



IBM Data Analyst Capstone Presentation

Martin Mroz

December 2nd, 2021

OUTLINE



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

EXECUTIVE SUMMARY



- Assessing the state of various programming language usage and database usage
- Will also be assessing:
 - Platforms
 - Web Frames
- Demographic information of respondents
- Geographic distribution of programmers and language, database, etc... used
- Gender differences in jobs

INTRODUCTION



- The goal of this presentation is to assess and analyze trends in global software and web development
- Specifically:
 - Determining current in-demand skills
 - Predict future in-demand skills
 - Identify gaps in the workforce that need to be addressed
- This presentation is intended for: students, programmers, developers, IT professionals, and HR professionals in tech

METHODOLOGY



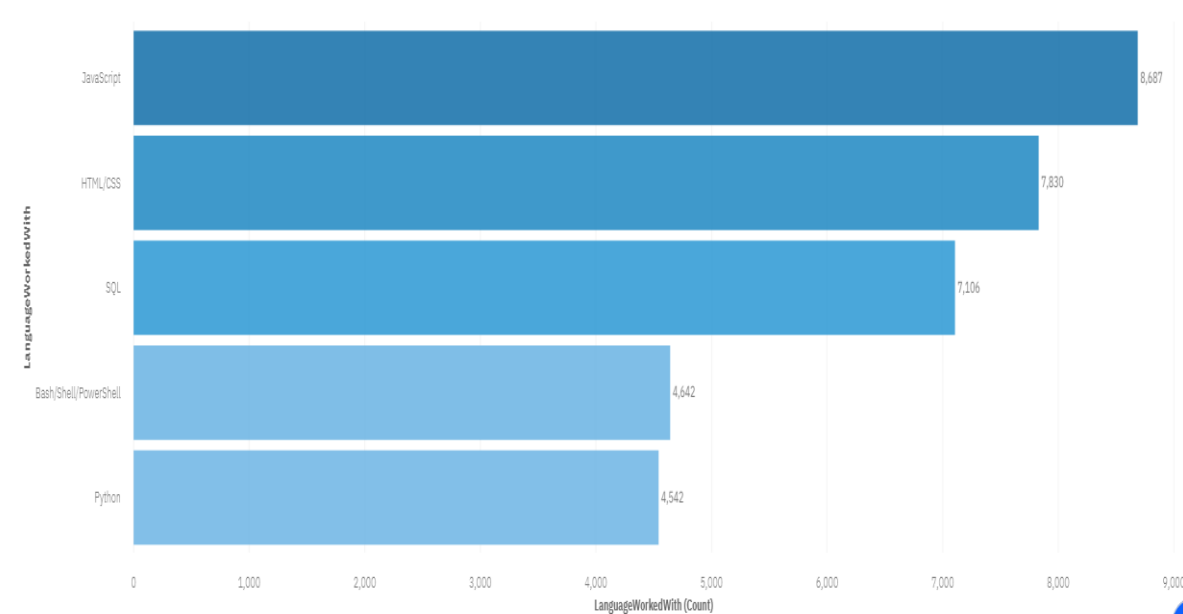
- Data Collection
 - Stack Overflow 2019 Developer Survey
 - Github Job Postings
 - Programming Languages Survey
- Data Wrangling
- Data Exploration
- Data Cleaning
- Data Visualization
 - IBM Cognos
 - Python
- Presentation

