



# 2019 Technology Situations and Trend for 2020

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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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## Data Collection

- APIs
- Web Scraping
- Public Data Resources
- Data Wrangling
- Duplicates Handling
- Missing Values Handling
- Data Standardization
- Found the current situation and future trends of changing technologies
- Analyzed the correlations of different features
- Visualized data and generated Dashboards by Python and Cognos

# INTRODUCTION

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- Situations
  - Technologies are being developed rapidly
  - Keep pace with changing technologies and remain competitive
  - Important and necessary to know the trend
  - Stack Overflow developer surveys since 2011
  - Clear view of the developing trend of programming languages as well as databases
- Our Analysis
  - Current situation in 2019 and future trend in 2020
  - Correlations between different features

# METHODOLOGY: Data collection

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## **GitHub Jobs API**

- Number of jobs currently open for various technologies

## **Web Scraping**

- Programming Languages and corresponding salaries

## **Open-Sourced Data**

- 2019 Stack Overflow Developer Survey

# METHODOLOGY: Data Wrangling

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- **Duplicates Handling**
  - Finding and Removing
- **Missing Values Handling**
  - Finding and Imputing
- **Data Normalization**
  - E.g. Transform all the salaries (Weekly/Monthly/Yearly) to Yearly

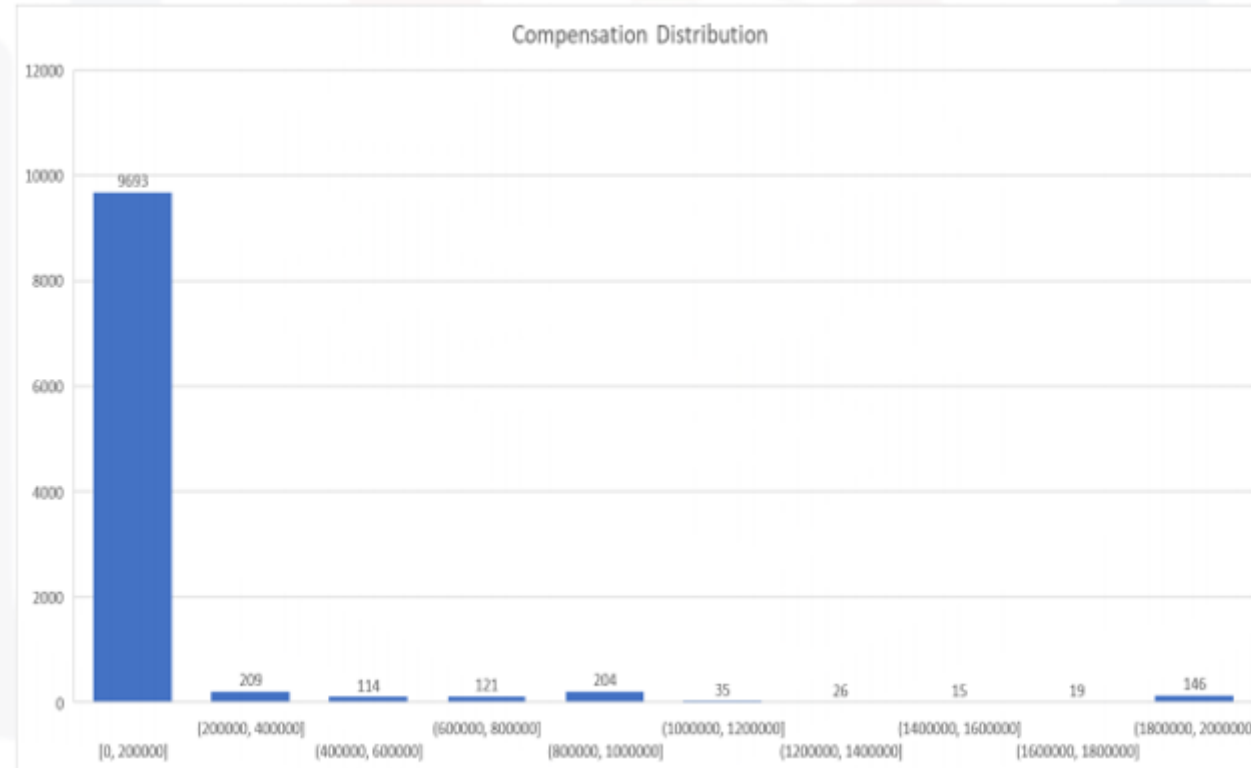
# METHODOLOGY: Exploratory Data Analysis

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- **Determine how data is distributed**
- **Identify and remove outliers**
- **Find the correlations between different features**

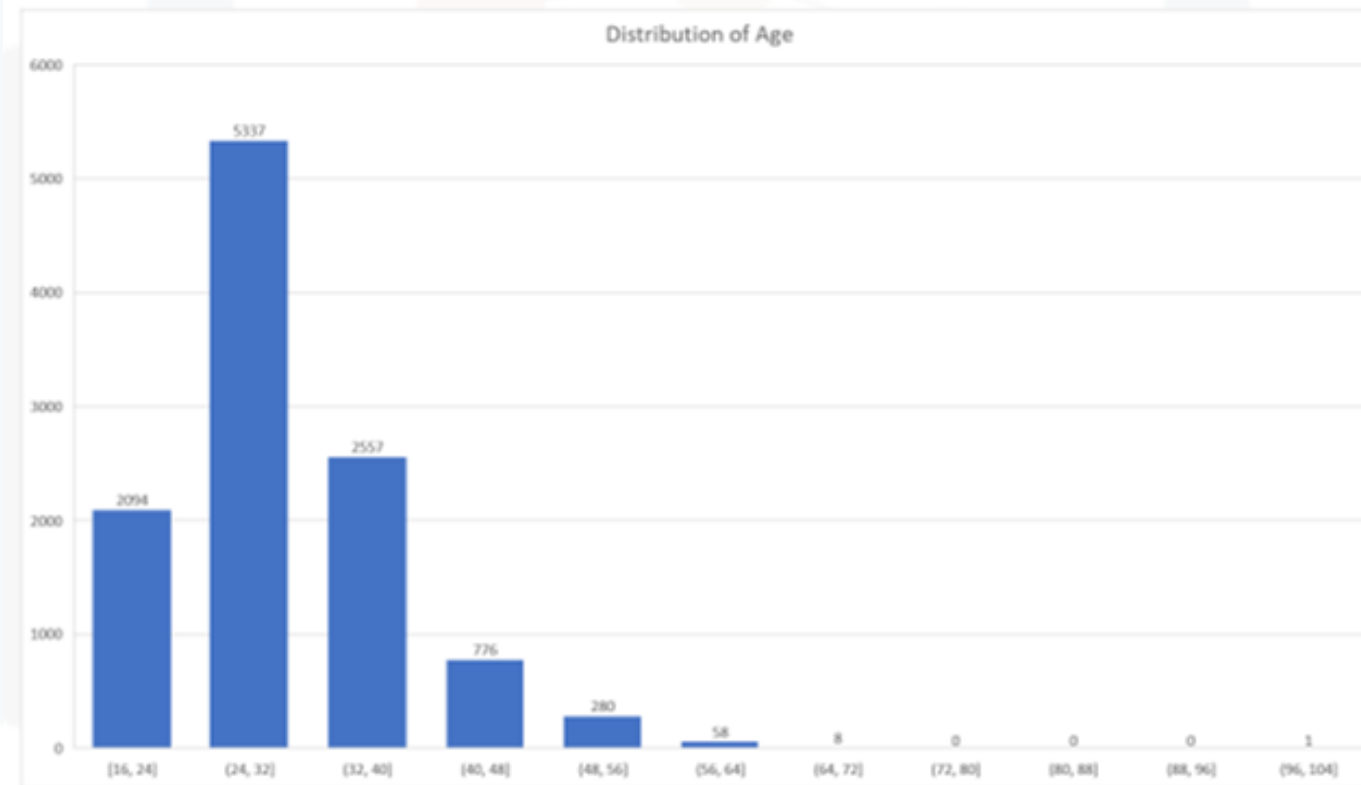
# RESULTS – Distribution of Compensation



