TECHNOLOGY TRENDS IN AN EVER CHANGING WORLD

Michelle Gianvecchio

July 19, 2023

IBM Developer

SKILLS NETWORK

OUTLINE

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

EXECUTIVE SUMMARY

As the Data Analyst of a global IT and Business Services firm. I gathered data from various sources then cleaned them using data wrangling techniques. I then applied statistical techniques and analyzed several datasets to help identify trends for emerging technologies. I chose appropriate visualizations to represent the data and added them to an interactive IBM Cognos dashboard. Demand trends for programming languages do not appear to be related to average annual salary. About 2/3 of those employed in the tech industry work in an office while around 1/3 work from home. Languages and Databases with better implementation for the web are predicted to increase in demand. Newer languages and databases will likely displace some older ones. Programmers will need to learn new programs and languages to stay current.

INTRODUCTION

You have recently been hired as a Data Analyst by a global IT and business consulting services firm that is known for their expertise in IT solutions and their team of highly experienced IT consultants. In order to keep pace with changing technologies and remain competitive, your organization regularly analyzes data to help identify future skill requirements.

As a Data Analyst, you will be assisting with this initiative and have been tasked with collecting data from various sources and identifying trends for this year's report on emerging skills.

- Collect and clean the data
- Analyze data for trends
- Create appropriate visualizations to represent the findings
- Add visualizations to a compelling and dynamic dashboard

METHODOLOGY

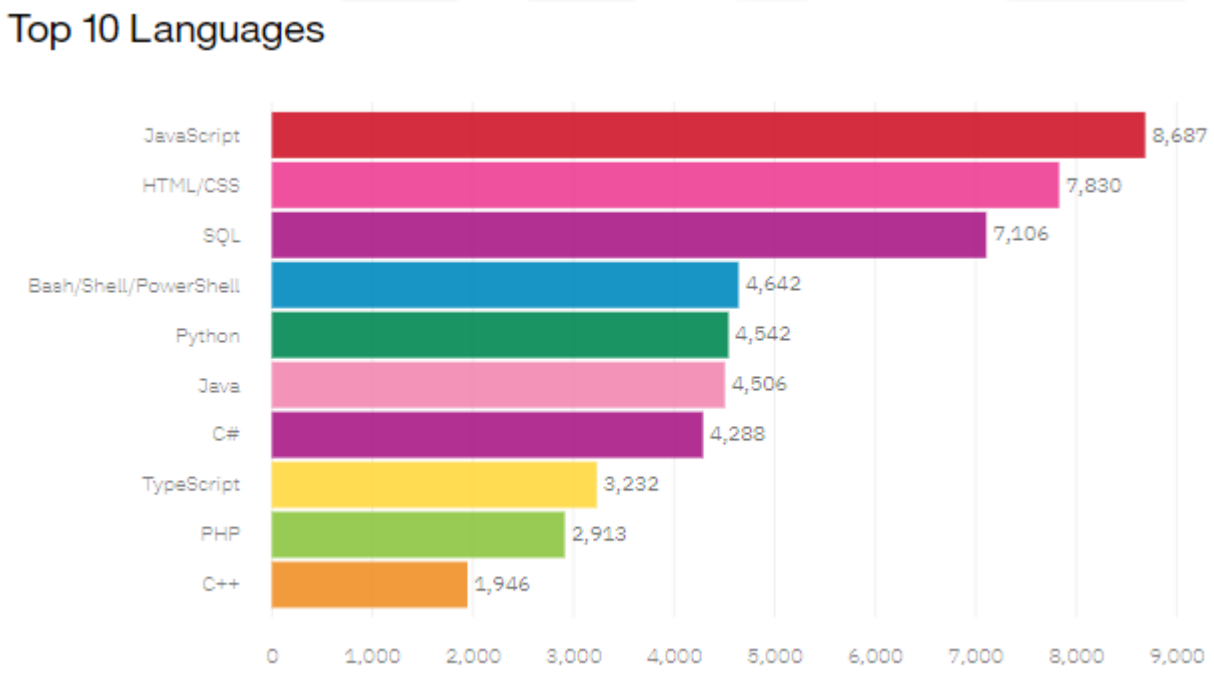
- **Module 1:** collected data for in demand technology skills from various sources including: Job postings, blog posts, surveys.
- **Module 2:** prepared the data for analyses by using data wrangling techniques: Finding duplicates, removing duplicates, finding missing values, and inputting missing values.
- **Module 3:** applied statistical techniques to analyze the data and identify insights and trends like:
  - What are the most in demand programming languages?
  - What are the most in demand database skills?
  - What are the most popular IDEs?
- **Module 4:** chose appropriate visualizations that best represented the data to help reveal the findings and trends.
- **Module 5:** employed Cognos to create interactive dashboards to help analyze and present the data dynamically.

