ANALYSIS: EMERGING TECHNOLOGIES & TRENDS

CAPSTONE PROJECT

IBM DATA ANALYST PROFESSIONAL CERTIFICATE

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Tuesday, June 25 '24

OUTLINE

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

The analysis provides insights into current and projected technological trends, as well as demographic information of technology professionals

- The data collected from StackOverflow, Github, and IBM was subjected to
  - Data Wrangling
  - Exploratory Analysis
  - Visualization
  - Dashboard Creation
- Key findings indicate
  - JavaScript is the most popular programming language
  - MySQL has the highest database usage
  - While JavaScript continues to be the most desired programming language for next year, PostgreSQL is set to beat MySQL
  - Majority of survey respondents are Male
  - The highest number of respondents originate from USA
  - The age group 24-32 has the highest number of survey respondents

INTRODUCTION

With the rapidly evolving technology sector, it is crucial for stakeholders across the industry to understand the dynamic trends highlighted across various technologies of today and tomorrow

- This report aims to provide insightful answers to the following questions:
  - What are the top programming languages in demand?
  - What are the top database skills in demand?
  - What are the popular IDEs or Web Frames?
  - What are the skill requirements for the future?

METHODOLOGY

- Sources utilized for data collection:
  - Github
  - IBM
  - StackOverflow
- Methods:
  - Descriptive statistics
  - Data cleaning
  - Data aggregation and grouping
  - Data visualization

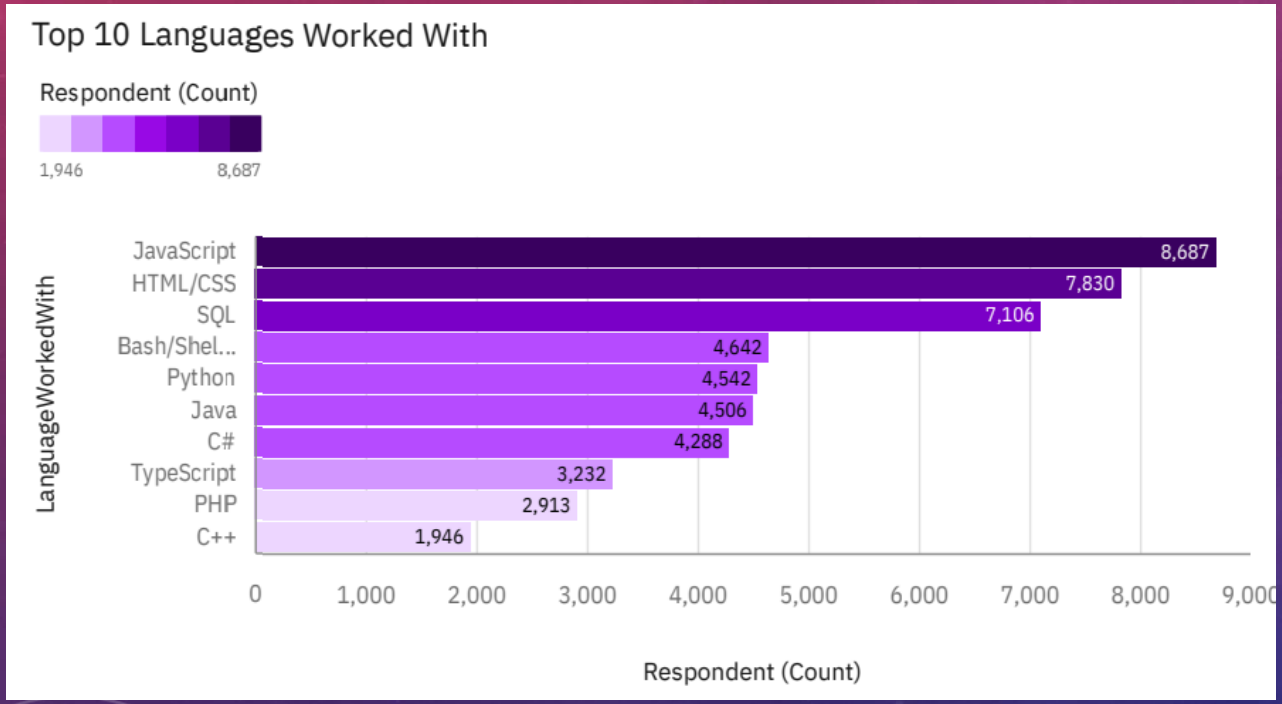
RESULTS

- The 'requests' module of Python was used to access the job APIs along with BeautifulSoup for web scraping
- Pandas dataframes were used to explore the data set, identify and remove duplicates/missing values, and normalize the data
- The distribution of the data was identified, outliers removed, and correlation established using Pandas along with Matplotlib and Seaborn for various visualizations
- Further visualization was carried out for the distribution of data, relationship between features, composition, and comparison
- Lastly, relevant dashboards were created using IBM Cognos

