Future Skill Requirements for Developers

Kelly Ondek

August 21, 2024

IBM Developer

SKILLS NETWORK

OUTLINE

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

IBM **Developer**

SKILLS NETWORK

EXECUTIVE SUMMARY

- JavaScript and HTML/CSS continue to be highly used and highly desired among developers, while the other programming languages are fluctuating between current usage and desire to be used.

- There is a lot of fluctuation between databases currently used and databases desired to be used by developers.

- What developers desire to use is not the same technologies that job postings are asking for
  - MongoDB and PostgreSQL are the exceptions

IBM Developer

SKILLS NETWORK

INTRODUCTION

- Identifying future skill requirements:
  - What are the top programming languages in demand?
  - What are the top database skills in demand?
  - What are the required skills for jobs?
  - What are the programming languages with the top annual salaries?

IBM Developer

SKILLS NETWORK

METHODOLOGY

- Data Sources:
- https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html
- https://www.kaggle.com/promptcloud/jobs-on-naukricom
- A modified subset of: https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/

- Data Wrangling

- Exploratory Data Analytics
  - Distribution
  - Outliers
  - Correlation

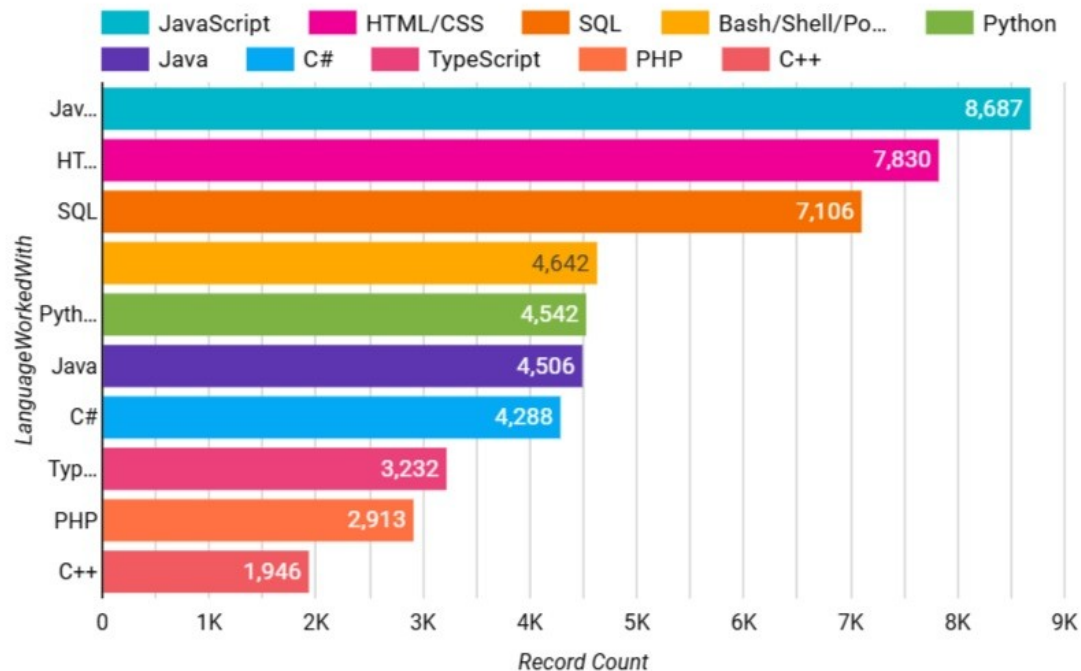- Data Visualization

- Dashboard

RESULTS

- Data Collection:
  - APIs
  - Webscraping
  - Surveys

- Organized in a variety of graphs for easy comparison

- Shows the Top 10 Programming Languages currently used by and desired by developers