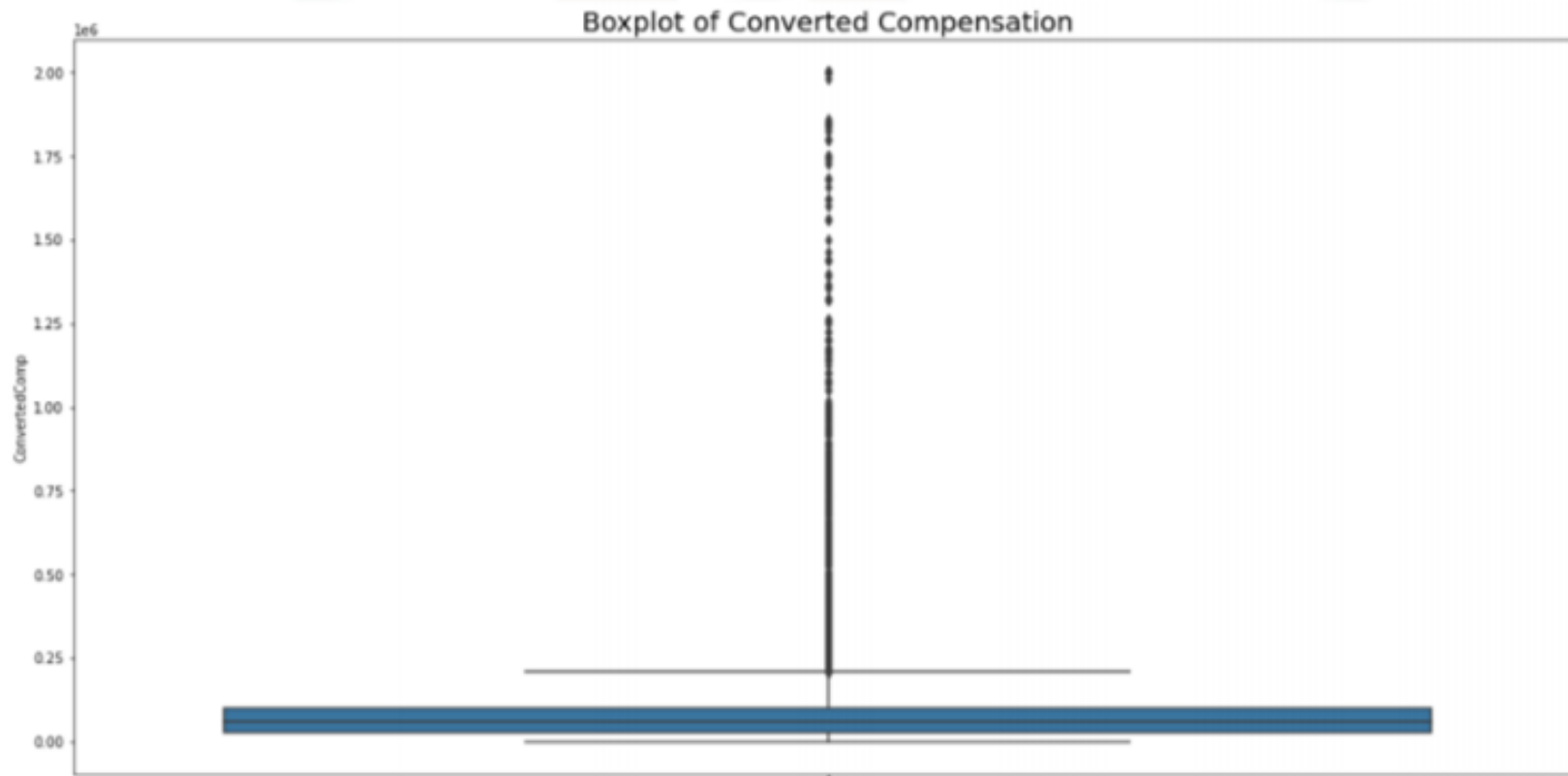


# RESULTS – Distribution of Age

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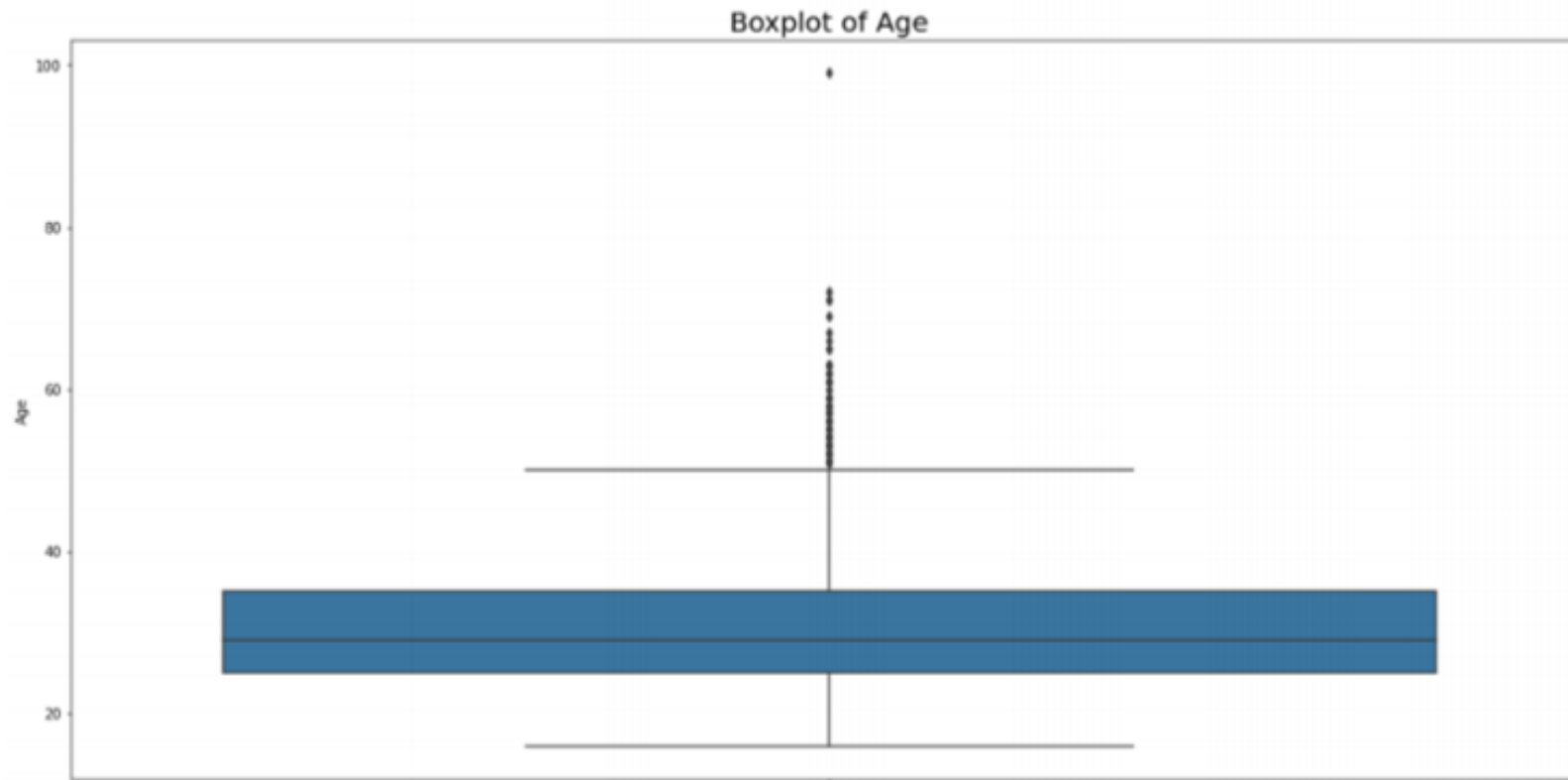


# RESULTS – Boxplot of Compensation



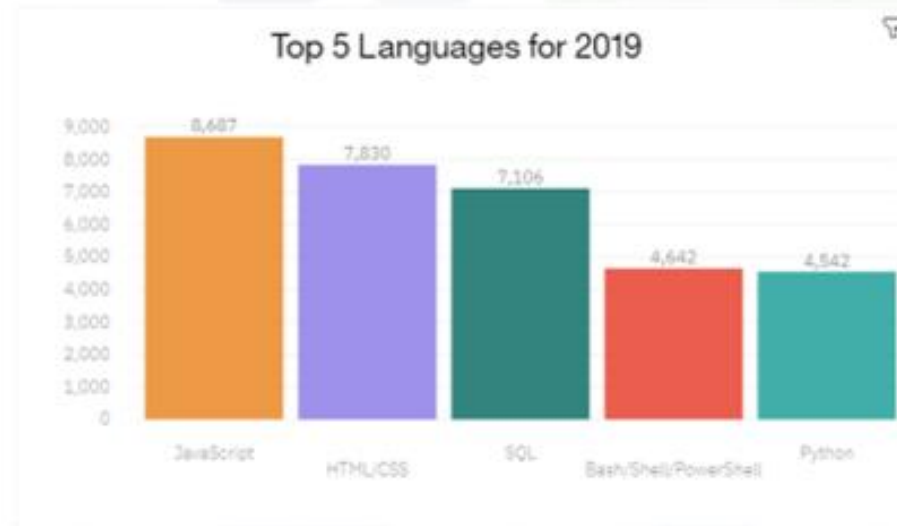
# RESULTS – Boxplot of Age

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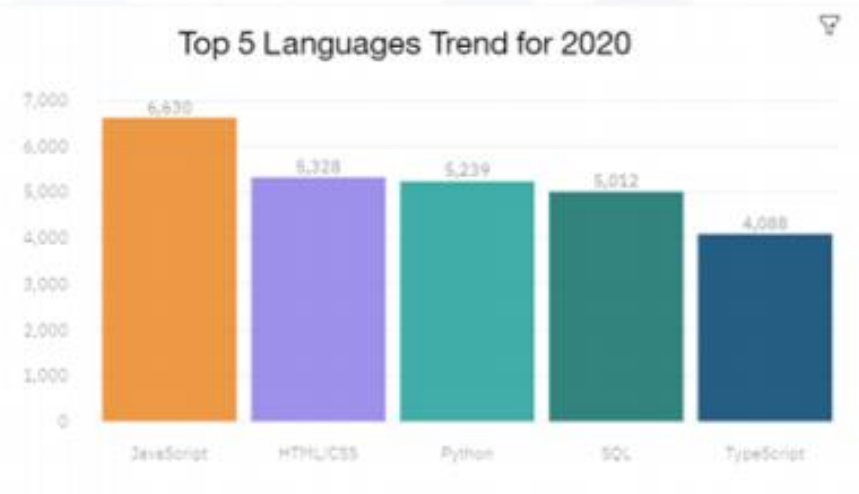


# PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- Average number of desires drops for top 5 languages
- Python remains in top 5 and desire is increased
- Typescript replaces Bash/Shell/PowerShell in top 5

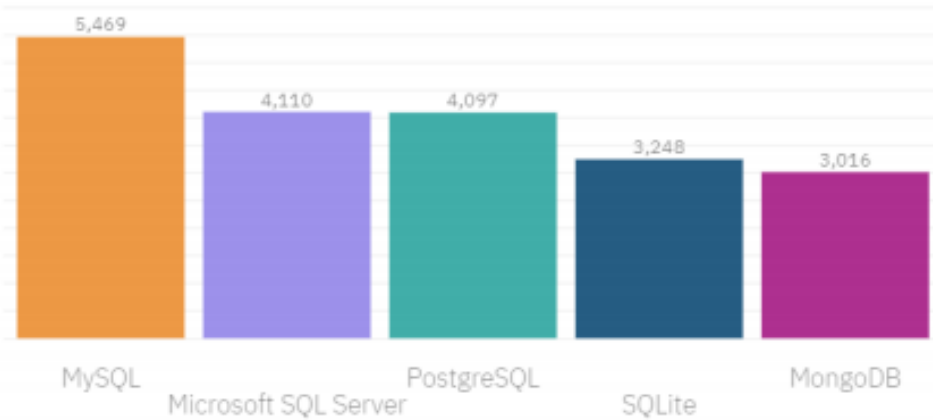
## Implications

- The non-top 5 languages has the trend to occupy more shares
- Python is becoming more competitive
- The competitive power of Shell Language has a dropping trend

