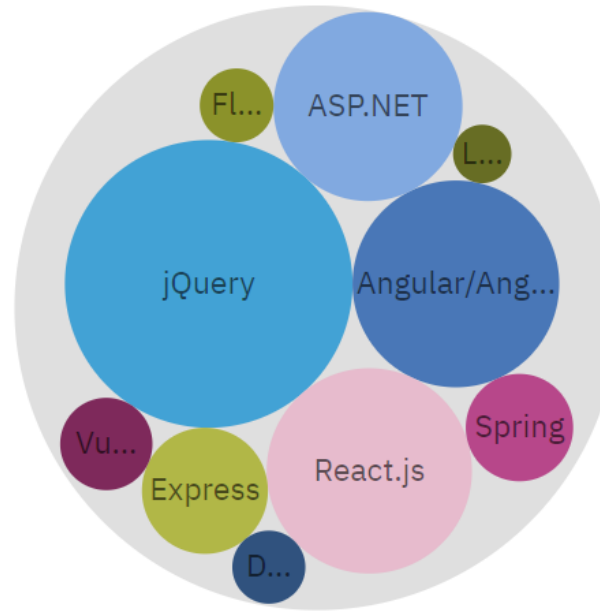
WebFrameWorkedWith

ASP.NET
Laravel

Angular/Angular.js
React.js
Django
Spring

Express
Vue.js

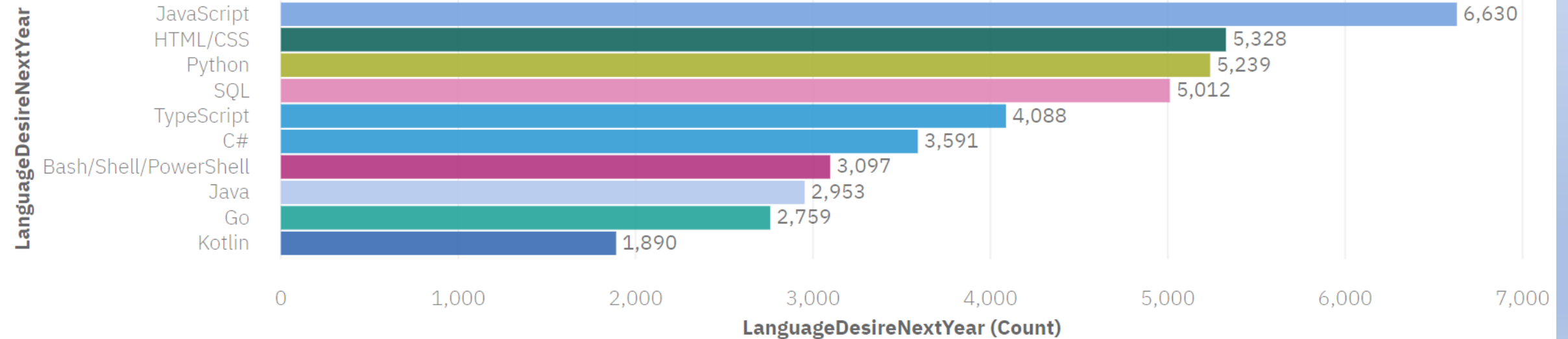
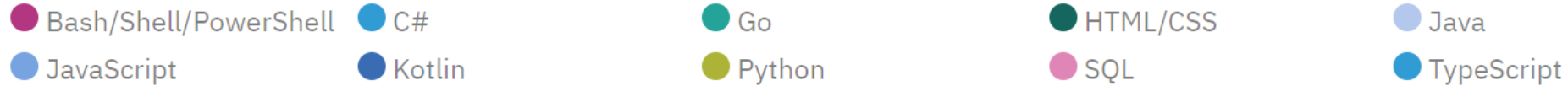
Flask
jQuery