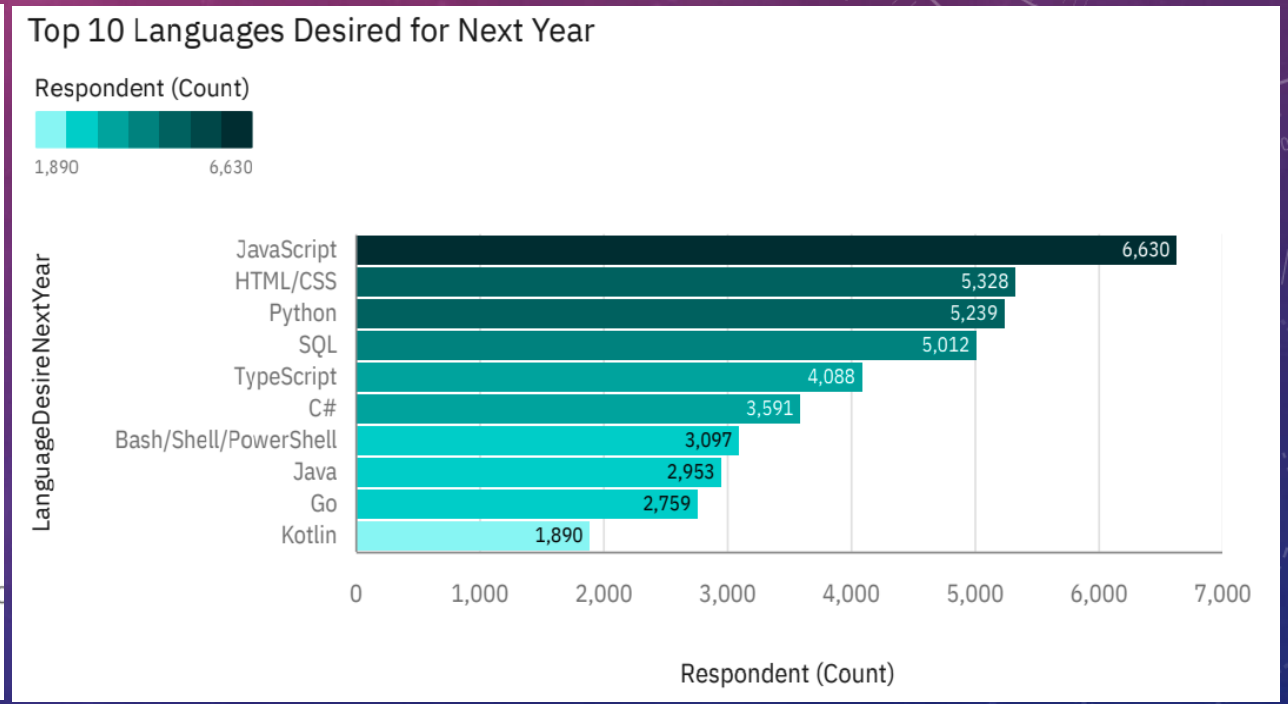
Let's review the findings in the following slides

