# OUTLINE

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# EXECUTIVE SUMMARY

The IT industry is highly competitive and constantly evolving, requiring professionals to continuously refine their programming skills and expertise in databases. This project aims to analyze emerging trends in IT and identify key areas for skill enhancement, helping professionals stay ahead of the curve in a rapidly changing landscape.

The project focuses on analyzing the following trends:

- **Current Technology Usage**: Understanding the technologies being widely adopted in the industry today.

- **Future Technology Trends**: Identifying upcoming technologies that are likely to dominate the future IT landscape.

- **Demographics in the IT Industry**: Analyzing the diversity and demographic shifts within the IT workforce.

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# EXECUTIVE SUMMARY

Key objectives of the project include:

- **Identifying the Top Programming Languages**: Determining which languages are most in demand and relevant in current and future contexts.

- **Highlighting Top Database Skills**: Pinpointing the most sought-after database management and development skills.

- **Popular IDEs**: Identifying the most widely used Integrated Development Environments (IDEs) among developers.

This analysis will provide a comprehensive overview of trends in the IT sector, offering insights that can guide skill development and career growth.

# INTRODUCTION

In today's rapidly evolving IT industry, staying ahead of emerging trends and skill demands is crucial for maintaining a competitive edge. As technology continues to advance, professionals must continuously refine their expertise, especially in areas like programming, database management, and cloud computing. This presentation will explore the key trends shaping the future of IT, the top programming languages in demand, essential database skills, and the most popular Integrated Development Environments (IDEs).

Using data collected from job postings, training portals, and surveys, we will provide insights into the future skill requirements, helping organizations and individuals navigate this dynamic landscape and prepare for the challenges ahead.

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# METHODOLOGY
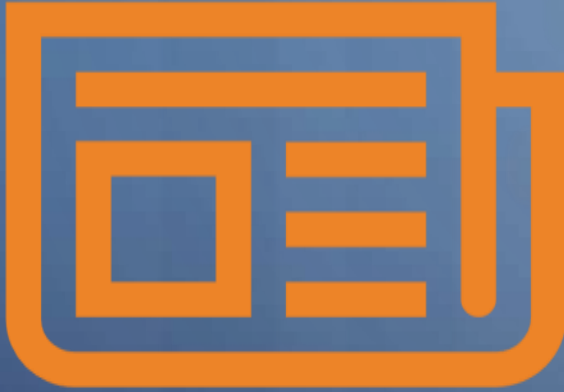
**Data Sources:**

- Data was sourced from **Stack Overflow**, utilizing two datasets:

  - **Demographics Data**

  - **Survey Data on Technologies**

  - **Survey Data:**

- This dataset was used to analyze both **current** and **future technology trends**. The following variables were examined:

  - **Respondents**

  - **Languages Worked With**, **Databases Worked With**, **Platforms Worked With**, **Web Frameworks Worked With**

  - **Languages Desired Next Year**, **Databases Desired Next Year**, **Platforms Desired Next Year**, **Web Frameworks Desired Next Year**

  - **Demographic Data:**

- The demographic data helped provide insights into the diversity of the IT industry. It included:

  - **Gender (Men and Women)**

  - **Age**

  - **Formal Education Level**

  - **Countries**

  - **Data Cleaning and Filtering:**

- **Null values** or **missing data** were removed.

- The demographic analysis was limited to **men and women** to focus on these two gender categories.

- **Data Illustration & Analysis Tools:**

- The following tools and libraries were used for data cleaning, analysis, and visualization:

  - **Python Libraries**: Numpy, Matplotlib, Pandas, Seaborn

  - **IBM Cognos Analytics/Looker Studio Dashboard:** For creating interactive dashboards and visualizations

  - **Jupyter Notebook**: For data cleaning and in-depth analysis

# RESULTS

The following analysis compares the graphs between **current technology usage** and **future technology trends,** highlighting key shifts in industry preferences:
Here's a refined version of your results section for the presentation:

