

IBM Data Analyst Capstone Project



Trends on Emerging IT Skills and Technologies

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Angela Lee

Data Analyst, ABC Consulting

(123) 456-7890

OUTLINE



Executive Summary

Introduction

Methodology

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- Visualization – Charts
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- Findings & Implications

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EXECUTIVE SUMMARY



As a global IT and business consulting services firm that is known for its expertise in IT solutions and its team of highly experienced IT consultants, ABC Consulting is keen to identify insights and trends on the emerging IT skills and technologies in order to keep up with ever-changing technologies and remain competitive in the market

This presentation is going to discuss:

- The most in-demand programming languages this and next year
- The most popular databases this and next year
- The most popular platforms this and next year
- The most popular web frames this and next year

EXECUTIVE SUMMARY



ABC Consulting may utilize the insights gained from this future skill requirements analysis to plan its headcount, job training programs, software and platform upgrades, as well as budgeting for the upcoming year accordingly

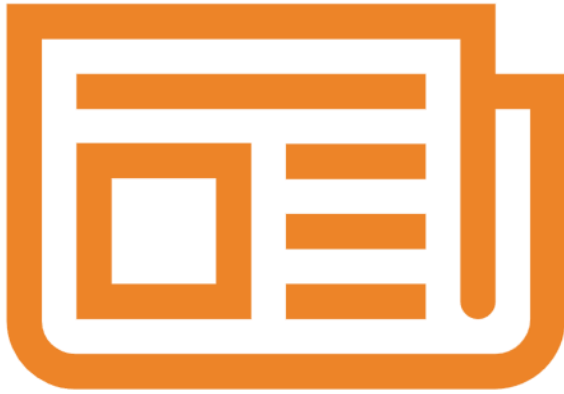


INTRODUCTION



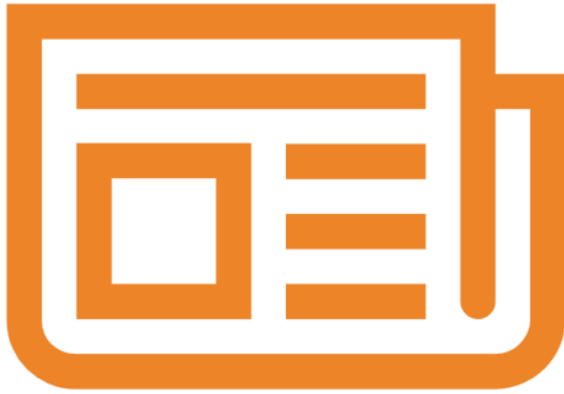
- The future skill requirements analysis aims to answer the following questions:
 - What are the top programming languages in demand?
 - What are the top database skills in demand?
 - What are the popular IDEs?
- To identify insights and trends on emerging IT skills and technologies, we collect data from various sources including:
 - Job postings
 - Training portals
 - Surveys

METHODOLOGY



- ❑ First, by scraping internet web sites and accessing APIs, data is collected into various formats like .csv files, excel sheets, and databases from job postings, training portals, and surveys
- ❑ Second, data is cleaned and made ready for analysis using data wrangling techniques including:
 - Removing duplicate rows
 - Identifying missing values
 - Filling up blank columns with the mean/median value
 - Normalizing data to the same base unit for easy comparison

METHODOLOGY



- ❑ Third, exploratory data analysis is performed to understand the distribution of data and to identify and remove any outliers. Statistical techniques are also applied to identify correlations between features in the dataset
- ❑ Fourth, by plotting graphs of different features in the data set, we visualize the distribution of data, the relationship between two features in the dataset, as well as the composition and the comparison of data

METHODOLOGY



- ❑ Fifth, a dashboard is created using IBM Cognos Analytics to visualize all information and trends (grouped under three tabs: *Current Technology Usage*, *Future Technology Trend*, and *Demographics*)
- ❑ Finally, the key findings are shared in this presentation

