

**IBM Data Analyst Capstone Project:
Analysis on Trend of technology skills and
the working environment for developers**

Tomoko Kobayashi

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OUTLINE



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- Discussion
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EXECUTIVE SUMMARY



Purpose and Background

The purpose of this study is to investigate trends in the skills required for developers based on job information for developers. In addition, the study also aims to summarize the work environment of developers and identify future challenges.

Method of Analysis

- A Stack Overflow Developer Survey
- job postings Data from IBM
- Data Extraction using API, web scraping, SQL
- Visualization using Looker Studio, Python and Excel

Result

JavaScript is the most popular language in current days.

There are technological gap in countries and the gender gap in this field.

Discussion

Technological innovation in this field is remarkable, and trends are changing dramatically.

Going forward, we will need to make efforts to prevent various disparities from arising around the world.

INTRODUCTION



Analyzing the trend in software development

the investment using the several data

1. Which programming languages are most in demand today and future?
2. Which database skill are most in demand today and future?
3. What are the popular IDEs and web frames?

METHODOLOGY For Data Analyst



- **Data Collection**
 1. Collecting Data Using APIs
 2. Collecting Data Using Web Scraping
- **Data Wrangling**
 1. Finding and Removing Duplicate
 2. Finding and Removing Missing Values
 3. Normalizing Data
- **Data Visualization**
 1. Using Python from Data extract by SQL
 2. Using Looker Studio
- **Data presentation**

*Data Source:

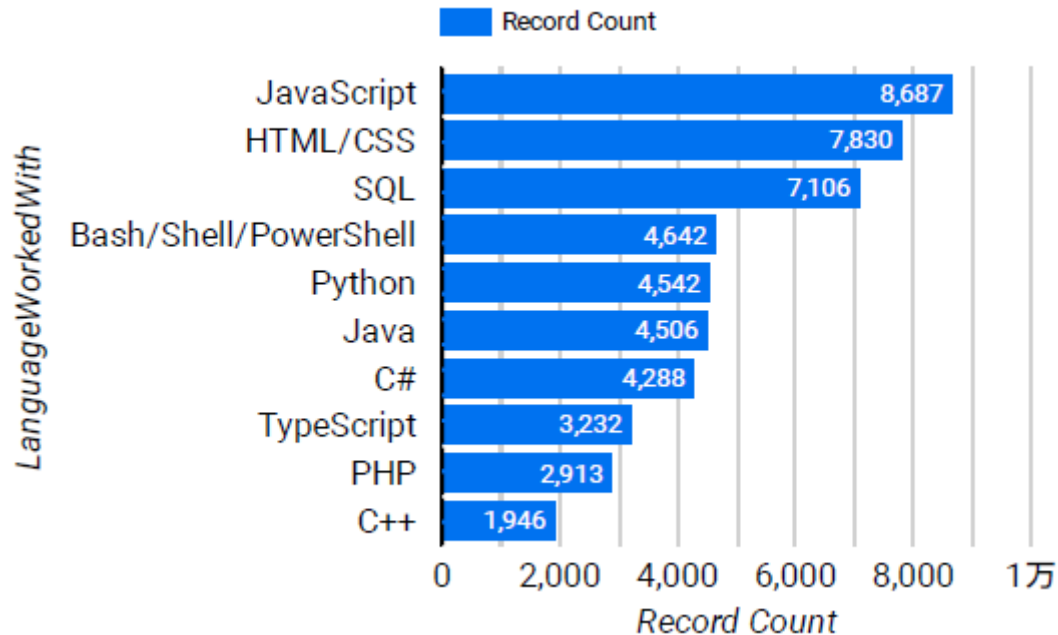
“working with the Stack Overflow Developer Survey 2019 dataset”