RESULTS

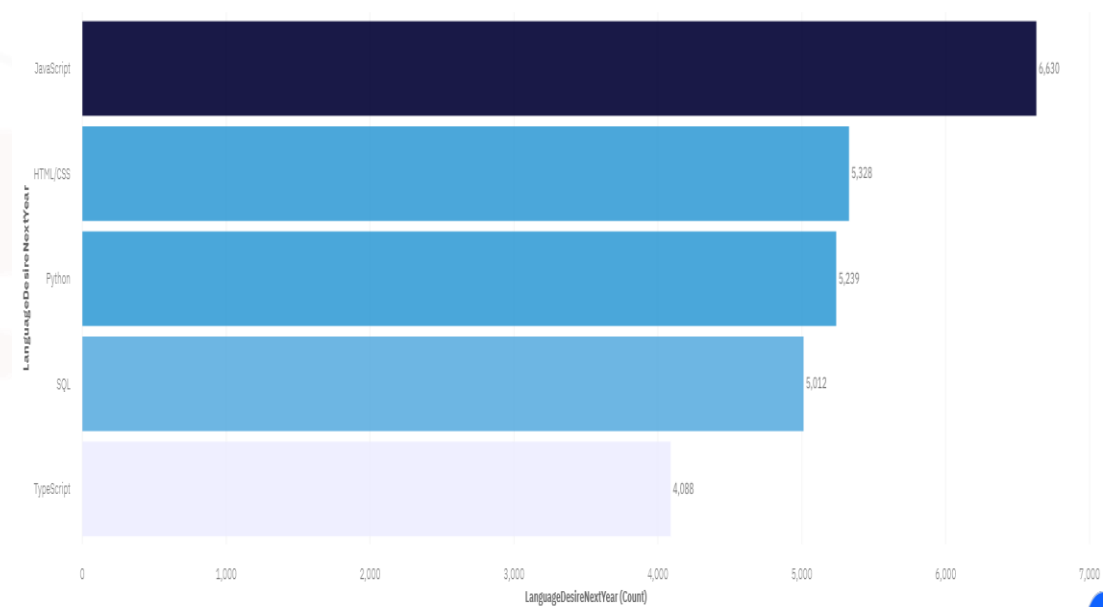
	Respondent	LanguageWorkedWith	LanguageDesireNextYear	DatabaseWorkedWith	DatabaseDesireNextYear	PlatformWorkedWith
0	4	C	C	MySQL	MySQL	Linux
1	4	C++	C#	SQLite	SQLite	Windows
2	4	C#	JavaScript	NaN	NaN	NaN
3	4	Python	SQL	NaN	NaN	NaN
4	4	SQL	NaN	NaN	NaN	NaN
...
74584	25142	Go	Python	NaN	NaN	NaN
74585	25142	HTML/CSS	R	NaN	NaN	NaN
74586	25142	PHP	NaN	NaN	NaN	NaN
74587	25142	Python	NaN	NaN	NaN	NaN
74588	25142	R	NaN	NaN	NaN	NaN

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

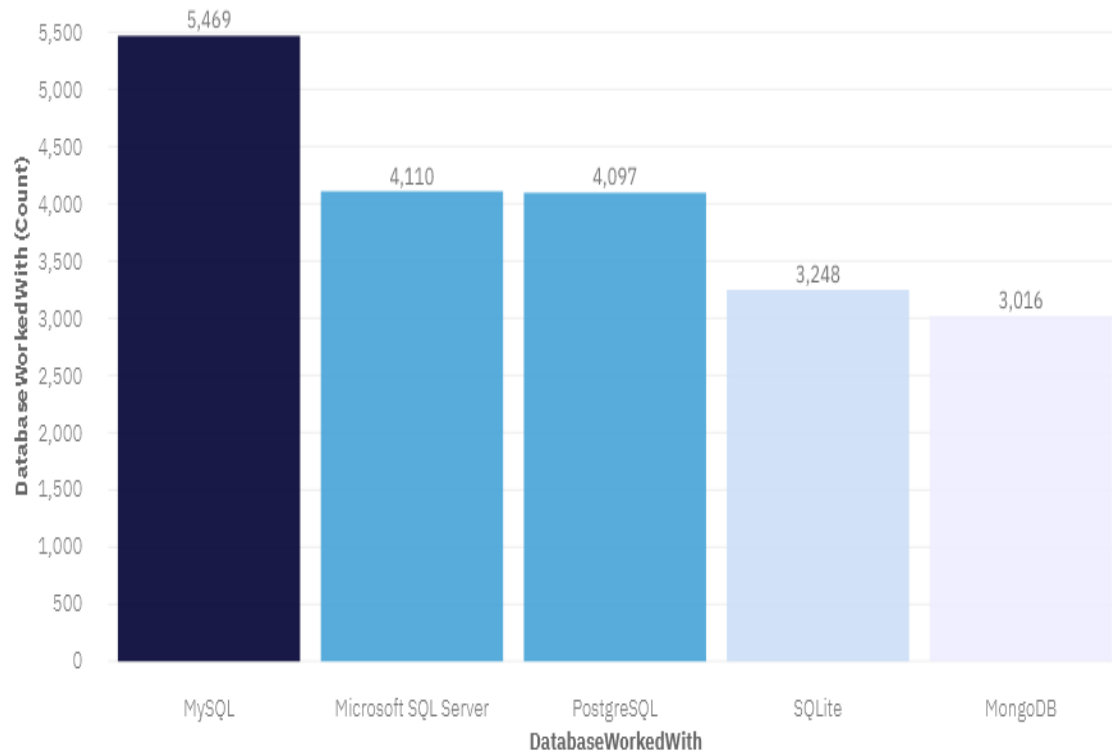
- Javascript top language currently used
- Javascript is over 2x more used than the #4 language, Bash
- Javascript is also the most desired language for next year

