IBM Data Analyst Capstone Project Presentation

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OUTLINE

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

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EXECUTIVE SUMMARY

- This report presents the trends in programming languages and databases.
- This shows a detailed review about
  - Current Technology Usage
  - Future Technology Trends and
  - Demographics of the Analyzed Data.
- Top Programming languages for the next year includes Go, Python, Shell, HTML/CSS.
- Top Databases preferred for the next year includes PostgreSQL, MongoDB, MySQL.

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INTRODUCTION

- Based on Stack Overflow Developer 2019 Survey, Analysis of programming languages, databases, platforms and web frameworks are carried out.

- This particular report focuses on programming languages and databases.
  - What are the top 5 programming languages used by the respondents?
  - What are the top 5 programming languages they want to learn next year?
  - What are the top 5 databases used by the respondents?
  - What are the top 5 databases they want to learn next year?

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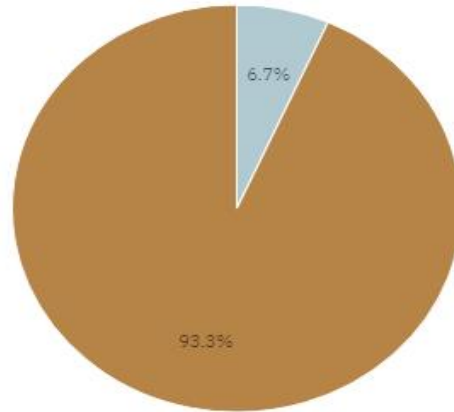
METHODOLOGY

- Data Collection
  - Using API's.
  - Web Scraping.

- Data Wrangling
  - Finding Duplicates and Missing Values.
  - Removing those and Cleaning the data.
  - Normalizing Data.

- Exploratory Data Analysis
  - Distribution, Outliers and Correlation.

- Data Visualization
  - Visualizing distribution of data.

- Dashboard Creation

RESULTS

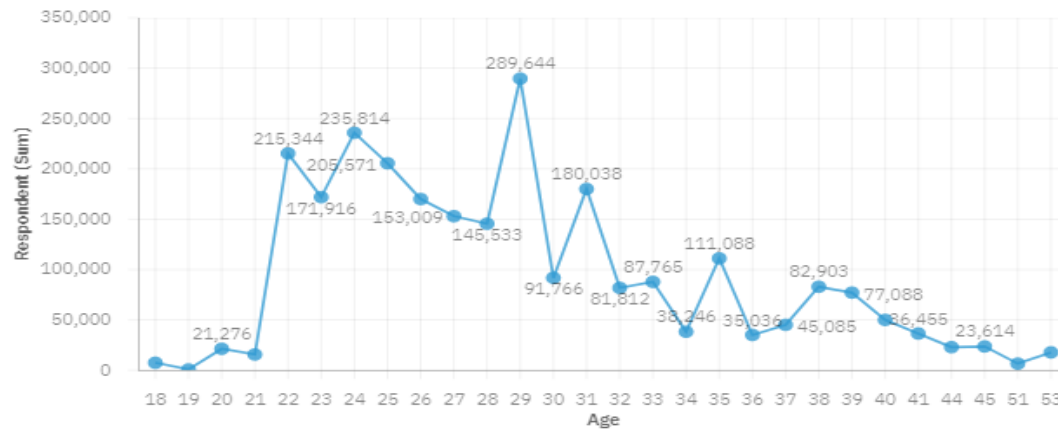## Respondent classified by Gender

Gender
- Woman
- Man

6.7%

93.3%

Respondent Count for Countries

Respondent (Sum)

865   38,170,293

Activate Windows

Respondent Count by Age

350,000
300,000
250,000   289,644
200,000   215,344   235,814   205,571
150,000   171,916   153,009   180,038   145,533
100,000   91,766   81,812   87,765   111,088   82,903   77,088
50,000   21,276   38,246   35,036   45,085   36,455   23,614
0