RESULTS

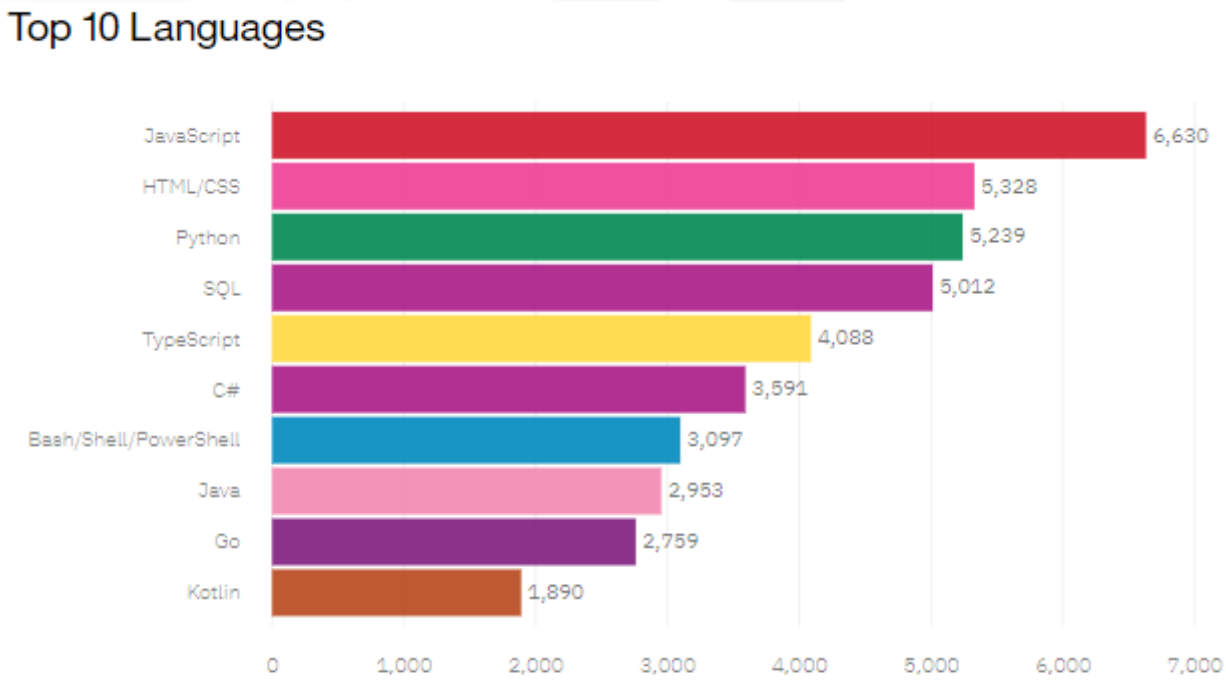
- Difficulty to learn a programming language does not seem to be correlated to average annual salary (see Appendix)
- Demand trends for programming languages do not appear to be related to average annual salary (see Appendix)
- ~2/3 of those employed in the tech industry work in an office while ~1/3 work from home
- There appears to be a direct relationship between age and salary (see Appendix)

