Stack Overflow Developer Survey 2019: Key Results

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EXECUTIVE SUMMARY

In this presentation slides, we summarize the key results from the analysis of the **2019 Stack Overflow Developer Survey** data.

The results showed the following insights:

- Most popular programming languages, databases, and other technologies (at the time of data collection)
- Future technology trends
- Demographics among developers

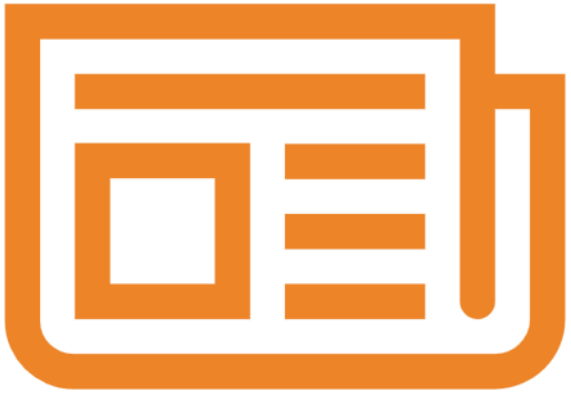
These insights can serve as a guideline to the

- Current and prospective developers
- Students
- Businesses
- Educators

INTRODUCTION

- Stack Overflow, a popular website for developers, has conducted an online survey of software professionals worldwide since 2011.
- The objective of the annual survey is to gather data from developers regarding how they learn and work, their salaries, languages, tools, and technologies they use.
- In this analysis, a randomized subset of the 2019 original dataset was explored, analyzed, and visualized.
- Target audience: Developers, Students, Businesses that plan to hire IT professionals, Educators