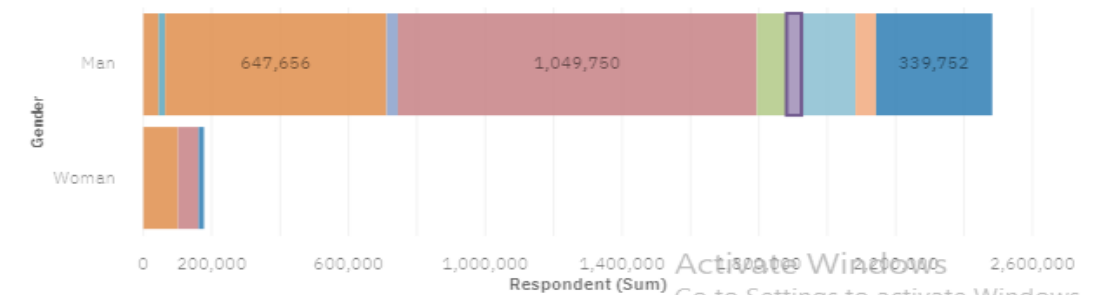18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 44 45 51 53
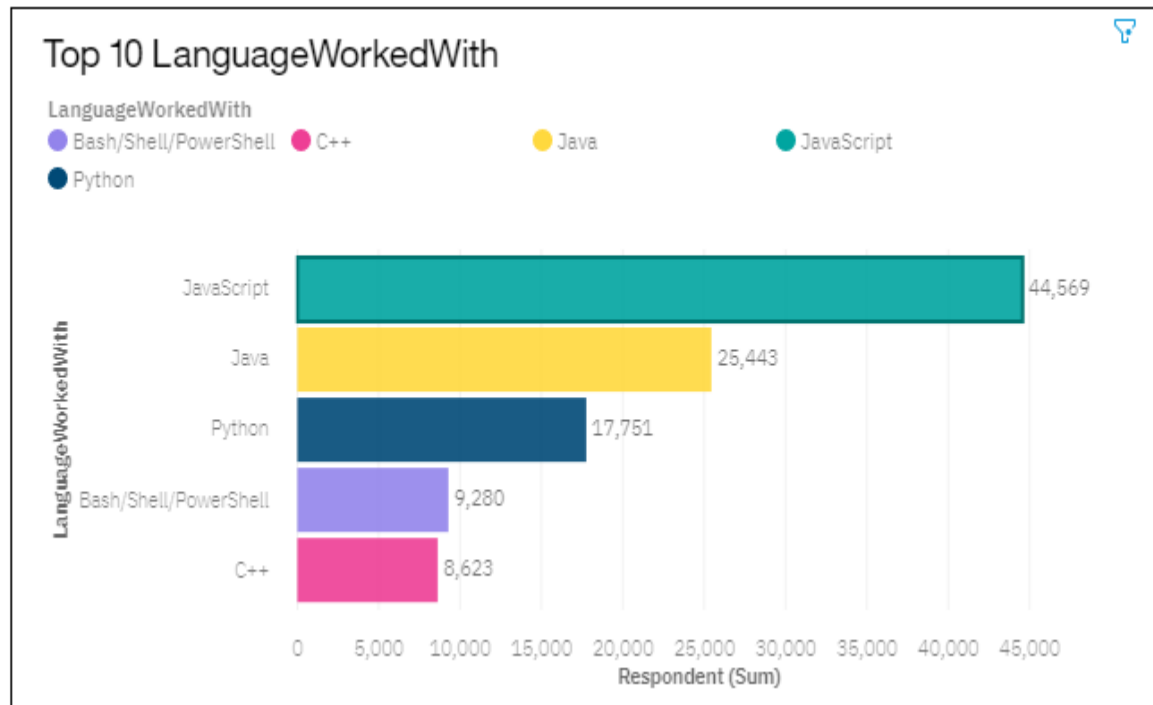
Age

Respondent (Sum)

Respondent Count by Gender, classified by Formal Education Level

EdLevel
- (no value)
- Associate degree
- Bachelor's degree (BA, BS, B.E...
- I never completed any formal ...
- Master's degree (MA, MS, M.E...
- Other doctoral degree (Ph.D, E...
- Primary/elementary school
- Professional degree (JD, MD, e...
- Secondary school (e.g. Americ...
- Some college/university study ...

