DATA ANALYSIS OF TECHNOLOGY TRENDS & DEMOGRAPHIES

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OUTLINE

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

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EXECUTIVE SUMMARY

- Current trends in technology and databases.

- Expected future trends in technology and databases.

- Demographics survey

- Technological gap in countries

- Gender gap in jobs

INTRODUCTION

- About: analyzing the trends in computer technology.

- Purpose:
  - What are the top programming languages in demand?
  - What are the top database skills in demand?
  - Identify skill requirements for future.
  - Identify the database that will be used in future.

- Target audience : human resource management.

METHODOLOGY

- Data collection
  - Using APIs
  - Using web scraping
- Data exploration
- Data cleaning
  - Finding duplicates and missing values.
  - Removing duplicates and missing values.
- Data visualization
  - Plotting data using various charts.
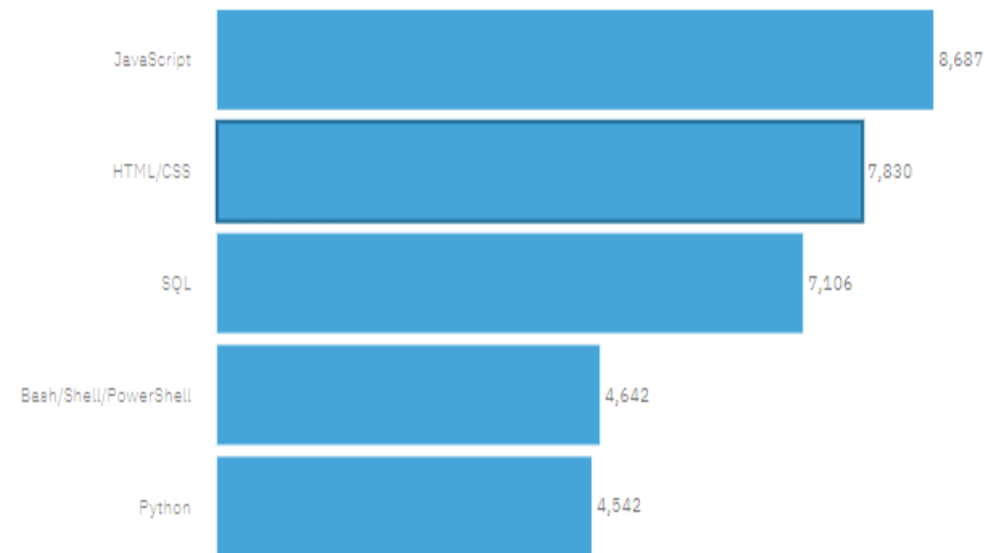 - Visualizing the relationships between the data.
- Presentation

RESULTS

	Respondent	LanguageWorkedWith	LanguageDesireNextYear	DatabaseWorkedWith	DatabaseDesireNextYear	PlatformWorkedWith
0	4	C	C	MySQL	MySQL	Linux
1	4	C++	C#	SQLite	SQLite	Windows
2	4	C#	JavaScript	NaN	NaN	NaN
3	4	Python	SQL	NaN	NaN	NaN
4	4	SQL	NaN	NaN	NaN	NaN
...	...	...	...	...	...	...
74584	25142	Go	Python	NaN	NaN	NaN
74585	25142	HTML/CSS	R	NaN	NaN	NaN
74586	25142	PHP	NaN	NaN	NaN	NaN
74587	25142	Python	NaN	NaN	NaN	NaN
74588	25142	R	NaN	NaN	NaN	NaN

PROGRAMMING LANGUAGE TRENDS

Current Year

Top 10 LanguageWorkedWith

Language	Value
JavaScript	8,687
HTML/CSS	7,830
SQL	7,106
Bash/Shell/PowerShell	4,642
Python	4,542

Next Year

Top 10 LanguageDesireNextYear

Language	Value
JavaScript	6,630
HTML/CSS	5,328
Python	5,239
SQL	5,012
TypeScript	4,088

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Javascript, HTML/CSS, SQL are top 3 languages this year.