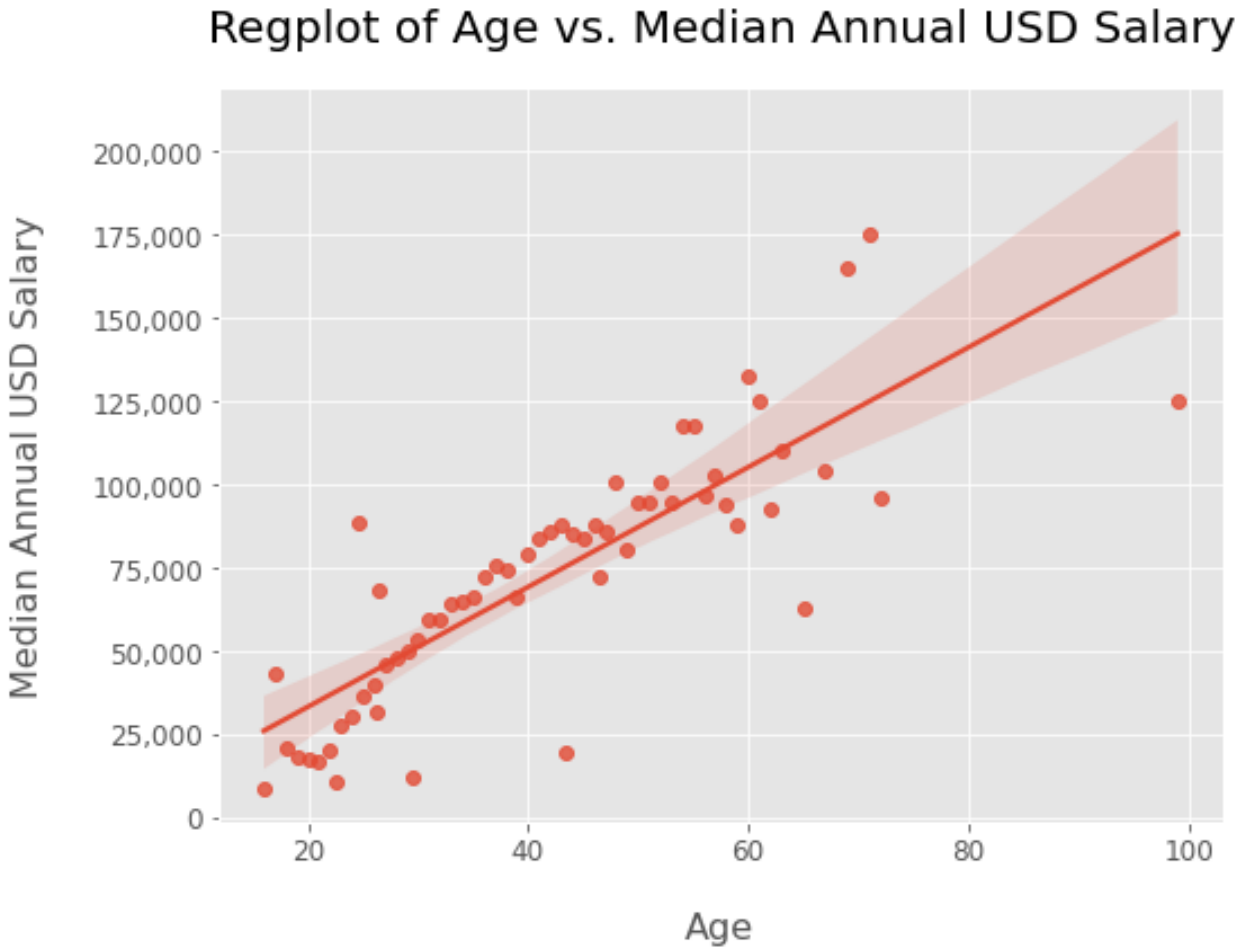
METHODOLOGY



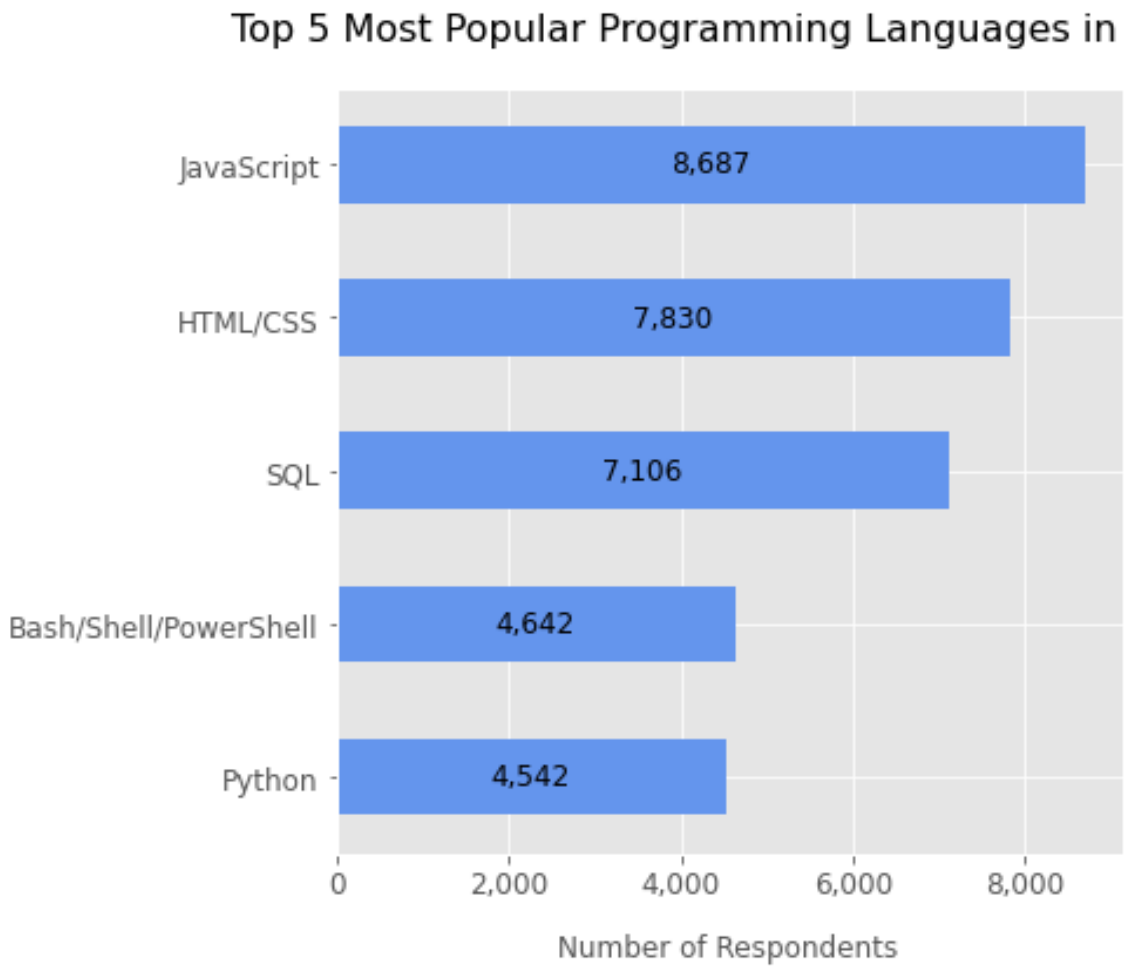
1. **Data Source**: Stack Overflow Developer Survey 2019
   - A randomized subset of the 2019 original dataset (sample dataset, *N* = 11,552; original dataset, *N* ≈ 90,000) was provided by IBM.
2. **Data Wrangling**: Dataset was loaded and cleaned using Python's Pandas library and SQL.
   - Process: Removed duplicates, imputed missing values, normalized data
3. **Data Analysis**: EDA was performed by using various Python libraries.
   - Process: Identified distribution of data, removed outliers, examined correlation between features
4. **Data Visualization**: Visualizations were made by using Python's libraries (Pandas, Matplotlib, and Seaborn) and Tableau dashboard. The following measures were examined:
   - Technologies that developers currently use in the workplace
   - Technologies that developers desire for next year
   - Demographics among developers

