Analysis of Stack Overflow Developer Survey Data

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EXECUTIVE SUMMARY

In the following we present key insights and implications found by analyzing the **Stack Overflow Developers Survey (2019)**:

Findings:

- popular **currently used programming languages, databases and developer tools**
- outlook of **It-tools which likely be popular in the future**
- **developers demographics**

➡ The findings are important for young developers, planning a career in IT.

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INTRODUCTION

The data is taken from the **2019 Stack Overflow Developer's survey**

- Link to Dataset: **https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/**

- A **randomized subset (size 11,398)** of the original **survey set (size 90,000)** was used for the analysis

- It contains information about:
    - used technologies
    - future trends
    - demographic data

METHODOLOGY

- Saving and uploading the Dataset (link on previous page)

- Data wrangling: A subset of the survey data was provided and cleaned (i.e. duplicate rows removed and missing data was replaced) by using Python.

- Data Analysis: Exploratory data analysis was performed again by using Python.

- Data Visualization: Data was plotted and visualized in several different ways by using Python as well as IBM Cognos
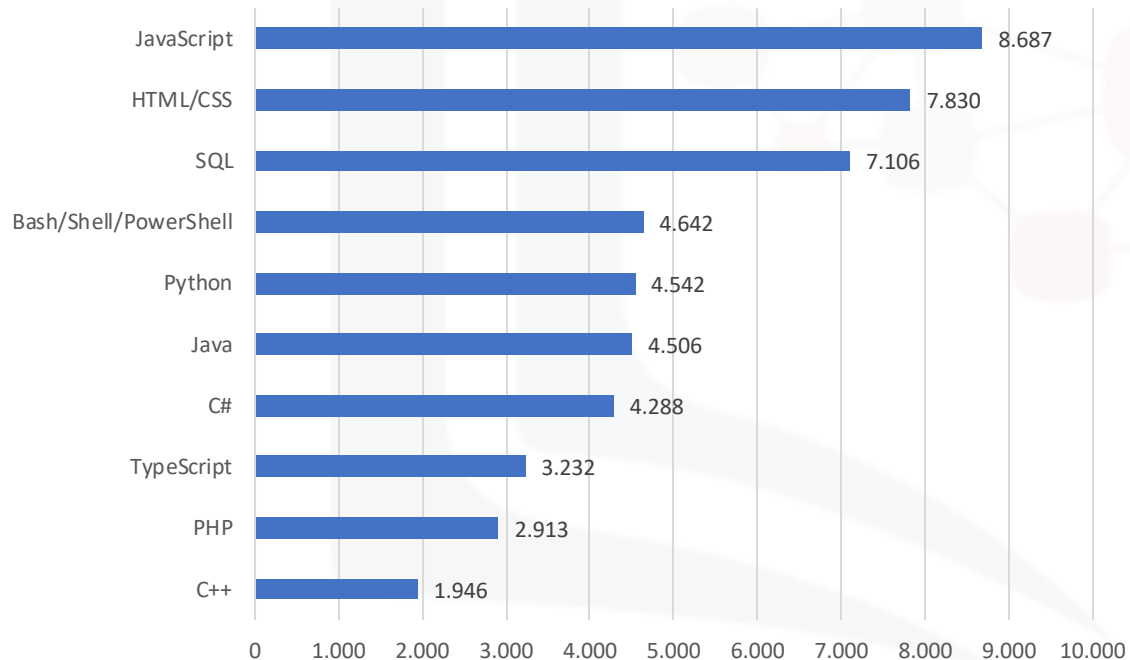
FIRST RESULTS: DEMOGRAPHICS & INCOME

A quick **analysis of demographics and compensation** was performed:

