Stack Over-Flow Developer Survey 2019-Data Analysis Project

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EXECUTIVE SUMMARY

- This report presents the findings of a data analysis project on the Stack Overflow survey 2019, which aimed to identify key trends and insights in the global software developer community.

- Insights presented in this project:
  - Top Languages, Databases, Frameworks and Platforms for the current year (2019)
  - Top Languages, Databases, Frameworks and Platforms trends for future year based on the data collection and analysis
  - An analysis of how gender, age and country influence the distribution of developers

- Point3

INTRODUCTION

- The main goal of this analysis is to gain a deeper understanding of the current technology and platform preferences of developers, by identifying trends and patterns in their usage.

- The data collected from Stack Overflow survey has enabled us to identify potential future technology trends through our analysis

- Audience
  - Developers
  - Students
  - IT professionals
  - Educators

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METHODOLOGY

- **Data Source**
  - Stack Overflow 2019 survey and Results
  - Data Provided by IBM: Technology Dataset and Demographics Dataset

- **Data Cleaning:** Python libraries Panadas and NumPy used to load data and perform cleaning techniques

- **Data Analysis:** Exploratory Data Analysis (EDA) is performed by using SQL queries

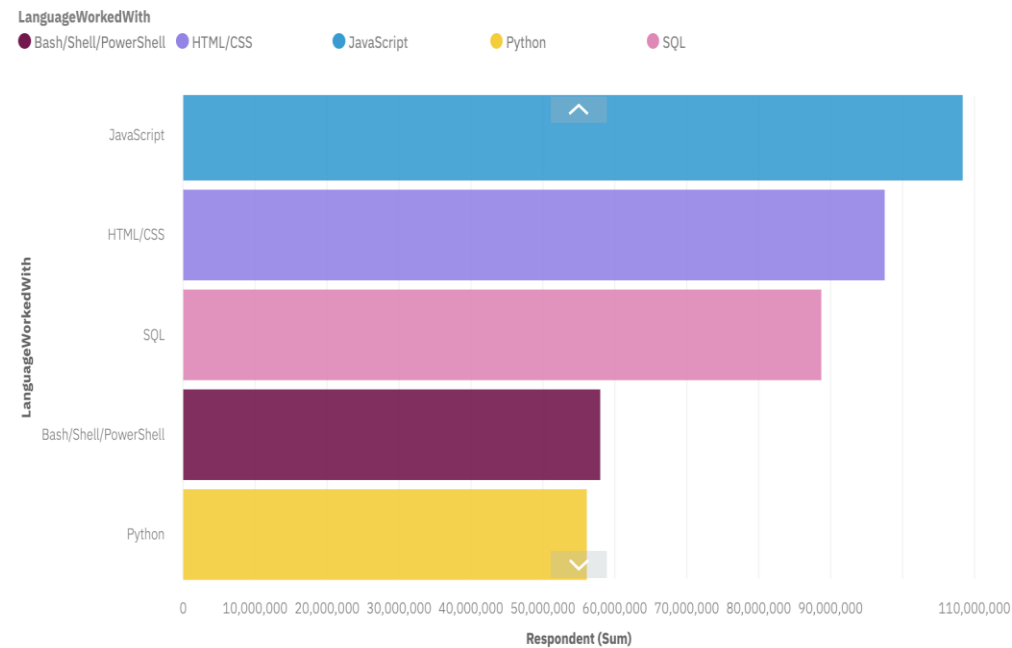- **Data Visualization**
  - Matplotlib and Seaborn
  - IBM Cognos