- Python and Typescript are becoming popular next year.
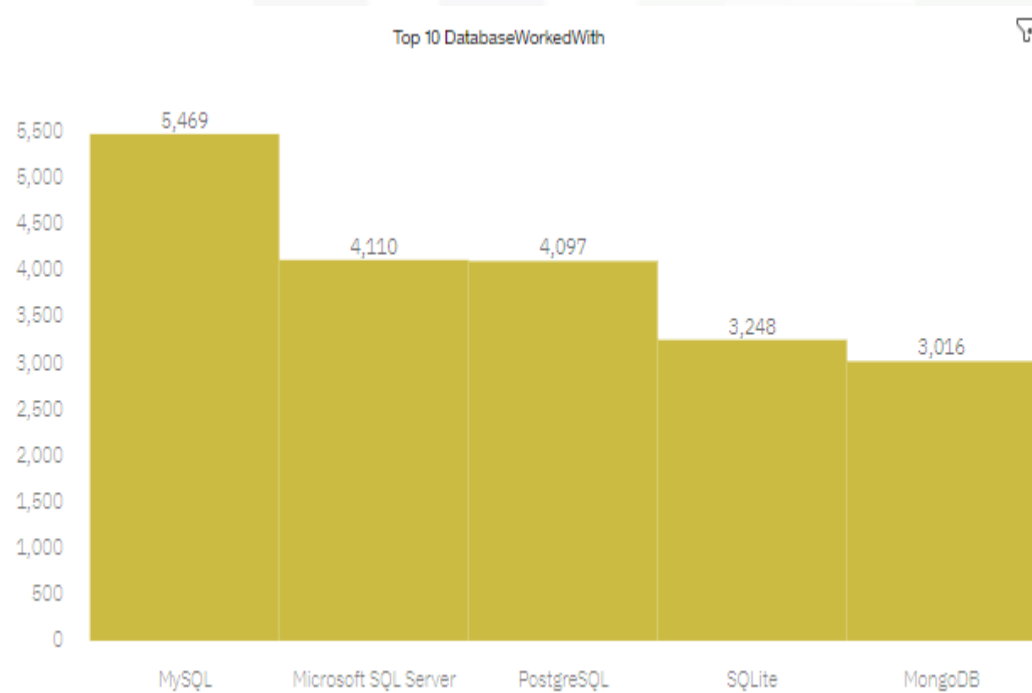
- PowerShell edged out in next year.

Implications

- Web development are still in high demand

- Big Data technology in companies still requires SQL

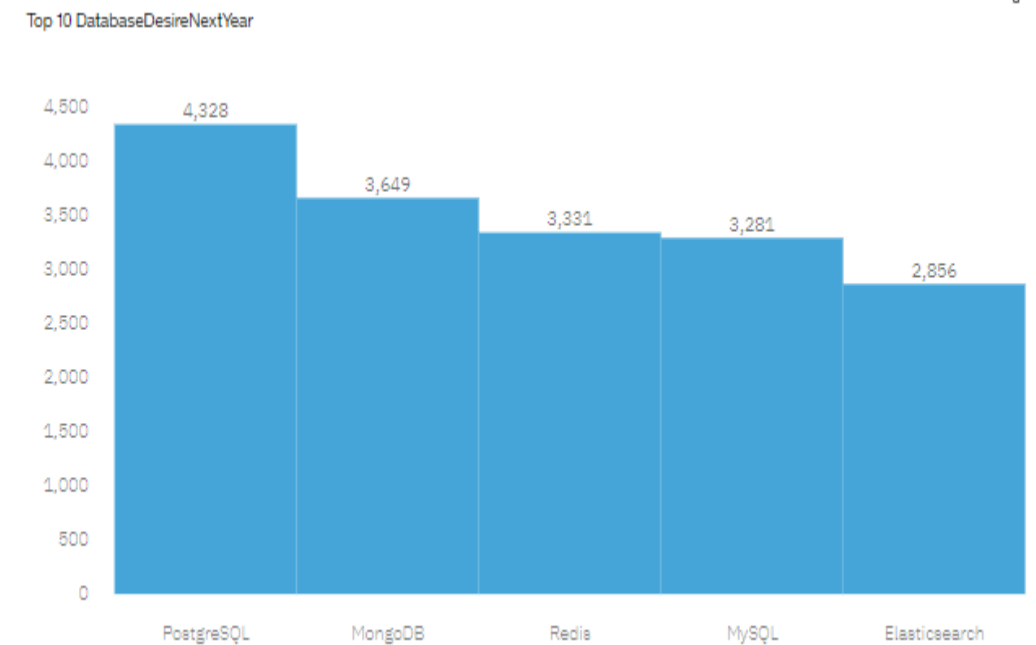- With AI and ML in rising demand, Python is best choice