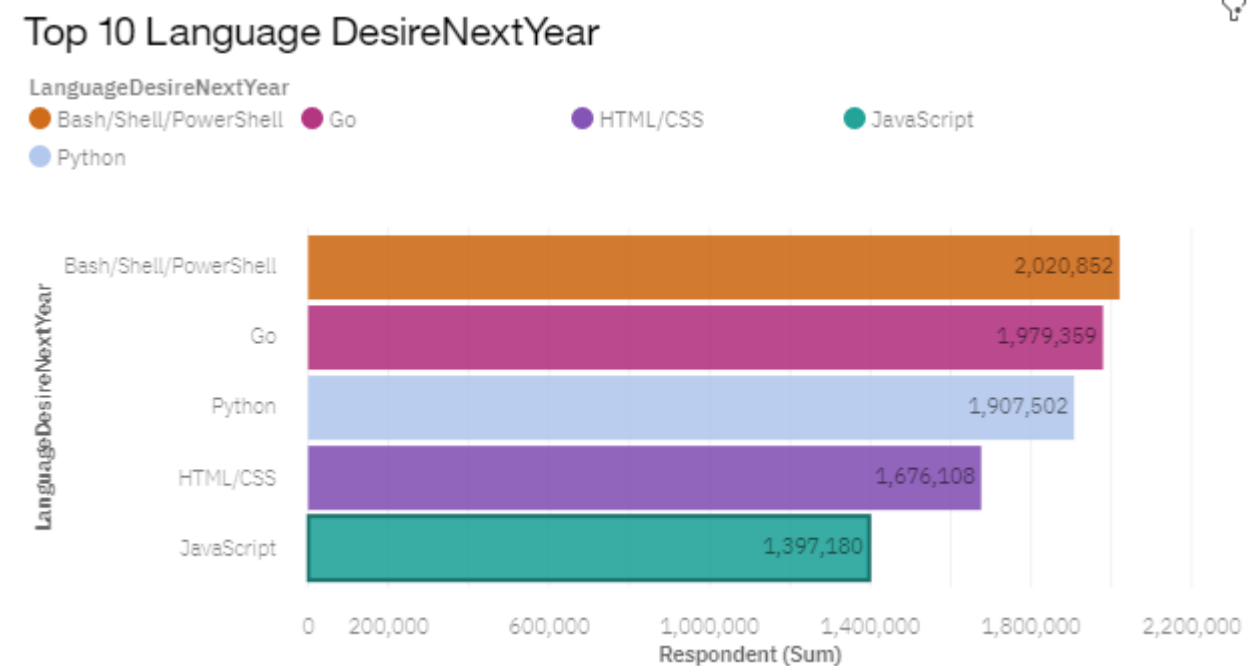Man   647,656   1,049,750   339,752

Woman

Gender

0   200,000   600,000   1,000,000   1,400,000   Activate Windows   2,600,000
                                         Respondent (Sum)   Go to Settings to activate Windows

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PROGRAMMING LANGUAGE TRENDS

Current Year

Top 10 LanguageWorkedWith

LanguageWorkedWith
- Bash/Shell/PowerShell
- C++
- Java
- JavaScript
- Python

Language	Respondent (Sum)
JavaScript	44,569
Java	25,443
Python	17,751
Bash/Shell/PowerShell	9,280
C++	8,623

Next Year

Top 10 Language DesireNextYear

LanguageDesireNextYear
- Bash/Shell/PowerShell
- Go
- HTML/CSS
- JavaScript
- Python

Language	Respondent (Sum)
Bash/Shell/PowerShell	2,020,852
Go	1,979,359
Python	1,907,502
HTML/CSS	1,676,108
JavaScript	1,397,180

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Current Top 3 – JavaScript, Java, Python
- HTML/CSS, Typescript, C# seems to rise during upcoming years.
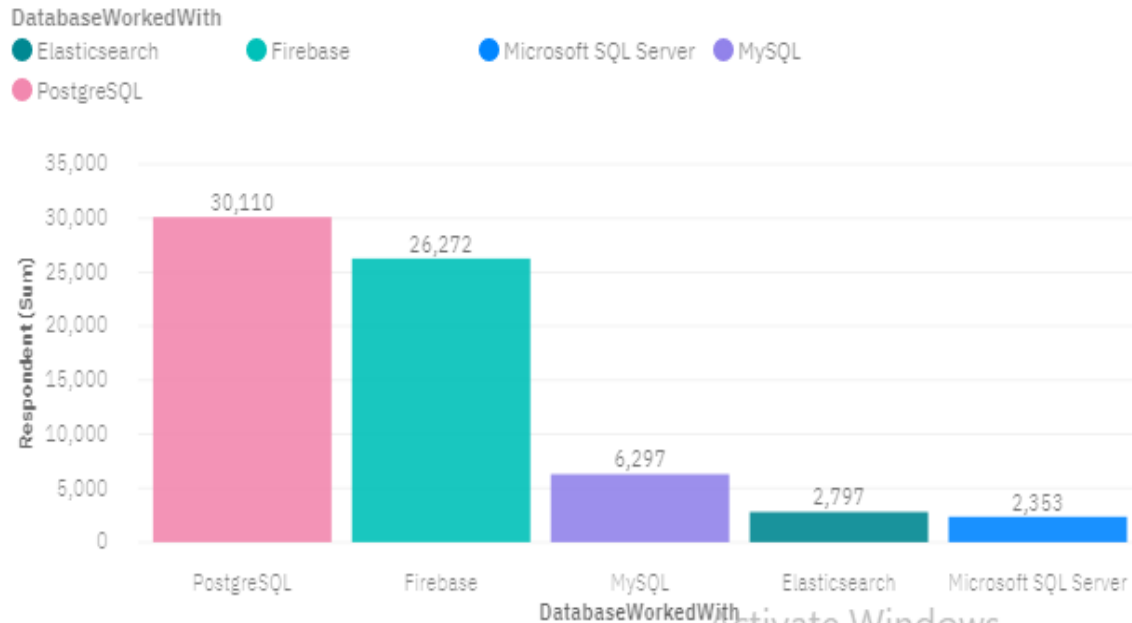- Web framework such as React.js and Angular are being used high.