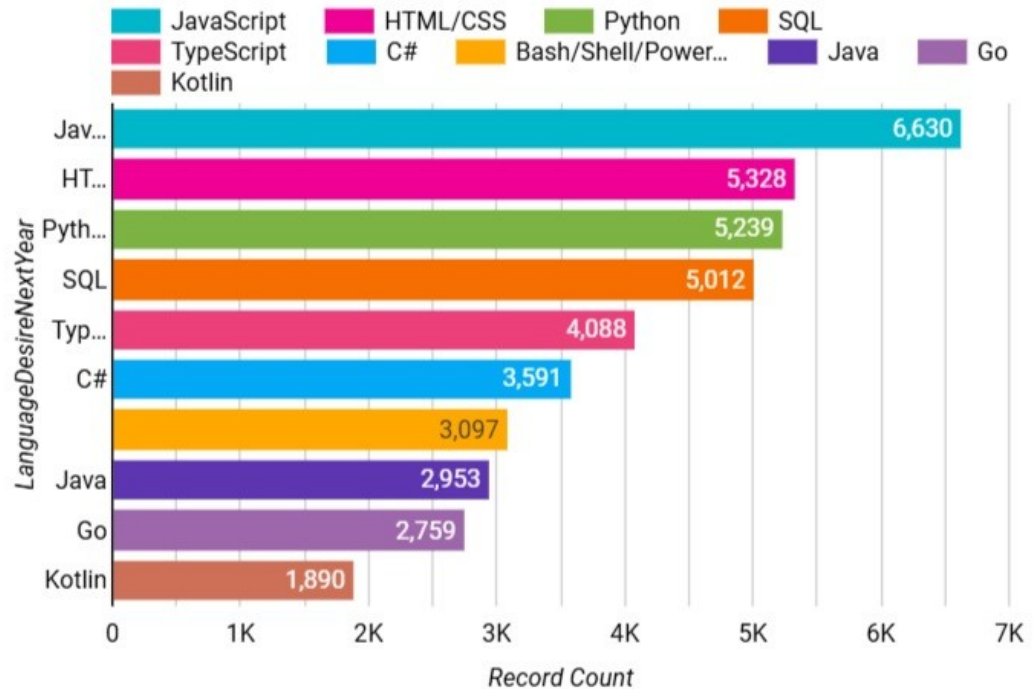- Shows the Top 10 Databases currently used by and desired by developers

IBM Developer

SKILLS NETWORK

PROGRAMMING LANGUAGE TRENDS

Current Year

Next Year

Top 10 Programming Languages Worked With

Legend: JavaScript, HTML/CSS, SQL, Bash/Shell/Po..., Python, Java, C#, TypeScript, PHP, C++

Language	Record Count
Jav...	8,687
HT...	7,830
SQL	7,106
(Bash/Shell)	4,642
Pyth...	4,542
Java	4,506
C#	4,288
Typ...	3,232
PHP	2,913
C++	1,946

Top 10 Languages Desired for Next Year

Legend: JavaScript, HTML/CSS, Python, SQL, TypeScript, C#, Bash/Shell/Power..., Java, Go, Kotlin

Language	Record Count
Jav...	6,630
HT...	5,328
Pyth...	5,239
SQL	5,012
Typ...	4,088
C#	3,591
(Bash/Shell)	3,097
Java	2,953
Go	2,759
Kotlin	1,890

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Javascript and HTML/CSS are the most worked with and the most desired programming languages
- C++ and PHP are currently worked with, but not desired
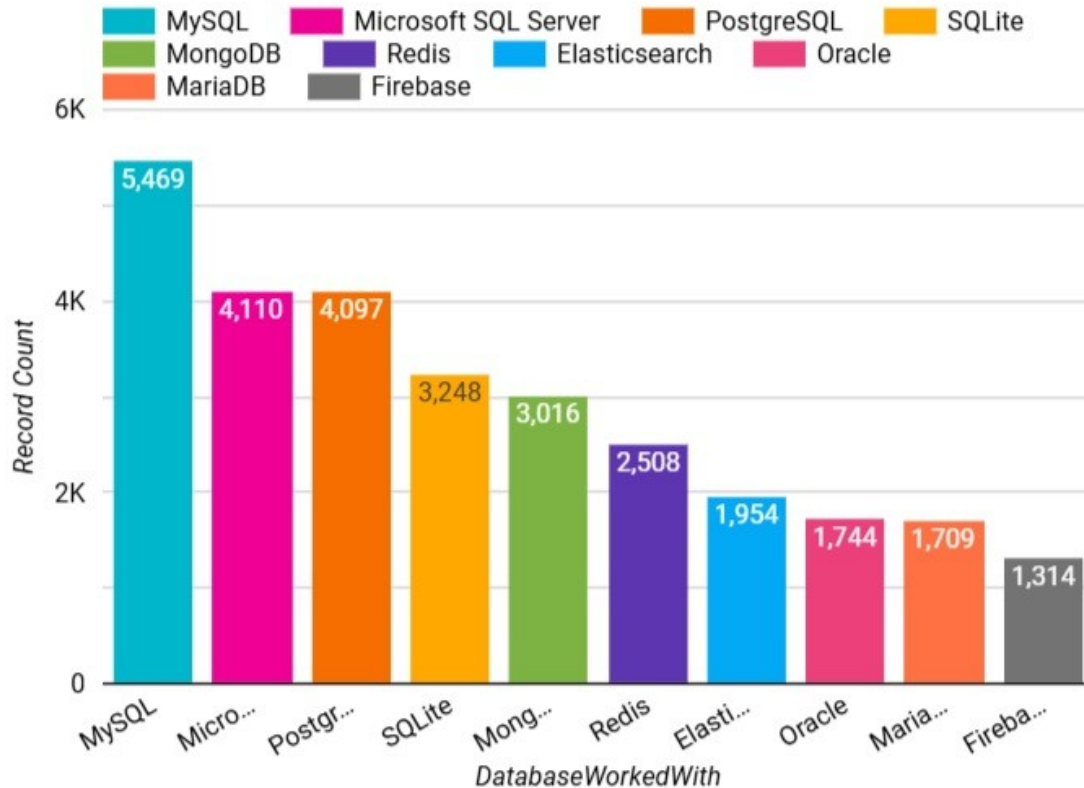- Kotlin and Go are desired, but not worked with.

