# IBM CAPSTONE PROJECT

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5th September, 2022

# OUTLINE

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

# EXECUTIVE SUMMARY

- Understanding Trends of programming languages
  - Current Technology usage
  - Future Technology Trend
- Demographics
- Gender Gaps

# INTRODUCTION

- Analyzing Trends in software programming language
  - Identify skill requirements today
  - Identify skill requirements in the future
  - Recognize popular platforms and databases

- Target Audience
  - Human Resource
  - IT Heads

# METHODOLOGY

- Data Collection and Source
  - Stack overflow  Developer 2019 Survey
  - Github  Job postings
- Data Exploration
- Data Cleaning
- Data Visualization
- Presentation

# RESULTS

Schema: 70 Columns

The preview includes only a limited set of columns and rows.

Last refresh: 16 seconds ago

Prepare data

| Respond... String | MainBran... String | Hobbyist String | OpenSou... String | OpenSou... String | Employm... String | Country String | Student String |
|---|---|---|---|---|---|---|---|
| 4 | I am a developer | No | Never | The quality of OS | Employed full-tin | United States | No |
| 9 | I am a developer | Yes | Once a month or | The quality of OS | Employed full-tin | New Zealand | No |
| 13 | I am a developer | Yes | Less than once a | OSS is, on averag | Employed full-tin | United States | No |
| 16 | I am a developer | Yes | Never | The quality of OS | Employed full-tin | United Kingdom | No |
| 17 | I am a developer | Yes | Less than once a | The quality of OS | Employed full-tin | Australia | No |
| 19 | I am a developer | Yes | Never | The quality of OS | Employed full-tin | Brazil | No |
| 20 | I am not primaril | No | Never | OSS is, on averag | Employed full-tin | Lithuania | No |
| 22 | I am a developer | Yes | Less than once p | OSS is, on averag | Employed full-tin | United States | No |
| 23 | I am a developer | Yes | Less than once p | The quality of OS | Employed full-tin | United States | No |

# RESULTS

Schema: 14 Columns

The preview includes only a limited set of columns and rows.

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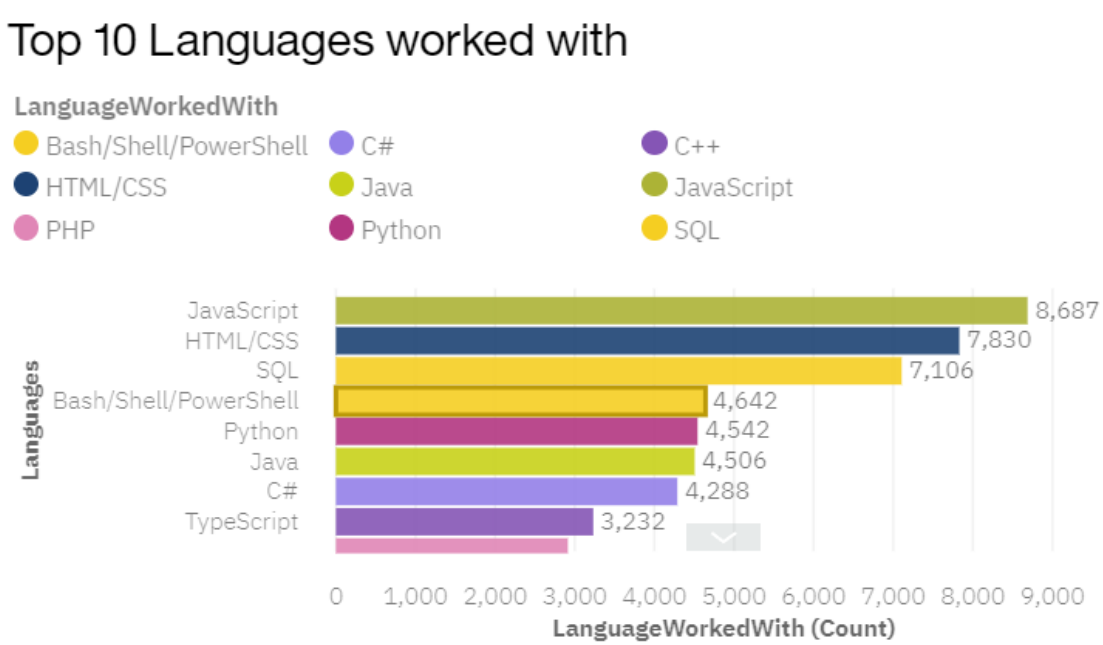
Prepare data