# DATABASE TRENDS

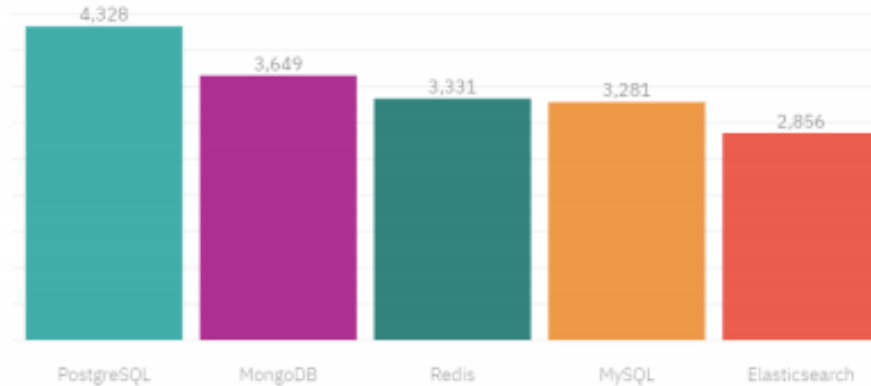
Current Year

Top 5 Database Worked With



Next Year

Top 5 Database Desired Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- SQL DB occupies 4 of top 5 in 2019 but only occupies 2 of top 5 in 2020 trend
- MySQL/PostgreSQL/Mongo DB remains top 5
- Redis and Elasticsearch step in top 5 trend

## Implications

- SQL DB is losing power
- Open-sourced SQL DB is still competitive
- Cloud-based/No-SQL DB becoming more competitive

# DASHBOARD

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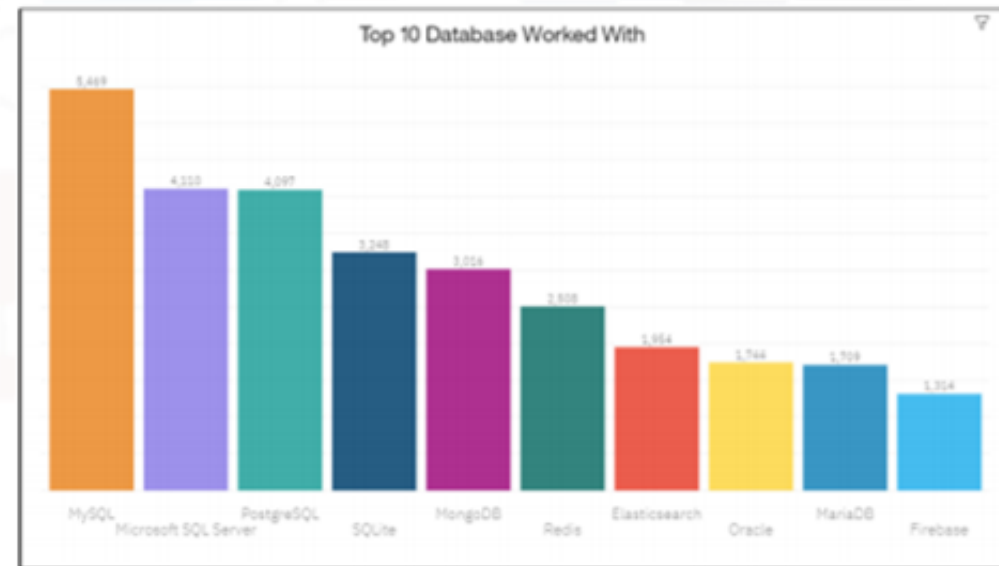
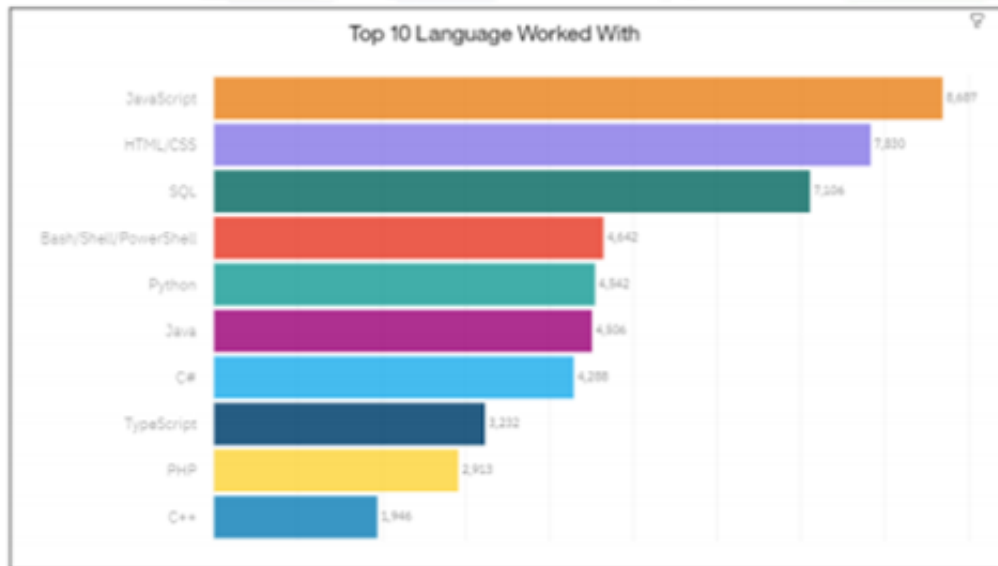


