



Trends in Skill Requirements for Developers

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OUTLINE



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- Discussion
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EXECUTIVE SUMMARY



- The goal of this analysis is to help identify future skill requirements based on a 2019 Stack Overflow Survey.
- Data was collected to identify the top skills that are most in demand from various sources including:
 - Job Postings
 - Training Portals
 - Surveys
- Driving questions that guided the analysis and visualizations:
 - What are the top programming languages in demand?
 - What are the top Databases desired?
 - What are the most popular platforms?
 - Demographics data:
 - Age information and gender distribution

EXECUTIVE SUMMARY Cont.

- The results can be used to help developers stay relevant in the job market, and guide employer training and support for upskilling current developers employed with them.
- Top Programming Languages
 - JavaScript
 - HTML/CSS
 - SQL
 - PowerShell
 - Python
- Top Database Skill:
 - MySQL
 - PostgreSQL
 - Microsoft SQL Server
 - SQLite
 - MongoDB
- Top Platforms:
 - Windows
 - Docker
 - Linux
 - AWS
- Demographics:
 - 93.7% of respondents are Male
 - Most developers are between 25-25 years old

INTRODUCTION



- As a Data Analyst at a consulting firm, we have been tasked with analyzing data to identify future technology trends to keep pace with changing technologies in order to remain competitive.
- Stack Overflow's annual developer survey is the largest and most comprehensive survey of people who code worldwide.
- Statistical analysis and techniques were performed on the cleaned data to identify trends and insights
- Visualizations were chosen based on the data to make the findings easier to understand.

METHODOLOGY



- Collect survey data
 - Utilized:
 - Web Scraping
 - APIs
 - Request Library
- Data Wrangling & Cleaning
 - Handled:
 - Missing Values
 - Finding & Removing Duplicates
- Exploratory Data Analysis
 - Analyzed Data Distribution
 - Handling Outliers
 - Correlation
- Visualizing Data
 - Used to Visualize:
 - Data Distribution
 - Relationships
- Dashboard

RESULTS

Data Collection

- Data was obtained from the Stack Overflow Survey
- Null were handled by imputing the median salary
- Duplicates were dropped

Normalizing Compensation

- Compensation was calculated using the salary and the frequency of payment to normalize into a total compensation column to accurately compare
- Skills with the highest salaries include Swift, Python and C++ (Appendix Fig-1)

Programming Languages

- Top languages this year include:
 - JavaScript
 - HTML/CSS
 - SQL
- Top languages next year:
 - JavaScript
 - Python
 - HTML/CSS

*Data for this project is only a fraction of the survey data. Survey results may vary using the entire data set.

RESULTS

Databases

- Top Databases this year include:
 - MySQL
 - PostgreSQL
 - Microsoft SQL Server
- Top languages next year:
 - MongoDB
 - MySQL
 - PostgreSQL

Platforms

- Top Platforms this year include:
 - Windows
 - Linux
 - Docker
- Top Platforms next year:
 - Linux
 - Docker
 - AWS

*Data for this project is only a fraction of the survey data. Survey results may vary using the entire data set.

RESULTS

Web Frames

- Top Web Frames this year include:
 - jQuery
 - Angular.js
 - React.js
- Top Web Frames next year:
 - React.js
 - Vue.js
 - Angular.js

