Stack Overflow Developer Survey in 2019: Key Findings

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IBM Developer

SKILLS NETWORK

OUTLINE

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EXECUTIVE SUMMARY

The following slides summarize key findings from an analysis of data collected as part of the 2019 Stack Overflow Developer Survey

- The analysis show us the followings :
  - Most popular languages, databases, and other technologies (at the time of data collection)
  - Attitudes reflecting which technologies will be become most popular in the future
  - Demographics Data (distributions of gender, countries, age, education ...)

These findings are relevant particularly to current and aspiring developers, recruiters, educators and policy makers.

INTRODUCTION

- Since 2011, the online programming knowledge sharing platform, Stack Overflow, has been conducting the **Stack Overflow Annual Developer Survey.**
- The primary objective of the annual surveys is to gather data regarding technology usage and trends among developers.
- In this analysis, a subset of the 2019 dataset was examined (present dataset: N = 11, 398; original dataset N ≈ 90,000).
- Audience: Developers (current and aspiring), HR professionals, educators, policy makers

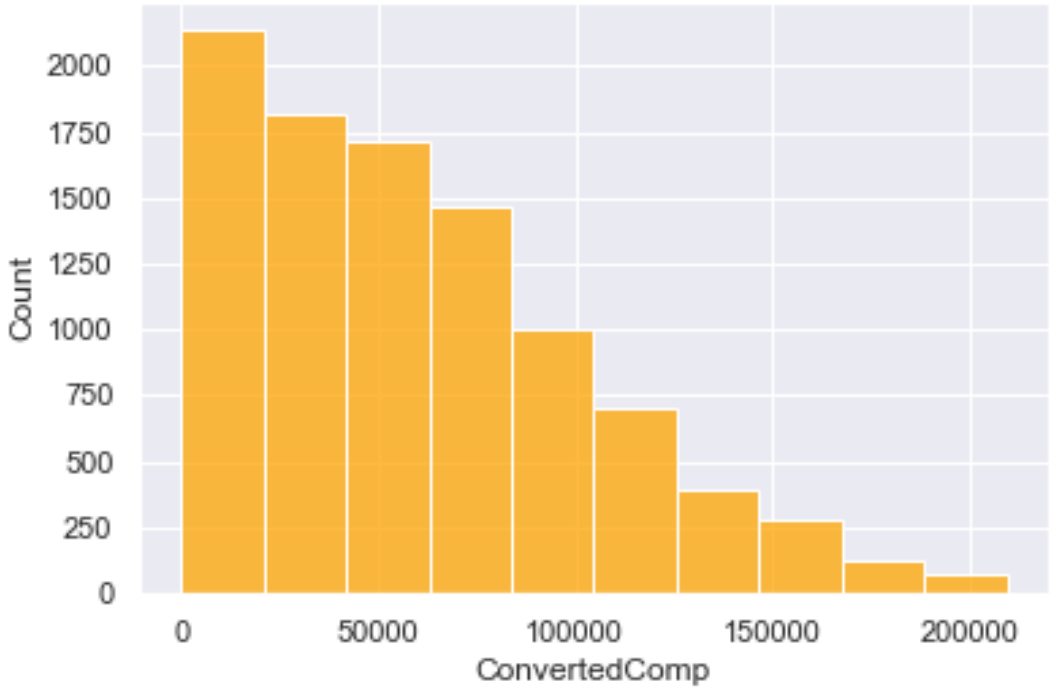
METHODOLOGY

- **Data Source :** 2019 Stack Overflow Developer Survey
  - Link to 2019 Stack Overflow Developer Survey data (Ctrl+Click)
- **Data Wrangling :** A portion of the dataset (provided by IBM) was loaded and cleaned using SQL and Python's Pandas library.
  - Cleaning Procedure: Duplicates removal, data imputation, data normalization
  - Link to dataset provided by IBM (Ctrl + Click)
- **Analysis & Visualization :** EDA and data visualization were conducted using various Python libraries and IBM Cognos. Specifically, the following measures were examined:
  - Technologies
  - Technologies most desired for the next year
  - Demographics (I.e., gender, education, age)