Implications

- JavaScript and HTML/CSS continue to be highly used in the field
- C++ and PHP is losing interested people in the future
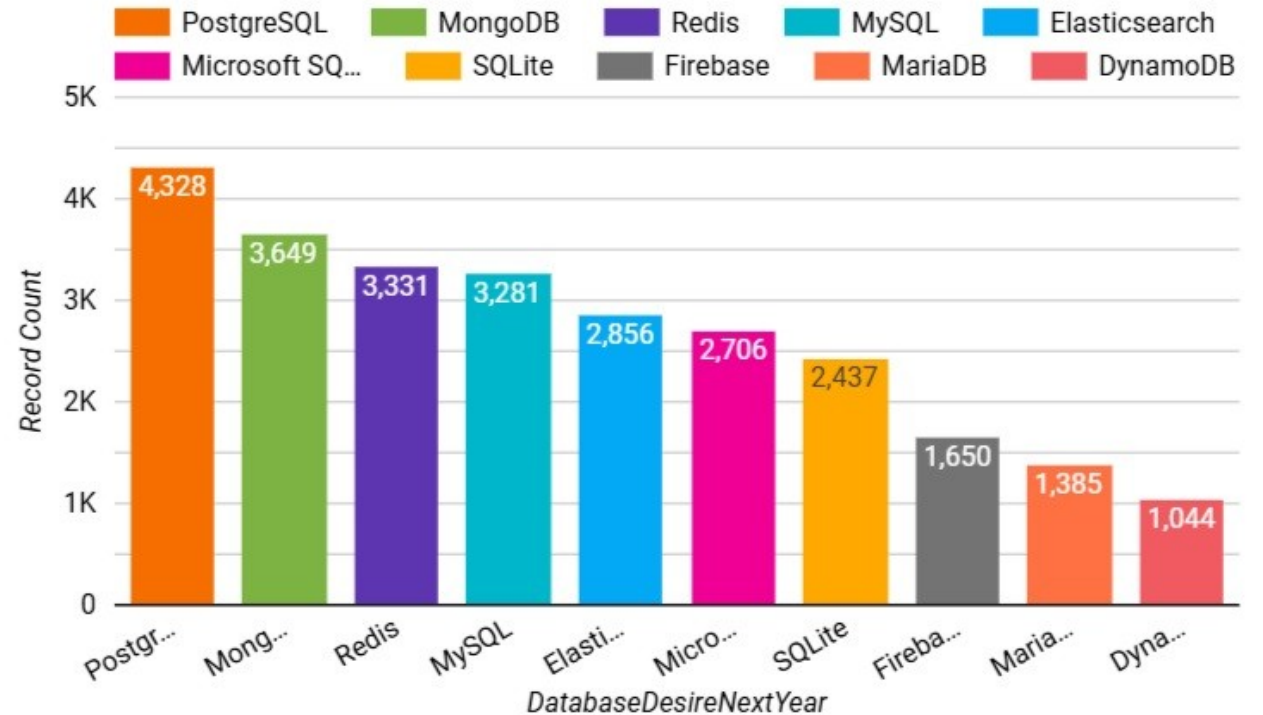- Kotlin and Go are gaining interest