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS:
FINDINGS & IMPLICATIONS

Findings

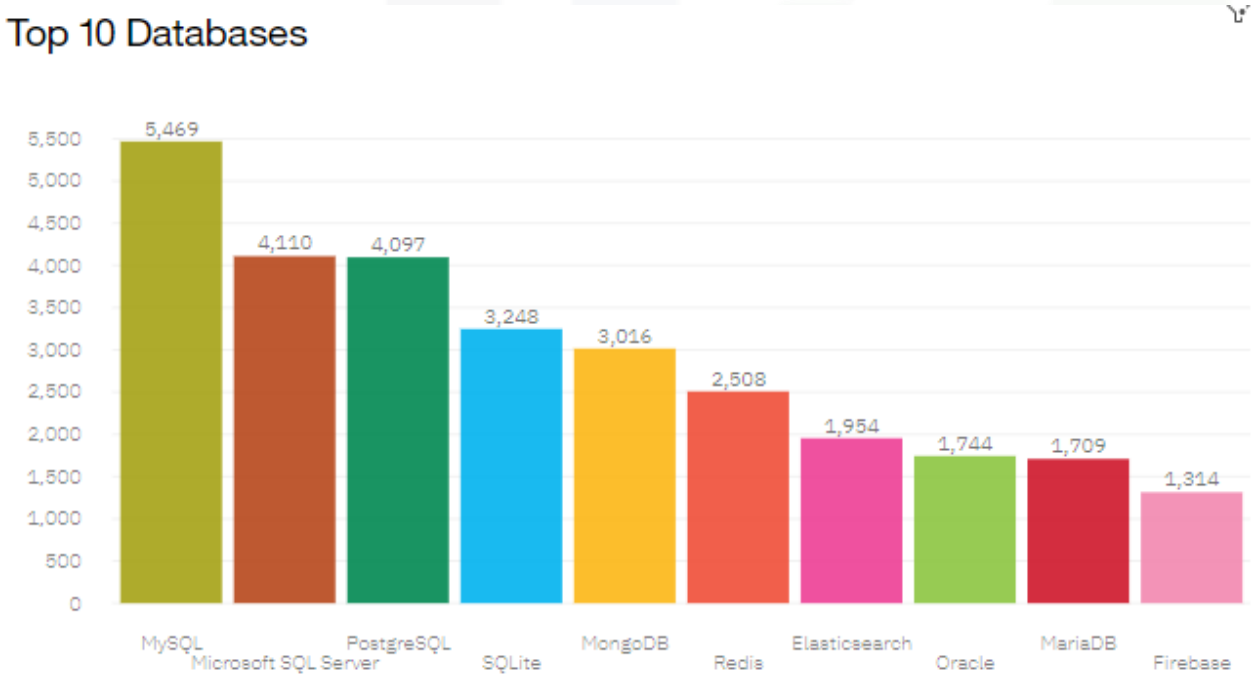
- Javascript, HTML/CSS, and SQL will remain in high demand
- Python and Typescript are rising up the list
- Shell, Java, PHP, C++ are in lower demand and some in the future will no longer make it onto the top 10 in demand list

Implications

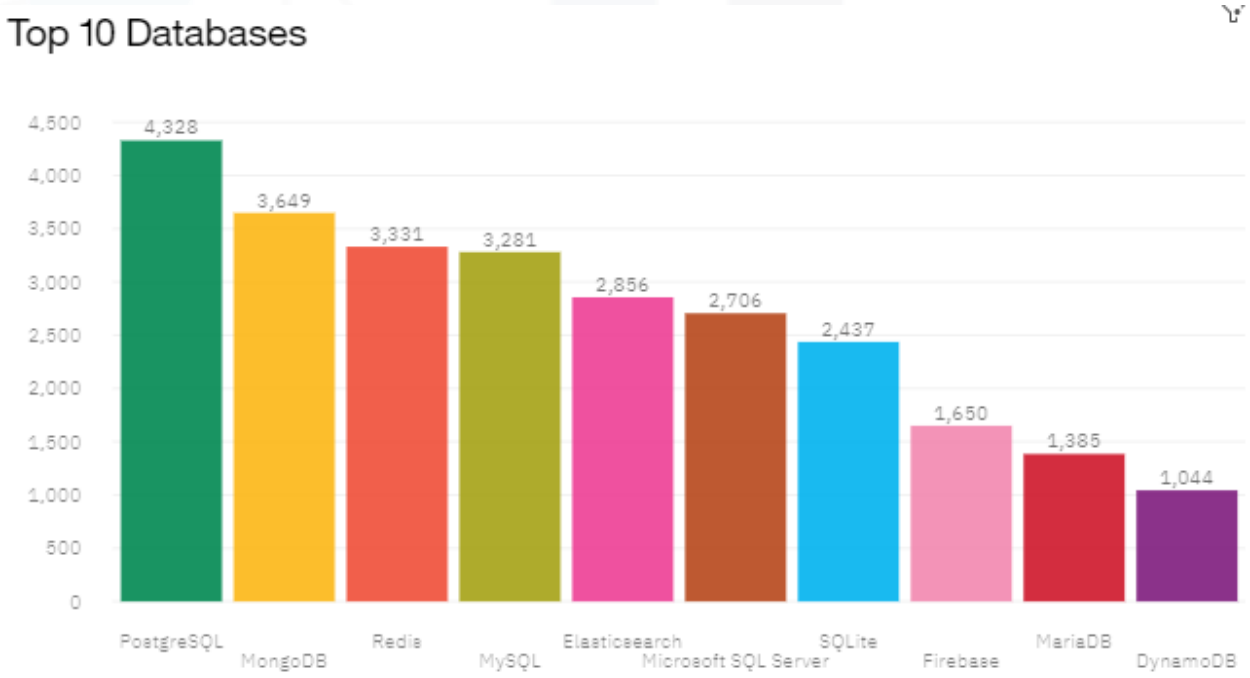
- The highest demand languages look to experience a mild decline that will translate to other languages like Python
- Python will likely displace SQL for the 3rd most in demand
- New in demand languages (i.e., Go and Kotlin) will rise up the ranks and replace those that have gone out of favor