Demographics

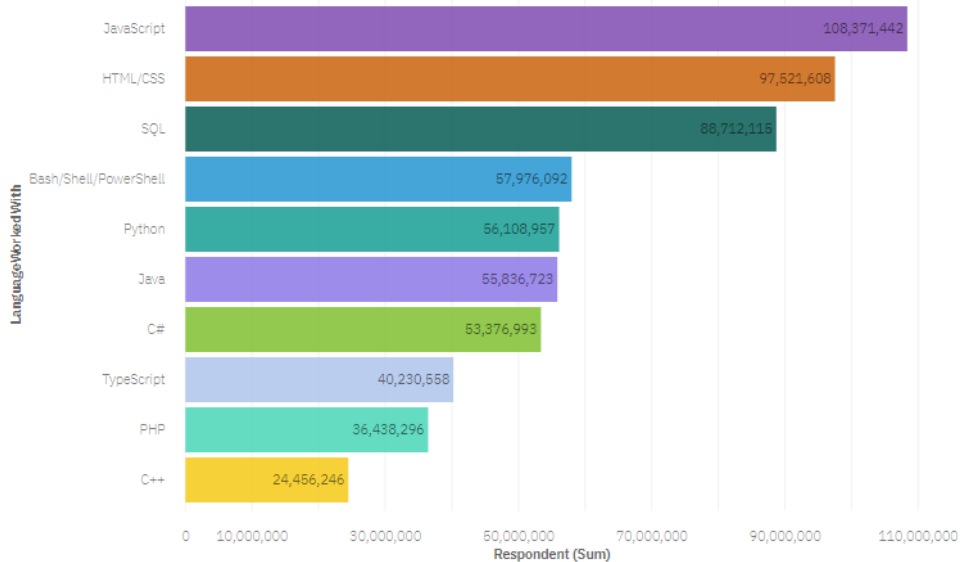
- Over 90% of respondents are Male
- Most developers live in the US
- Most developers fall into the age group of 25-35, with the most frequent age being 28
- A majority of developers have some college or professional degree

*Data for this project is only a fraction of the survey data. Survey results may vary using the entire data set.

PROGRAMMING LANGUAGE TRENDS

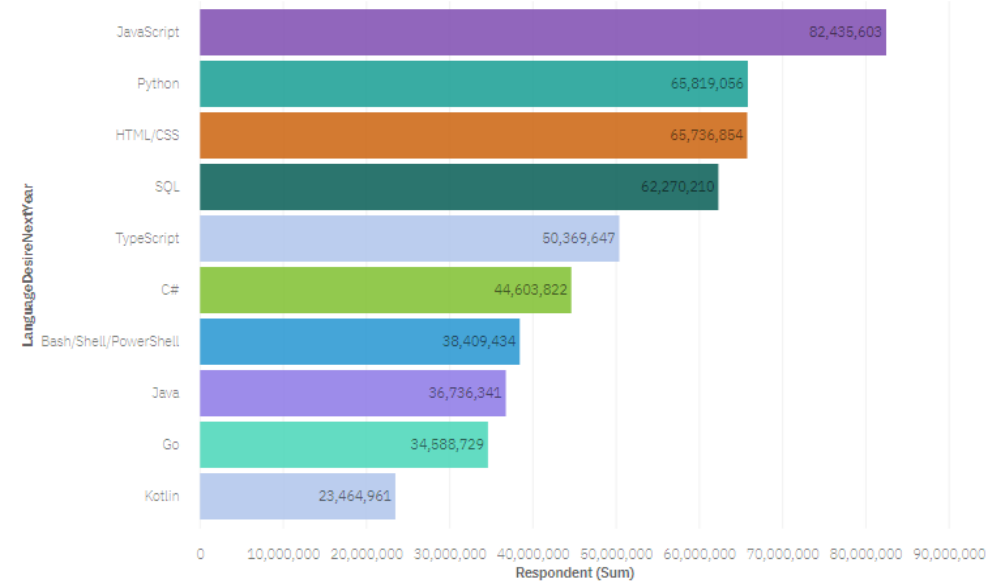
Current Year

Top 10 Languages Worked With



Next Year

Top 10 Languages Desired Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript remains the most desired language
- Python is a fast-growing language, going from 5th to 2nd
- PHP and C++ drop out of the top 10 and are replaced with Go and Kotlin