DATABASE TRENDS

Current Year

Top 10 DatabaseWorkedWith

Next Year

Top 10 DatabaseDesireNextYear

DATABASE TRENDS – FINDINGS & IMPLICATIONS

Findings

- MySQL most popular

- Behind is Microsoft SQL

- MongoDB and Redis are upcoming favorites

- New kid on the block: Elasticsearch

Implications

- Open-source databases are still preferable in companies

- NoSQL databases will make an impact for storing non-relational data

- Pre-tuned search to website, app, or ecommerce store

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DASHBOARD

IBM COGNOS DASHBOARD LINK:

https://dataplatform.cloud.ibm.com/dashboards/6cf9db34-2647-401e-8096-465dfe4430fb/view/4663f63c0fec2dd473c7c4e4079c24037530775fb0bb8607d6837b490c647497a8601492c82c1d098f130c60a1ea470ccc

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DASHBOARD TAB 1

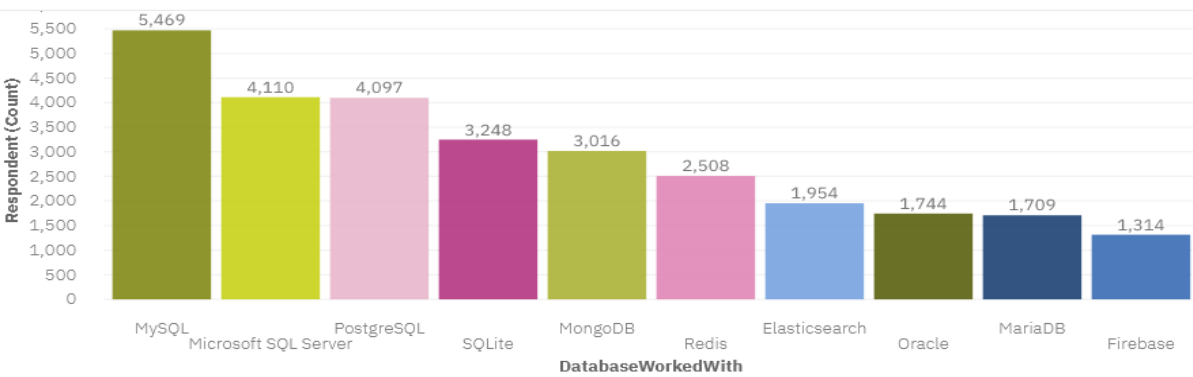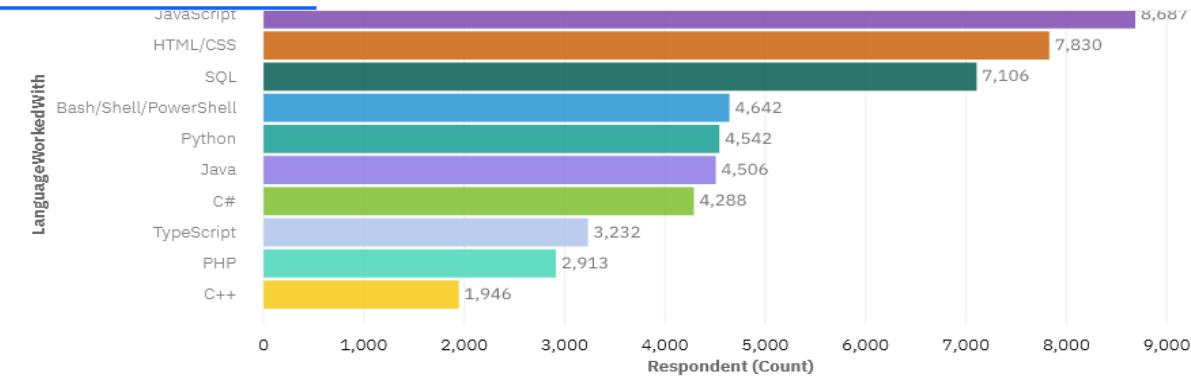▽ **All tabs**   No filters have been applied.   ‖   ▽ **This tab**   No filters have been applied.