Implications

- Python a must known programming language for the future.
- Web Developers needs to acquire new skills such as Typescript and some of the latest web framework to use it as an asset.
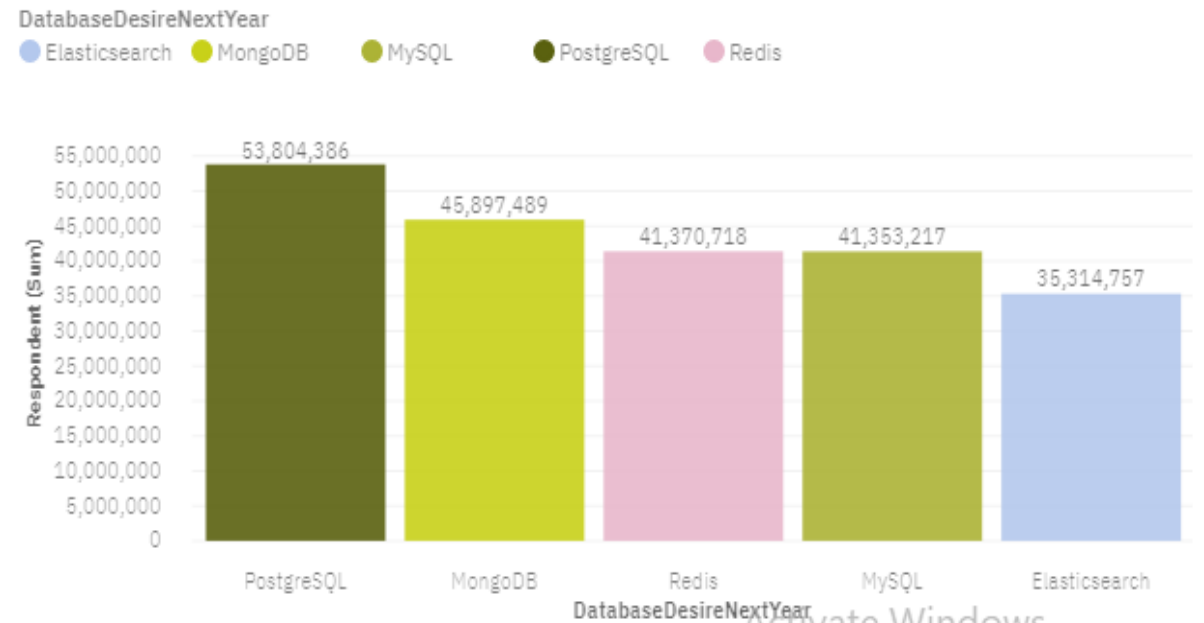
DATABASE TRENDS

Current Year

Top 10 Database WorkedWith

DatabaseWorkedWith
● Elasticsearch ● Firebase ● Microsoft SQL Server ● MySQL
● PostgreSQL

Current Year bar chart — Respondent (Sum) vs DatabaseWorkedWith:
- PostgreSQL: 30,110
- Firebase: 26,272
- MySQL: 6,297
- Elasticsearch: 2,797
- Microsoft SQL Server: 2,353

Next Year

Top 10 Database DesireNextYear

DatabaseDesireNextYear
● Elasticsearch ● MongoDB ● MySQL ● PostgreSQL ● Redis

Next Year bar chart — Respondent (Sum) vs DatabaseDesireNextYear:
- PostgreSQL: 53,804,386
- MongoDB: 45,897,489
- Redis: 41,370,718
- MySQL: 41,353,217
- Elasticsearch: 35,314,757

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- The most common and well-know databases are in the top three rank.
- Databases such are PostgreSQL, and MongoDb has occurred top 2 for the next year.
- MongoDb a document-oriented NoSQL database has occurred top 2 for the upcoming year.

Implications

- Companies may be shifting to PostgreSQL from MySQL for the next year.
- NoSQL databases will have higher impact in coming years.
- Demand for database skills are stable over the upcoming years.

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DASHBOARD

https://dataplatform.cloud.ibm.com/dashboards/bfc92cb2-40a7-43e6-8266-15e0dc7cc933/view/6c15f91b018203f468e2f6e407cc2c067f61275be6bb8405d1837b4959647997a96f1190c87b4b598b455163a0bd1450ca
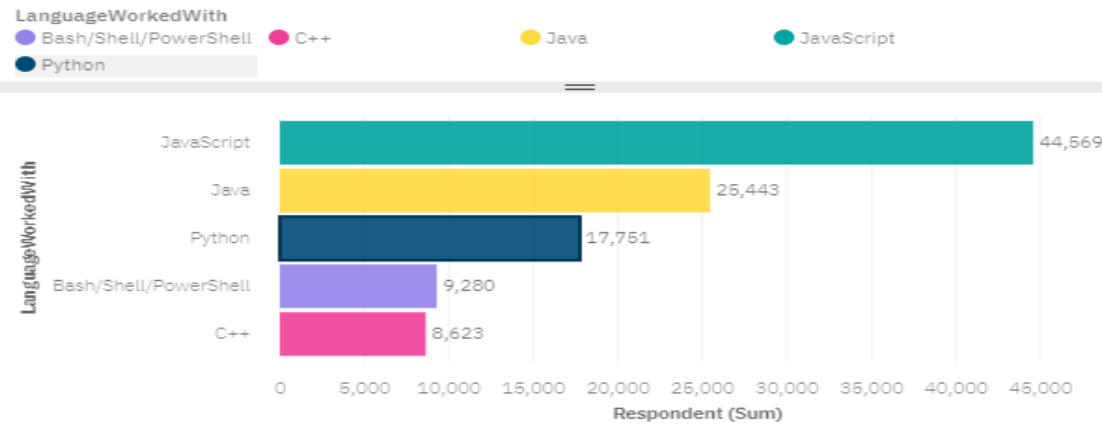
DASHBOARD TAB 1

