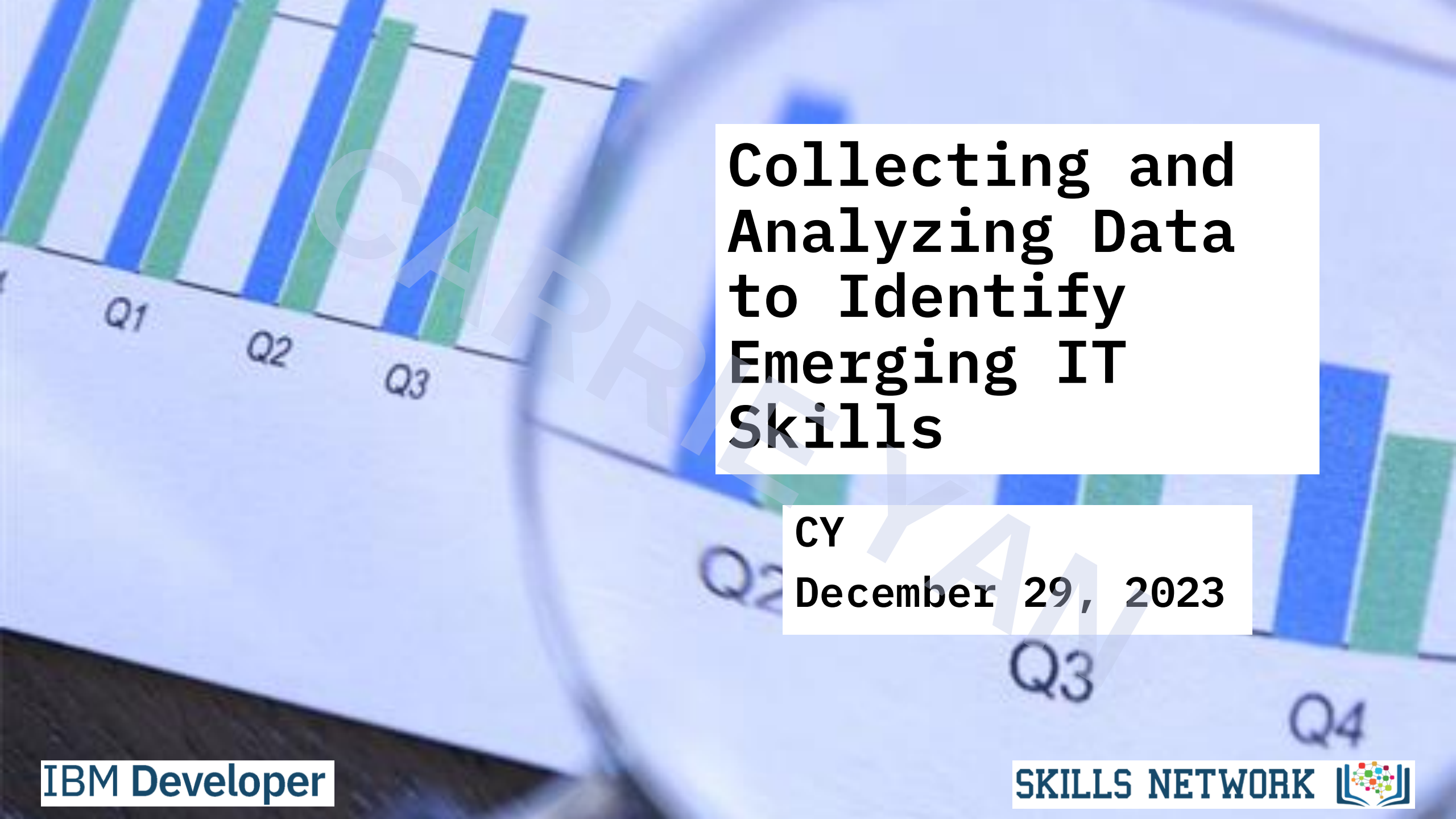


Collecting and Analyzing Data to Identify Emerging IT Skills

CY

December 29, 2023

IBM Developer

SKILLS NETWORK

OUTLINE

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

EXECUTIVE SUMMARY

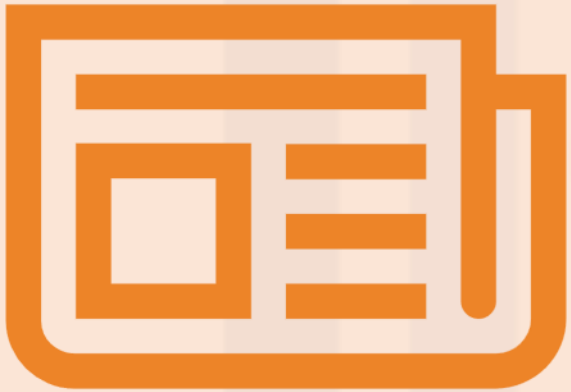
- Goal: Determine current and emerging industry technologies to help our firm remain competitive.
- Key Findings: JavaScript is the most widely used programming language, while TypeScript and Python are gaining popularity. MySQL is the most used database this year.
- Summary of methodologies
  - Data Collection using Jobs API and web scraping
  - Data Wrangling
  - Exploratory Data Analysis
  - Data Visualization using SQL
  - Interactive Dashboard using Cognos Analytics
- Summary of results
  - Exploratory Data Analysis
  - Data Visualizations
  - Interactive Dashboard
  - Findings & Implications
  - Conclusion

INTRODUCTION

Project Background and Context:

- The purpose of this project is to help our global IT and business consulting services firm remain competitive in a rapidly changing industry by identifying emerging skills.
- This report uses data analysis to identify trends and insights that can guide our organization's future growth and development.
- Key Objectives
  - Identify the top programming languages in demand
  - Identify the top database skills in demand
  - Identify popular IDEs

METHODOLOGY



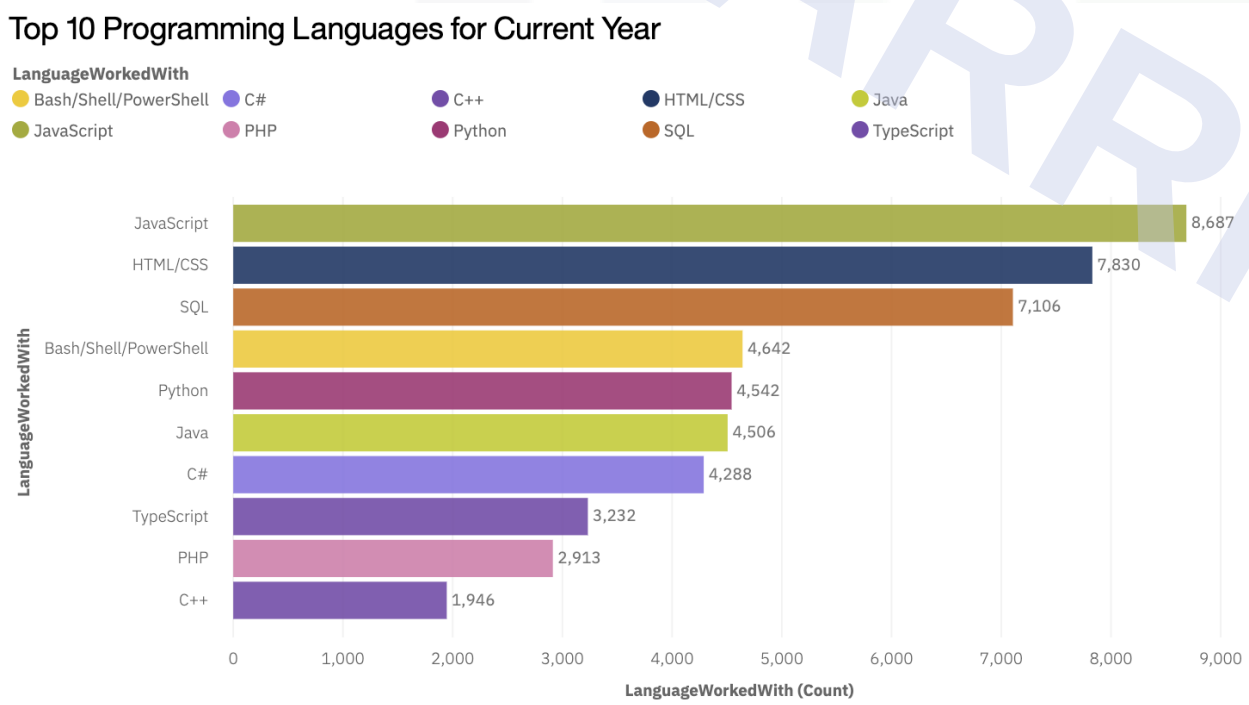
- Data collection methodology:
  - Collect data from various sources such as job postings, training portals, and surveys using the Jobs API and web scraping
- Perform data wrangling
  - Identify and remove duplicate values
  - Identify and impute missing values
  - Normalize data using multipliers
- Perform Exploratory Data Analysis (EDA)
  - Identify the distribution of data
  - Identify and remove outliers
  - Determine correlations between features
- Perform data visualization of RDBMS using SQL
  - Visualize relationships between features using charts and plots
- Build interactive dashboard using Cognos Analytics
  - Present current and future technology usage and demographics

