THE 2019 STACK OVERFLOW DEVELOPER SURVEY RESULTS ANALYSIS

Rana Ali

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OUTLINE

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EXECUTIVE SUMMARY

- This report explores the tech skills developers and organizations need to stay competitive in a rapidly evolving landscape, highlighting key trends in:
  - programming languages,
  - developer demographics, and
  - infrastructure

  based on data from job postings, training platforms, and the 2019 Stack Overflow Developer Survey.
- The tech industry continues to rely on core technologies like JavaScript, HTML/CSS, Python, and SQL.
- As cloud platforms and NoSQL databases become increasingly vital, continuous learning and cloud adoption are critical.
- Addressing the gender disparity in the field is essential for fostering a more inclusive tech community.

INTRODUCTION

- This report is done for identifying emerging tech skill requirements to keep developers and organizations competitive in a rapidly evolving technological landscape.
- This report focuses on the most in-demand programming skills, leveraging data from various sources, including
  - job postings,
  - training portals,
  - and surveys.
- A key resource for this analysis is the 2019 Stack Overflow Developer Survey, which provides valuable insights into developers' Demographics, current and preferred technologies, and job preferences worldwide.
- By scraping data and applying statistical techniques utilizing different Python libraries, we will uncover trends in programming languages, database skills, and popular web-frames, presenting our findings through a comprehensive dashboard created with IBM Cognos Analytics.

METHODOLOGY

Data Analysis and Visualization

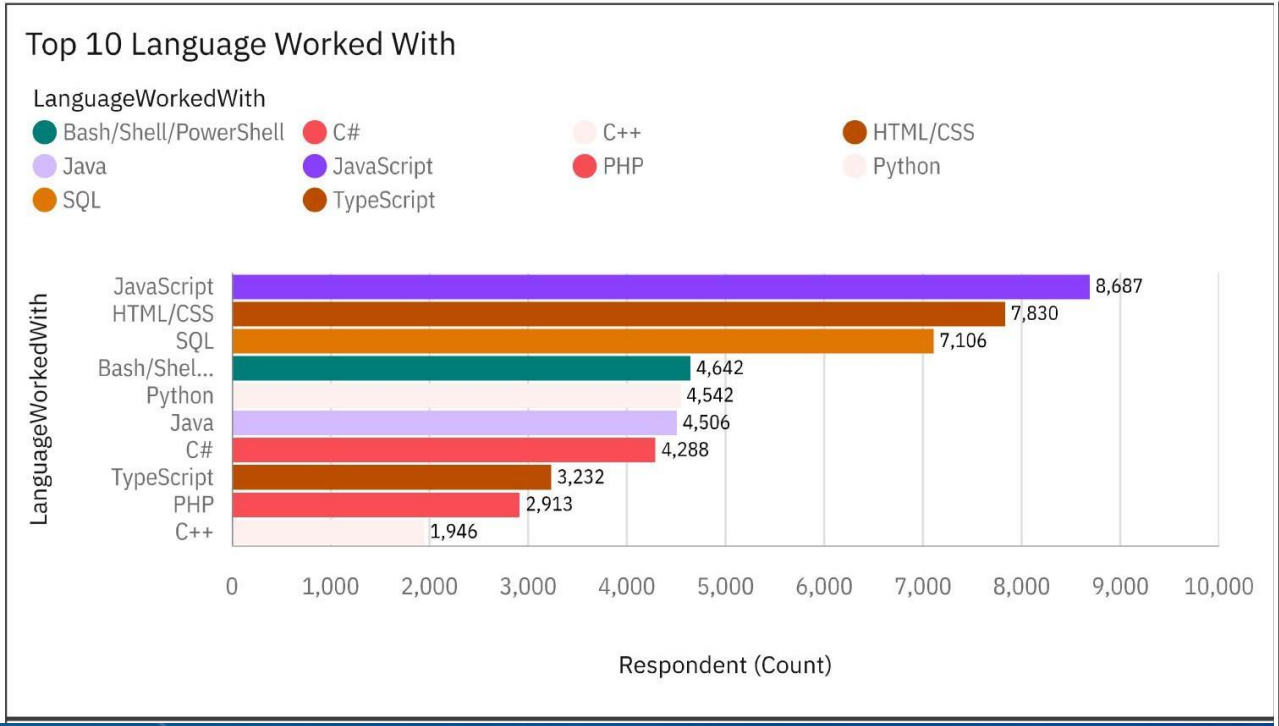
Analysis and visualizations were performed using various Python libraries, Sqlite and IBM Cognos Analytics.

- **Data Collection:** using
  - APIs
  - Web Scraping
- **Data Wrangling**
  - Finding and removing duplicates
  - Handling missing values
  - Cleaning and normalizing data
- **Exploratory Data Analysis:** finding
  - Distribution
  - Outliers
  - Correlation
- **Data Visualization**
  - Visualizing data distribution
  - Dashboard creation