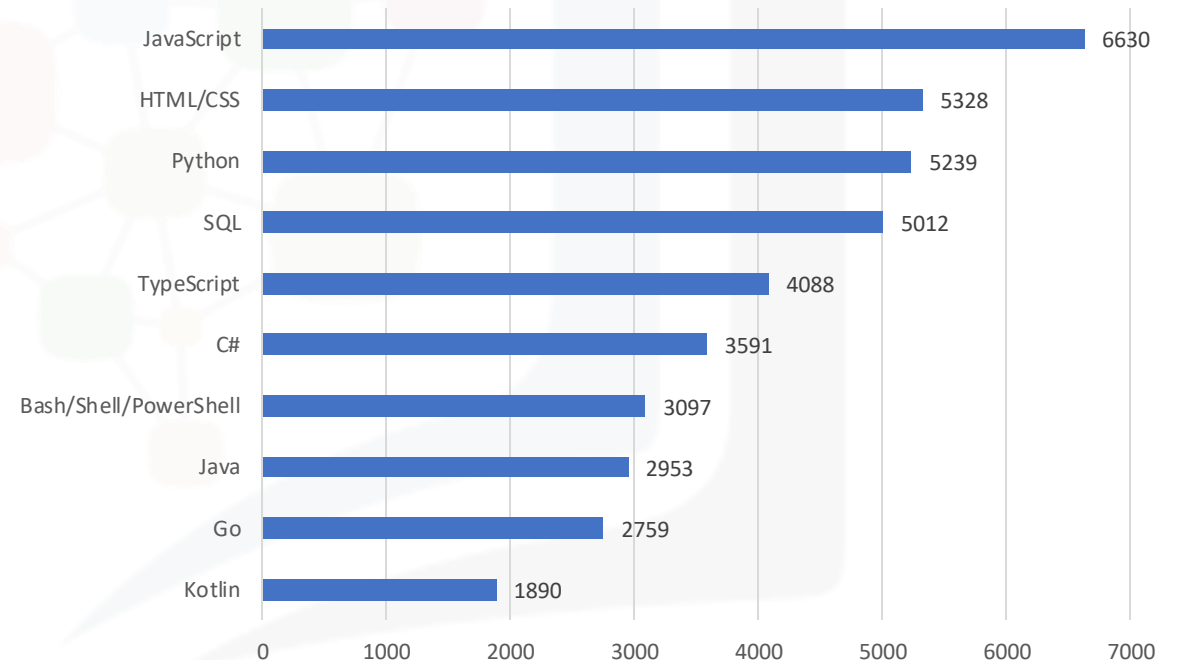- **Median age** of developers in the survey: **29 years**

- **Median income: 52,704 $ per year** (man: 52,399 $, women: 54,956 $)

- **Ratio of gender** of respondants: **92.5% male, 6.5% female, 1% divers**

- **Correlation between age and income** (correlation factor 0.4)

PROGRAMMING LANGUAGE TRENDS

Top ten languages, developers are using currently:

Language	Value
JavaScript	8.687
HTML/CSS	7.830
SQL	7.106
Bash/Shell/PowerShell	4.642
Python	4.542
Java	4.506
C#	4.288
TypeScript	3.232
PHP	2.913
C++	1.946

Top ten languages, developers are planning to use in the future:

Language	Value
JavaScript	6630
HTML/CSS	5328
Python	5239
SQL	5012
TypeScript	4088
C#	3591
Bash/Shell/PowerShell	3097
Java	2953
Go	2759
Kotlin	1890

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings:

- JavaScript, HTML/CSS & SQL are currently most frequently used languages by a margin