Implications

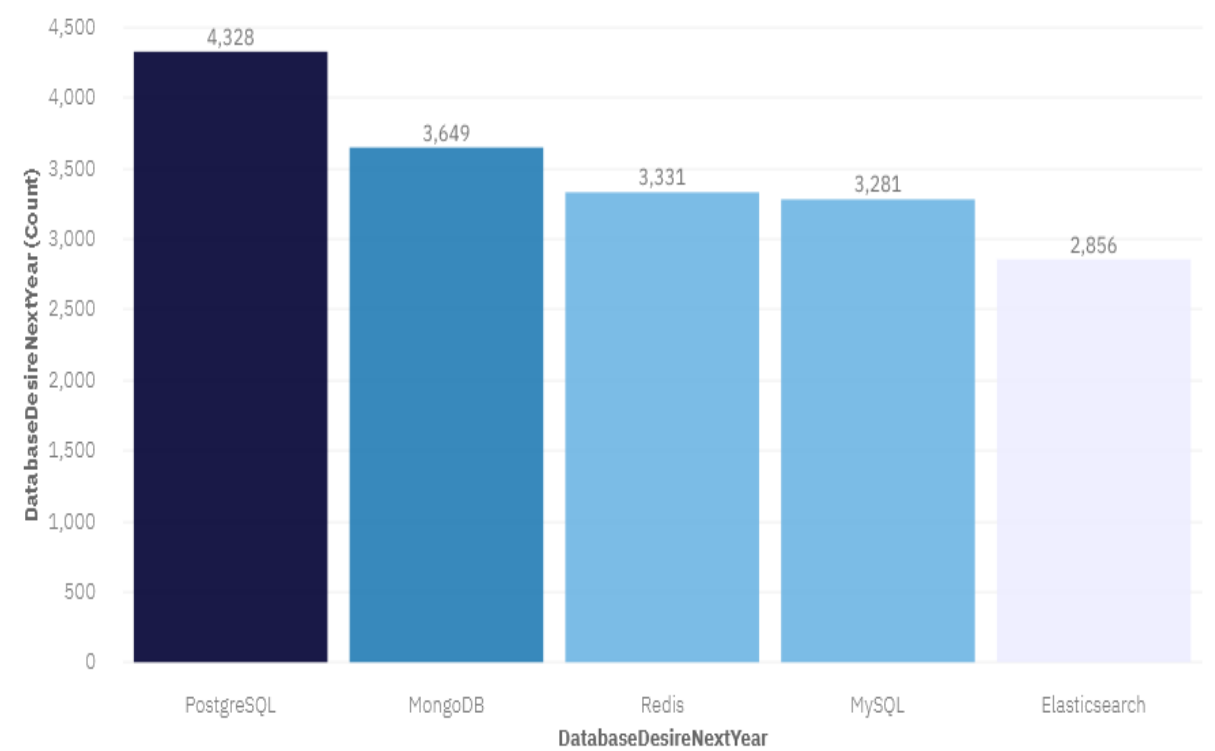
- Around 2000 less people want to learn Javascript next year so its demand is decreasing
- Python is currently 5th most used but 3rd most desired so an increase in Python users is expected
- Go & Kotlin are both top-10 most desired for next year but not currently in the top-10 so more users are to be expected