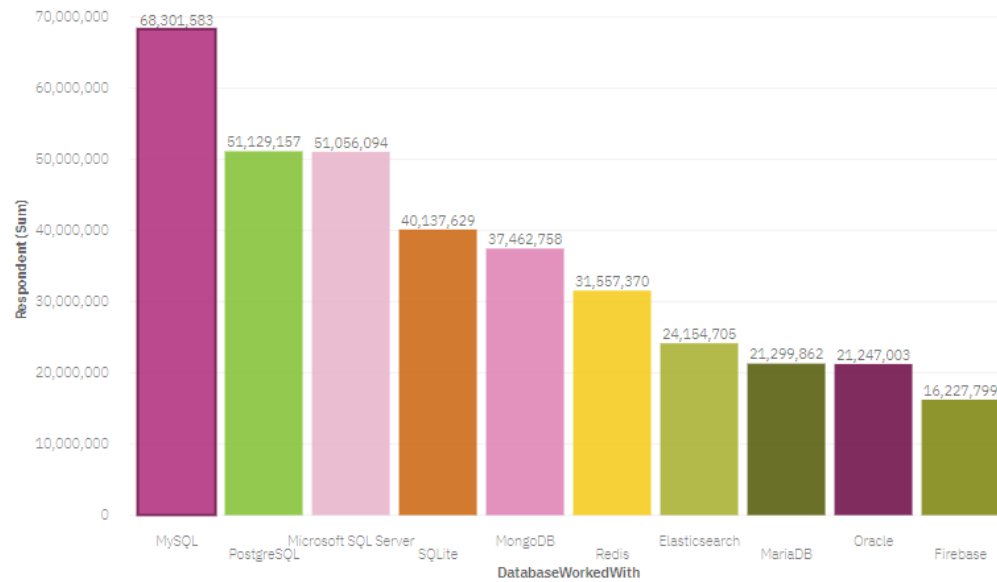
Implications

- With demand for Python increasing, it may lead to increased compensation for developers who have the skill
- Developers with Go and Kotlin skills may initially have a higher compensation until more developers acquire the skills.
- As demand for certain languages decreases, developers are going to opt for upskilling with new languages, whose demand is increasing.

DATABASE TRENDS

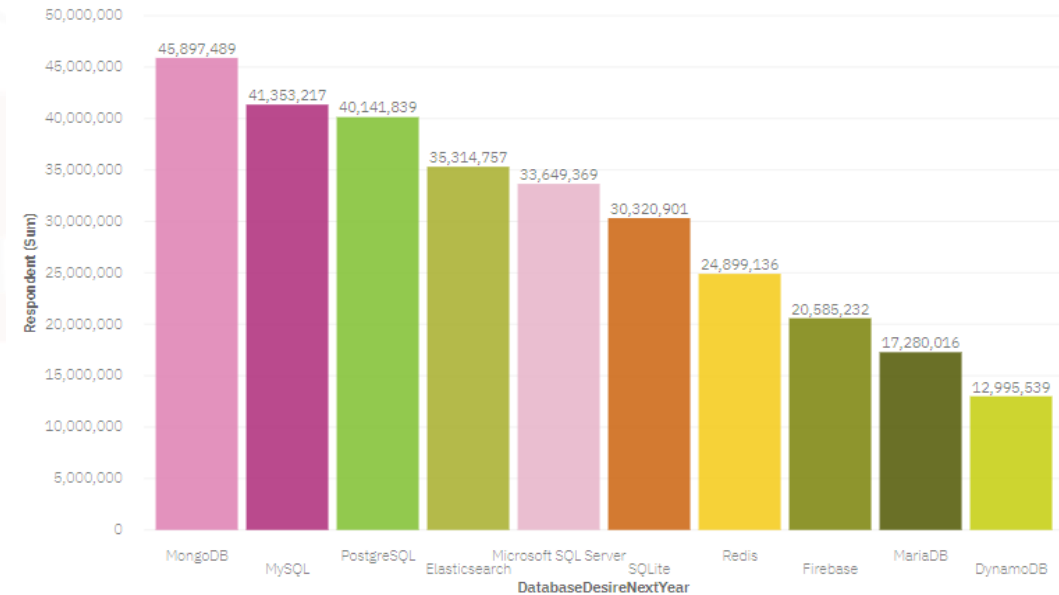
Current Year

Top 10 Databases Worked With



Next Year

Top 10 Databases Desired Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Respondents have identified MongoDB, Elasticsearch, and Firebase as the growing Database systems they desire next year.
- Oracle has dropped out of the top 10 and is replaced by DynamoDB

