



# Trends For Emerging Technology & Skills

Ting Gong

May 24, 2021

# OUTLINE

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

# EXECUTIVE SUMMARY

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- With the emerging of new technology, IT professionals must keep learning new knowledge and new skills.
- Top trends of technology in near future.
  - JavaScript, HTML/CSS, and Python are the top programming languages. SQL stays the top query language.
  - PostgreSQL and MongoDB will become the top 2 databases in near future.
  - Docker platform and React.js web frame keep growing their popularity in IT industry.
- IT profession is still man-dominated. It's not necessary to have an advanced degree to work in the industry.
- Java, JavaScript, and Python are in high demand in the job market. And the average salaries of those languages are above \$100k.

# INTRODUCTION

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- The demand of IT profession grows fast whereas new technology and skills emerge. To keep competitive in the market, we need to understand the trends of future technology and skills in demand.
- This analysis is to help readers or IT profession to understand the trends in technology and skills by identifying the trends of popular programming languages, databases, and IDEs.
- In addition, the analysis also studied the demand and supply of skills through job postings, webpages and surveys so job seekers can better prepare themselves.
  - Github job postings reflect the demand of skills
  - Surveys show what skills are available in the market now and the possible changes in near future.

# METHODOLOGY

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- Collect Data from various sources such as job postings, training portals, and surveys by using APIs and webscraping.
- Explore datasets to understand the size, columns, content, data types, etc by using Pandas.
- Wrangle data to remove duplicates, find and import missing values, and to normalize data by using Pandas & Numpy.
- Analyze the datasets to understand the distribution, outliers, correlation, etc by using Pandas & Matplotlib.
- Use data visualization to show data distribution, relationships, composition, and comparison by using Matplotlib & Seaborn.
- Create a dashboard to display key trends by using IBM Cognos.

