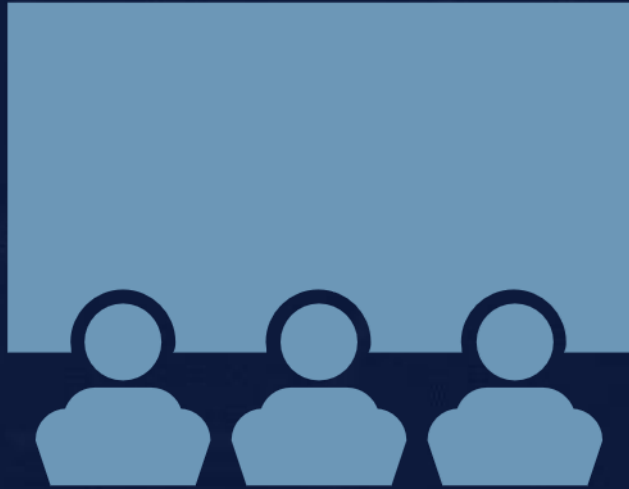# 2019 STACK OVERFLOW DEVELOPER SURVEY

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JULY 2022

OUTLINE

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

EXECUTIVE SUMMARY

- A number of relevant skills are in-demand in the Tech space and this demand has increased over the years.

- Due to this growing demand, it is important to always analyze alongside the current trend, the likely future trend of those skills.

  - This is to enable Tech Industries spot relevant opportunities and make informed decisions as it relates to cost and budget inclusions.

- Survey of the demographics for different technologies.

- Age and Gender bias in the technology sector.

INTRODUCTION

- This presentation is aimed at gaining insights on the future skill requirements and platforms in the technology space and their impact on the growing competitive trend.

- The presentation is also targeted at Global IT Industry Leaders, Programmers, and Students, to enable them spot the possible relevant skills which will help them make informed decisions on budget, learning/training cost, and personnel management.

- The analysis will cut across various aspects of the Tech Space, and positive conclusions will be drawn afterwards.

METHODOLOGY

- Data Collection (Web-Scraping):
  - Stack overflow developer 2019 survey[1]
  - GitHub job postings[2]
  - Programming languages annual salary[3]
- Data Wrangling:
  - Checking for quality and tidiness issues.
- Data Cleaning
  - Handling missing data, normalization, and checking for datatype consistency.
- Exploratory Data Analysis
  - Assessing the distribution of the datasets, presence of outliers, and correlation between columns.
- Data Visualization (tools):
  - Python Matplotlib & Seaborn
  - IBM Cognos Dashboard
- Presentation of Results

RESULTS

	Respondent	LanguageWorkedWith	LanguageDesireNextYear	DatabaseWorkedWith	DatabaseDesireNextYear	PlatformWorkedWith	PlatformDesireNextYear
0	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	4.0	C	C	MySQL	MySQL	Linux	Linux
2	4.0	C++	C#	SQLite	SQLite	Windows	Windows
3	4.0	C#	JavaScript	NaN	NaN	NaN	NaN
4	4.0	Python	SQL	NaN	NaN	NaN	NaN
...	...	...	...	...	...	...	...
74585	25142.0	Go	Python	NaN	NaN	NaN	NaN
74586	25142.0	HTML/CSS	R	NaN	NaN	NaN	NaN
74587	25142.0	PHP	NaN	NaN	NaN	NaN	NaN
74588	25142.0	Python	NaN	NaN	NaN	NaN	NaN
74589	25142.0	R	NaN	NaN	NaN	NaN	NaN