**1. Programming Language Trends**
- A comparative analysis between the **most widely used programming languages today** and the **languages that are projected to be in demand** in the coming years.
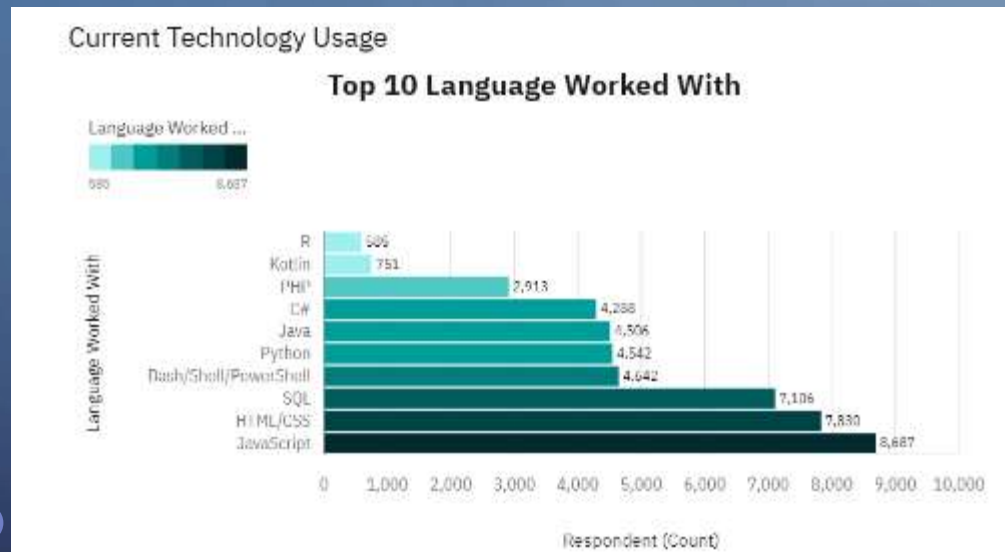
**2. Database Trends**
- An exploration of current **database technologies** in use and those expected to gain popularity in the future, based on industry and survey data.
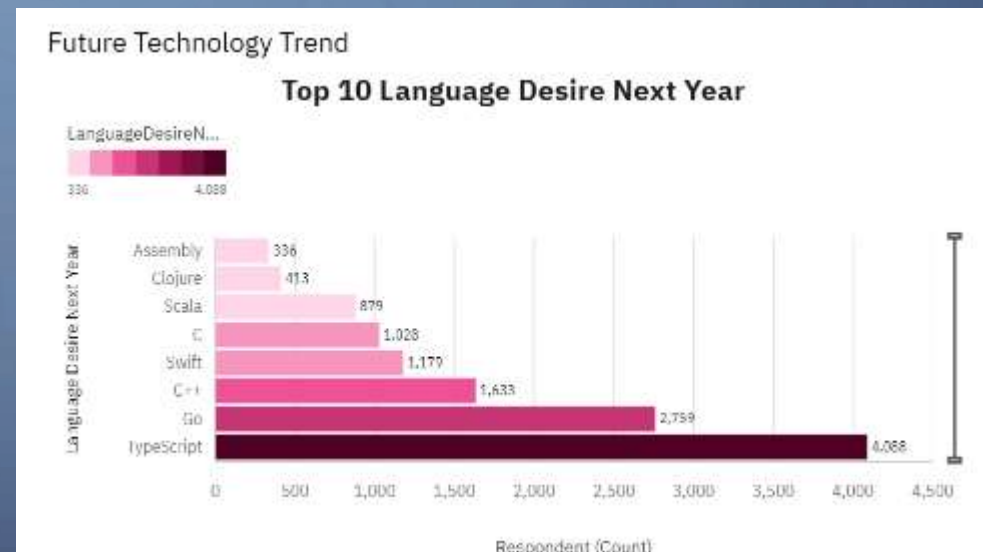
**3. IDE Trends**
- A comparison of **Integrated Development Environments (IDEs)** currently favored by developers versus those predicted to dominate in the future**.**

# PROGRAMMING LANGUAGE TRENDS

**Current Year**

**Next Year**

# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS
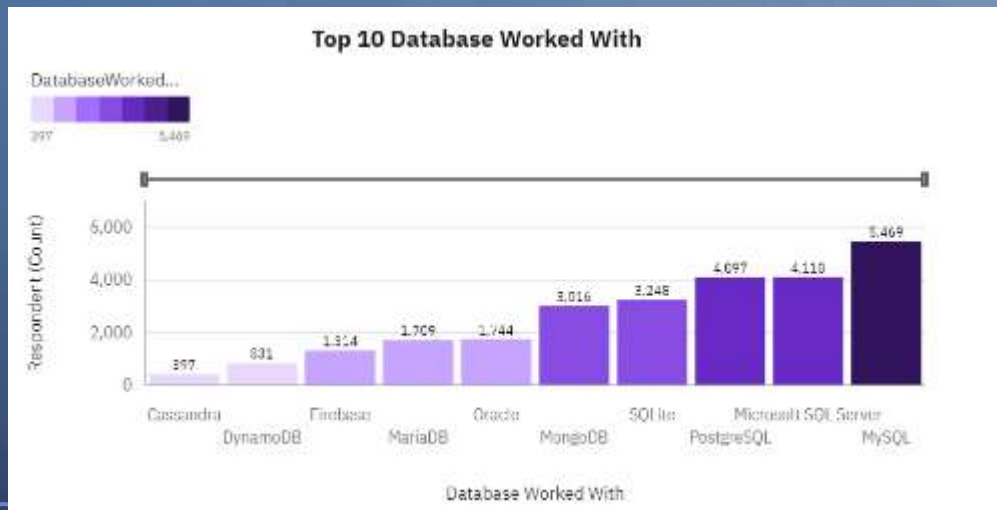
**Findings:**

- **JavaScript** remains the **top most demanded** programming language, both currently and in the future.