RESULTS

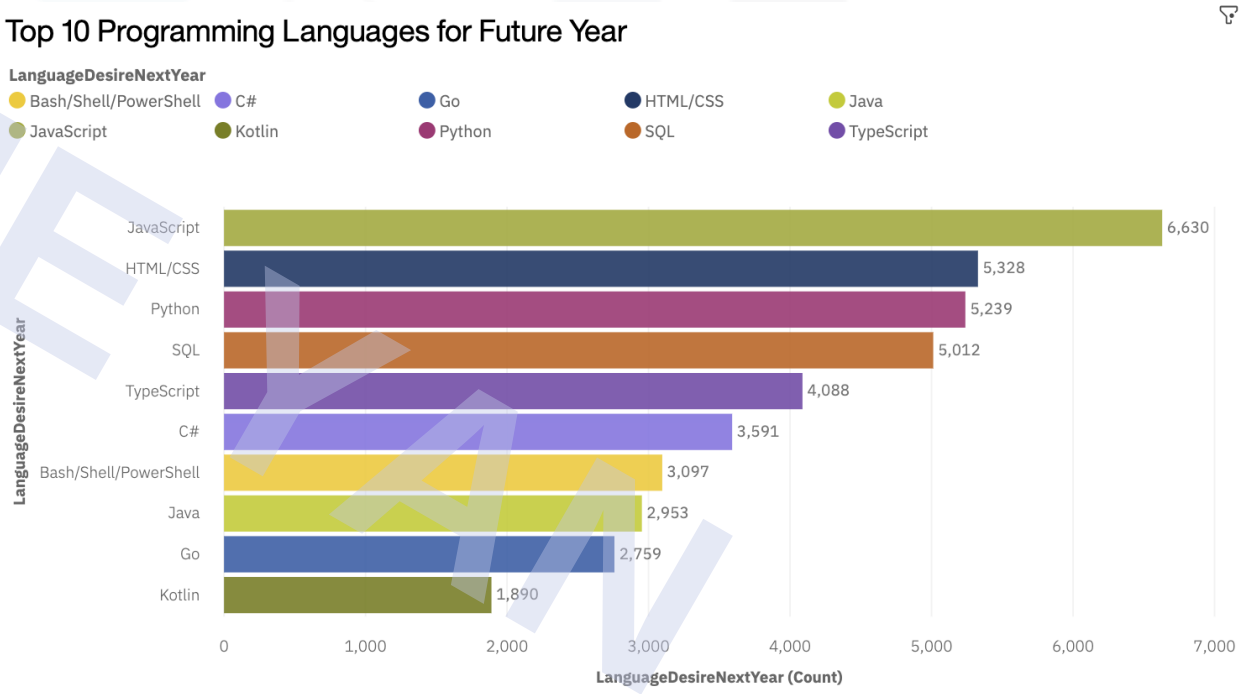
- Interactive Dashboard demo in screenshots
  - Programming Language Trends
  - Database Trends
  - Demographics

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

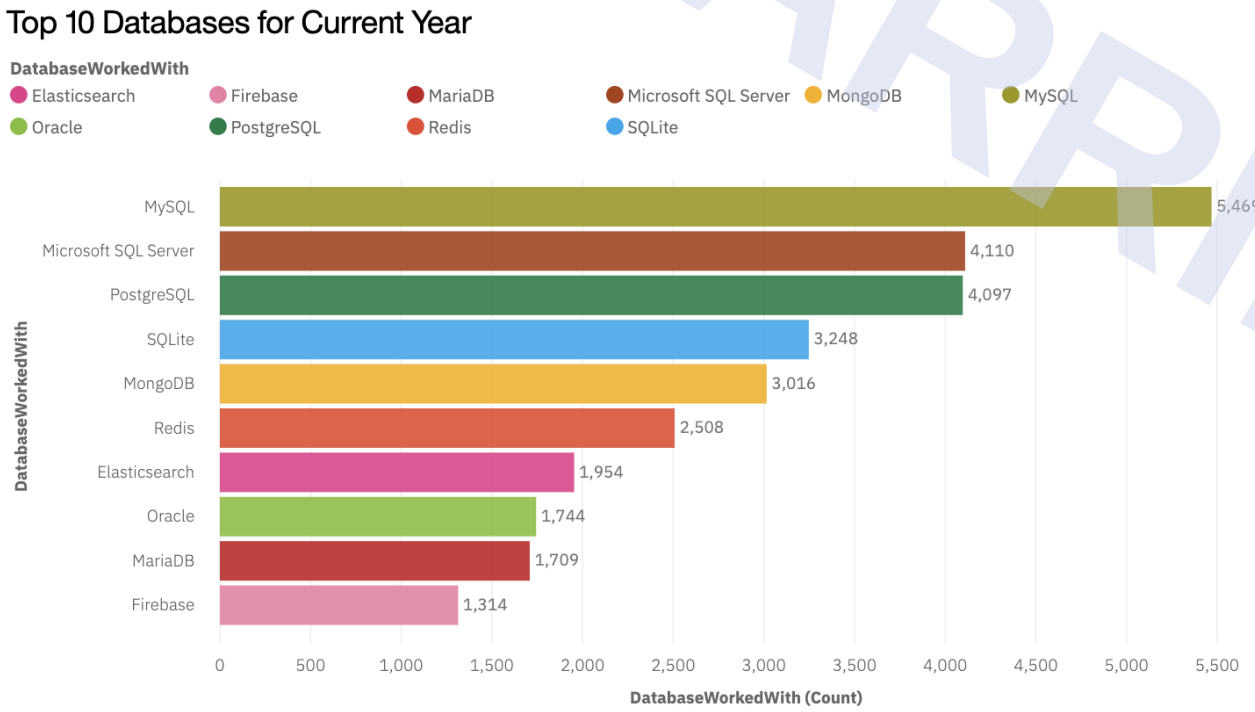
- JavaScript is the leading programming language.
- Python and TypeScript are growing rapidly.
- C++ and PHP are less desired languages in the next year.
- JavaScript, HTML/CSS, and SQL are the top programming languages in the current year.

Implications

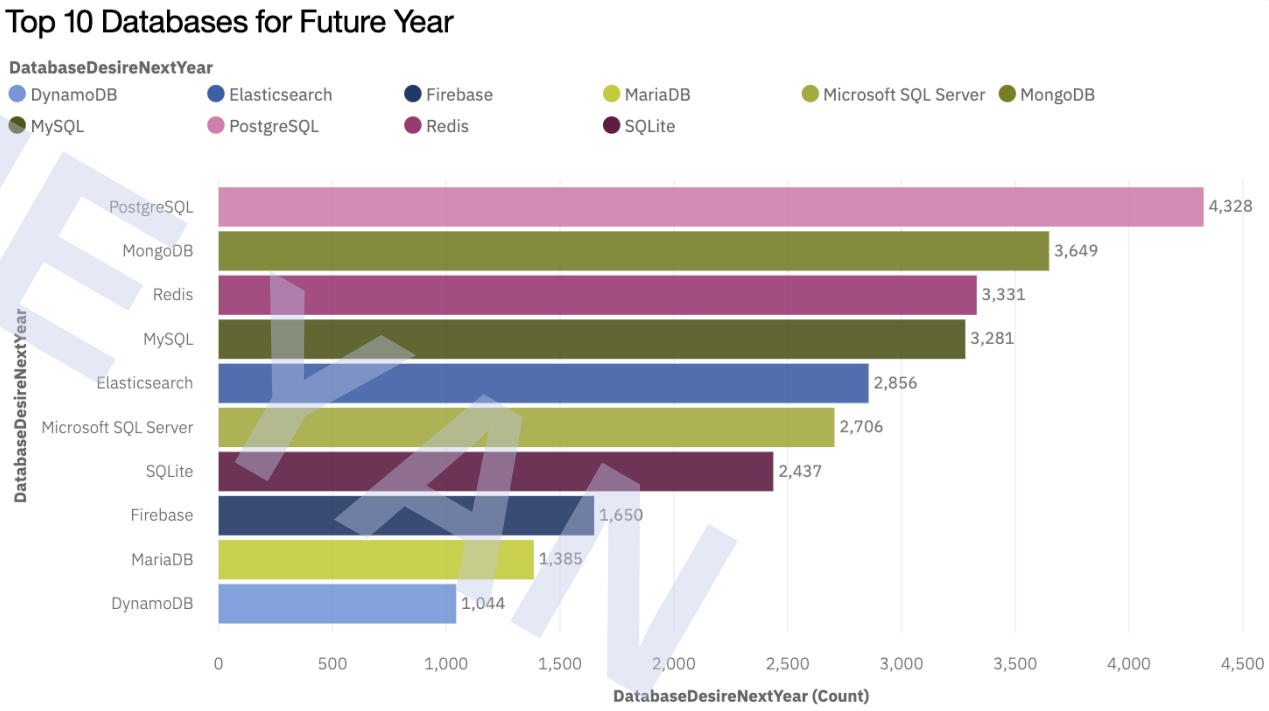
- Developers who are proficient in JavaScript and Python may have an advantage in the market.
- Typescript is gaining popularity, so it may be worth learning for developers who want to stay ahead of the curve.
- Developers who specialize in C++ and PHP may find it harder to find work in the future because they are becoming less popular.
- The popularity of these languages may indicate that they are versatile and suitable for a wide range of applications.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL was the most worked with database.
- There is an increasing interest in PostgreSQL, MongoDB, and Redis databases for next year.
- The interest in Microsoft SQL Server, SQLite, and Oracle databases is decreasing.
- MySQL, Microsoft SQL Server, and PostgreSQL are the top 3 most used databases this year.

Implications

- MySQL is still a widely used database.
- PostgreSQL, MongoDB, and Redis databases are gaining popularity and may become more desirable in the future.
- Developers should consider learning databases that are gaining popularity to stay ahead of the curve.
- Developers who specialize in Microsoft SQL Server, SQLite, and Oracle databases may find it harder to find work in the future.