74590 rows × 14 columns

PROGRAMMING LANGUAGE TRENDS

Current Year

Top 5 Programming Languages For The Current Year

Language	Value
JavaScript	8,687
HTML/CSS	7,830
SQL	7,106
Bash/Shell/PowerShell	4,642
Python	4,542
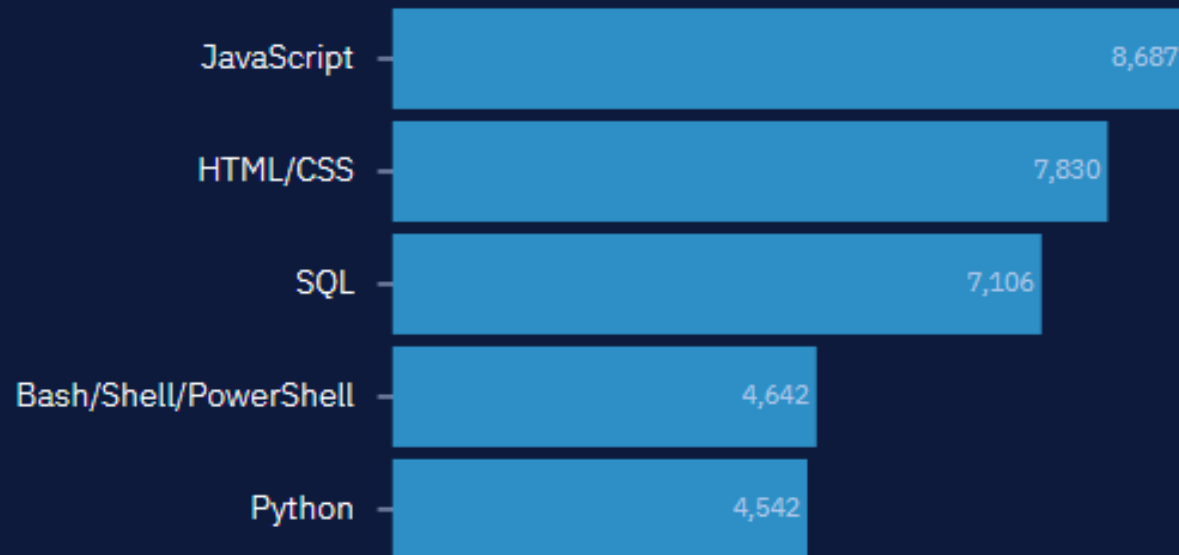
Next Year

Top 5 Programming Languages For Next Year

Language	Value
JavaScript	6,630
HTML/CSS	5,328
Python	5,239
SQL	5,012
TypeScript	4,088
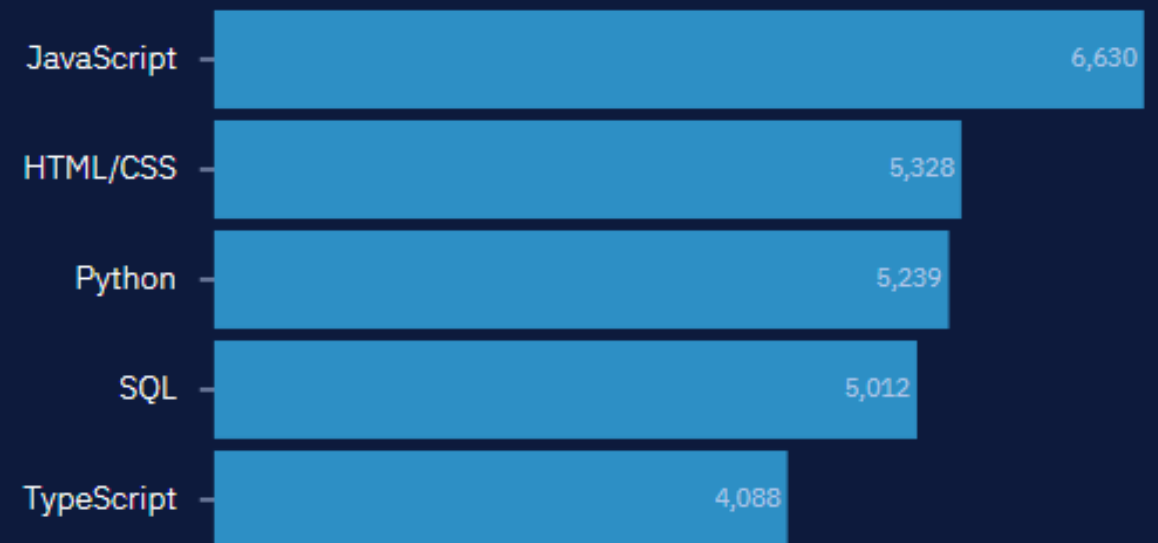
PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS

- JavaScript and HTML/CSS are the most popular programming languages. This means that Web development is still in high demand.

