



## Identifying Emerging skills in the Tech Industry

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# OUTLINE

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- Executive Summary
- Introduction
- Methodology
- Results
  - Visualization – Charts
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
- Appendix

# EXECUTIVE SUMMARY

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**The Scenario** - To keep pace changes in technologies, it is required to perform regular analysis of the developer ecosystem to identify current/future skill requirements.

**Proposed Solution** - By collecting and analysing wrangled datasets from sources including; Job postings, Training portals and Surveys obtained through API endpoints and web scraping. This will allow for greater understanding of the most in demand skill sets for programmers this would facilitate impactful insights by answer the following:

- *What are the top programming languages in demand?*
- *What are the top database skills in demand?*
- *What are the key demographics of developers?*

**Processes** - Through data collecting and wrangling, exploratory data analysis and visualisation was possible using statistical and explorative data practices including data normalisation, outlier detection, aggregation and visualisation to help provide impactful and actionable insights into the future skills development of Technologists within different disciplines.

**The opportunities** - This insight can help guide resource allocation, training initiatives, and hiring strategies to stay competitive in the rapidly evolving IT landscape. Further resulting in organisations being able to identify areas of growth and investment to stay ahead of the curve in a rapidly evolving tech industry.

# INTRODUCTION

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Data was obtained using an API to determine the number of jobs currently open for various technologies and for various locations. This involved retrieving jobs based on their:

- **Location**
- **Technologies (programming languages and DQLs).**

Further data was retrieved through web scraping tabular data based on **average annual salary** for different **technologies**.

# METHODOLOGY

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**Data collection** – Data was obtained through web scraping and API endpoints, which included Technologies used in industry along with characteristics of the Developer that used such technologies.

**Data Preparation** – Data exploration of the data set was performed using the Pandas Library to gain understanding of its format. Data Wrangling was then utilized to identify duplicates, find missing values, impute missing values and normalize data for later comparison.

**Exploratory Data Analysis** – The converted to dataframes from a CSV format to allow for the distribution of key data points to be assessed. Further exploration through descriptive statistics, aggregation and outlier detection and correlation matrix analysis for the Age of developers.

**Data Visualization** – Data was then queried using SQL from a data warehouse. Data including the compensation of Developers, age of developers, Work hours by age and compensation by age. Additionally, a dashboard was created using the same dataset that gained insight into the current technologist landscape, more specifically looking at the current and future Languages/Databases used by Developer in industry.

# RESULTS

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## Python visualizations

- The distribution of compensation for developers was skewed right, and unimodal, with a modal salary of approximately \$21,000.
- A strong positive correlation for the compensation developers receive against ages was found.
- A clear majority of the respondents for the dataset were developers by profession.

## Currently used technologies

- JavaScript, HTML/CSS and SQL were amongst the top 3 currently used languages.
- MySQL, Microsoft SQL Servers and PostgreSQL were amongst the top 3 currently used databases.
- JQuery, React.js and Angular were amongst the top 3 currently used Web Frames.

## Future technologies

- JavaScript, HTML/CSS and Python were amongst the top 3 languages to be learnt next year.
- PostgreSQL, MongoDB, and Redis were amongst the top 3 Databases to be learn next year.
- React.js, Vue.js and Angular were amongst the top 3 Web Frames to be learnt next year.