DASHBOARD

Cognos Analytics Dashboard Link:

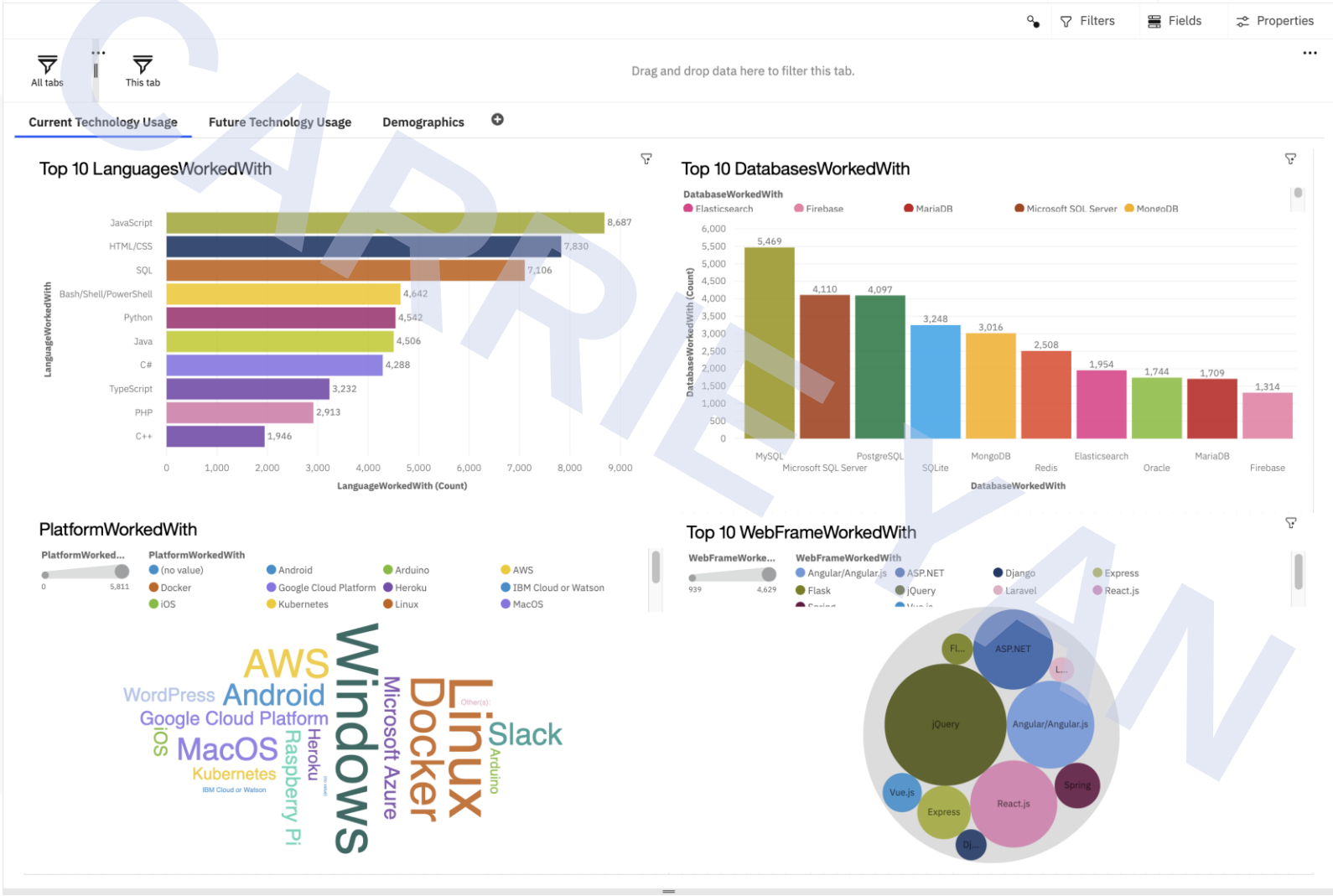
https://dataplatform.cloud.ibm.com/dashboards/ba54a939-2a17-485e-bf82-0100a2549204/view/4e27ff39038828f56bd0dce407982d0f746323 5eb2bb8a52d5817b4907687397a93b1195c8261e53d2190166f6eb125e9c

DASHBOARD

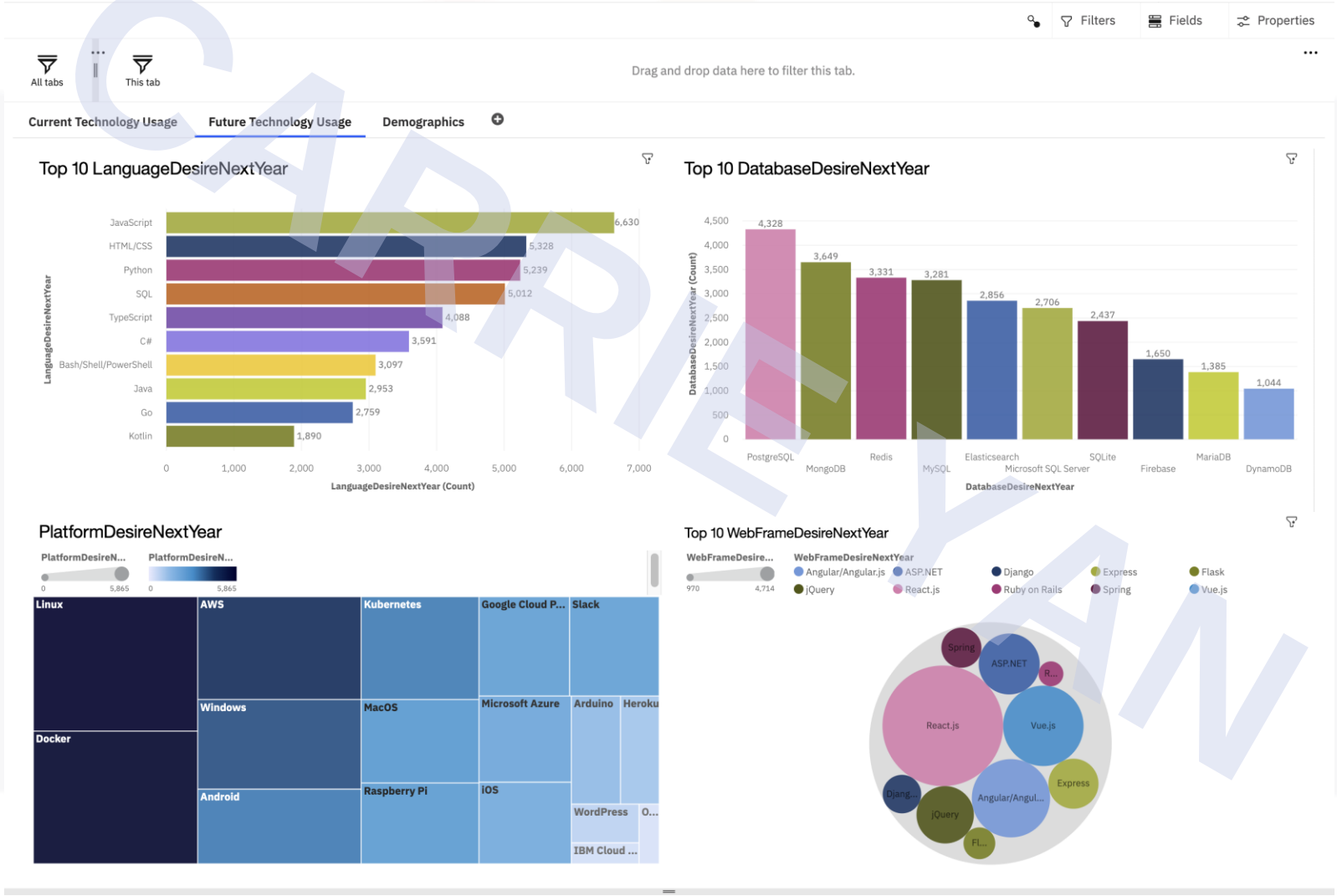
Tableau Dashboard Link:

https://public.tableau.com/app/profile/carrie/viz/TechnologyUsageandDemographics/Story1

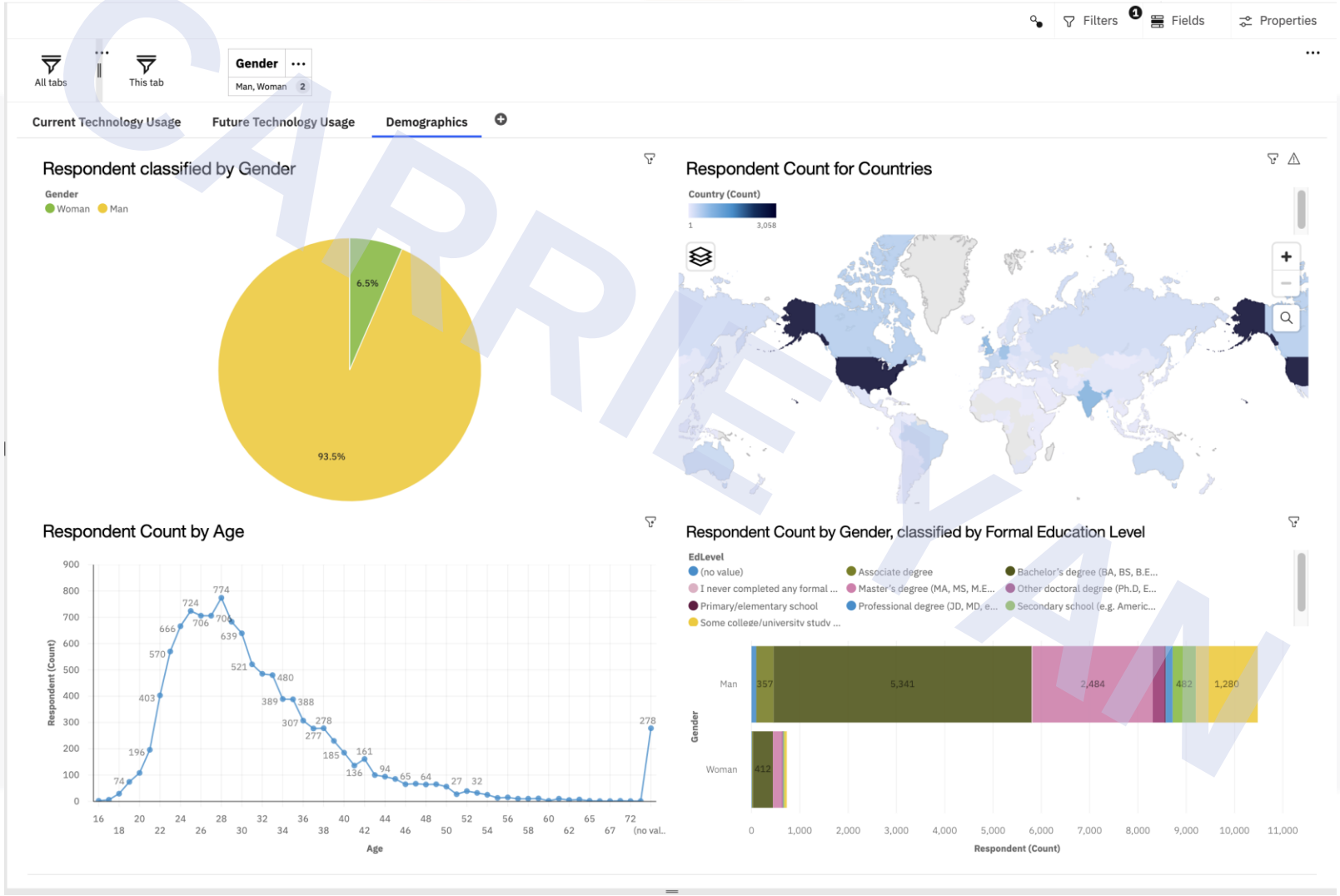
Current Technology Usage



Future Technology Usage



Demographics



DISCUSSION

- Overall Findings & Implications
- Conclusion
- Appendix

OVERALL FINDINGS & IMPLICATIONS

Findings

- Over 90% of developers are young men.
- JavaScript is the most widely used programming language.
- TypeScript and Python are gaining popularity.
- Developers are mostly located in developed countries.
- The majority of developers have at least a Bachelor's degree.