- Python gained more popularity over time. This could be due to more interest in Data Science and Artificial Intelligence

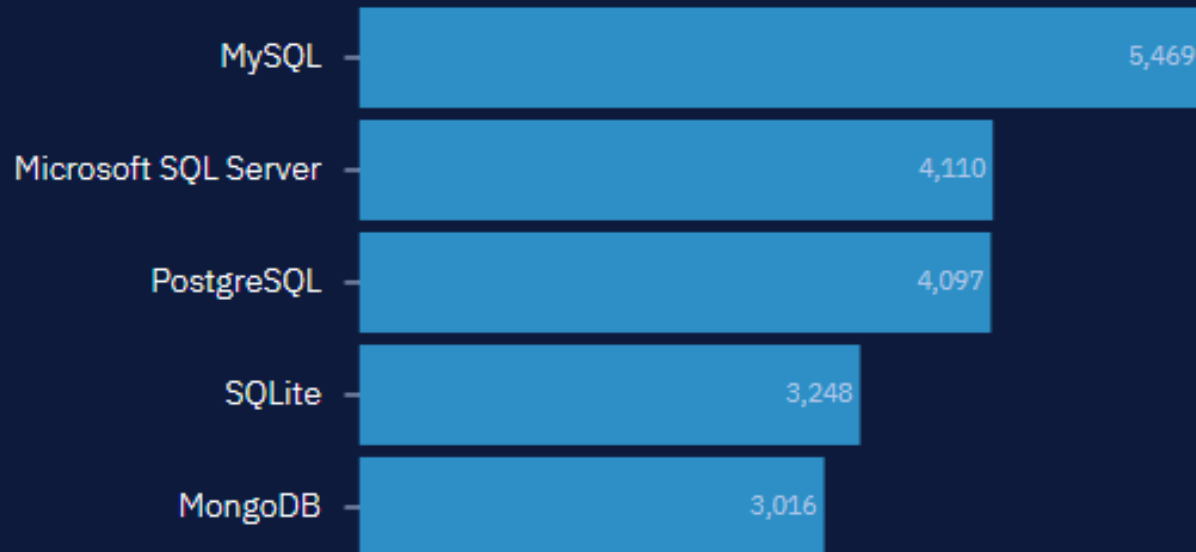- The demand for SQL dropped significantly.

IMPLICATIONS

- Due to the high demand in Web Development, more personnel should be hired for the JavaScript and HTML/CSS skills

- The growing interest in AI and Machine Learning suggests that Python will gain more significance and popularity in the coming years.

DATABASE TRENDS

Current Year

Top 5 Databases For The Current Year

Database	Value
MySQL	5,469
Microsoft SQL Server	4,110
PostgreSQL	4,097
SQLite	3,248
MongoDB	3,016