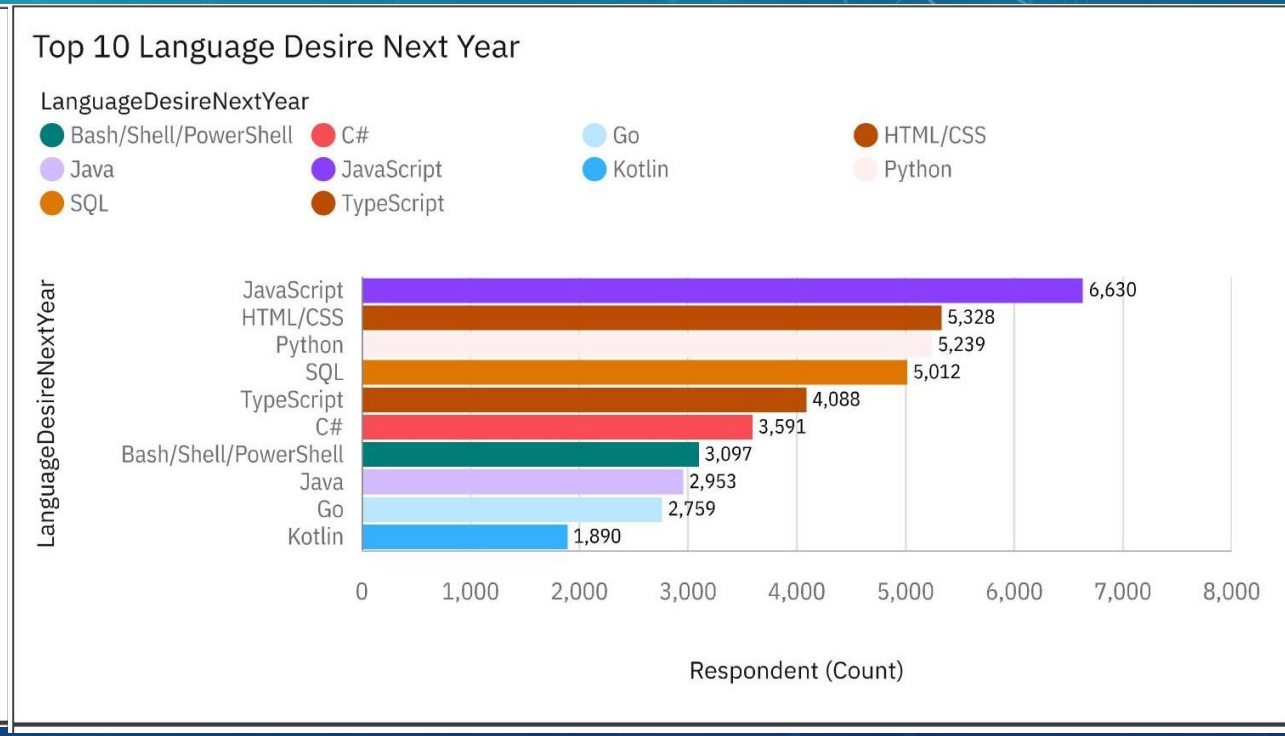
RESULTS

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

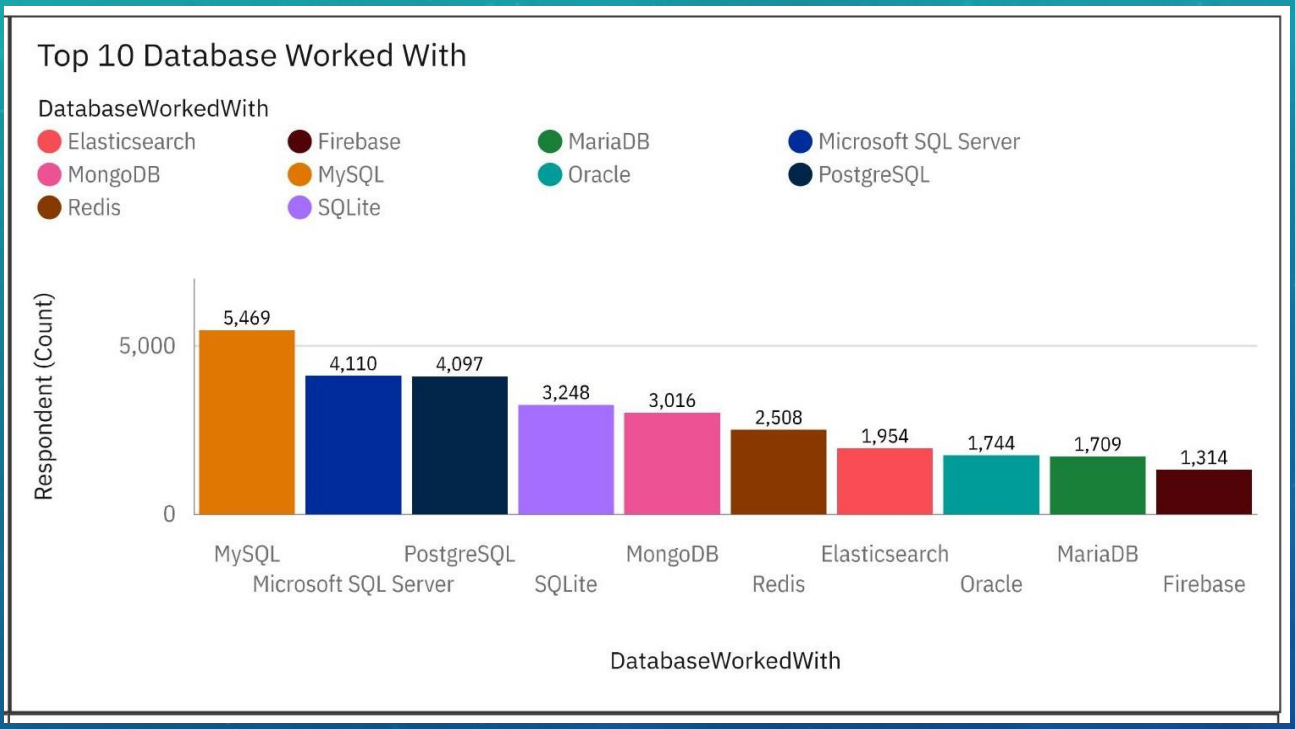
- **JavaScript Dominance:** Most used and desired language.
- **Python's Growth:** Highly popular and in demand.
- **HTML/CSS & SQL:** Essential for web development and databases.
- **Rising TypeScript:** Increasingly popular for type safety in JavaScript.
- **Emerging Languages:** Go and Kotlin are gaining interest but still behind the established ones.

Implications

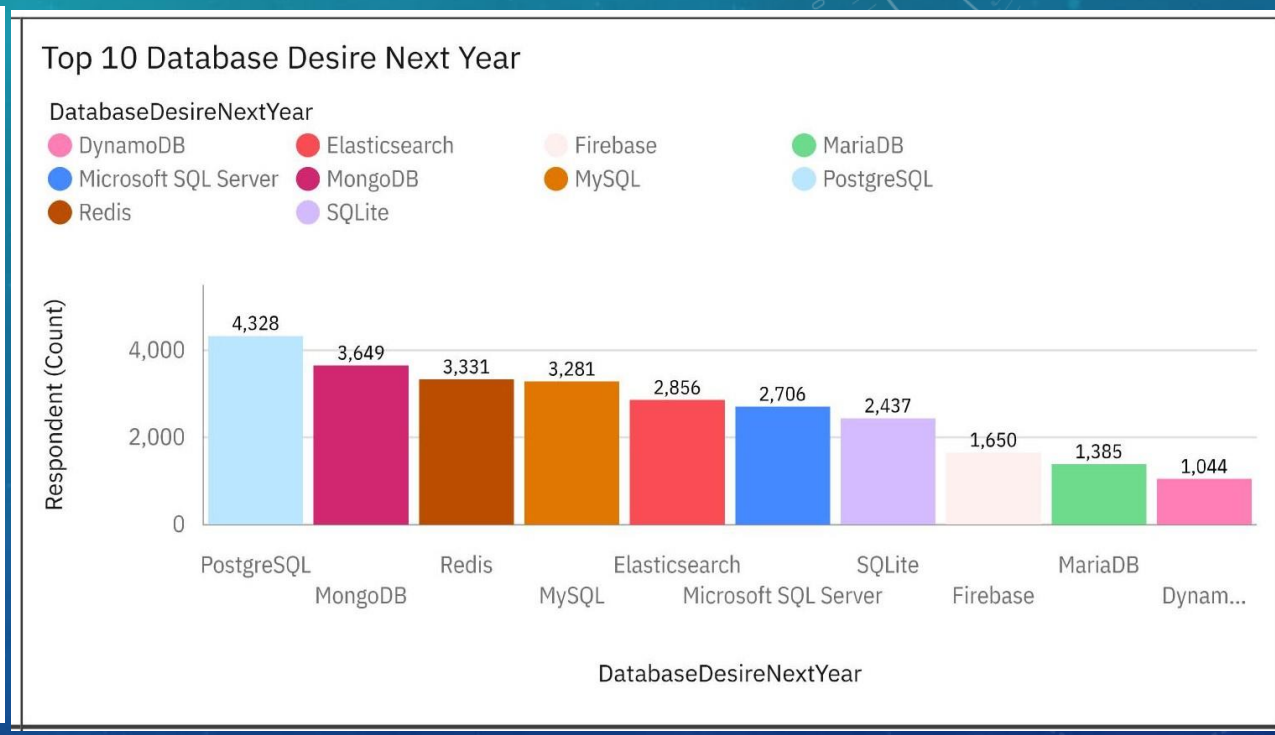
- **Developers:** should build a strong foundation in JavaScript, HTML/CSS, SQL, and TypeScript for versatile web development. Consider Python for data-centric projects and stay updated on emerging languages like Go and Kotlin for specialized needs.
- **Companies:** Invest in JavaScript and TypeScript ecosystems for robust web applications. Utilize Python for data-driven projects and explore Go or Kotlin for specific performance or platform requirements.