PROGRAMMING LANGUAGE TRENDS

Current Year



Next Year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

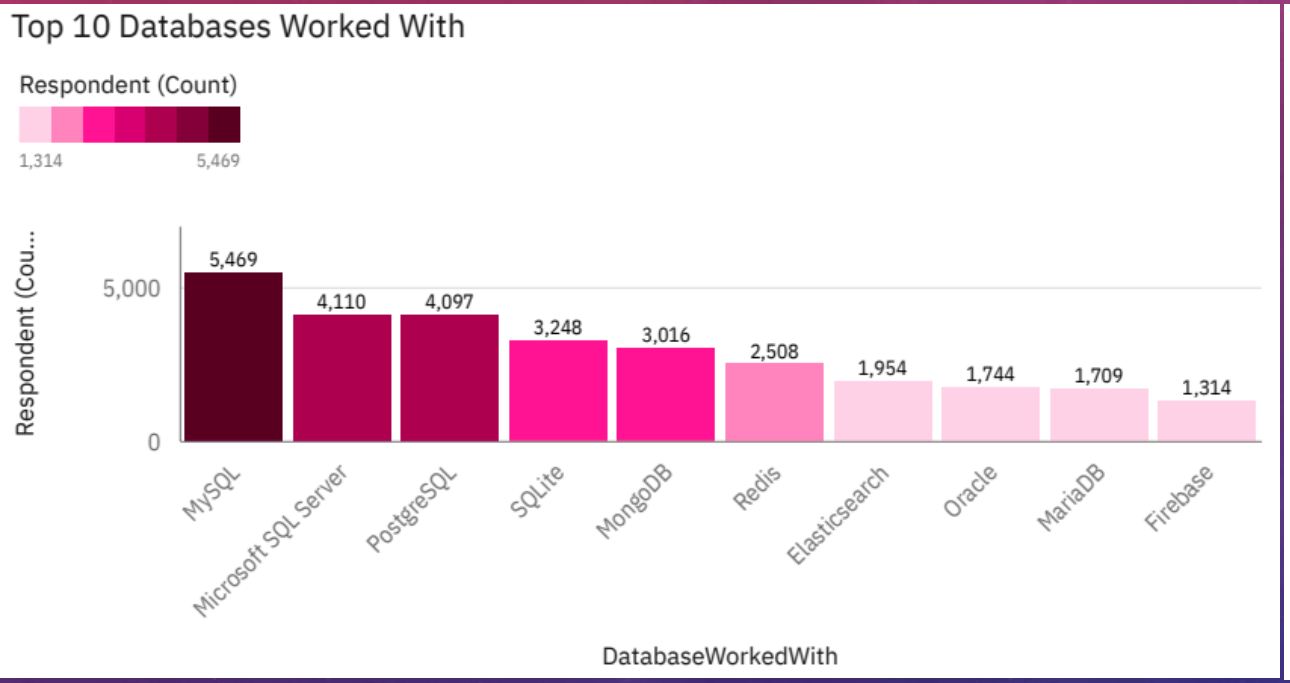
- JavaScript, HTML/CSS, and SQL top three current programming languages
- Python will catch up to SQL to become the third most popular programming language

Implications

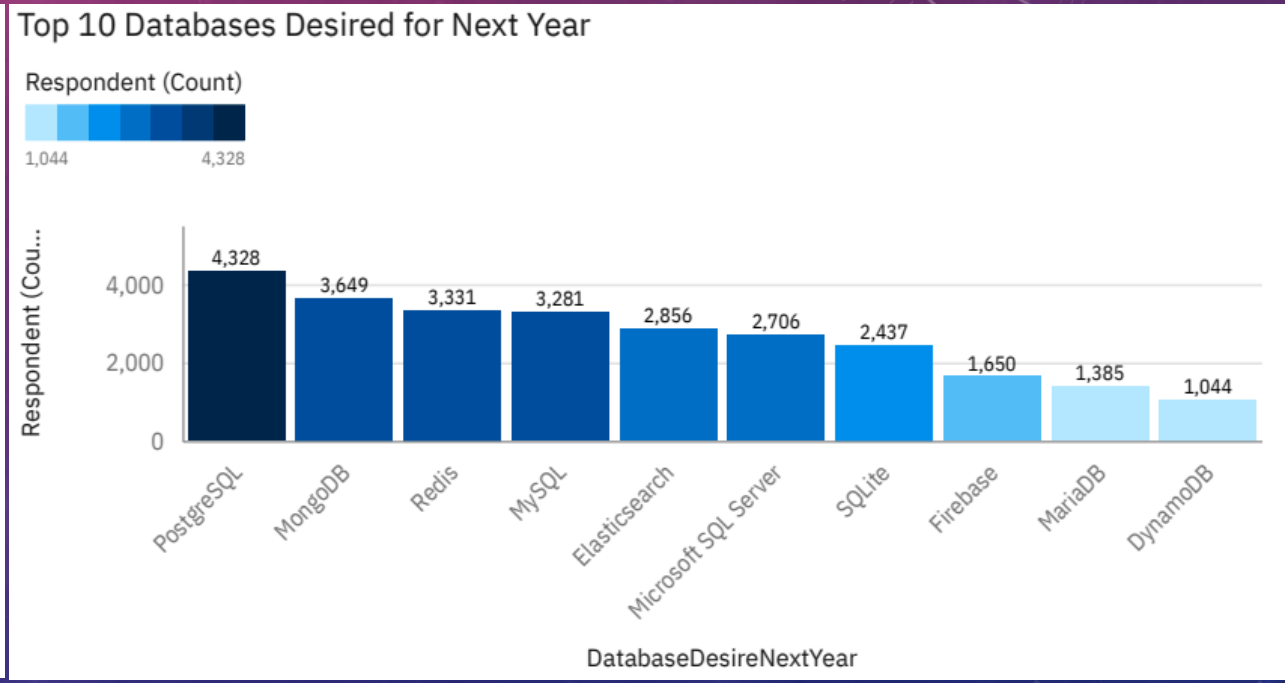
- Both JavaScript and HTML/CSS are premier languages for web development, indicating that web development as a skill is in high demand
- ML and AI are rapidly growing fields, hence pushing Python up the ladder