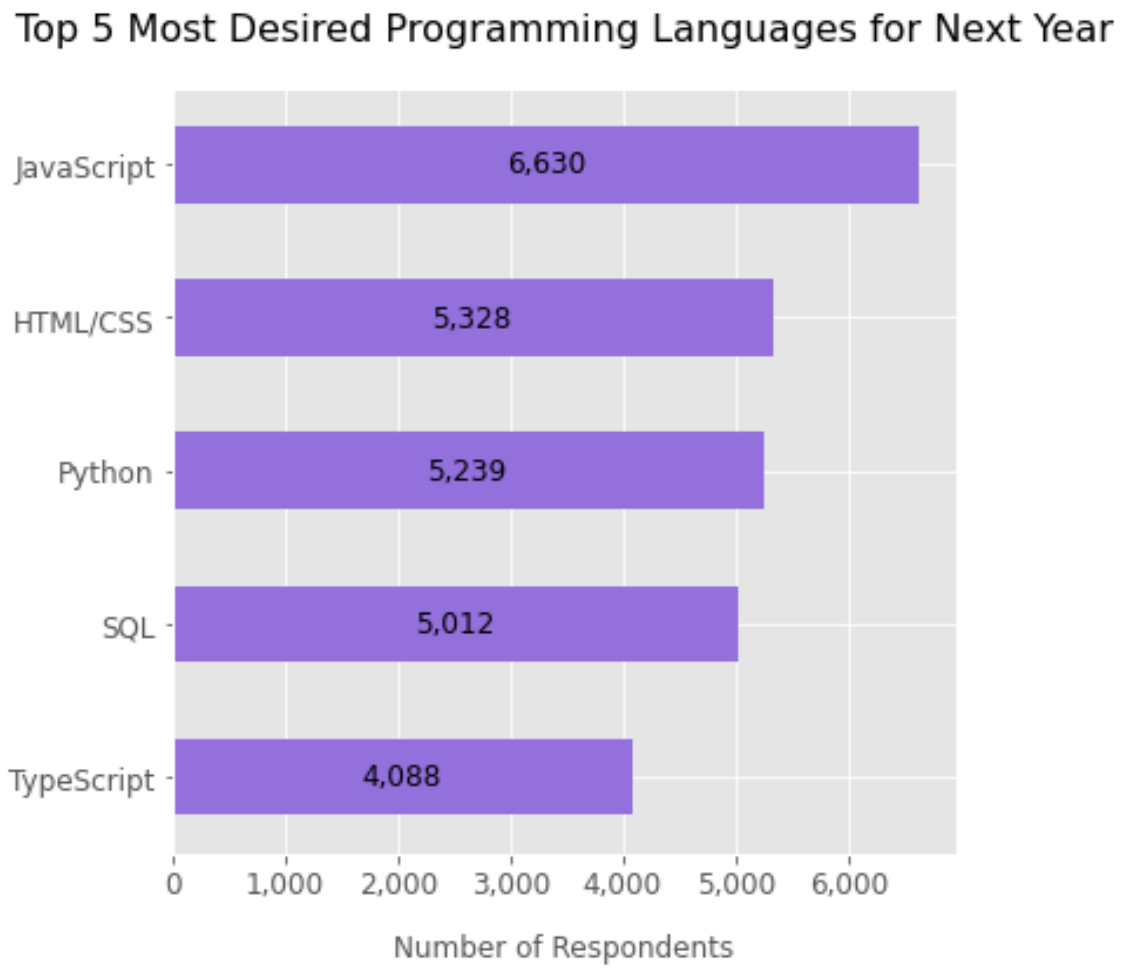
RESULTS: GENDER, AGE & SALARY

- The respondents had a median age of 29 and median annual salary of US$52,704.
- There is a high gender gap between the men and women respondents (93.5% of men vs. 6.5% of women).
- However, the median salary of women (US$54,956) is slightly higher than men (US$52,339).
- Age and annual USD salary were positively correlated (r = 0.40).
- The regplot showed that the increase in age will follow by the rise in the median annual USD salary.