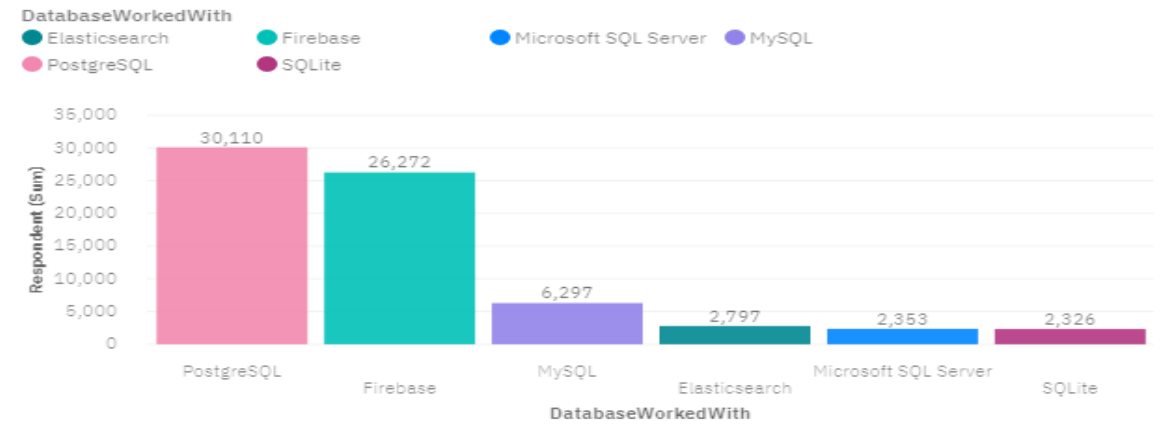Current Technology Usage   Future Technology Trend   Demographics
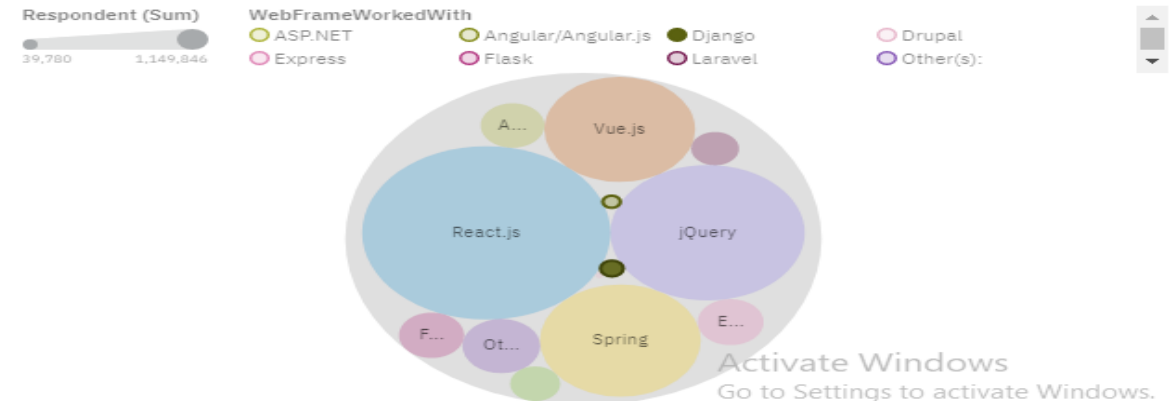
Top 10 LanguageWorkedWith

LanguageWorkedWith
● Bash/Shell/PowerShell   ● C++   ● Java   ● JavaScript
● Python

JavaScript	44,569
Java	25,443
Python	17,751
Bash/Shell/PowerShell	9,280
C++	8,623

Respondent (Sum)
0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000

Top 10 Database WorkedWith

DatabaseWorkedWith
● Elasticsearch   ● Firebase   ● Microsoft SQL Server   ● MySQL
● PostgreSQL   ● SQLite

PostgreSQL	30,110
Firebase	26,272
MySQL	6,297
Elasticsearch	2,797
Microsoft SQL Server	2,353
SQLite	2,326

DatabaseWorkedWith

Platforms WorkedWith

Respondent (Sum)   PlatformWorkedWith
2,562   4,163,714
● AWS   ● Android   ● Arduino
● Docker   ● Google Cloud Platform   ● Heroku
● IBM Cloud or Watson   ● Kubernetes   ● Linux
● MacOS   ● Microsoft Azure   ● Other(s):

Linux Android AWS Docker
Raspberry Pi   Heroku
Windows   Google Cloud Platform   Kubernetes MacOS
Arduino   Microsoft Azure
iOS

Top 10 WebFrame WorkedWith

Respondent (Sum)   WebFrameWorkedWith
39,780   1,149,846
● ASP.NET   ● Angular/Angular.js   ● Django   ● Drupal
● Express   ● Flask   ● Laravel   ● Other(s):

A...   Vue.js
React.js   jQuery
F...   Ot...   Spring   E...