Implications

- With growing demand of MongoDB, Elasticsearch and Firebase, developers are going to opt to upskill in these database systems
- Developers with skills in DynamoDB are likely to have a higher compensation, until more developers acquire the skills

DASHBOARD

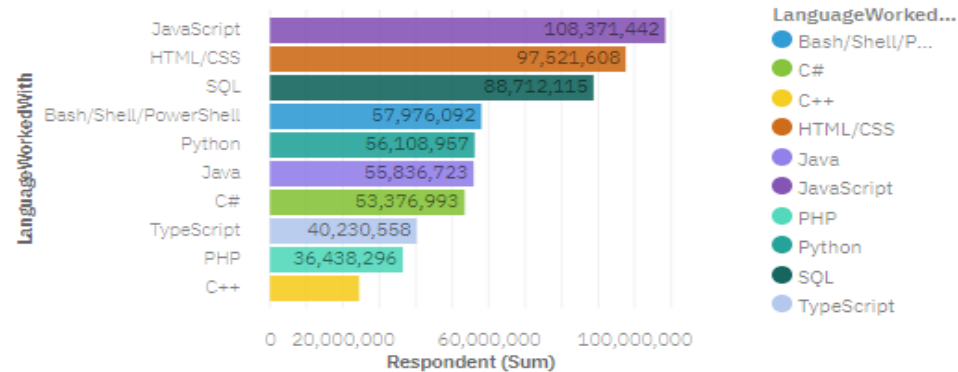


Permanent Link to the Read-Only View of the Cognos Dashboard:

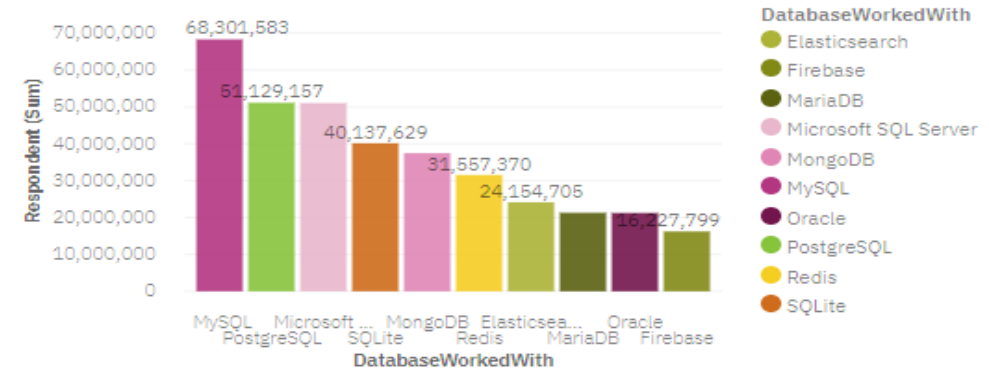
<https://dataplatform.cloud.ibm.com/dashboards/92117510-5e9e-4605-8f99-bb4f6e80756a/view/5e64a7606f9e10c467b5c0e407cd2b0428322758b7bbd602d1d47b4907687097a96d1498c8791e5adc190c66a5b915519d>