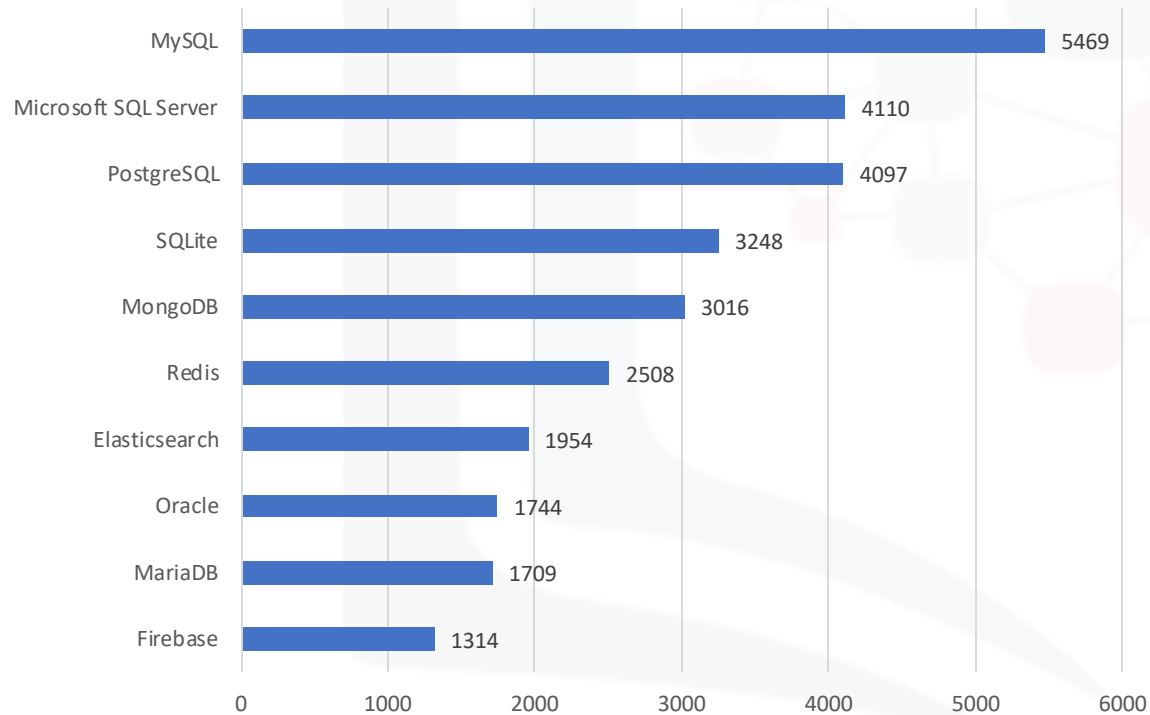- JavaScript, HTML/CSS, SQL & Python are most aspiring languages

Implications:

- Use of current languages reflects IT-topics which are popular right now:
  - JavaScript: used for development of web-based applications
  - HTML/CSS: used for creating websites
  - SQL: used for (big) data handling

- Future trend languages reflect which topics might become more important
  - JavaScript, HTML & SQL stay popular
  - Python: might reflect the upcoming importance of AI, Machine Learning & Data Handling
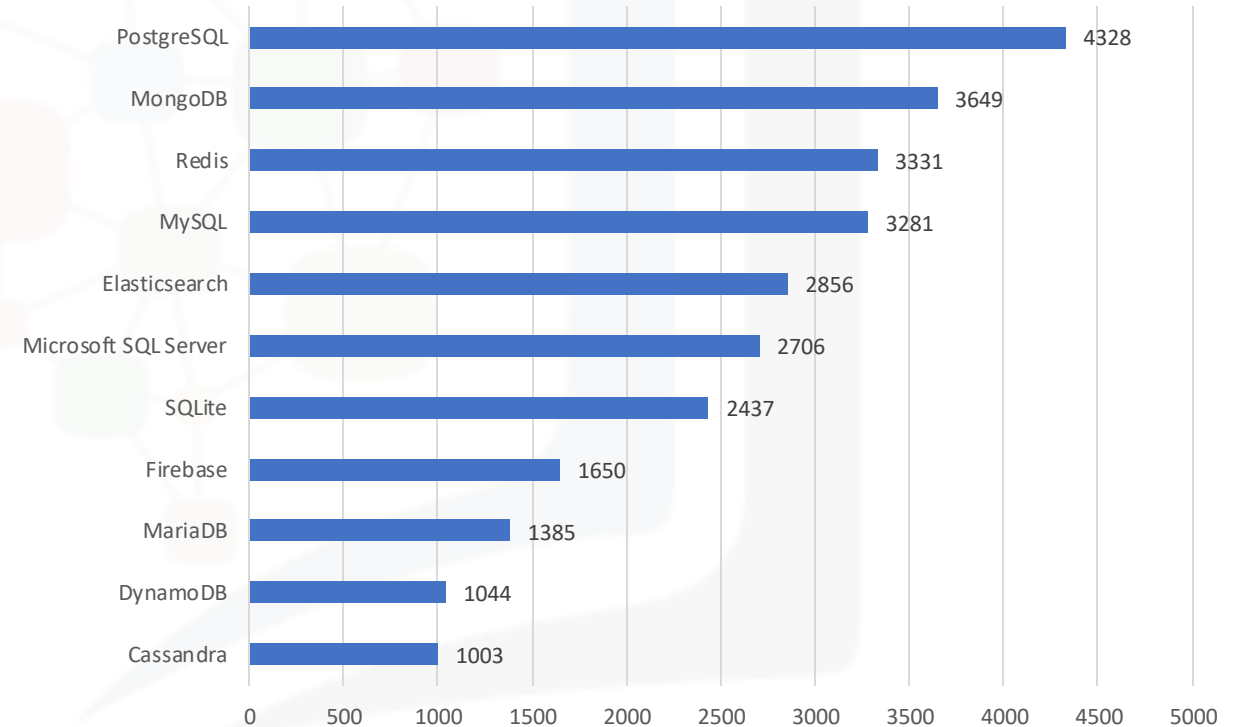
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DATABASE TRENDS