DASHBOARD TAB 2, Panel 1

Top 10 Languages Desired Next Year

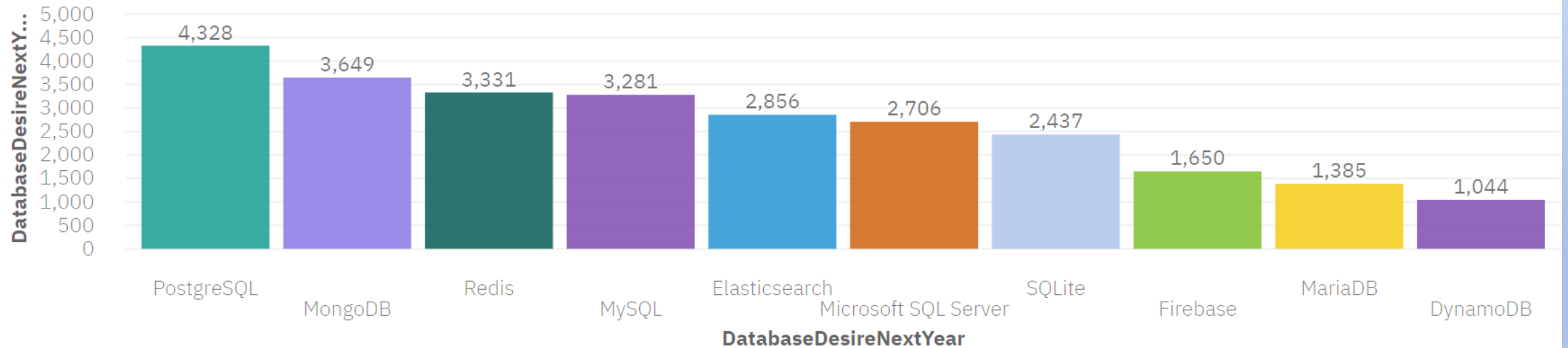
LanguageDesireNextYear



DASHBOARD TAB 2, Panel 2

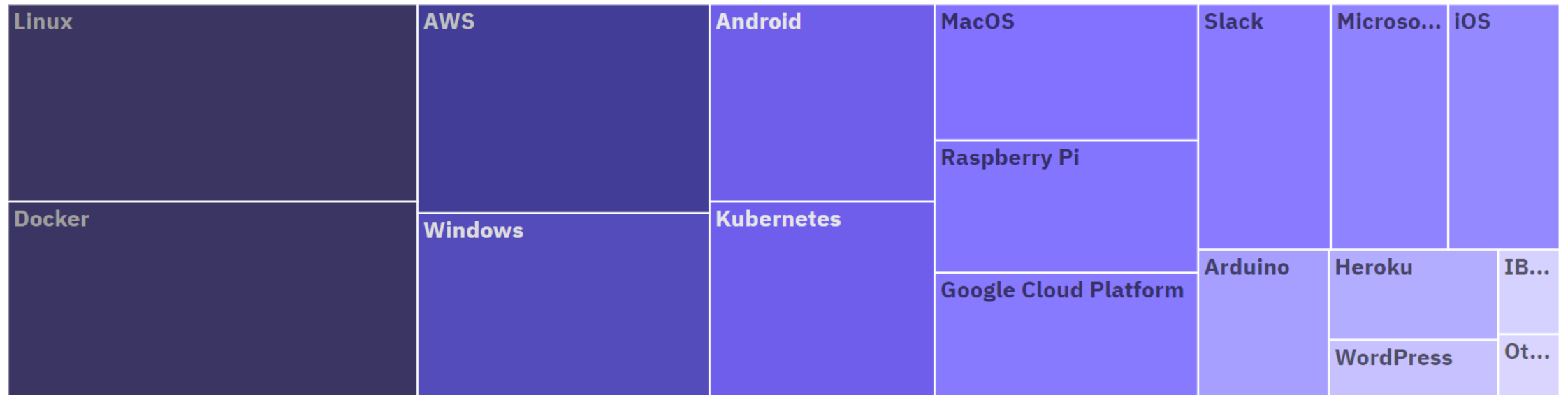
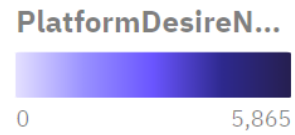
Top 10 Databases Desired Next Year