DATABASE TRENDS

Current Year



Next Year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- MySQL, MS SQL Server, PostgreSQL top three databases currently
- PostgreSQL, MongoDB, Redis to overtake the current top DBs in the next year

Implications

- Open source DBs still preferred by organizations
- As important as SQL DBs are, NoSQL to have a significant impact for non-relational data needs

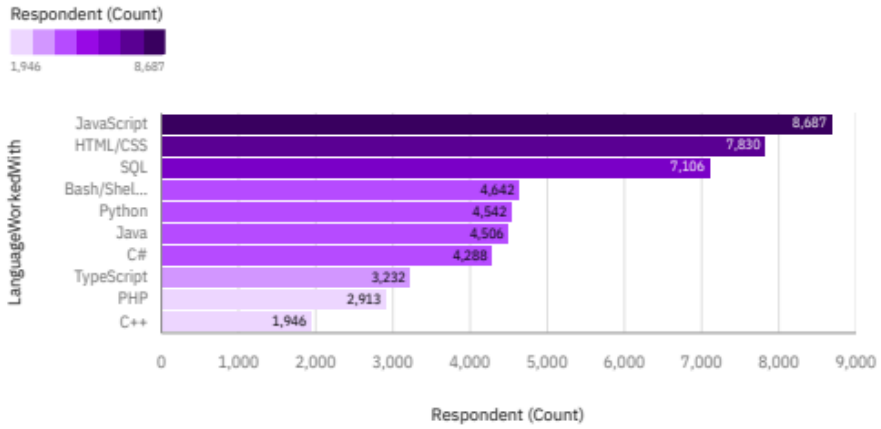
DASHBOARD

The Cognos dashboard report can be found here

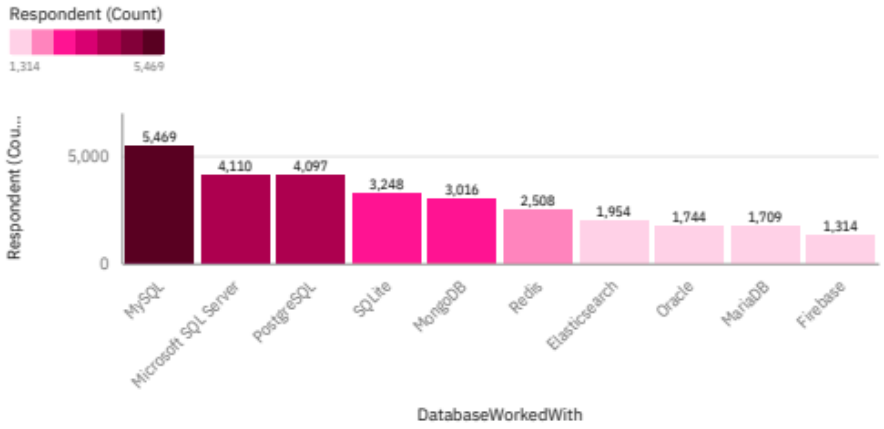
DASHBOARD TAB 1