Top ten databases, developers are using currently:

Database	Value
MySQL	5469
Microsoft SQL Server	4110
PostgreSQL	4097
SQLite	3248
MongoDB	3016
Redis	2508
Elasticsearch	1954
Oracle	1744
MariaDB	1709
Firebase	1314

Top ten databases, developers are planning to use in the future::

Database	Value
PostgreSQL	4328
MongoDB	3649
Redis	3331
MySQL	3281
Elasticsearch	2856
Microsoft SQL Server	2706
SQLite	2437
Firebase	1650
MariaDB	1385
DynamoDB	1044
Cassandra	1003

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL, Microsoft SQL Server & PostgreSQL are most frequently used databases

- They stay popular, but MongoDB & Redis are gaining popularity and even surpass MySQL & Microsoft SQL Server

Implications

- SQL Databases are currently more popular than NoSQL Databases

--> currently more relational data stored

- NoSQL is becoming more important

--> indicates the uprising of big data

- Future developers should focus on SQL as well as on NoSQL
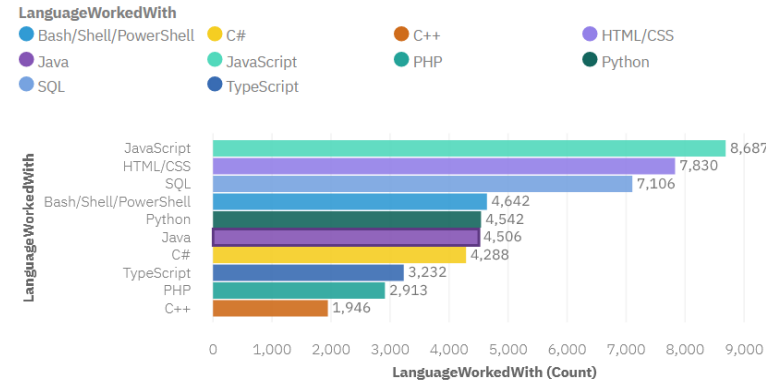
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DASHBOARD

The following is the link to an extensive Dashboard, which visualizes the technology use of IT-Users and Developers as well as future trends in technologies and demographics:
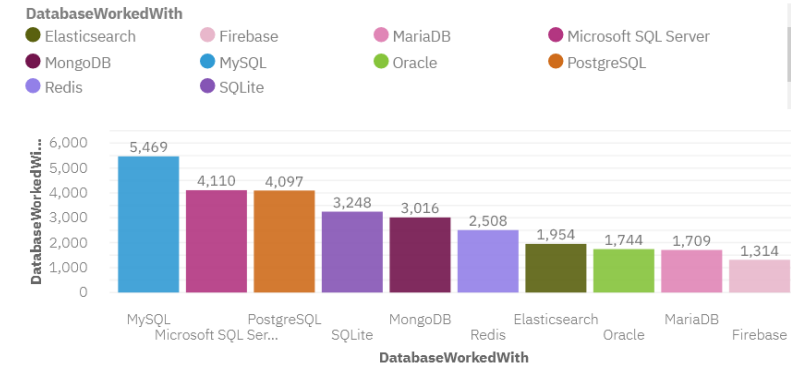
Link to dashboard of technology trends and demographics.