Implications

- The technology industry needs more diversity and inclusion.
- Proficiency in JavaScript can give developers an advantage in the job market.
- Learning Python and TypeScript can help developers stay ahead of the curve.
- Developers should consider moving to developed countries where most of the jobs are located.
- Having at least a Bachelor's degree is becoming increasingly important for developers who want to succeed in the job market.

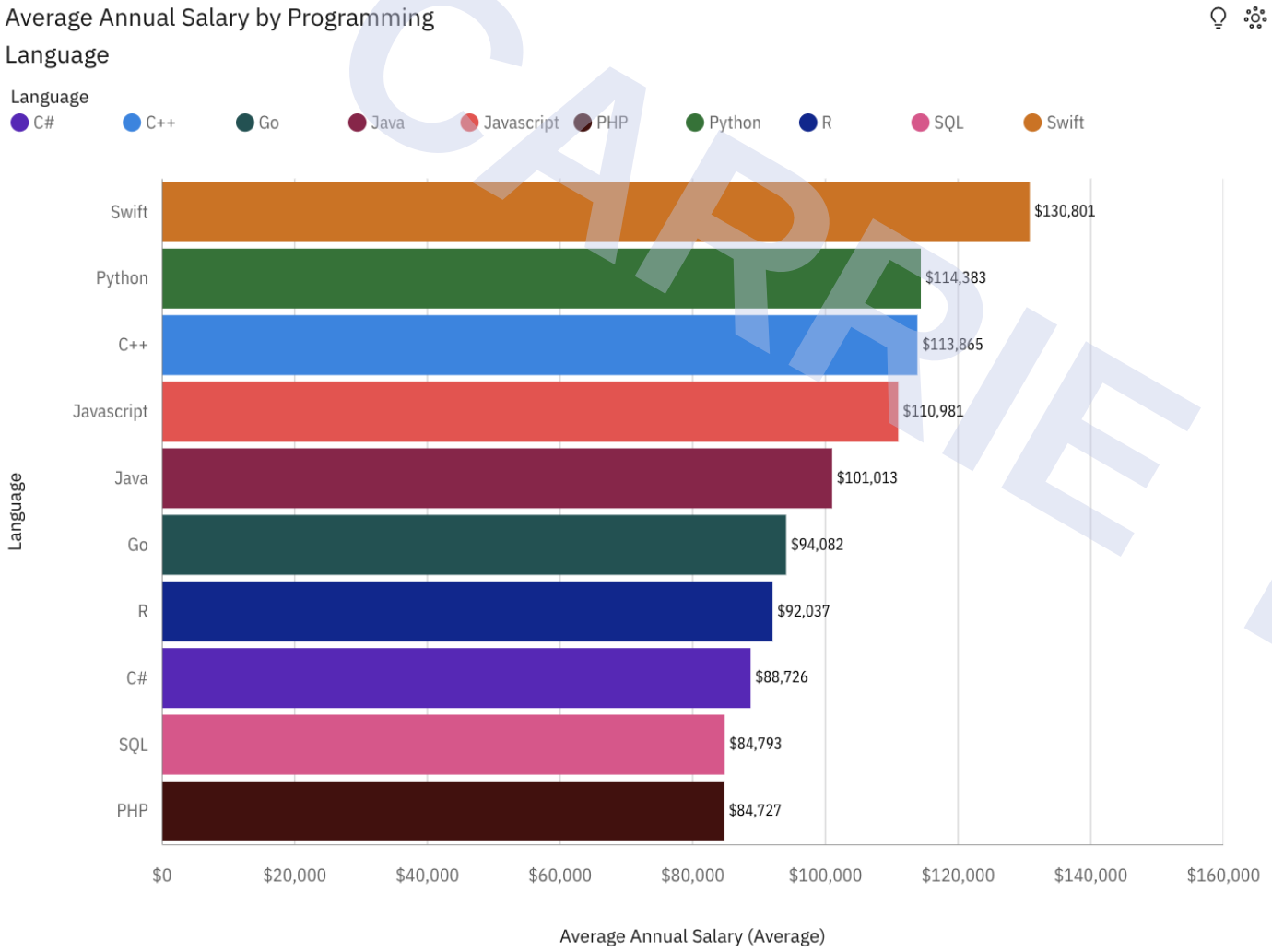
CONCLUSION AND INNOVATIVE IDEAS

- Companies can promote diversity and inclusion by:
  - Offering flexible work arrangements
  - Providing diversity and inclusion training
  - Promoting diversity in leadership
  - Partnering with diversity organizations
  - Creating a mentorship program to help underrepresented groups
- JavaScript is the most popular and versatile programming language.
- Python and TypeScript are emerging as high-demand programming languages.
- Developers can explore job opportunities in developed countries, such as the US and Canada, which offer more job opportunities and higher salaries.

APPENDIX OF DATA COLLECTED FROM OTHER SOURCES

- Bar Charts
  - Job Postings
  - Popular Languages
- Additional Plots
  - Distribution Curve
  - Histograms
  - Box Plots
  - Scatter Plot
  - Bubble Plot
  - Pie Chart
  - Stacked Chart
  - Line Chart
  - Horizontal Bar Chart