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

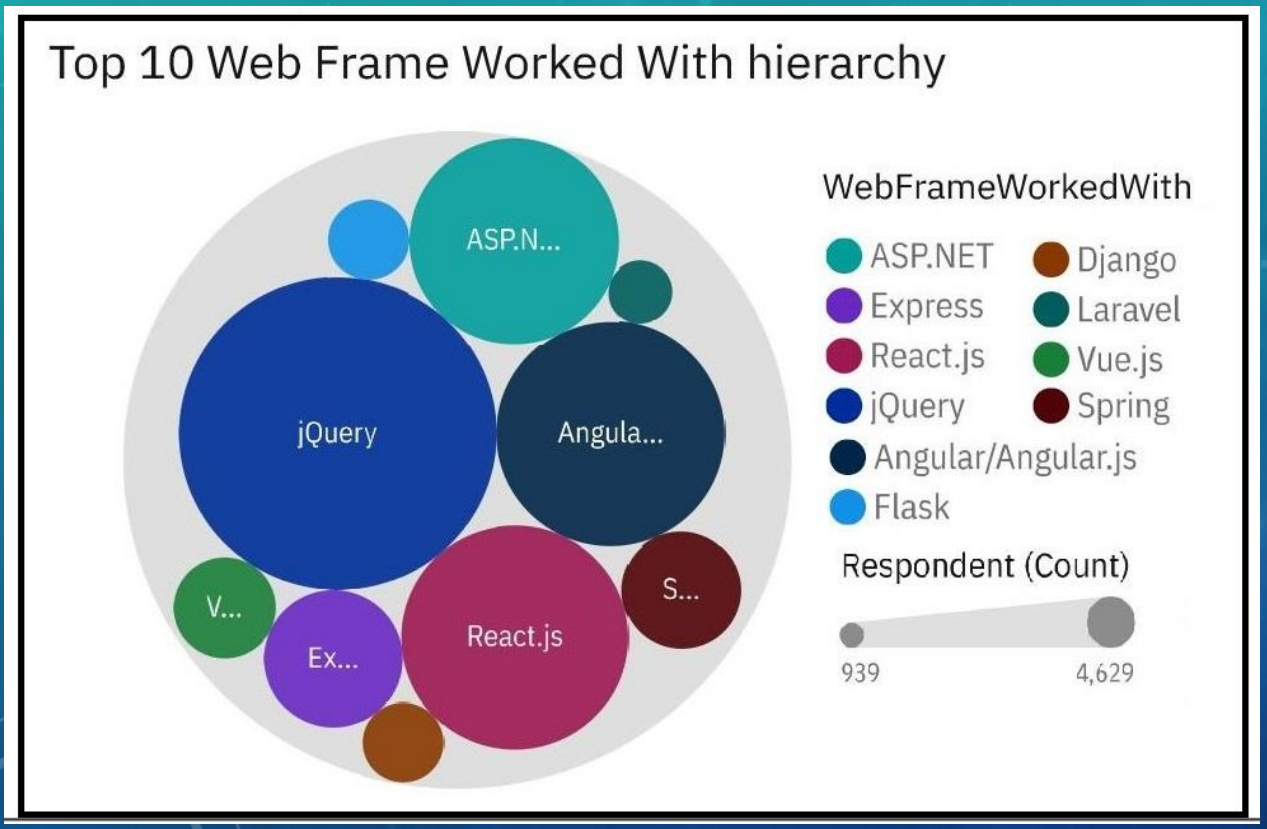
- Interest in MySQL and Microsoft SQL Server is declining.
- PostgreSQL is the top choice for next year.
- NoSQL databases (MongoDB, Redis, Elasticsearch) gaining popularity.
- Cloud-based options on the rise.
- SQL vs. NoSQL preference split.

Implications

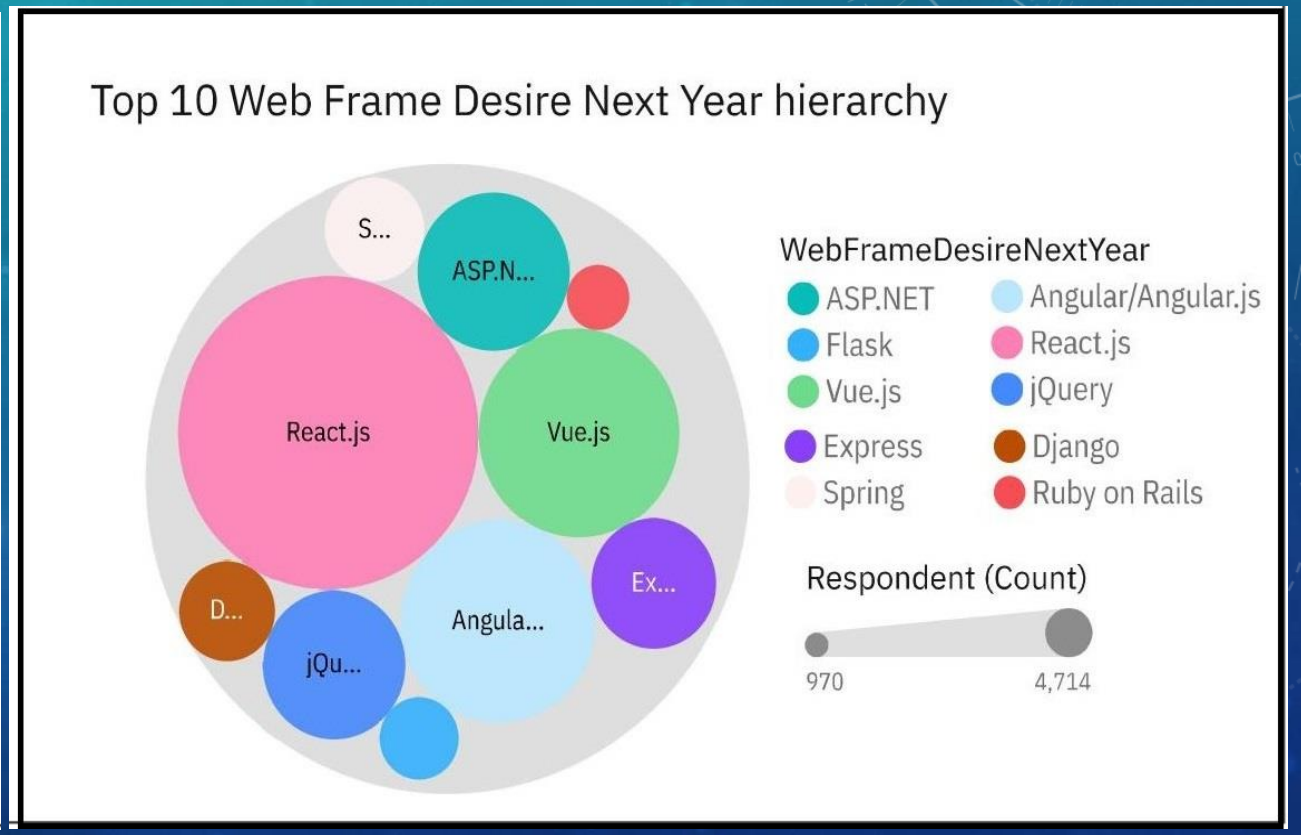
- Developers: Build a diverse skill set encompassing SQL, NoSQL, and cloud databases to enhance career opportunities.
- Companies: Strategically invest in database infrastructure, considering hybrid approaches (i.e., polyglot persistence strategy[1]) and cloud migration, to support business growth and hire skilled talent.

WEB-FRAME TRENDS

Current Year



Next Year



WEB-FRAME TRENDS - FINDINGS & IMPLICATIONS

Findings

- jQuery is the most widely used library, but its trend is declining.
- React.js is rapidly gaining popularity.
- Angular and Vue.js hold strong positions.
- Django increasing in backend development with slight decreasing desire in ASP.NET Core.

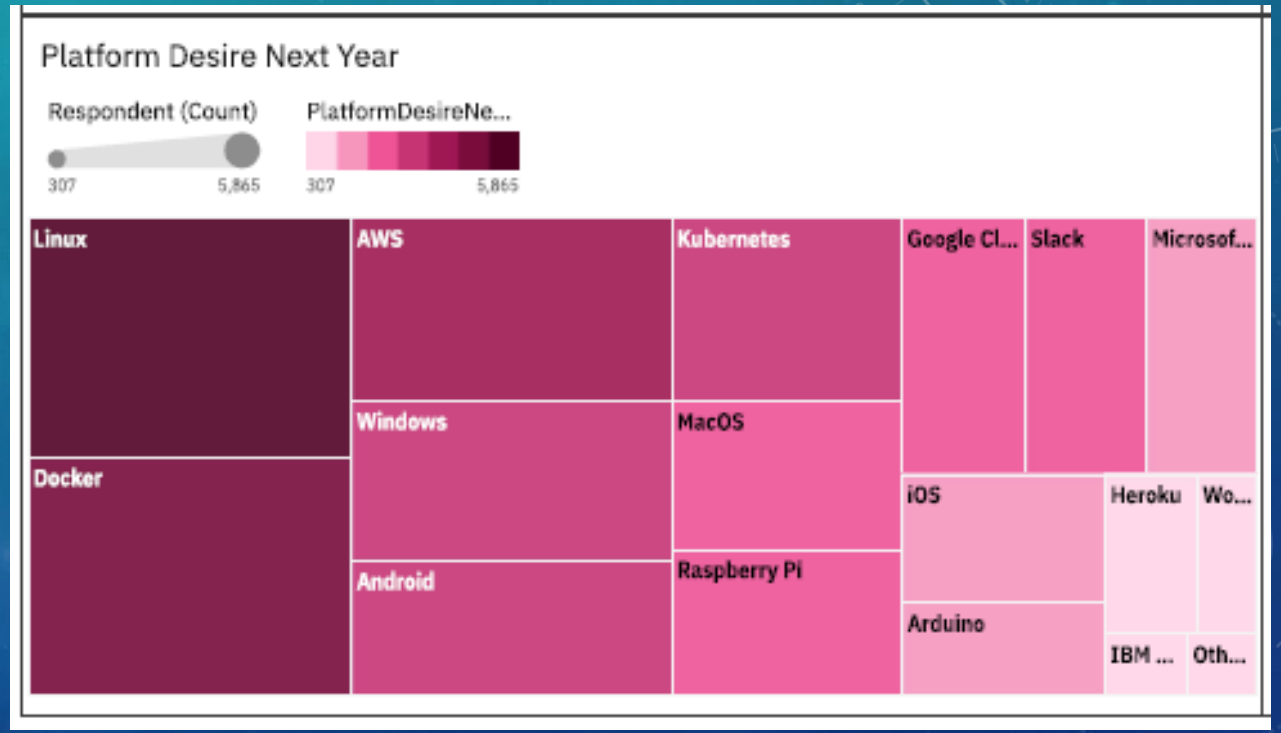
Implications

- **Developers:** Maintain jQuery proficiency for existing projects. Prioritize learning React.js for new projects and career advancement. Consider Angular or Vue.js for alternative options. Explore Django for backend development.
- **Companies:** Support jQuery for legacy systems. Invest in React.js for new frontend development. Evaluate Angular or Vue.js based on project requirements. Consider Django for backend needs.