RESULTS

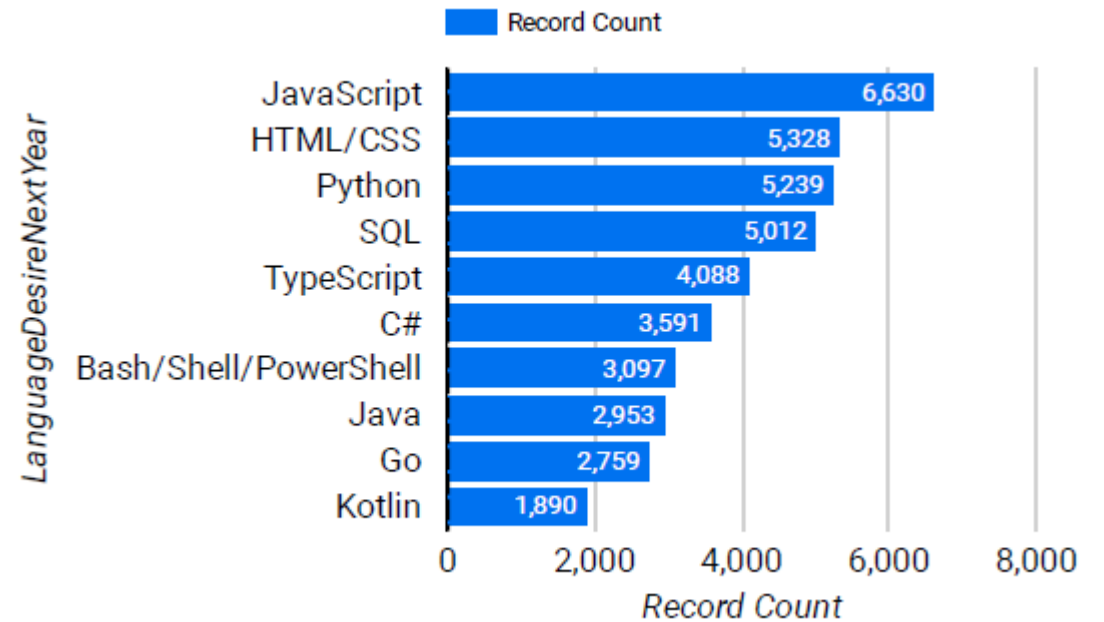
1. PROGRAMMING LANGUAGE TRENDS
2. DATABASE TRENDS
3. DASHBOARD by Looker Studio About DATABASE TRENDS and PROGRAMMING LANGUAGE TRENDS

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

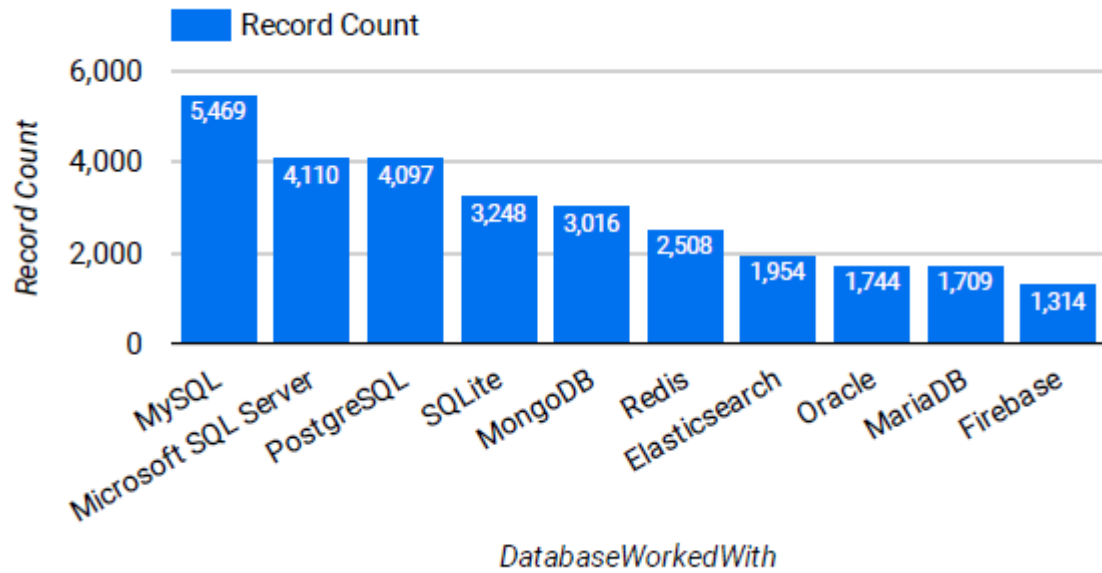
- Python and TypeScript is growing fast.
- JavaScript, HTML/CSS and SQL keep the most popular languages.
- Go and Kotlin are new additions to the Top 10.