RESULTS: PROGRAMMING LANGUAGE TRENDS





PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

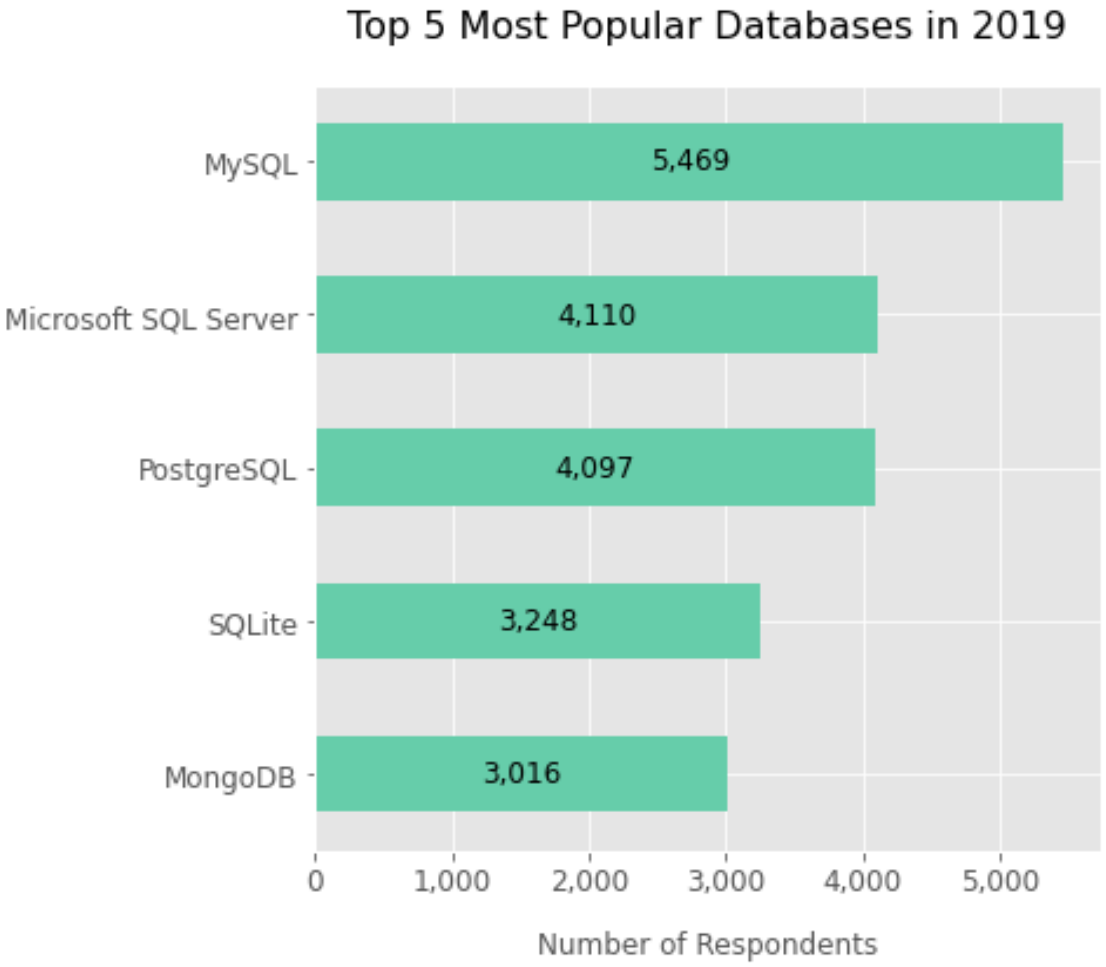
Findings

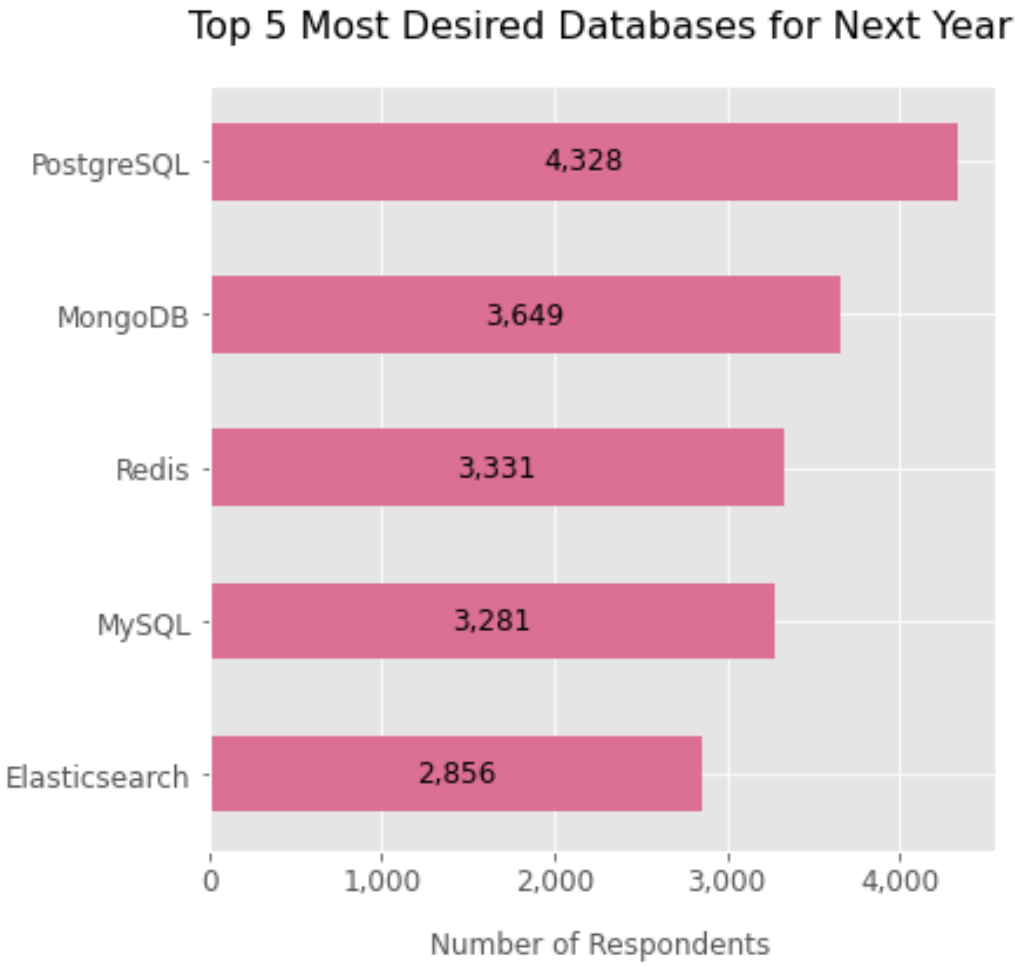
- *JavaScript* and *HTML/CSS* are the most popular programming language in 2019 and also rank as the top languages to learn for next year.
- *SQL* remains the preferred programming language for 2019 and the following year.
- Increasing interest in *Python* and *TypeScript.*
- Decreasing interest in *Bash/Shell/PowerShell.*

Implications

- *JavaScript* and *HTML/CSS* will remain the most commonly used programming language as there is high demand for skilled web developers in the market.
- However, *TypeScript* may catch up soon to be the widely used programming language in web development in the future.
- The increase in *Python's* popularity will likely reflect the high market demand for data science professionals.

RESULTS: DATABASE TRENDS





DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- SQL databases are most commonly used database in 2019, with *MySQL* ranking top, followed by *Microsoft SQL Server*, *PostgreSQL*, and *SQLite*.
- There is a growth in the popularity of *PostgreSQL* compared to other SQL databases, and it is ranked as the top desired database for next year.
- *MongoDB*, *Elasticsearch*, and *Redis* have gained interest for next year.

Implications

- Professional developers appear to prefer using open-source databases such as *PostgreSQL*, *MongoDB*, *Redis*, and *MySQL* in the future.
- The rise in the popularity of NoSQL databases such as *MongoDB*, *Elasticsearch*, and *Redis* will likely reflect the market shift toward using a database program that can handle the high volume of unstructured data.