PLATFORM TRENDS

Current Year

Next Year



PLATFORMS TRENDS - FINDINGS & IMPLICATIONS

Findings

- Strong interest in cloud platforms (AWS, GCP, Azure) both for current use and future plans.
- Docker's popularity for both current use and future desire.
- Kubernetes emerging as one of the top choices for the next year.
- Windows and Linux remain staple, especially for those desiring it next year.

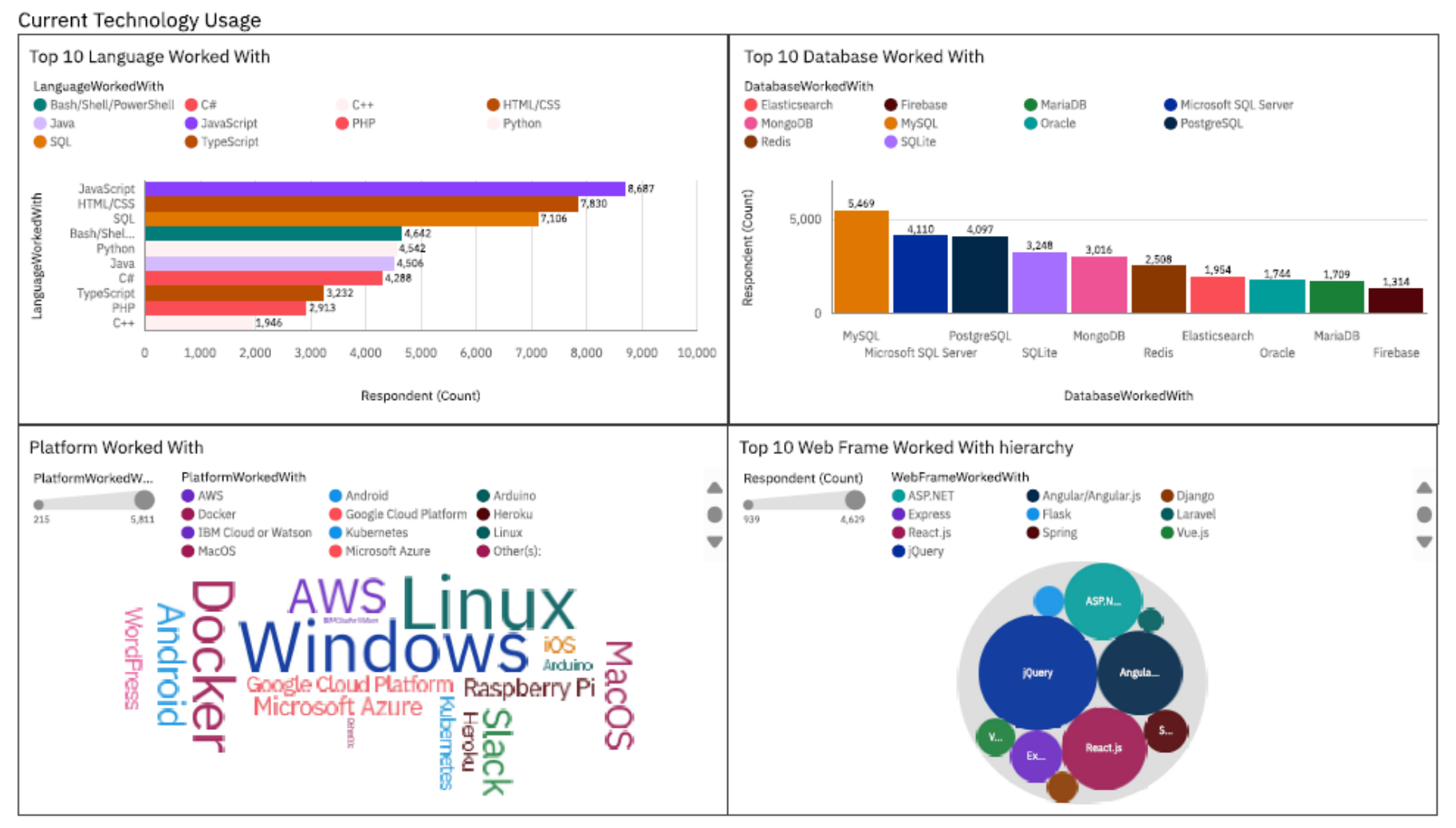
Implications

- **Developers:** Master cloud platforms (AWS, GCP, Azure), embrace containerization (Docker), learn Kubernetes for cloud-native development, and maintain OS proficiency (macOS, Windows, Linux).
- **Companies:** Invest in cloud infrastructure (AWS, GCP, Azure), adopt containerization (Docker), explore Kubernetes for optimization, and ensure OS compatibility (macOS, Windows, Linux).