Activate Windows
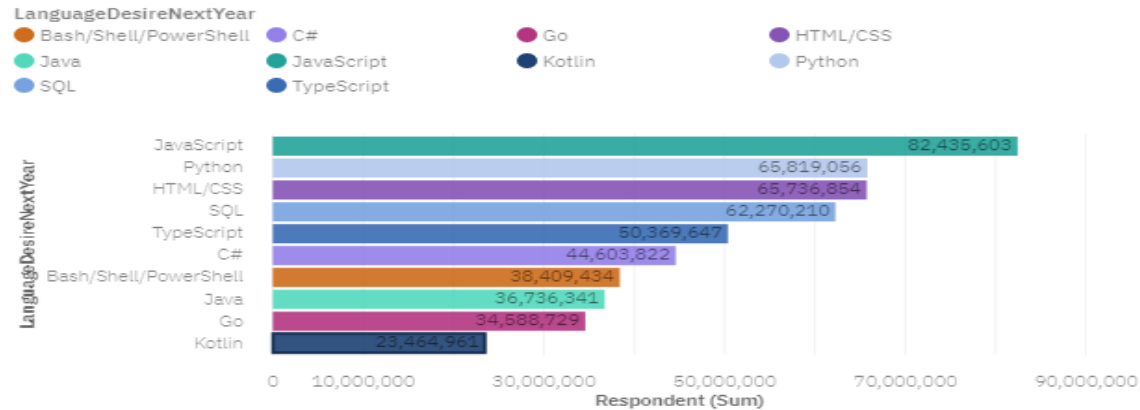Go to Settings to activate Windows.

DASHBOARD TAB 2

Current Technology Usage   **Future Technology Trend**   Demographics

Top 10 Language DesireNextYear

LanguageDesireNextYear
- Bash/Shell/PowerShell
- C#
- Go
- HTML/CSS
- Java
- JavaScript
- Kotlin
- Python
- SQL
- TypeScript

Language	Respondent (Sum)
JavaScript	82,435,603
Python	65,819,056
HTML/CSS	65,736,854
SQL	62,270,210
TypeScript	50,369,647
C#	44,603,822
Bash/Shell/PowerShell	38,409,434
Java	36,736,341
Go	34,588,729
Kotlin	23,464,961

Top 10 Database DesireNextYear

DatabaseDesireNextYear
- DynamoDB
- Elasticsearch
- Firebase
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- PostgreSQL
- Redis
- SQLite

Database	Respondent (Sum)
PostgreSQL	53,804,386
MongoDB	45,897,489
Redis	41,370,718
MySQL	35,314,757
Elasticsearch	30,320,901
Microsoft SQL Server	
SQLite	20,585,232
Firebase	12,995,539
MariaDB	
DynamoDB	

Platform DesireNextYear
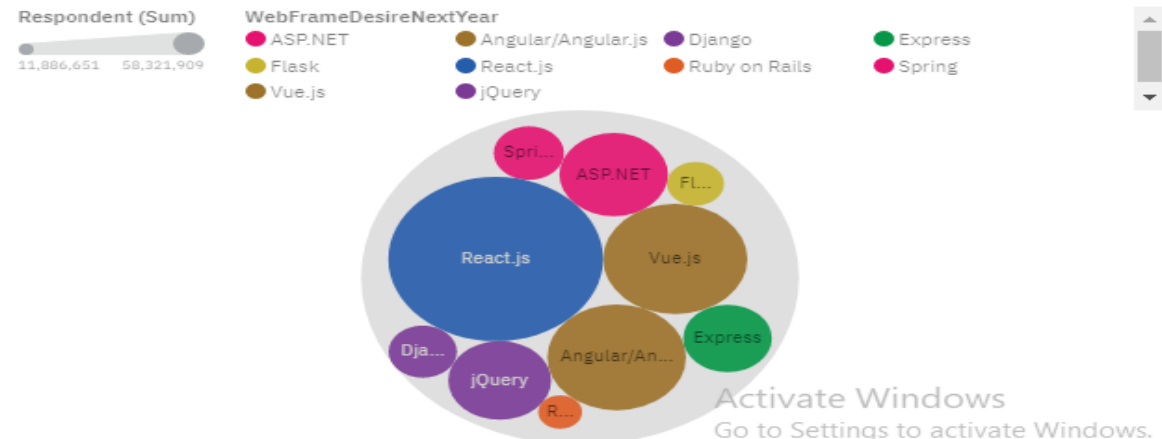
Respondent (Sum) 3,752,980 – 73,486,491

PlatformDesireN... 307 – 5,865

Linux, Docker, AWS, Windows, Android, Kubernetes, MacOS, Raspberry Pi, Google ..., iOS, Arduino, Slack, Heroku, IBM ..., Micros..., W..., Ot...

Top 10 WebFrame DesireNextYear

Respondent (Sum) 11,886,651 – 58,321,909

WebFrameDesireNextYear
- ASP.NET
- Angular/Angular.js
- Django
- Express
- Flask
- React.js
- Ruby on Rails
- Spring
- Vue.js
- jQuery

Spri..., ASP.NET, Fl..., React.js, Vue.js, Dja..., jQuery, Angular/An..., Express, R...

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Activate Windows
Go to Settings to activate Windows.