IBM Developer

SKILLS NETWORK

DATABASE TRENDS

Current Year   Next Year

Top 10 Databases Worked With

Legend: MySQL, Microsoft SQL Server, PostgreSQL, SQLite, MongoDB, Redis, Elasticsearch, Oracle, MariaDB, Firebase

Record Count:
- MySQL: 5,469
- Micro... : 4,110
- Postgr... : 4,097
- SQLite: 3,248
- Mong... : 3,016
- Redis: 2,508
- Elasti... : 1,954
- Oracle: 1,744
- Maria... : 1,709
- Fireba... : 1,314

x-axis: DatabaseWorkedWith

Top 10 Databases Desired for Next Year

Legend: PostgreSQL, MongoDB, Redis, MySQL, Elasticsearch, Microsoft SQ..., SQLite, Firebase, MariaDB, DynamoDB

Record Count:
- Postgr... : 4,328
- Mong... : 3,649
- Redis: 3,331
- MySQL: 3,281
- Elasti... : 2,856
- Micro... : 2,706
- SQLite: 2,437
- Fireba... : 1,650
- Maria... : 1,385
- Dyna... : 1,044

x-axis: DatabaseDesireNextYear

IBM Developer   **SKILLS NETWORK**

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySql and Microsoft SQL Server are currently very highly used, but drop a lot for the desired database

- PostgreSQL, MangoDB, Redis, Elasticsearch, and Firebase all increase from number of people currently using to number desiring it.

- Oracle is not in the top 10 desired listing.

Implications

- Interest in MySql and Microsoft SQL Server is decreasing.
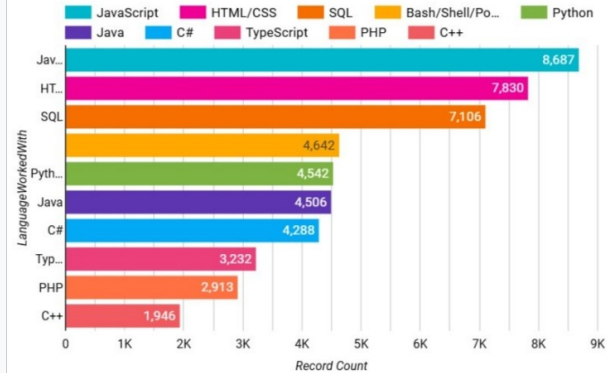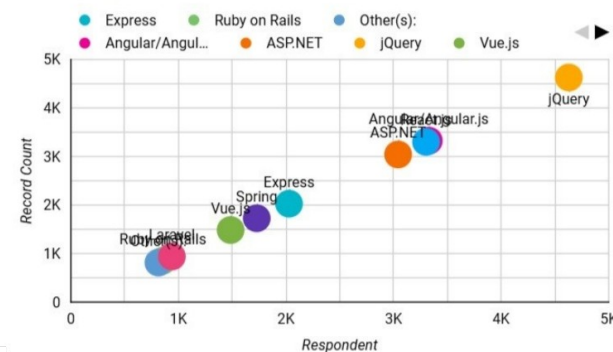
- Interest in other databases is increasing

- Interest in Oracle is decreasing.

IBM Developer

SKILLS NETWORK

DASHBOARD

https://github.com/mysticwolf57/IBM-Capstone-Dashboard

Current Technology Usage

Top 10 Programming Languages Worked With
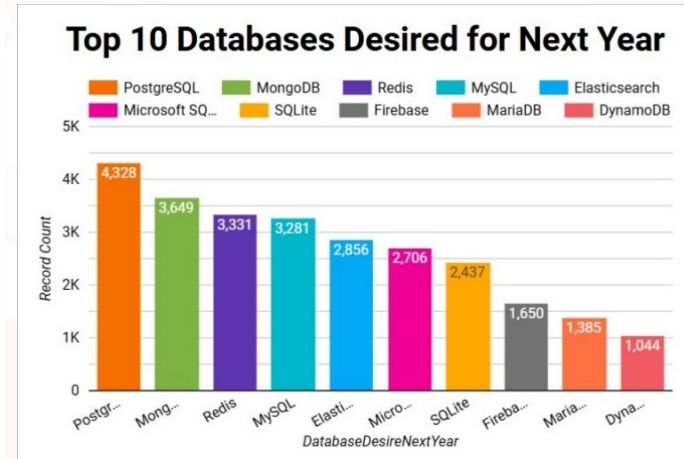