DATABASE TRENDS

Current Year



Next Year



IBM Developer

SKILLS NETWORK

DATABASE TRENDS: FINDINGS & IMPLICATIONS

Findings

- PostgreSQL, MongoDB, Redis, and Elasticsearch are rising up the list
- MySQL, Microsoft SQL Server, SQLite, Oracle and Firebase are in lower demand
- Oracle in the future will no longer make it onto the top 10 in demand list

Implications

- The top 2 databases in demand languages will likely get displaced by PostgreSQL and MongoDB
- Redis will move up to take the #3 spot
- New to the top 10 list is DynamoDB

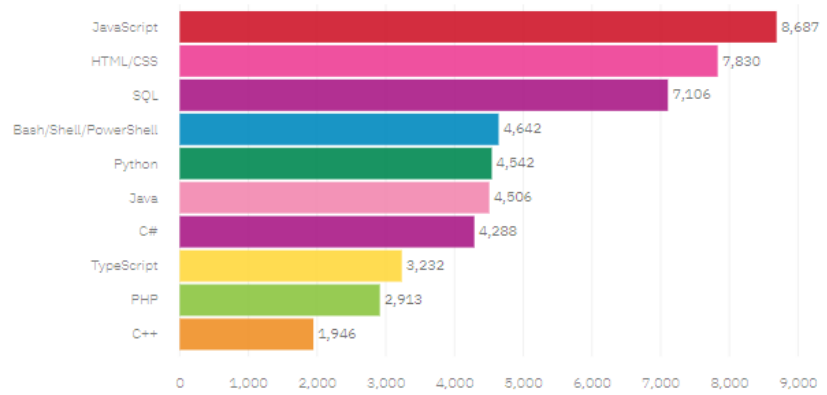
DASHBOARD

Dashboard link: Current and Future Technology trends based on survey

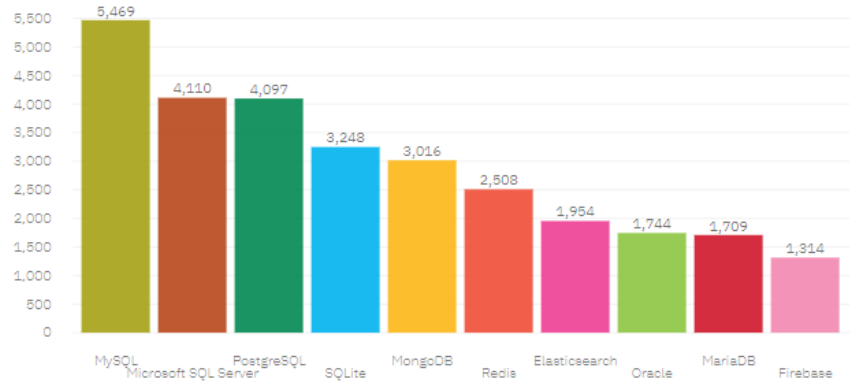
DASHBOARD TAB 1

Current Technology Usage | Future Technology Trend | Demographics

Top 10 Languages



Top 10 Databases