Next Year

Top 5 Databases For Next Year

Database	Value
PostgreSQL	4,328
MongoDB	3,649
Redis	3,331
MySQL	3,281
Elasticsearch	2,856
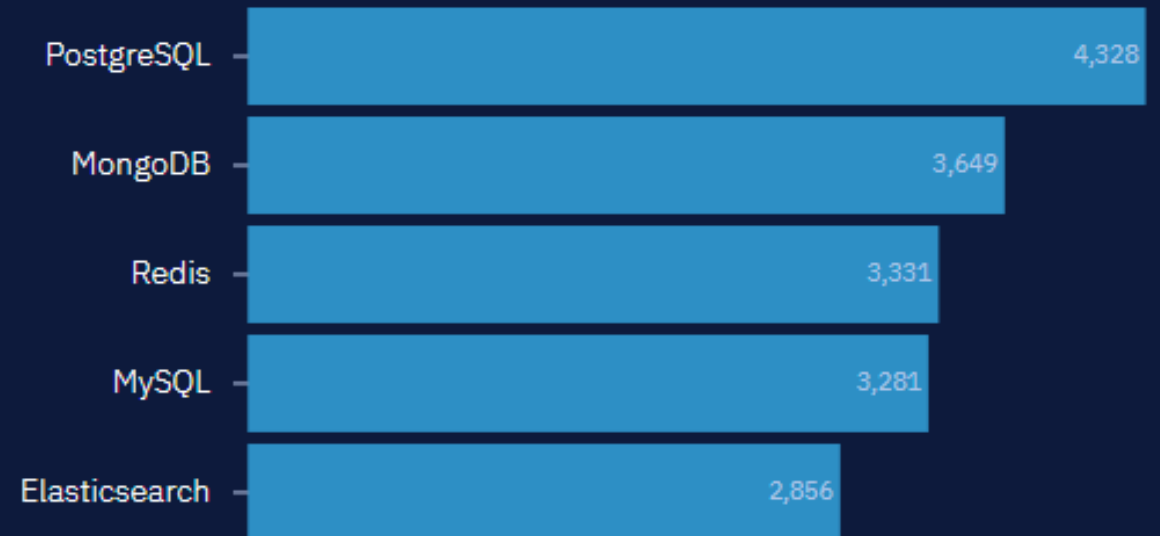
DATABASE TRENDS - FINDINGS & IMPLICATIONS

FINDINGS

- There was a significant drop in the popularity of MySQL.

- PostgreSQL gained a very significant popularity and has become the most widely used Database tool, followed by MongoDB

IMPLICATIONS

- The vast advantages of Non-Relational Database Systems have contributed to the popularity of MongoDB and Redis.

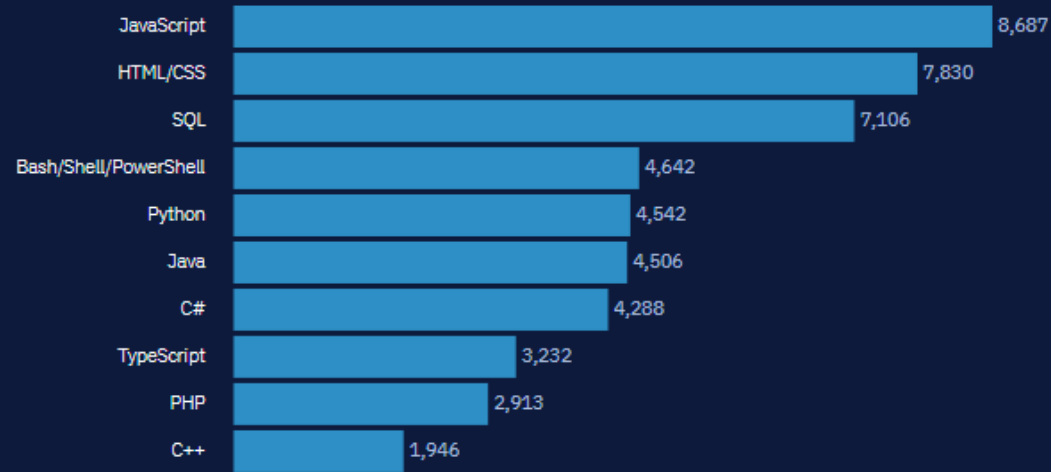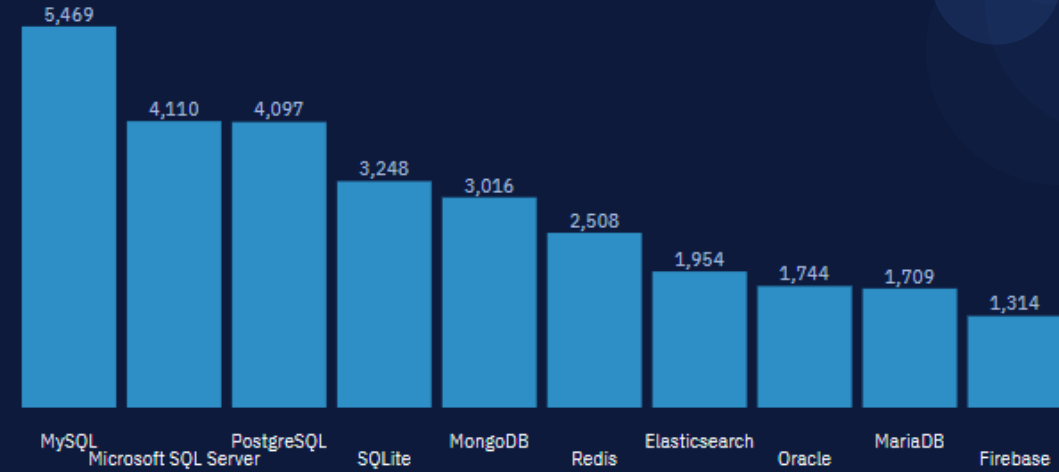- PostgreSQL has gained more popularity due to its Open Source platform.