Top 10 Databases Worked With
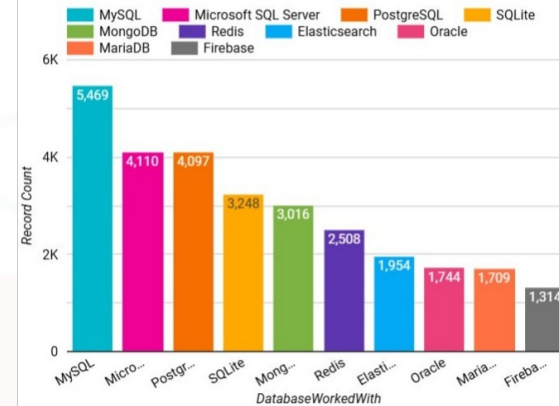
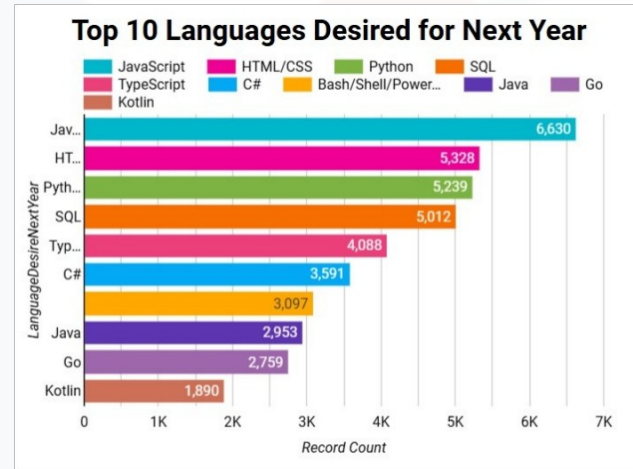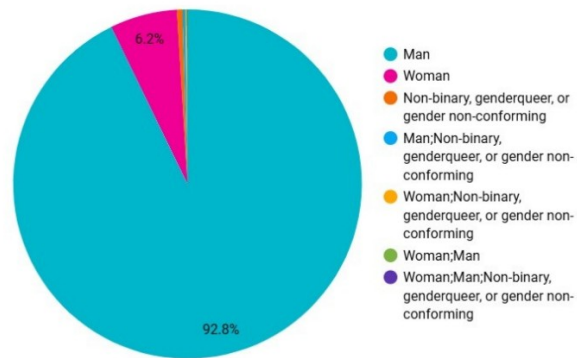Platform Worked With by Record Count