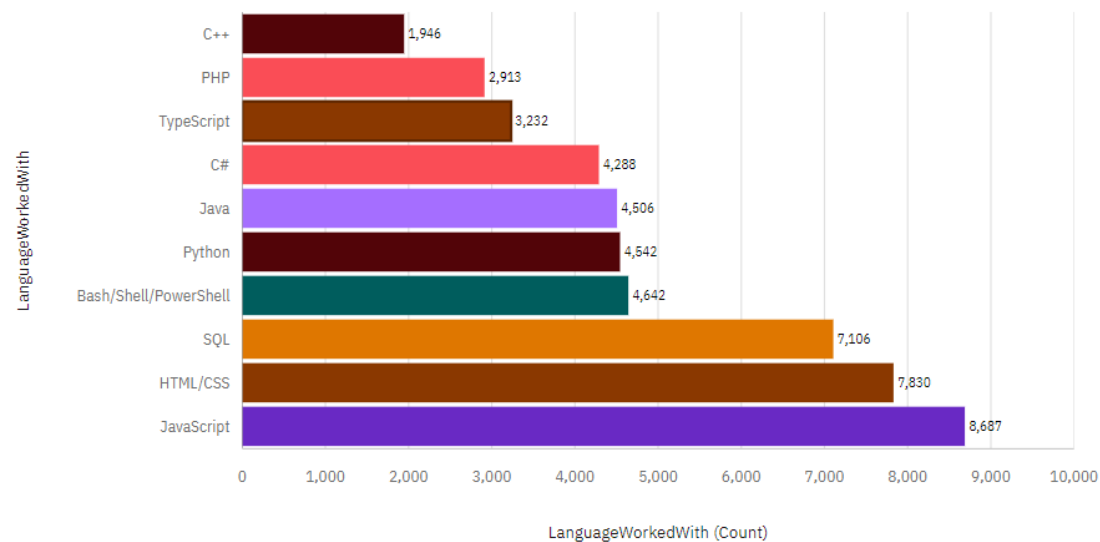
## Demographics

- An expected majority of the respondents were male (93.5%), with the mainstream of which having a Bachelor's Degree, from a wide variety of countries and a modal age of 28 years.

# PROGRAMMING LANGUAGE TRENDS

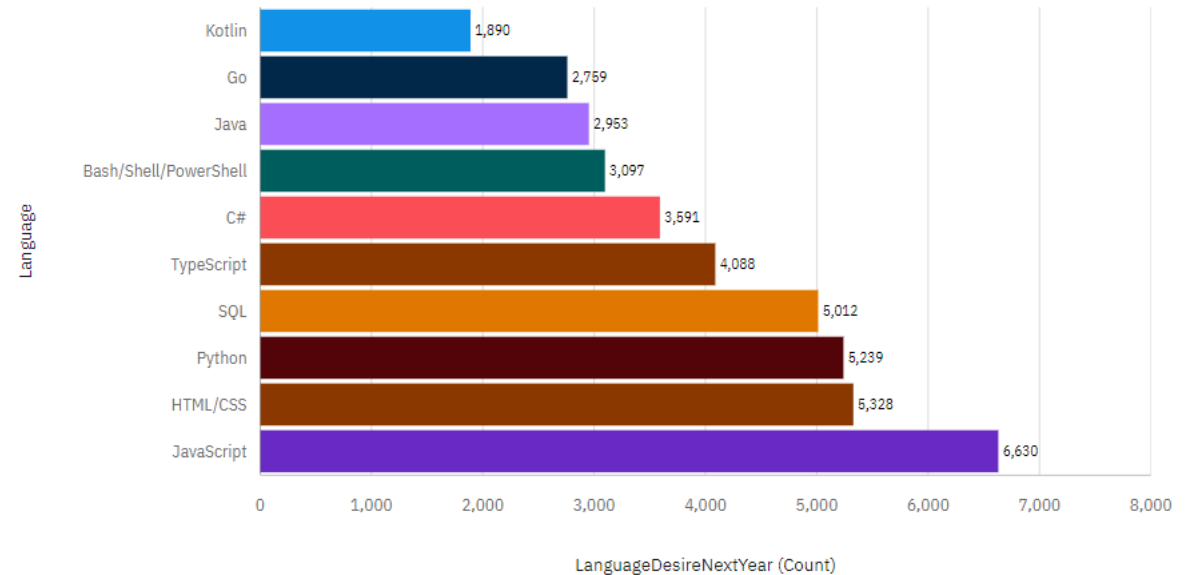
## Current Year

Top 10 Languages used by Developers



## Next Year

Top 10 Languages Desired to be Learned Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- There is an anticipated increase in the use of Python both compared to the current year and in the coming year.
- JavaScript is currently the top programming language and is expected to remain so in the upcoming year for developers.
- Languages such as Go and Kotlin are among the top 10 future languages to learn next year.