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RESULTS

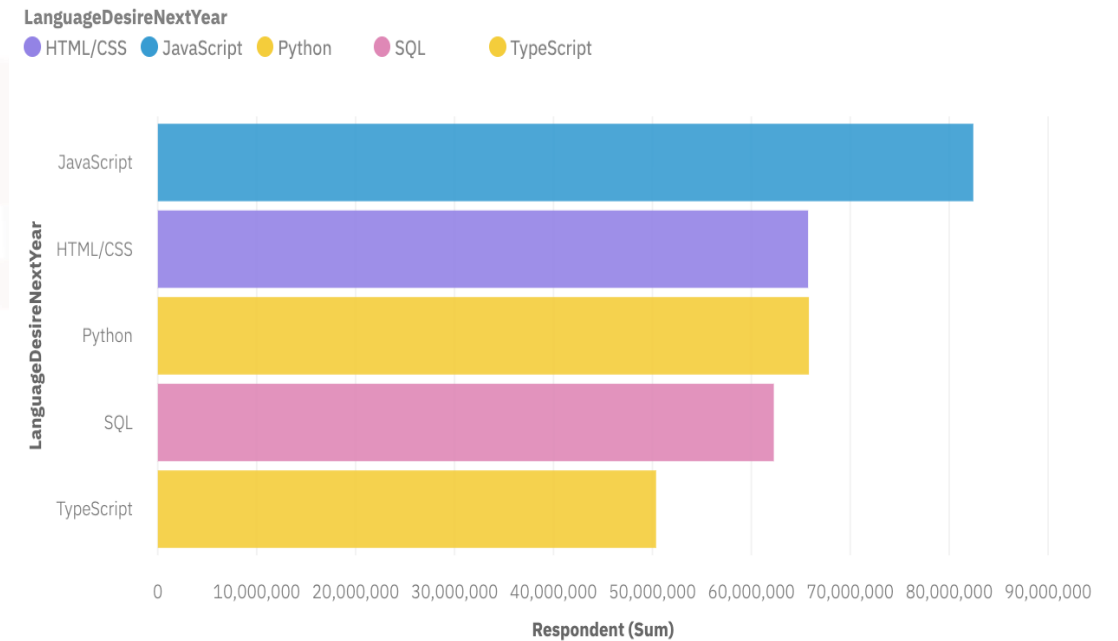|									
1	9	I am a developer by profession	Yes	Once a month or more often	The quality of OSS and closed source software ...	Employed full-time	New Zealand	No	Some college/university study without earning ...	engin
2	13	I am a developer by profession	Yes	Less than once a month but more than once per ...	OSS is, on average, of HIGHER quality than pro...	Employed full-time	United States	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	engin
3	16	I am a developer by profession	Yes	Never	The quality of OSS and closed source software ...	Employed full-time	United Kingdom	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	
4	17	I am a developer by profession	Yes	Less than once a month but more than once per ...	The quality of OSS and closed source software ...	Employed full-time	Australia	No	Bachelor's degree (BA, BS, B.Eng., etc.)	engin
...	...	...	...	...	...	...	...	...	...	
11547	25136	I am a developer by profession	Yes	Never	OSS is, on average, of HIGHER quality than pro...	Employed full-time	United States	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	engin
11548	25137	I am a developer by profession	Yes	Never	The quality of OSS and closed source software ...	Employed full-time	Poland	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	engin

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript and HTML/CSS most popular languages for year 2019 and for upcoming year

- Python and SQL has a large popularity among developers

- Python has gained interest for the next year

Implications

- Increasing Demand on Python will result in the growth of AI and machine learning field

- Web development languages JavaScript and HTML/CSS will continue to be popular

- SQL expected to remain in trends and increases a chance of employment in Big Data field