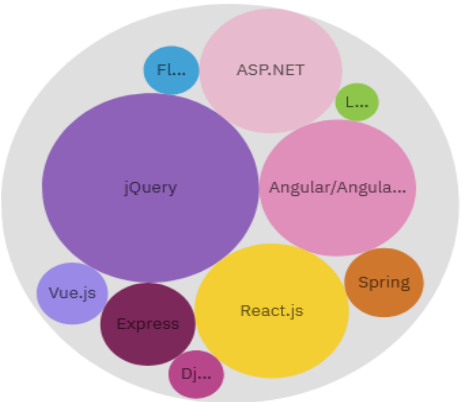**Current Technology Usage**   **Future Technology Trend**   **Demographics**

Bar chart — LanguageWorkedWith vs Respondent (Count):
- JavaScript — 8,687
- HTML/CSS — 7,830
- SQL — 7,106
- Bash/Shell/PowerShell — 4,642
- Python — 4,542
- Java — 4,506
- C# — 4,288
- TypeScript — 3,232
- PHP — 2,913
- C++ — 1,946

Bar chart — DatabaseWorkedWith vs Respondent (Count):
- MySQL — 5,469
- Microsoft SQL Server — 4,110
- PostgreSQL — 4,097
- SQLite — 3,248
- MongoDB — 3,016
- Redis — 2,508
- Elasticsearch — 1,954
- Oracle — 1,744
- MariaDB — 1,709
- Firebase — 1,314

Word Chart

Respondent (Sum)   2,532,293 — 72,858,619

PlatformWorkedWith
- AWS
- Android
- Arduino
- Docker
- Google Cloud Platform
- Heroku
- IBM Cloud or Watson
- Kubernetes
- Linux
- MacOS
- Microsoft Azure
- Other(s):
- Raspberry Pi
- Slack
- Windows
- WordPress
- iOS

Top 10 Web Frame Worked With

Respondent (Sum)   11,517,716 — 57,310,840

WebFrameWorkedWith
- ASP.NET
- Angular/Angular.js
- Django
- Express
- Flask
- Laravel
- React.js
- Spring
- Vue.js
- jQuery

DASHBOARD TAB 2

Top 10 Language Desire Next Year

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

LanguageDesireNextYear	Respondent (Count)
JavaScript	6,630
HTML/CSS	5,328
Python	5,239
SQL	5,012
TypeScript	4,088
C#	3,591
Bash/Shell/PowerShell	3,097
Java	2,953
Go	2,759
Kotlin	1,890

Top 10 Database Desire Next Year

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

DatabaseDesireNextYear	Respondent (Count)
PostgreSQL	4,328
MongoDB	3,649
Redis	3,331
MySQL	3,281
Elasticsearch	2,856
Microsoft SQL Serv...	2,706
SQLite	2,437
Firebase	1,650
MariaDB	1,385
DynamoDB	1,044

Platform Desire Next Year

Respondent (Cou...) 2,359 — 5,865

PlatformDesireN... 2,359 — 5,865

Linux | Docker | AWS | Windows | Android | Kubernetes | MacOS | Raspberr... | Google Cloud Pla... | Slack