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL is the most desired database for the future
- MySQL is currently the most used
- Elasticsearch is currently 7th most used but is 5th in future desire

Implications

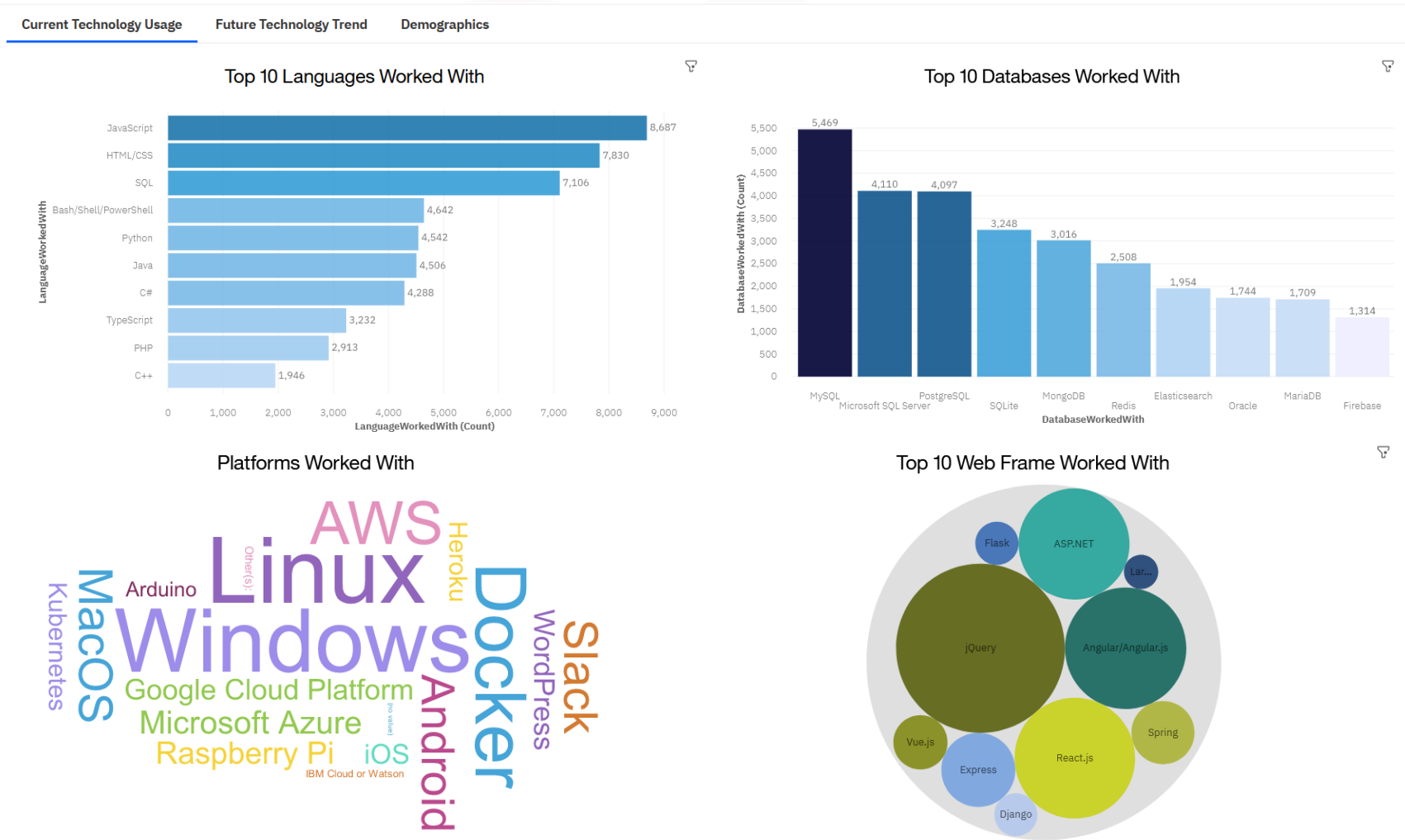
- Oracle is currently 8th in usage but is not top-10 for the future, where DynamoDB enters at 10th
- MongoDB is the 2nd most desired database but is 5th currently used, a large shift towards that DB is expected
- Similarly, Redis is also expected to move up in usage as it is the 3rd most desired but 6th most used