Current Technology Usage

Top 10 Languages Worked With

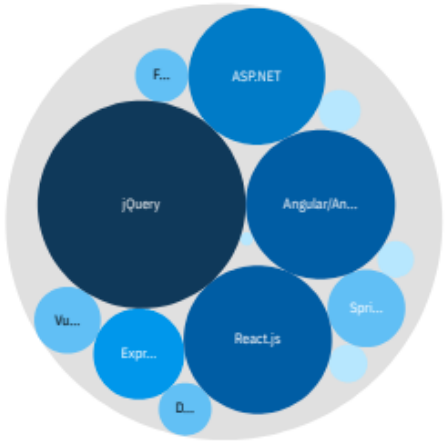


Top 10 Databases Worked With



Top Platforms Worked With

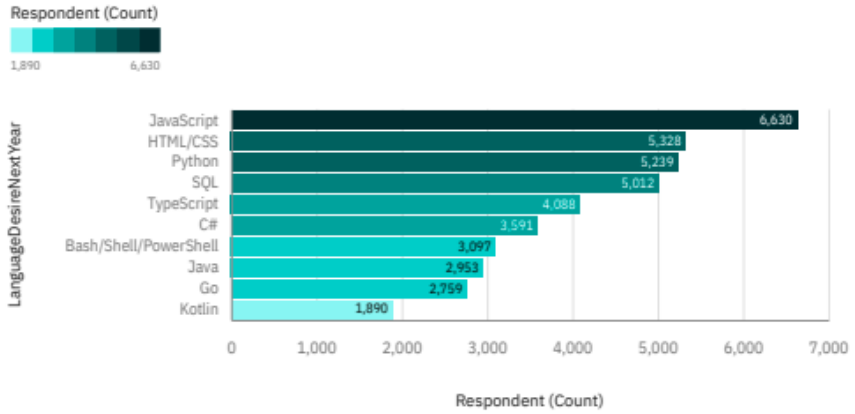
Top 10 Web Frames Worked With



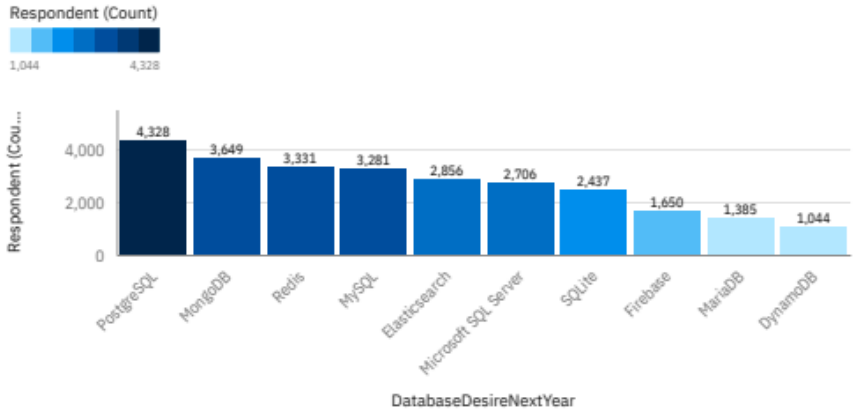
DASHBOARD TAB 2

Future Technology Trends

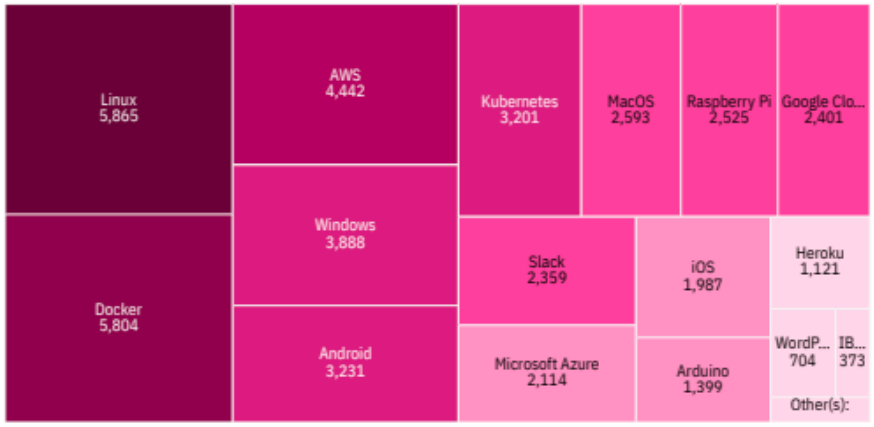
Top 10 Languages Desired for Next Year



Top 10 Databases Desired for Next Year



Top Platforms Desired for Next Year

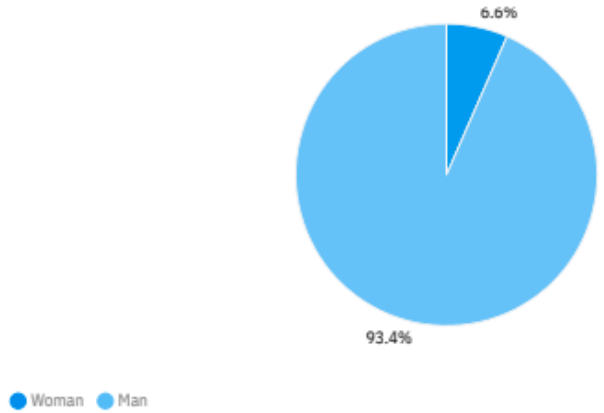


Top 10 Web Frames Desired for Next Year