## Implications

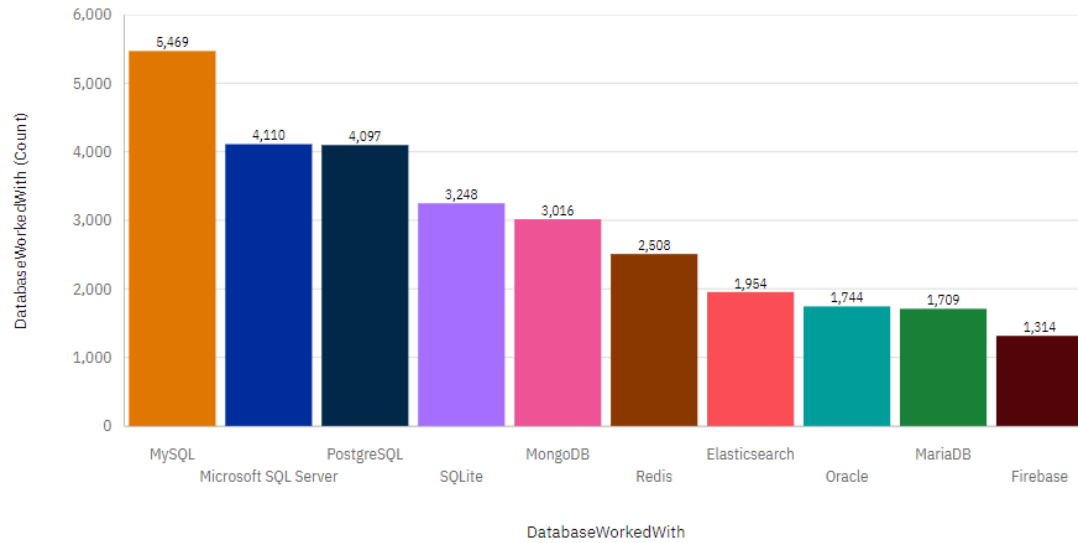
- Python may see increased demand over time and might be crucial for the career development of many developers in the industry.
- Front-end development skills will remain highly sought after by both developers and recruiters in the future.
- There appears to be a transition towards more modern programming languages in the near future