Top 10 Web Frame Desire Next Year

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
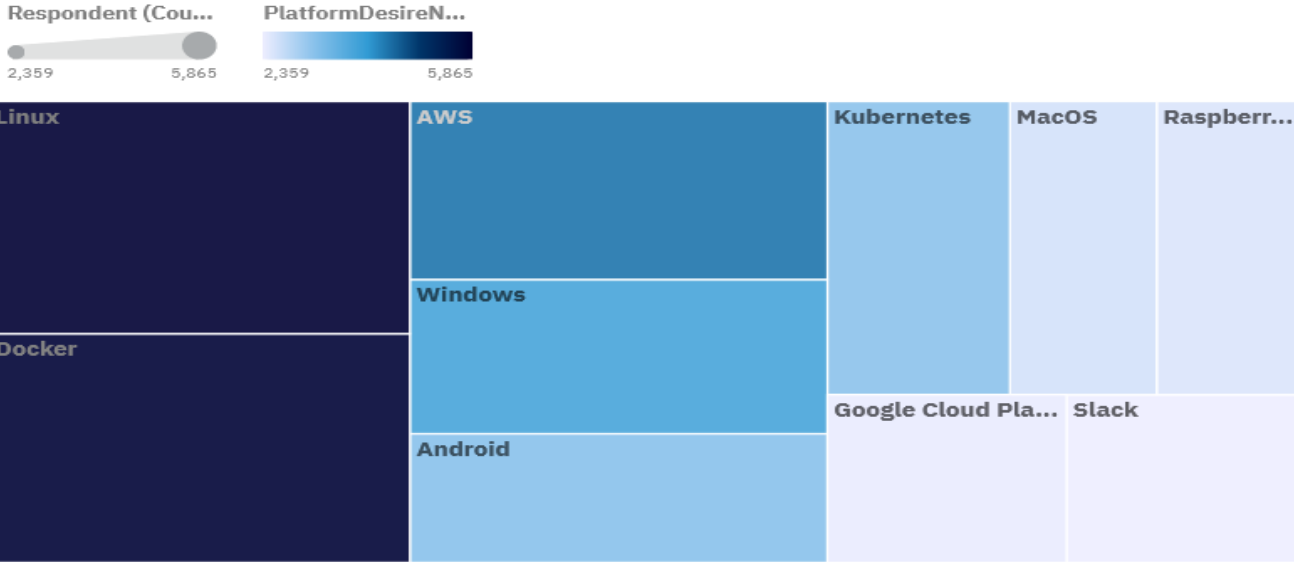
Spri... | ASP.NET ... | Fla... | React.js | 58,321,909 | Vue.js | 39,18... | Djan... | jQuery | ... | Angular/Ang... | Expres... | R...
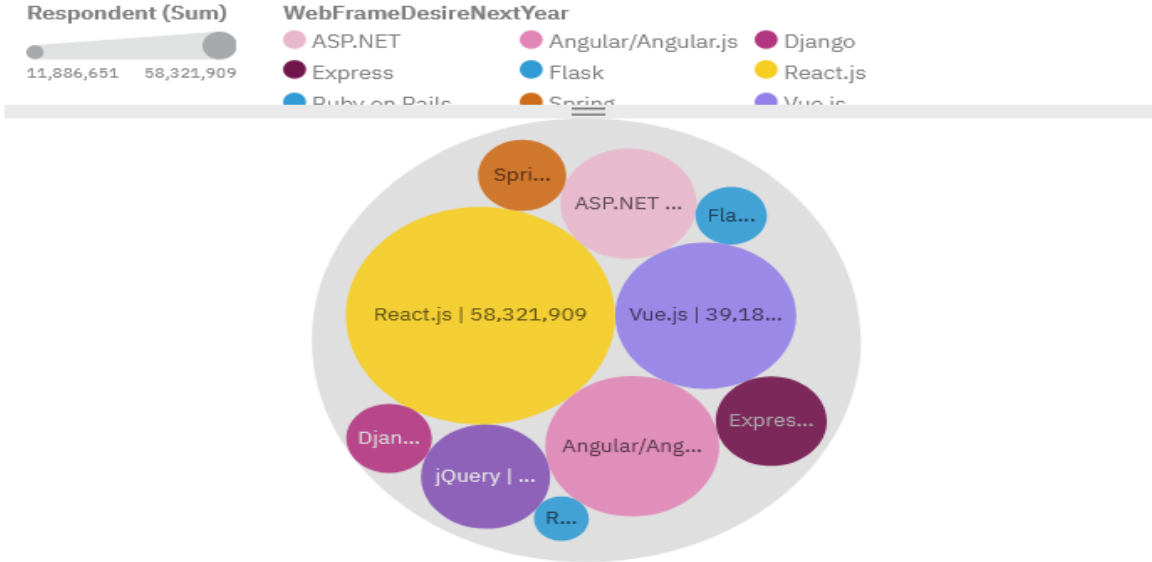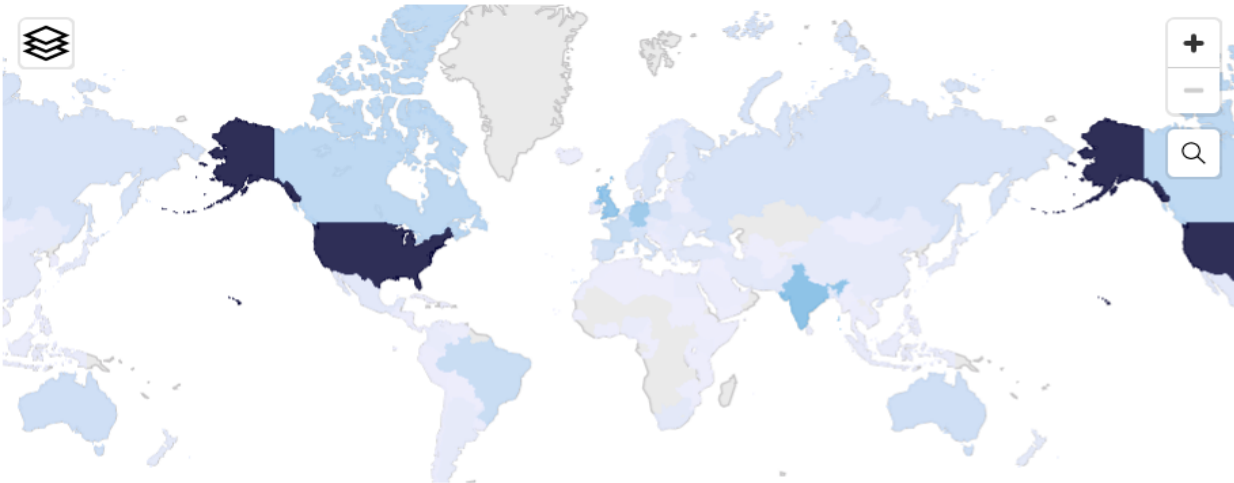
DASHBOARD TAB 3