DATABASE TRENDS

Top 5 databases for the 2019 year

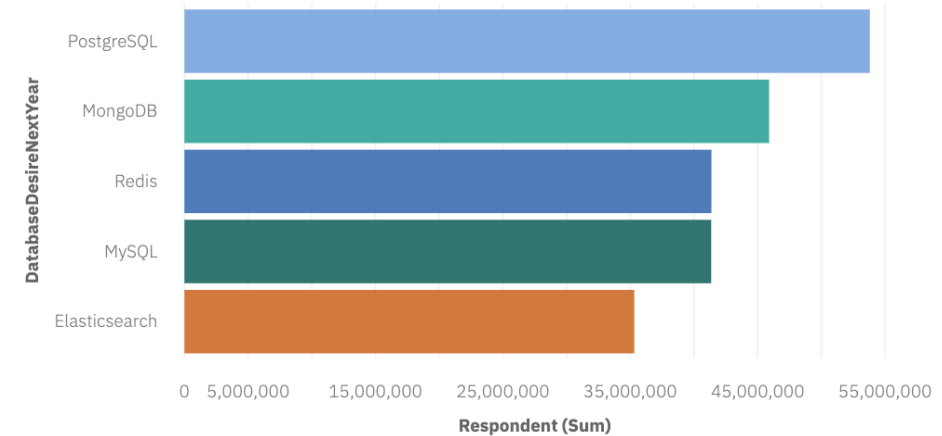**DatabaseWorkedWith**
- ● Microsoft SQL Server
- ● MongoDB
- ● MySQL
- ● PostgreSQL
- ● SQLite
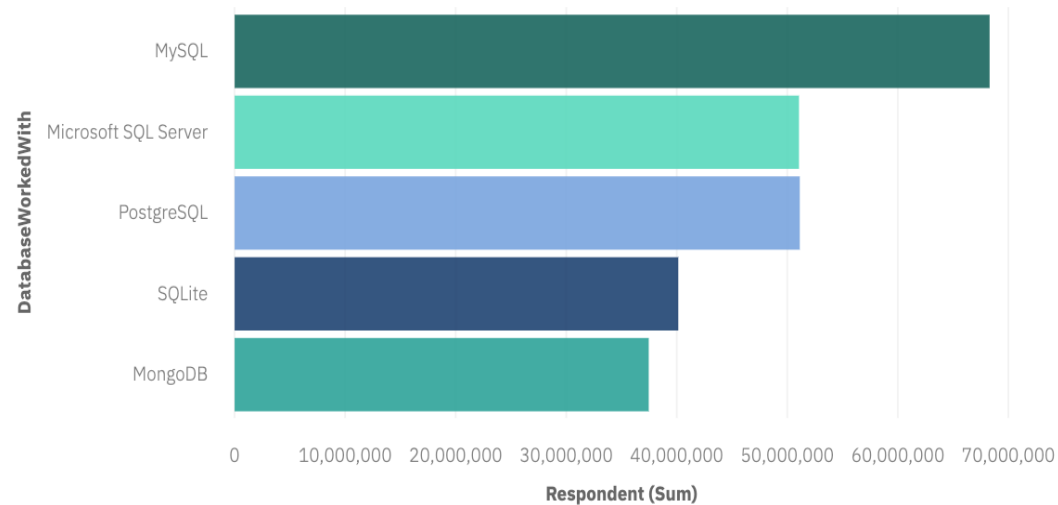
Next Year

Top 5 databases for the next year

DatabaseDesireNextYear
- ● Elasticsearch
- ● MongoDB
- ● MySQL
- ● PostgreSQL
- ● Redis

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL was the most popular Database in 2019
- PostgreSQL and MongoDB were quite popular in 2019
- Microsoft SQL Server had a huge popularity among developers

Implications

- MySQL is likely to remain in trends and become one of the essential skills for all developers
- PostgreSQL and NOSQL database MongoDB is considered to be learned by most developers
- The demand on both NOSQL and SQL database will be increased for managing structured and unstructured data and they will be one of the top requirements skills by employee

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DASHBOARD

Link to the Dashboard

DASHBOARD TAB 1

Current Technology Usage   **Future Technology Trend**   **Demographics**   ⊕

Top 10 LanguageWorkedWith

LanguageWorkedWith	Respondent (Sum)
JavaScript	108,371,442
HTML/CSS	97,521,608
SQL	88,712,115
Bash/Shell/PowerShell	57,976,092
Python	56,108,957
Java	55,836,723
C#	53,376,993
TypeScript	40,230,558
PHP	36,438,296
C++	24,456,246

LanguageWorke...
- Bash/Shell/P...
- C#
- C++
- HTML/CSS
- Java
- JavaScript
- PHP
- Python
- SQL
- TypeScript