RESULTS



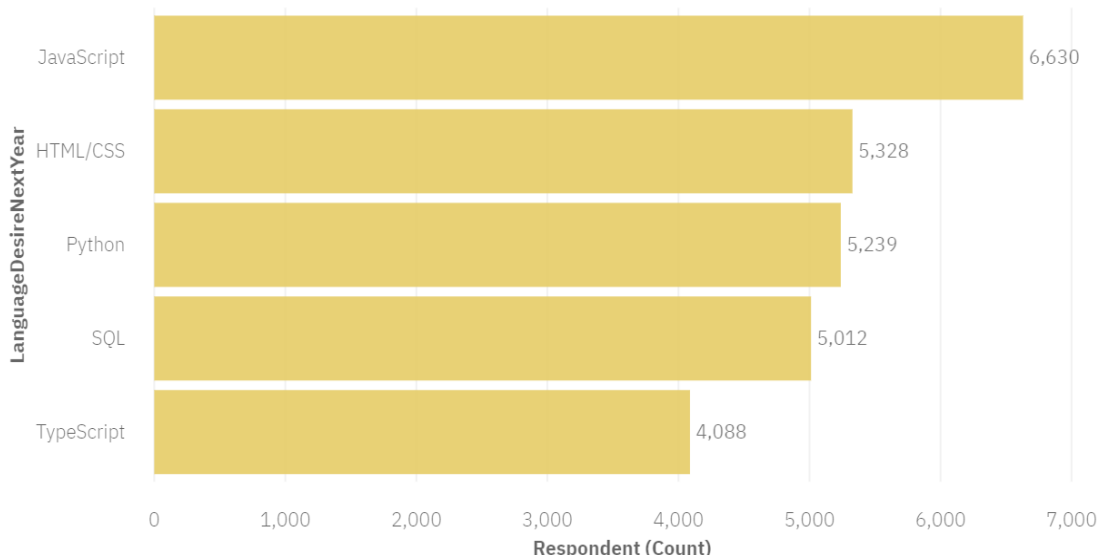
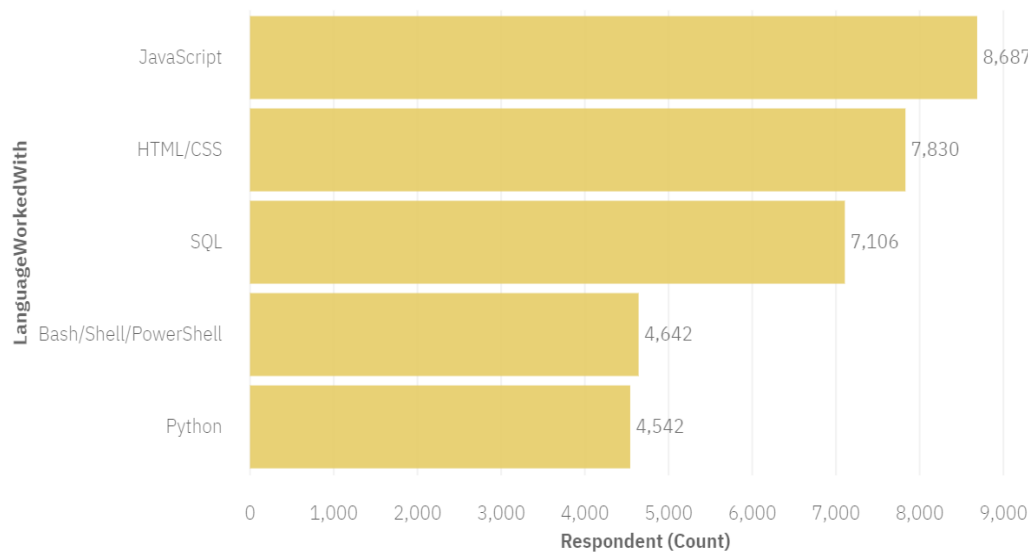
PROGRAMMING LANGUAGE TRENDS

Current Year

Next Year

Top 5 programming languages for the current year

Top 5 programming languages for the next year



PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript and HTML/CSS are the 2 most popular programming languages for the current year and the next year
- Python is having an increasing popularity for the coming year as it is going up from the 5th place this year to the 3rd place next year

Implications

- JavaScript and HTML/CSS will remain in high demand next year, and the company should make sure there is enough manpower for this skill
- As Python is facing an uptrend demand, the company may wish to hire or train more staff to meet this demand

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- SQL is having a slightly decreasing popularity for the coming year as it goes from 3rd place this year to 4th place next year, but it is still one of the most popular languages
- Bash/Shell/PowerShell is deemed as less in demand in the coming year as it is falling out of top five in the next year
- TypeScript is deemed as more important as it is making its way to the top 5 for the next year