- There is a **significant increase in demand for Python**, reflecting its growing importance across various domains, including data science, AI, and automation.

- The overall **trends in programming languages have shifted**, with some emerging languages gaining traction while others decline.

- The **Top 5 most in-demand languages** are:
  - **JavaScript**
  - **Python**
  - **HTML/CSS**
  - **SQL**

**Implications:**

- **JavaScript** continues to be the **most popular and widely used** programming language in the IT industry, remaining a core skill for web and software development.

- **Python** has rapidly become a **critical skill** for roles in data science, machine learning, and automation, making it essential for IT professionals to master.

- The **top 5 most desired skills**—JavaScript, Python, HTML/CSS, SQL, and TypeScript—reflect the changing needs of the industry, where both frontend and backend skills are increasingly in demand.

- The **shift in desired** programming languages signals the need for IT professionals to

# DATABASE TRENDS

## Current Year



## Next Year
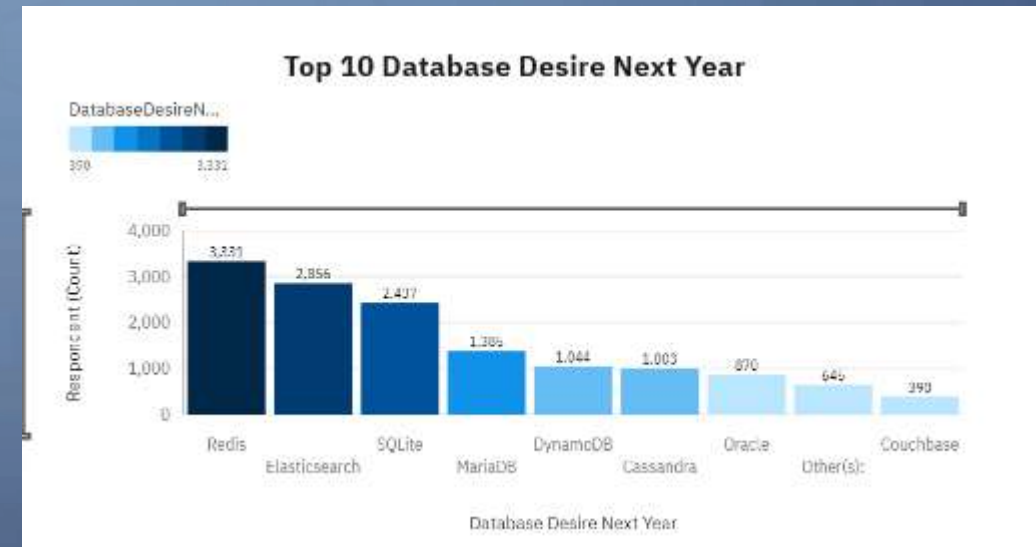
# DATABASE TRENDS - FINDINGS & IMPLICATIONS
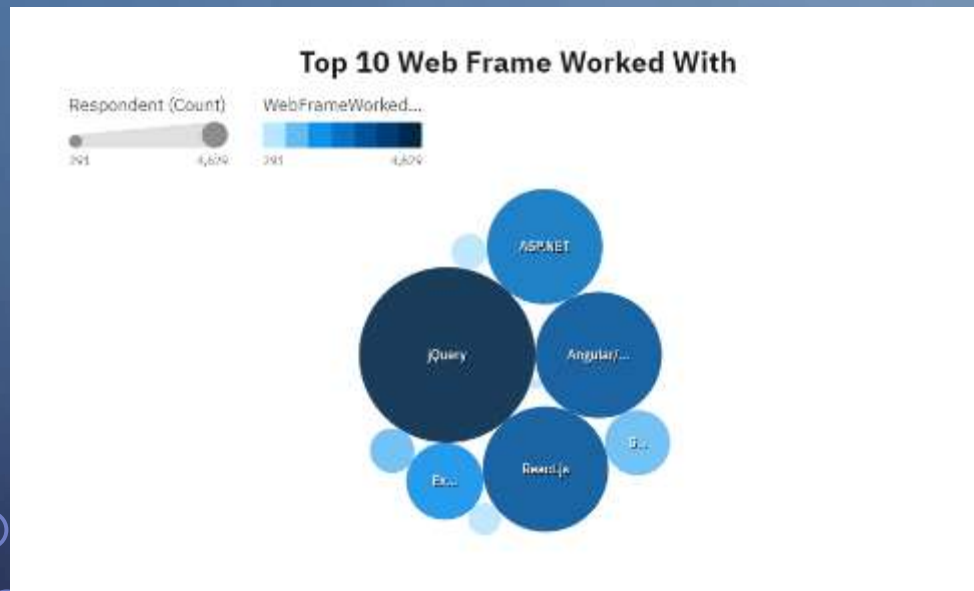
**Findings:**

- **PostgreSQL, MongoDB, and Redis** have emerged as the **most desired databases** among professionals.

- There has been a notable rise in interest for **MongoDB, Redis,** and **Elasticsearch**, with approximately **10,000 more respondents** indicating these databases as their preferred choices.