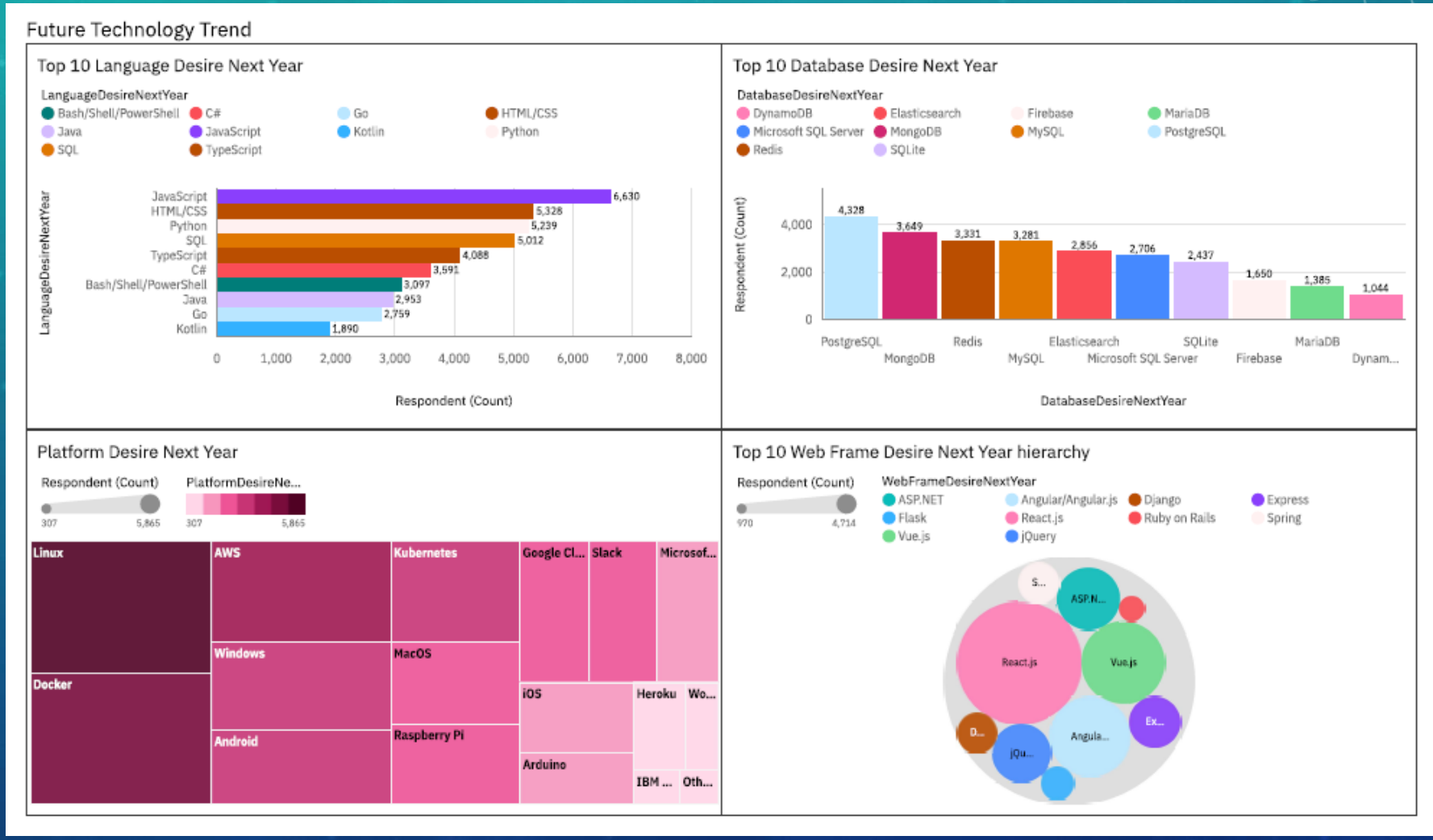
DASHBOARD

https://github.com/RanaTuk/IBM-Cognos-Analytics-Projects/blob/8d10f42d6f9fc253bf80ac4f5fe975a23f3a4e7e/The_2019_Stack_Overflow_Developer_Survey.pdf

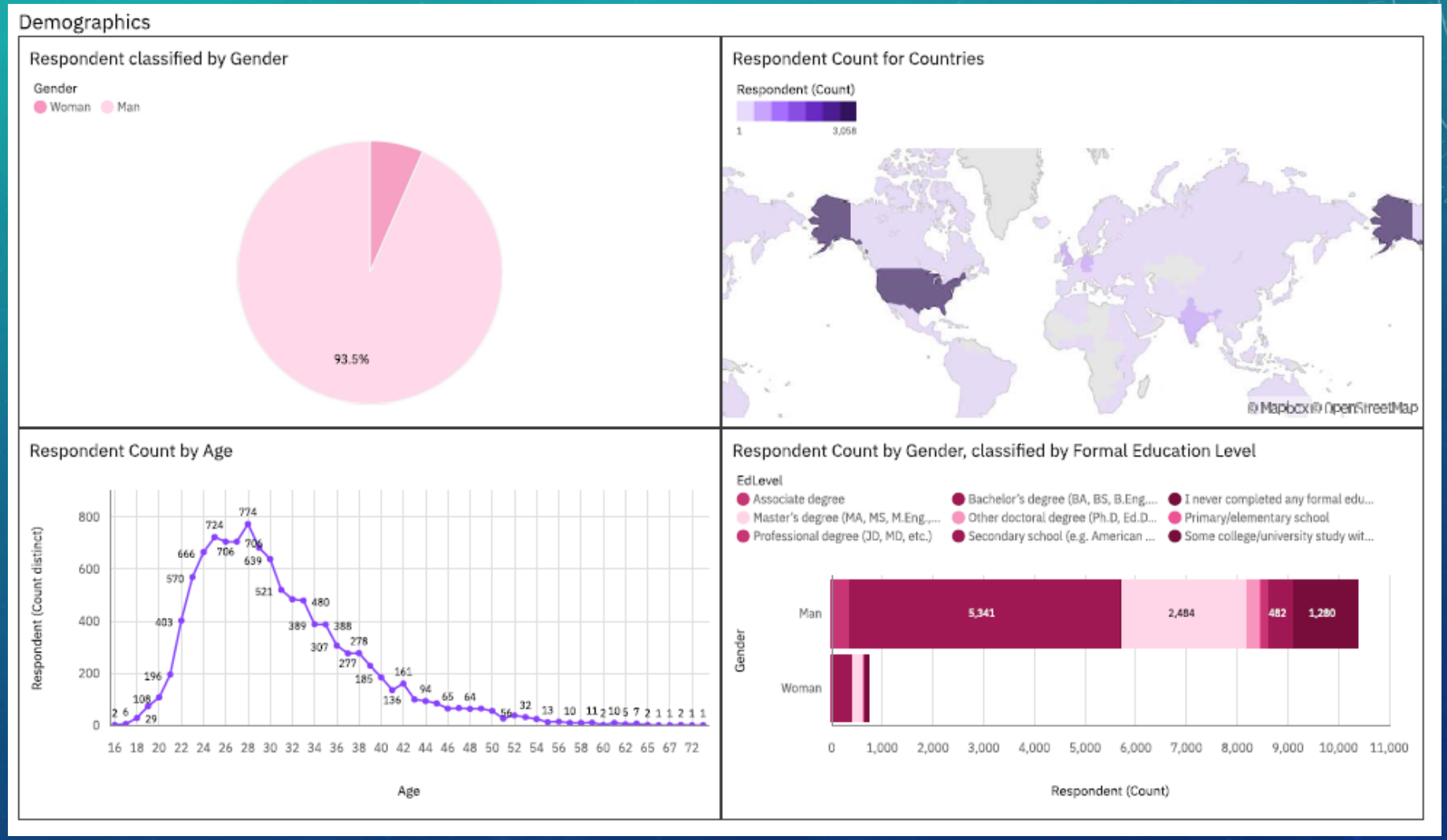
DASHBOARD TAB 1



DASHBOARD TAB 2



DASHBOARD TAB 3



DISCUSSION

- How long will JavaScript and Python maintain their dominance in the programming landscape?
- Is there a growing demand for NoSQL database expertise?
- Is it better to learn several languages or to focus on just one?
- Are workers over 40 excluded from the tech job market?
- How do stereotypes and unconscious biases impact women's career paths in tech?

OVERALL FINDINGS & IMPLICATIONS

Findings

- Technology Landscape: JavaScript, HTML/CSS, SQL, and Python dominate programming, cloud platforms (AWS, GCP, Azure) lead infrastructure, Docker's gaining popularity, React.js is the preferred frontend framework, PostgreSQL and NoSQL databases are increasingly adopted.
- Developer Demographics: A predominantly male-dominated field with a concentration of developers residing in the USA aged 20-35, often holding Bachelor's degrees.

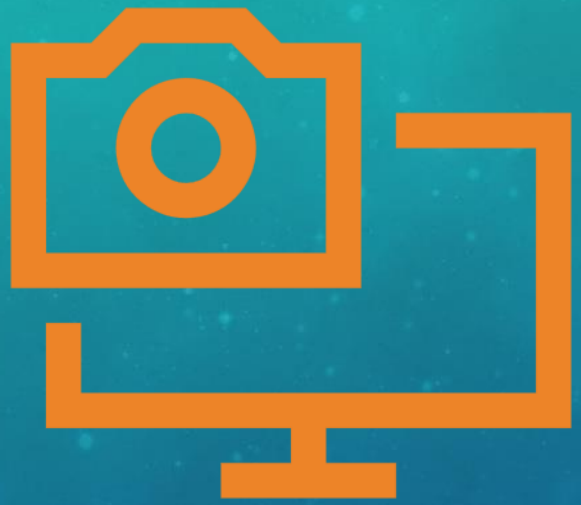
Implications

- Developers: Build a strong foundation in core languages and frameworks, continuously upskill, and specialize in cloud technologies.
- Companies: Invest in cloud infrastructure, prioritize data driven solutions, and foster a diverse and inclusive workplace culture.

CONCLUSION

- The tech industry is characterized by a continued reliance on core technologies like JavaScript, HTML/CSS, Python, and SQL.
- Cloud platforms (AWS, GCP, Azure) are increasingly essential for operational efficiency.
- NoSQL databases are vital for handling modern data challenges.
- To thrive, developers and organizations must prioritize continuous learning, cloud adoption, and data-driven strategies while addressing the persistent gender gap in the industry.