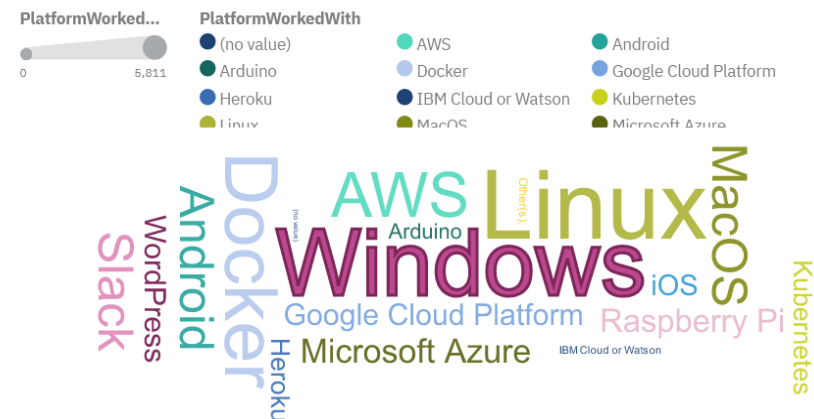On the next three pages are the screenshots of the Dashboards.

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DASHBOARD TAB 1

Top ten languages developers use:

LanguageWorkedWith
- Bash/Shell/PowerShell
- C#
- C++
- HTML/CSS
- Java
- JavaScript
- PHP
- Python
- SQL
- TypeScript

Language	Count
JavaScript	8,687
HTML/CSS	7,830
SQL	7,106
Bash/Shell/PowerShell	4,642
Python	4,542
Java	4,506
C#	4,288
TypeScript	3,232
PHP	2,913
C++	1,946

LanguageWorkedWith (Count)
0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000

Top ten databases developers use:

DatabaseWorkedWith
- Elasticsearch
- Firebase
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- Oracle
- PostgreSQL
- Redis
- SQLite

Database	Count
MySQL	5,469
Microsoft SQL Ser...	4,110
PostgreSQL	4,097
SQLite	3,248
MongoDB	3,016
Redis	2,508
Elasticsearch	1,954
Oracle	1,744
MariaDB	1,709
Firebase	1,314

DatabaseWorkedWith

Most frequently used platforms:

PlatformWorked... 0 — 5,811

PlatformWorkedWith
- (no value)
- AWS
- Android
- Arduino
- Docker
- Google Cloud Platform
- Heroku
- IBM Cloud or Watson
- Kubernetes
- Linux
- MacOS
- Microsoft Azure

Most frequently used Web Frames:

WebFrameWorke... 939 — 4,629

WebFrameWorkedWith
- ASP.NET
- Angular/Angular.js
- Django
- Express
- Flask
- Laravel
- React.js
- Spring
- Vue.js
- jQuery
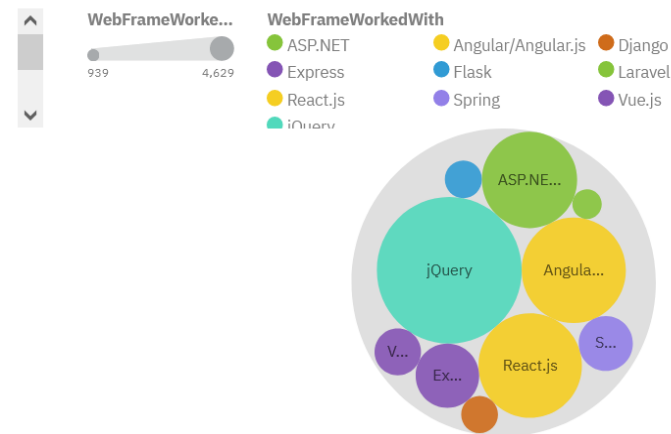
DASHBOARD TAB 2

Top ten languages developers want to learn in the future:

LanguageDesireNextYear
- Bash/Shell/PowerShell
- C#
- Go
- HTML/CSS
- Java
- JavaScript
- Kotlin
- Python
- SQL
- TypeScript

LanguageDesireNextYear	
JavaScript	6,630
HTML/CSS	5,328
Python	5,239
SQL	5,012
TypeScript	4,088
C#	3,591
Bash/Shell/PowerShell	3,097
Java	2,953
Go	2,759
Kotlin	1,890

Top ten databases developers plan to use in the future:

DatabaseDesireNextYear
- DynamoDB
- Elasticsearch
- Firebase
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- PostgreSQL
- Redis
- SQLite