| Respond... String | LanguageWorked... String | LanguageDesireNext... String | DatabaseWorked... String | DatabaseDesireNext... String | PlatformWorked... String | PlatformDesireNex... String | WebF String |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 4 | C | C | MySQL | MySQL | Linux | Linux | |
| 4 | C++ | C# | SQLite | SQLite | Windows | Windows | |
| 4 | C# | JavaScript | | | | | |
| 4 | Python | SQL | | | | | |
| 4 | SQL | | | | | | |
| 9 | Bash/Shell/PowerShell | Bash/Shell/PowerShell | DynamoDB | PostgreSQL | AWS | AWS | Expre |
| 9 | C# | C | PostgreSQL | Redis | Docker | Docker | Ruby |
| 9 | HTML/CSS | HTML/CSS | SQLite | SQLite | Heroku | Heroku | Other |

# RESULTS


Top 10 Languages worked with
LanguageWorkedWith
Bash/Shell/PowerShell
C#
C++
HTML/CSS
Java
JavaScript
PHP
Python
SQL
Languages
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
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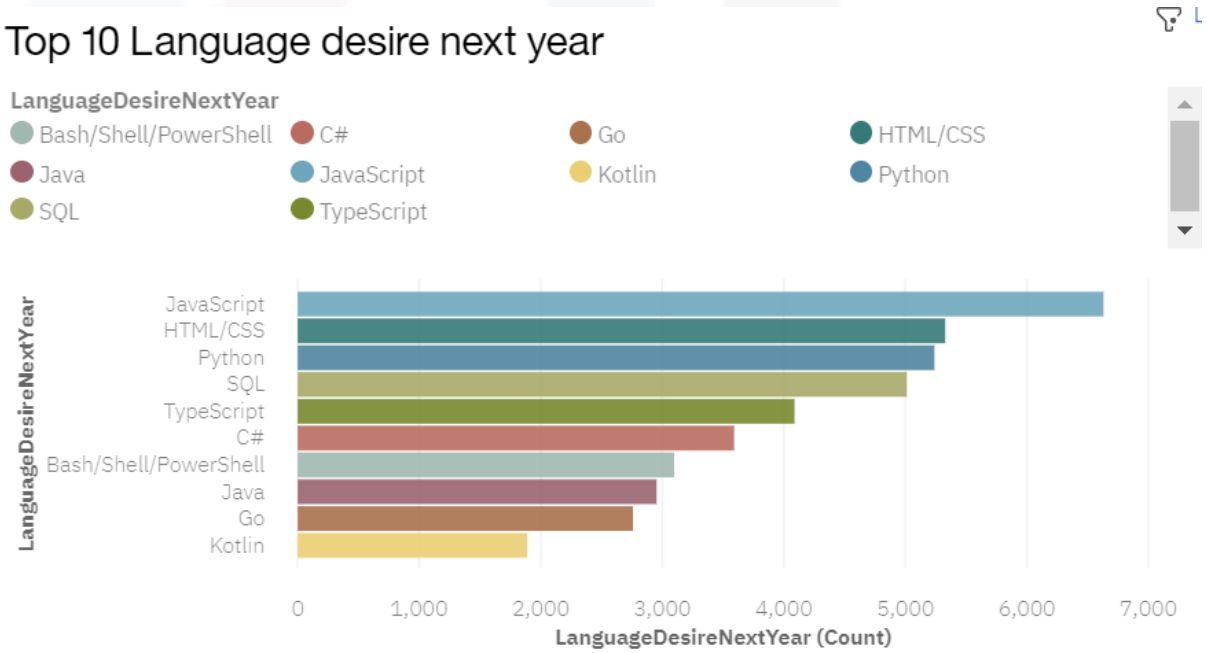
LanguageWorkedWith (Count)


Top 10 Language desire next year
LanguageDesireNextYear
Bash/Shell/PowerShell
C#
Go
HTML/CSS
Java
JavaScript
Kotlin
Python
SQL
TypeScript
LanguageDesireNextYear
JavaScript
HTML/CSS
Python
SQL
TypeScript
C#
Bash/Shell/PowerShell
Java
Go
Kotlin
0 1,000 2,000 3,000 4,000 5,000 6,000 7,000
LanguageDesireNextYear (Count)