APPENDIX



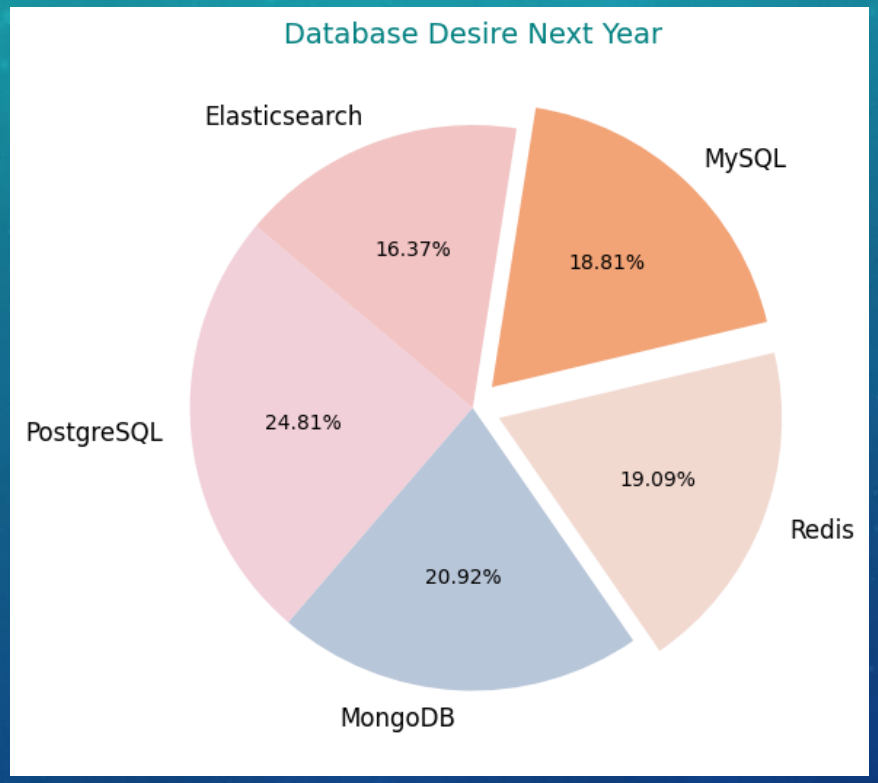
Terminology and Concepts

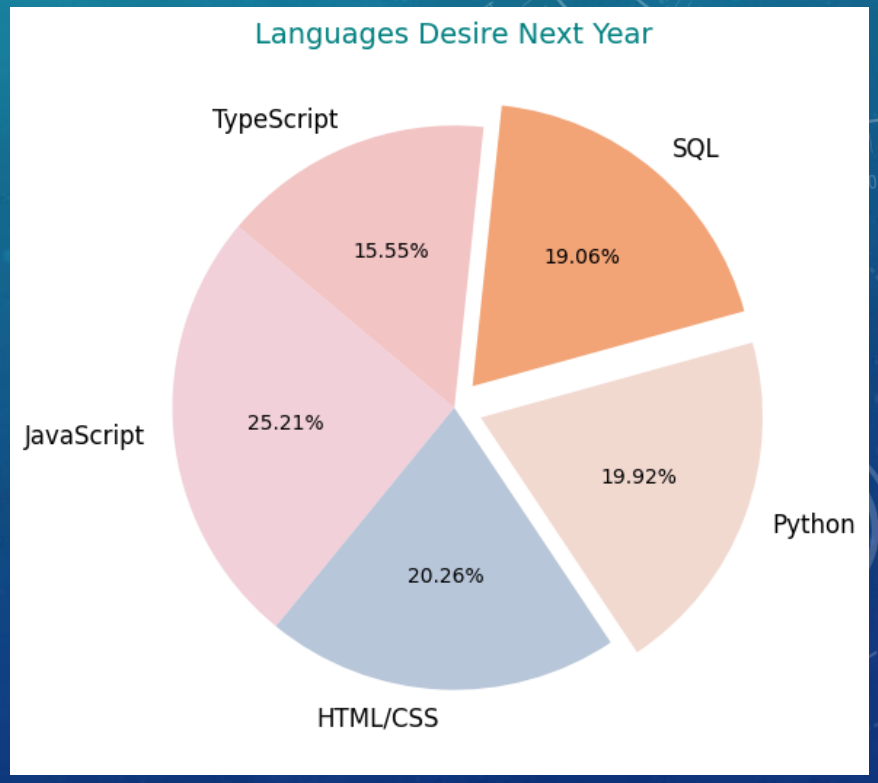
1- Polyglot persistence is a specific term that accurately describes a hybrid approach to using multiple database technologies in a single application or system. It's like having a toolbox with different tools, each perfect for a specific job.

2- **Containerization (Docker):**
Containerization involves packaging an application and its dependencies into a lightweight, portable container, ensuring consistent performance across different environments. Docker is the leading platform for managing these containers, simplifying deployment, scaling, and management of applications.

APPENDIX

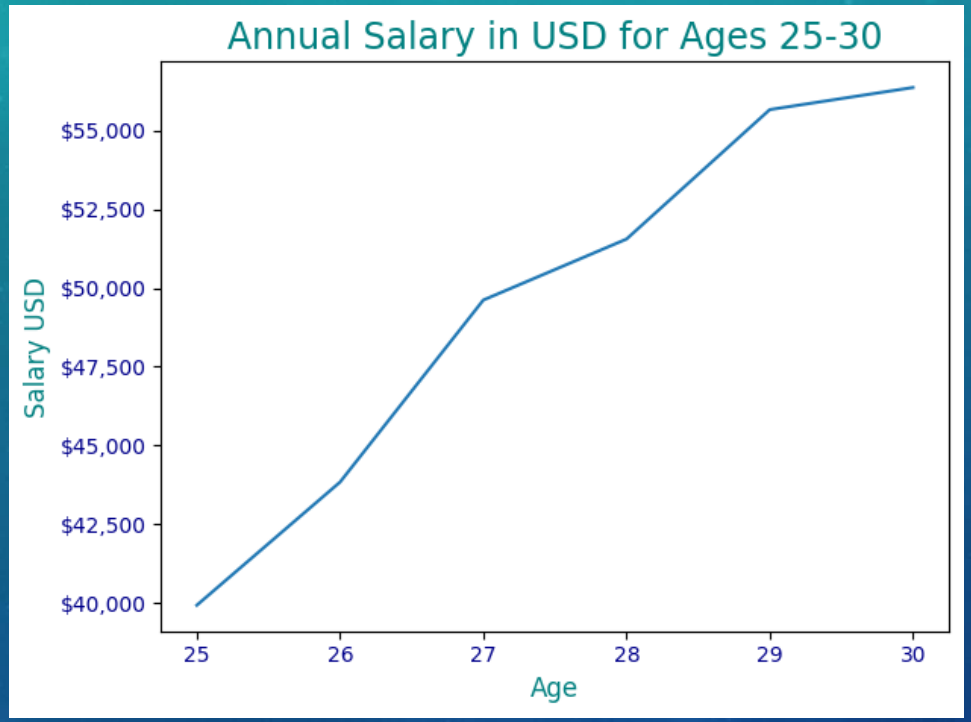
Pie charts showing the percentage of languages and databases desired to learn next year.