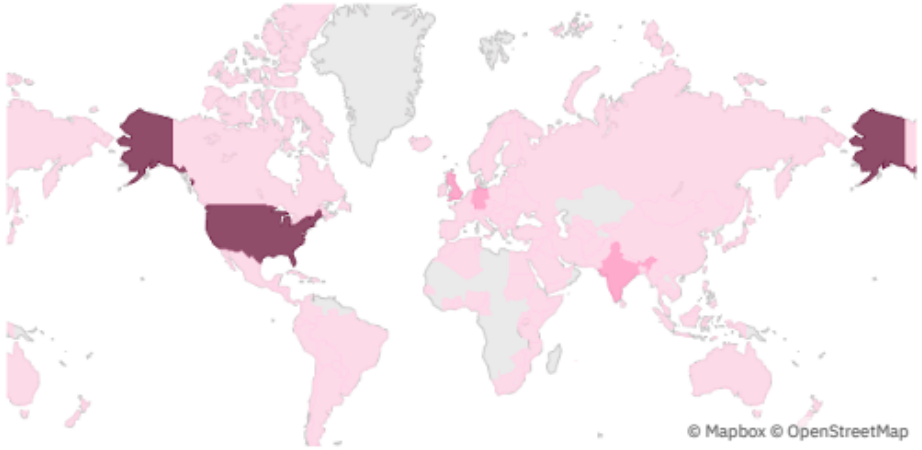
DASHBOARD TAB 3

Demographics

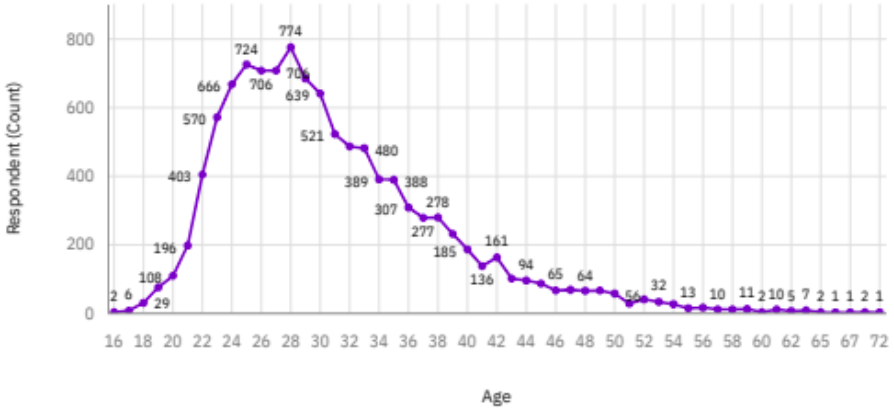
Respondents by Gender



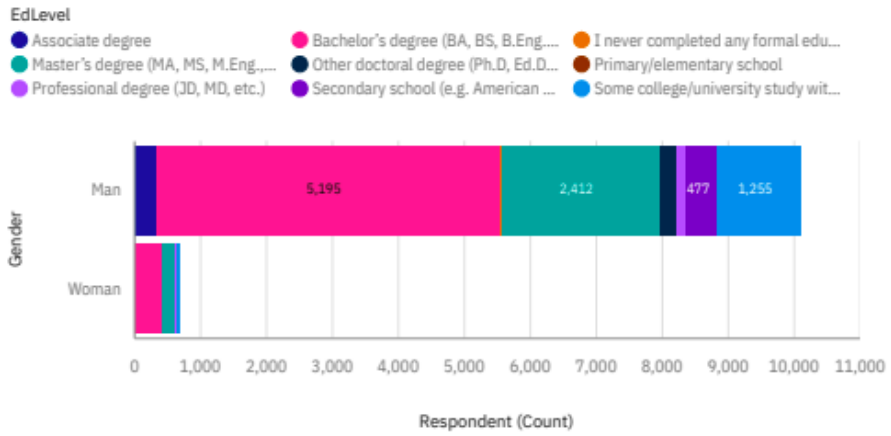
Respondents by Country



Respondents by Age



Respondents by Gender Classified by Formal Education



DISCUSSION

- Current and projected technological trends
- Wide gender gap in the sector
- The (in)significance of formal education in tech roles
- Increased technology access and development in India in contrast to neighboring countries
- Majority of developers in the age range of 22-34 years old