Implications

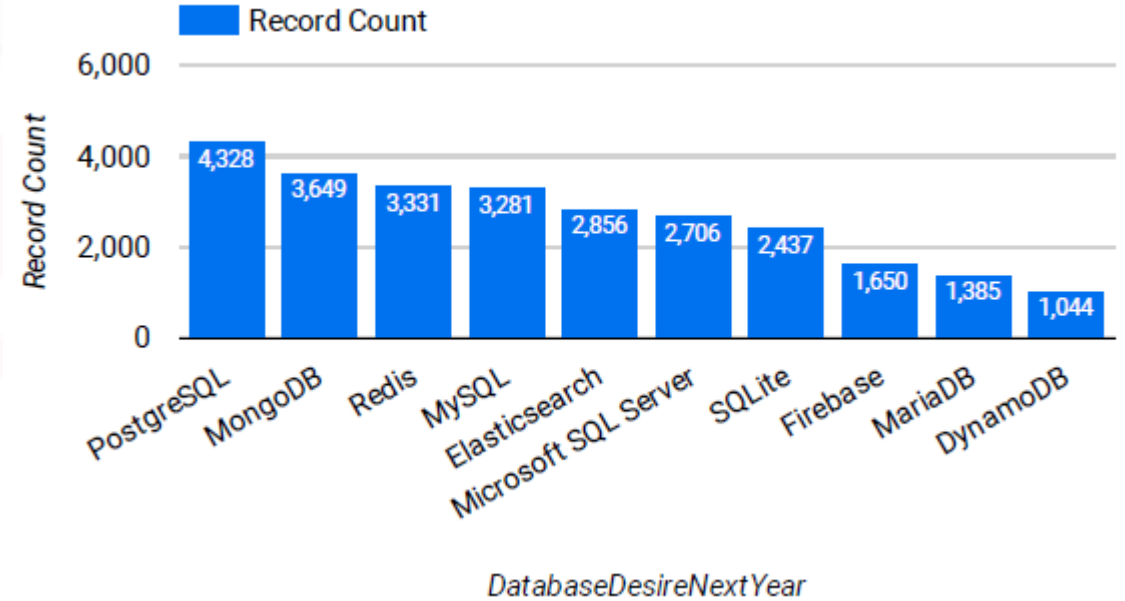
- JavaScript, HTML/CSS and SQL are necessary Languages for developer.
- Python and TypeScript will be the most popular languages in the future as the demand for AI and ML .

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MongoDB and PostgreSQL is growing.
- MySQL and Microsoft SQL Server are showing large declines.

Implications

- SQL is still a major tool as database skill.