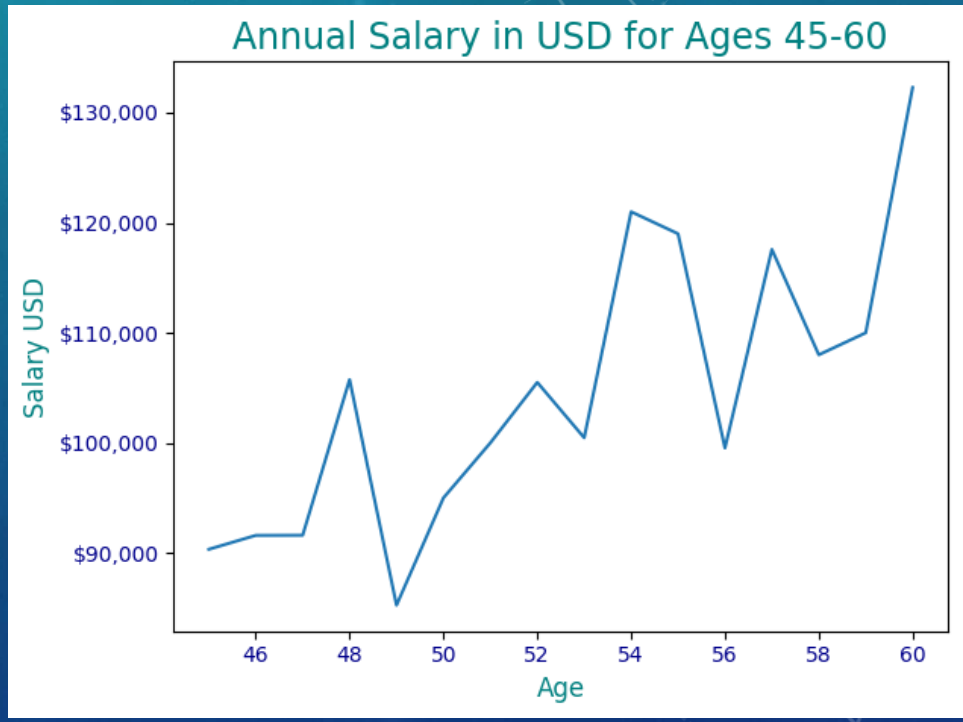




APPENDIX

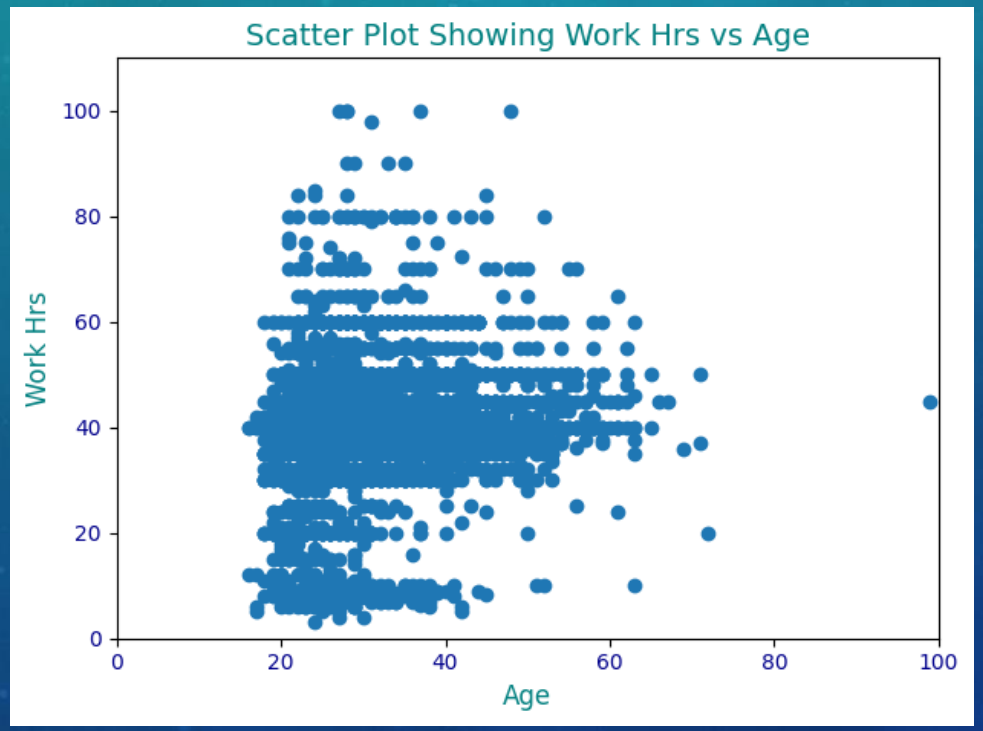
Line charts showing the median annual salary in USD for tow age groups 25-30 and 45-60.

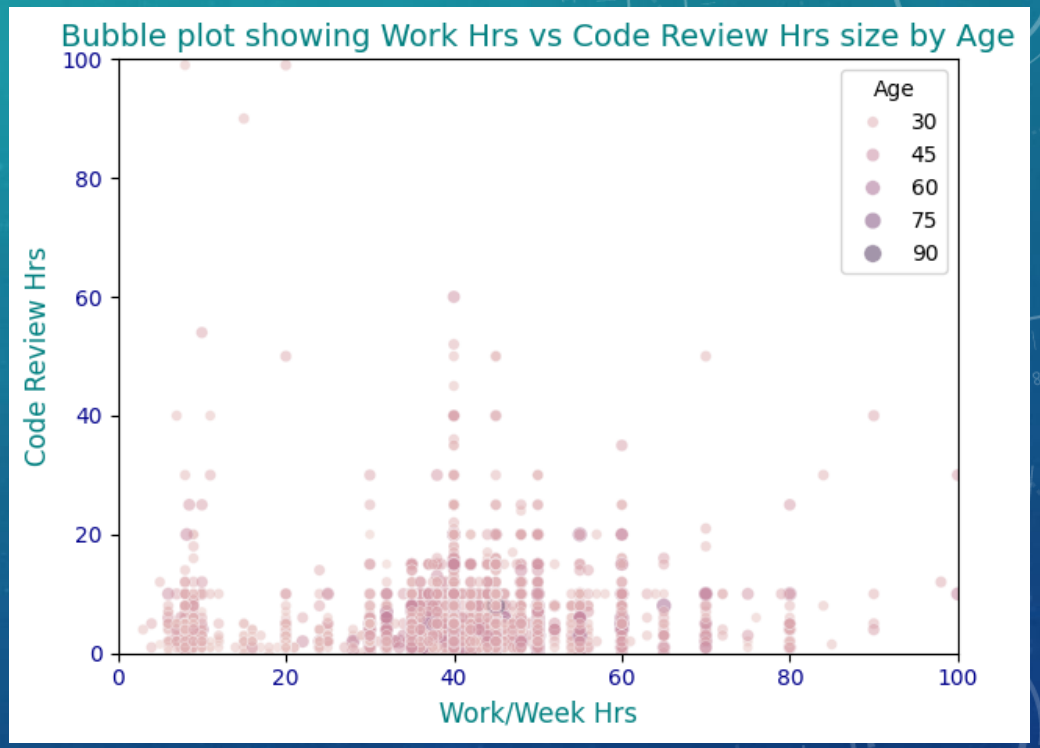




APPENDIX

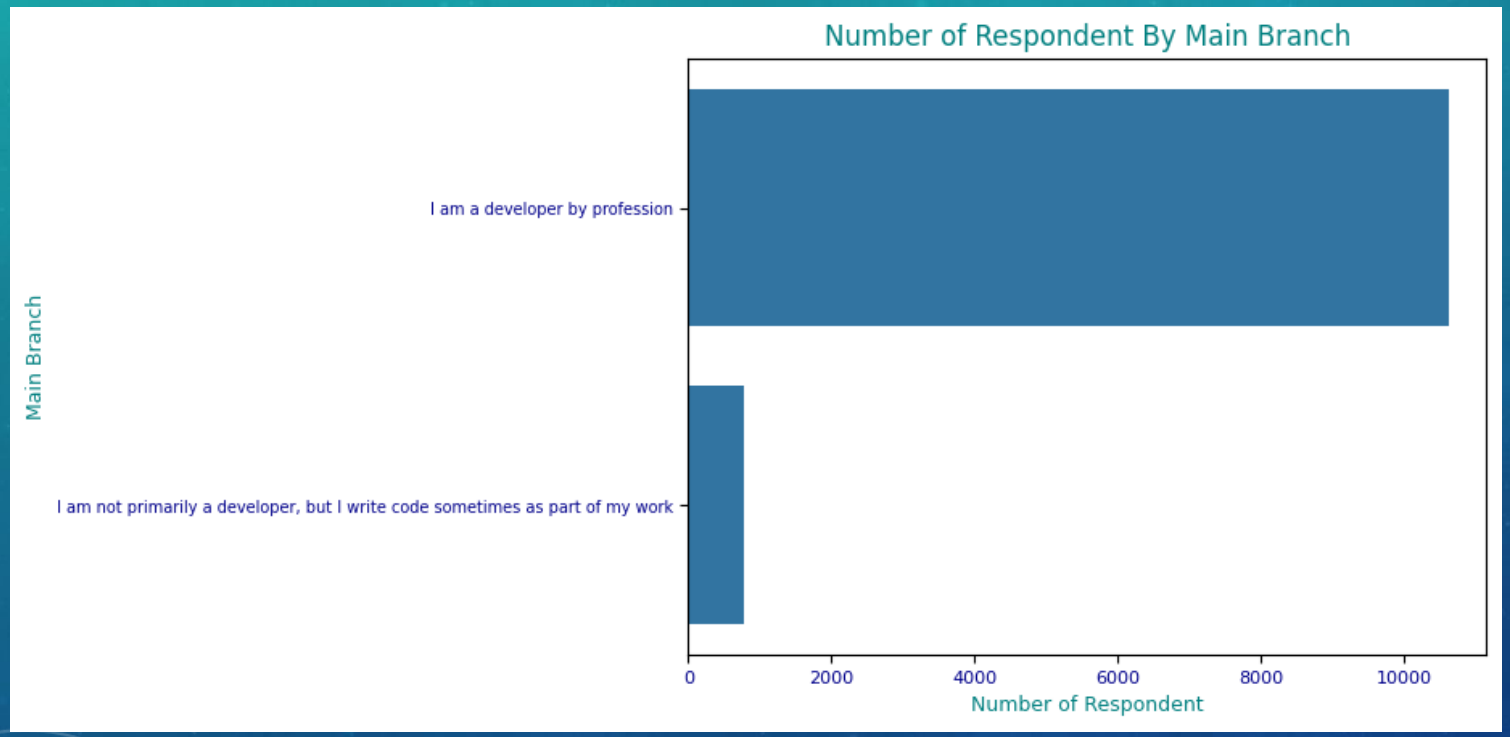
A scatter plot of age vs work hours per week.