RESULTS 1:COMPENSATION & DEMOGRAPHICS

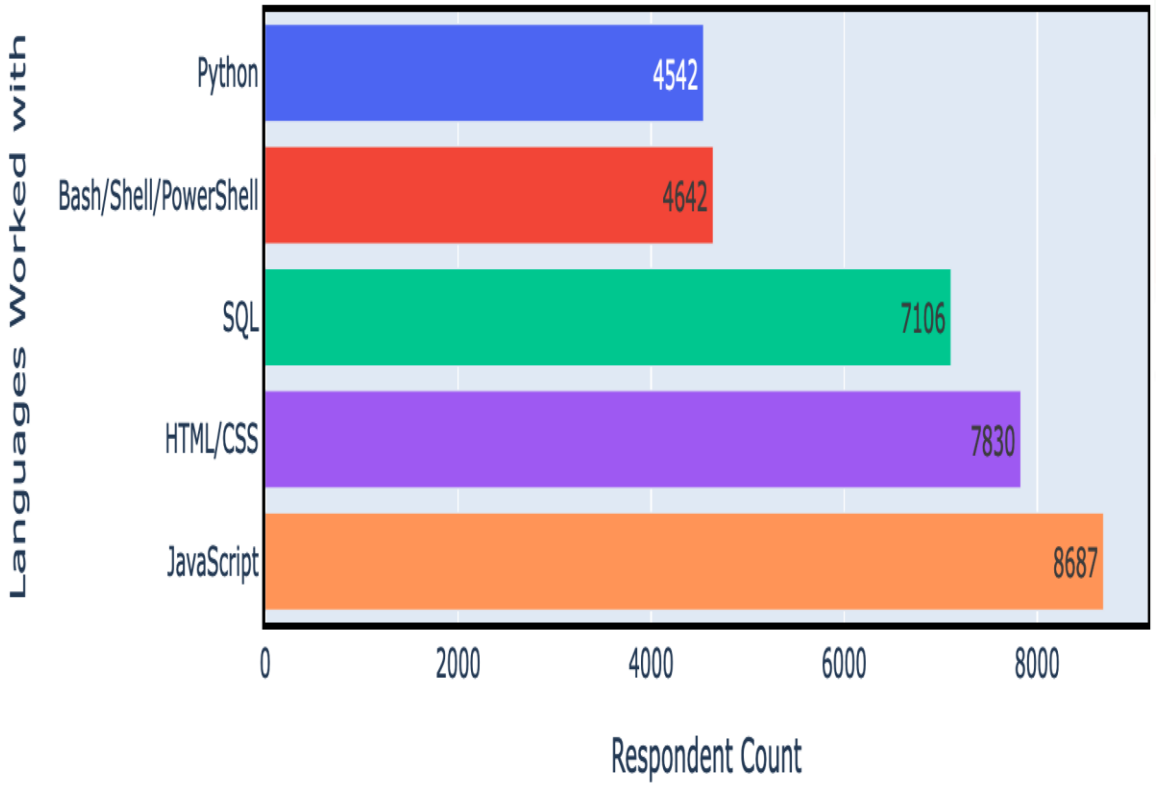
Compensation per Year Analysis

- First, descriptive statistics regarding demographics and total annual compensation were computed.
- Sample size : Original data **N = 11,398** after remove **N= 9703** , **N_outliers = 1695**
- Median compensation after outlier removal : **$52,704 USD**
- Median age of respondents is **29** and respondents are predominantly male (I.e., **93.5% male** and **6.5% female**)
- Compensation and Age are positively correlated: r = .40
- Median compensation is higher for **women : $54,956** than **men $52,339 USD**.