**IBM Cognos Dashboard Link:**

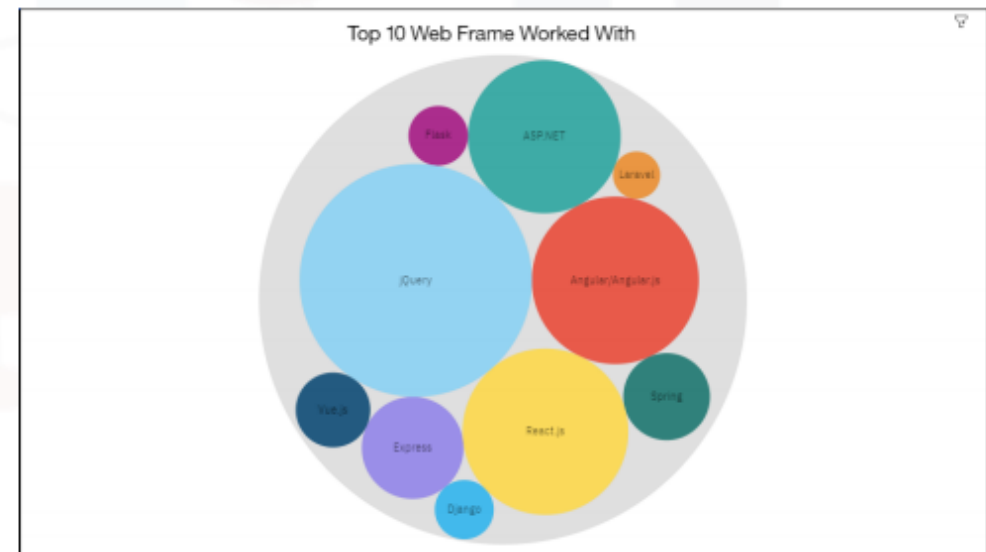
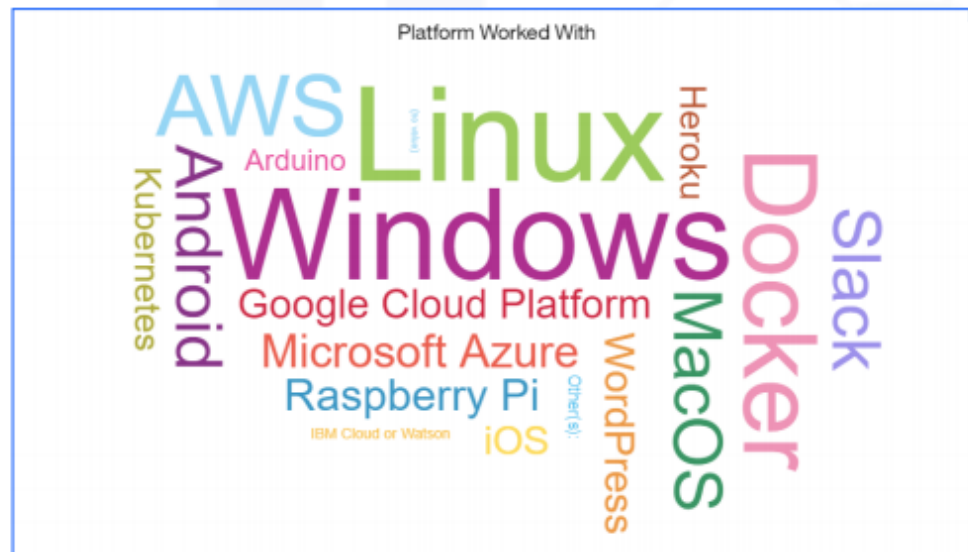
<https://dataplatform.cloud.ibm.com/dashboards/93db381f-225d-4824-8d16-d477f609dfb8/view/771fd77f358b368d76ecc4e407ca7a542e32205cb2bb8152d5807b490e637897a83f14c7c87a490cd9420c31a0ea410ac0>



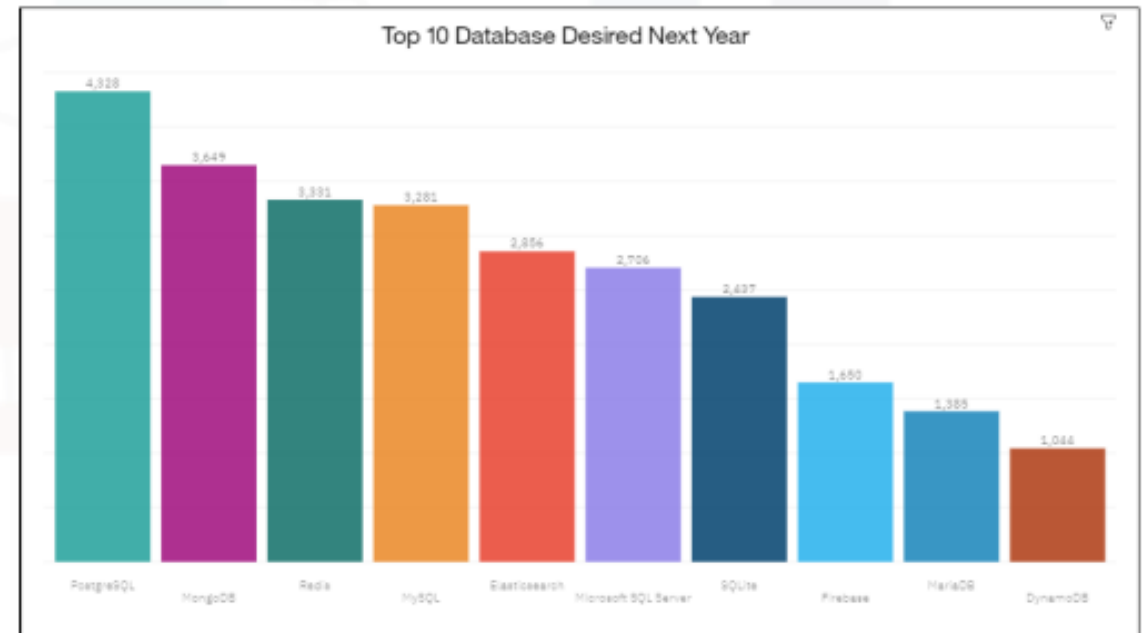
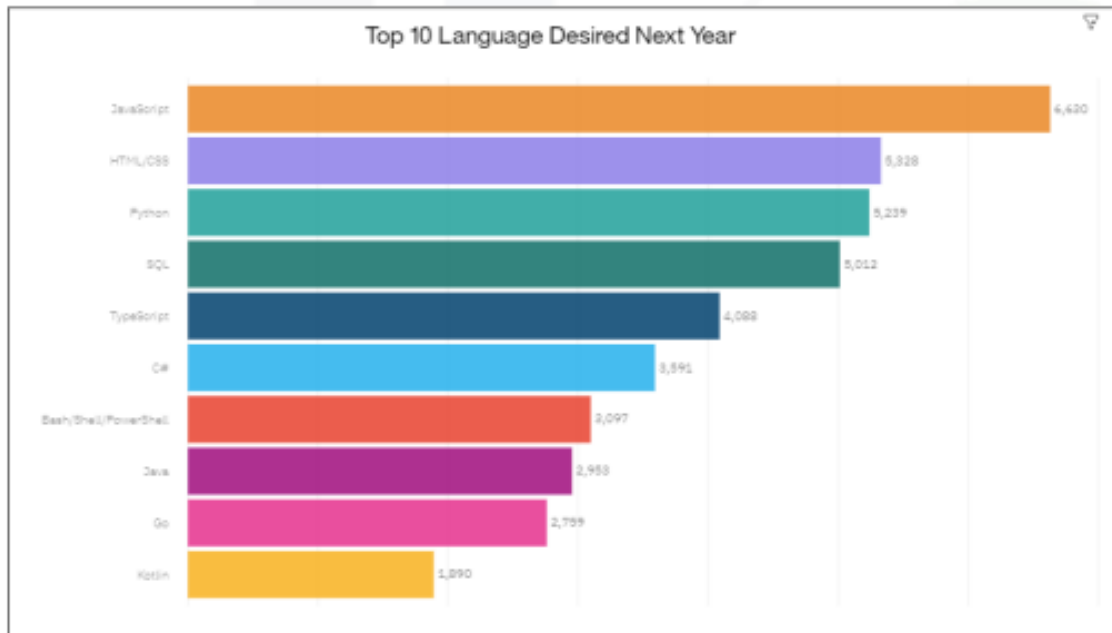
# DASHBOARD – Current Technology Usage



