IBM Data Analyst Capstone Project

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EXECUTIVE SUMMARY

- Current Technology Usage
  - Language
  - Database
  - Platform
  - Web Frame

- Future Technology Trend
  - Language
  - Database
  - Platform
  - Web Frame

- Demographic Insights
  - Gender Distribution
  - Geographic Distribution
  - Age Range
  - Educational Background

INTRODUCTION

OVERVIEW:

- Understanding trends in programming languages, remote work, and job satisfaction is crucial for staying competitive in the tech industry. This presentation highlights key insights to help identify current trends and future needs.

AUDIENCE:

- Technology Professionals, including Developers, Engineers, and Data Analysts

- HR Managers, Tech Managers, Students, and Educators in computing and digital disciplines

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METHODOLOGY

- Data Collection
  - The 2019 Stack Overflow Developer Survey Results
- Data Wrangling
- Exploratory Data Analysis
- Data Visualization
  - Dashboard With IBM Cognos Analytics
 - Dashboard with Google Looker studio
- Presentation of Findings

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RESULTS

- **Top Programming Languages:** JavaScript leads in popularity, with Python also rising due to its role in data science and machine learning.

- **Remote Work Trends:** 60% of developers work remotely at least part-time, showing a shift towards flexible work environments.

- **Job Satisfaction:** Competitive salaries and career growth are key factors in job selection.

- **Technology Adoption:** Cloud platforms like AWS and Azure are widely used, indicating a strong move towards cloud-based solutions.

- **Developer Demographics:** The survey highlights a diverse range of developers, with a growing presence of women and underrepresented groups in the tech field.