DatabaseDesireNextYe... values: 4,328 (PostgreSQL), 3,649, 3,331 (Redis), 3,281, 2,856 (Elasticsearch), 2,706, 2,437 (SQLite), 1,650, 1,385 (MariaDB), 1,044

Platforms developers plan to use in the future:

PlatformDesireN... 0 — 5,865
PlatformDesireN... 0 — 5,865

Linux, Docker, AWS, Windows, Android, Kubernetes, MacOS, Raspberry Pi, Google ..., iOS, Arduino, Slack, Heroku, W..., IBM ..., Ot..., Micros...
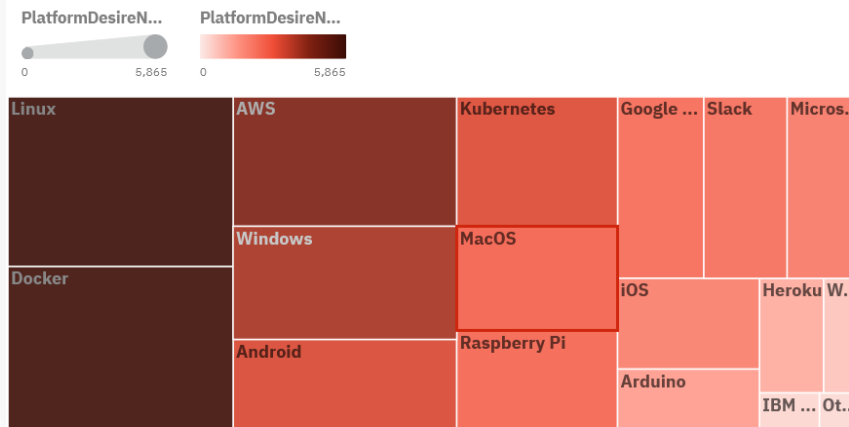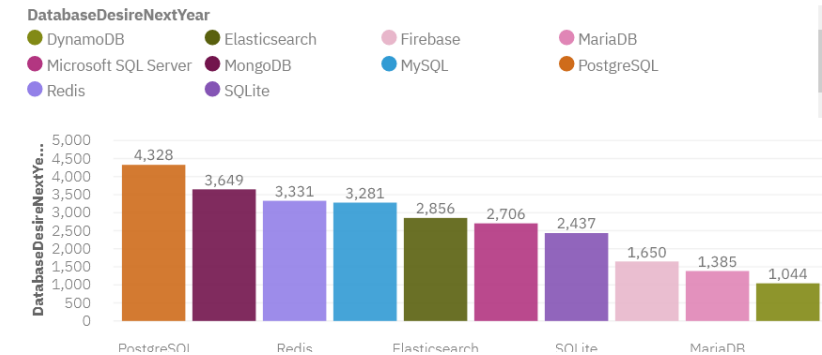
Top ten Webframes developers plan to use in the future:
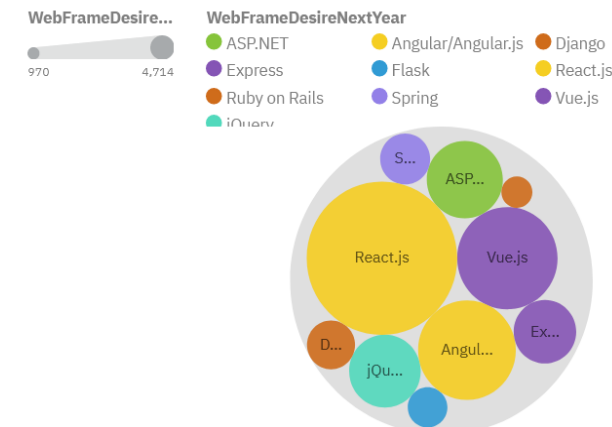
WebFrameDesire... 970 — 4,714

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

React.js, Vue.js, Angul..., jQu..., ASP..., Ex..., D..., S...