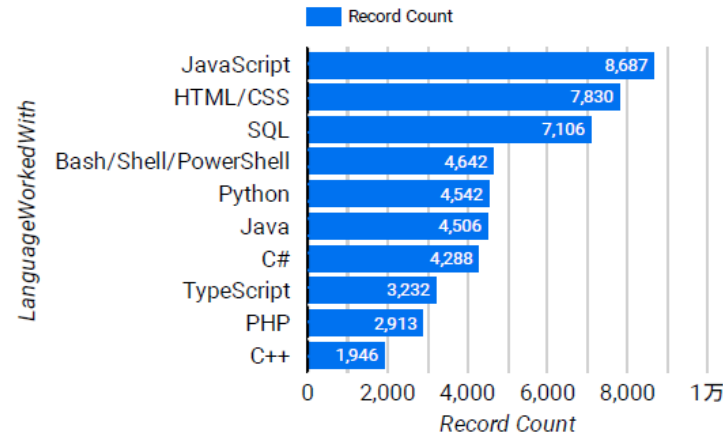
DASHBOARD by Looker Studio



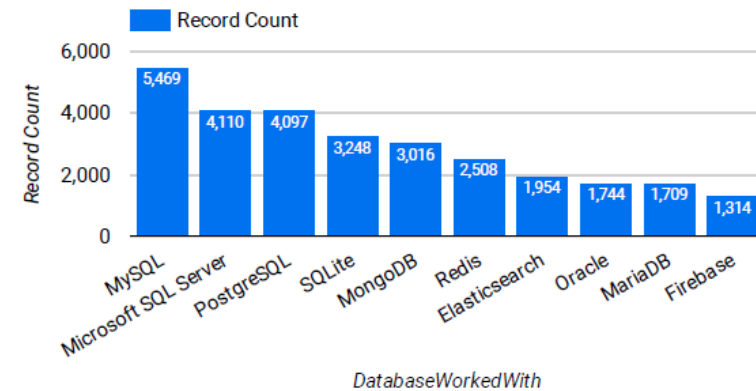
[The GitHub link of Looker Studio dashboard goes here.](#)