DASHBOARD

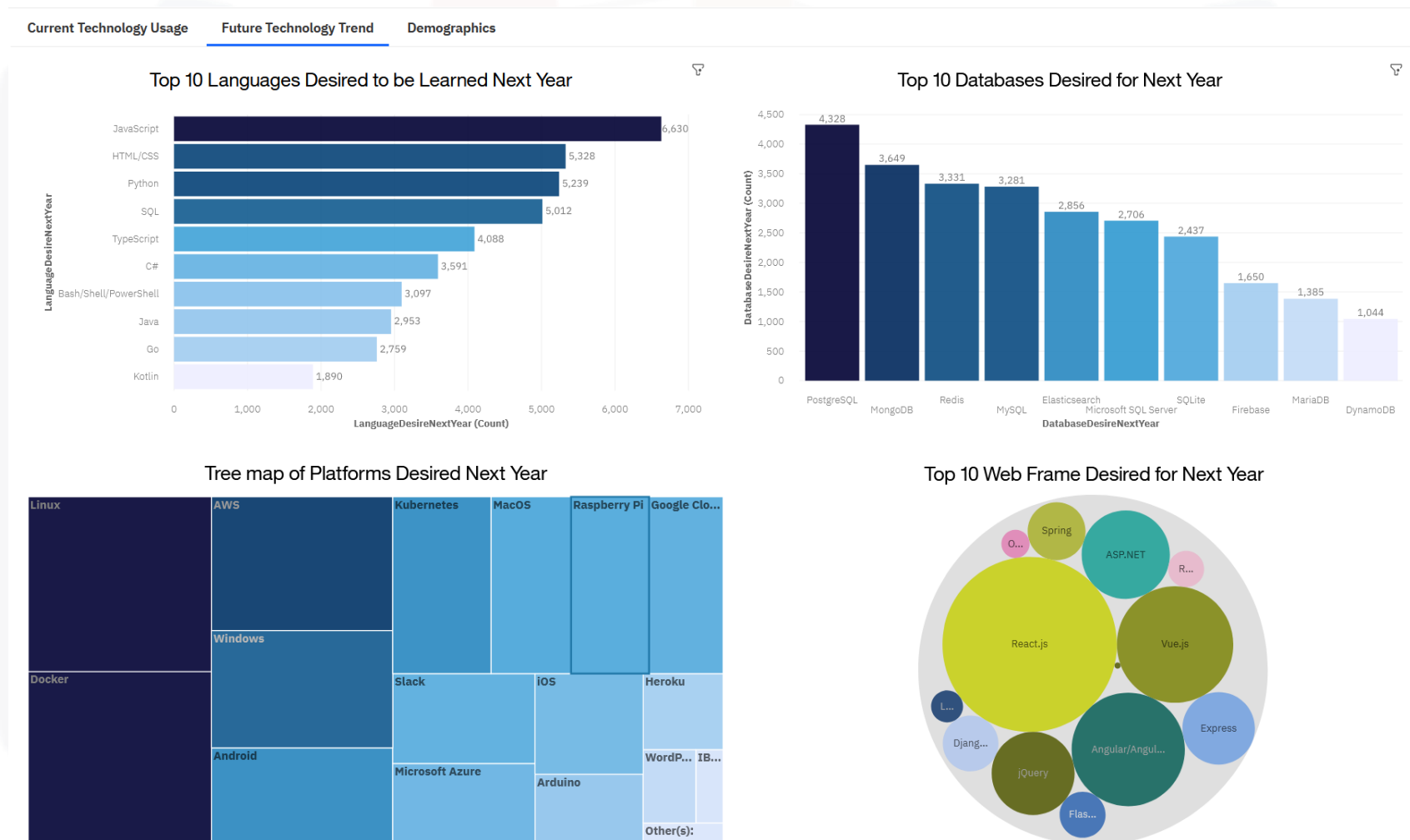


<https://dataplatform.cloud.ibm.com/dashboards/d146624e-1ac8-44e1-b27c-1ff0eeddb59c/view/5a61e716379c2cdf12cad4e4079e7f0674307108b7bb875783d77b495c672497a93f1294c82d43088f445032a6ea150fcf>