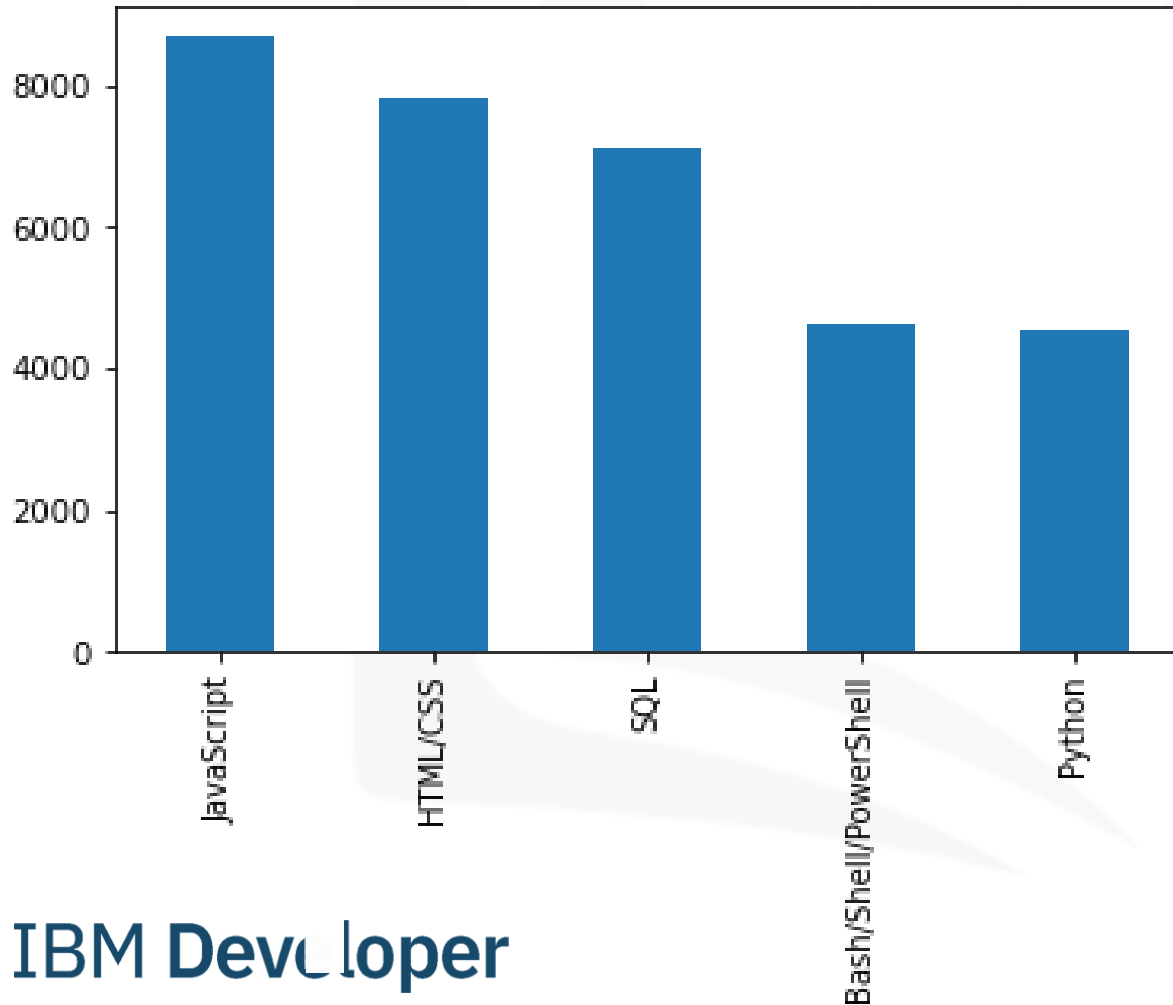
# RESULTS

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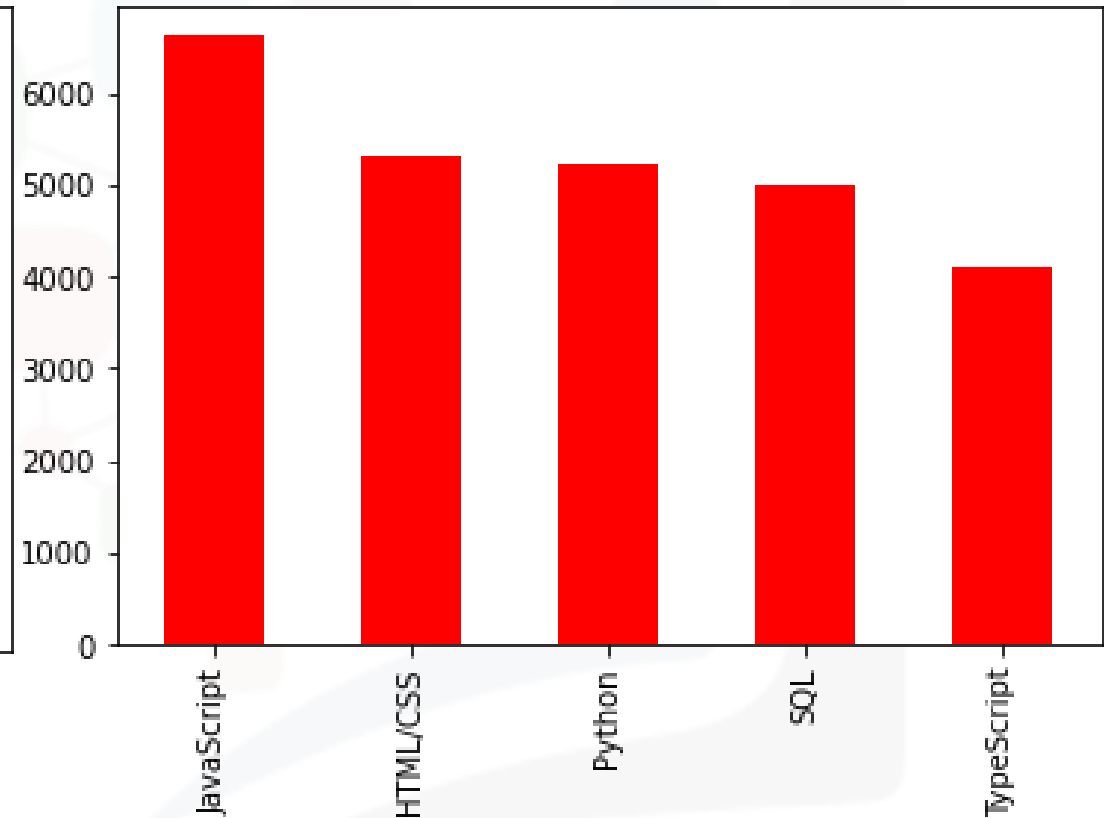
- Visualization charts
  - Charts of programming language trends
  - Charts of database trends
- Dashboard
  - Current technology usage
  - Future technology trends
  - Demographic of IT profession

# PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- JavaScript and HTML/CSS are the top 2 languages in current year and next year.
- JavaScript will lead the top 1 language by big margin in next year.
- Python moves up to the 3<sup>rd</sup> position next year from the 5<sup>th</sup> position this year.
- SQL down from the 3<sup>rd</sup> position this year to the 4<sup>th</sup> position next year.

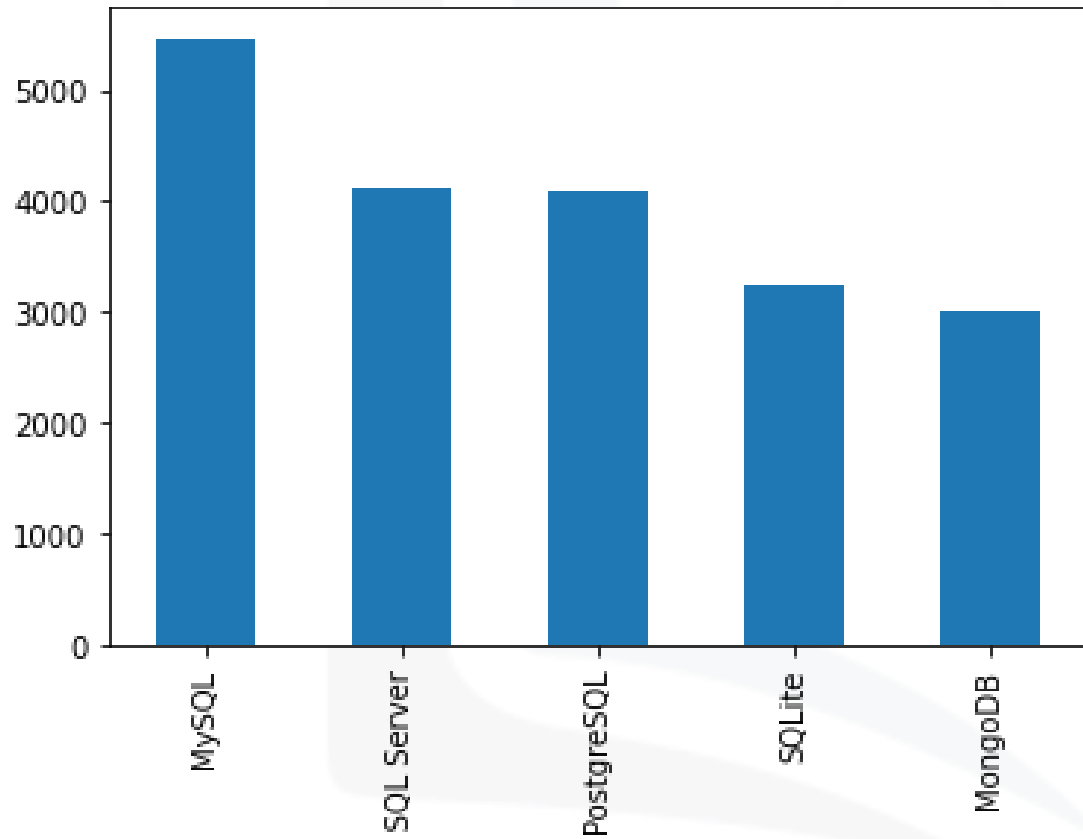
## Implications

- JavaScript and HTML remain the most important skills in the near future.
- It's important to learn these top languages to get in the field.
- Python continues expanding its market share, which means more positions will require Python in near future.
- SQL may become less popular, however, it's still the most popular query language. Therefore, it's the essential skill for IT professionals.