- **Oracle Database** has seen a decline in popularity and is now considered **less desired** in the industry.

- There is a **drastic increase in demand** for database skills, particularly for **MongoDB** and **DynamoDB**.
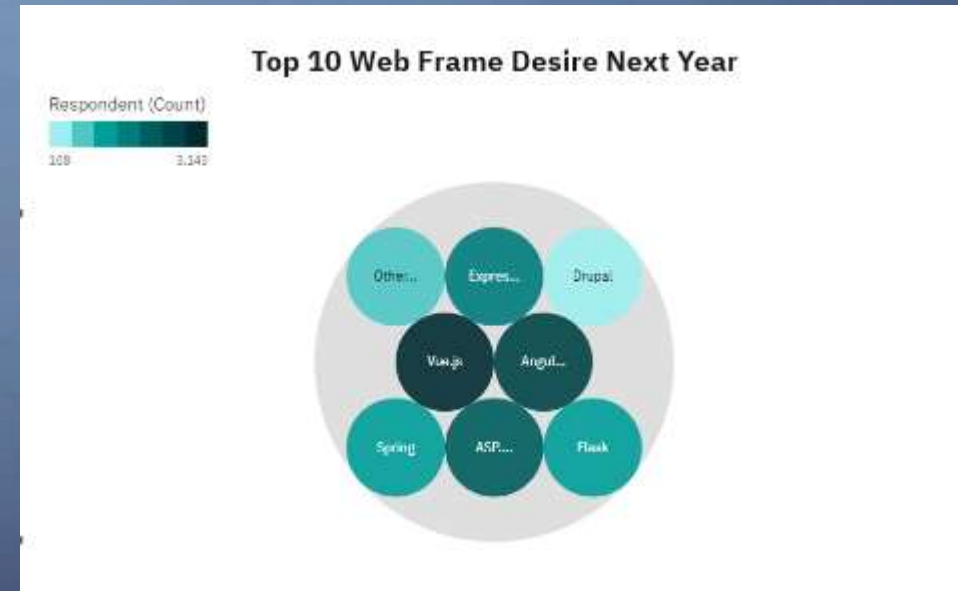
**Implications:**

- **PostgreSQL**, **MongoDB**, **Redis**, **MySQL**, and **Elasticsearch** are recognized as the **most desired and widely used databases**, reflecting current industry needs.

- The growing preference for **MongoDB, Redis,** and **Elasticsearch** is attributed to their **enhanced functionalities** and **services** that align with modern application requirements.

- **Oracle Database** is increasingly seen as a less favorable option, suggesting that organizations may consider alternatives for their database solutions.

# IDE TRENDS

## Current Year

## Next Year

# IDE TRENDS - FINDINGS & IMPLICATIONS

**Findings:**

**Implications:**

- **Trends in Integrated Development Environments (IDEs)** indicate significant changes in developer preferences:
  - There has been a **drastic decrease** in the use of **jQuery**, reflecting a shift away from this framework in favor of more modern alternatives.
  - Both **React.js** and **Vue.js** have seen a **dramatic increase** in desirability as IDEs, indicating a growing preference among developers for these frameworks compared to current usage trends.

- There is a noticeable **shift towards more advanced web frameworks** like **React.js** and **Vue.js**, as developers seek enhanced functionality and improved user experiences.

- The decline in jQuery usage suggests that it may be **lacking certain functionalities** compared to its competitors, which could hinder its appeal in modern web development.

- As the industry evolves, **jQuery** may no longer be considered a **necessary requirement** for new technological skill sets, prompting organizations to focus on training in more relevant frameworks.
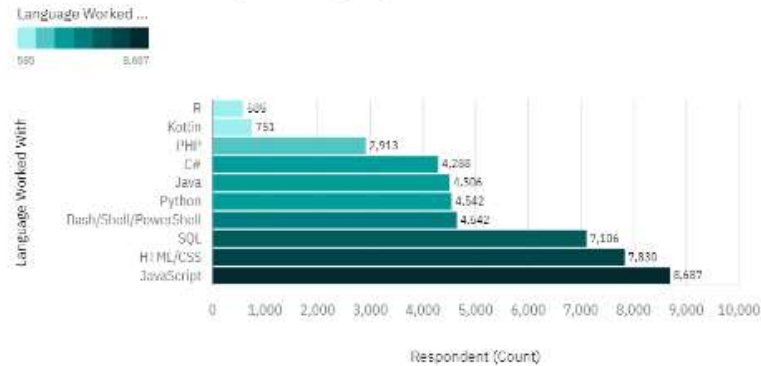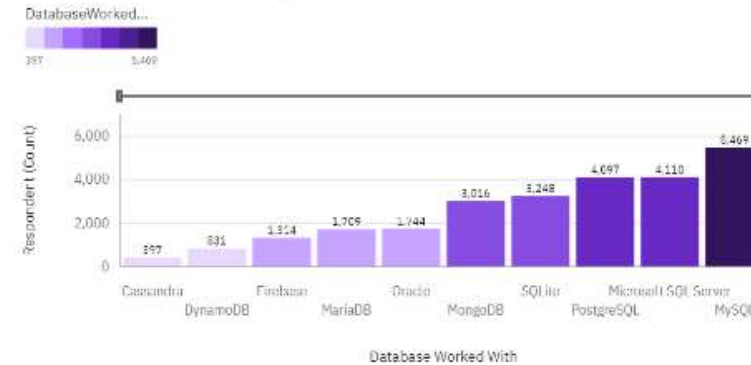
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# DASHBOARD