# RESULTS

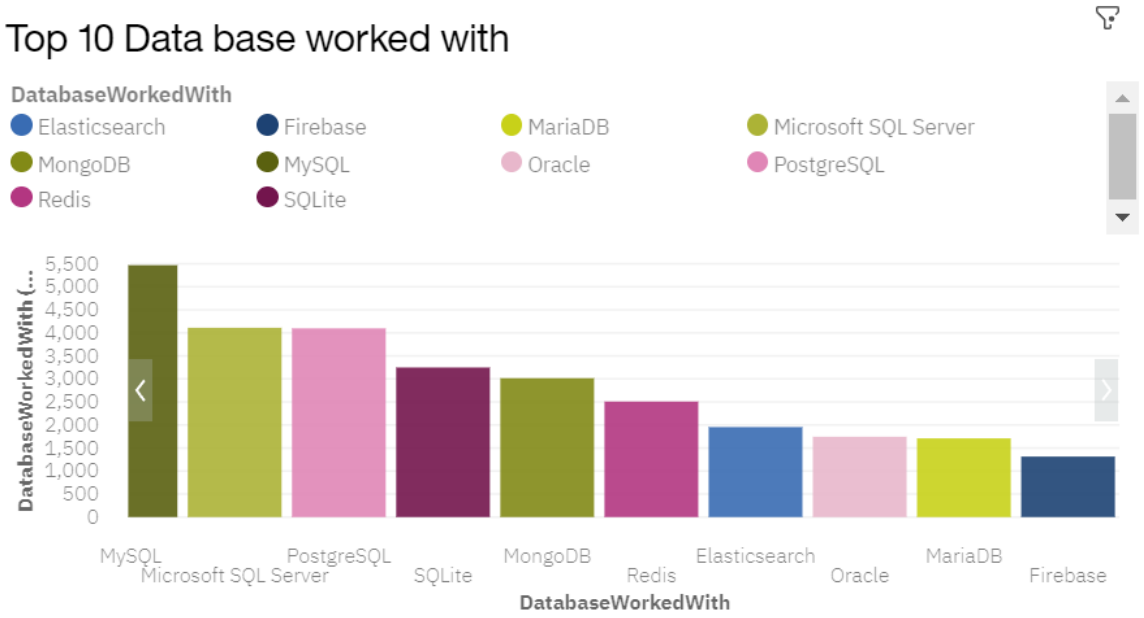
## Findings

- Top 3 programming languages this year include Javascript, HTML/CSS and SQL
- Python and Typescript will be emerging next year.
- Power shell and Java appear to be edging out next year

## Implications

- SQL is highly in demand and will be for the next couple of years.
- With AI and ML rising in demand, python will emerge as best choice with time.

# RESULTS


Top 10 Data base worked with
DatabaseWorkedWith
Elasticsearch
Firebase
MariaDB
Microsoft SQL Server
MongoDB
MySQL
Oracle
PostgreSQL
Redis
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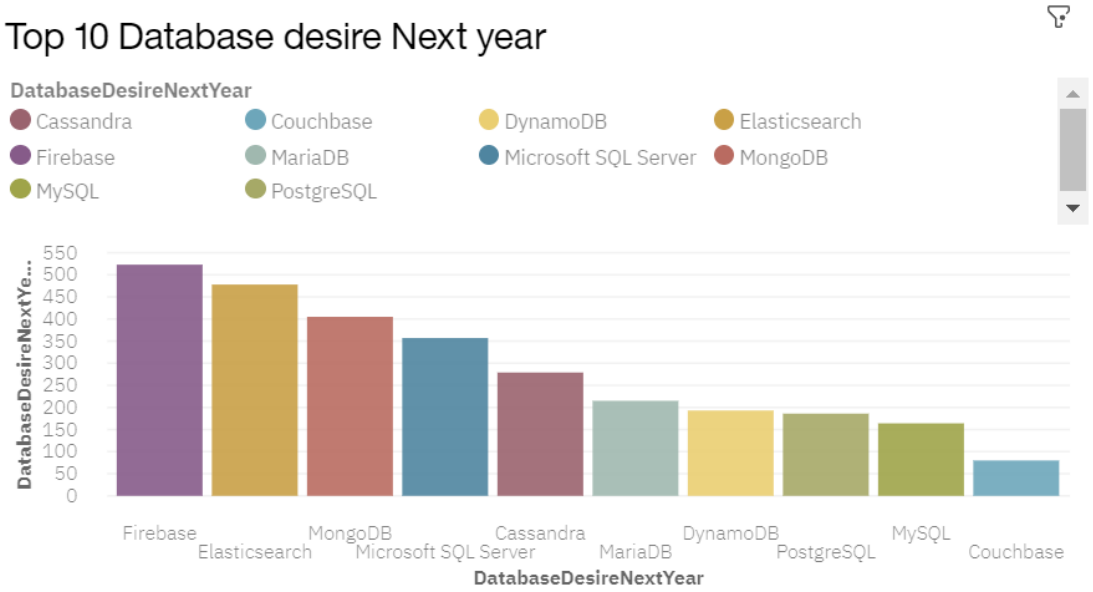
Top 10 Database desire Next year
DatabaseDesireNextYear
Cassandra
Couchbase
DynamoDB
Elasticsearch
Firebase
MariaDB
Microsoft SQL Server
MongoDB
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Firebase
Elasticsearch
MongoDB
Microsoft SQL Server
Cassandra
MariaDB
DynamoDB
PostgreSQL
MySQL
Couchbase
DatabaseDesireNextYear