Top Platforms

Top 10 Web frames

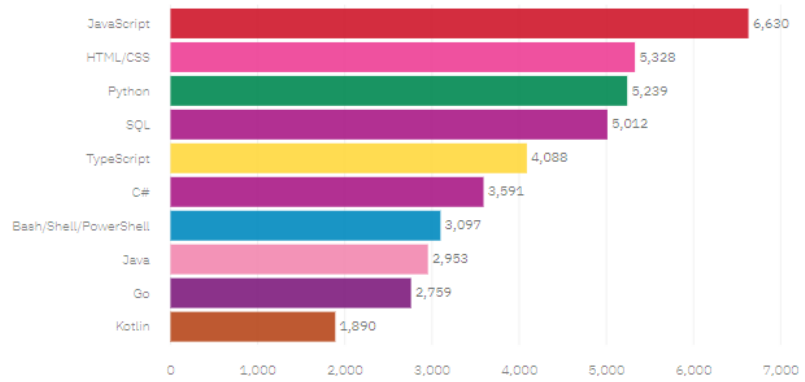
IBM Developer

SKILLS NETWORK

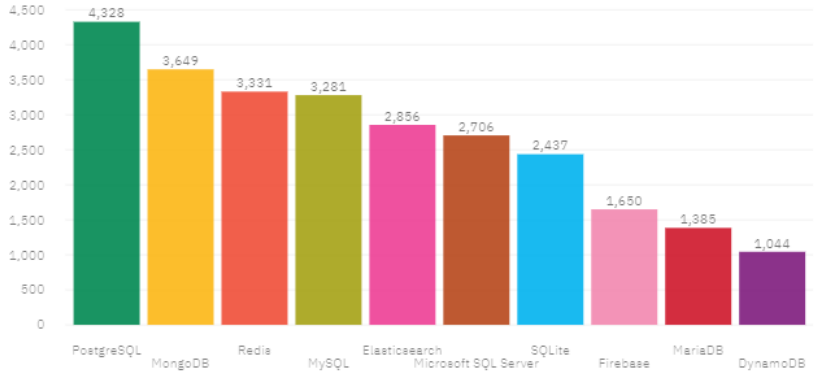
DASHBOARD TAB 2

Current Technology Usage | Future Technology Trend | Demographics

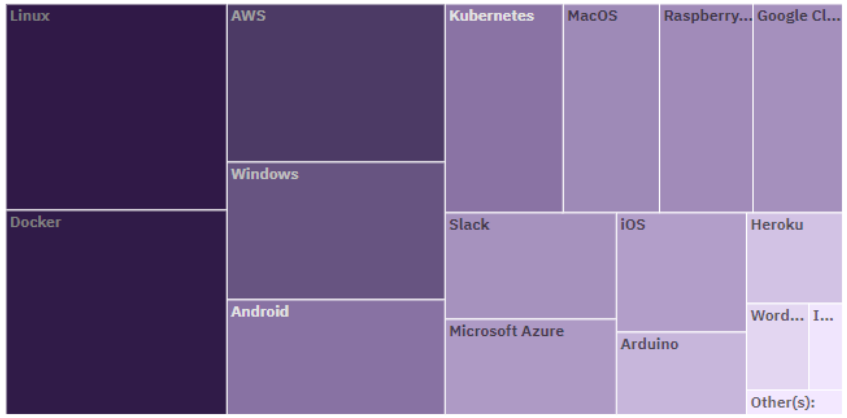
Top 10 Languages



Top 10 Databases



Top Platforms



Top 10 Web Frames

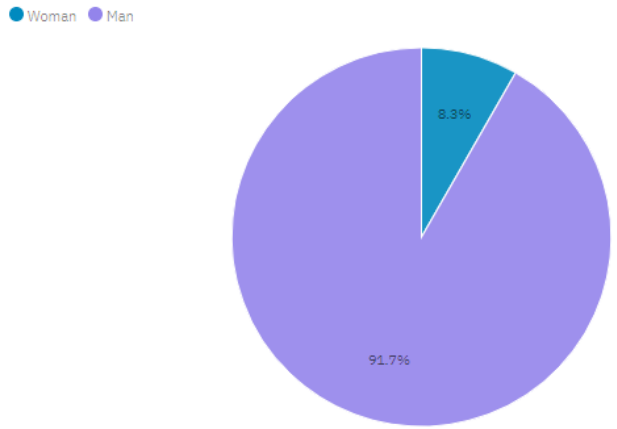
IBM Developer

SKILLS NETWORK

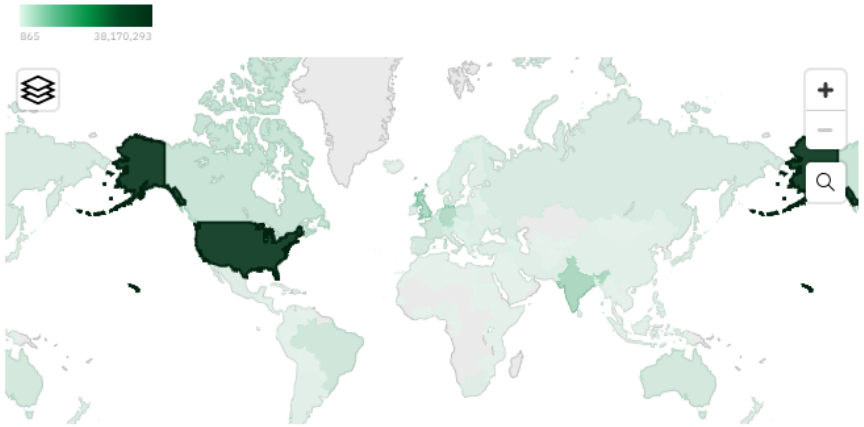
DASHBOARD TAB 3

Current Technology Usage | Future Technology Trend | Demographics

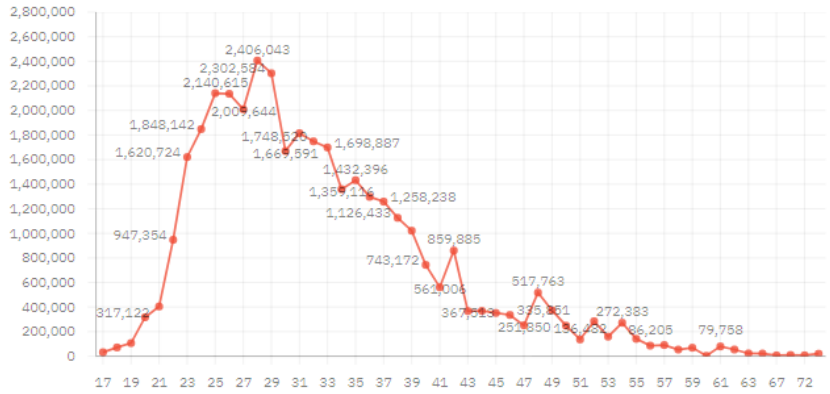
Respondent by Gender



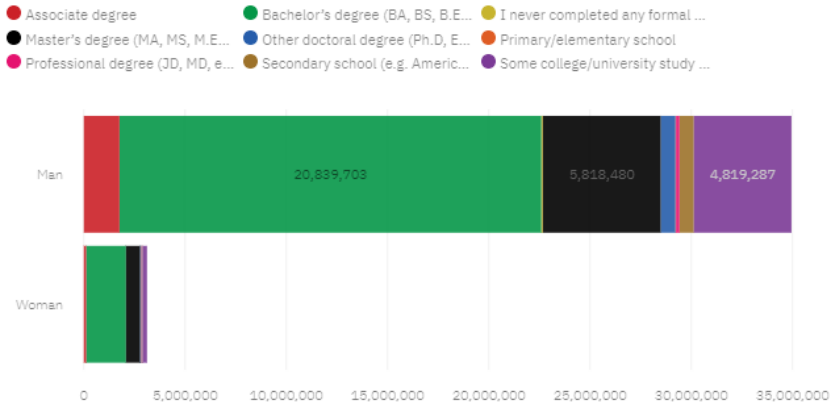
Respondent Count by Countries



Respondent Count by Age



Respondent Count by Gender Classified by Formal Education Level



IBM Developer

SKILLS NETWORK

DISCUSSION

- Majority of respondents were male
  - Results may be skewed from an uneven dataset
  - Tech industry appears to be very male dominated
- Most respondents were in their 20s and 30s
- Respondents were mostly from the USA, again potential for skewed results

OVERALL FINDINGS & IMPLICATIONS

Findings

- Newer languages and databases will likely displace some older ones
- Languages and Databases with better implementation for the web are predicted to increase in demand
- Respondents were mainly male in their late 20s/early 30s and from the USA

Implications

- Programmers will need to learn new programs and languages to stay current
- Internet security demand may also rise as more and more information is stored and transferred over the web it will be vulnerable
- Opinions may be skewed based on this group of individuals