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PROGRAMMING LANGUAGE TRENDS

Current Year
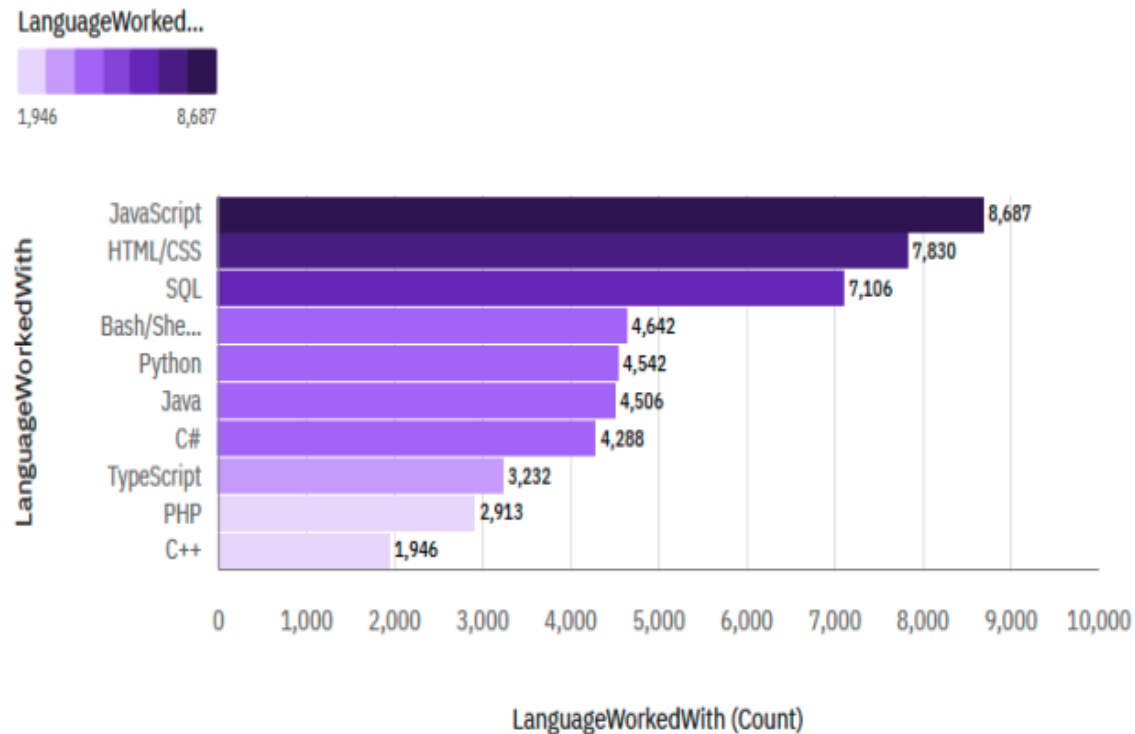
Next Year
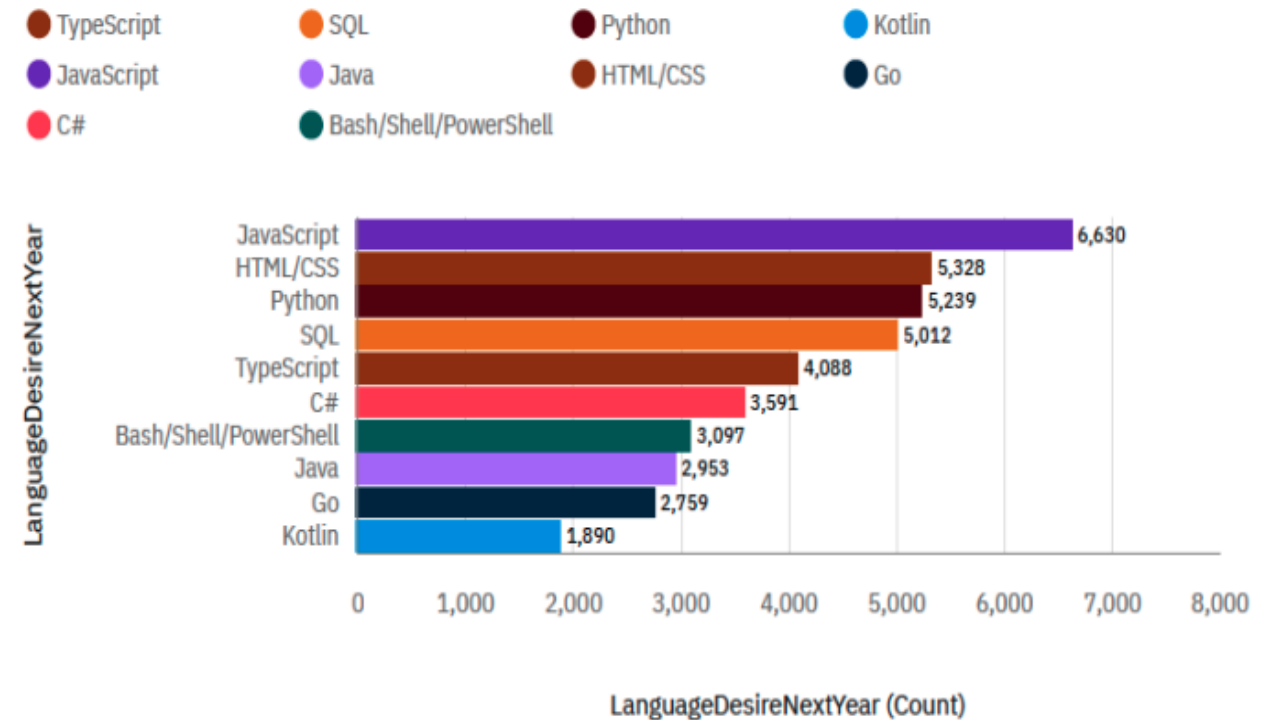
PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- **JavaScript** remains a top choice for web development.
- **TypeScript** is growing in popularity for its added functionality.
- **Python** is rapidly expanding in data science and AI.
- **SQL** is often paired with Python for data analysis.
- **PHP** has significantly declined in use.
- **Java and C++** have seen a slight decrease, possibly due to Python.
- **Kotlin and Go** are gaining traction for mobile and cloud applications.
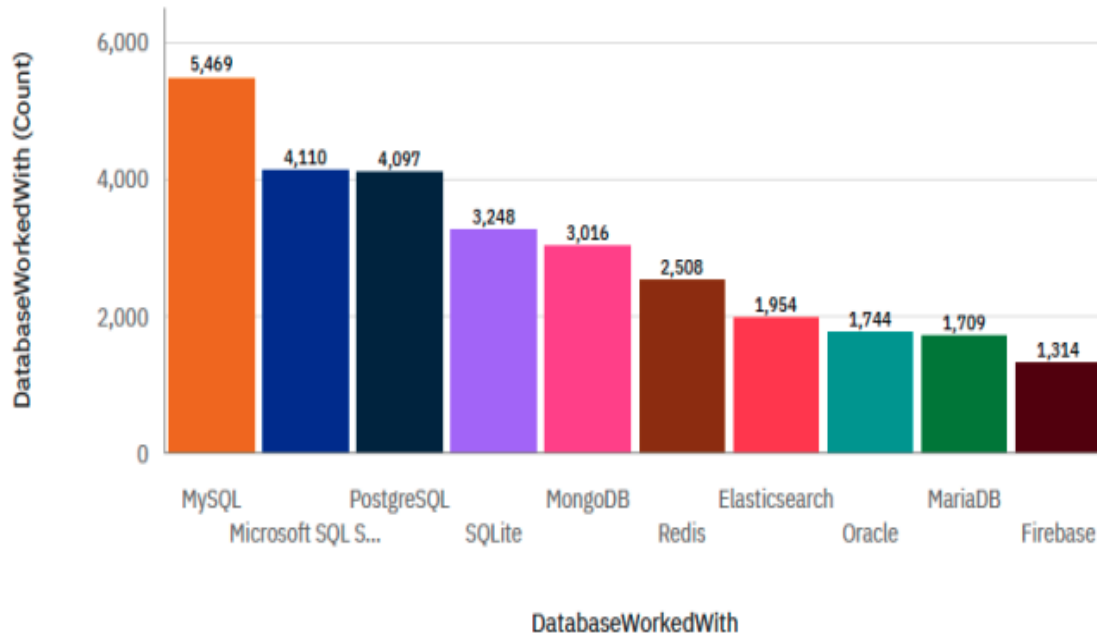
Implications