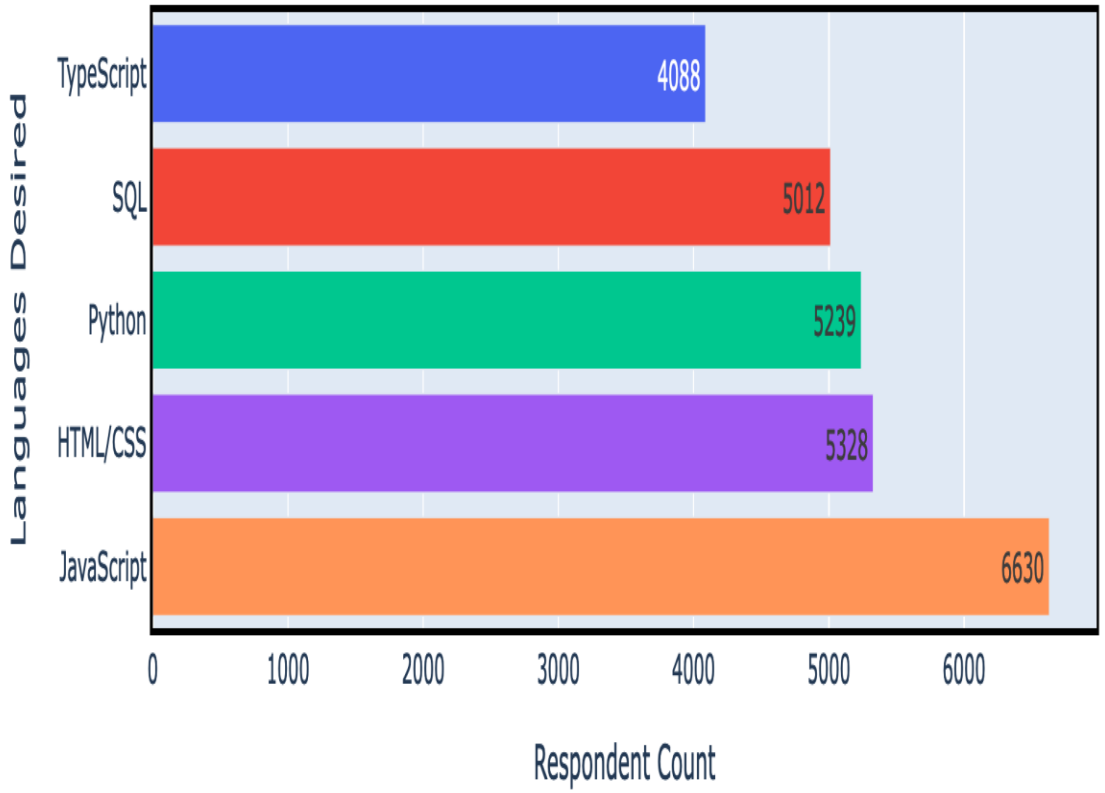


PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

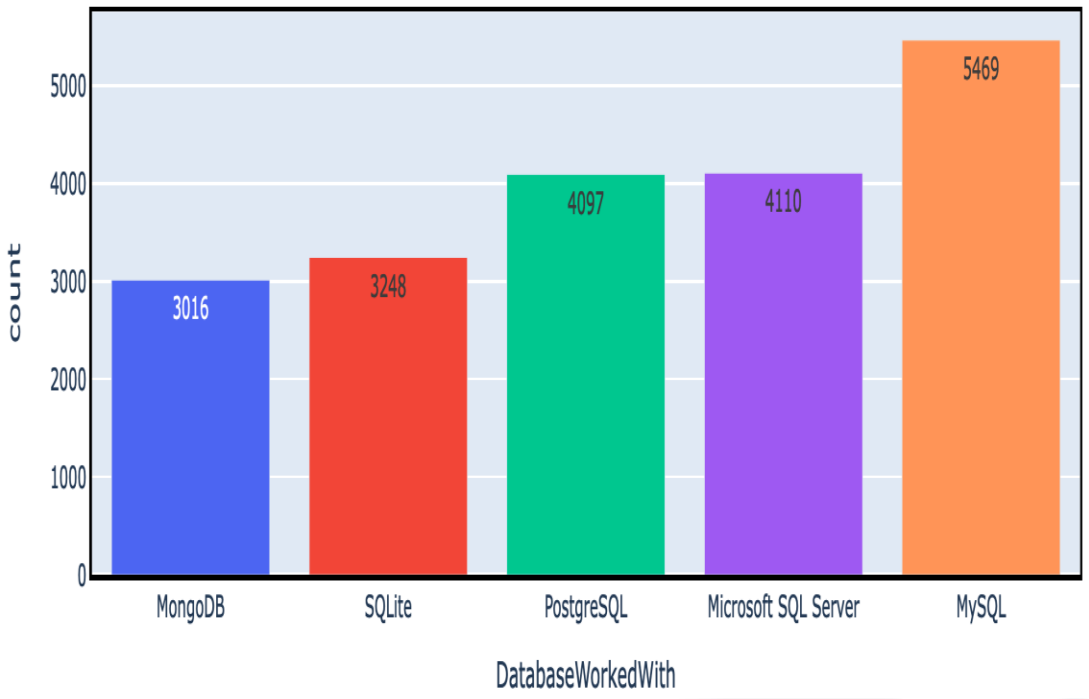
- JavaScript and HTML/CSS were the most popular in 2019 and will likely remain so the following year
- SQL was popular in 2019 and will likely remain so.
- Increasing interests in Python and TypeScript
- Decreasing interests in PowerShell/Bash.