DASHBOARD TAB 3
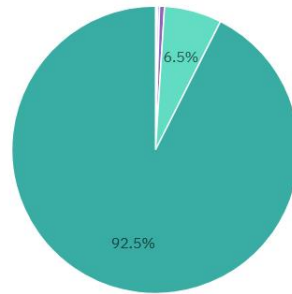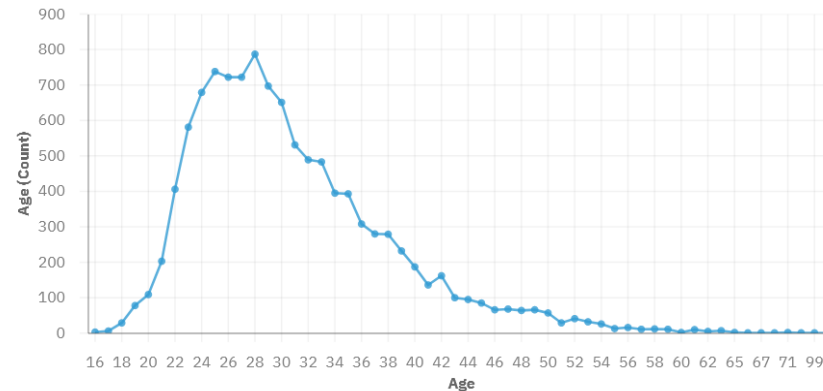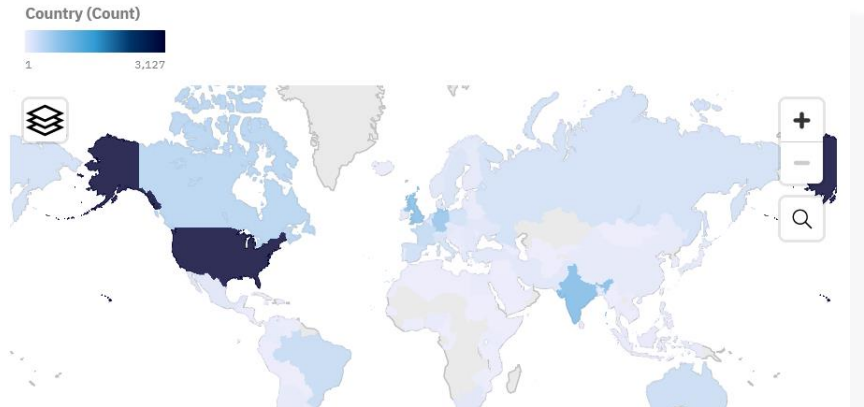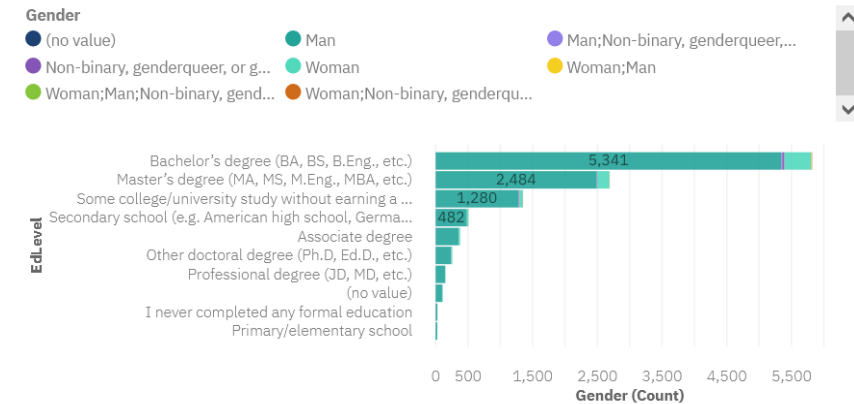
DISCUSSION

- We gave insights into the demographics and compensation of developers

- We showed which programming languages and databases most developers use currently and will be used in the near future

We gathered important information for young upcoming professionals and developers who want to start a career in Tech.

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OVERALL FINDINGS & IMPLICATIONS

Findings:

- JavaScript, HTML/CSS & SQL most frequently used

- JavaScript, HTML/CSS, SQL & Python are most uprising languages

- SQL Databases are currently more important, but NoSQL Databases becoming more popular

- Man are demographically strongly overrepresented, although women have a slightly higher median income

Implications

- Developers for web-applications and web pages as well as data experts are currently and in the future in high demand

- Use of Python indicates, that AI, ML and Data Analytics are fast growing fields