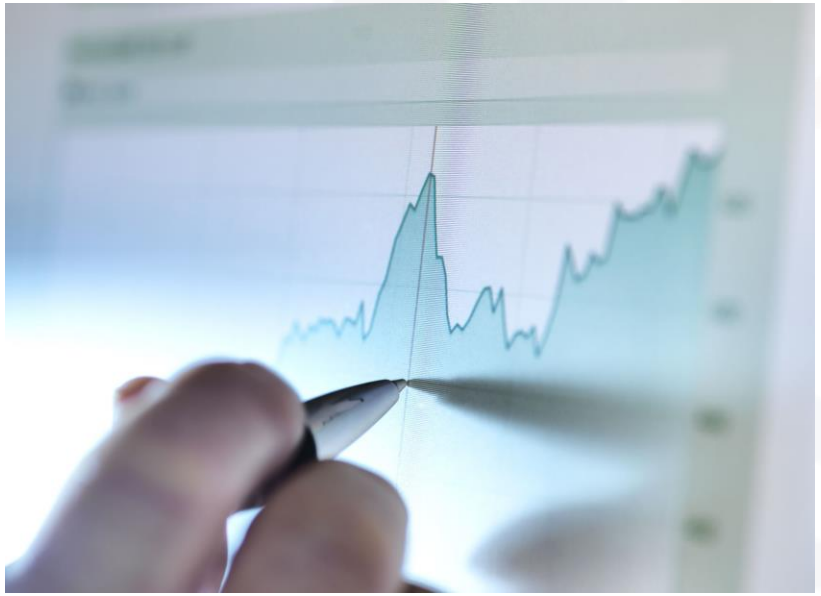
POPULAR LANGUAGES

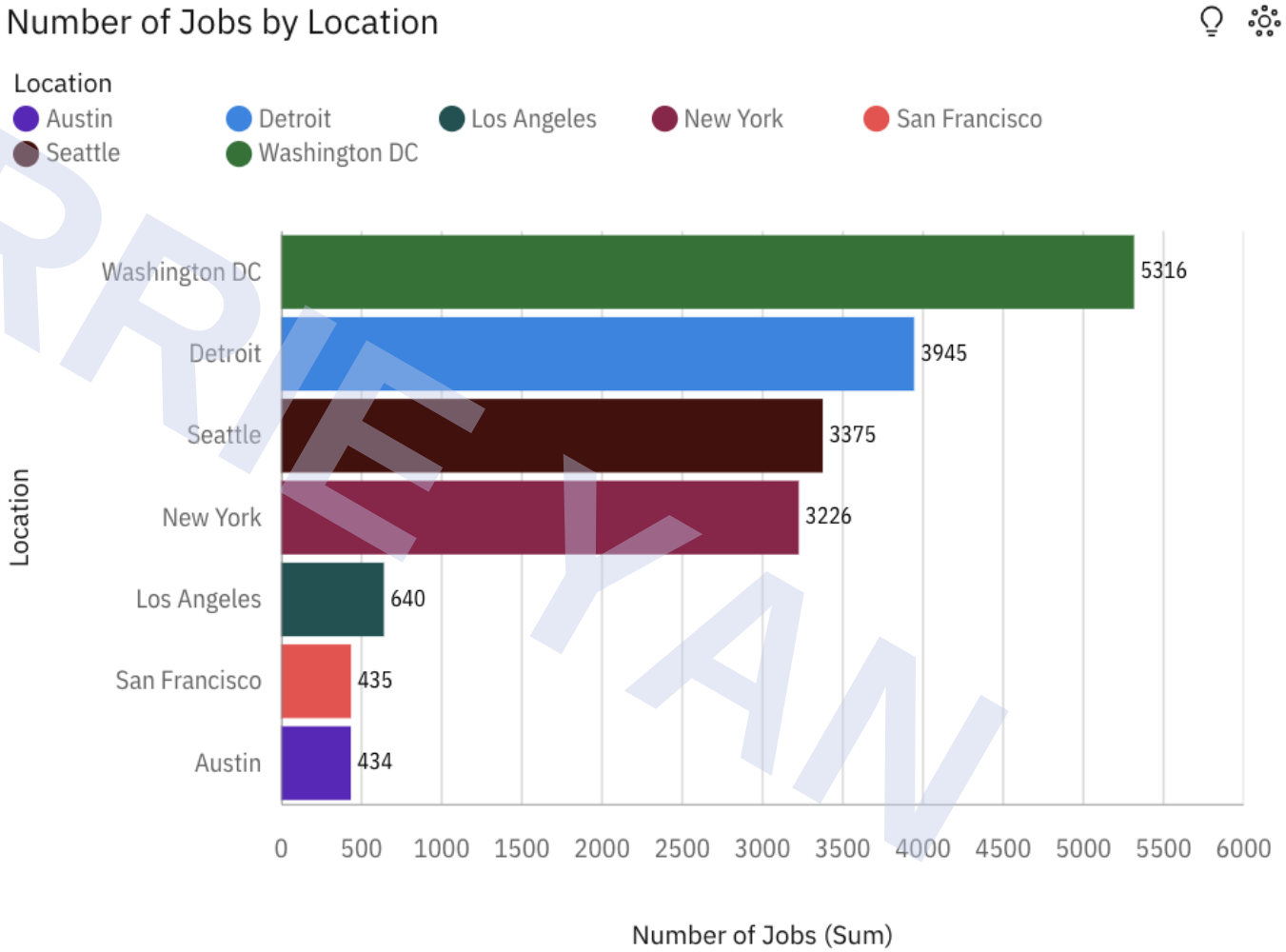


- The programming language with the highest average annual salary is Swift.

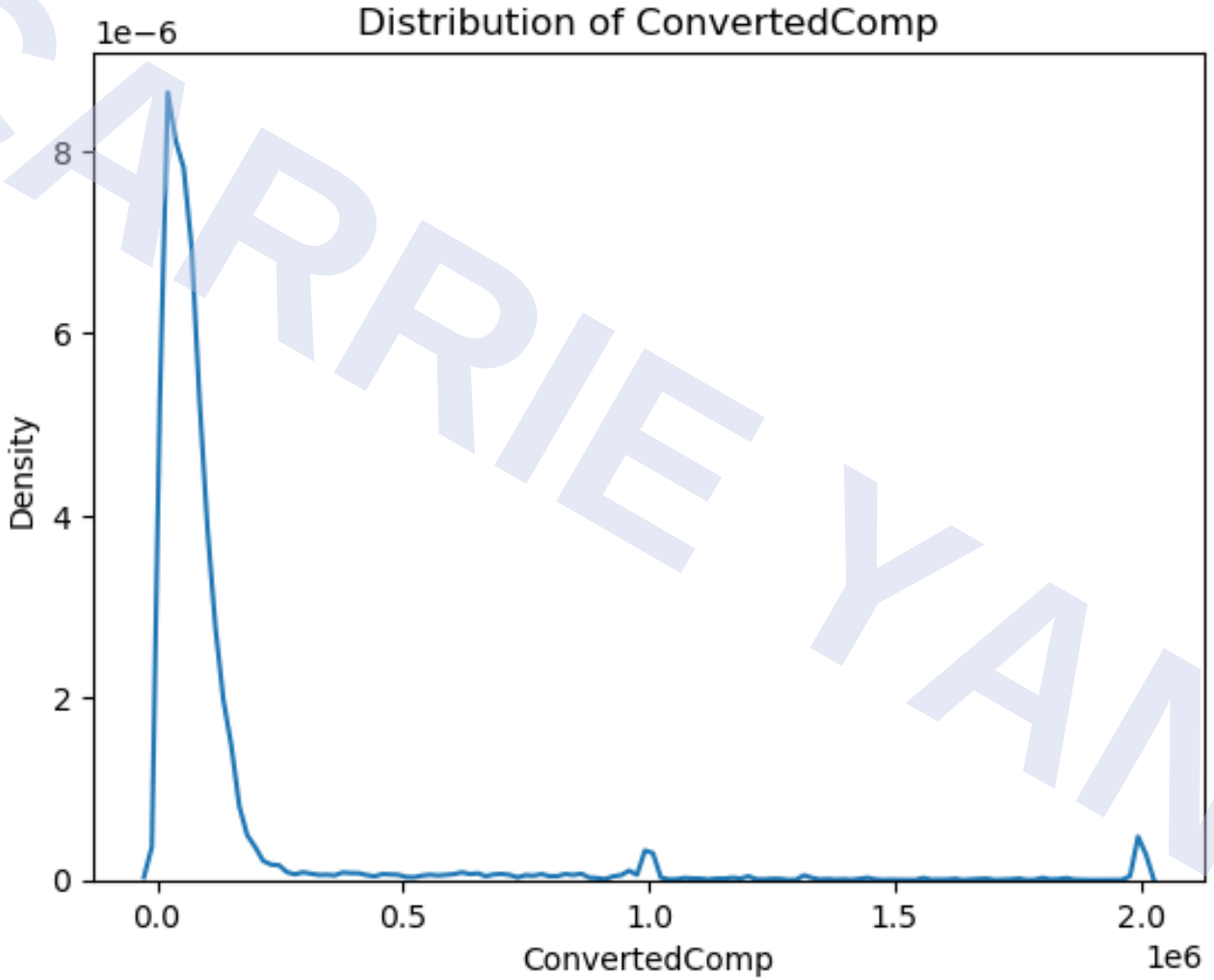
JOB POSTINGS

- Washington DC has the most jobs while Austin has the least.