- **JavaScript and TypeScript** are essential for web development roles.
- **Python** is crucial for data science, AI, and automation.
- **Combining SQL with Python** is important for managing and analyzing data.
- **Transition away from PHP** to modern languages.
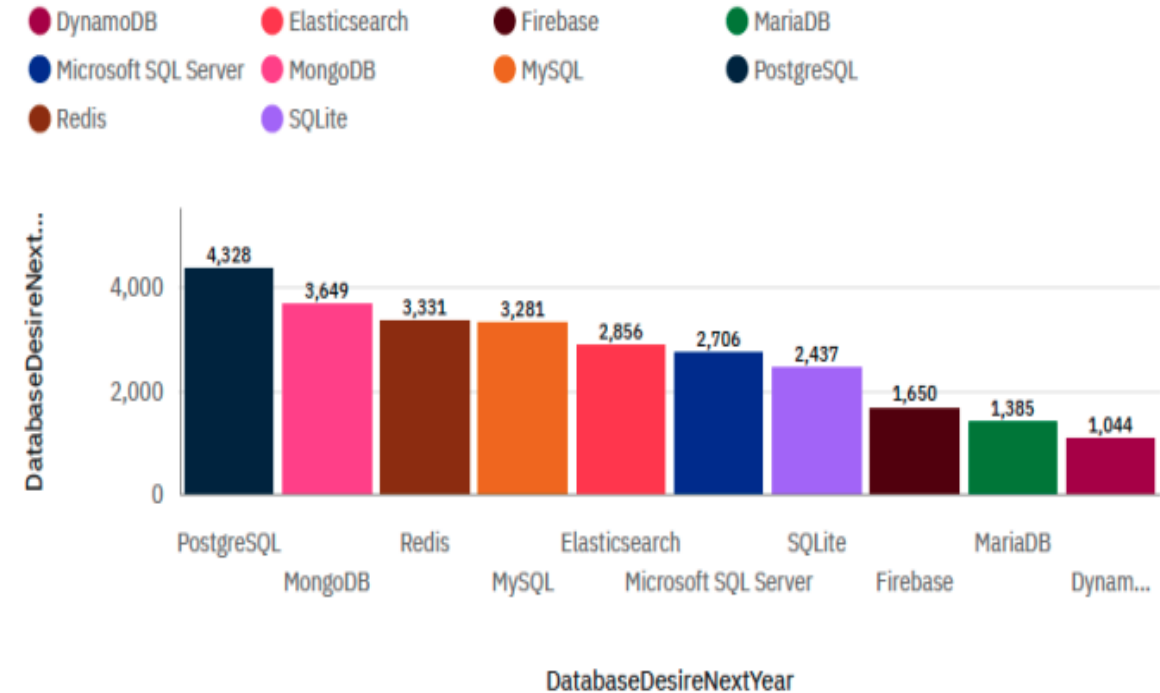- **Consider Kotlin and Go** for new opportunities in mobile and cloud computing.