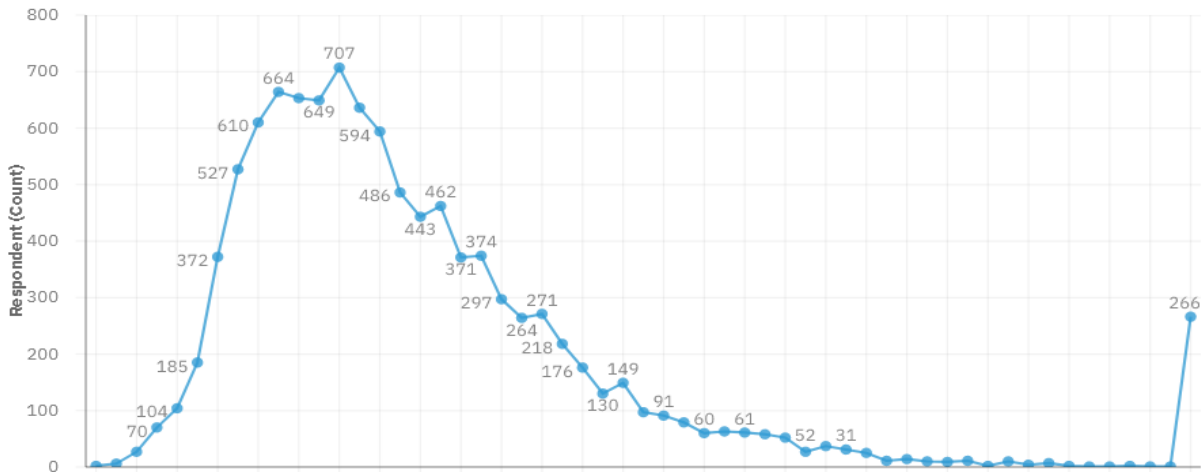Respondent classified by Gender

Gender
○ Woman ● Man

6.3%

93.7%
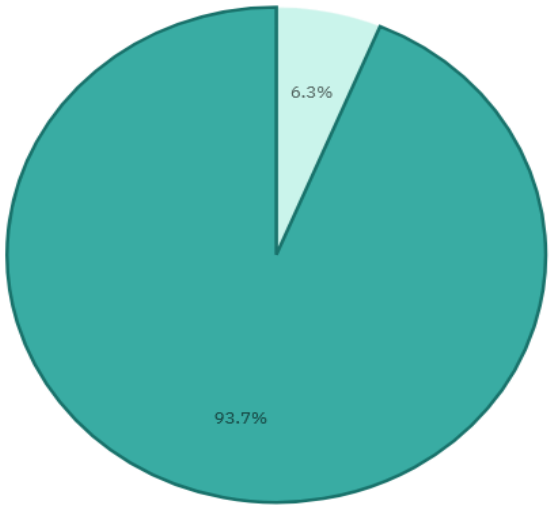
Respondent Count for Country

Respondent (Cou...
1   2,805

Respondent Count by Age

Respondent Count by Gender, classified by Formal Education

EdLevel
● 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   357   5,341   2,484   482   1,280