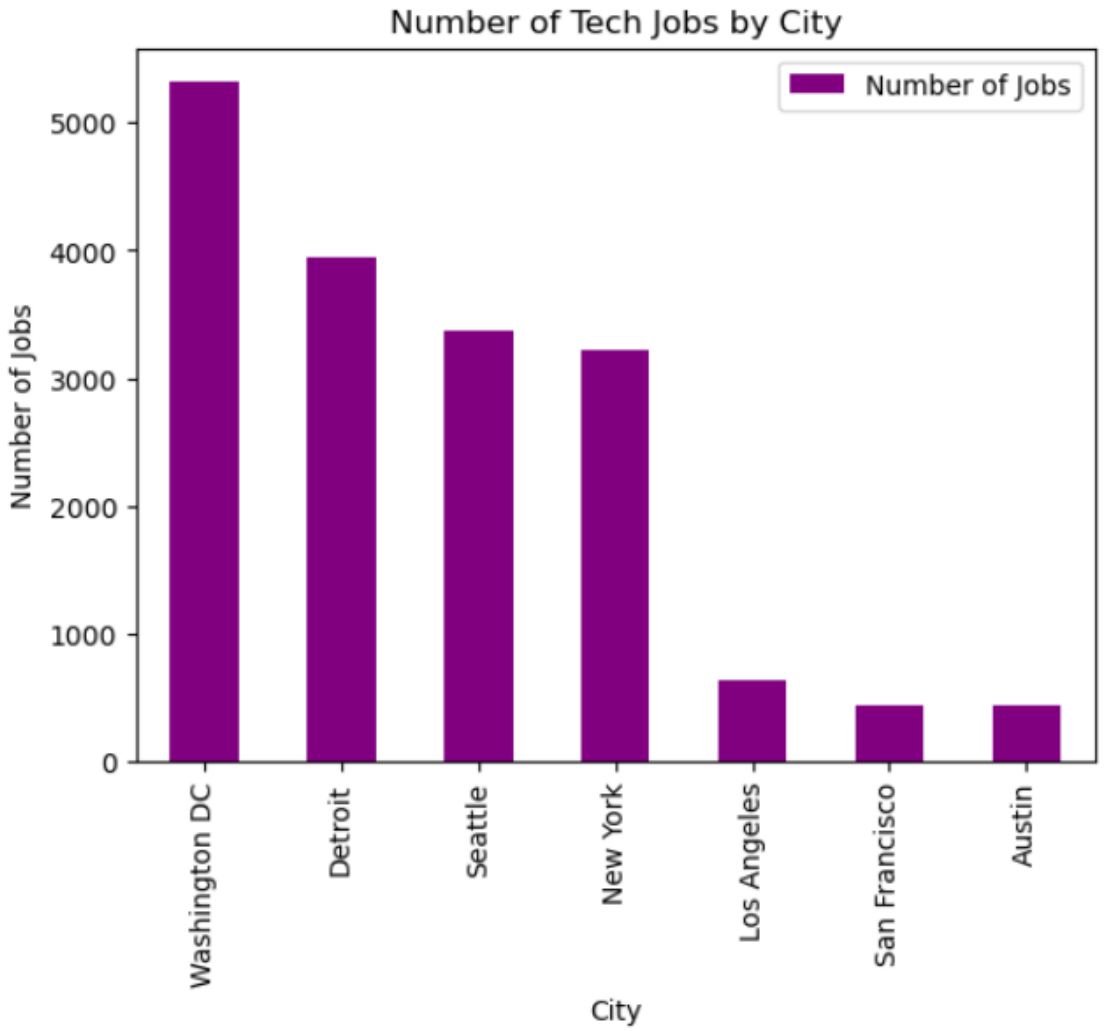
CONCLUSION

- Languages and Databases with better implementation for the web are predicted to increase in demand
  - Future Languages: Javascript, HTML/CSS, and SQL will remain in high demand, while Python and Typescript will rise up the list
  - Future Databases: PostgreSQL, MongoDB, Redis, and Elasticsearch will rise up the list
- Newer languages and databases will likely displace some older ones
- Programmers will need to learn new programs and languages to stay current