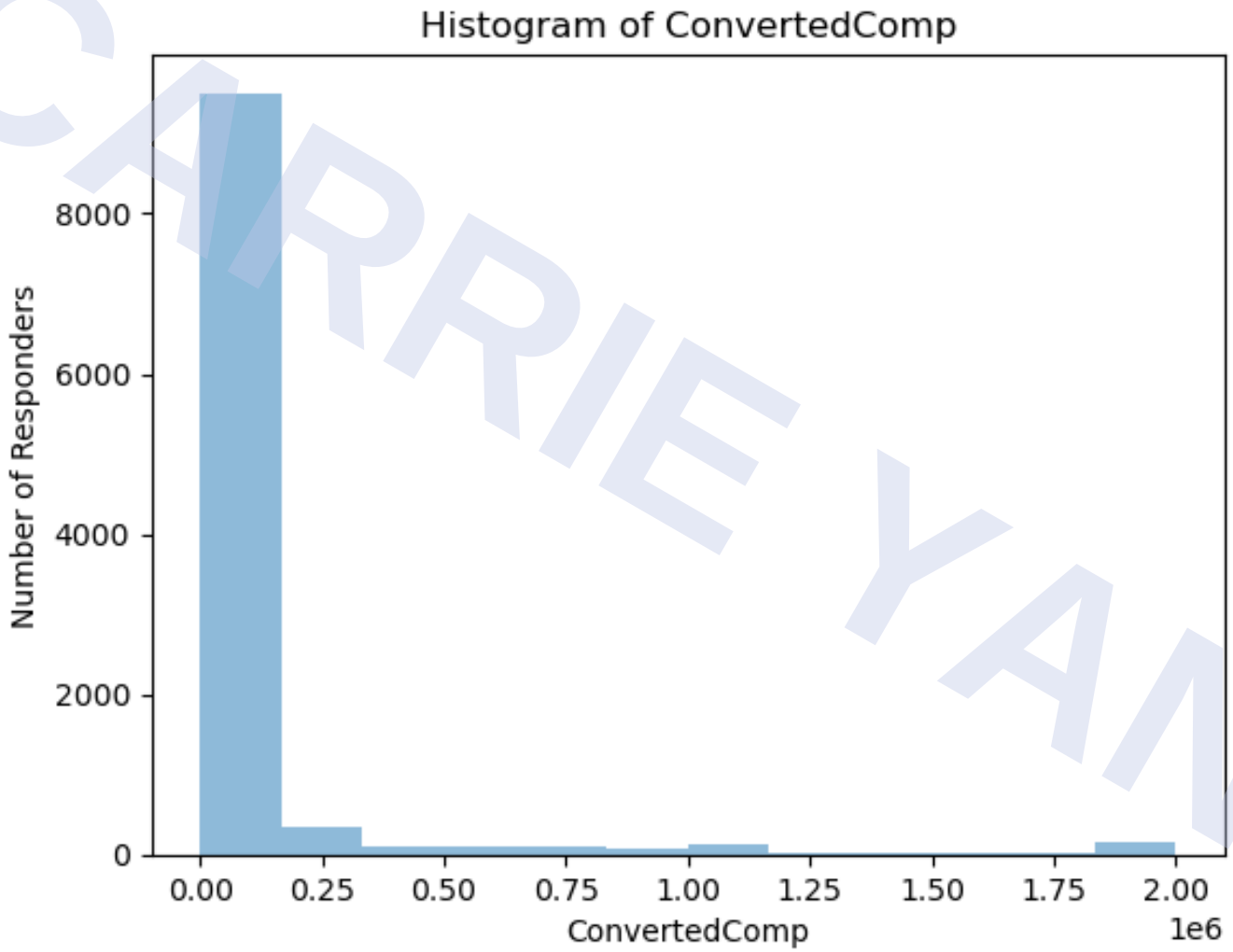




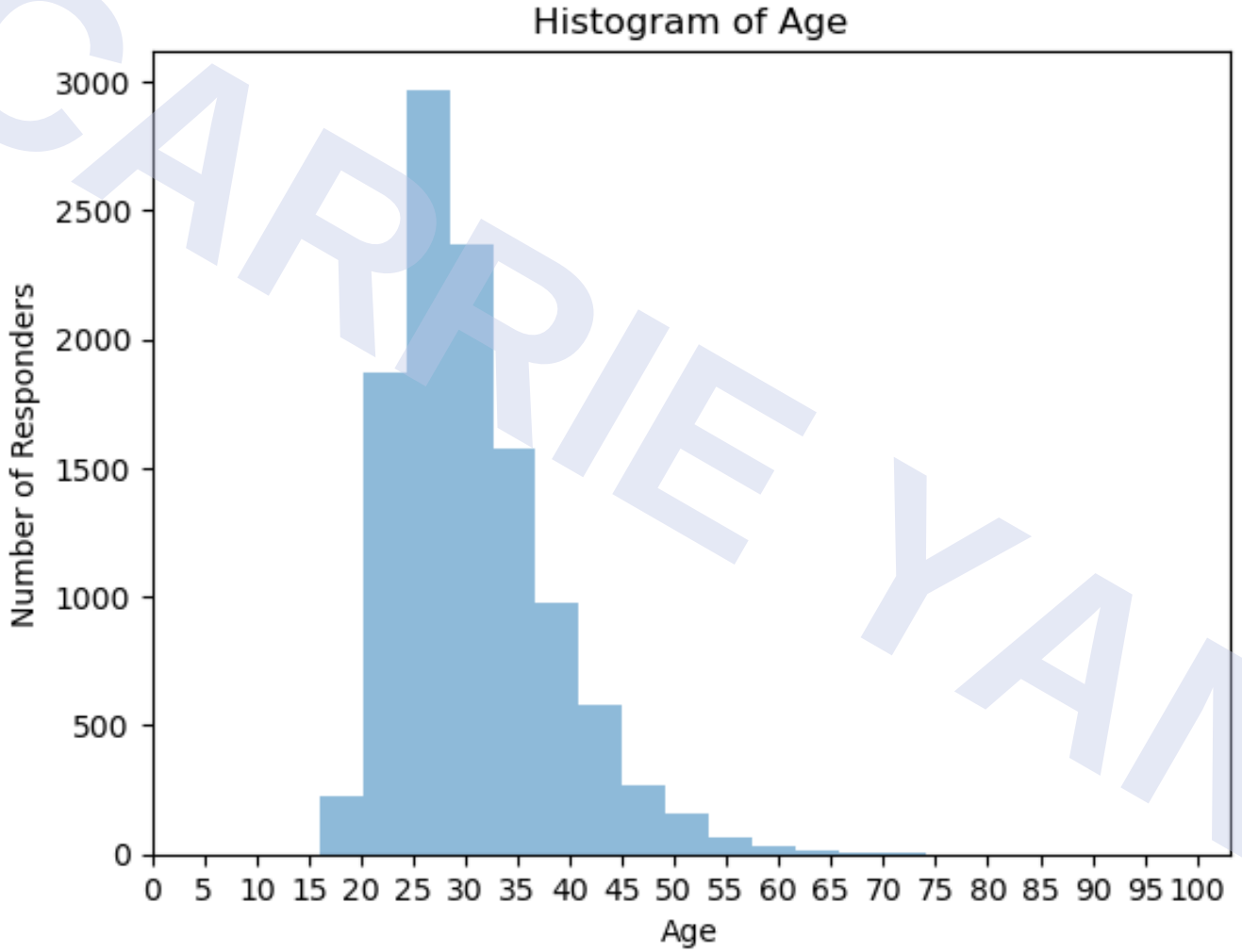
Distribution Curve of Salary



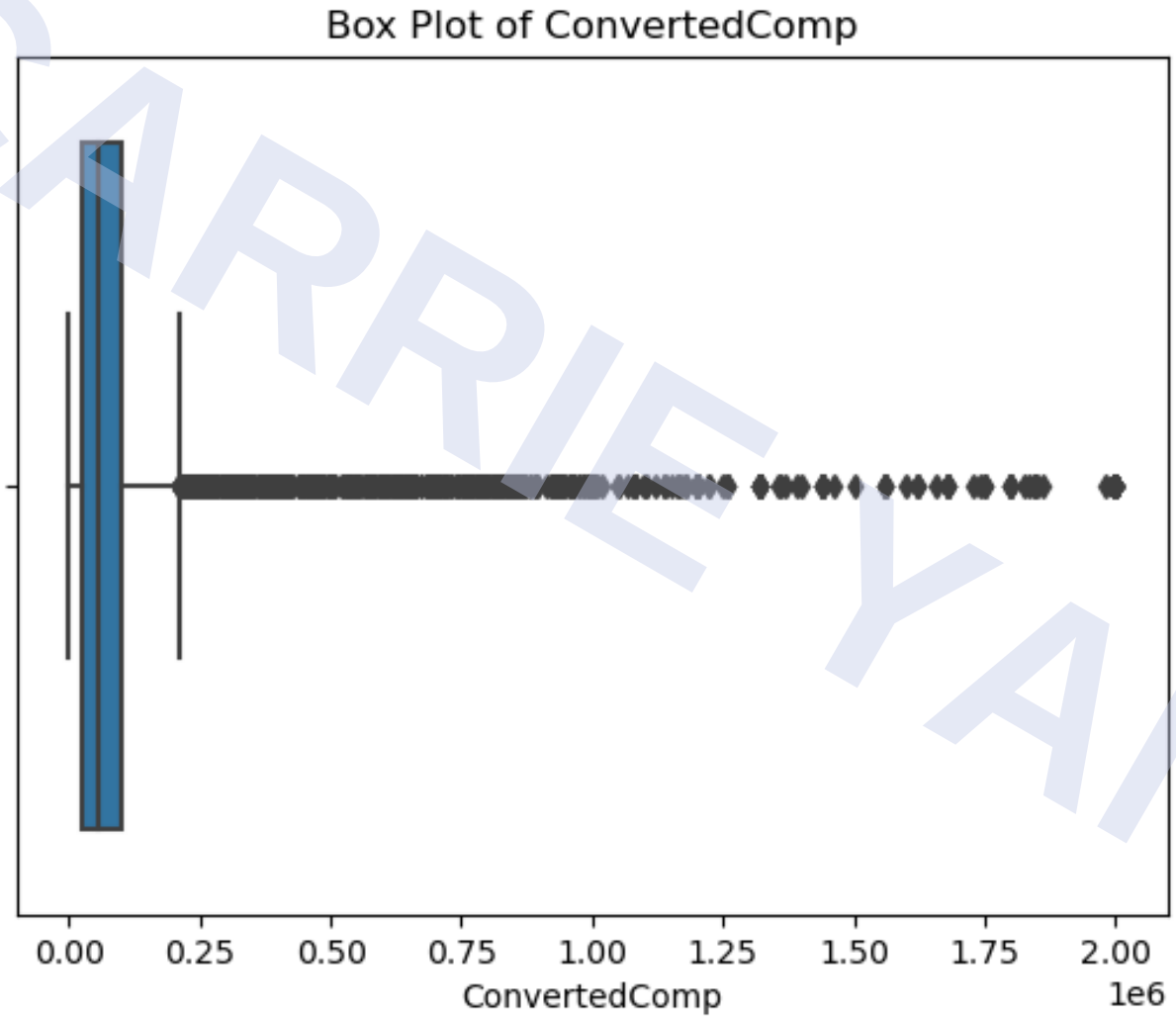
Histogram of Salary



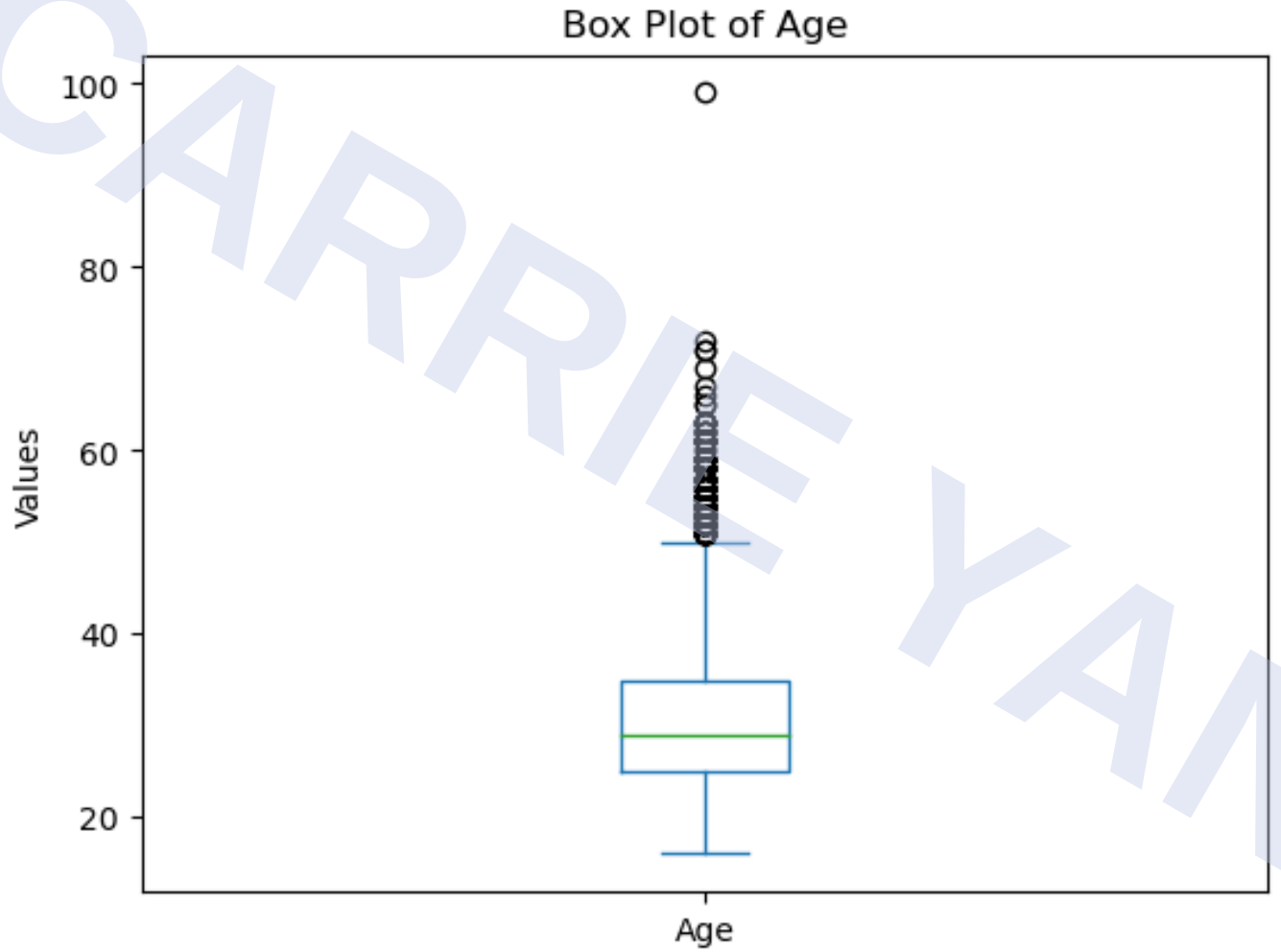
Histogram of Age