DATABASE TRENDS

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- **MySQL** has seen a decline in usage.
- **Microsoft SQL Server** is also down.
- **PostgreSQL** has increased significantly and is now the leading database.
- **SQLite** has experienced a decrease.
- **MongoDB** has seen growth in popularity.
- **Redis** is on the rise for in-memory data storage.
- **Elasticsearch** has increased slightly for search and analytics.
- **Oracle** is less popular, while **DynamoDB** is emerging as a new choice.

Implications

- **Focus on PostgreSQL** for its growing dominance in relational databases.
- **Consider MongoDB and Redis** for scalable, NoSQL, and in-memory needs.
- **Evaluate Elasticsearch** for search and analytics requirements.
- **Shift away from MySQL and Microsoft SQL Server** to more popular alternatives.
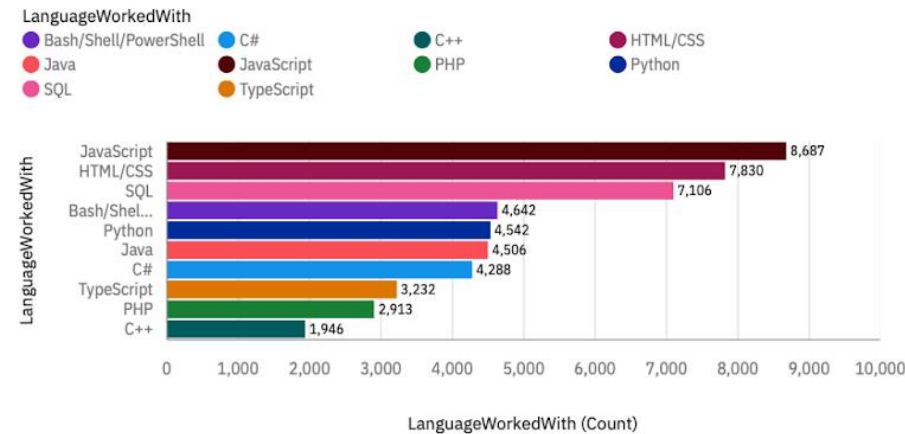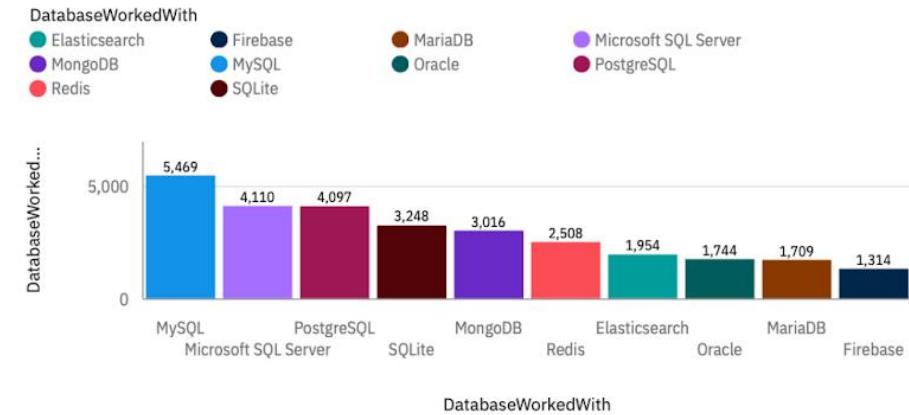- **Explore DynamoDB** for new, scalable database solutions.