DASHBOARD TAB 1



DASHBOARD TAB 2



DASHBOARD TAB 3

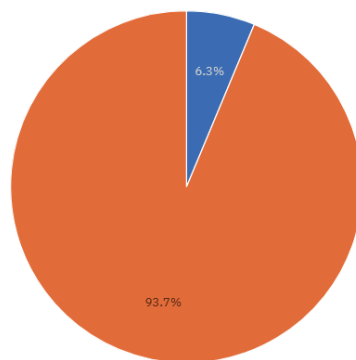
Current Technology Usage

Future Technology Trend

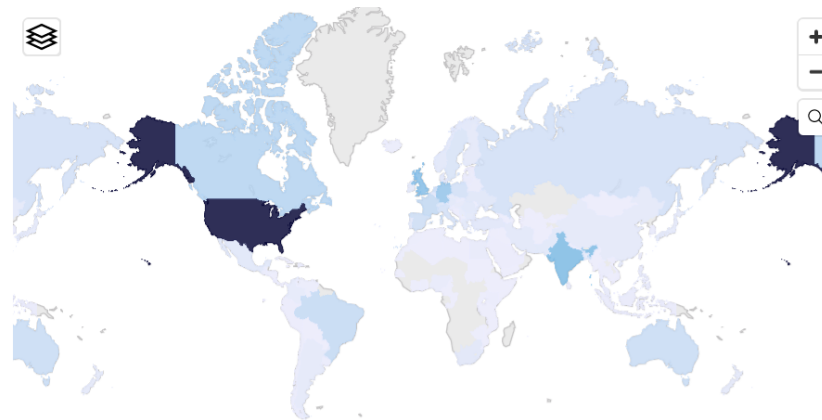
Demographics

Respondent Classified by Gender

Gender
● Woman ● Man

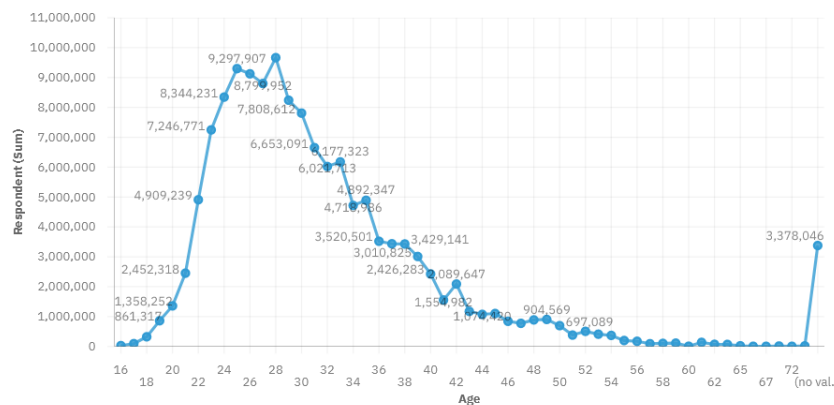


Respondent Count for Countries



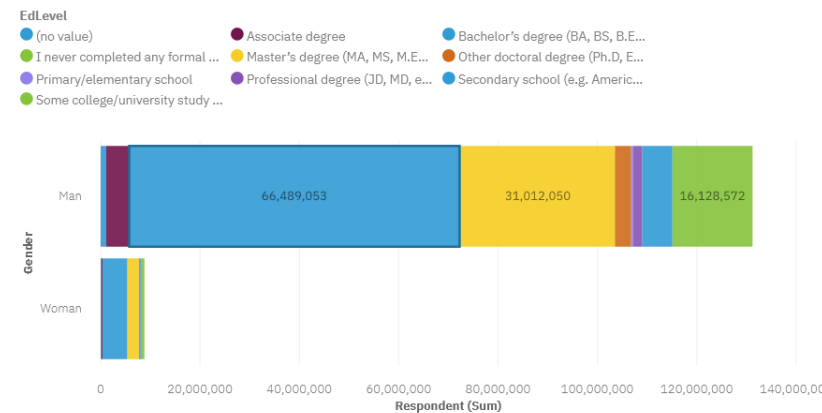
Respondent Count by Age

Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level

Respondent Count by Gender, classified by Formal Education Level



DISCUSSION



- Current technology trends vs upcoming trends
- Gender gap
- Age and Education discrimination
- Lack of developers/programmers in developing nations