DASHBOARD

[Click Here](#) to view the detailed visualization of the Cognos Dashboard

CURRENT TECHNOLOGY USAGE

Top 10 Languages Worked With

Language	Count
JavaScript	8,687
HTML/CSS	7,830
SQL	7,106
Bash/Shell/PowerShell	4,642
Python	4,542
Java	4,506
C#	4,288
TypeScript	3,232
PHP	2,913
C++	1,946

Top 10 Databases Worked With

Database	Count
MySQL	5,469
Microsoft SQL Server	4,110
PostgreSQL	4,097
SQLite	3,248
MongoDB	3,016
Redis	2,508
Elasticsearch	1,954
Oracle	1,744
MariaDB	1,709
Firebase	1,314

Platforms Worked With

AWS
iOS
Linux
Arduino
Slack
MacOS
Windows
Google Cloud Platform
Microsoft Azure
Raspberry Pi
IBM Cloud or Watson
Kubernetes
Docker
Android
WordPress
Heroku
Other(s)

Top 10 WebFrame Worked With

4,629
939

- ASP.N...
- Angula...
- Django
- Express
- Flask
- Laravel
- React.js
- Spring
- Vue.js
- jQuery

FUTURE TECHNOLOGY TREND

Top 10 Language Desire Next Year

Language	Value
JavaScript	6,630
HTML/CSS	5,328
Python	5,239
SQL	5,012
TypeScript	4,088
C#	3,591
Bash/Shell/PowerShell	3,097
Java	2,953
Go	2,759
Kotlin	1,890

Top 10 Database Desire Next Year

Database	Value
PostgreSQL	4,328
MongoDB	3,649
Redis	3,331
MySQL	3,281
Elasticsearch	2,856
Microsoft SQL Server	2,706
SQLite	2,437
Firebase	1,650
MariaDB	1,385
DynamoDB	1,044

Platform Desire Next Year

Linux, AWS, Kubernetes, MacOS, Raspberr..., Google C..., Docker, Windows, Slack, iOS, Heroku, Android, Microsoft Azure, Arduino, Word..., I...

Top 10 Web Frame Desire Next Year

4,714

970

- ASP.NET
- Angula...
- Django
- Express
- Flask
- React.js
- Ruby o...
- Spring
- Vue.js
- jQuery
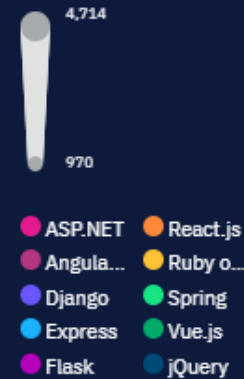
DEMOGRAPHICS