# RESULTS

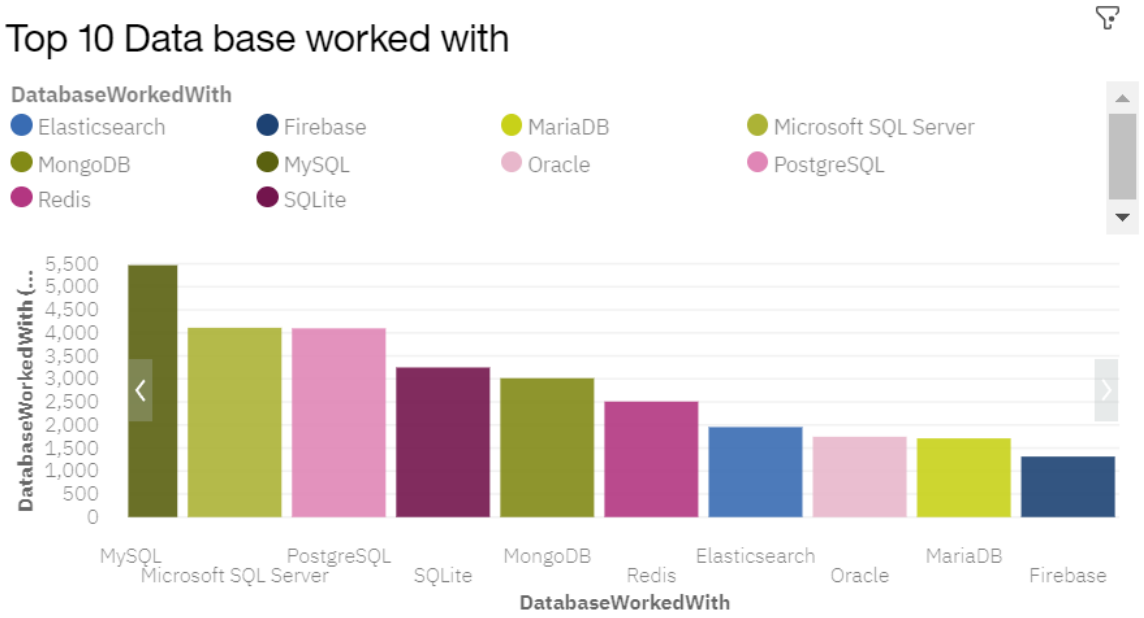
## Findings

- MySQL is the most popular, followed by Microsoft SQL
- MongoDB and Redis are coming behind SQL

## Findings

- Open source databases stands a higher chance in companies
- Redis supports abstract data types and could come in handy soonest.