RESULTS: TABLEAU DASHBOARD

This section will show the static screenshots of the Tableau dashboard that summarize the following:

I. Current Technology Usage

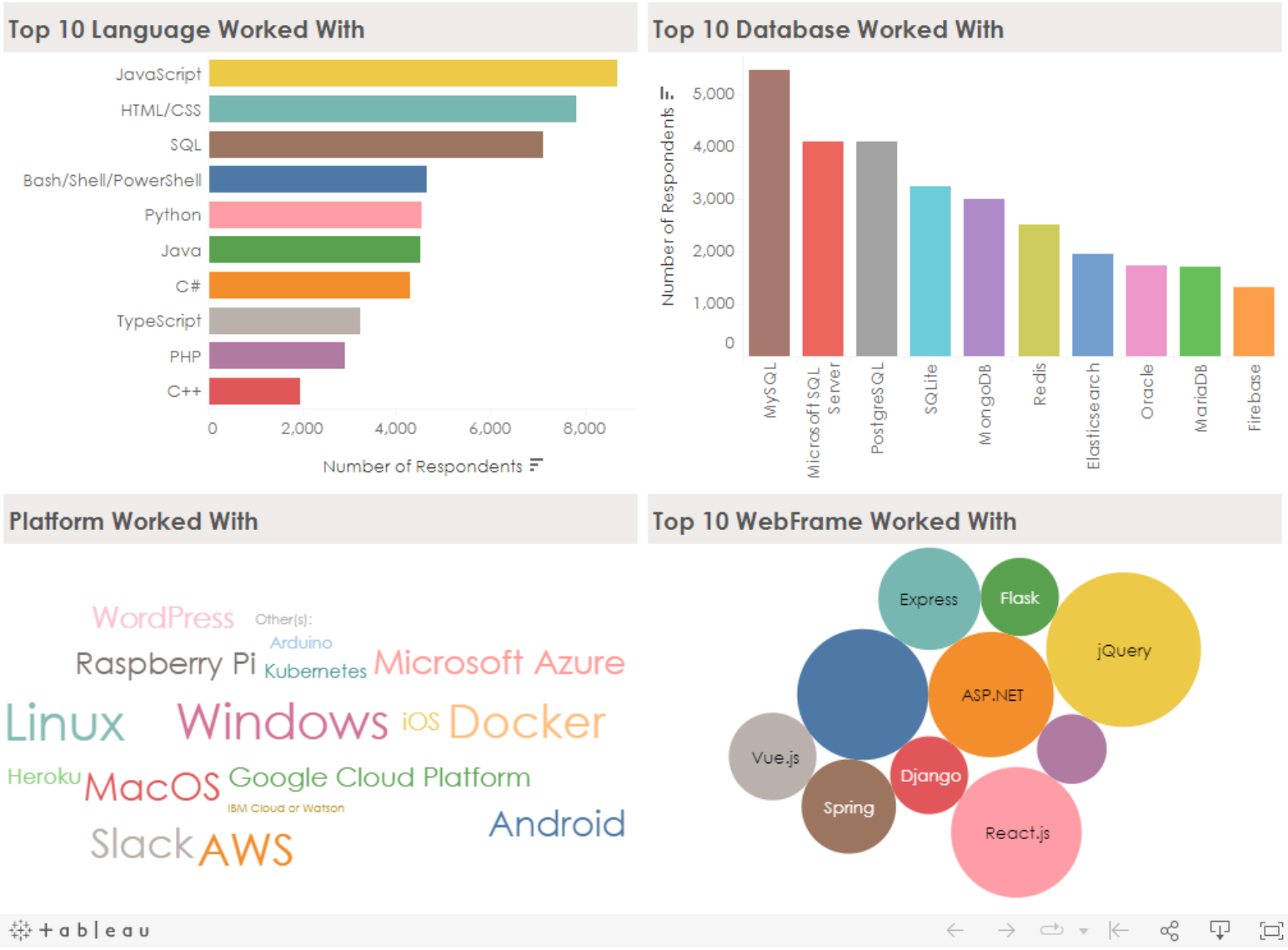
II. Future Technology Trend

III. Demographics of Respondents

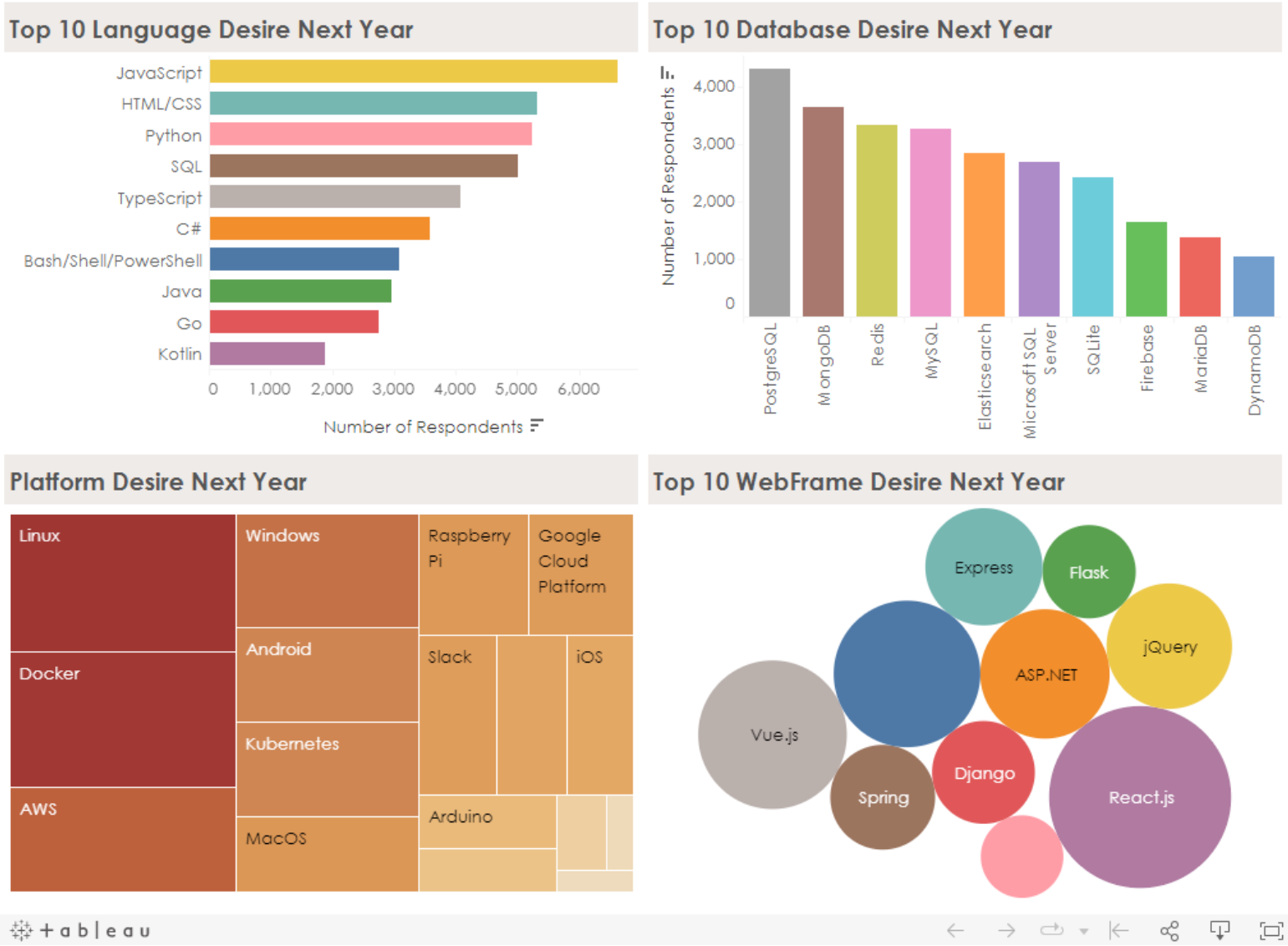
Click the link below to access the interactive Tableau dashboard.