DASHBOARD: CURRENT TECHNOLOGY USAGE

Top 10 Languages Worked With



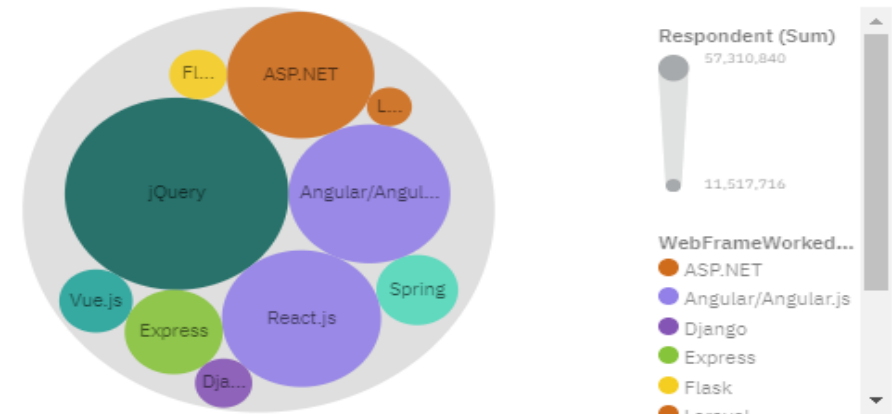
Top 10 Databases Worked With



Platforms Worked With

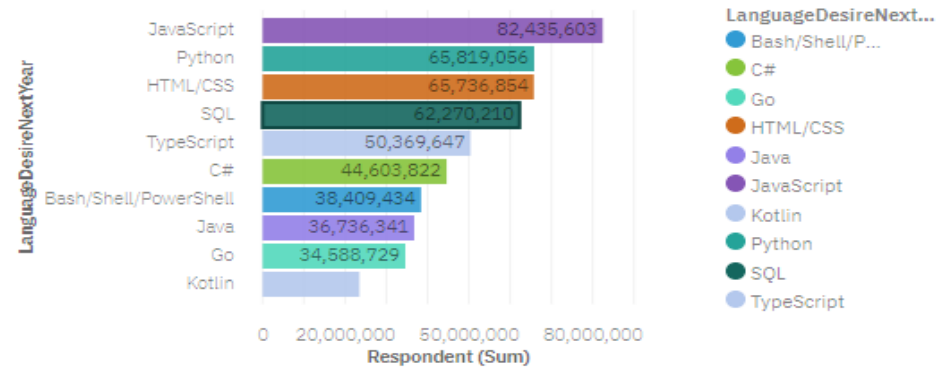


Top 10 WebFrames Worked With

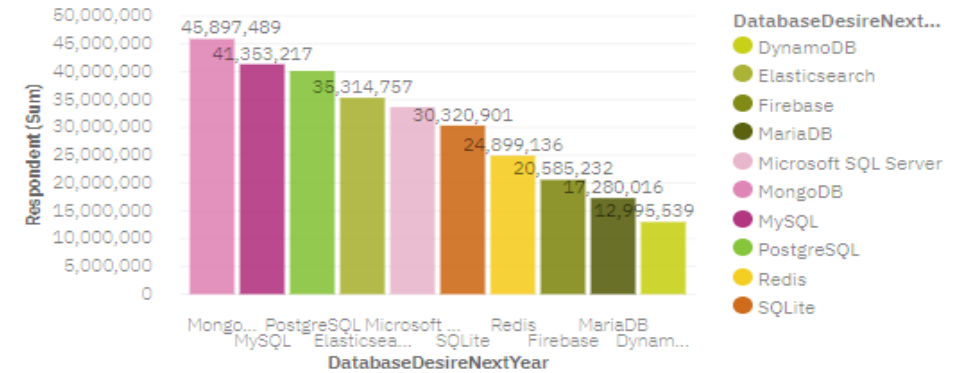


DASHBOARD: FUTURE TECHNOLOGY

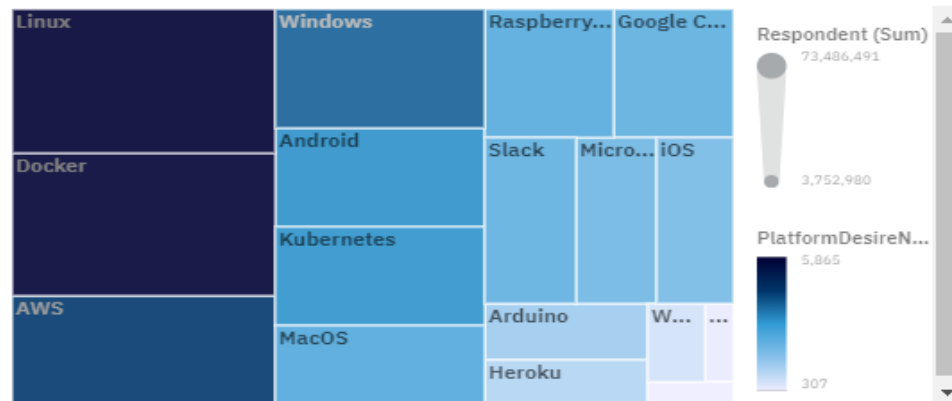
Top 10 Languages Desired Next Year



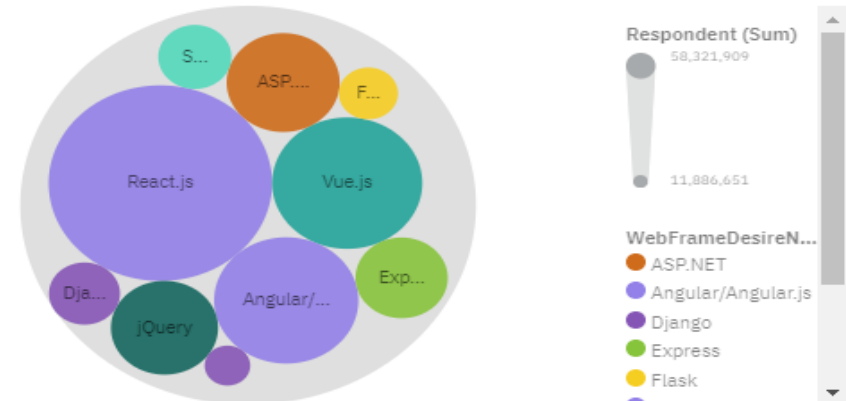
Top 10 Databases Desired Next Year



Desired Platforms Next Year



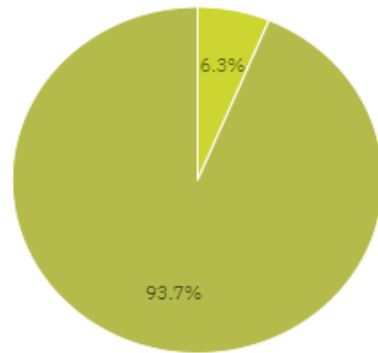
Top 10 WebFrames Desired Next Year



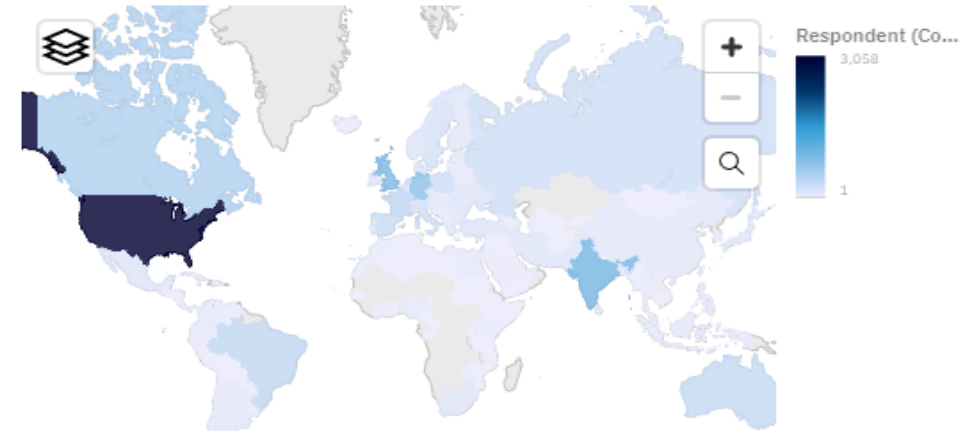
DASHBOARD: DEMOGRAPHICS

Respondents Classified by Gender