DASHBOARD

[The GitHub link of the dashboard.](#)

CURRENT TECHNOLOGY USAGE

Top 10 LanguageWorkedWith
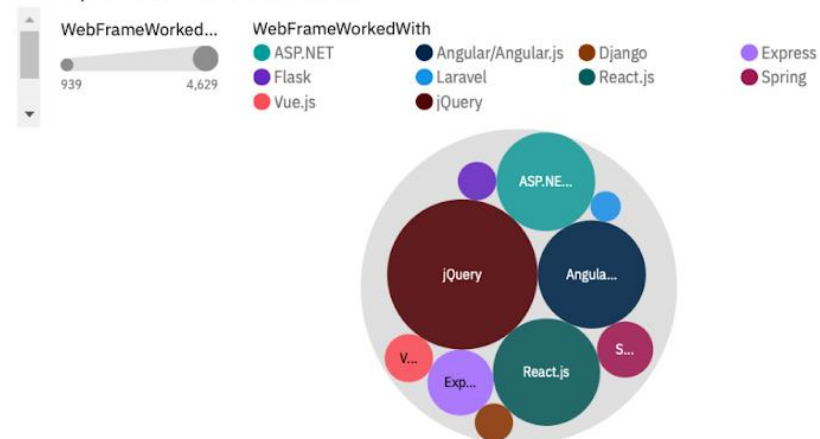
LanguageWorkedWith
- Bash/Shell/PowerShell
- C#
- C++
- HTML/CSS
- Java
- JavaScript
- PHP
- Python
- SQL
- TypeScript

LanguageWorkedWith	Count
JavaScript	8,687
HTML/CSS	7,830
SQL	7,106
Bash/Shel...	4,642
Python	4,542
Java	4,506
C#	4,288
TypeScript	3,232
PHP	2,913
C++	1,946

LanguageWorkedWith (Count)

Top 10 DatabaseWorkedWith

DatabaseWorkedWith
- Elasticsearch
- Firebase
- MariaDB
- Microsoft SQL Server
- MongoDB
- MySQL
- Oracle
- PostgreSQL
- Redis
- SQLite

Database	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

DatabaseWorkedWith

PlatformWorkedWith

PlatformWorkedW...   0   5,811

PlatformWorkedWith
- (no value)
- AWS
- Android
- Arduino
- Docker
- Google Cloud Platform
- Heroku
- IBM Cloud or Watson
- Kubernetes
- Linux
- MacOS
- Microsoft Azure

Top 10 WebFrameWorkedWith

WebFrameWorked...   939   4,629

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

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FUTURE TECHNOLOGY TREND

Top 10 LanguageDesireNextYear

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

LanguageDesireNextYear	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

LanguageDesireNextYear (Count)