Woman   412
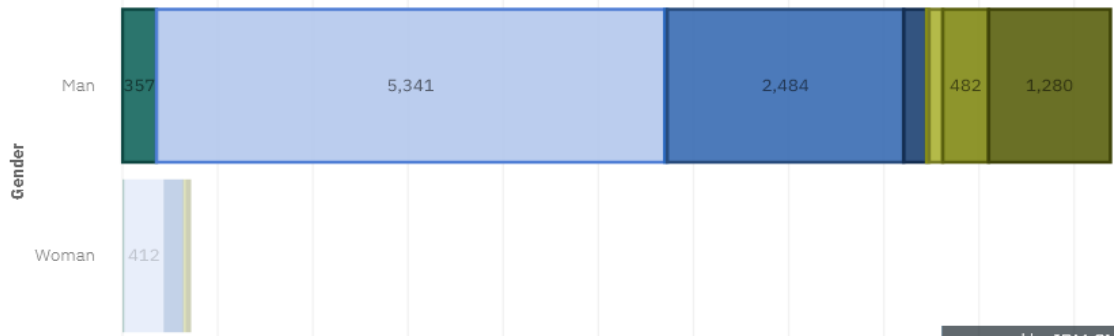
DISCUSSION

- Technology Trends now and future
- Training and Reskilling workers
- Female participation in Technology field
- Bridge divide of technology gaps in developing countries
- Eliminate age and education discrimination in employment

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OVERALL FINDINGS & IMPLICATIONS

Findings

- Fast changing technology every year

- Concentration on several countries like USA and India

- Gender gap in technology jobs

- Platforms like Docker and AWS are growing

Implications

- Companies need to be flexible and adjust to rapid changes

- Need to spread technology out to lagging countries

- Impact of job hiring's

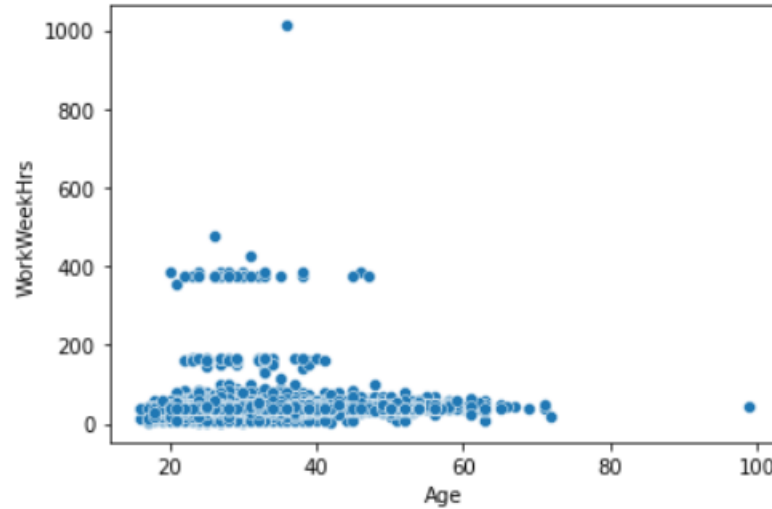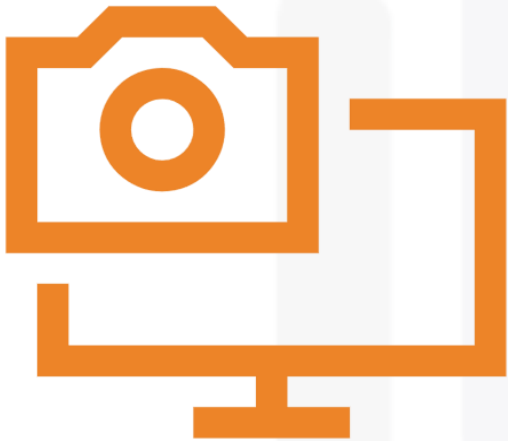- Shift to faster app deployments and cloud services in future