DASHBOARD TAB 3

Respondent classified by Gender

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Respondent Count by Age
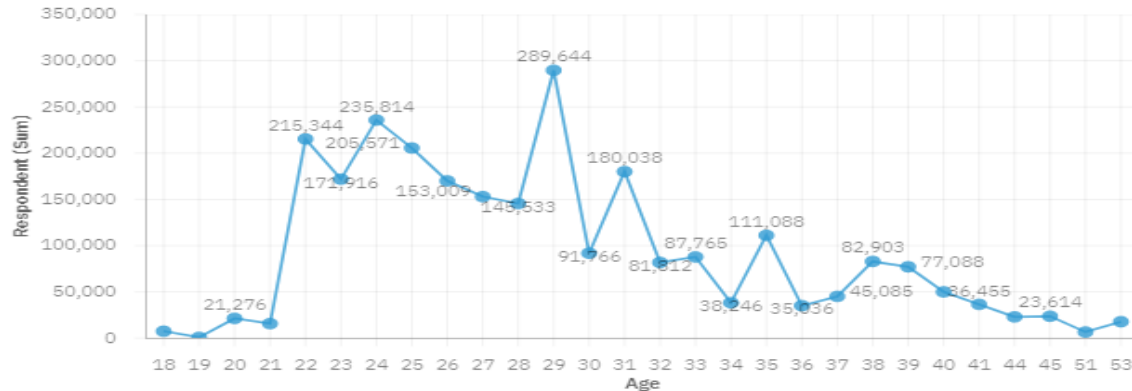
350,000

300,000   289,644

250,000   235,814

215,344   205,571

200,000   172,916   180,038

153,009

150,000   146,533   111,088

100,000   91,766   87,765   82,903   77,088

81,812   45,085   36,455

50,000   21,276   38,246   35,036   23,614

0

18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 44 45 51 53

Age

Respondent (Sum)

Respondent Count by Gender, classified by Formal Education Level

EdLevel
● (no value)   ● Associate degree   ● Bachelor's degree (BA, BS, B.E...
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● Some college/university study ...

Man   647,656   1,049,750   339,752

Gender

Woman

0   200,000   600,000   1,000,000   1,400,000   2,600,000

Respondent (Sum)

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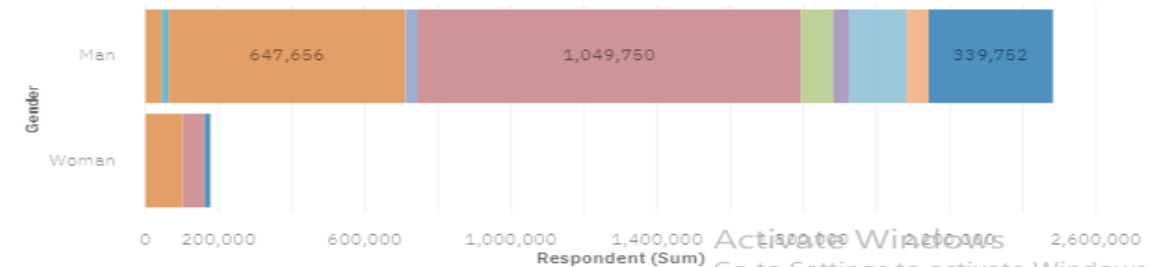
DISCUSSION

- Will JavaScript and Python be dominant for next 10 years?
- Is it better to learn several languages or to focus on just one?
- Are workers over 40 out of the tech job market?
- Is the Web Development market saturated?

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OVERALL FINDINGS & IMPLICATIONS

Findings

- The trends show that Web Development market is strong
- Highly demanded and rapidly changing sectors.
- Most workers aged 22-32.

Implications

- The I.T development market is getting more competitive.
- Employees should adapt to changes.
- Learning different technology (programming language, database and cloud services) can be very advantageous.
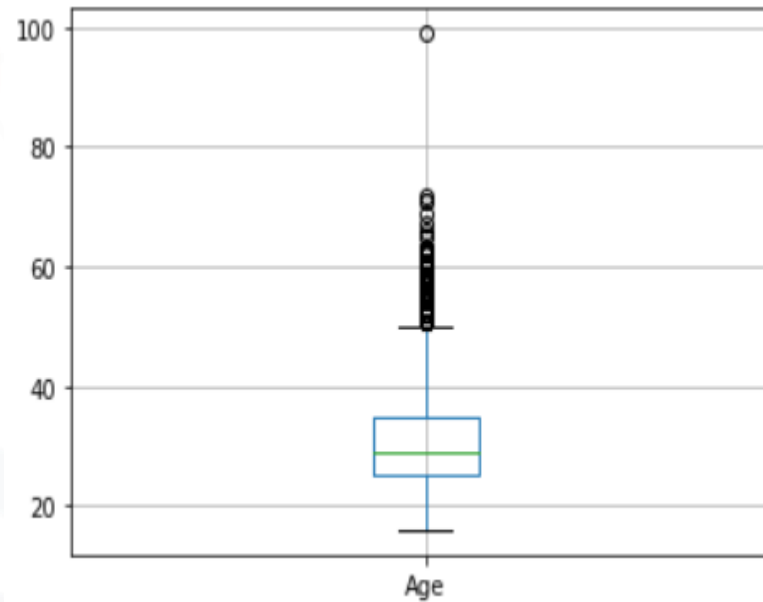
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CONCLUSION

- Respondents are focused on Web Development .

- JavaScript and HTML/CSS are still the most popular languages throughout next year.