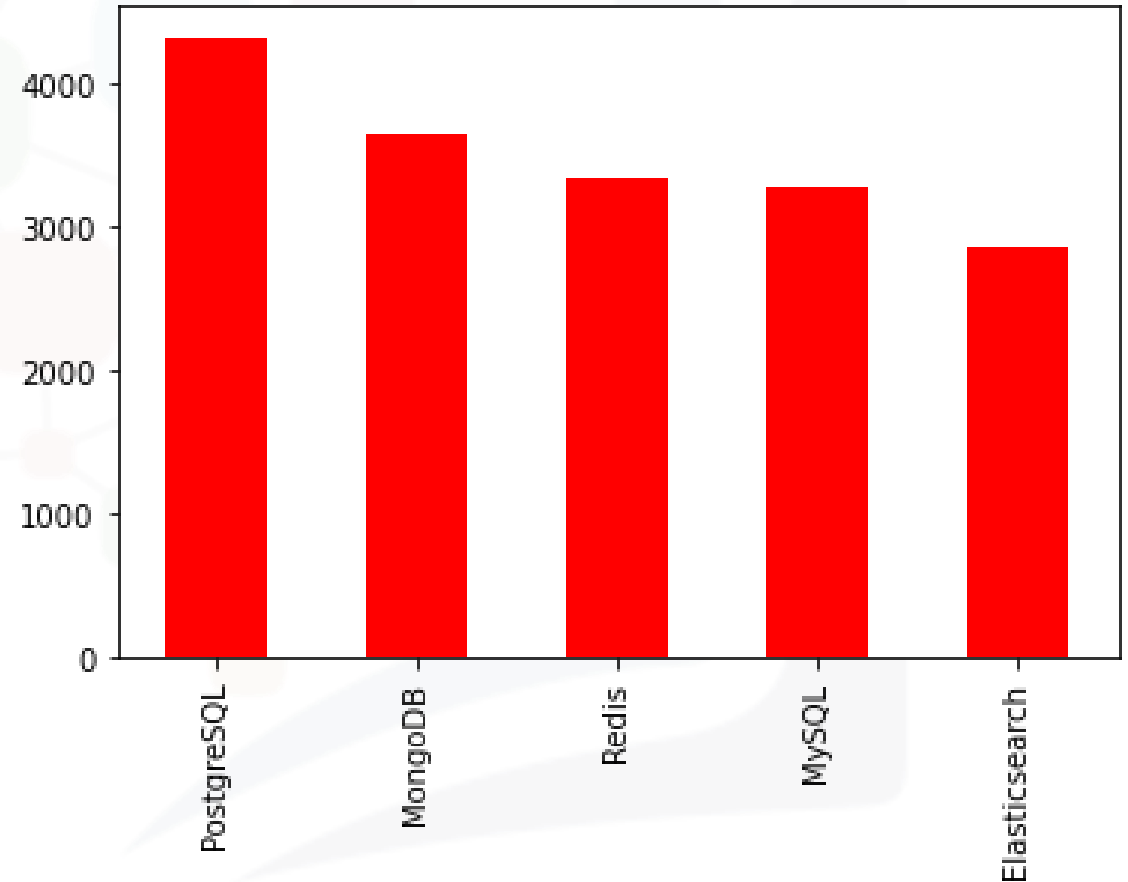


# DATABASE TRENDS

Current Year



Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

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## Findings

- Relational databases remain the mainstream in near future
- PostgreSQL and MangoDB will be the top 2 databases in near future.
- The current top 2 databases MySQL and Microsoft SQL Server will lose their popularity in the future.
- Redis will be one of the most popular databases in the future.

## Implications

- The use of relational databases remain dominant in the future.
- The rapid growth of data volume requires new databases with faster speed and more scalability.
- New emerging databases such as PostgreSQL and MangoDB can better meet the demand and quickly become the leaders in the industry in near future.
- It's important for IT professionals to gain knowledge and skills of emerging databases.