# DATABASE TRENDS

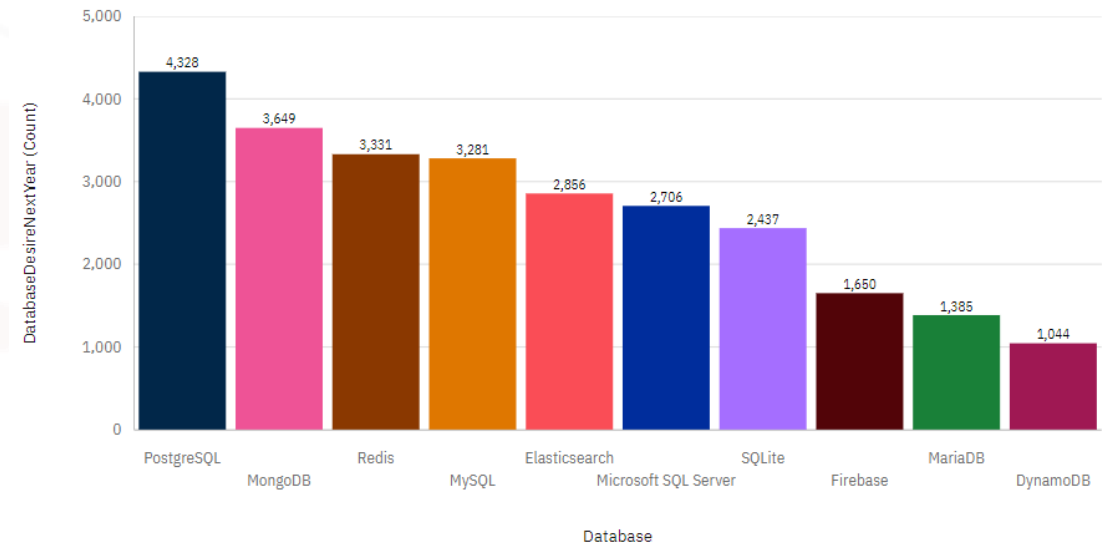
## Current Year

Top 10 Databases used by Developers



## Next Year

10 Top Databases Desired to be Learned Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- There appears to be a shift towards the use of MongoDB and Redis by Developers soon.
- PostgreSQL has the highest count for databases to be learnt next year, replacing the current highest MySQL.
- A more even spread of databases desired to be learnt next year can be seen, compared to a 3 more 'dominant' databases in the current year.

## Implications

- A shift towards databases that are more flexible and more accommodating for 'big data' is expected in the near future.
- Developers are predominantly desiring to learn PostgreSQL next year, which differs from this year's most in use database of MySQL.
- Developers are seeking to learn a more diverse array of databases in the coming year.

# DASHBOARD

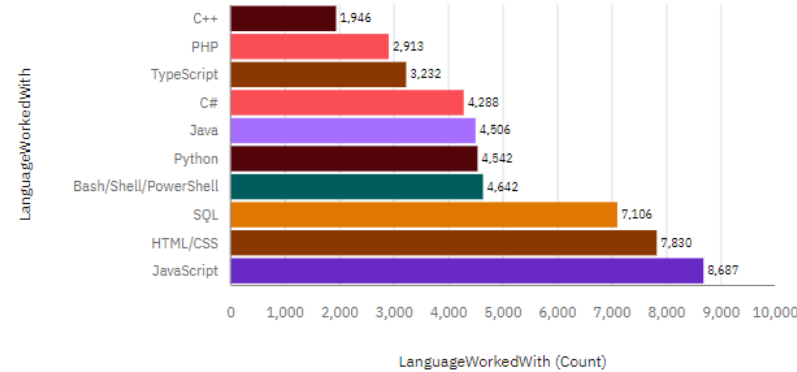
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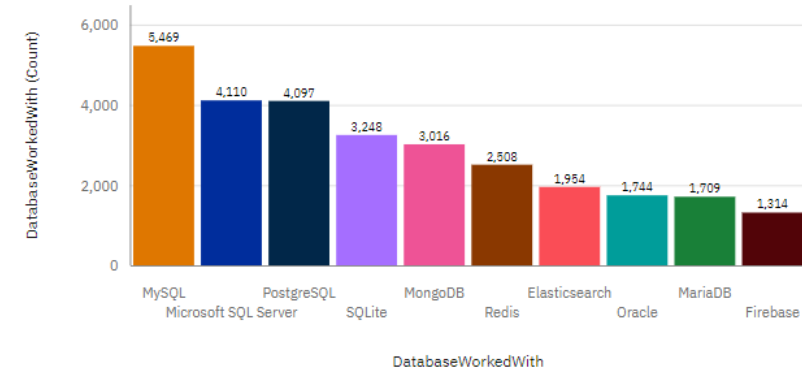
<https://github.com/LiamBatiste/IBM-Capstone-Cognos?tab=readme-ov-file>