Top 10 DatabaseDesireNextYear

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

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

DatabaseDesireNextYear

PlatformDesireNextYear
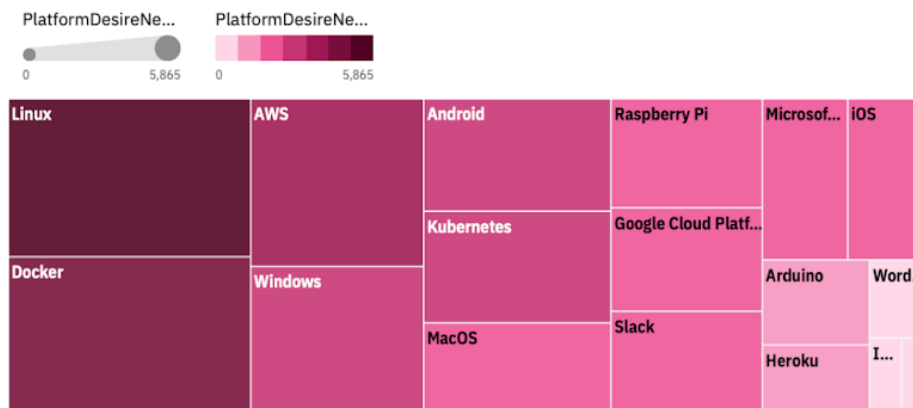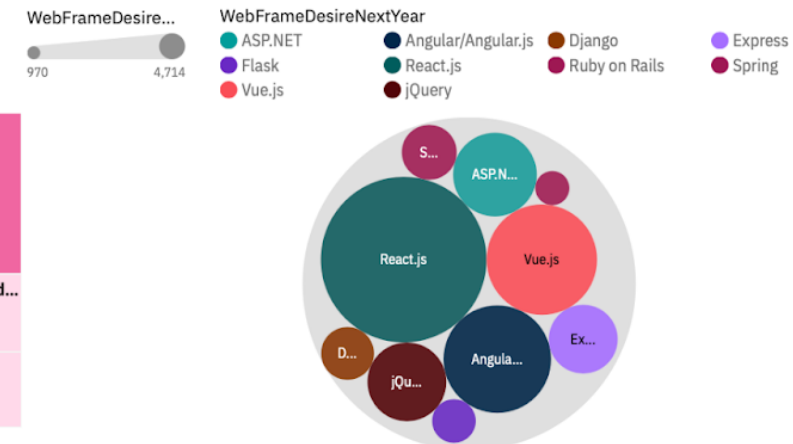
PlatformDesireNe...   0   5,865
PlatformDesireNe...   0   5,865

Linux | AWS | Android | Raspberry Pi | Microsof... | iOS
Docker | Windows | Kubernetes | Google Cloud Platf... | Arduino | Word...
| | MacOS | Slack | Heroku | I...