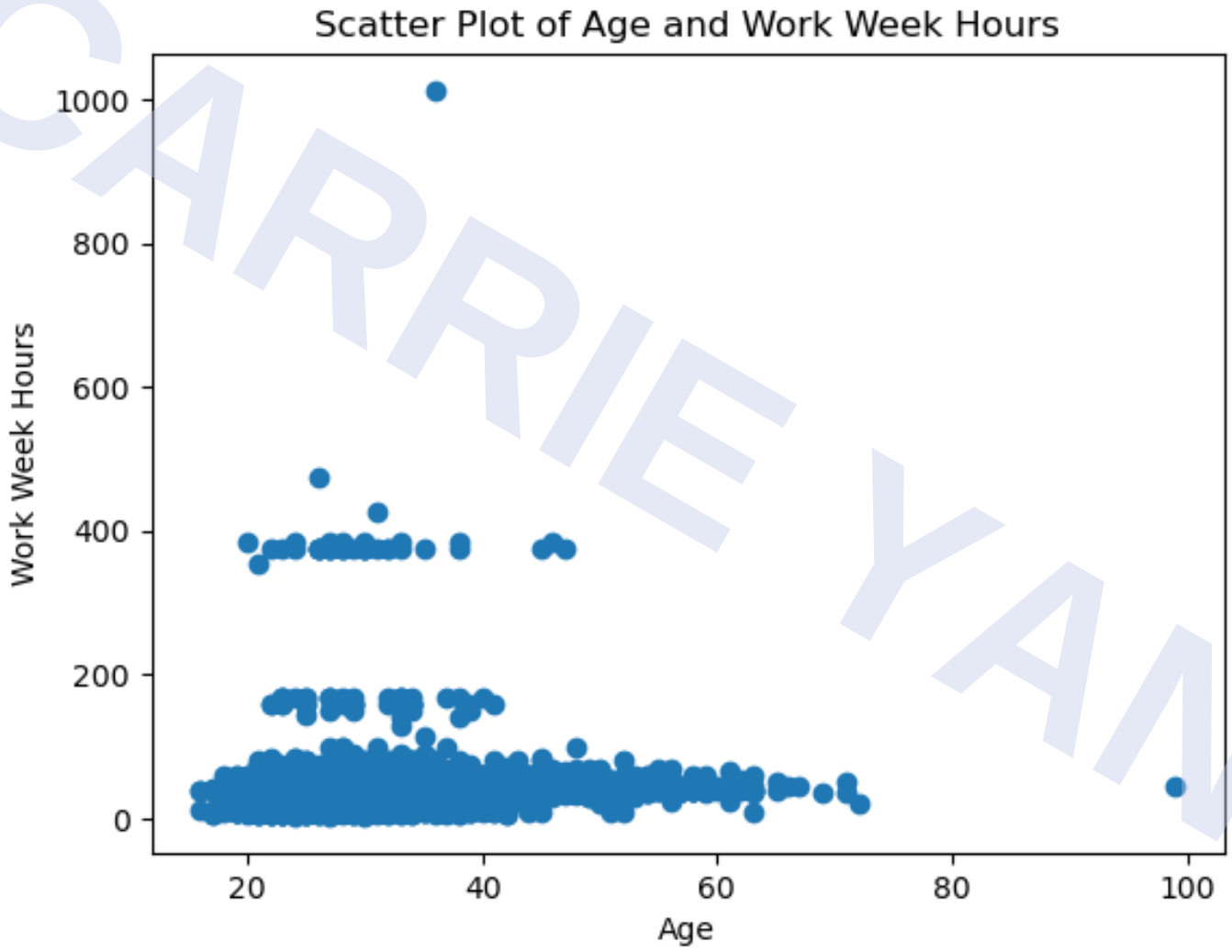
Salary Box Plot



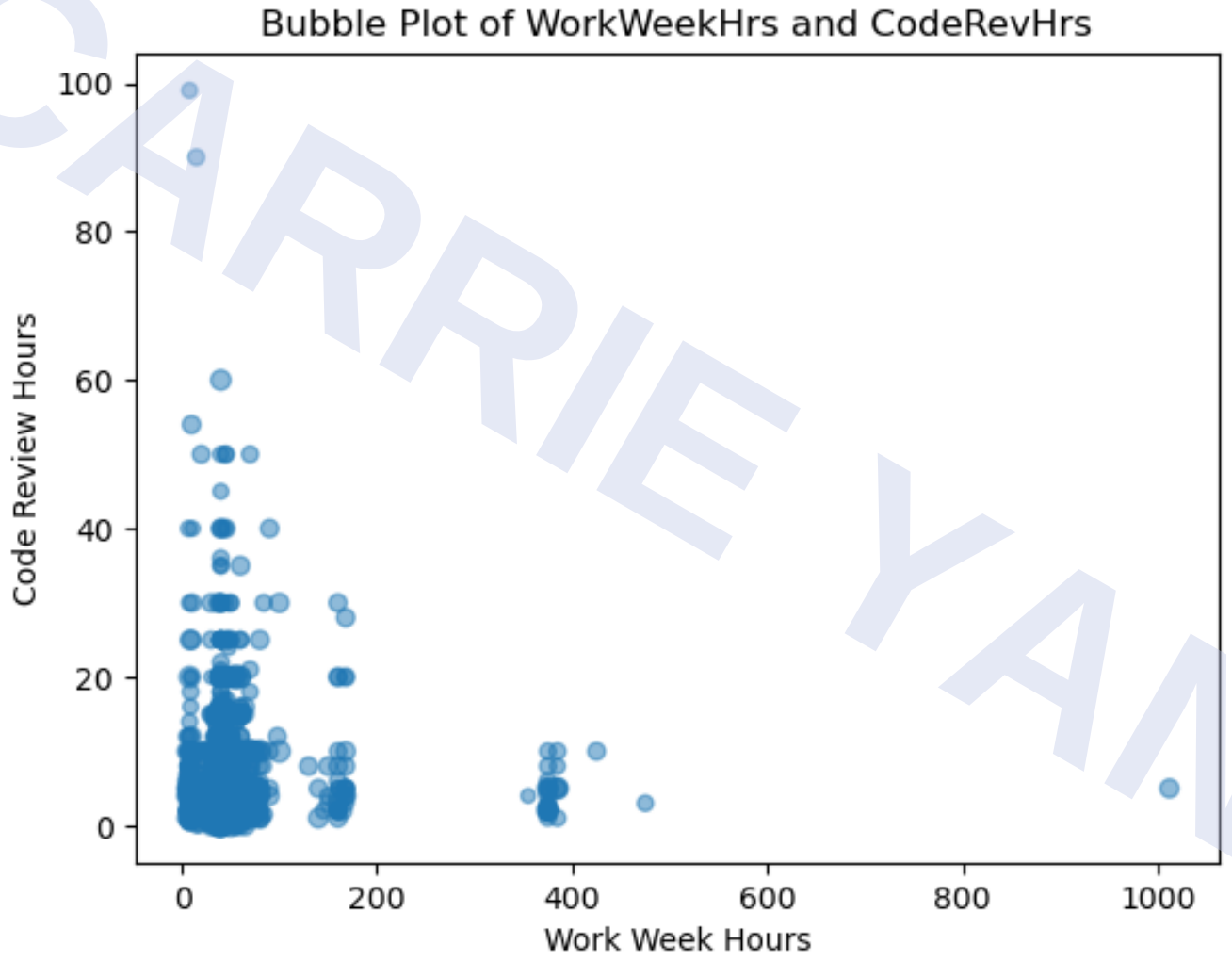
Age Box Plot



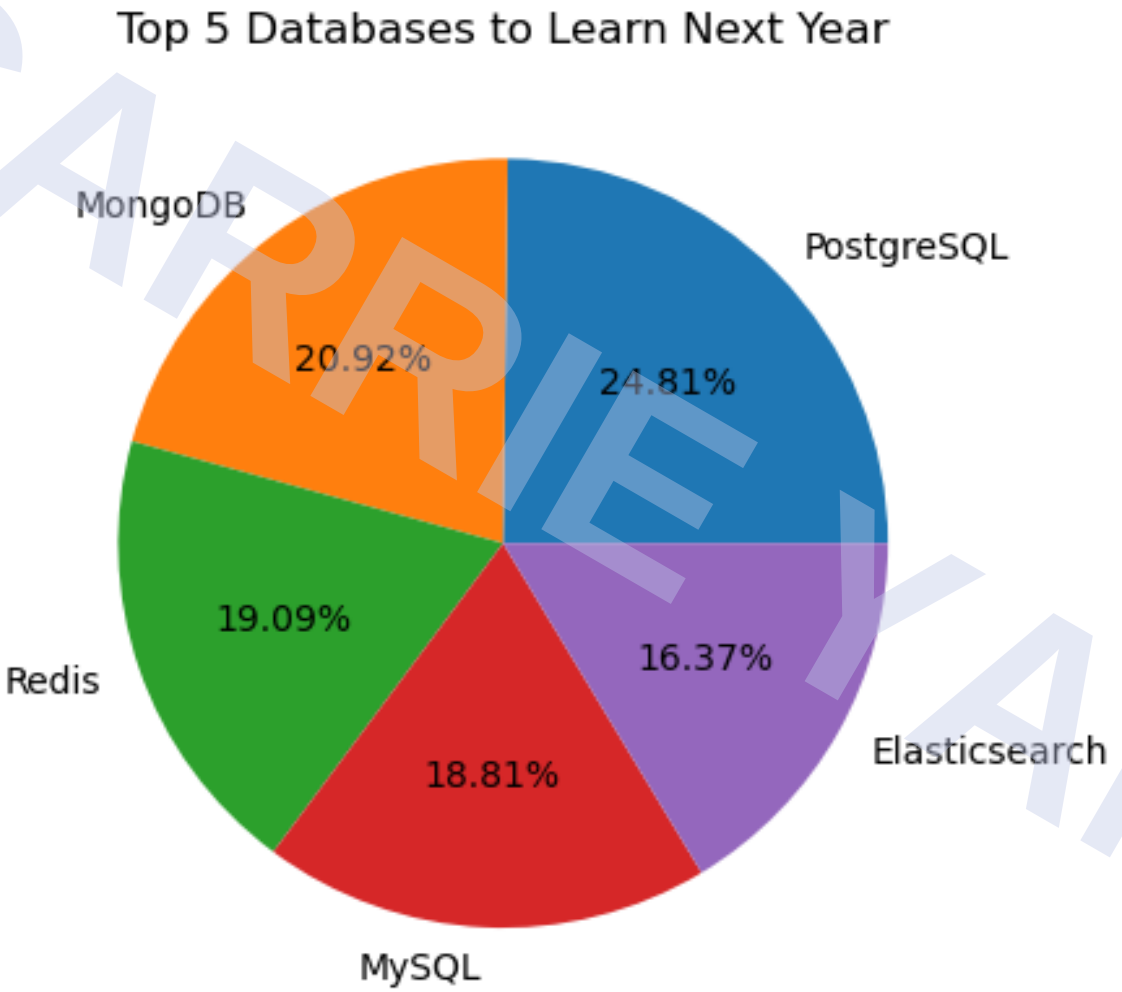
Scatter Plot of Age and Work Week Hours



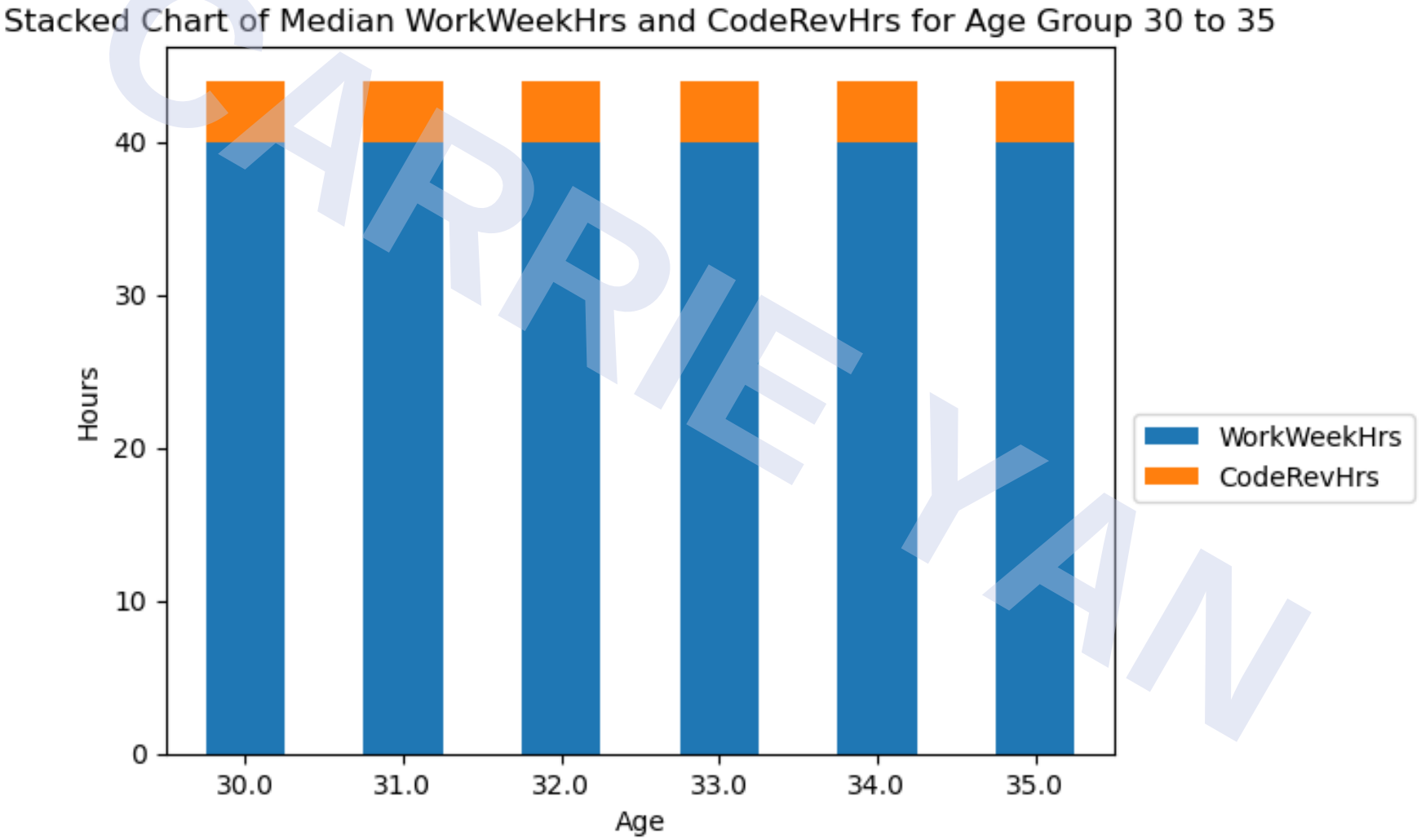