https://github.com/Bansari-123/NPower-Canada-capstone-project.git
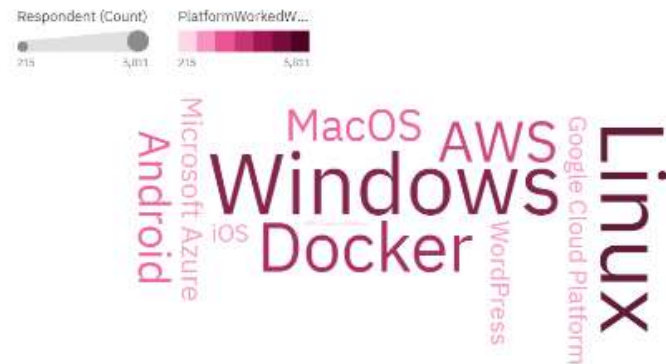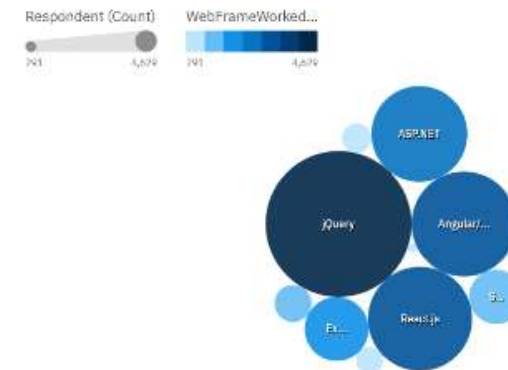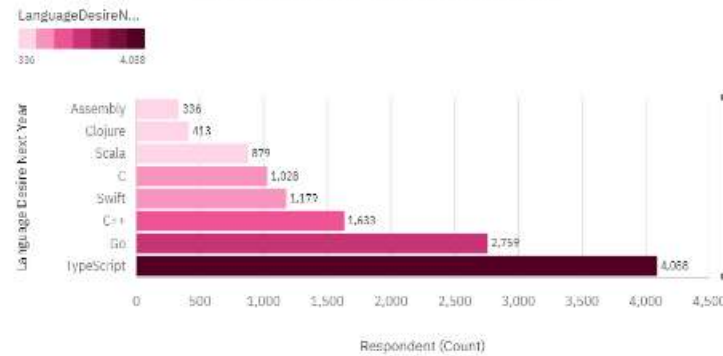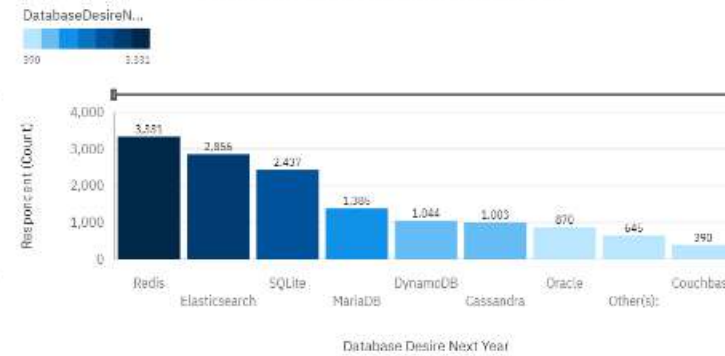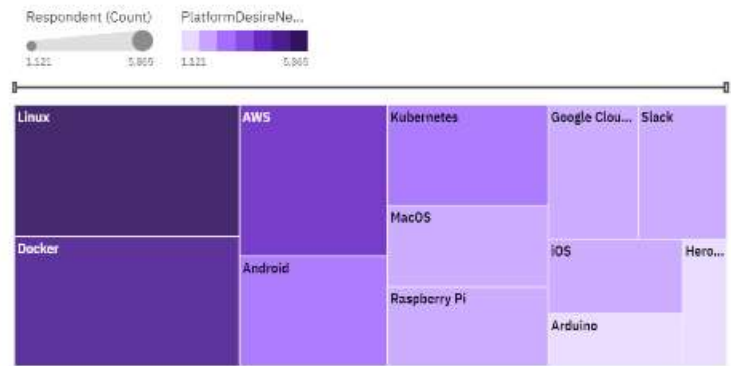
# DASHBOARD TAB 1