Top 10 DatabaseWorkedWith

DatabaseWorkedWith	Value
MySQL	5,313
Microsoft SQL Server	4,061
PostgreSQL	3,820
MongoDB	2,953
SQLite	2,853
Redis	2,139
Elasticsearch	1,936
MariaDB	1,700
Oracle	1,659
Firebase	1,309

DatabaseWor...
- Elastics...
- Firebase
- MariaDB
- Microsof...
- MongoDB
- MySQL
- Oracle
- Postgre...
- Redis
- SQLite

PlatformWorkedWith

Respondent (Sum)   2,371,114 — 67,350,617

PlatformWorkedWith
- AWS   Android   Arduino
- Docker   Google Cloud Platform   Heroku

Linux Windows AWS Arduino Docker Android MacOS Slack Google Cloud Platform iOS Heroku WordPress Microsoft Azure Raspberry Pi Kubernetes IBM Cloud or Watson Oracle

Top 10 WebFrameWorkedWith

jQuery ASP.NET Angular/A... React.js D... V... Expr... Sp... F...

WebFrameWorkedWith
- ASP.NET
- Angular/Angular.js
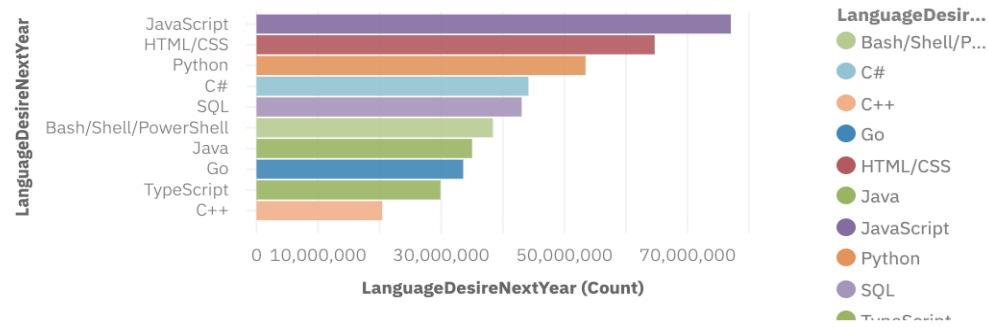- Django
- Express
- Flask
- Laravel
- React.js
- Spring
- Vue.js
- jQuery

DASHBOARD TAB 2

Current Technology Usage | **Future Technology Trend** | Demographics ⊕

Top 10 LanguageDesireNextYear

LanguageDesir...
- Bash/Shell/P...
- C#
- C++
- Go
- HTML/CSS
- Java
- JavaScript
- Python
- SQL
- TypeScript