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CONCLUSION

- Technology Trends for current and next year

- Programming Languages, Database and Platform overview

- Demographics overview

- Actions to be taken

- In future, incorporate Machine Learning to predict trends and salaries

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APPENDIX

Top 5 Databases Respondents Wish To Learn

- PostgreSQL
- MongoDB
- Redis
- MySQL
- Elasticsearch

24.8%, 16.4%, 18.8%, 19.1%, 20.9%
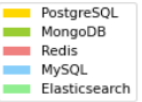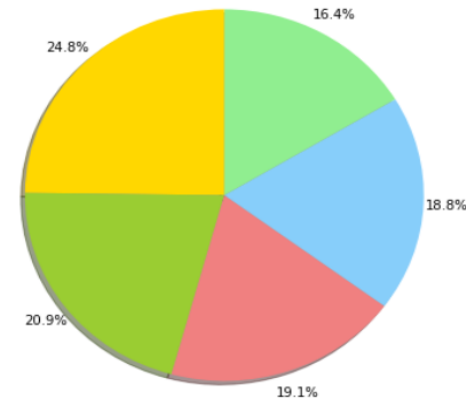
```
count     11111.000000
mean         30.778895
std           7.393686
min          16.000000
25%          25.000000
50%          29.000000
75%          35.000000
max          99.000000
Name: Age, dtype: float64
```

```
df.corr()['Age']
```

```
Respondent       0.004041
CompTotal        0.006970
ConvertedComp    0.105386
WorkWeekHrs      0.036518
CodeRevHrs      -0.020469
Age              1.000000
Name: Age, dtype: float64
```
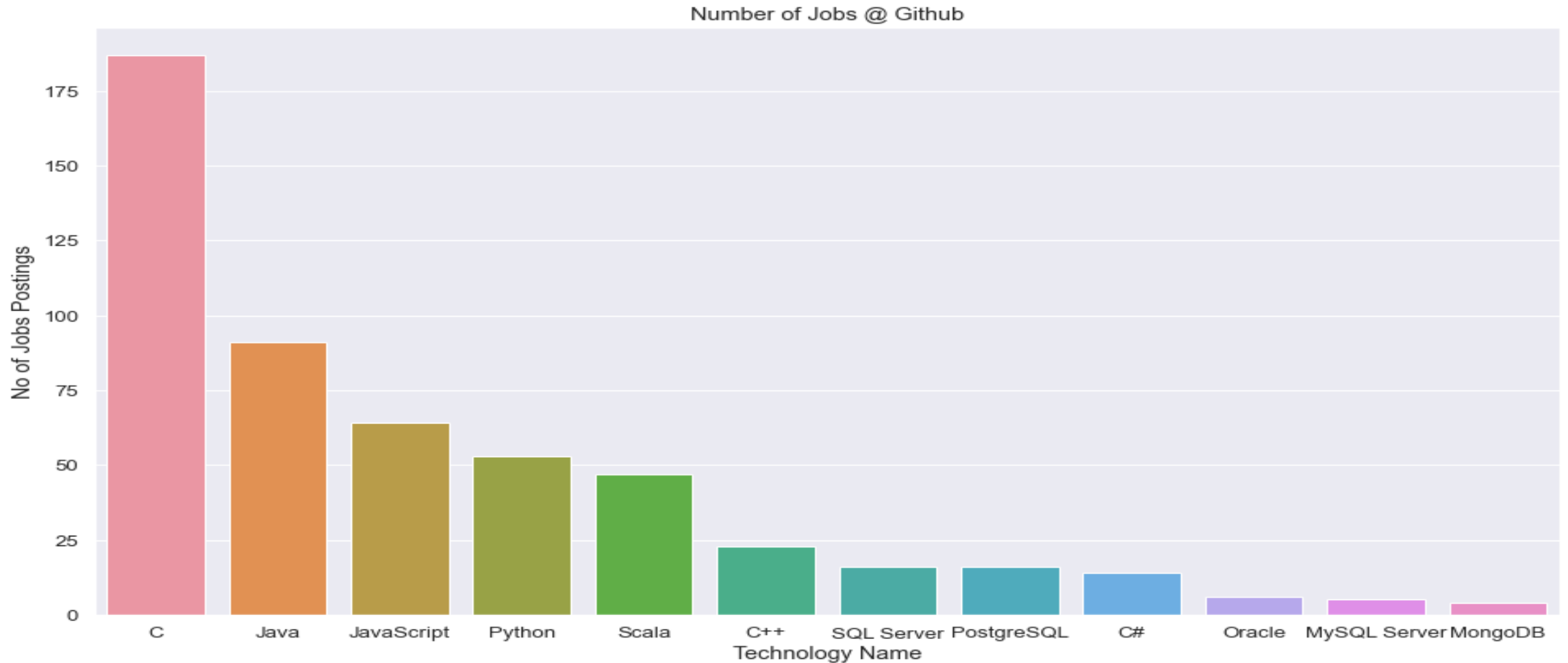
	Language	Average Annual Salary
1	Python	$114,383
2	Java	$101,013
3	R	$92,037
4	Javascript	$110,981
5	Swift	$130,801
6	C++	$113,865
7	C#	$88,726
8	PHP	$84,727
9	SQL	$84,793
10	Go	$94,082

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JOB POSTINGS

Number of Jobs @ Github

POPULAR LANGUAGES