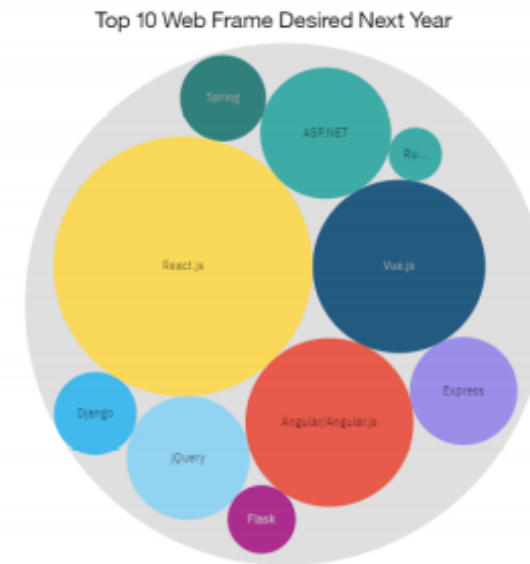
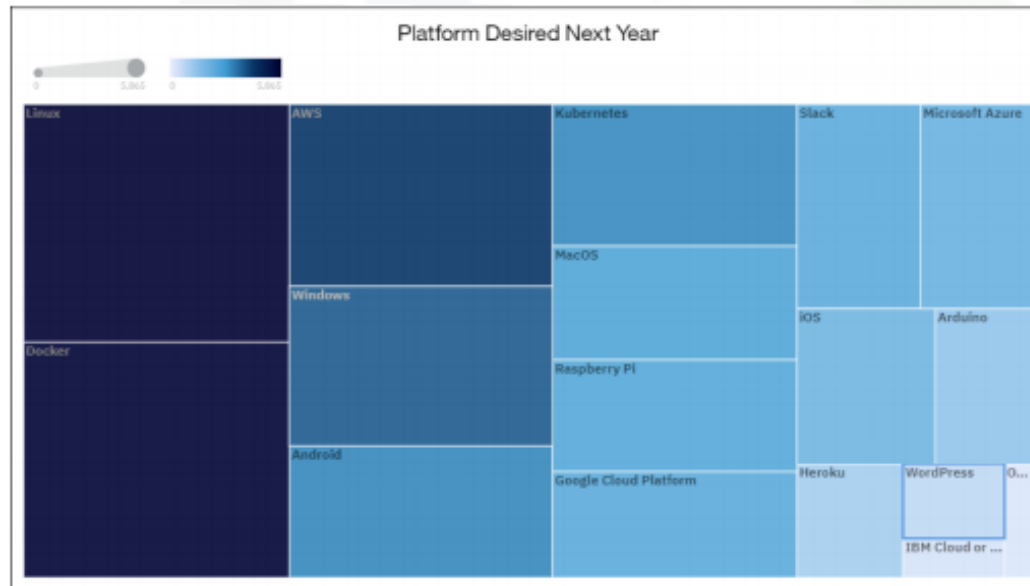
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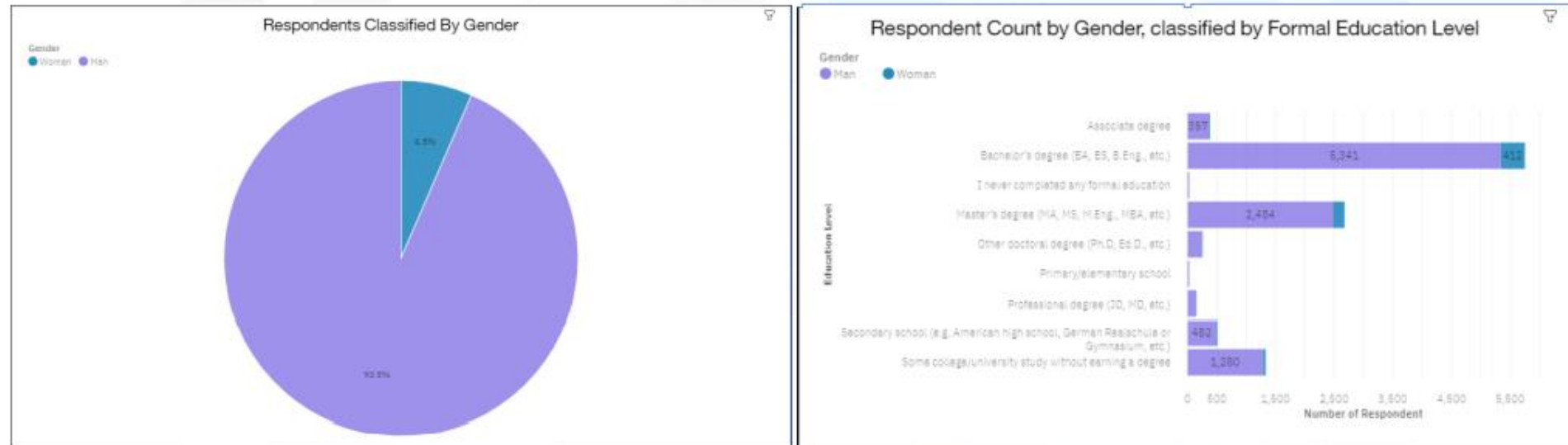
# DASHBOARD – Future Technology Trend