Top 10 DatabaseDesireNextYear

DatabaseDesireNextY...
- DynamoDB
- Elasticsearch
- Firebase
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- PostgreSQL
- Redis
- SQLite
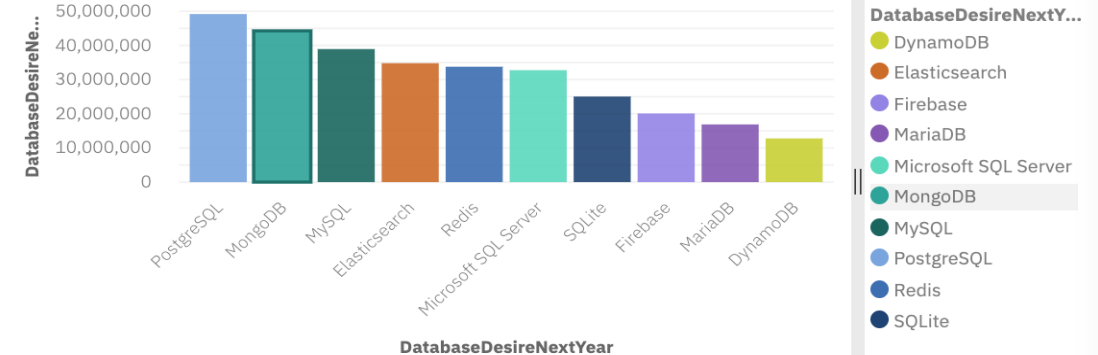
PlatformDesireNextYear
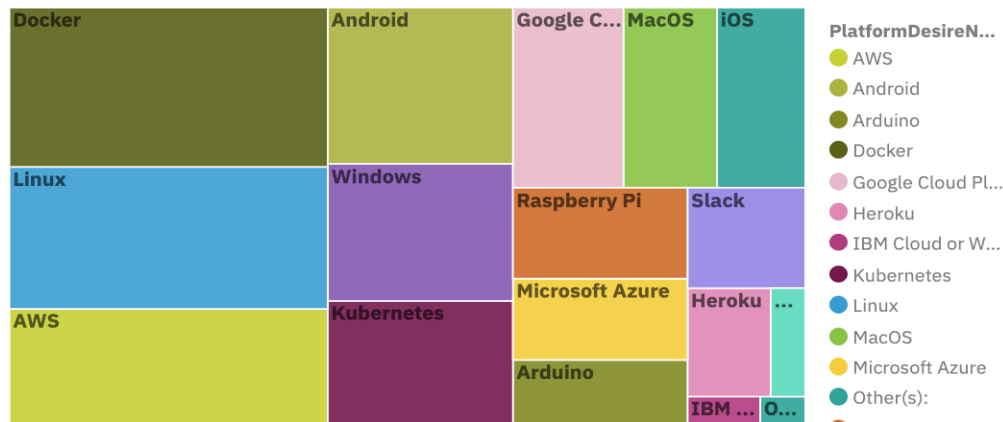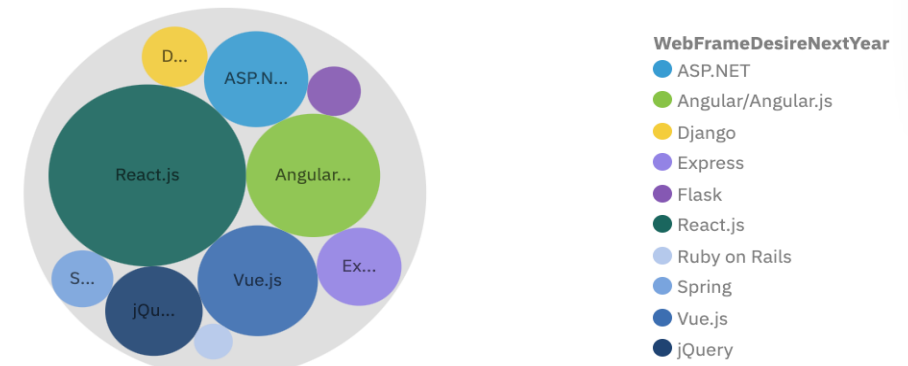
PlatformDesireN...
- AWS
- Android
- Arduino
- Docker
- Google Cloud Pl...
- Heroku
- IBM Cloud or W...
- Kubernetes
- Linux
- MacOS
- Microsoft Azure
- Other(s):

Top 10 WebFrameDesireNextYear

WebFrameDesireNextYear
- ASP.NET
- Angular/Angular.js
- Django
- Express
- Flask
- React.js
- Ruby on Rails
- Spring
- Vue.js
- jQuery