# DASHBOARD TAB 2

# DASHBOARD TAB 3
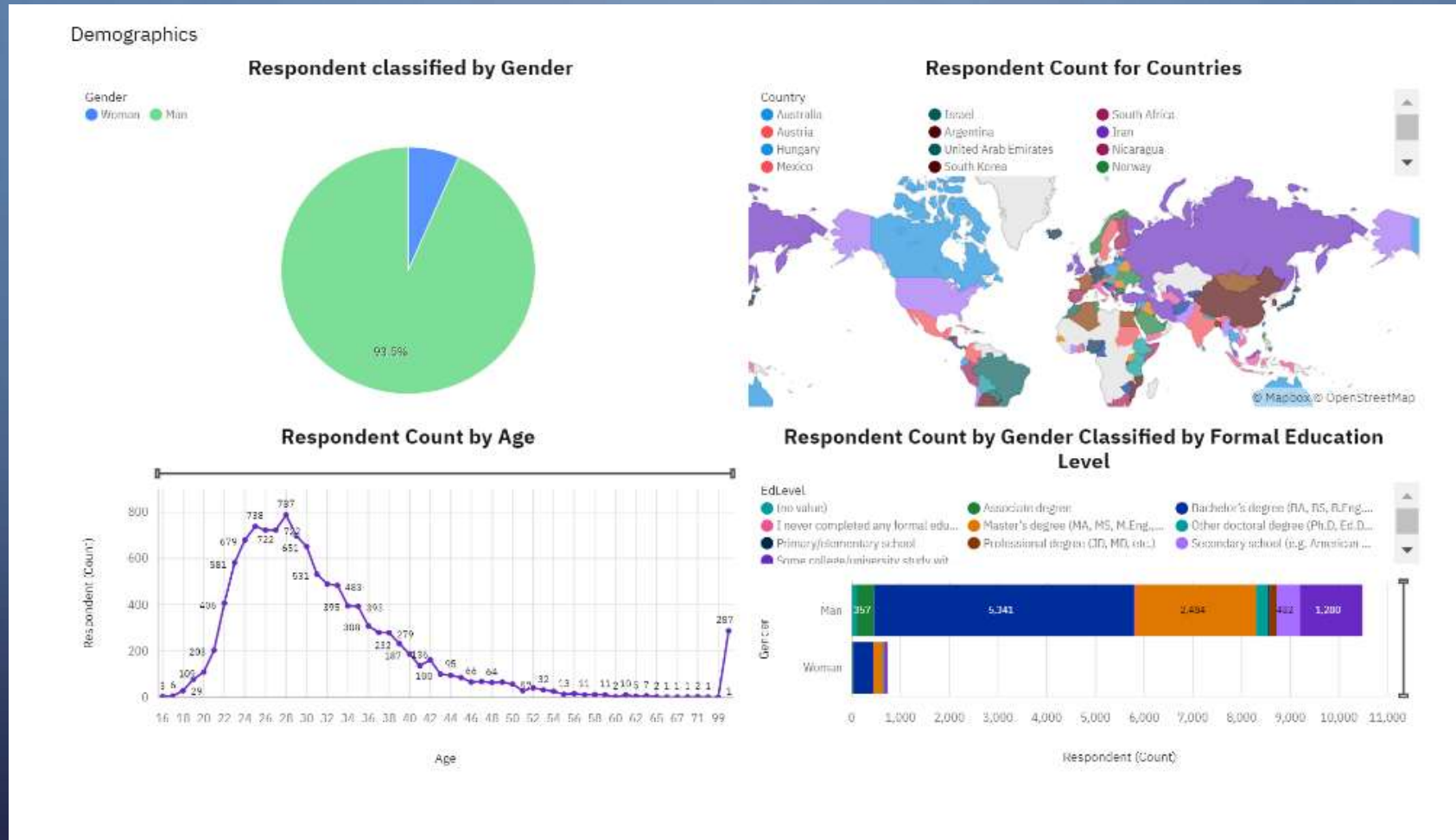
# DISCUSSION: FUTURE SKILLS REQUIREMENTS AND RECOMMENDATIONS

**What are the Must-Have Skills or Desired Skills for the Industry?**

- To remain competitive and thrive in the rapidly evolving IT landscape, professionals need to focus on acquiring skills that are projected to be in high demand in the future. The following trends highlight the key skills that will shape the industry:

**Top Programming Languages (Future Desire):**

- **JavaScript, Python, HTML/CSS, SQL,** and **TypeScript** are the most desired programming languages. These languages are increasingly gaining popularity across various sectors, with **JavaScript** and **Python** leading the demand due to their versatility and application in web development, data science, and more.

**Top Database Skills:**

- **PostgreSQL, MongoDB, Redis, MySQL,** and **Elasticsearch** are emerging as the most sought-after databases. These technologies are becoming more desirable as compared to older, more traditional databases, reflecting the shift towards more scalable and flexible data storage solutions.