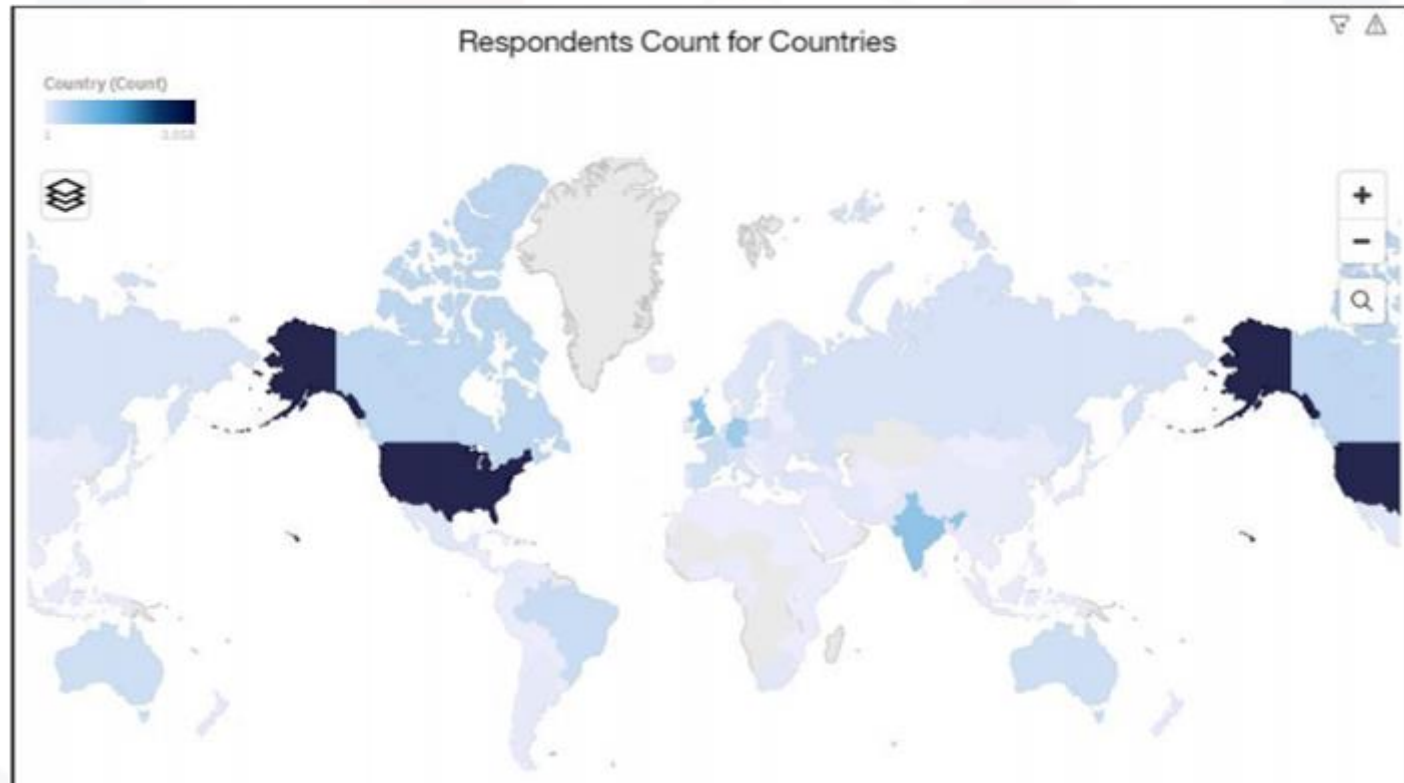
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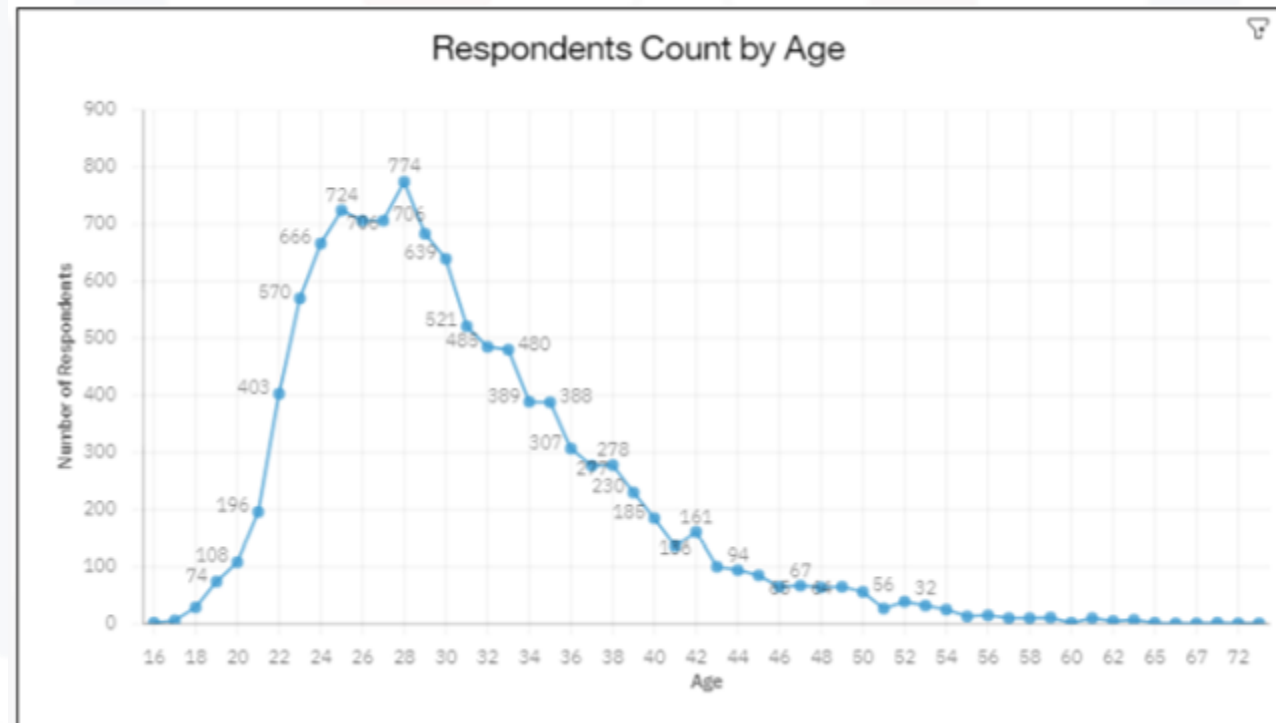
# DASHBOARD - Demographics



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# DASHBOARD - Demographics



# DISCUSSION

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The actual power of programming languages is when the right programmer uses them with the right features to solve a specific problem or for any other specific purpose



# OVERALL FINDINGS & IMPLICATIONS

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## Findings

- Men forms a large proportion of coding industry
- Most developers are between 20 to 40 years old(especially 24~32)
- Most developers hold a Bachelor's or Master's degree

## Implications

- Industry should make some efforts to balance the gender
- A good age for coding is less than 40 years old, step into management level after 40