Bubble Plot of Work Week Hours and Code Review Hours



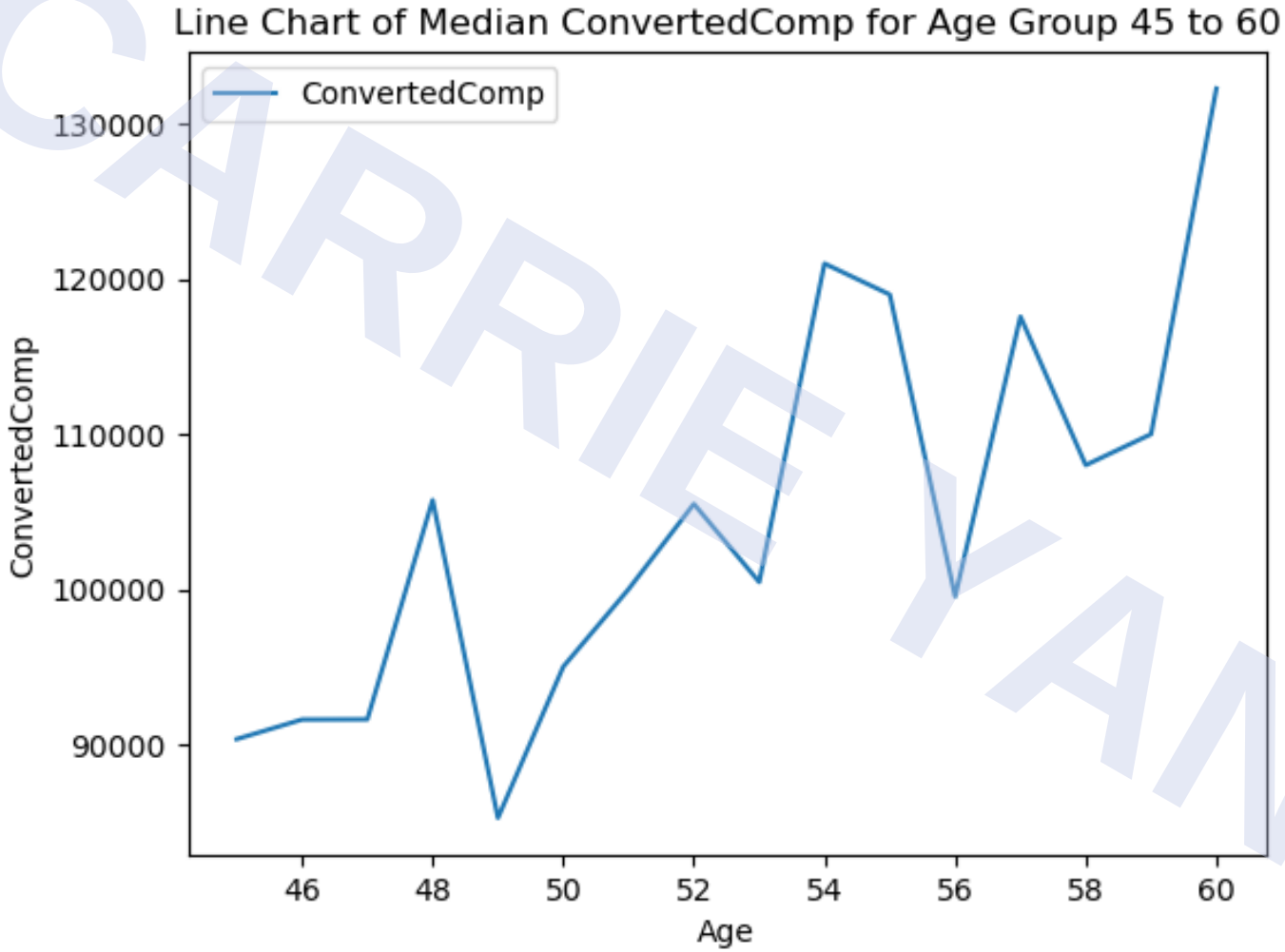
Pie Chart of Top 5 Databases to Learn Next Year



Stacked Chart of Hours for Ages 30-35



Line Chart of Salary for Ages 45-60



Horizontal Bar Chart of Main Branch