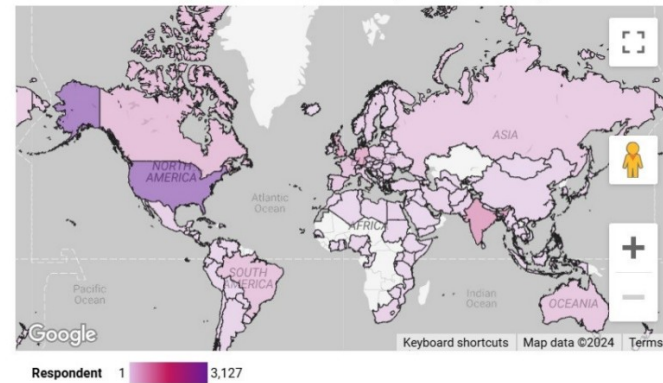

Top 10 Web Frames Worked With

Future Technology Trend
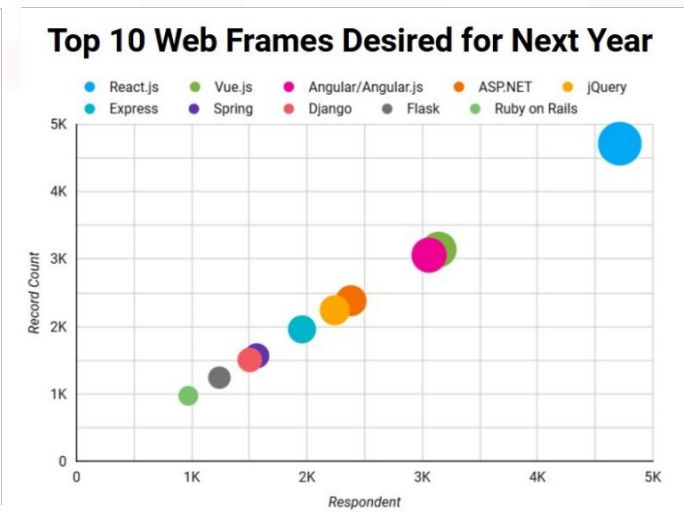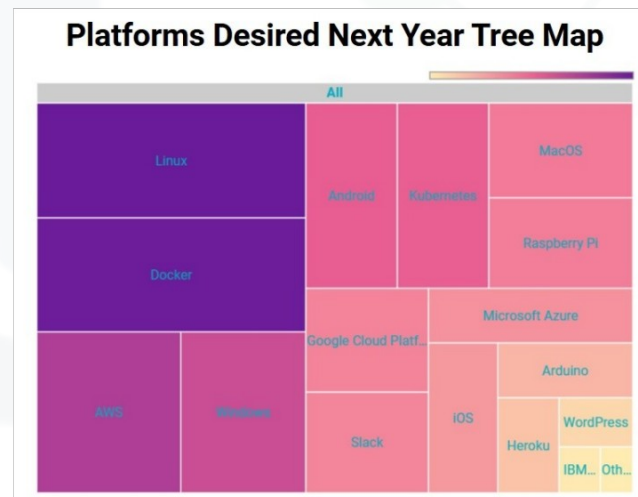
Top 10 Languages Desired for Next Year

Top 10 Databases Desired for Next Year

Platforms Desired Next Year Tree Map

Top 10 Web Frames Desired for Next Year

Demographics
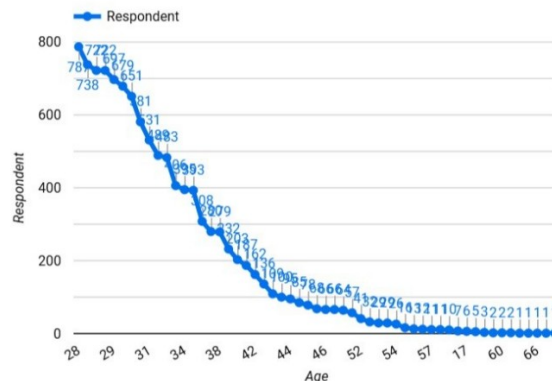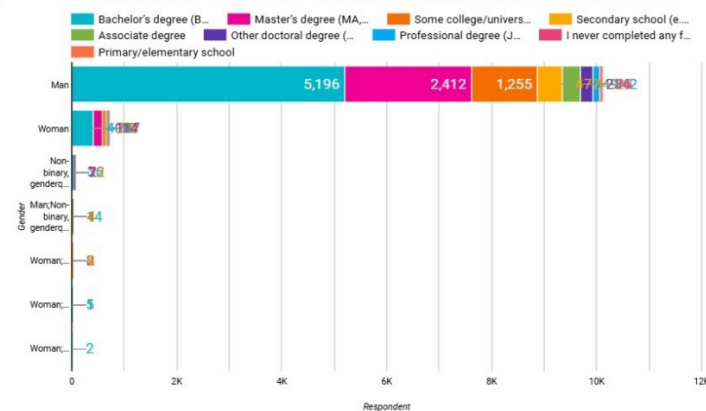
DISCUSSION

- Many of the developers are desiring programming languages or databases that do not have high annual salaries or as many job postings

  - This will make it harder for the the developers to find jobs

  - The exceptions are Mongo DB and PostgreSQL, which many developers desire in the next year and which have some of the higher number of job postings for databases.

  - The programming language with the highest average annual salary is not being used or desired by the developers that were surveyed.