- Retraining and reskilling workers

OVERALL FINDINGS & IMPLICATIONS

Findings

- A small amount of countries control most of the tech workers e.g. USA
- Significant gender gap exists, with few female workers
- Trends in technology are constantly shifting

Implications

- Both workers and companies need to be flexible to adapted to ever evolving tech trends
- The tech lag in developing countries will increase unless dealt with
- Significant steps are required to encourage females to enter the tech sector

CONCLUSION



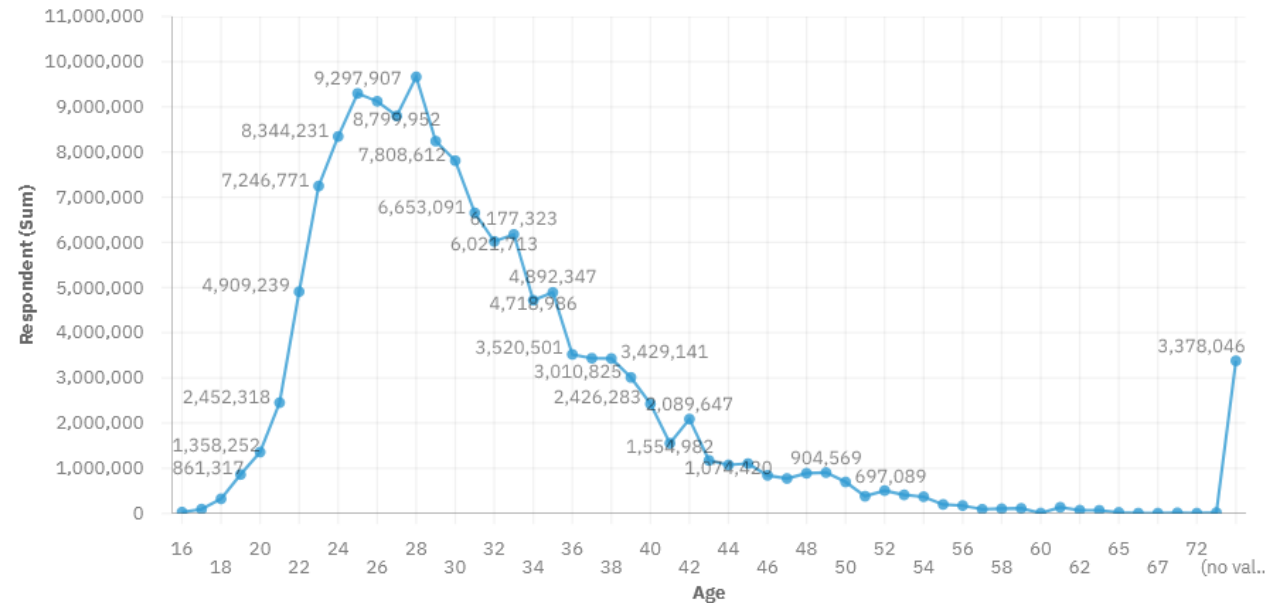
- Technology trends in languages, databases, platforms, and web frames
- Demographic trends e.g. gender, age
- Future trends
- Actions to be taken