# RESULTS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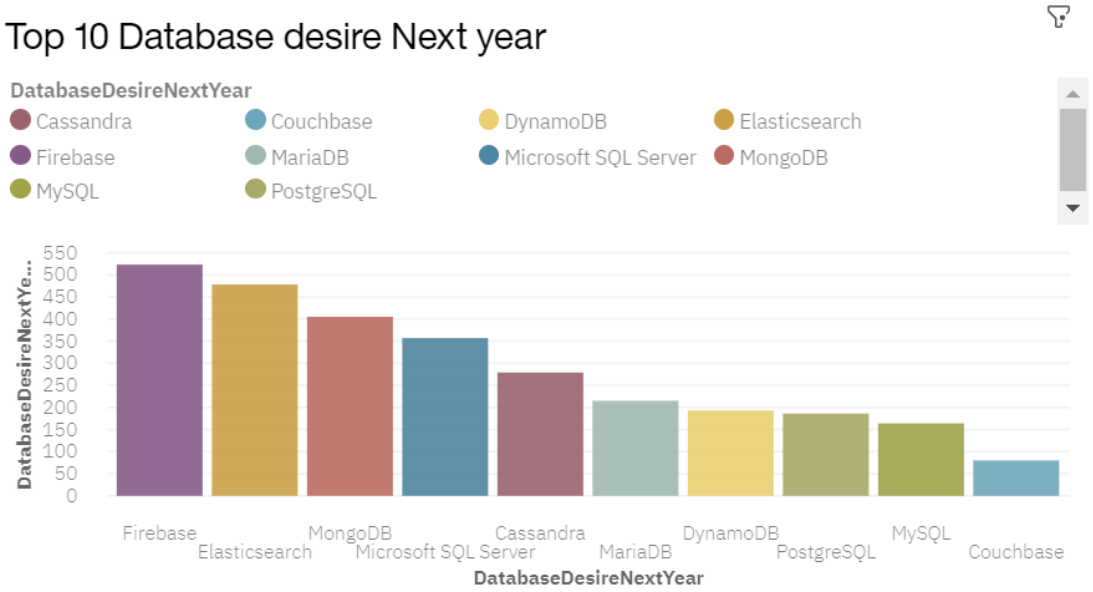
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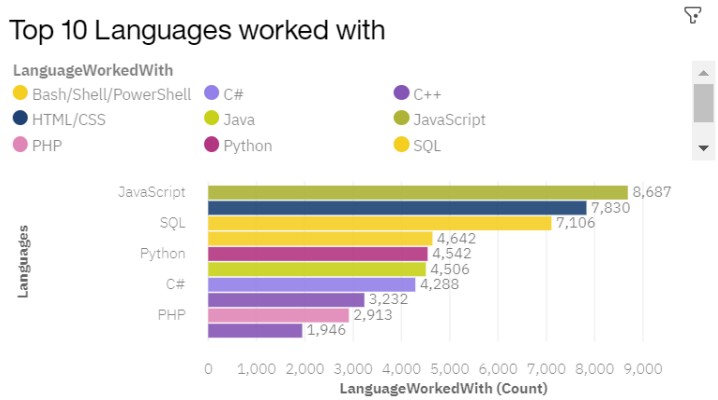
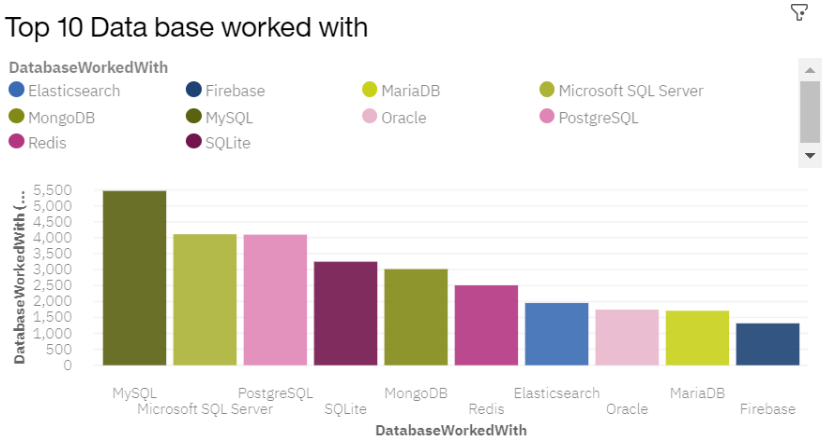
Firebase
Elasticsearch
MongoDB
Microsoft SQL Server
Cassandra
MariaDB
DynamoDB
PostgreSQL
MySQL
Couchbase
DatabaseDesireNextYear