OVERALL FINDINGS & IMPLICATIONS

Findings

- Web Development languages on top of the programming languages ladder for current and future years
- The technology sector majorly comprises of young males under 40
- It is a rapidly evolving sector with new technologies and platforms on the rise amongst tech professionals and organizations alike

Implications

- Companies need to be adaptable to rapid changes
- Data professionals need to become proficient in NoSQL in addition to relational databases
- Young professionals with less conventional formal education on the rise

CONCLUSION

- It is crucial to stay up-to-date with new technological trends for jobseekers and employers alike
- Creative and innovative ways to encourage women's participation in the STEM fields need to be brainstormed in order to bridge the massive gender gap in the sector
- There is a need to increase accessibility of new technologies to developing countries which are lagging behind in order to get a richer talent pool

APPENDIX

	Language	Avg 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

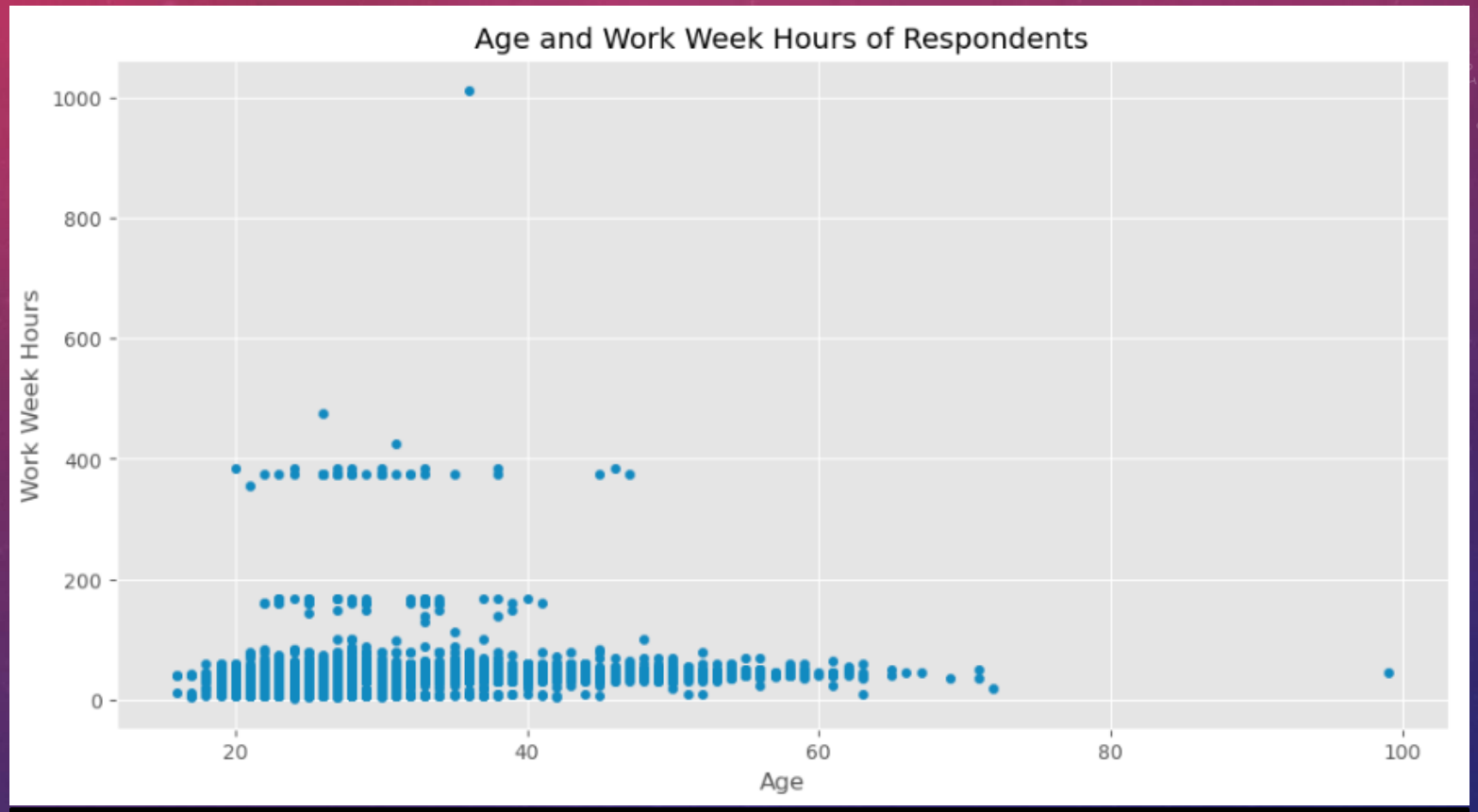
Swift, Python, C++ are the top three highest paid language skills