# DASHBOARD

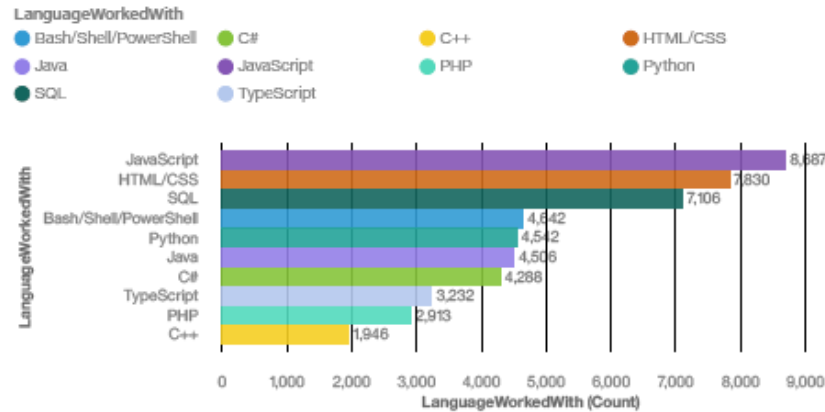
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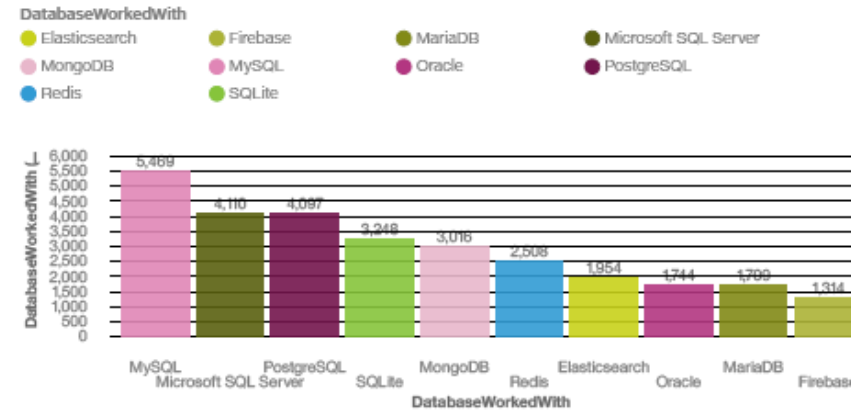
<https://dataplatform.cloud.ibm.com/dashboards/8a875625-a9b9-4e8b-80f9-98fbb0da5f98/view/0514da3f27ac22ea61e5f6e407ca78027c37230fb3bb8a5780d07b4909357897f3614796c82e1f5ede455760f5ec115bce>