APPENDIX

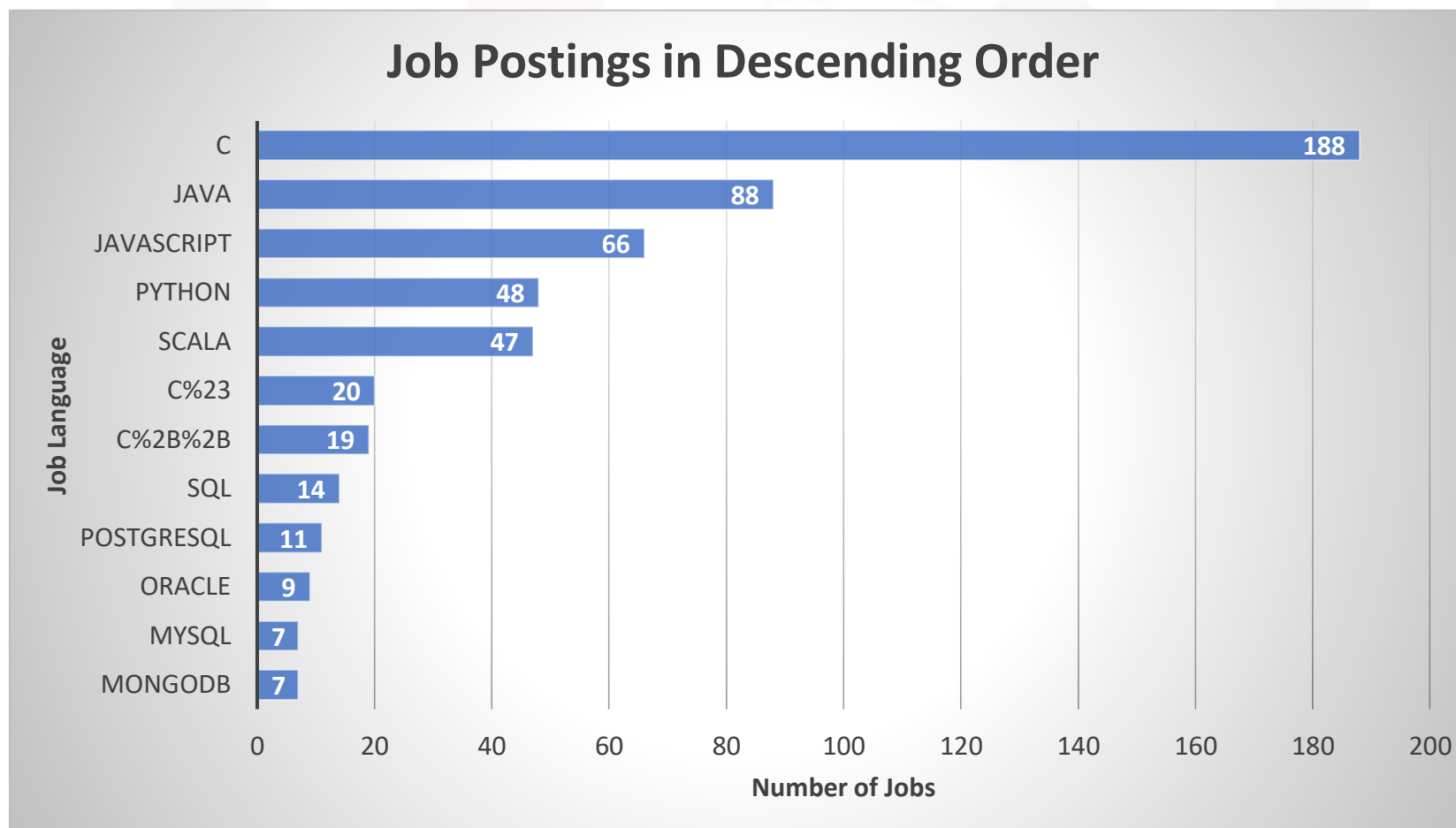
European Respondent Count



Respondent Count By Age



GITHUB JOB POSTINGS



POPULAR LANGUAGES