Respondent classified by Gender

Gender
- ● Woman
- ● Man

6.5%

93.5%
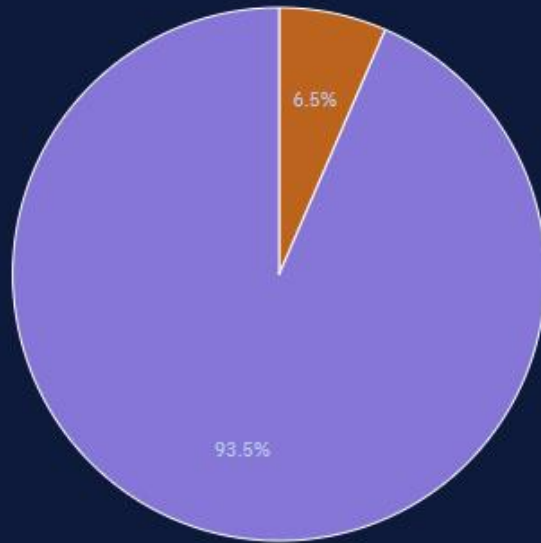
Respondent Count By Countries

1   3,058

Respondent Count By Age

9,297,907
8,799,952
8,344,231
7,808,612
7,246,771
6,653,091
6,021,713
4,909,239
4,892,347
4,718,986
3,520,501   3,429,141   3,378,046
2,452,318   2,426,283
1,358,252   1,554,982
861,317   1,074,420   904,569   370,610

16   20   24   28   32   36   40   44   48   52   56   60   65   72   (no v...
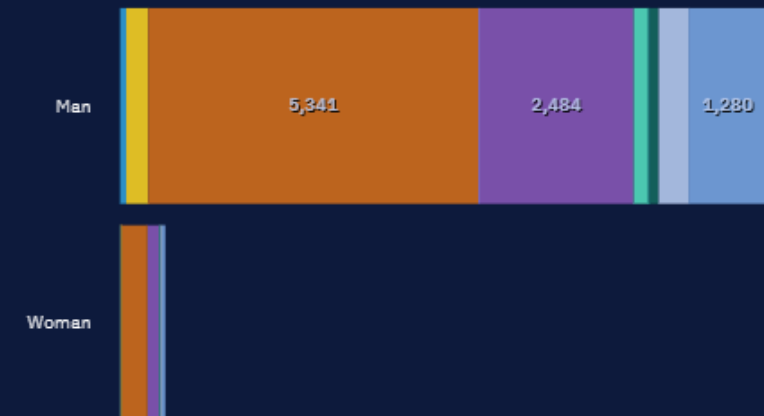 18   22   26   30   34   38   42   46   50   54   58   62   67
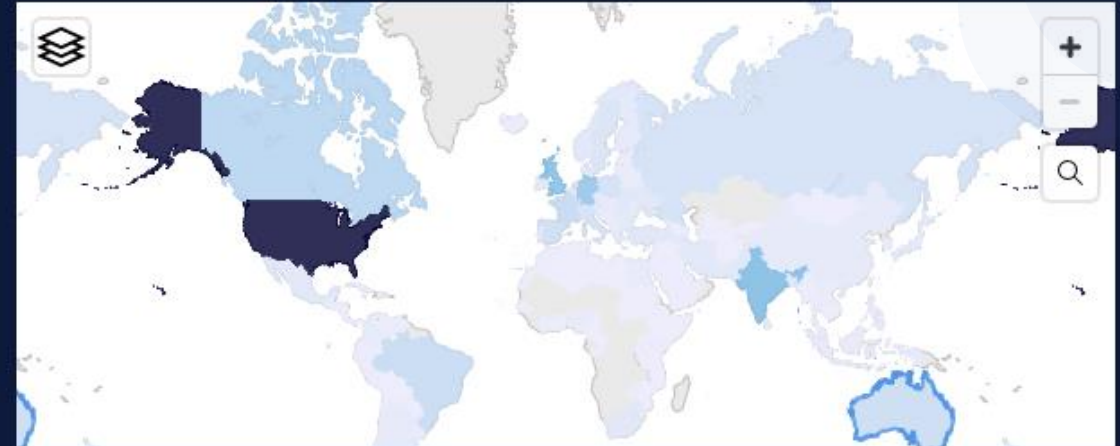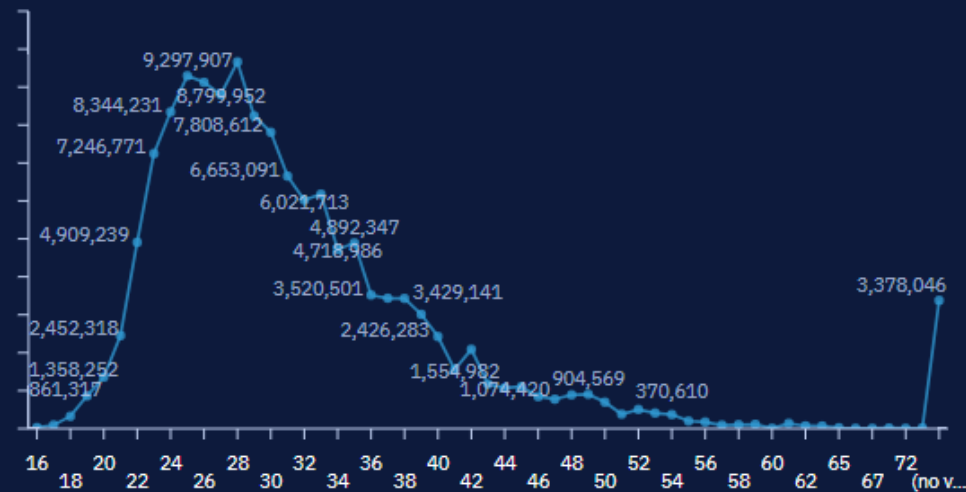
Respondent Count by Gender, Classified by Formal Education Level