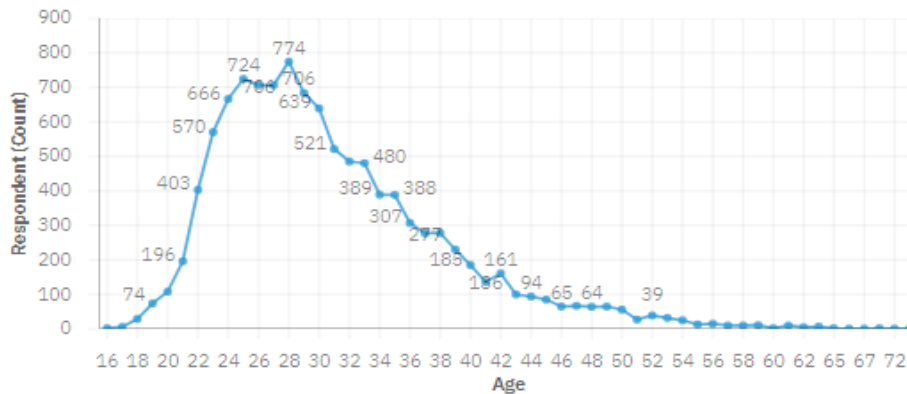
Gender
● Woman ● Man



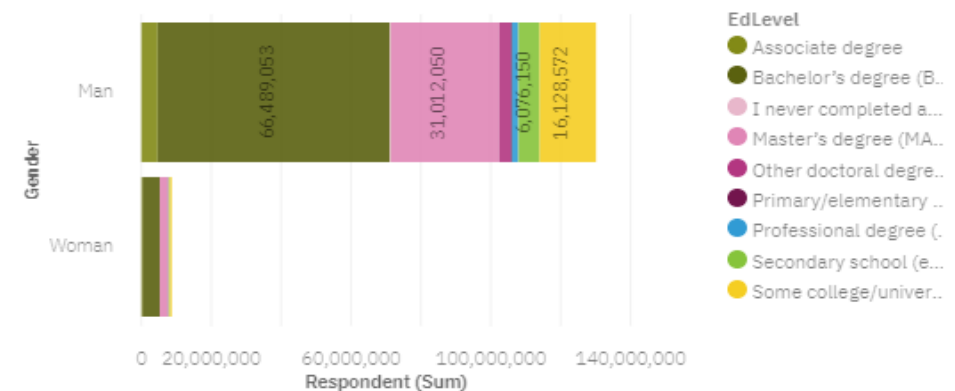
Respondent Country Count



Respondent Age Count



Respondent Education Level by Gender



DISCUSSION



OVERALL FINDINGS & IMPLICATIONS

Findings

- Preference for certain languages, like Python and TypeScript are increasing among developers.
- Preference for MongoDB as a database is increasing while Oracle is decreasing among developers.
- Over 90% of developers are male and a majority of all developers live in the US.

Implications

- Developers will choose to upskill and learn a new programming language, as opposed to continuing in a language that is decreasing in demand.