# DASHBOARD - Current Technology Usage

## Top 10 Languages



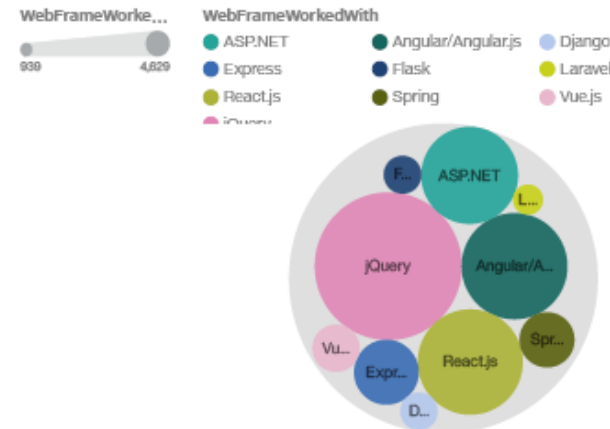
## Top 10 Databases



## Platforms

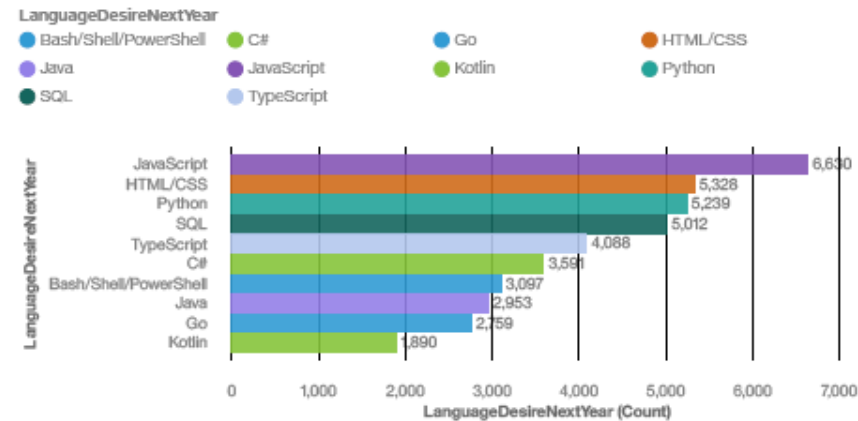


## Top 10 WebFrames

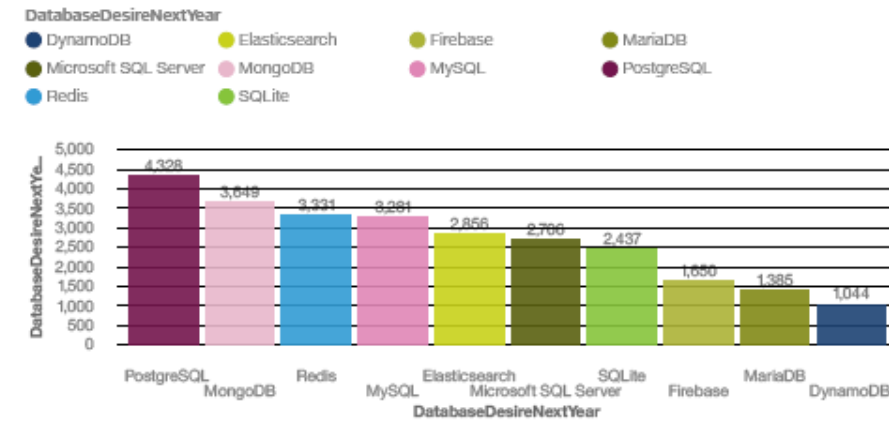


# DASHBOARD - Future Technology Trend

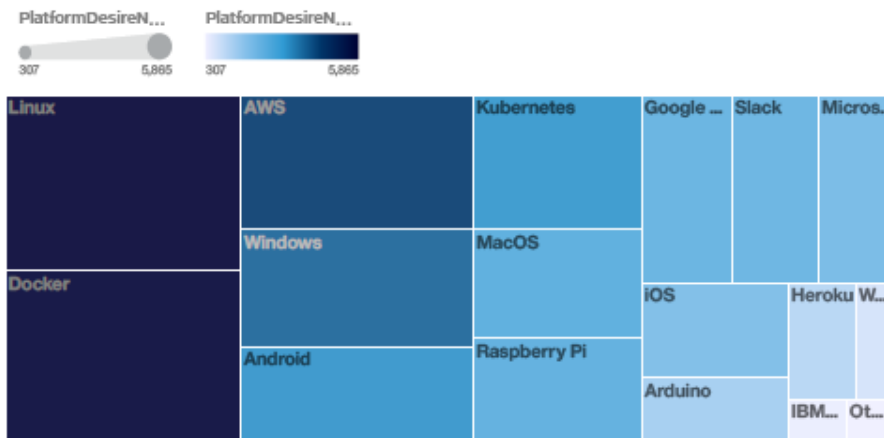
## Top 10 Languages desired for the next year



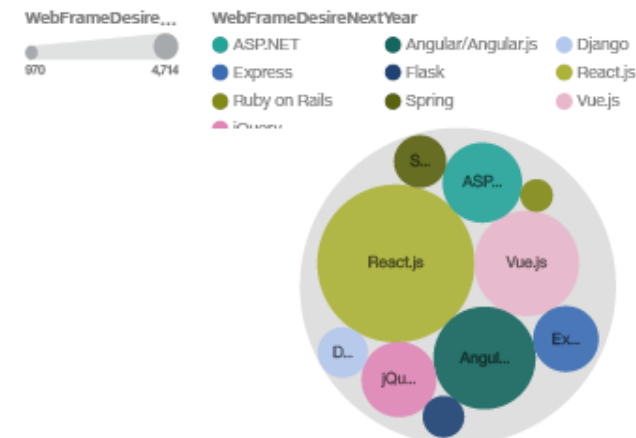
## Top 10 Databases desired for the next year



## Desired platforms for the next year



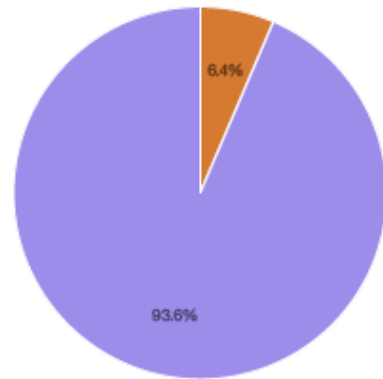
## Top 10 WebFrames desired for the next year