Current Technology Usage

Top 10 Language Worked With



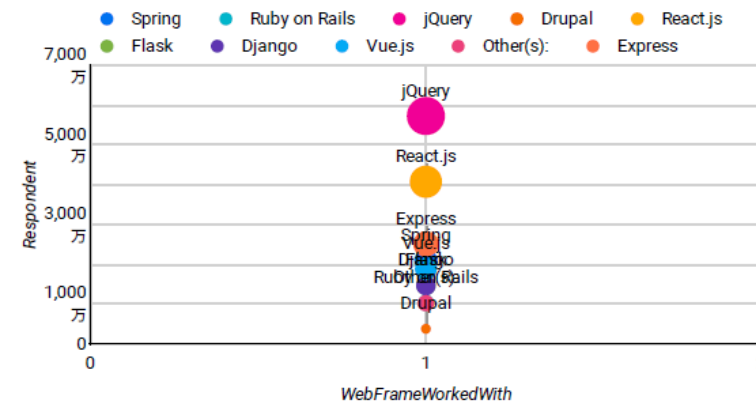
Top 10 Database Worked With



Platform Worked with

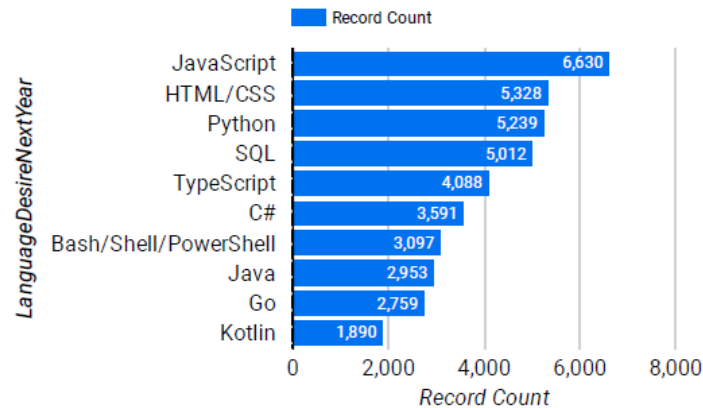


Top 10 WebFrameWorkedWith

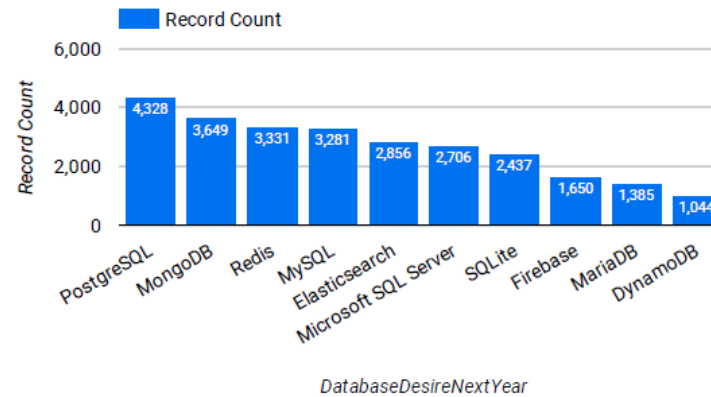


Future Technology Trend

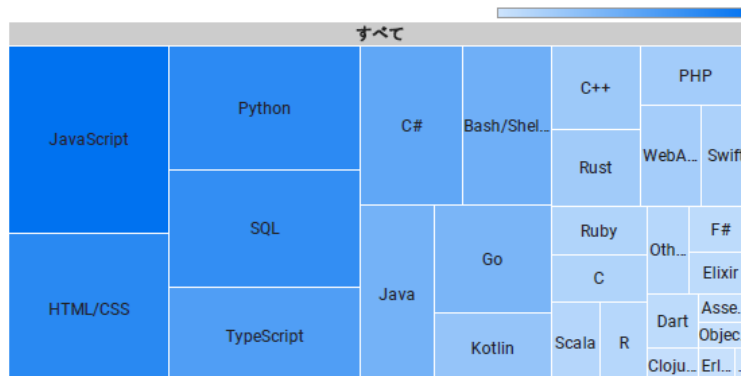
Top 10 LanguageDesireNextYear



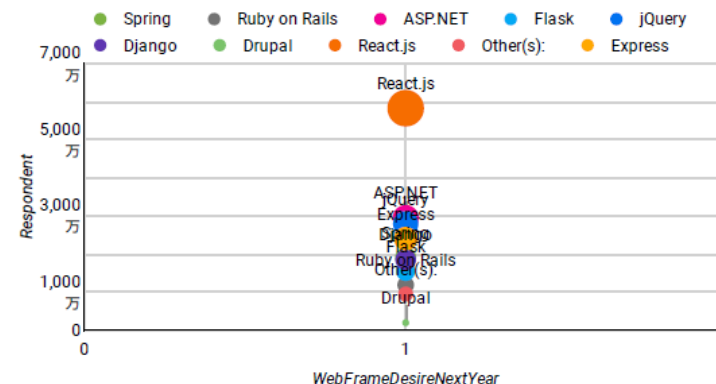
Top 10 DatabaseDesireNextYear



PlatformDesireNextYear

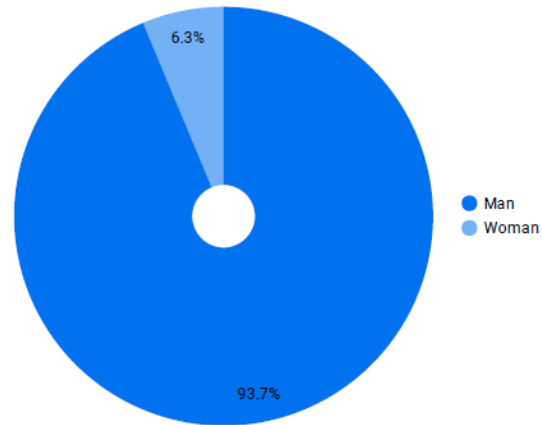


Top 10 WebFrameDesireNextYear

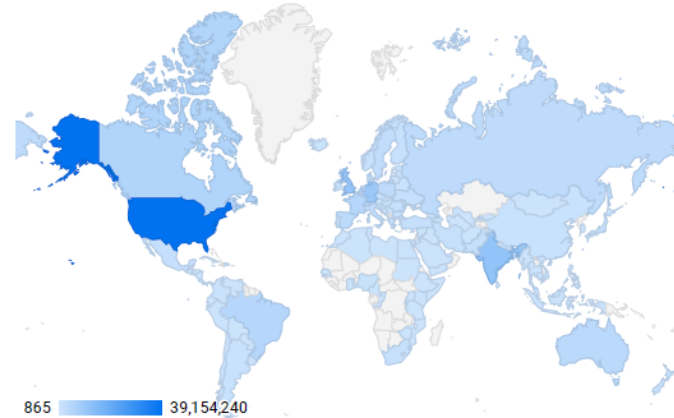


Demographics

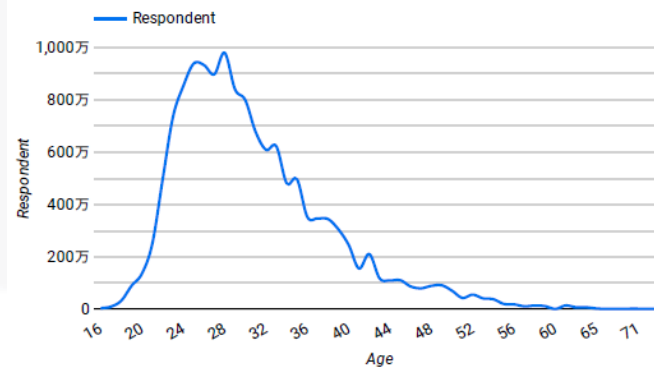
Respondent classified by Gender



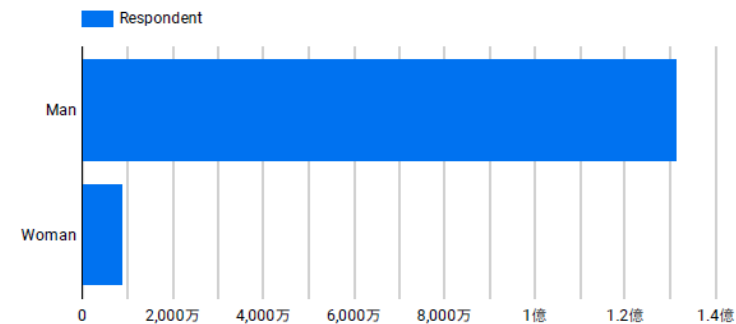
Respondent Count for Countries



Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level



OVERALL FINDINGS & IMPLICATIONS

Findings

- Over 90% developer is young (a polarimetry 25-35 years old) male.
- The most Developer located in US. Secondly, in India.
- JavaScript is the most popular language in current days.

Implications

- It is necessary to increase woman developer and older developer for the future.
- The developer population needs to be globally distributed.

DISCUSSION



- The lack of female developers in the industry is a major issue. This fact may lead to prejudices and conflicts as result of development.
- Appendix data shows C is the most sought-after skill by job poster, but Trend languages are JavaScript, HTML/CSS and SQL. It might change the most necessary skill for job dramatically in the future.
- Appendix data shows Swift is not the most sought-after skill by job poster, but it's the highest-paid. It might be a good idea to acquire skills as a developer.

CONCLUSION



We found that there are disparities in the environment for developers depending on region, gender, and age.

Because this industry is growing rapidly, it is an environment that favors developed countries and young men. It is necessary to supply an environment where they can learn while working for job seekers in their 30s and older, in addition, an environment where they can work while raising children for women.

For example, it is important to create an environment where skills can be guaranteed on web training sites like Coursera and remote working is permitted.