OVERALL FINDINGS & IMPLICATIONS

Findings

- C and Java have the highest job postings

- Swift and Python have the highest average annual salaries

- Sql Server, Mongo DB, and PostgreSQL have the highest job postings

Implications

- Developers are not desiring to use C and Java, meaning these job postings are less likely to be filled

- Developers in the survey are not using Swift as much as other languages

- Developers are desiring to use some of the databases that are in demand for jobs.
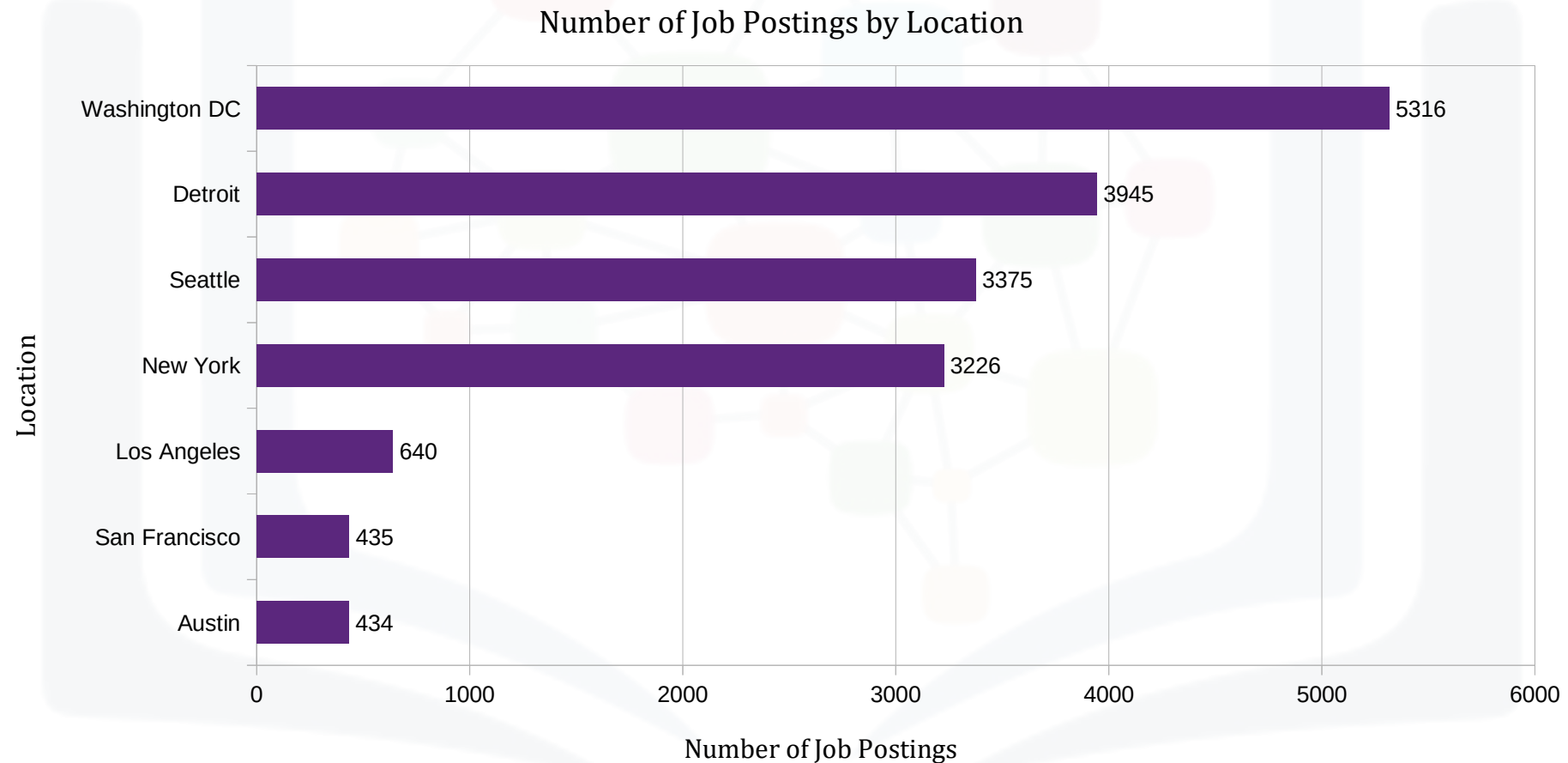
IBM Developer

SKILLS NETWORK

CONCLUSION

- The top programming languages for jobs postings are:
  - C, Java, Python, Oracle, JavaScript, C#, and C++

- The top programming languages desired by developers are:
  - JavaScript, HTML/CSS, Python, SQL, and TypeScript

- The top database skills for job postings are:
  - SQL Server, MongoDB, PostgreSQL, and MySQL

- The top database skills desired by developers are:
  - PostgreSQL, MongoDB, Redis, MySQL, and Elasticsearch