# DASHBOARD – Current Technology Usage

Top 10 Languages used by Developers



Top 10 Databases used by Developers



Platform Popularity for Developers

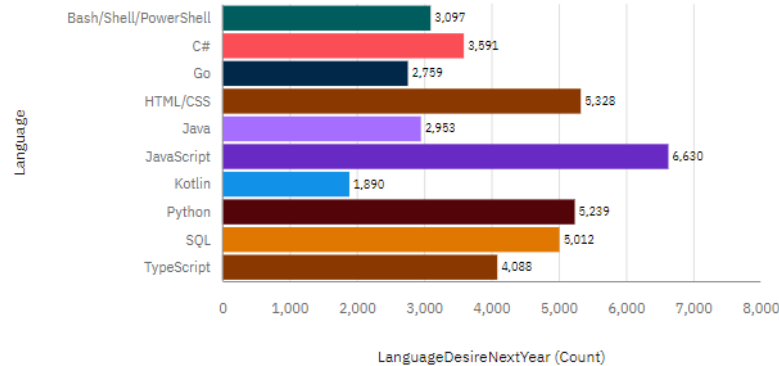


Webframe Popularity for Developers

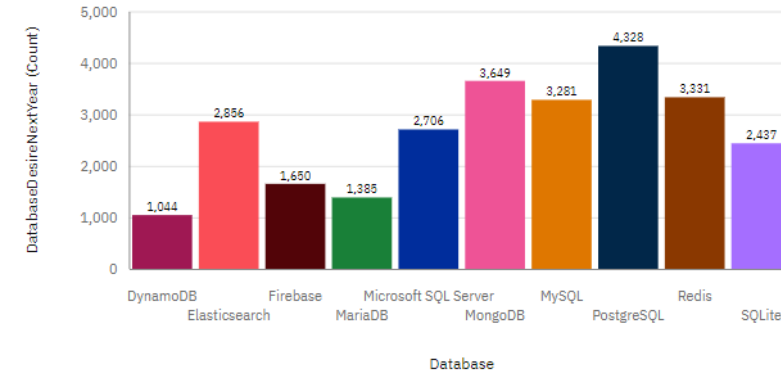


# DASHBOARD – Future Technology Trend

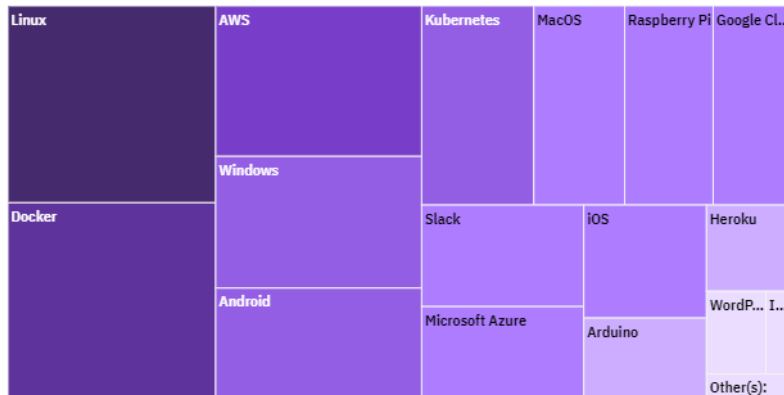
Top 10 Languages Desired to be Learned Next Year



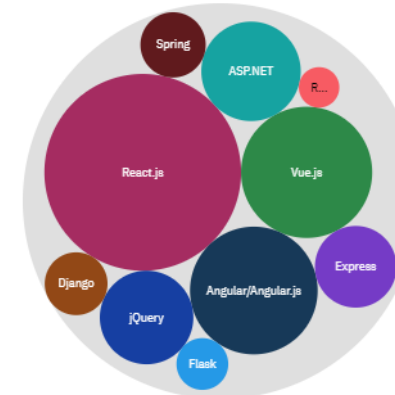
10 Top Databases Desired to be Learned Next Year



Platforms Desired to be Learned Next Year



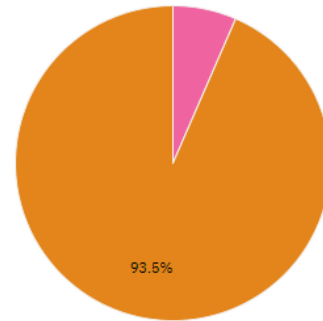
Top 10 Web Frames Desired to be Learned Next Year