EdLevel
- ● (no value)
- ● Associate degree
- ● Bachelor's degree (BA, B.
- ● I never completed any fo..
- ● Master's degree (MA, MS.
- ● Other doctoral degree (P..
- ● Primary/elementary sch...
- ● Professional degree (JD, ..
- ● Secondary school (e.g. A...
- ● Some college/university ..

Man   5,341   2,484   1,280

Woman

DISCUSSION

- Current Technology Trend and Future Trend

- How the Trend in Technology relates to Age, Gender, and Location.

OVERALL FINDINGS & IMPLICATIONS

FINDINGS

- **Platform** – Linux and Windows remain the most desired platforms.
- **Web Frameworks** – React.js and Vue.js have increased in popularity while interests in jQuery have dropped significantly.
- JavaScript and PostgreSQL remain the most popular Programming Language and Database tool respectively.
- More Male than Female are in the Tech Space. This could be a sign of gender discrimination.
- USA ranks highest in the Technology space.
- Majority of the Tech experts fall within the age of 15 and 42 years.

IMPLICATIONS

- Equal opportunities should be given to both genders in the Tech space.
- There is need to expose the trend in Technology to more countries and they should all have equal opportunity to participate.
- Age shouldn't necessarily be a barrier when venturing into Tech.
- The trend in Technology is ever changing, and every programmer, regardless of their domain should be open-minded and flexible enough to adapt to these changes.

CONCLUSION

1. The trend in Technology is constantly changing. As a result, quality Personnel management is key to ensuring adequate upskilling for more demanding skills and growing trends.