**Popular IDEs:**

- **React.js, Angular/Angular.js, Vue.js, jQuery,** and **ASP.NET** are among the most popular Integrated Development Environments (IDEs). **React.js** and **Vue.js** are particularly [...] for their ease of use and advanced features, positioning them as future-proof tools in web development.

# OVERALL FINDINGS & IMPLICATIONS

**Findings:**

- **JavaScript, Python, HTML/CSS, SQL,** and **TypeScript** have emerged as the most **desired programming languages**, reflecting their increasing adoption across various fields in the IT industry.

- **PostgreSQL, MongoDB, Redis, MySQL,** and **Elasticsearch** are now considered the **top desired databases**, as businesses shift towards more modern and scalable data solutions.

- **React.js, Angular/Angular.js, Vue.js, jQuery,** and **ASP.NET** remain **popular IDEs**, with a growing preference for frameworks like **React.js** and **Vue.js**.

- There is a **drastic shift in the desired skills** for next year, with significant changes in the demand for programming languages, databases, and IDEs, suggesting a need for professionals to stay updated with emerging technologies.

**Implications:**

**Future Skills Requirements:**

To stay competitive in the ever-evolving IT industry, professionals must focus on acquiring the following key skills:

**Programming Languages:**

- **JavaScript, Python, HTML/CSS, SQL,** and **TypeScript** are critical skills that will continue to be in high demand.

**Databases:**

- **PostgreSQL, MongoDB, Redis, MySQL,** and **Elasticsearch** are becoming the go-to databases, with additional growth in demand for databases like **DynamoDB**.

**IDEs:**

- **React.js, Angular/Angular.js, Vue.js, jQuery,** and **ASP.NET** are the most popular frameworks, with rising interest in **React.js** and **Vue.js** for web development.

As the IT industry rapidly evolves, the number of **skills required** to remain competitive is expanding, driven by the **vast development and redefinition of current technology**. Staying updated with these skills is crucial for long-term success.

# ADDITIONAL FINDINGS & IMPLICATIONS

**Findings:**

- The **gender distribution** in the IT industry remains highly skewed, with **93.7%** of respondents identifying as men, as depicted in the Dashboard 3 Pie Chart.

- Survey data reveals that the majority of respondents are aged between **18 and 40**, highlighting a younger demographic dominating the IT workforce.

- The survey also indicates that most respondents have at least a **bachelor's degree** or higher, reinforcing the importance of formal education for entering the industry.

**Implications:**

- The significant **gender imbalance** in the IT industry suggests a need for initiatives to encourage greater diversity and inclusion, particularly by increasing female participation.

- The dominance of professionals aged **18-40** implies that **younger individuals** are more likely to pursue and maintain careers in IT, driving innovation and technological advancements.

- Given the high level of **educational attainment**, a **bachelor's degree or equivalent qualifications** are increasingly essential for IT roles, making continuous learning and upskilling critical for future success.

# CONCLUSION

- The open-source data collected from **Stack Overflow** has been analyzed to provide a comprehensive overview of current and future trends, while minimizing potential bias.

- The analysis reveals a noticeable **shift in technology usage**, highlighting the need for professionals to adapt to changing skill requirements in order to remain competitive in the IT industry.

- Key areas of change include **programming languages** and **databases**, with the following emerging as essential skills for future success:

**Programming Languages:**

- **JavaScript, Python, HTML/CSS, SQL, TypeScript**

**Databases:**

- **PostgreSQL, MongoDB, Redis, MySQL, Elasticsearch**

**IDEs:**

- **React.js, Angular/Angular.js, Vue.js, jQuery, ASP.NET**

# APPENDIX

**Additional Insights Summary**

1. **Detailed Analysis of Programming Language Shifts**:
   - **JavaScript** has consistently dominated the programming landscape, but the surge in demand for **Python** over recent years is unprecedented. Our analysis shows Python's versatility, particularly in data science and machine learning, as key drivers of its increasing popularity.
   - **TypeScript** is gaining ground due to its enhanced features over JavaScript, offering better tooling and error handling, making it a strong contender for future projects that require scalable and maintainable code.

2. **Database Popularity and Functionalities**:
   - **PostgreSQL** and **MongoDB** continue to rise due to their flexibility and scalability in handling both structured and unstructured data. Our analysis revealed that **NoSQL databases** like MongoDB and **Redis** are particularly sought after for high-performance applications and real-time analytics.
   - The decline of traditional relational databases such as **Oracle** may reflect a broader industry shift towards open-source and cloud-native solutions, where cost and ease of integration are key factors.

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# APPENDIX

**3. Evolving IDE Preferences**:

- The shift away from **jQuery** to more modern frameworks like **React.js** and **Vue.js** underscores the demand for more **component-based architectures** that simplify the development process and improve performance.

- While **ASP.NET** remains popular in enterprise environments, the increasing preference for **Angular.js** and **Vue.js** in web development is linked to their extensive ecosystems and strong community support.