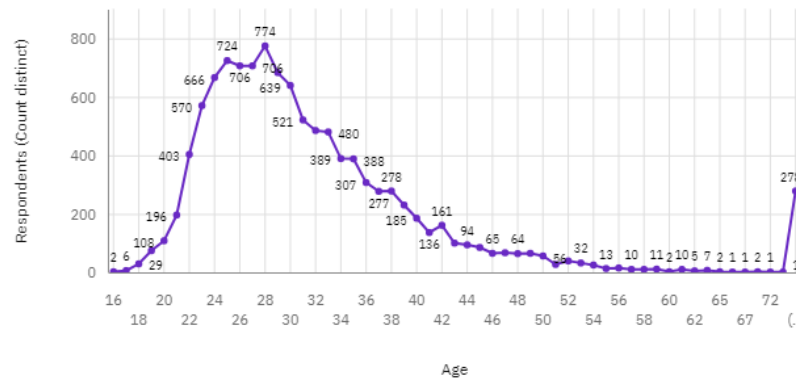
# DASHBOARD TAB 3

Number of Respondents by Gender

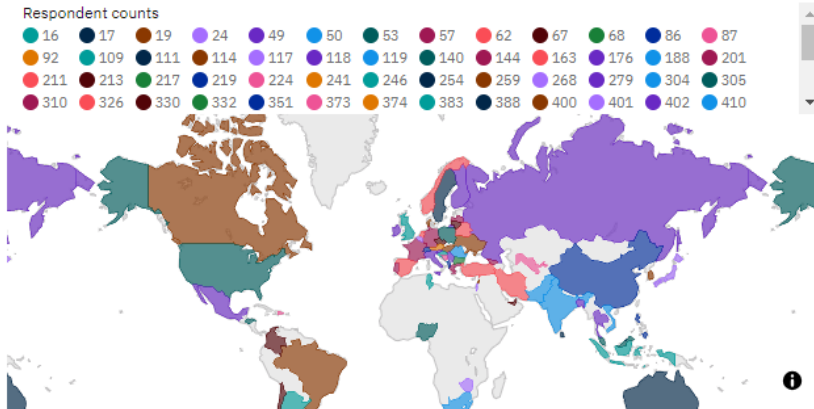
Gender  
Woman Man



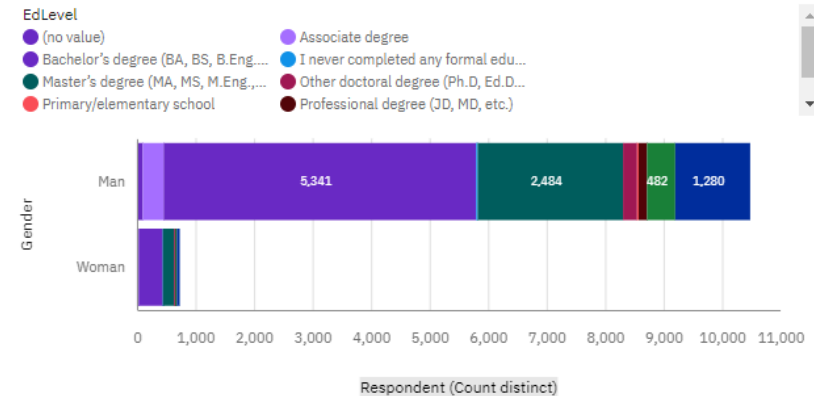
Respondent Count by Age



Respondent Count by Country



Respondent Count by Gender, Classified by Formal Education Level



# OVERALL FINDINGS & IMPLICATIONS

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## Findings

**Languages** – There a consistent desire by developers for front end development languages, but also increased emphasis on emerging programming languages.

**Databases** – Databases such as MongoDB and Redis along with PostgreSQL appear to be more desired by developer in the near future.

## Implications

**Languages** – Front end development languages will continue to stay at the forefront of developer skillsets, along with newer languages such as Python and Go and Kotlin.

**Databases** – Developers are seeking to learn a more diverse array of databases in the coming year, with a particular focus on databases that accommodate ‘big data’.