# DASHBOARD - Demographics

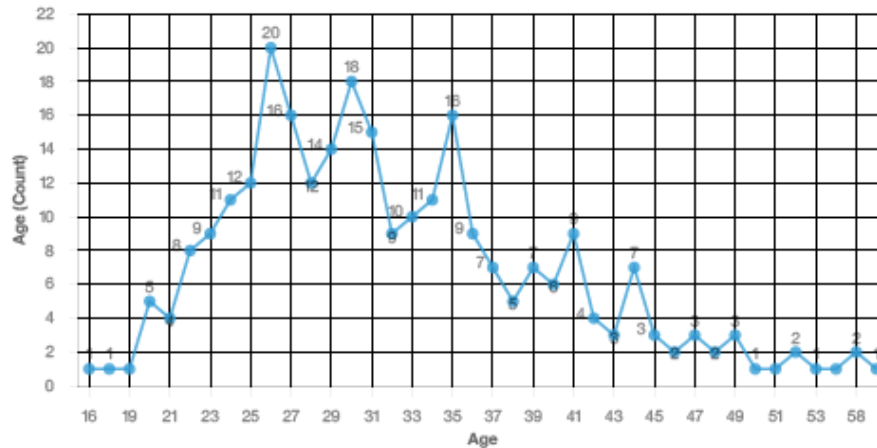
Respondent classified by gender

Gender  
● Woman ● Man



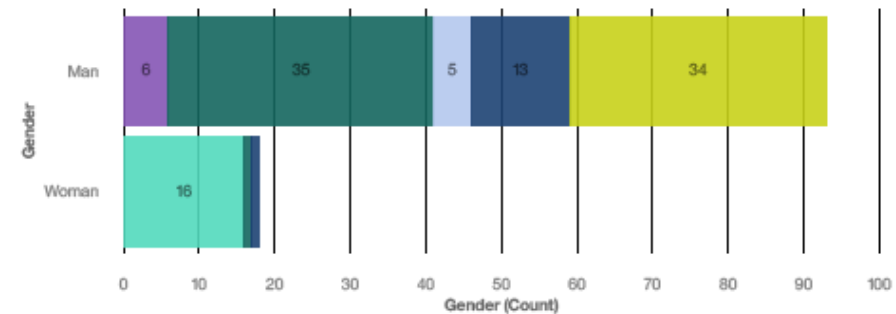
Respondent count for countries

Country (Count)  
1 3,008



Respondent count by gender and classified by education level

EdLevel  
● Associate degree ● Bachelor's degree (BA, BS, B.E... ● Master's degree (MA, MS, M.En...  
● Other doctoral degree (Ph.D, E... ● Secondary school (e.g. Americ... ● Some college/university study ...



# DISCUSSION

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- The trend of platforms
- The trend of Web Frames
- Educational background of IT professionals

# OVERALL FINDINGS & IMPLICATIONS

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## Findings

- Windows, Linux, AWS, and Docker are the most popular platforms. However, Windows will lose its popularity while emerging platform Docker keeps growing its market share.
- React.js will lead the industry whereas J.Query loses its leading position.
- The field is male dominated.
- Majority of IT professional don't have an advanced degree.

## Implications

- New emerging technology will soon gain popularity and replace existing technology.
- The shift of Web Frames is faster than that of Platforms.
- Women may still face challenges in the field.
- It's not necessary to have an advanced degree to be IT professionals.



# CONCLUSION

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- Python as one of the top programming languages keeps gaining its popularity and becomes the most sought-after and highest pay programming language. (see charts in appendix)
- Other programming languages such as Java, JavaScript, C, C++ still are in high demand. It is essential for IT professionals to know more than just one language. (see charts in appendix)
- Relational databases remain dominant thus SQL is still the most important query language. PostgreSQL and MongoDB expand the market shares and are the top two databases sought-after by employers. (see Github job postings in appendix)
- The growing demand of data requires new technology and new skills. New technology emerge fast, which shorten the lifespan of existing technology. It's important for IT professionals to keep on top of new knowledge and skills to be competitive in near future.