2. The Tech Space should be accommodating regardless of Age, Gender, and Location.

3. Adequate Budgeting plan is vital in ensuring resources are channeled to the right skill for improved performance.

APPENDIX

[1]m5_survey_data_demographics.csv,
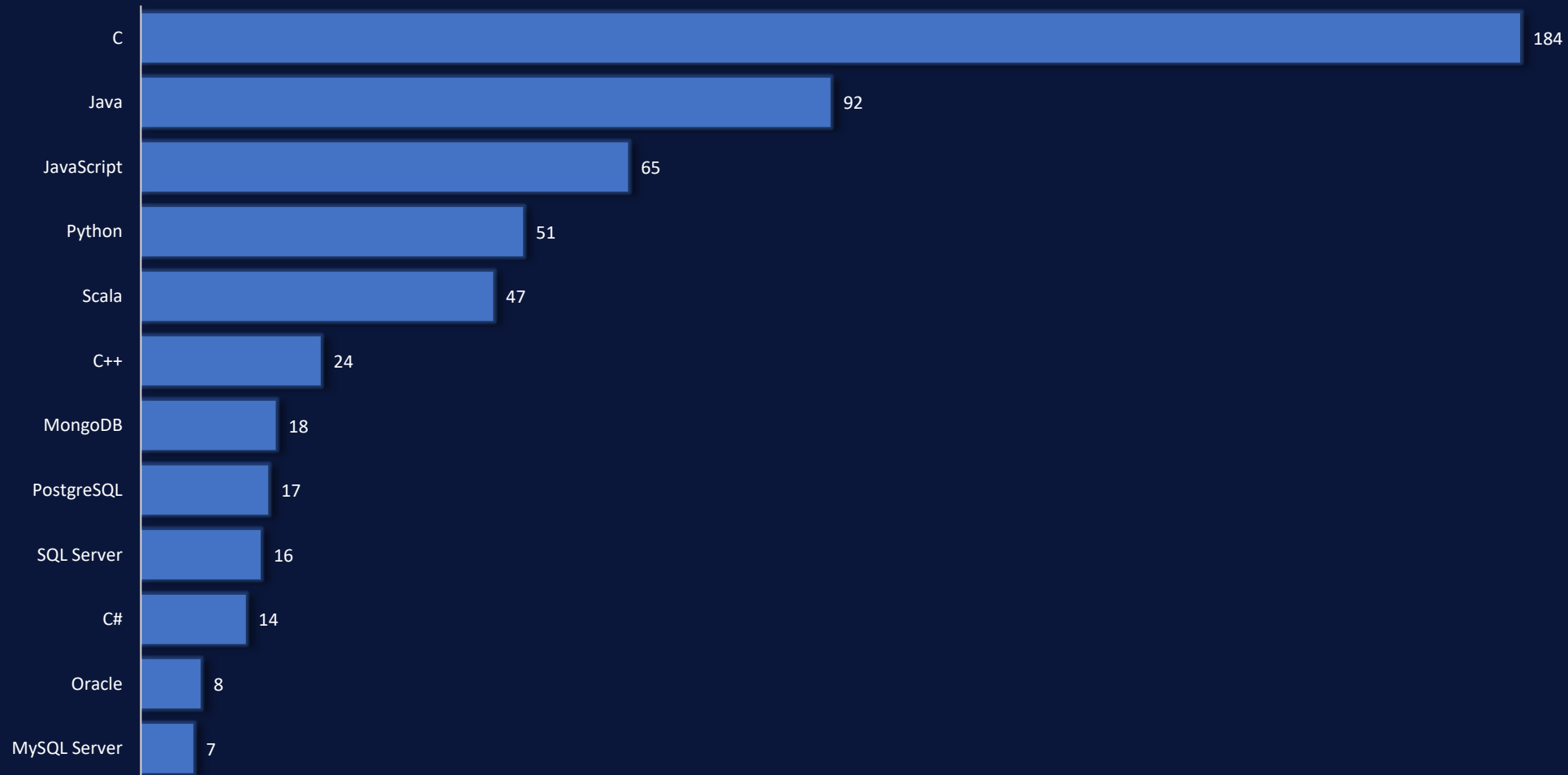m5_survey_data_technologies_normalised.csv

[2]Github Job Postings View Source

[3]job-postings.xlsx

IBM Cognos Dashboard

JOB POSTINGS

Number of Job Postings By Programming Language

Language	Value
C	184
Java	92
JavaScript	65
Python	51
Scala	47
C++	24
MongoDB	18
PostgreSQL	17
SQL Server	16
C#	14
Oracle	8
MySQL Server	7

POPULAR LANGUAGES

Average Annual Salary of Popular Languages

Language	Salary
Swift	$130,801
Python	$114,383
C++	$113,865
Javascript	$110,981
Java	$101,013
Go	$94,082
R	$92,037
C#	$88,726
SQL	$84,793
PHP	$84,727