# CONCLUSION

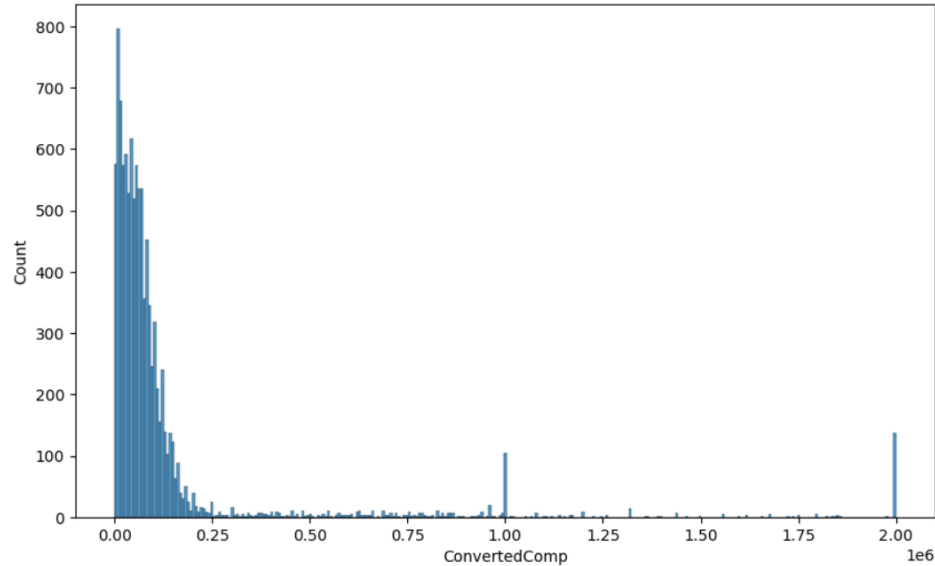
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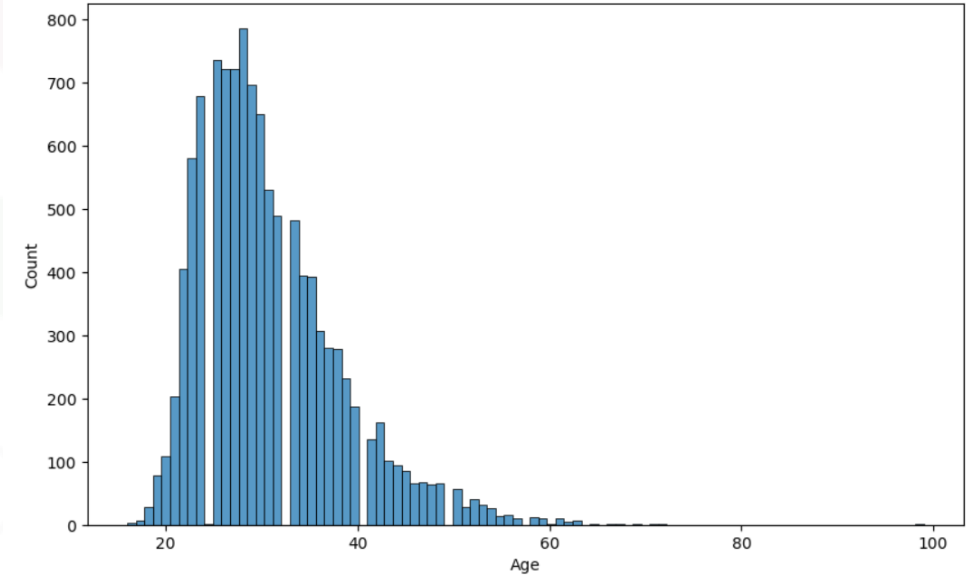
A shift in both languages and databases desired by developers is apparent for next year. Both of which may lead to developers seeking a more diverse spread of modern languages and databases accommodating for better performance and big data respectively. Conversely, front end development tools such as JavaScript and HTML/CSS seems to be steadily increasing with respect to it's desirability by developers, evidencing they are 'here to stay'.



# APPENDIX



*Fig 1. Count of respondent Compensation (\$) for developers.*



*Fig 2. Count of respondent age for developers.*

# POPULAR LANGUAGES