Implications

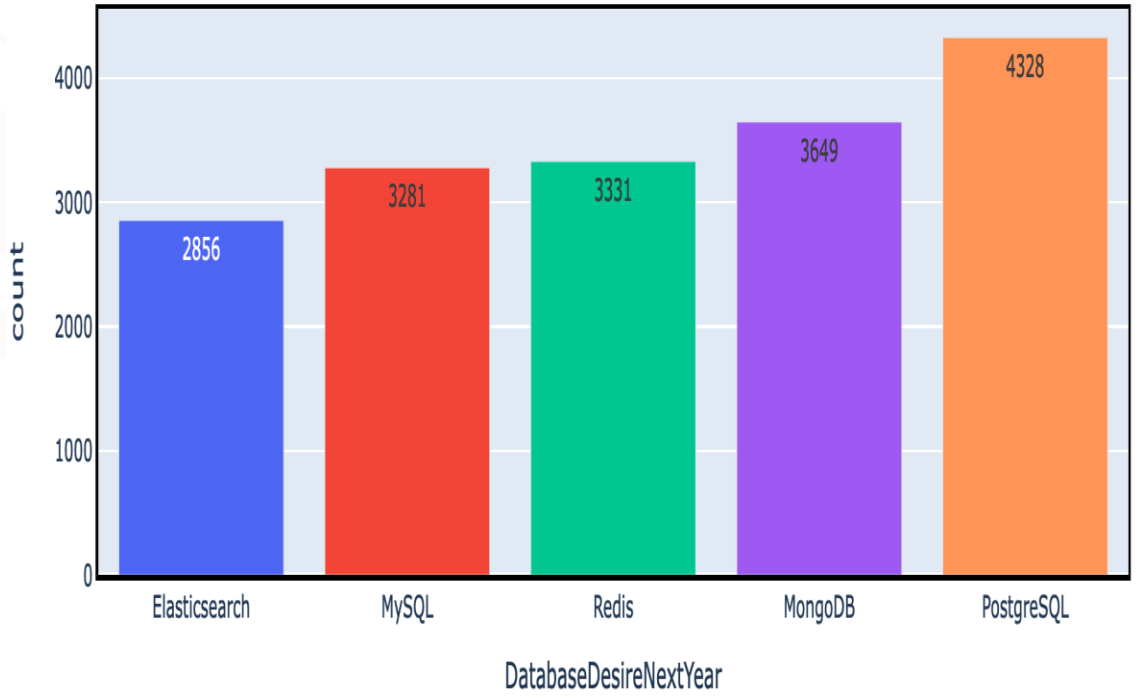
- Web Development is still in high demand and JavaScript and HTML/CSS remain the dominant languages – however ,TypeScript may catch up in the future
- SQL remains the preferred language for big data storage and querying = it is not likely go away anytime soon.
- Python's popularity is rising because of AI and ML works.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- SQL Database programs were the most popular in 2019, with MySQL in the lead.
- PostgreSQL is gaining popularity over the SQL database programs, and it was the overall most desired database for the next year.
- MongoDB was popular in 2019 and gaining interest.
- Increasing interest in Elasticsearch.

Implications

- It seems that increasing developer preference toward open-source database programs.
- NoSQL database programs are gaining popularity, which likely reflects a growing need to handle non-relational and unstructured data.
- Current and aspiring data analysts should develop competence in NoSQL in addition to SQL database programs.