APPENDIX

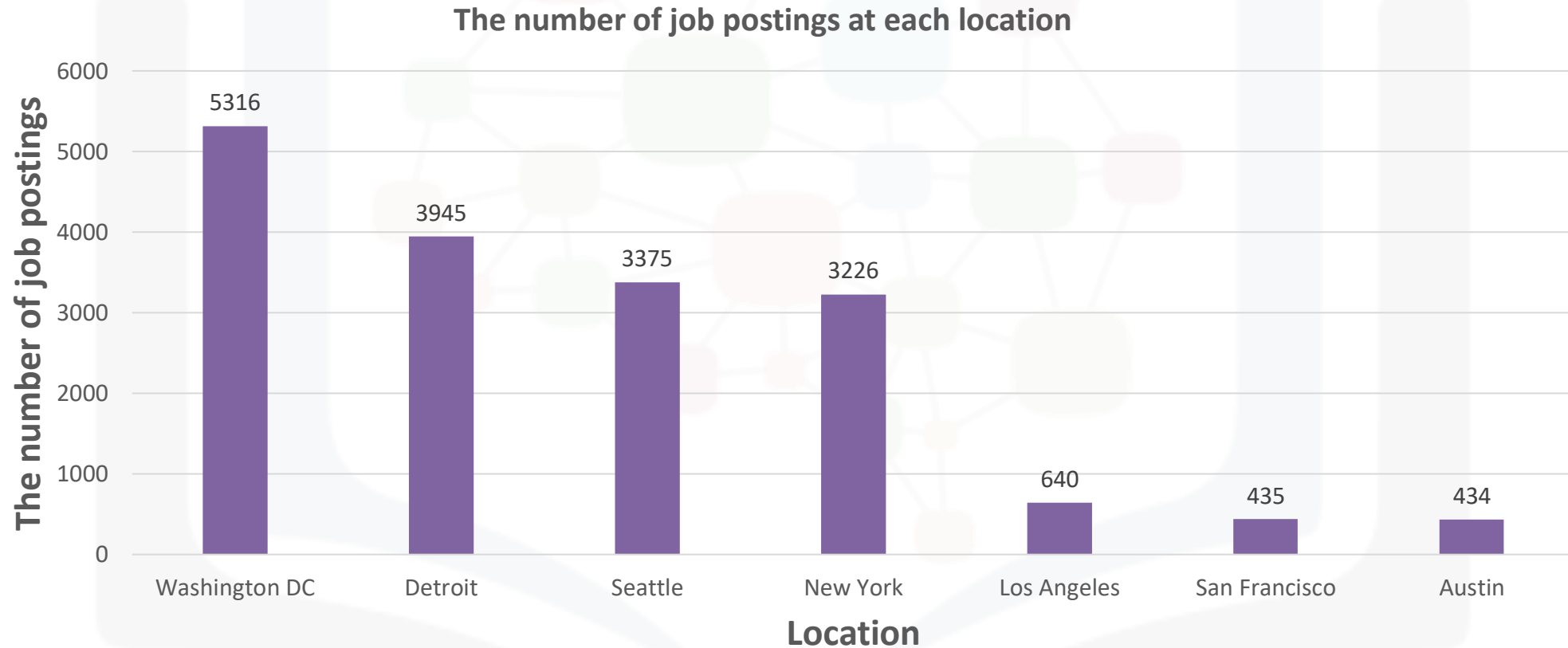
Data resource



- **Collecting Job Data Using APIs for Job Postings**
<https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/module%201/Accessing%20Data%20Using%20APIs/jobs.json>
- **The job postings data using web scraping for popular languages**
https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html

JOB POSTINGS 1

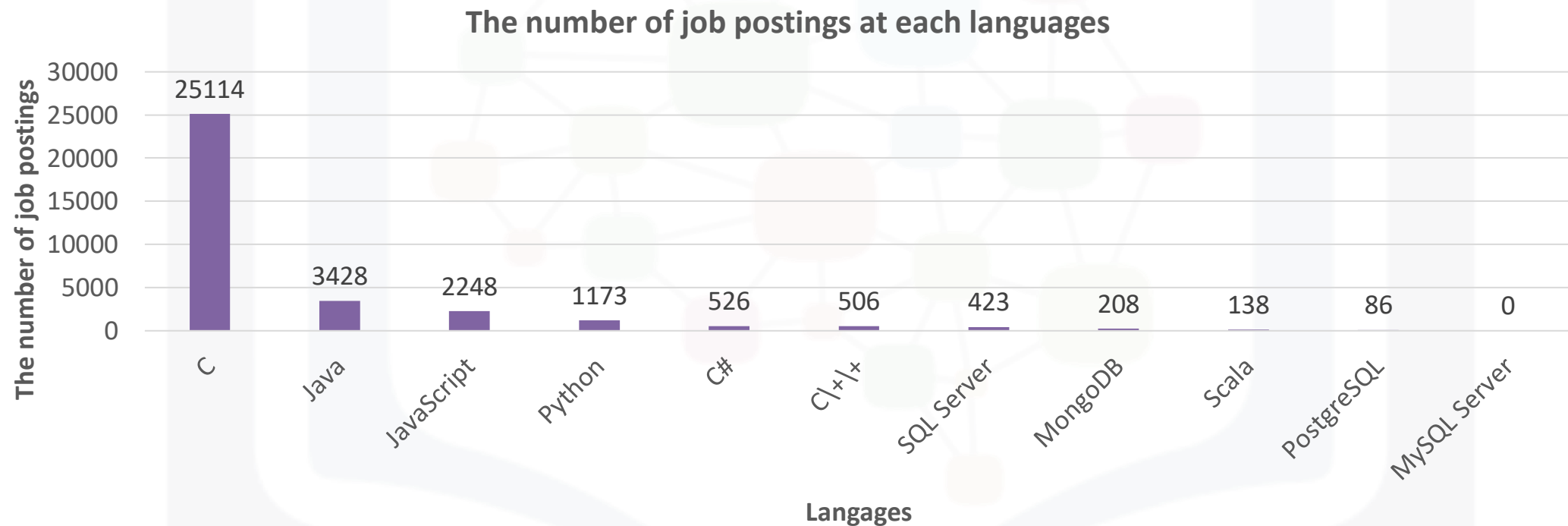
Collecting Job Data Using APIs [job-postings.xlsx](#)