- The programming languages with the highest annual salary:
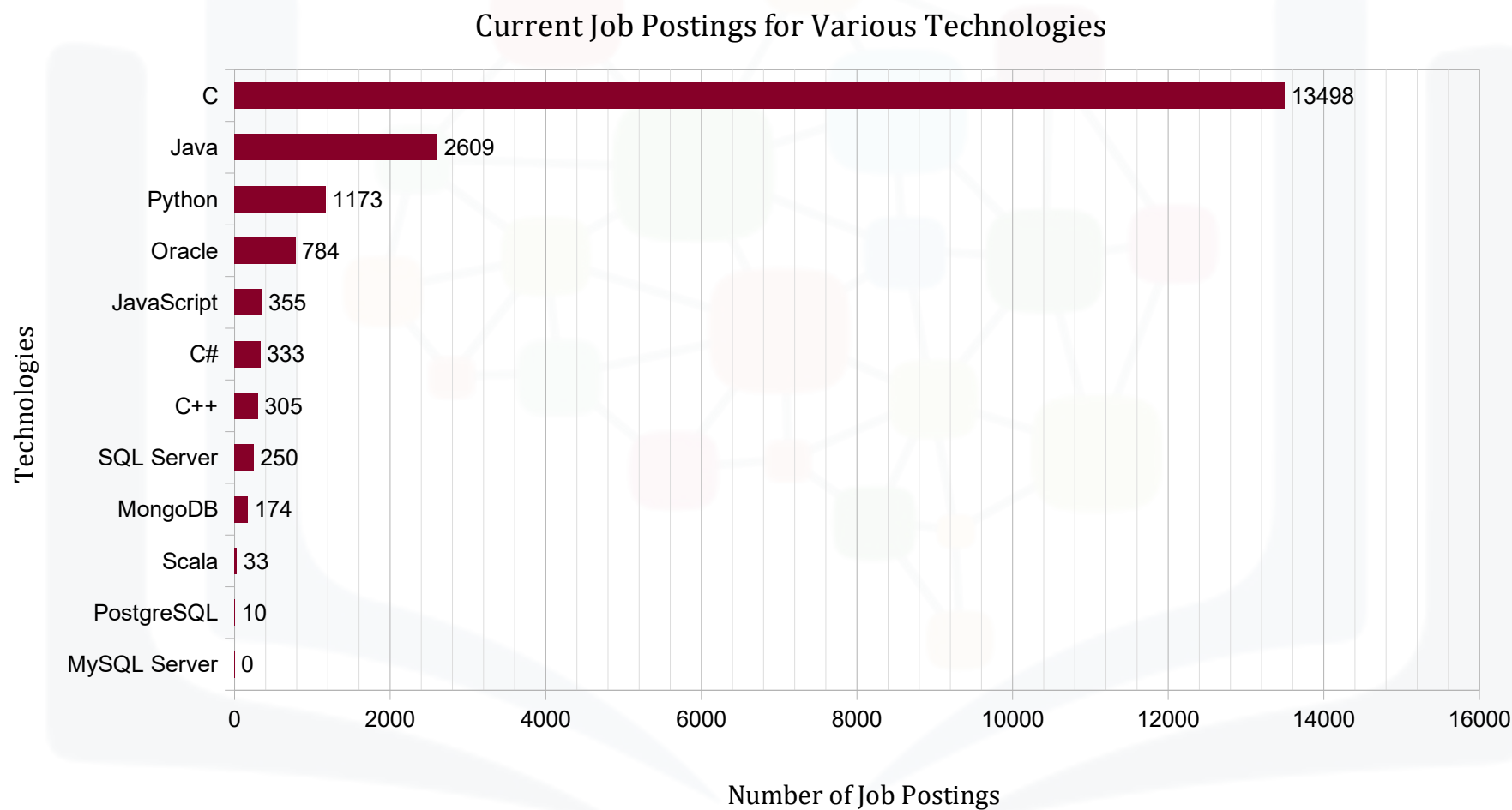 - Swift, Python, C++, JavaScript, and Java

IBM Developer

SKILLS NETWORK

APPENDIX

JOB POSTINGS BY LOCATION

Number of Job Postings by Location

JOB POSTINGS BY TECHNOLOGIES

Current Job Postings for Various Technologies

POPULAR LANGUAGES

Average Annual Salary per Programming Language

Programming Language	Annual Salary (USD)
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

IBM Developer

SKILLS NETWORK