DASHBOARD

The Links contains interactive Dashboards ;

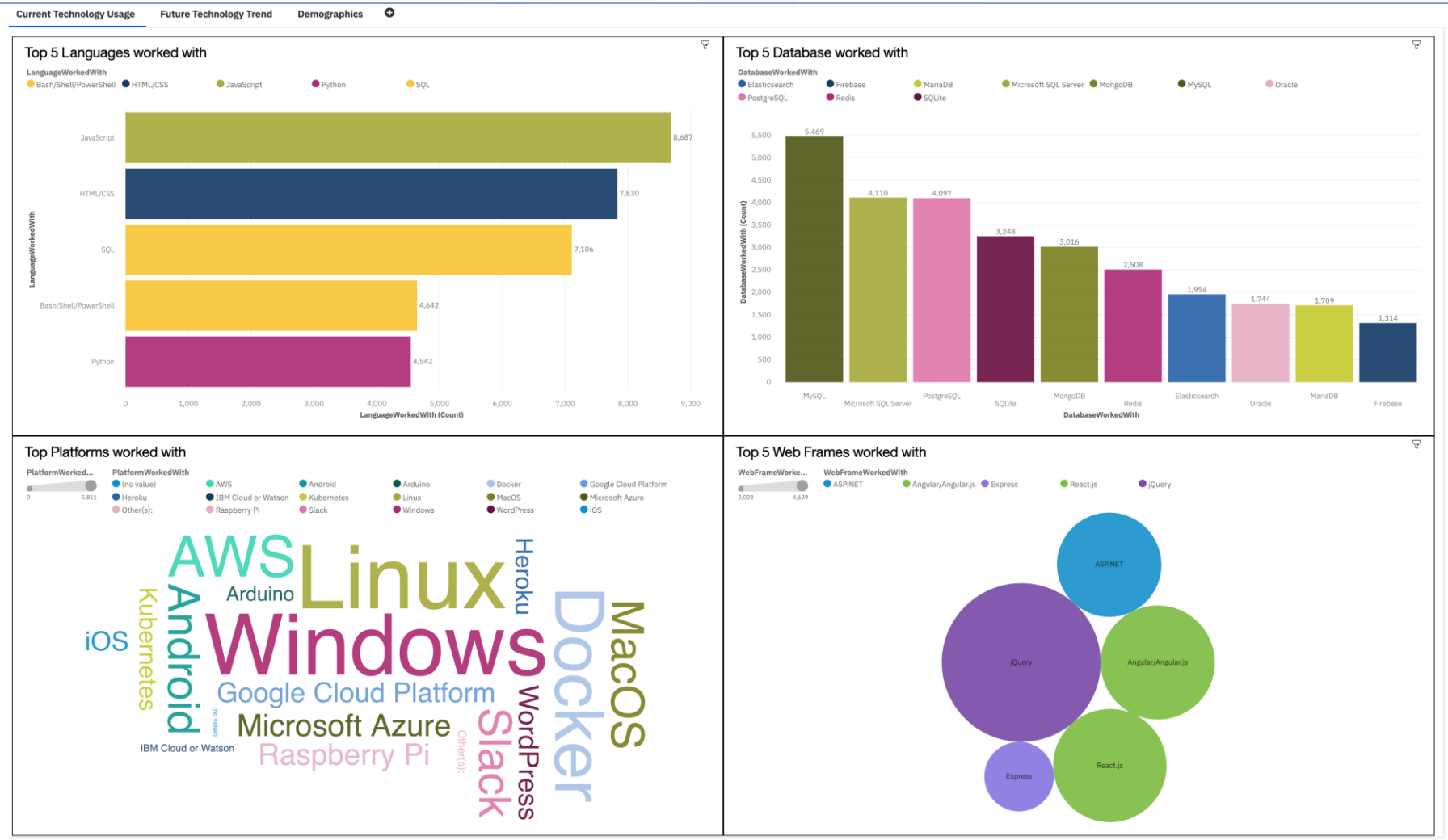
1 – current technology use