Washington DC has the most job postings

JOB POSTINGS 2

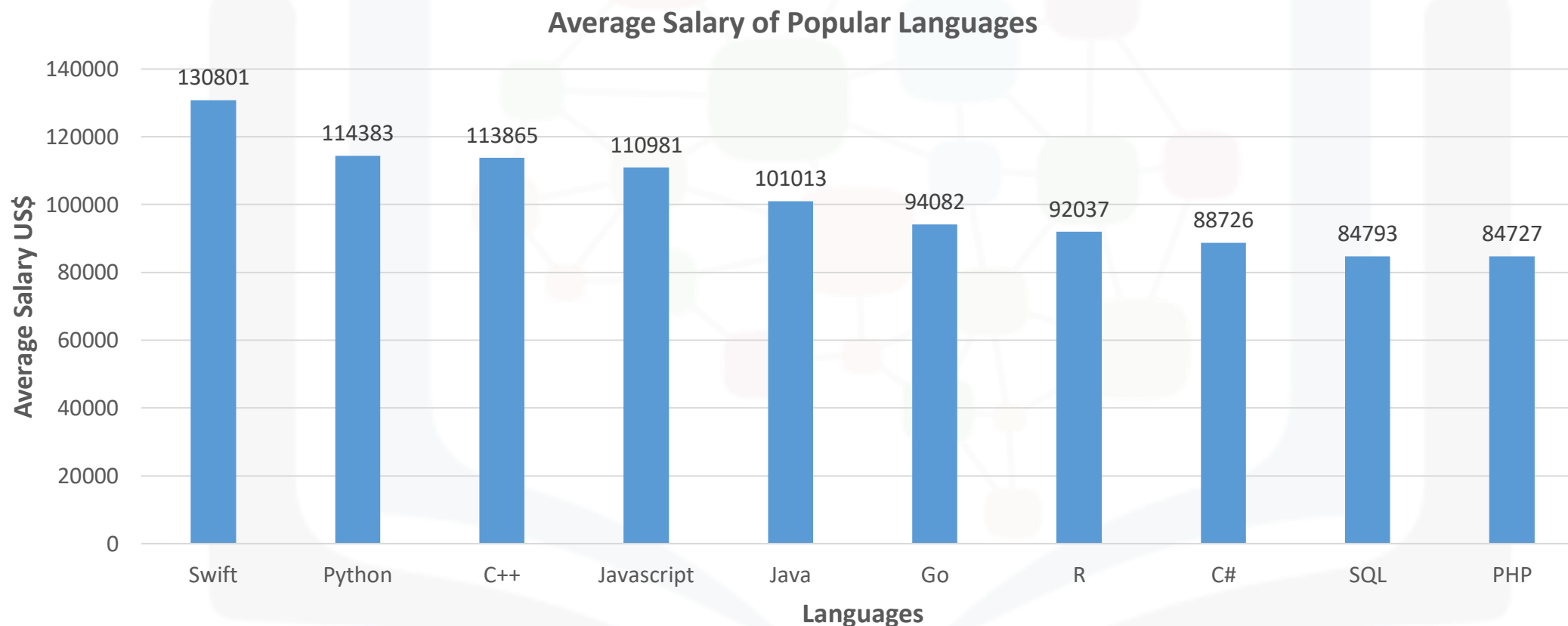
Collecting Job Data Using APIs [Job posting popular-languages.xlsx](#)



C is the most sought-after language in job Postings.

POPULAR LANGUAGES

the job postings data using web scraping [popular-languages.csv](#)



Swift has the highest average salary

Gratitude and Expectation

For our teacher

“Your instruction helped me succeed in this project.”

For our colleagues

“Let’s continue to grow together and achieve great results.”