DatabaseDesireNextYear



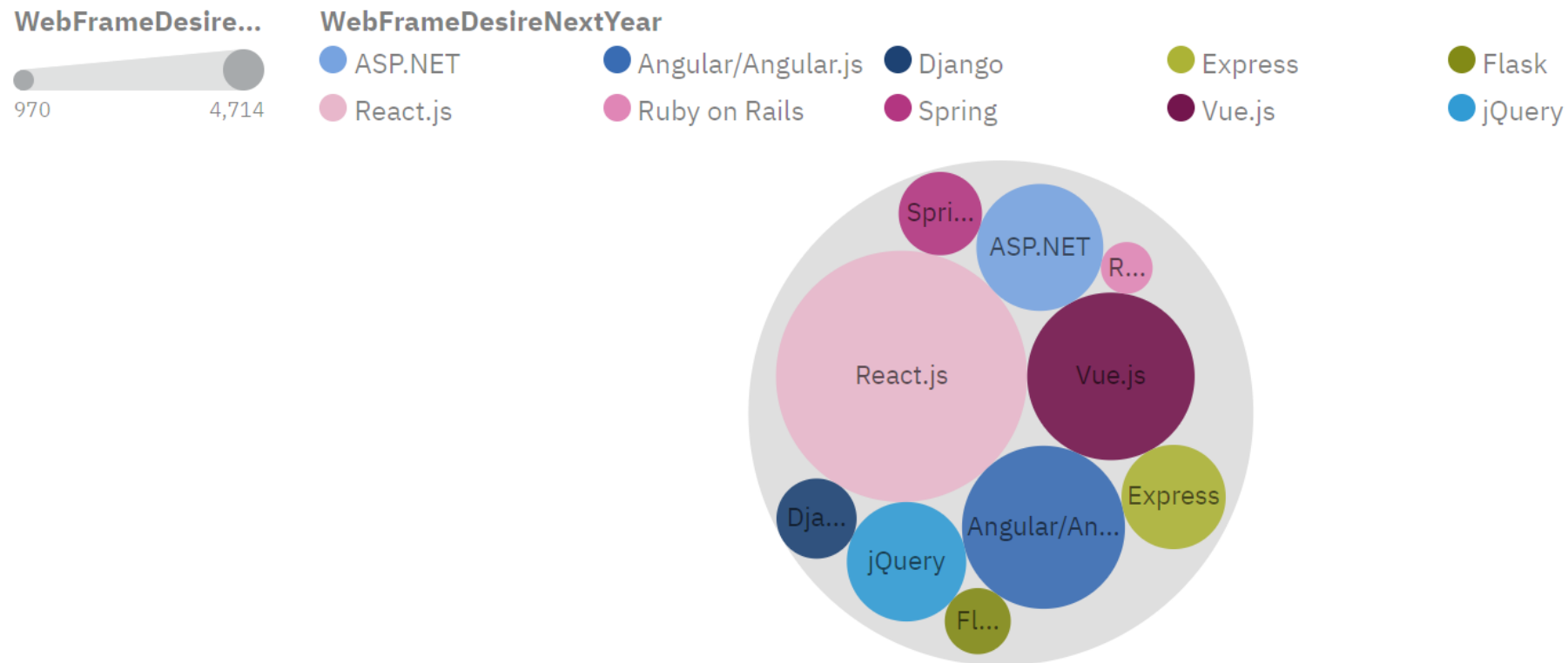
DASHBOARD TAB 2, Panel 3

Platforms Desired Next Year



DASHBOARD TAB 2, Panel 4

Top 10 Web Frameworks Desired Next Year

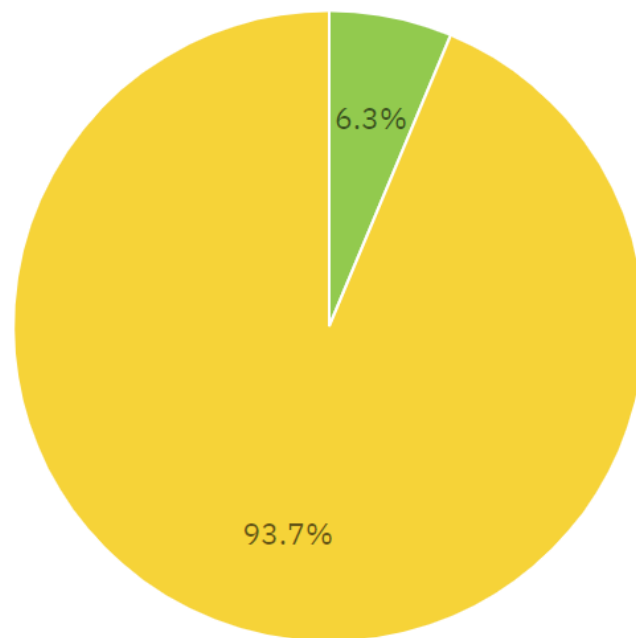


DASHBOARD TAB 3, Panel 1

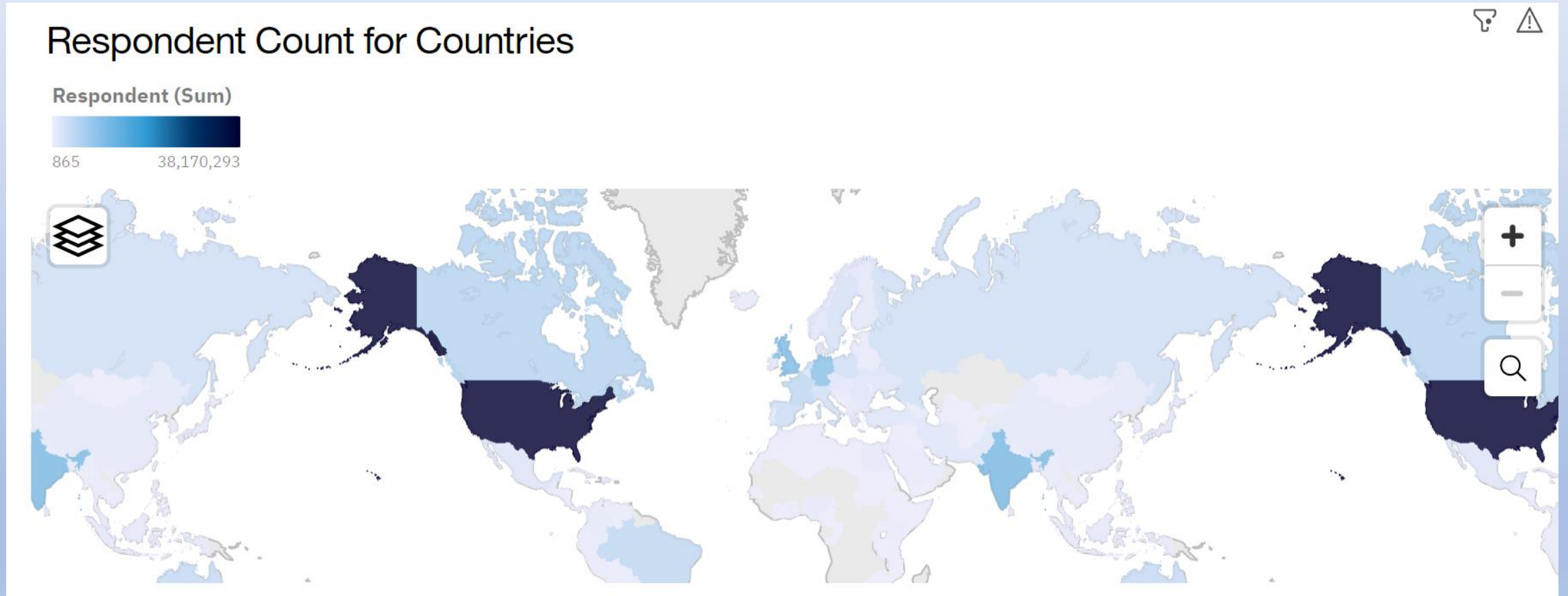
Respondent classified by Gender

Gender

● Woman ● Man

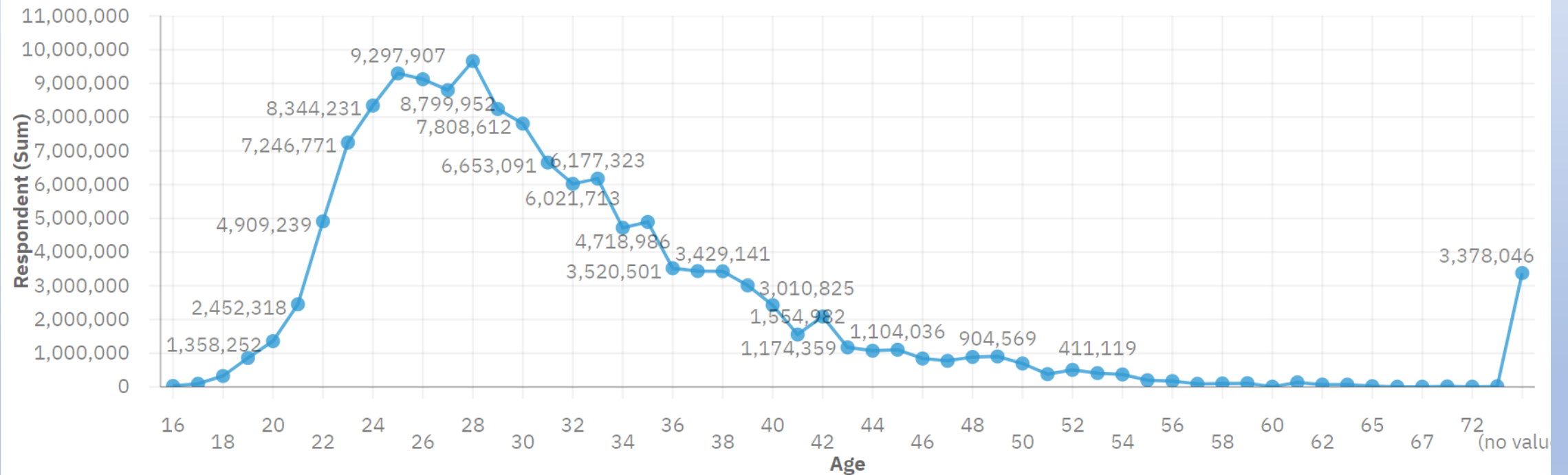


DASHBOARD TAB 3, Panel 2



DASHBOARD TAB 3, Panel 3

Respondent Count by Age

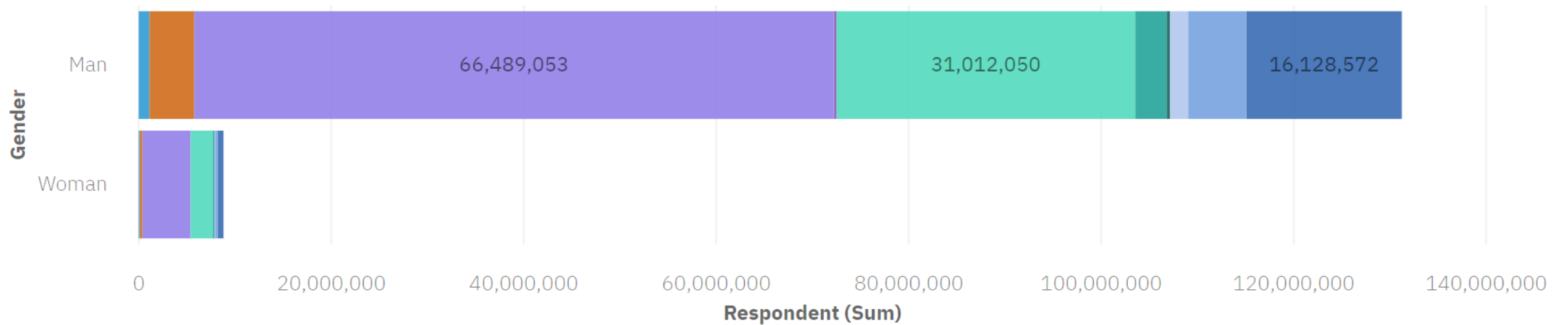


DASHBOARD TAB 3, Panel 4

Respondent Count by Gender, classified by Formal Education Level

EdLevel

- (no value)
- Associate degree
- Bachelor's degree (BA, BS, B.E...
- I never completed any formal ...
- Master's degree (MA, MS, M.E...
- Other doctoral degree (Ph.D, E...
- Primary/elementary school
- Professional degree (JD, MD, e...
- Secondary school (e.g. Americ...
- Some college/university study ...



References and acknowledgments

- Image on cover page from

- <https://towardsdatascience.com/why-data-analytics-is-gaining-hype-in-the-21st-century-b7b1ca289f09>

- Data on python use in science

- <https://skillcrush.com/blog/what-is-python-used-for/#opt2>
 - <https://www.stxnext.com/blog/most-popular-python-scientific-libraries/>
 - <https://docs.python-guide.org/scenarios/scientific/#:~:text=Python%20is%20frequently%20used%20for%20high%2Dperformance%20scientific%20applications.&text=Due%20to%20its%20high%20performance,are%20NumPy%2C%20SciPy%20and%20Matplotlib.>

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SKILLS NETWORK 