2 – future technology trend

3 – demographics

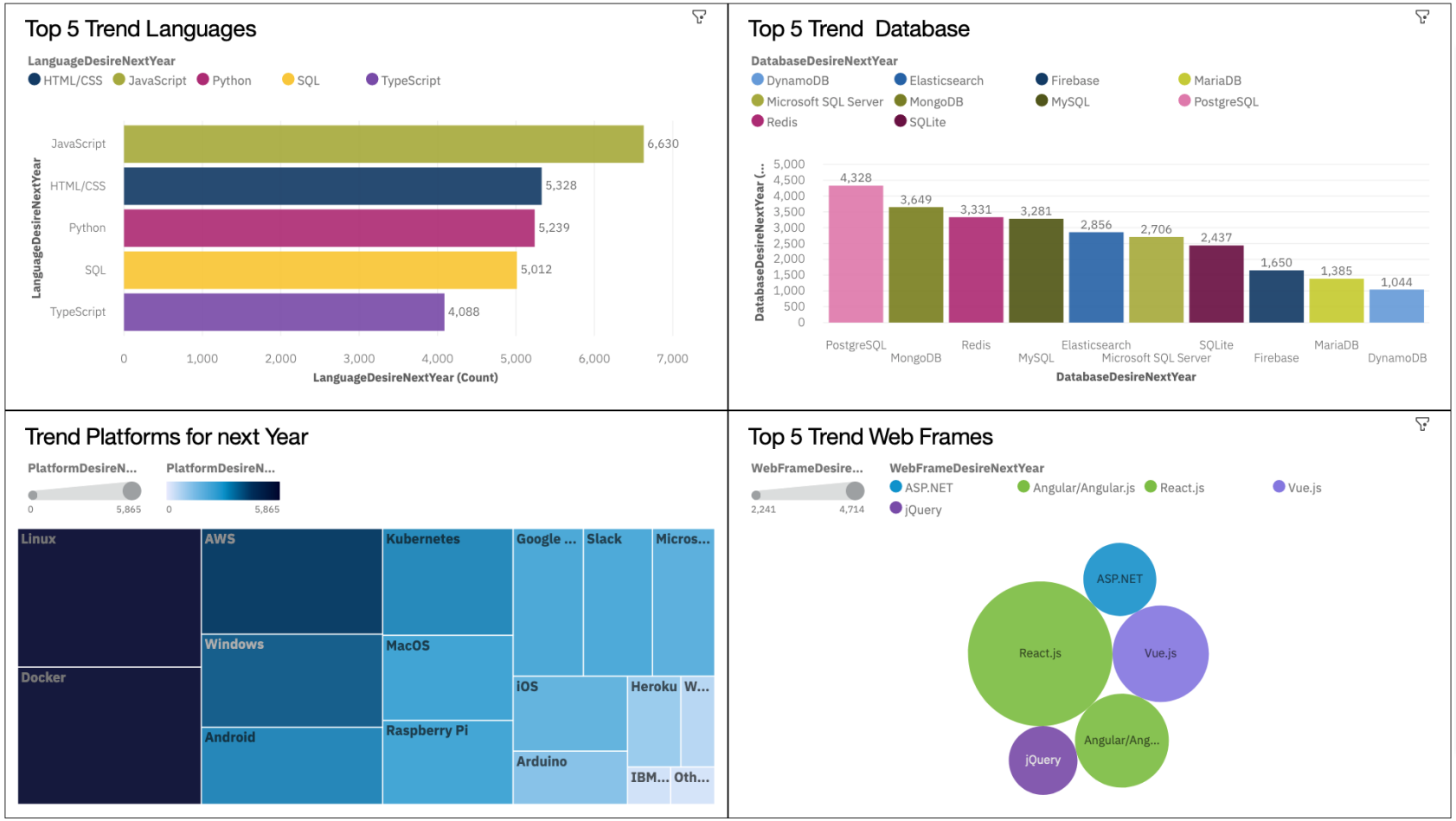
IBM Cognos Link (Ctrl + Click)