Top 10 WebFrameDesireNextYear

WebFrameDesire...   970   4,714

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

DEMOGRAPHIC INSIGHTS
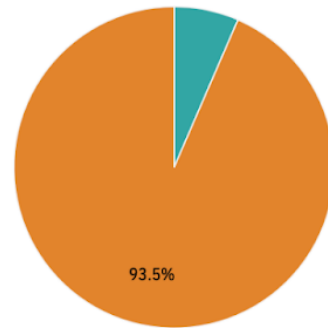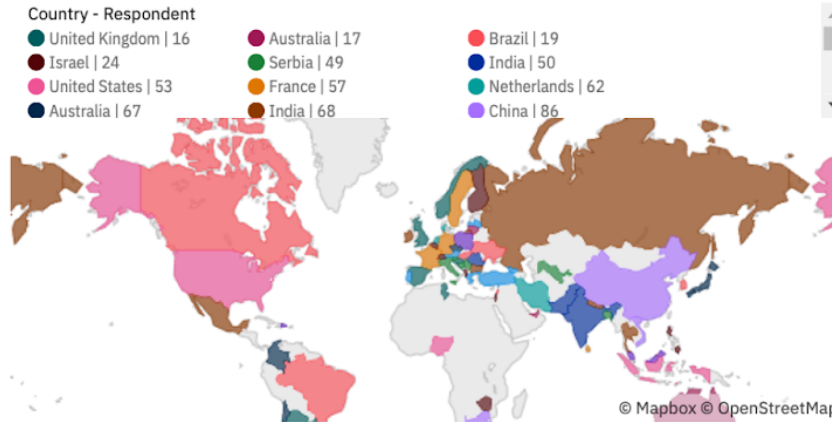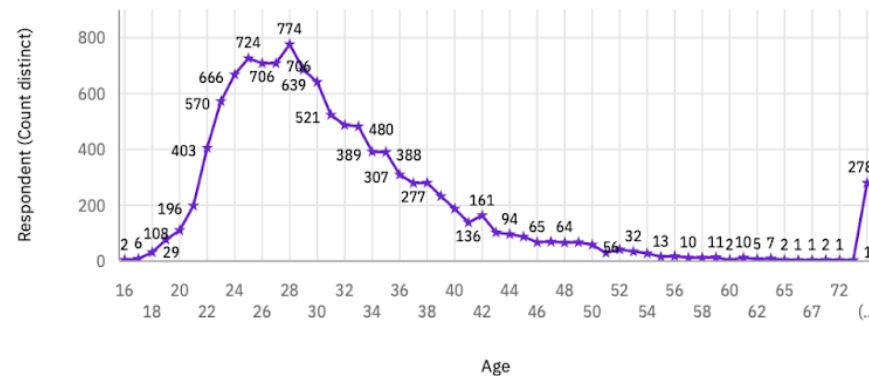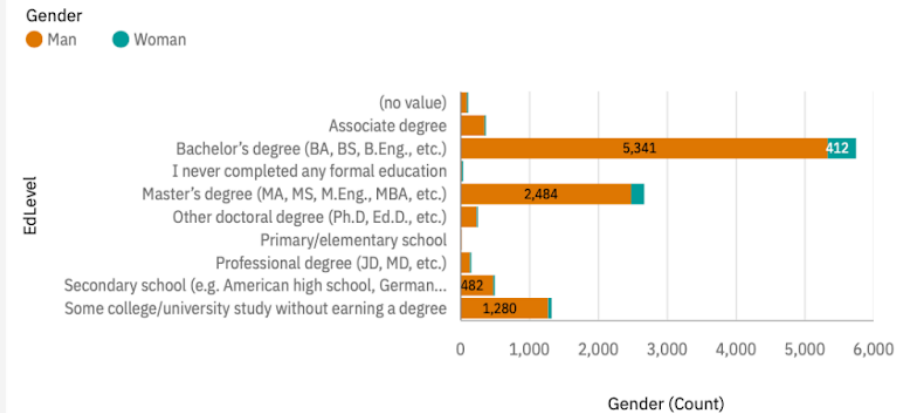
DISCUSSION

- **Language Popularity**: JavaScript is the most widely used language, showing its central role in web development. Python's rise highlights its growing importance in data science and AI, reflecting industry trends.

- **Developer Preferences**: There's a significant shift towards remote work, with 60% of developers working remotely at least part-time. This shift impacts how teams collaborate and manage projects.

- **Job Satisfaction**: Competitive salaries and career growth opportunities are key factors in job satisfaction, influencing job choices and retention.

- **Technology Adoption**: The adoption of modern technologies, including cloud platforms and newer programming languages like TypeScript, reflects evolving industry needs and preferences.

OVERALL FINDINGS & IMPLICATIONS

Findings

- **JavaScript** remains the top programming language.
- **Python** is rapidly growing in use, especially in data science and AI.
- **Remote Work** is increasingly common, with 60% of developers working remotely part-time or more.
- **Job Satisfaction** is strongly influenced by salary and career development opportunities.
- **TypeScript** is gaining popularity alongside traditional languages like JavaScript.

Implications

- **Enhance Skills in JavaScript and Python** to stay competitive in web development and data-driven fields.
- **Adapt to Remote Work** by developing strong communication and project management skills for distributed teams.
- **Focus on Salary and Career Growth** when evaluating job opportunities to ensure job satisfaction and long-term career success.
- **Stay Current with New Technologies** like TypeScript and modern cloud platforms to align with industry trends and demands.

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CONCLUSION

- The 2019 Stack Overflow survey reveals significant trends in programming languages and work preferences.

- Developers are increasingly leaning towards remote work and cloud technologies.

- Job satisfaction remains closely tied to salary and career development opportunities.