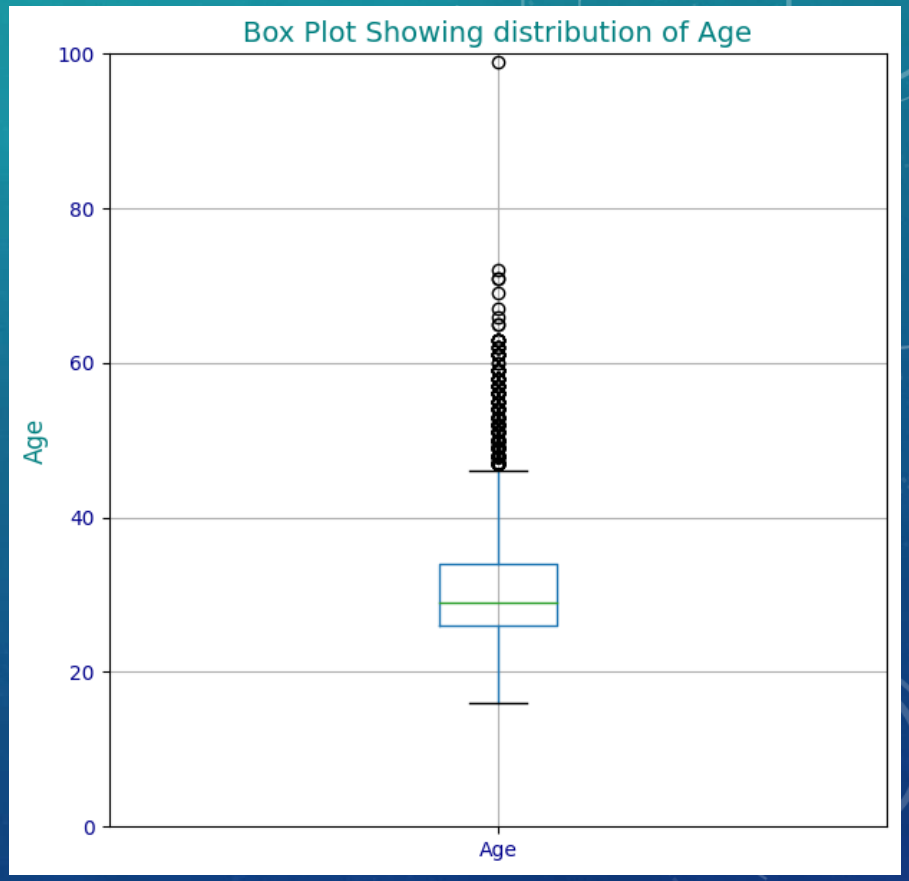


A bubble plot of work hours vs code review hours per week sized by age.

APPENDIX



A bar chart shows the count of developers by main branch.

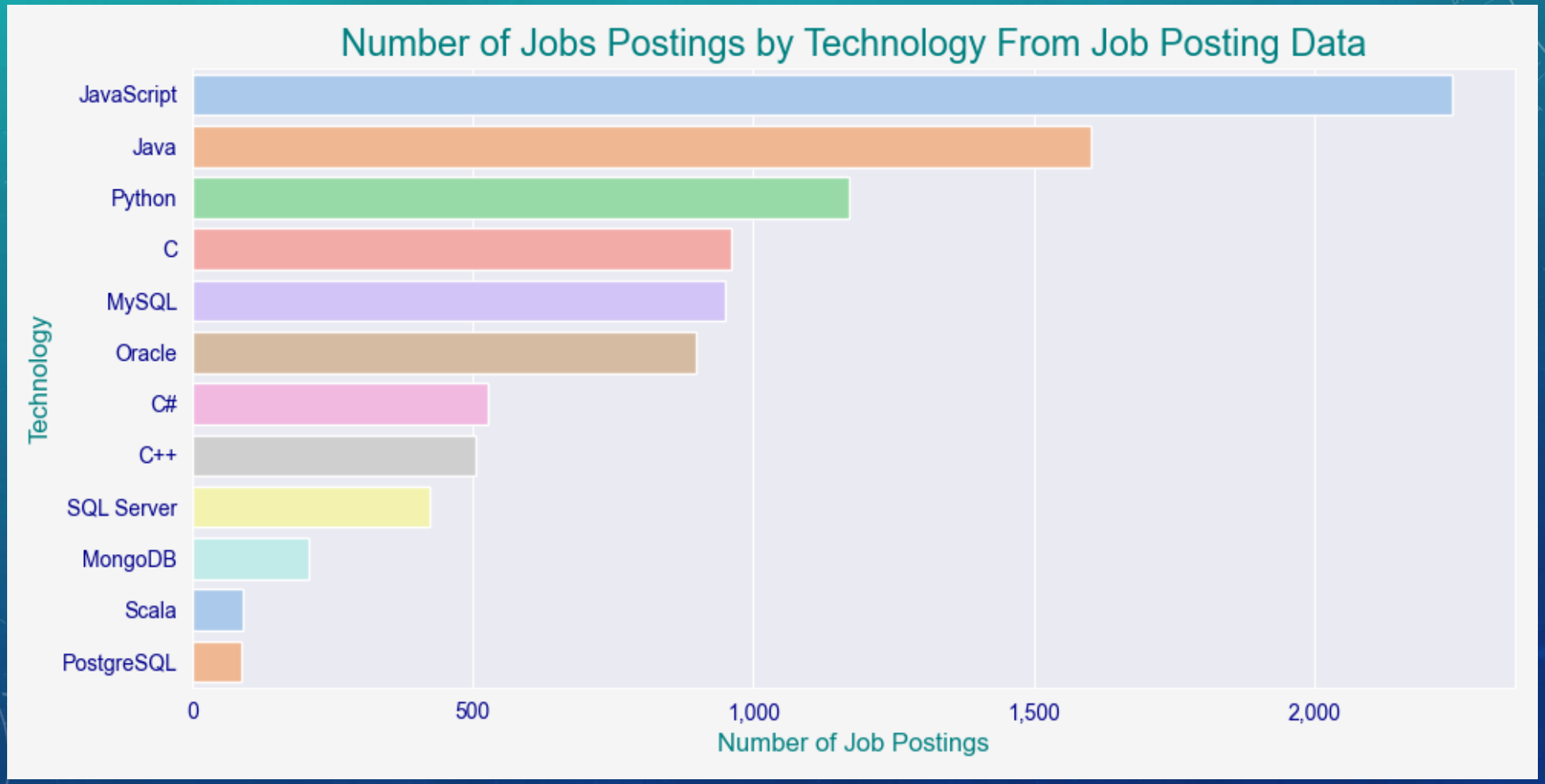


A box plot shows the distribution of Age.

JOB POSTINGS

A bar chart represents job posting data in descending order of the number of job postings.

The job posting data have been collected using Github Job API.



POPULAR LANGUAGES

A bar chart represents the most the most popular programming languages from job postings data. in the descending order of salary. The data have been collected using web scraping.