DASHBOARD TAB 1

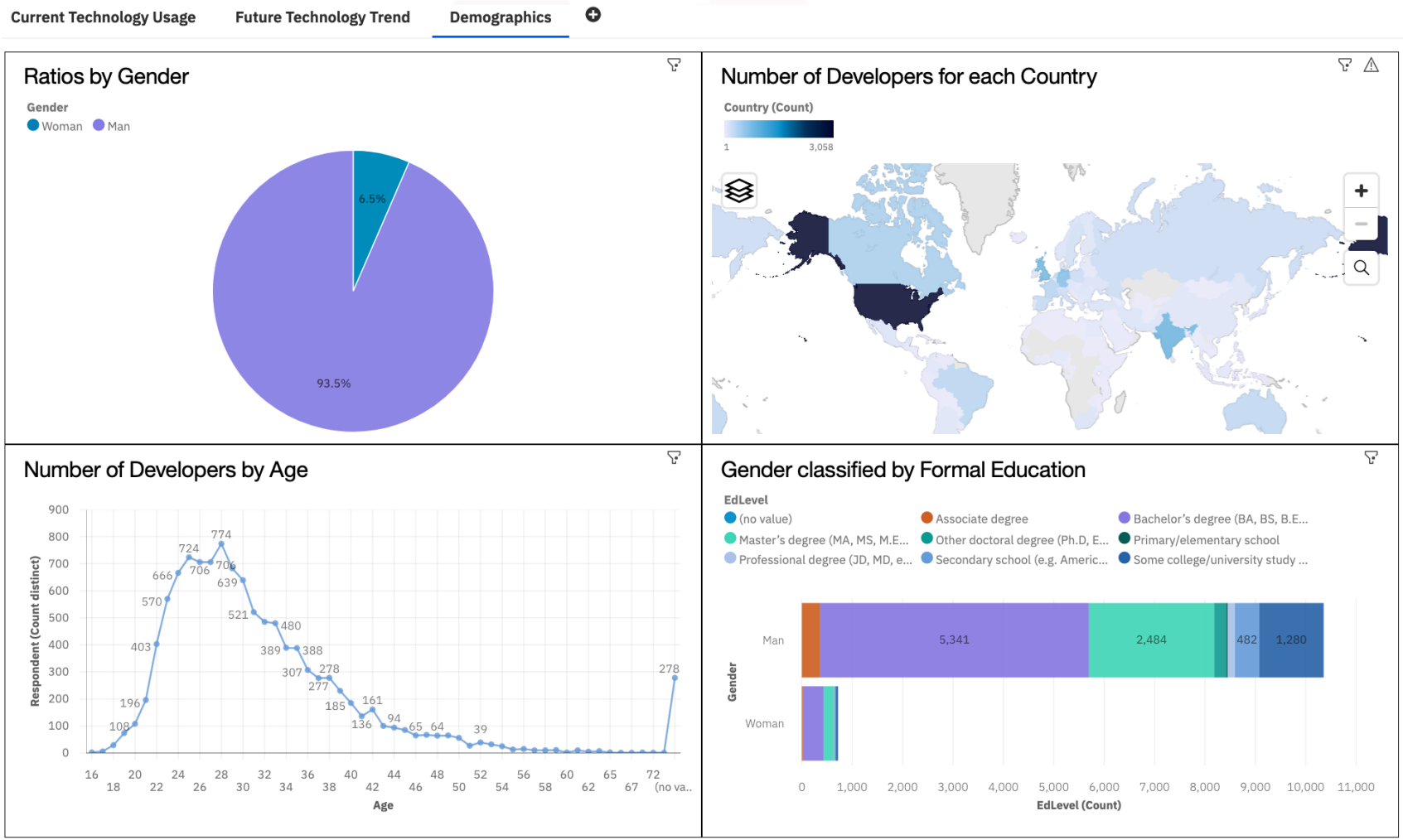


DASHBOARD TAB 2

Current Technology Usage | Future Technology Trend | Demographics



DASHBOARD TAB 3



DISCUSSION

Let ask some questions according to the datasets ;

- Which technologies are in top demand ?
- Which technologies should prospective developers and data professionals be learning ?
- Which technologies should educators place more emphasis on teaching in upcoming years ?
- What does the distribution of annual compensation for developers look like ?
- What is the developer demographic like?