# CONCLUSION

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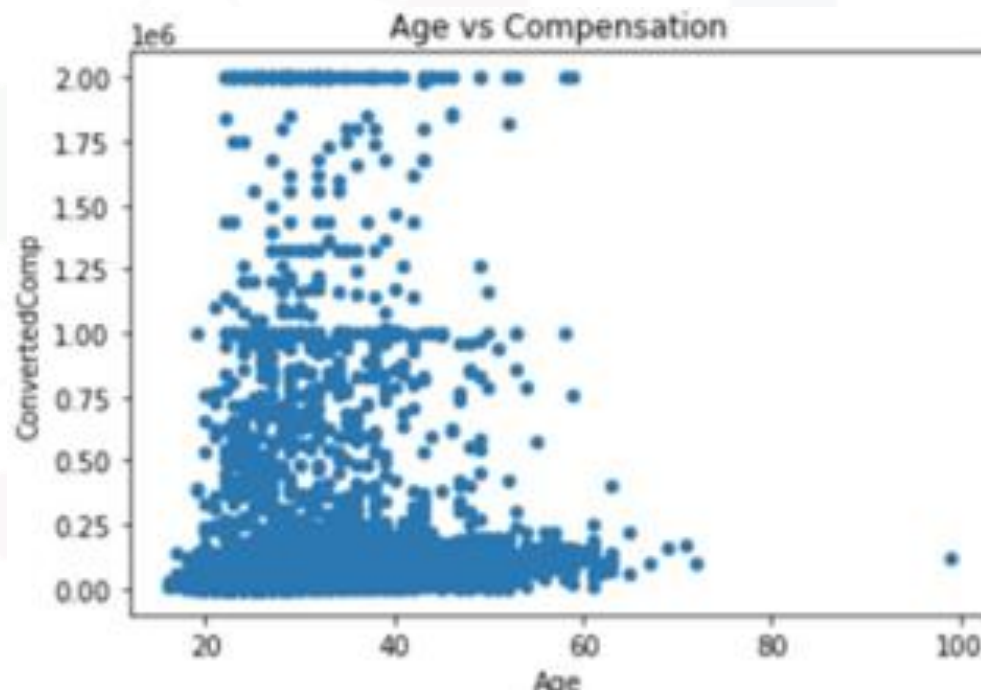
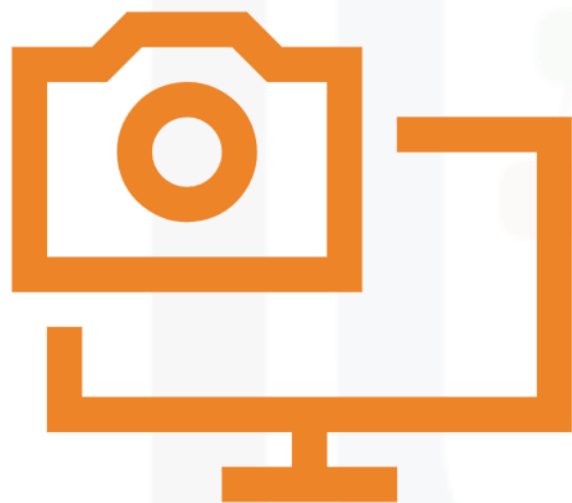


Python as an open-sourced, easy-to-use language is becoming more competitive

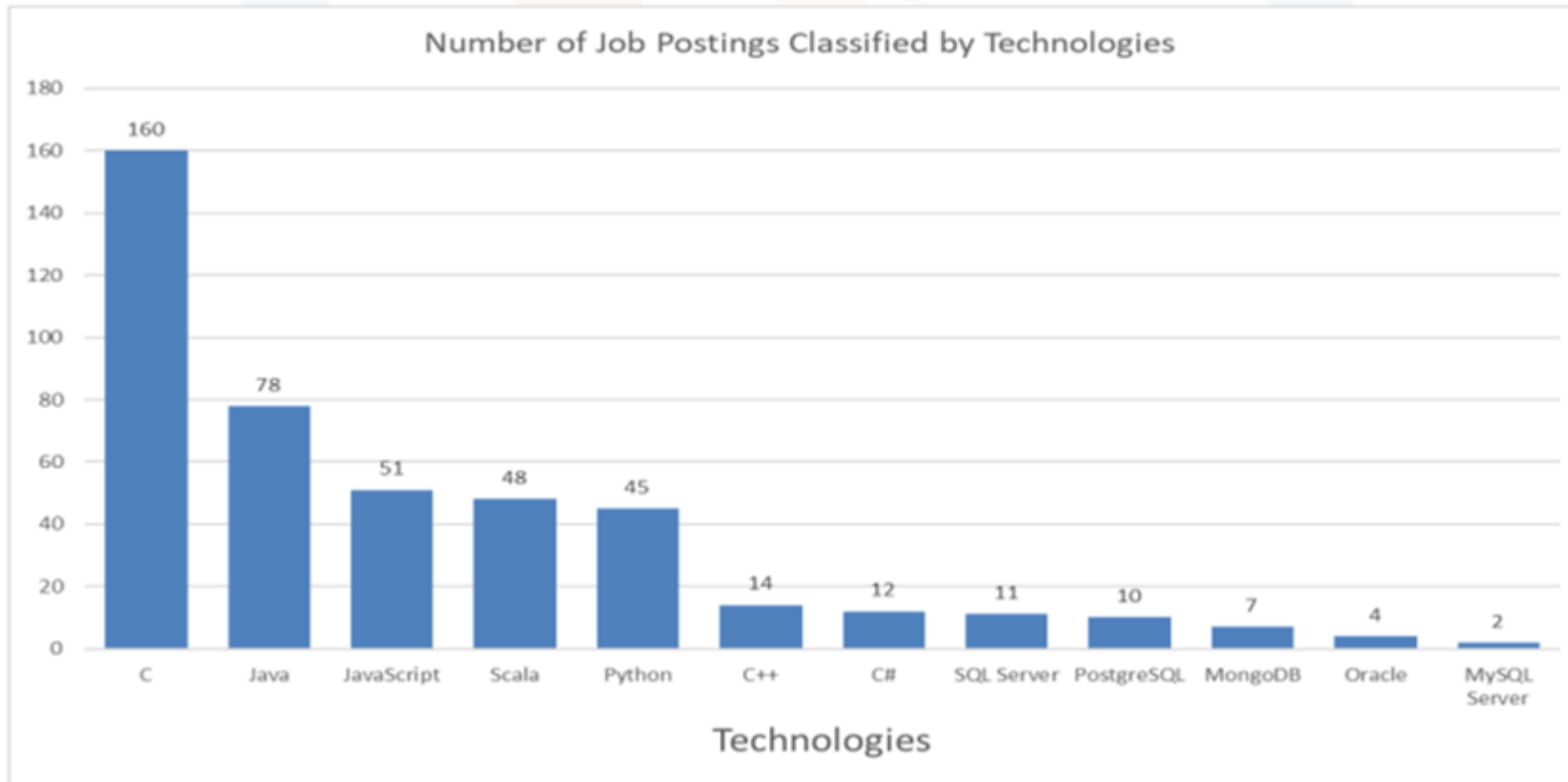
- Cloud based database is turning desirable because of efficiency and mobility
- No-SQL seems more important as data is not just in tabular form
- Windows and Linus are still the most important platform for development

# APPENDIX

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# GITHUB JOB POSTINGS



# POPULAR LANGUAGES