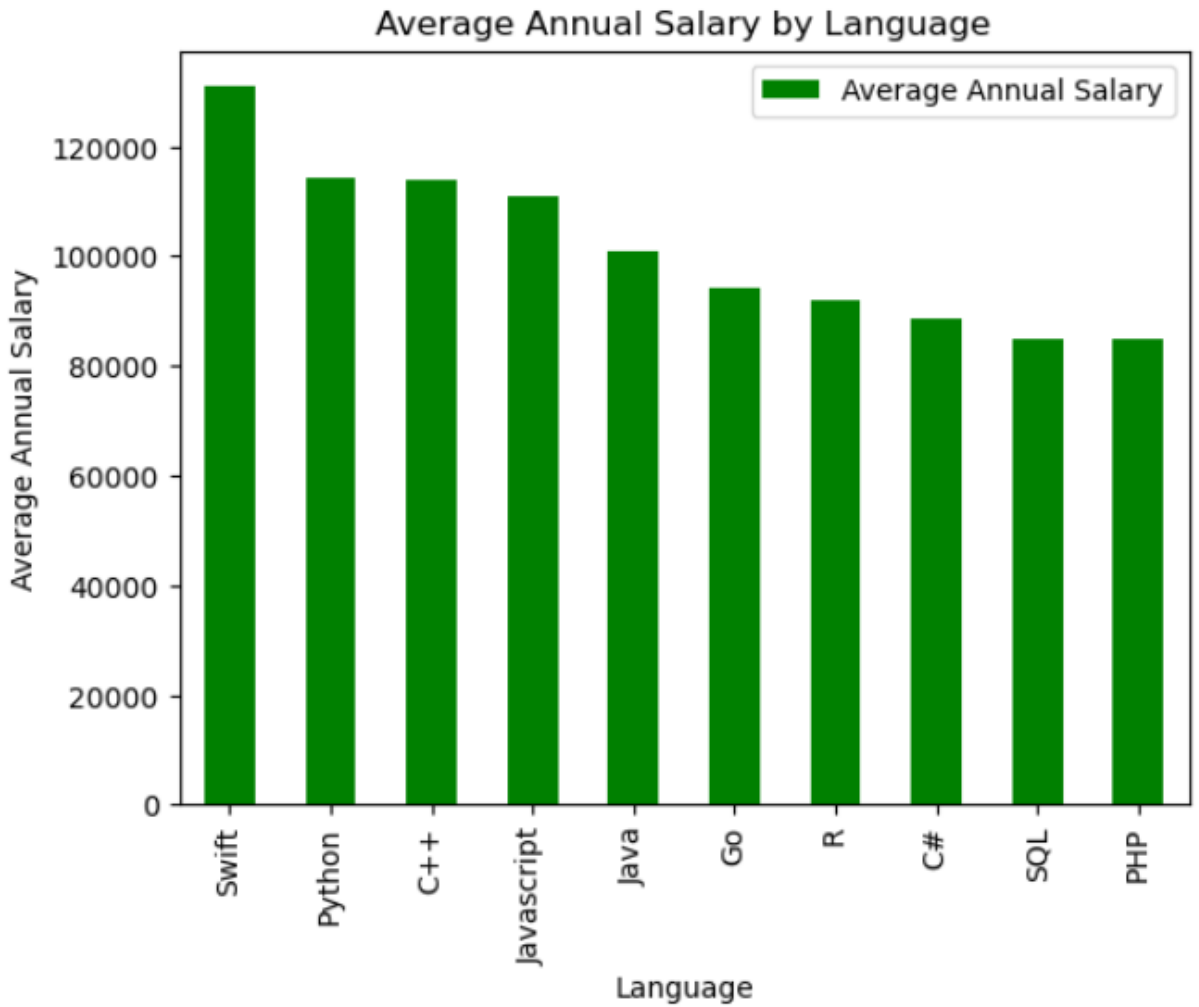
APPENDIX

- Job Postings
  - Number of Technology related job postings in descending order by city
- Popular Languages
  - Average annual salary of popular programming languages in descending order by salary
- Popular Languages Table
  - Data from a survey with information on popular programming languages, average annual salary, and difficulty to learn the language

JOB POSTINGS



POPULAR LANGUAGES



POPULAR LANGUAGES TABLE

No.	Language	Created By	Average Annual Salary	Learning Difficulty
1	Python	Guido van Rossum	$114,383	Easy
2	Java	James Gosling	$101,013	Easy
3	R	Robert Gentleman, Ross Ihaka	$92,037	Hard
4	Javascript	Netscape	$110,981	Easy
5	Swift	Apple	$130,801	Easy
6	C++	Bjarne Stroustrup	$113,865	Hard
7	C#	Microsoft	$88,726	Hard
8	PHP	Rasmus Lerdorf	$84,727	Easy
9	SQL	Donald D. Chamberlin, Raymond F. Boyce.	$84,793	Easy
10	Go	Robert Griesemer, Ken Thompson, Rob Pike.	$94,082	Difficult

SALARIES AND AGE