OVERALL FINDINGS & IMPLICATIONS

Findings

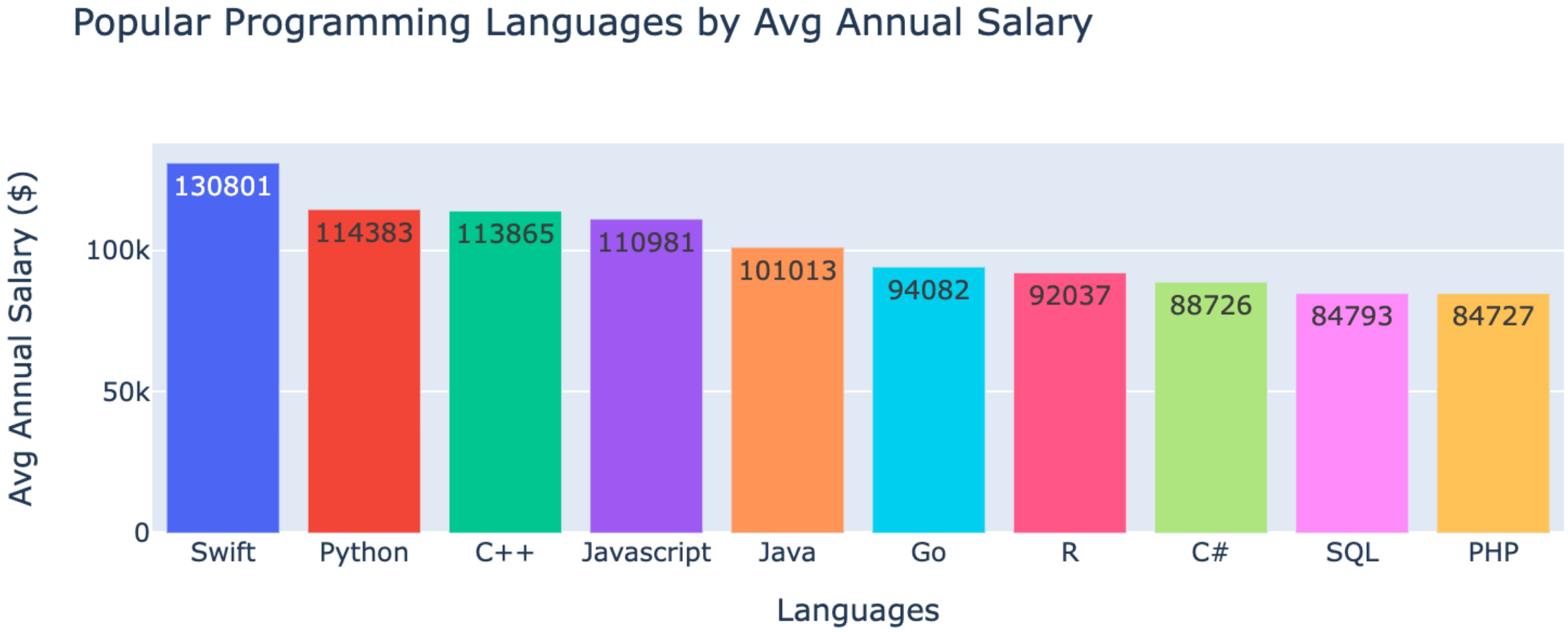
- High usage and interest in JavaScript and HTML/CSS remain high usage. There is also increasing interest in TypeScript.
- NoSQL database programs gaining interest, of which *MongoDB* was the most used in 2019 and desired for the next year.
- Majority of coders are in the age of 24 – 30 years
- Majority of coders have at least High school level education
- Windows, Linux and AWS are top desired platforms usage in tech.
- USA has the high percentage of the developers.

Implications

- Web development is still in high demand. Current and prospective developers may consider picking up *Typescript* in addition to *JavaScript* and *HTML/CSS.*
- With the growing need to handle big data and perform AI and ML work, data professionals should continue to enhance SQL competence but also enhance competence with NoSQL database programs and *Python*.
- Businesses need to adapt to changing technology preferences, especially in terms of talent acquisition and development.

CONCLUSION

- A subset of data collected as part of the *2019 Stack Overflow Developer Survey* was examined.
- The findings yielded numerous insights into the technologies most used and desired by developers in addition to the developer demographic.
- These insights should be particularly relevant for current and prospective developers aiming to remain competitive, businesses aiming to upskill their talent, educators in the field, and policy makers aiming to address gender and economic issues.

APPENDIX 01- JOB POSTINGS

APPENDIX 02 - POPULAR LANGUAGES