- Similar to Programming Languages, developers will upskill based on the increasing demand of database systems
- A majority of developers being younger allows for them to acquire new skills easier.
- With a majority of developers being men, there could be an increased need for pathways for female developers.

CONCLUSION

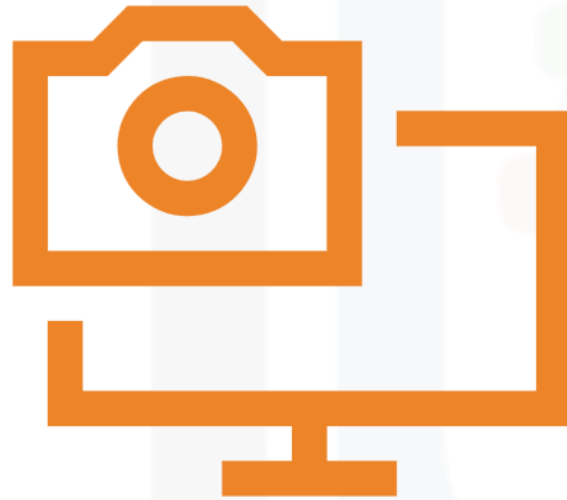


In the beginning, we defined the problem based on 4 guiding questions

- What are the top programming languages in demand?
 - JavaScript, HTML/CSS, SQL
- What are the top database skills in demand?
 - MySQL, PostgreSQL, Microsoft SQL Server
- What are the most popular platforms?
 - Windows, Linux, Docker
- Demographics data: Age and gender distributions