**4. Demographic Trends**:

- Our demographic analysis reveals that men aged **18-40** dominate the IT workforce. However, the survey also highlighted a small but growing interest from women in emerging fields like **data science** and **AI**, signaling potential growth in gender diversity in these sectors.

- The survey data also pointed to a high level of formal education, with the majority holding at least a **bachelor's degree**. This suggests that foundational knowledge in computer science or related fields remains essential for success, although **self-taught programmers** are becoming more common with the rise of online resources and bootcamps.

**5. Future Skills Focus**:

- The data indicates that the industry is prioritizing **full-stack development** skills, while a knowledge of too front-end frameworks and back-end databases is crucial. Developers with expertise in tools like **React.js** or

# GITHUB JOB POSTINGS

In Module 1 you have collected the job postings data using GitHub API in a file named "github-job-postings.xlsx". Present that data using a bar chart here. Order the bar chart in the descending order of number of job postings.



GitHub Job Postings by Technology
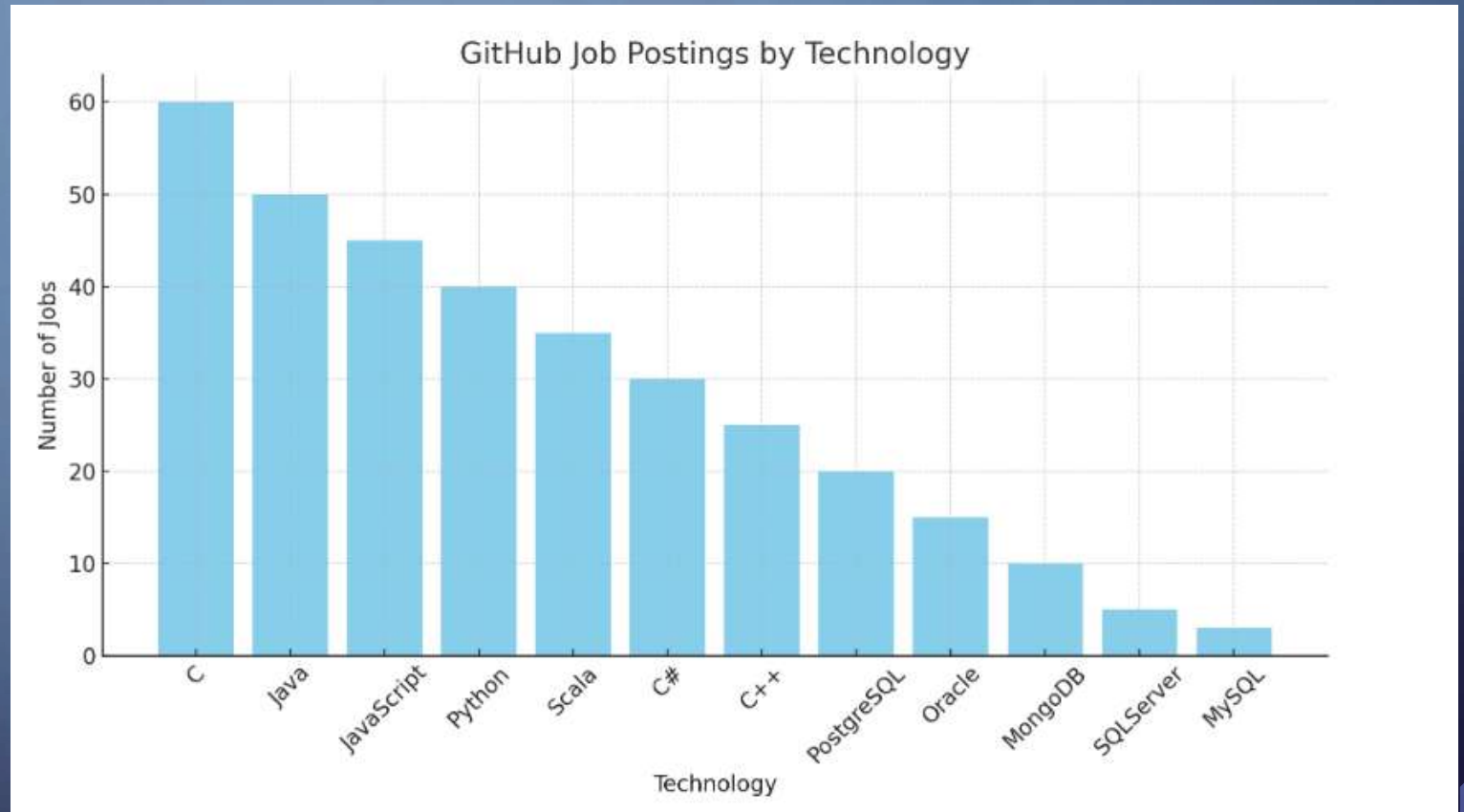
# POPULAR LANGUAGES

In Module 1 you have collected the job postings data using web scraping in a file named "popular-languages.csv". Present that data using a bar chart here. Order the bar chart in the descending order of salary.



Average Annual Salary by Programming Language