- Link to the Tableau Public

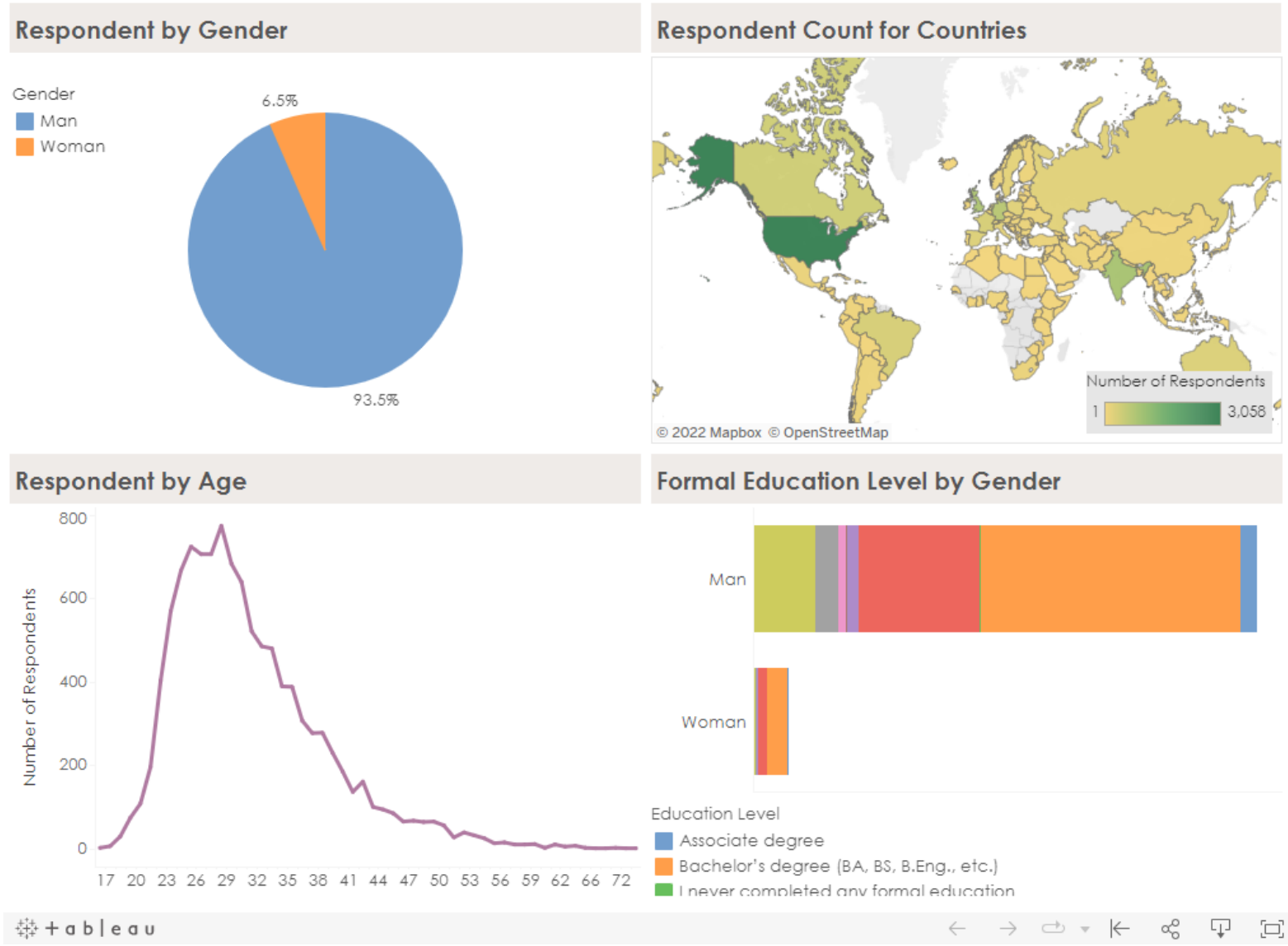
DASHBOARD I: CURRENT TECHNOLOGY USAGE



DASHBOARD II: FUTURE TECHNOLOGY TREND



DASHBOARD III: DEMOGRAPHICS OF RESPONDENTS



DISCUSSION

The analysis has yielded the following questions and will be discussed in this section.

1. What are the top technologies in demand?
2. What technologies should the developers, students, businesses, and educators emphasize more?
3. What are the demographics and salaries of the developers?

OVERALL FINDINGS & IMPLICATIONS

Findings

- *JavaScript* and *HTML/CSS* are the most commonly used and desired programming languages, while *TypeScript* is also gaining interest among developers.
- *Python* is gaining popularity among developers.
- *MySQL* is the most commonly used database in 2019, while *PostgreSQL* and *MongoDB* are gaining interest among developers.
- Despite the median salary of women developers being slightly higher than men developers, there remains a high gender gap between men and women developers, which is in favour of men developers.

Implications

- Skilled web developers still present a high demand in the market. Current and prospective developers should consider learning TypeScript in addition to JavaScript and HTML/CSS.
- With the increasing need for data professionals to handle and analyze big data, current and prospective developers should continually enhance their skills in SQL and Python.
- There is a possible boom in NoSQL adoption in the future. The current and prospective developers should develop their NoSQL skills to maintain their competence in the market.
- Businesses should put effort into bridging the gender gap among developers to create diverse and inclusive workplaces.

CONCLUSION

The analysis of the 2019 Stack Overflow Developer Survey data yielded insights into the developers' salaries, demographics, and most popular and desired technologies.

These insights provide a snapshot of the programming community and serve as a guideline for

- Current and prospective developers aiming to remain competitive
- Students studying in this field
- Businesses deciding to upskill their workers and establish hiring strategies
- Educators planning to roll out the relevant courses to their students