- Python, Typescript and Go will continue to grow over upcoming years.

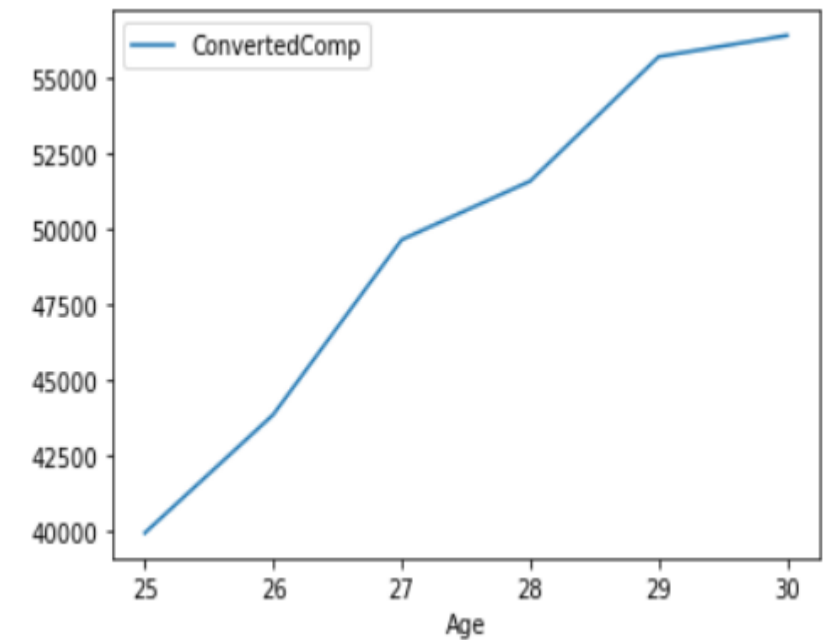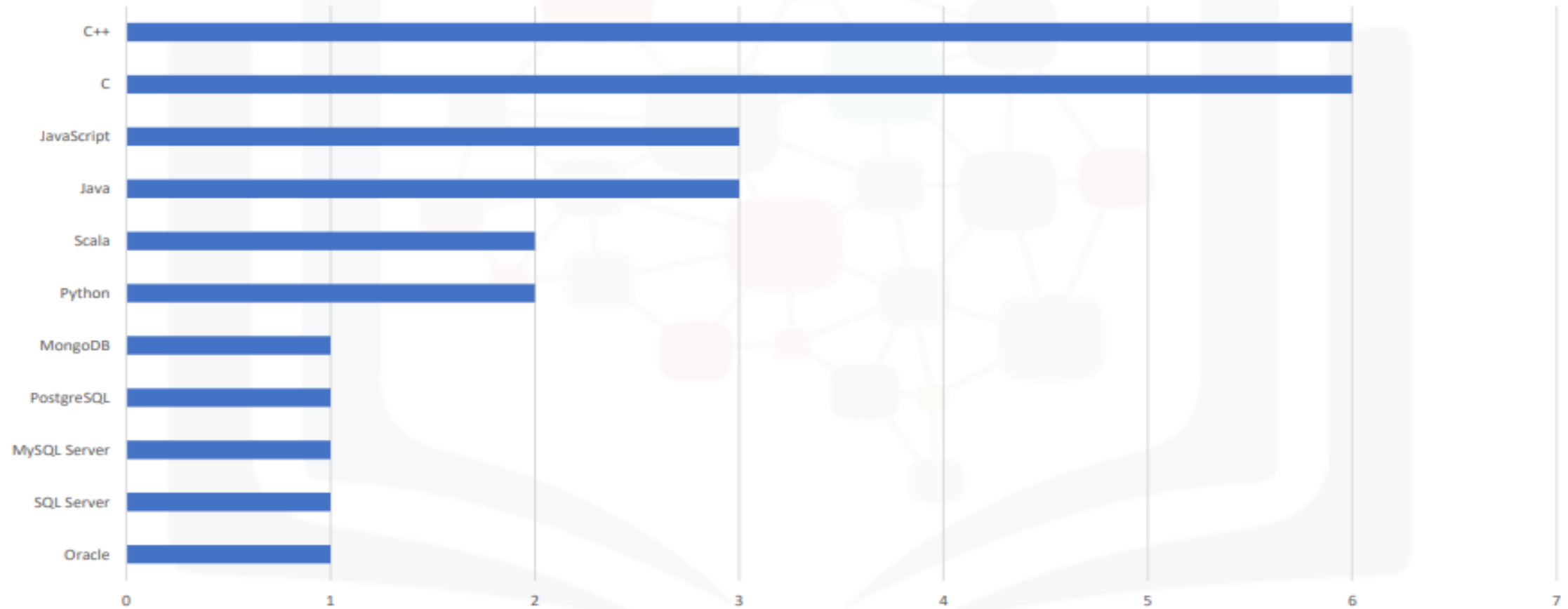- Demand for working with these technologies increases every time.

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APPENDIX

Boxplot chart showing
that 50% of
respondents are
between 25 and 35

Line chart showing a
positive correlation
between Age.

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GITHUB JOB POSTINGS

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POPULAR LANGUAGES