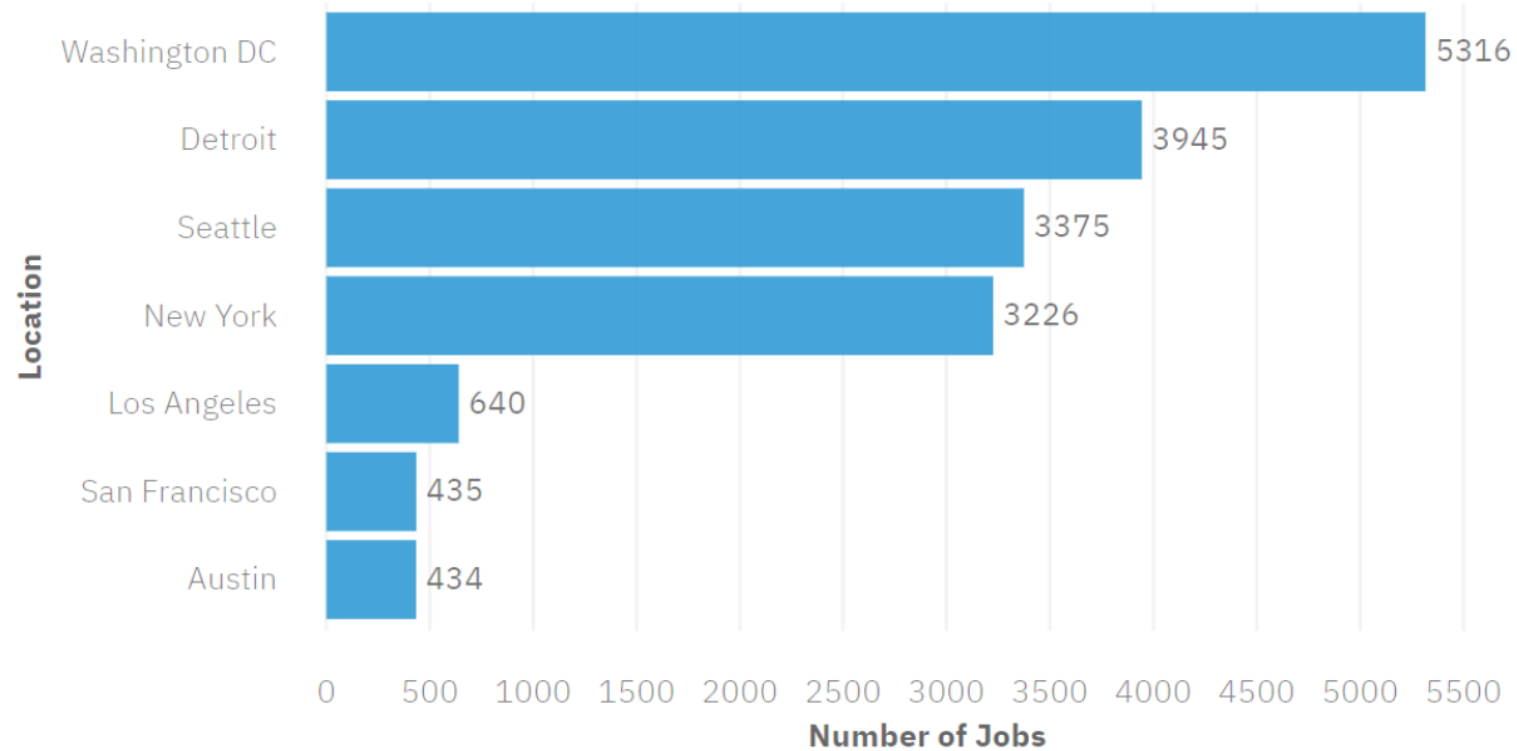- These insights can help shape strategic decisions for both tech professionals and organizations.

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APPENDIX

Developers' Primary Operating Systems

Windows	**47.5%**	
MacOS	**26.8%**	
Linux-based	**25.6%**	
BSD	**0.1%**	

JOB POSTINGS

POPULAR LANGUAGES

Average Annual Salary by Language:
- Swift: 130.801
- Python: 114.383
- C++: 113.865
- Javascript: 110.981
- Java: 101.013
- Go: 94.082
- R: 92.037
- C#: 88.726
- SQL: 84.793
- PHP: 84.727