# APPENDIX

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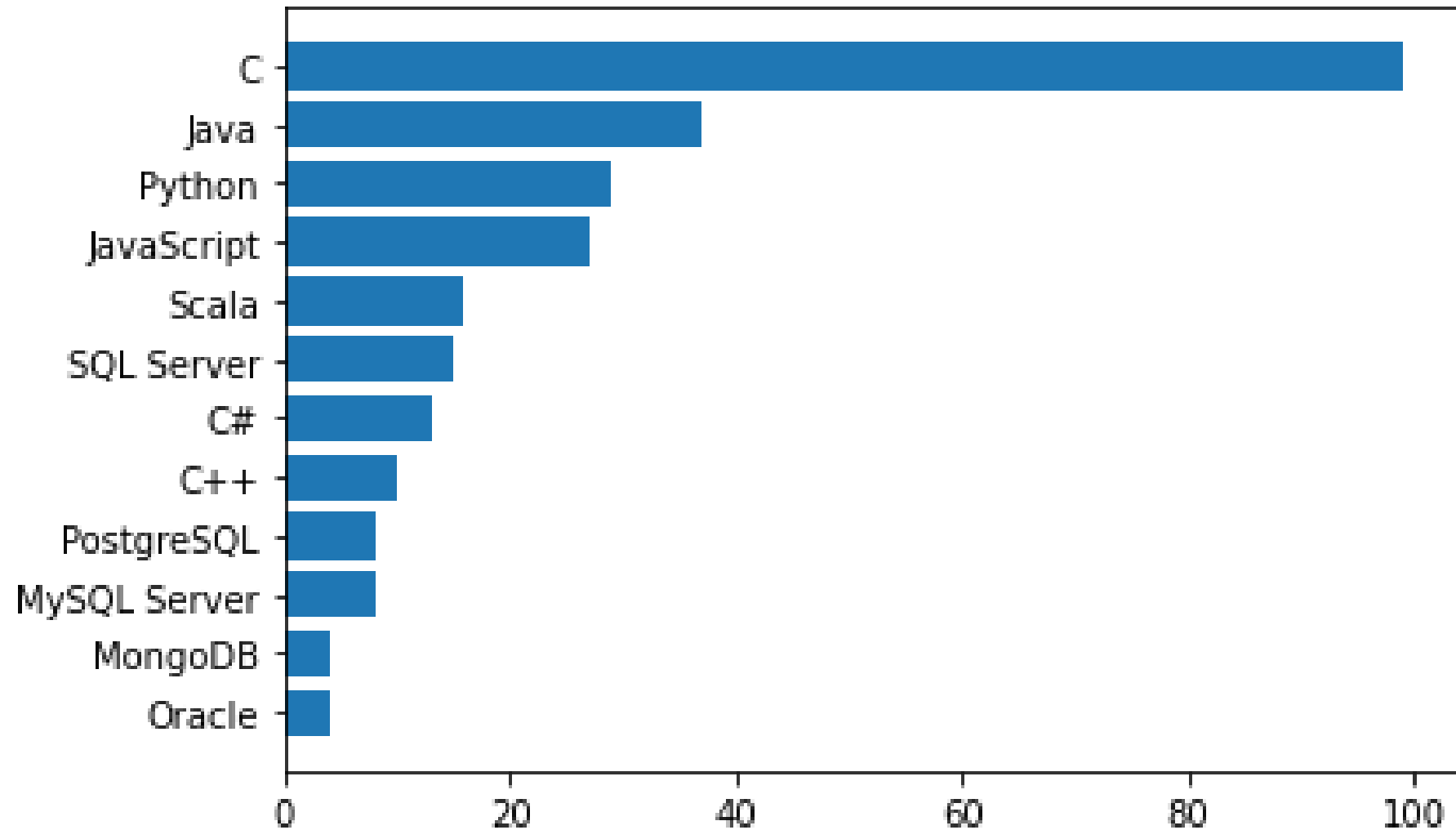
- Job postings from GitHub

<https://jobs.github.com/positions.json>

- Average annual salary by programming language from web.

[https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming\\_Languages.html](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/labs/datasets/Programming_Languages.html)

# GITHUB JOB POSTINGS



# POPULAR LANGUAGES