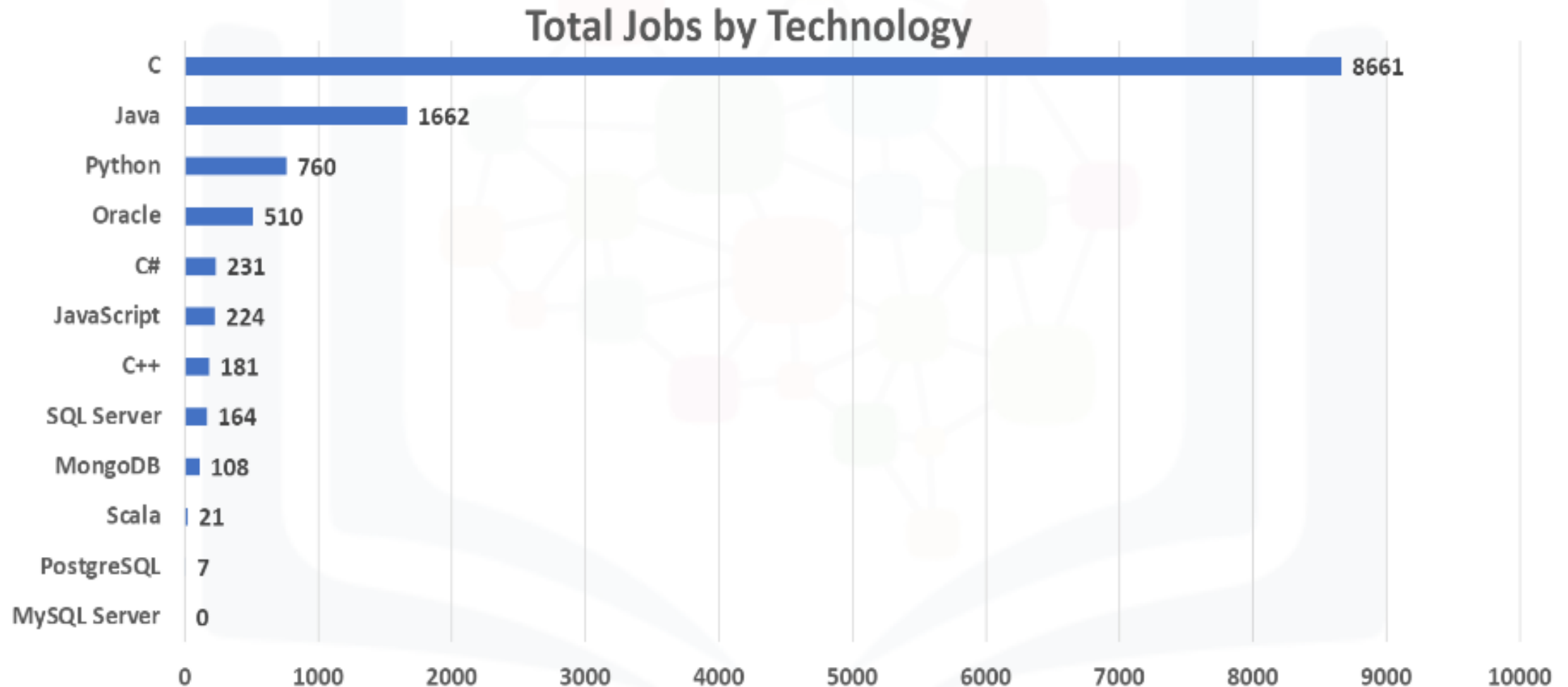
APPENDIX

- Fig – 1: Average salary of languages and the associated difficulty of learning it



	Language Name	Average Salary	Learning Difficulty
1	Python	\$114,383	Easy
2	Java	\$101,013	Easy
3	R	\$92,037	Hard
4	Javascript	\$110,981	Easy
5	Swift	\$130,801	Easy
6	C++	\$113,865	Hard
7	C#	\$88,726	Hard
8	PHP	\$84,727	Easy
9	SQL	\$84,793	Easy
10	Go	\$94,082	Difficult

JOB POSTINGS



POPULAR LANGUAGES