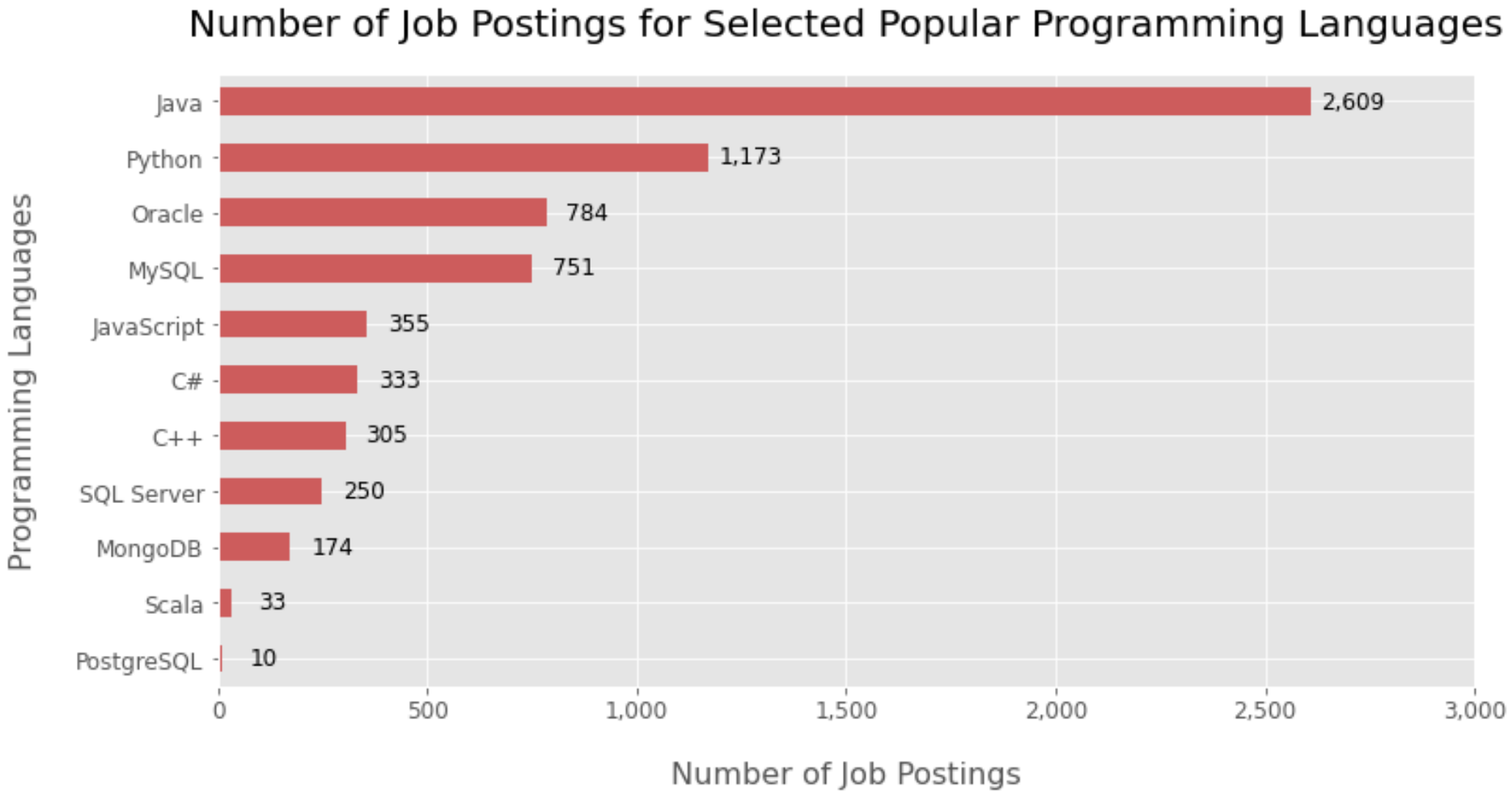
APPENDIX

This section will include additional visualizations that summarize the following:

I. Number of job postings for selected popular programming languages

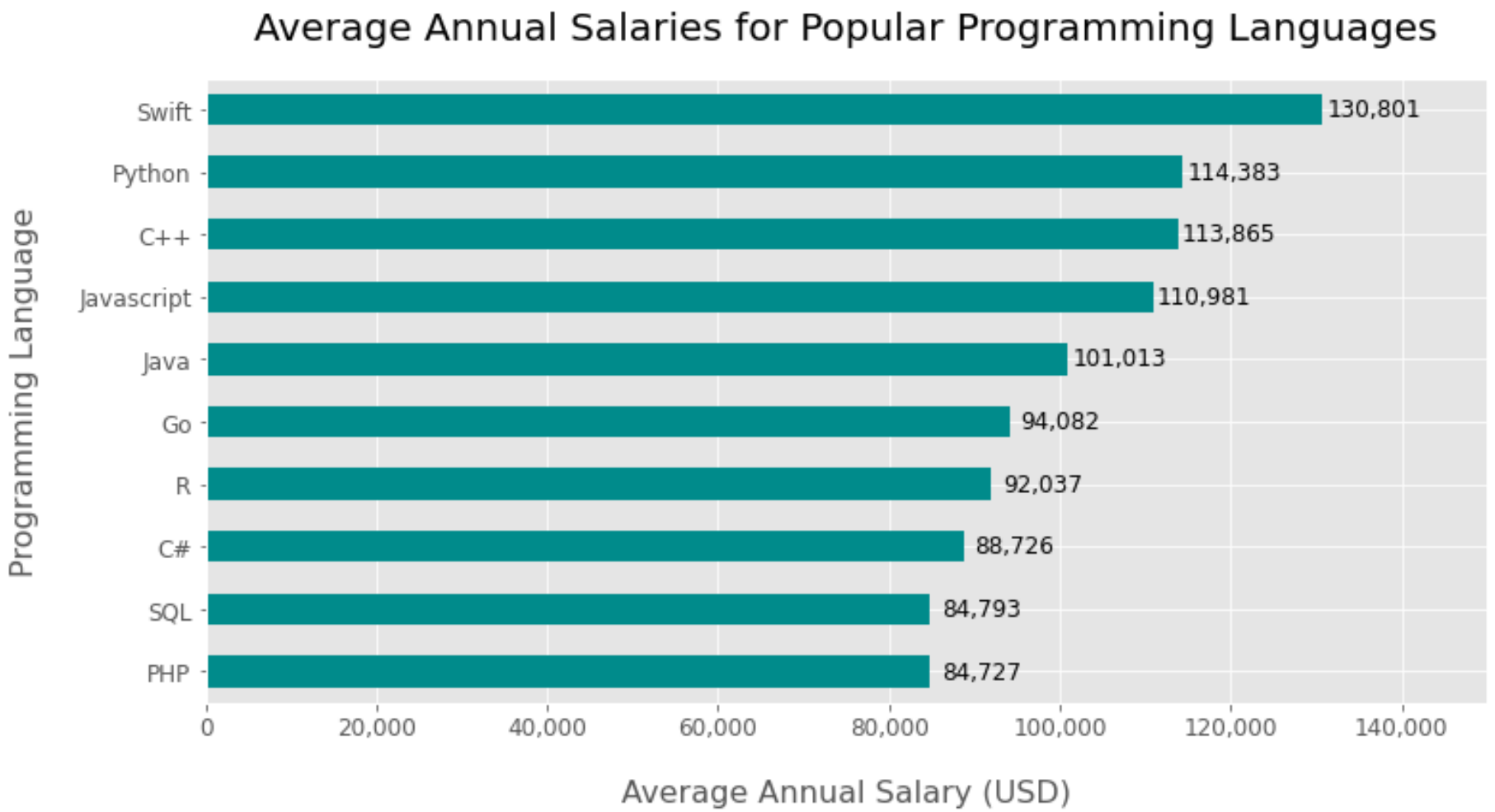
II. Average annual salaries for popular programming languages

APPENDIX I: JOB POSTINGS FOR SELECTED POPULAR PROGRAMMING LANGUAGES



Note: Job postings data for the 11 selected programming languages shown above were collected using the Jobs API provided by IBM.

APPENDIX II: AVERAGE ANNUAL SALARIES FOR POPULAR PROGRAMMING LANGUAGES



Note: Salary data for popular programming languages shown above were collected from the website provided by IBM. Data source: Popular Programming Languages

THANK YOU

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