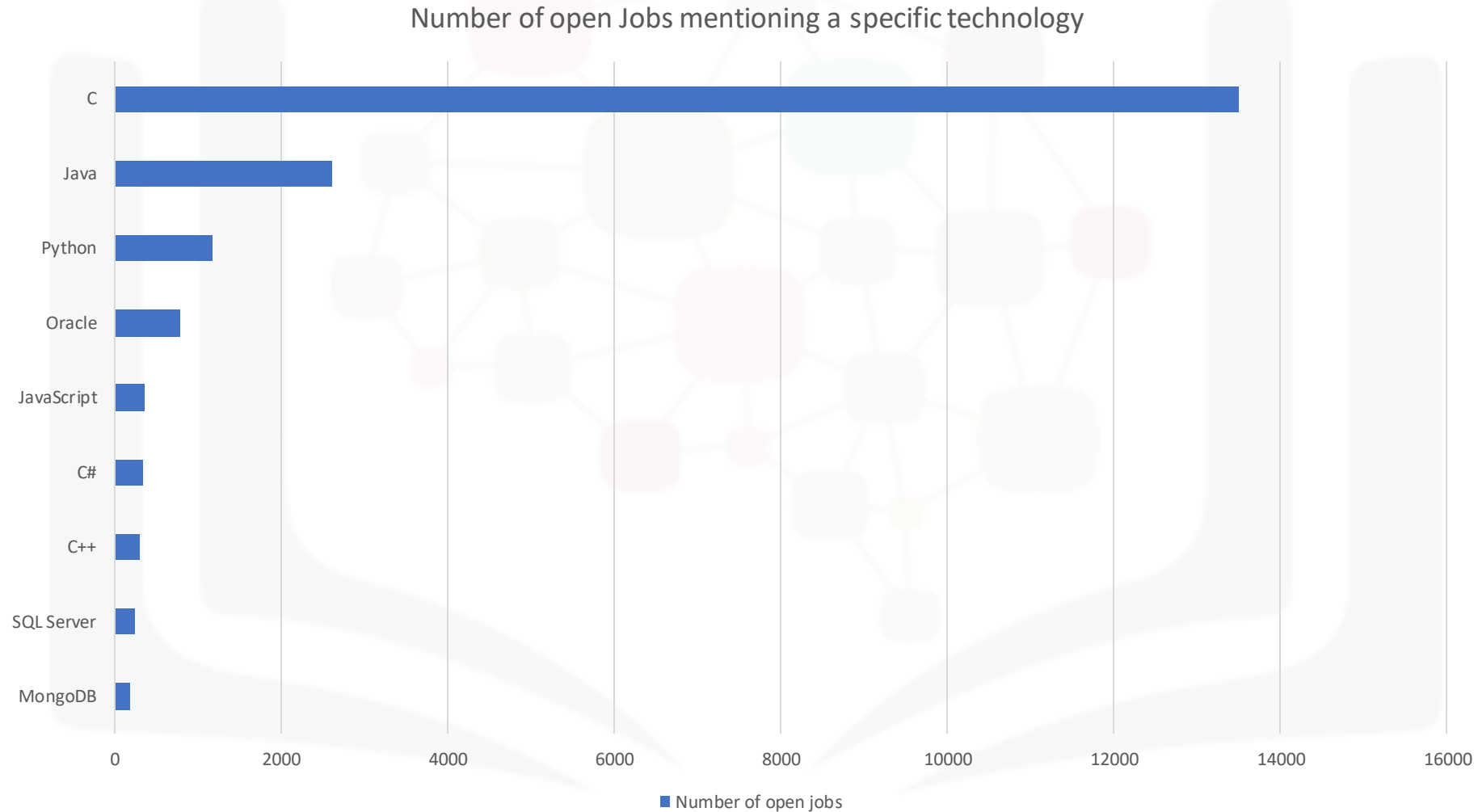- (Big) Data is still a fast growing, developing and changing field

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CONCLUSION

- The broad field of IT is still a growing and developing field

- Developers and Companies have to pay close attention to the changes in technologies in order to stay competitive

- Judging from the Income statistics, the field of IT is a highly lucrative career

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NUMBER OF OPEN JOB POSTINGS

Number of open Jobs mentioning a specific technology

■ Number of open jobs

ANNUAL SALARY OF POPULAR LANGUAGES

Average Annual Salary

| | Swift | Python | C++ | Javascript | Java | Go | R | C# | SQL | PHP |

■ Average Annual Salary

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