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DASHBOARD TAB 3
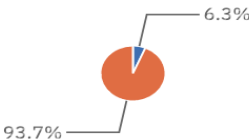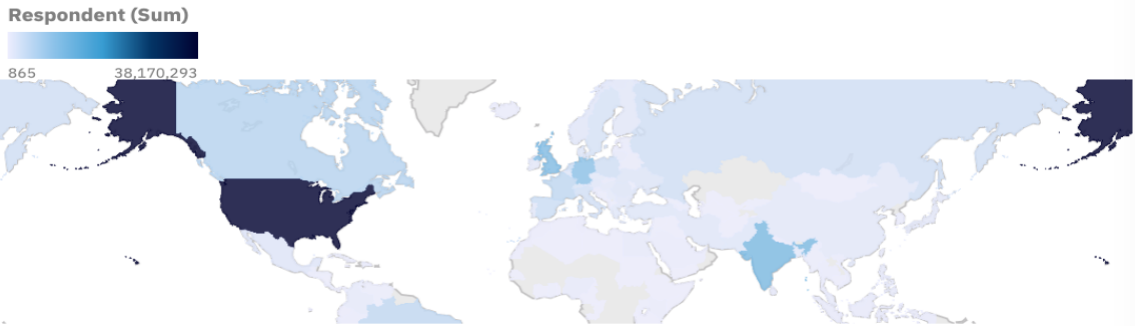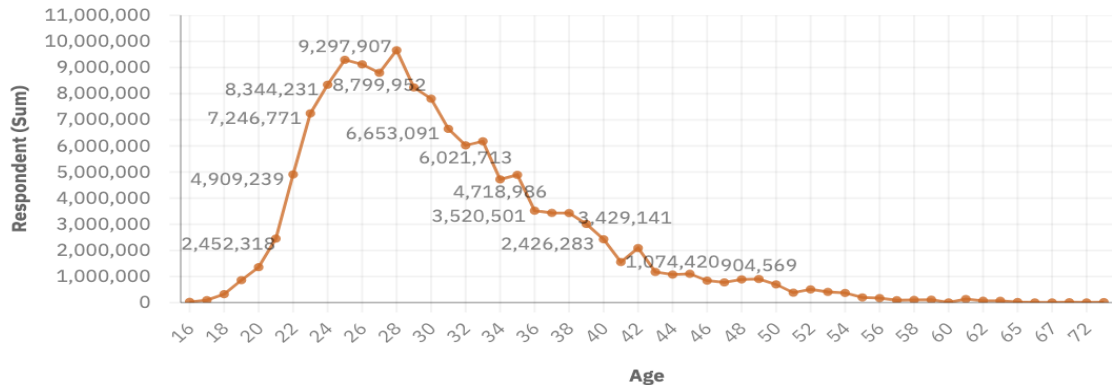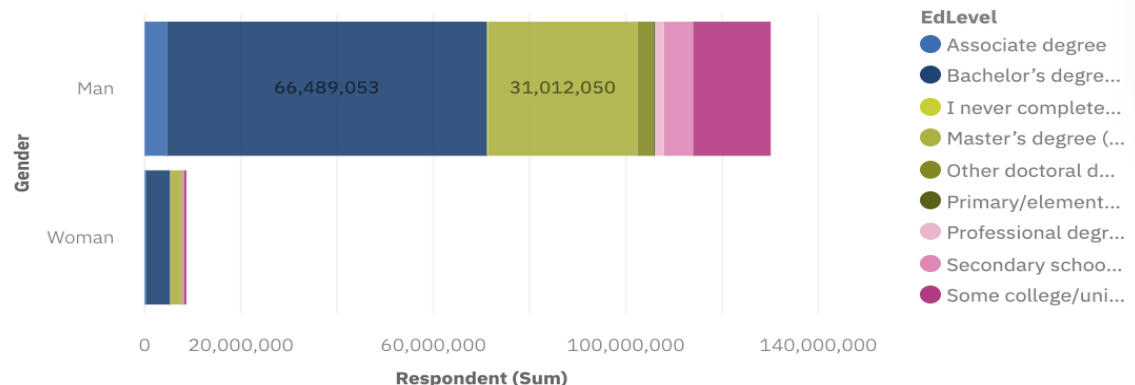
DISCUSSION

- After conducting a comprehensive analysis of the 2019 survey data we can gain valuable insights:

  ✓ The gender gap ratio in this field of IT

  ✓ The recommended programming languages, Databases, and Platforms for developers to be learned

  ✓ The group age that most likely in the fields or participated in the survey

OVERALL FINDINGS & IMPLICATIONS

Findings

- JavaScript, HTML/CSS and Python remains on the top trend. TypeScript has become more popular

- There is a high gender gap, we can see a significant proportion of males in the IT field