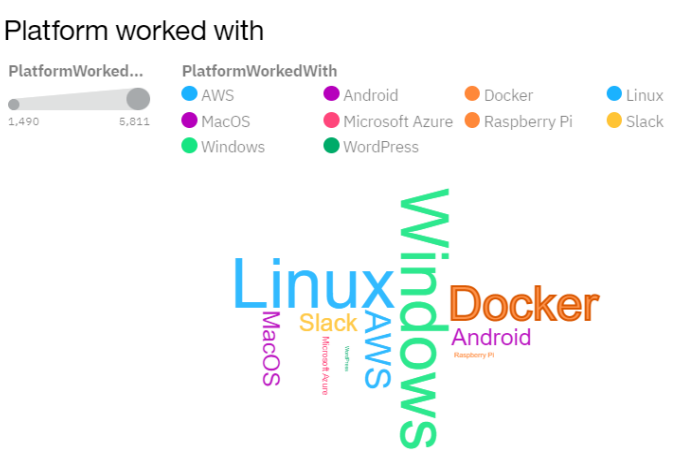
# DASHBOARD

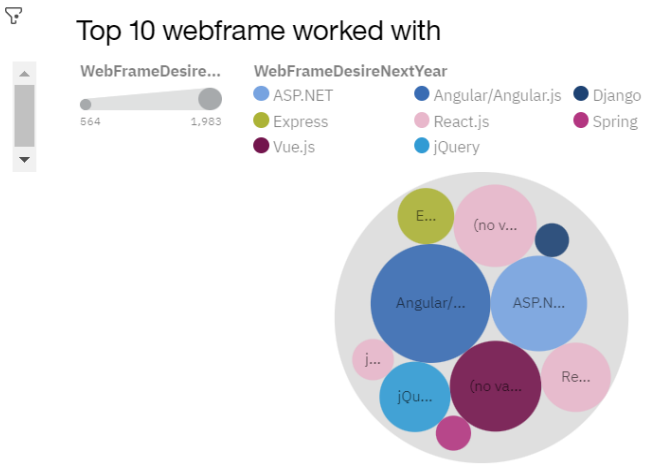
https://eu-de.dataplatform.cloud.ibm.com/dashboards/29a32f6e-5fd9-40cc-8192-6152ef16d4df/view/4f24e40566e31bc156c1d0e4079b7a0e7b3f7455e0bbd00a88817b4906667397a96811c5c826185fd8125365f7ec460dc8