Despite remote work on the rise, the majority of tech professionals are working from office

```
df['WorkLoc'].value_counts()
```

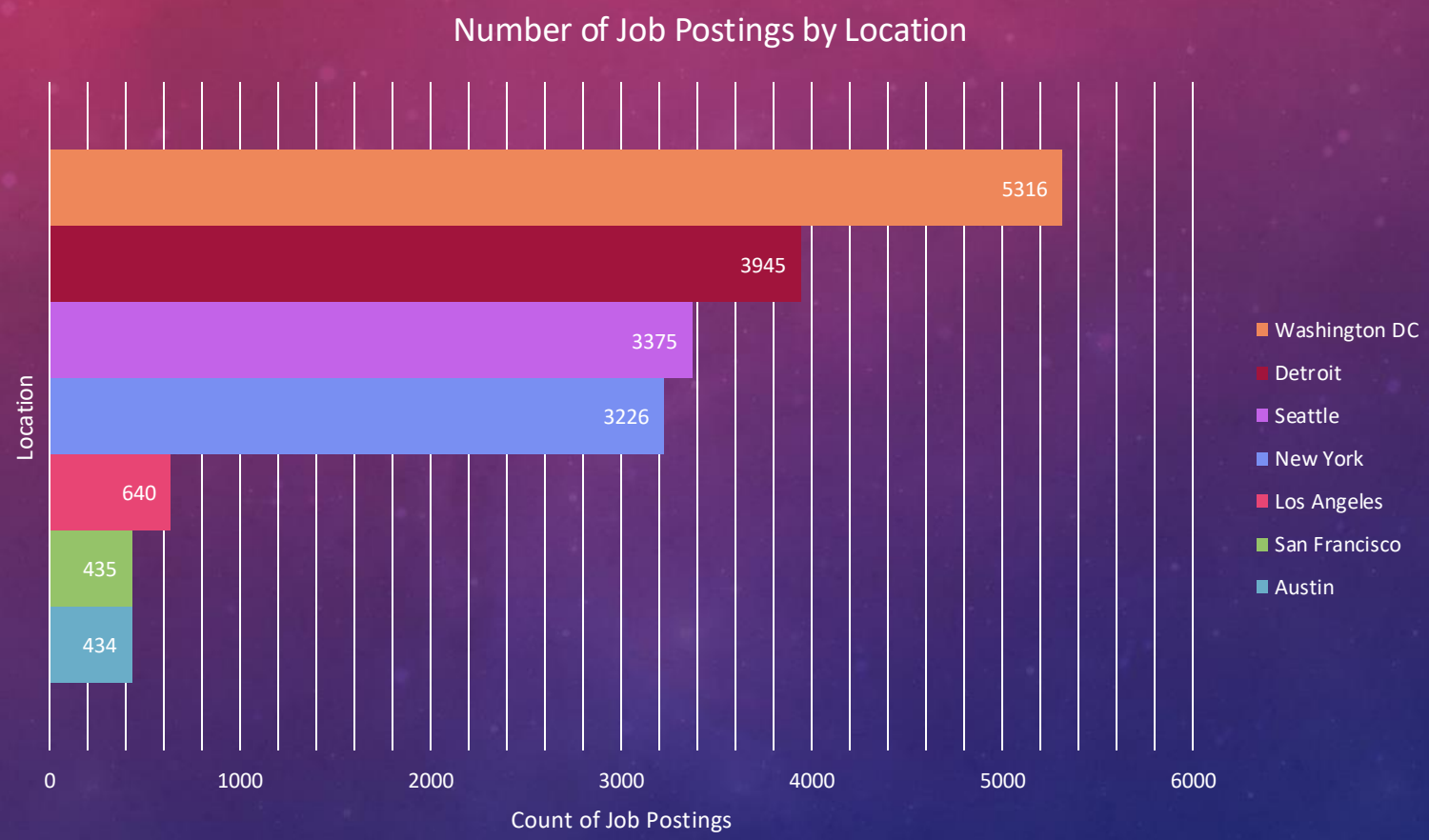
```
Office                                          6806
Home                                            3589
Other place, such as a coworking space or cafe   971
Name: WorkLoc, dtype: int64
```

APPENDIX



The correlation between respondents' age and work week hours is difficult to clearly identify

JOB POSTINGS



POPULAR LANGUAGES