- The difference in count of Developers and Professional based on countries are very high

Implications

- Learning the most trend languages and Databases can help developers to handle big data and participate in AI projects

- Greater number women should be encouraged to pursue their passion for IT

- Learning HTML/CSS and JavaScript can be incredibly helpful for aspiring developers

CONCLUSION

- To conclude the 2019 Stack Over-Flow survey dataset, here is some findings:

✓ The recommendations for whom are interested to get into IT field and for whom are aiming to upskill are

✓ Language to learn: Python, JavaScript and HTML/CSS
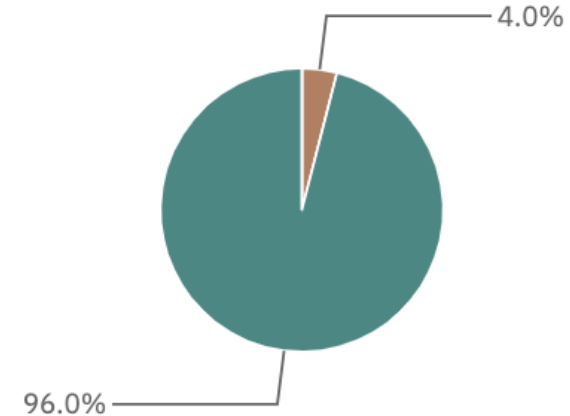
✓ Database to learn: NOSQL and SQL

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APPENDIX

Participants Employees types

Employment
- Employed part-time
- Employed full-time

4.0%

96.0%

JOB POSTINGS

Data Source: Job Post Link
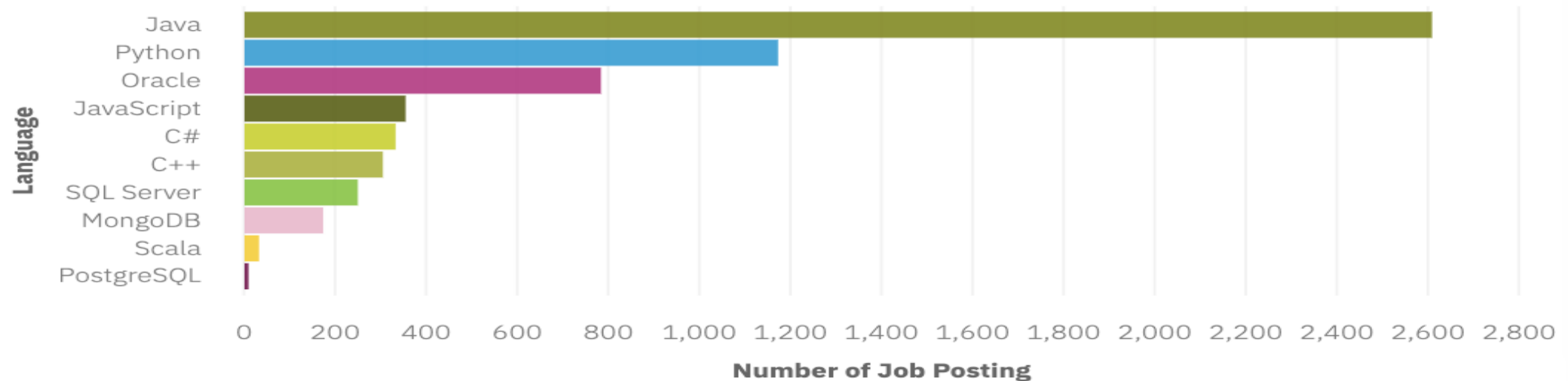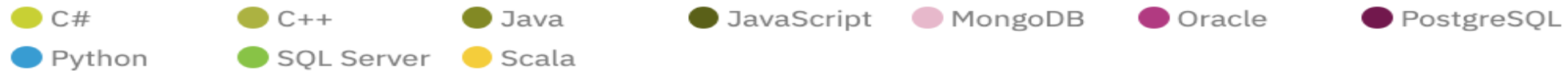
POPULAR LANGUAGES

Average Annual Salary by Language

Language	Average 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