# DASHBOARD1-Current Technology

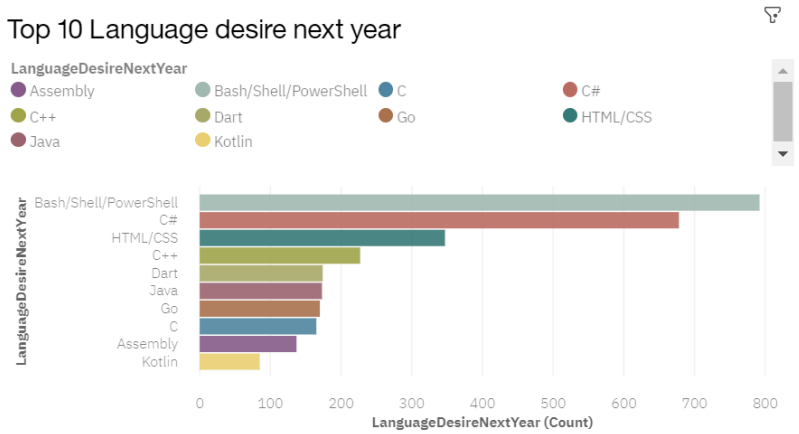


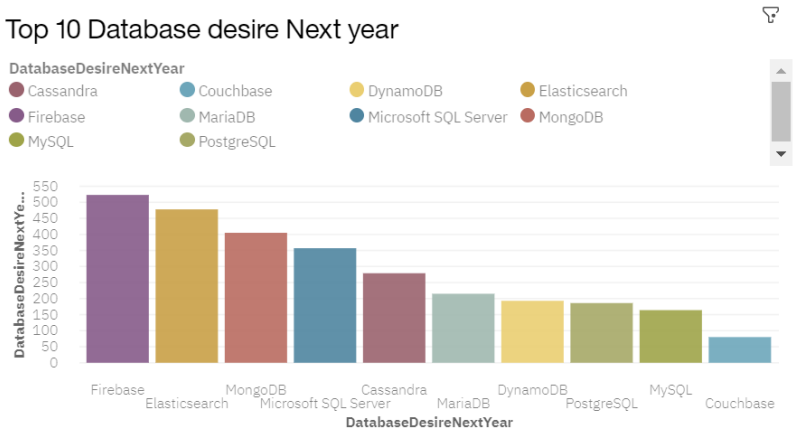



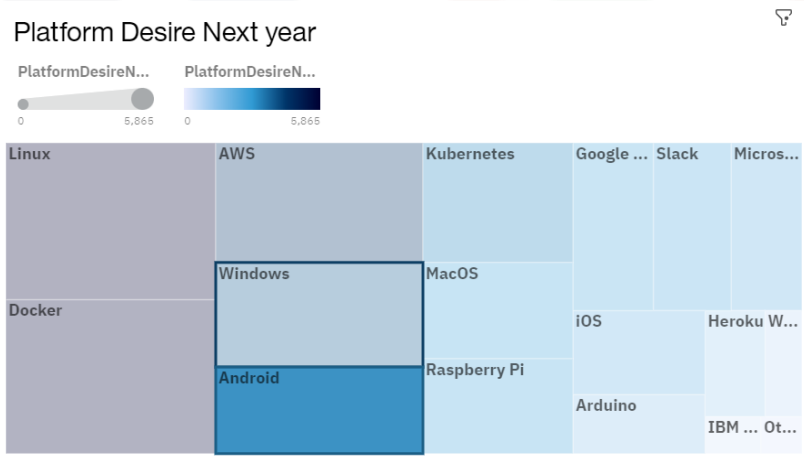



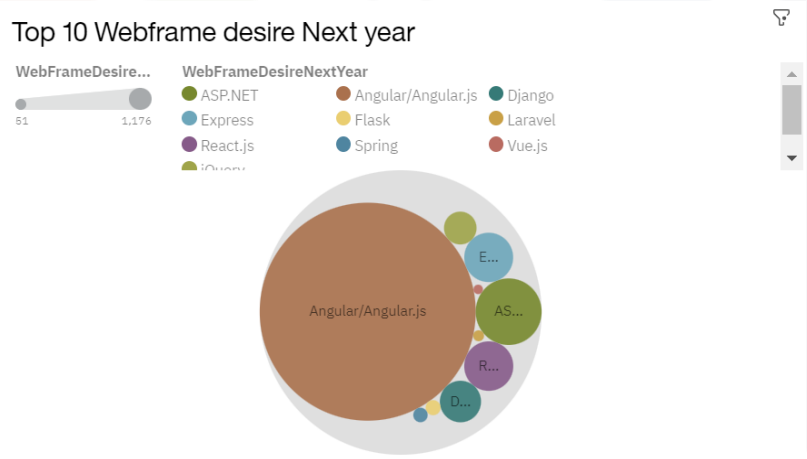



# DASHBOARD2-FutureTechnology

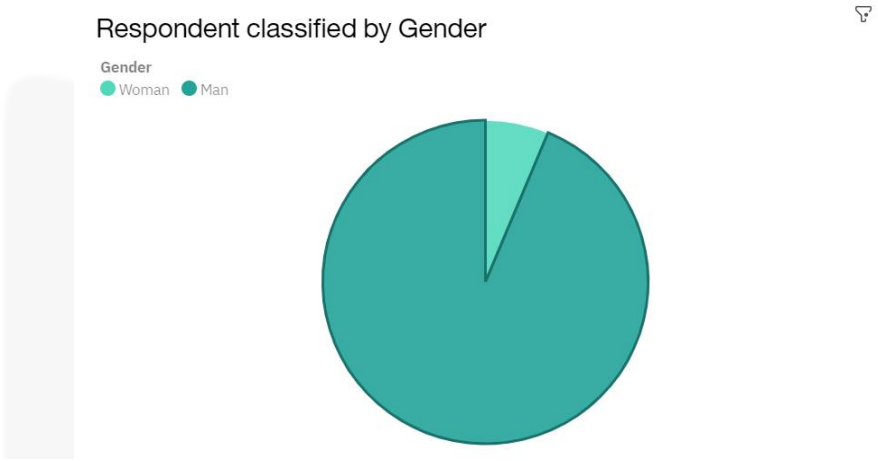


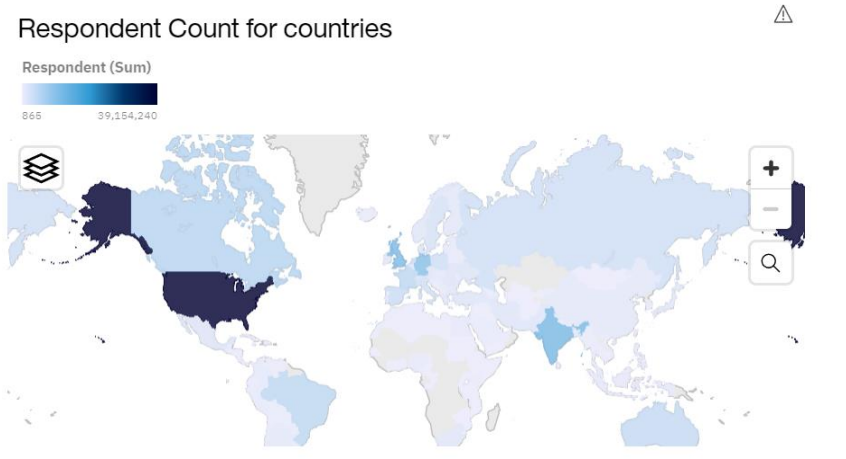



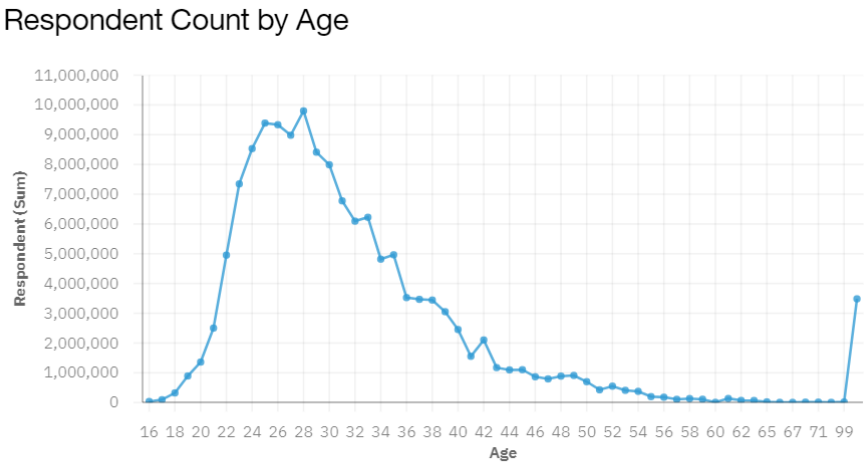



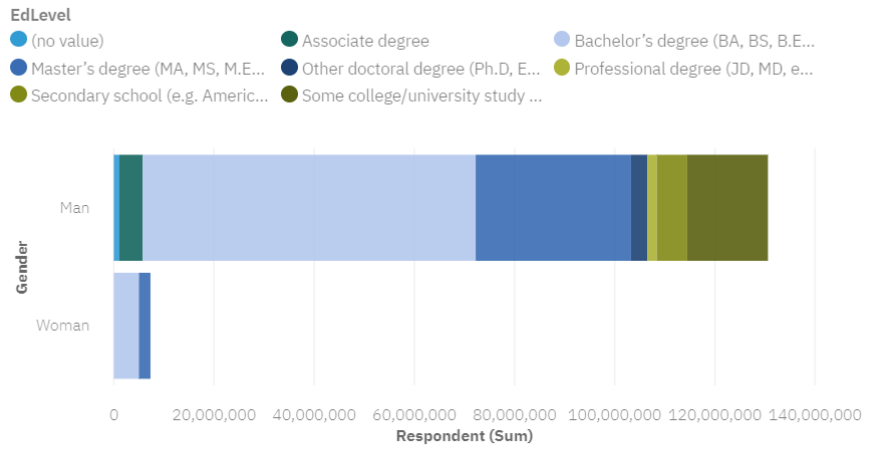



# DASHBOARD3-Demographics



# DISCUSSION

- It is important for individuals to upskill and companies invest in training and reskilling employees
- According to Demographics,
  - Female participation in Technology field should be encouraged
  - The technology gaps in developing countries should be bridged
- Discrimination regarding age and education should be eliminated

# OVERALL FINDINGS & IMPLICATIONS

## Findings

- Fast changing Technology
- USA and India projected as Tech base
- Data platforms like Docker and AWS are fast becoming
- Obvious gender gap in technology jobs

## Implications

- Tech companies should be more open to adjusting to quick changes
- It is becoming more important to spread technology across countries that are behind
- Human Resource should do better and encourage more females
- Cloud services will become more accessible own to vast and big data

# CONCLUSION

- Technolgy is evolving faster
- This trend is based on analyzing data programming languages, databases and platforms
- Demographics reveal how personal this study can become
- AI and ML can be used to predict future trends and salaries