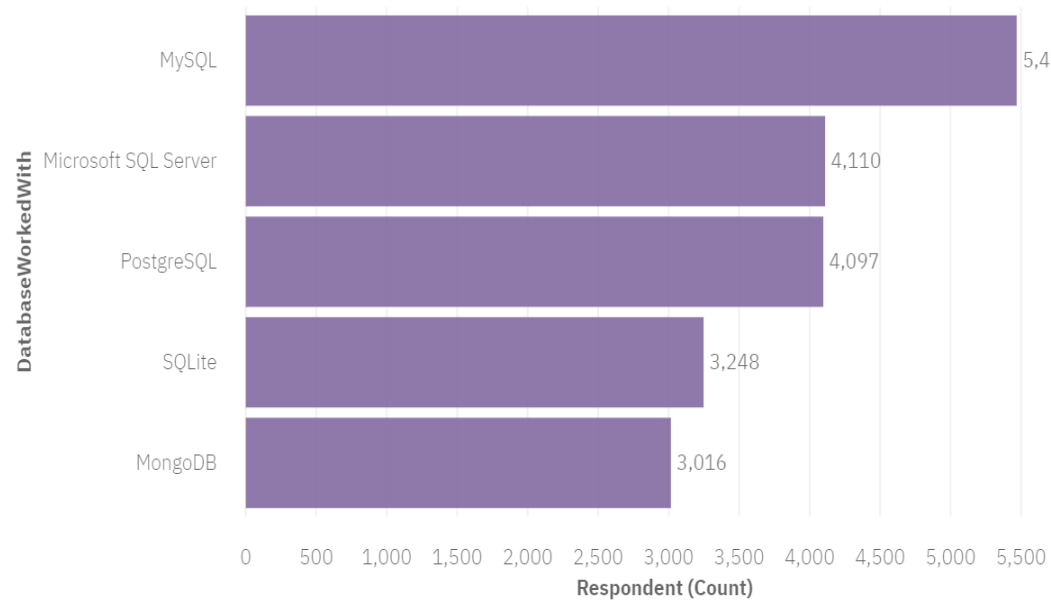
Implications

- As SQL's popularity remains similar next year, the company may wish to keep the same amount of staff that are skilled in SQL
- As Bash/Shell/PowerShell's popularity is decreasing, the company may wish to hire fewer staff that are skilled in Bash/Shell/PowerShell
- As TypeScript's popularity is increasing, the company may wish to hire or train more staff to fill the demand

DATABASE TRENDS

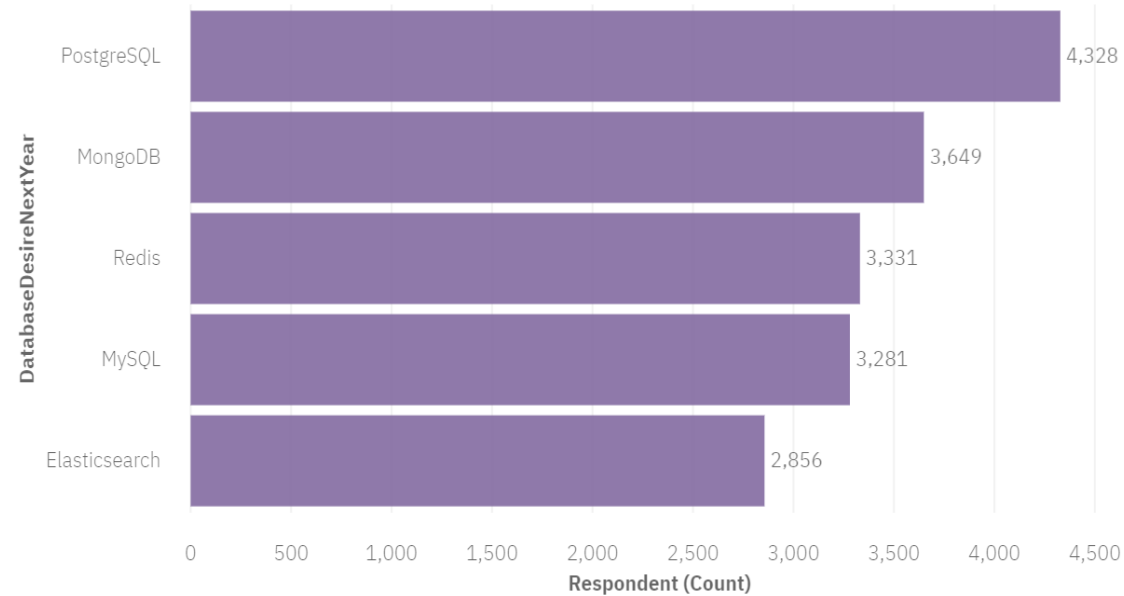
Current Year

Top 5 databases for the current year



Next Year

Top 5 databases for the next year



DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL and MongoDB are ranked 3rd and 5th respectively this year, but they are making their way to the first and second places for the next year
- MySQL is having a decreasing popularity for the coming year as it goes from 1st place this year to 4th place next year

Implications

- As PostgreSQL and MongoDB are quickly emerging and will become the 2 most popular databases for the next year, the company should make sure there is enough manpower for these skills
- As MySQL is facing a decreasing popularity, the company may wish to hire fewer staff that are skilled in MySQL

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Microsoft SQL Server and SQLite are ranked 2nd and 4th respectively in the current year but is falling out of top five for the next year
- Redis and Elasticsearch are making their way to top 5 and are ranked 3rd and 5th respectively for the next year

Implications

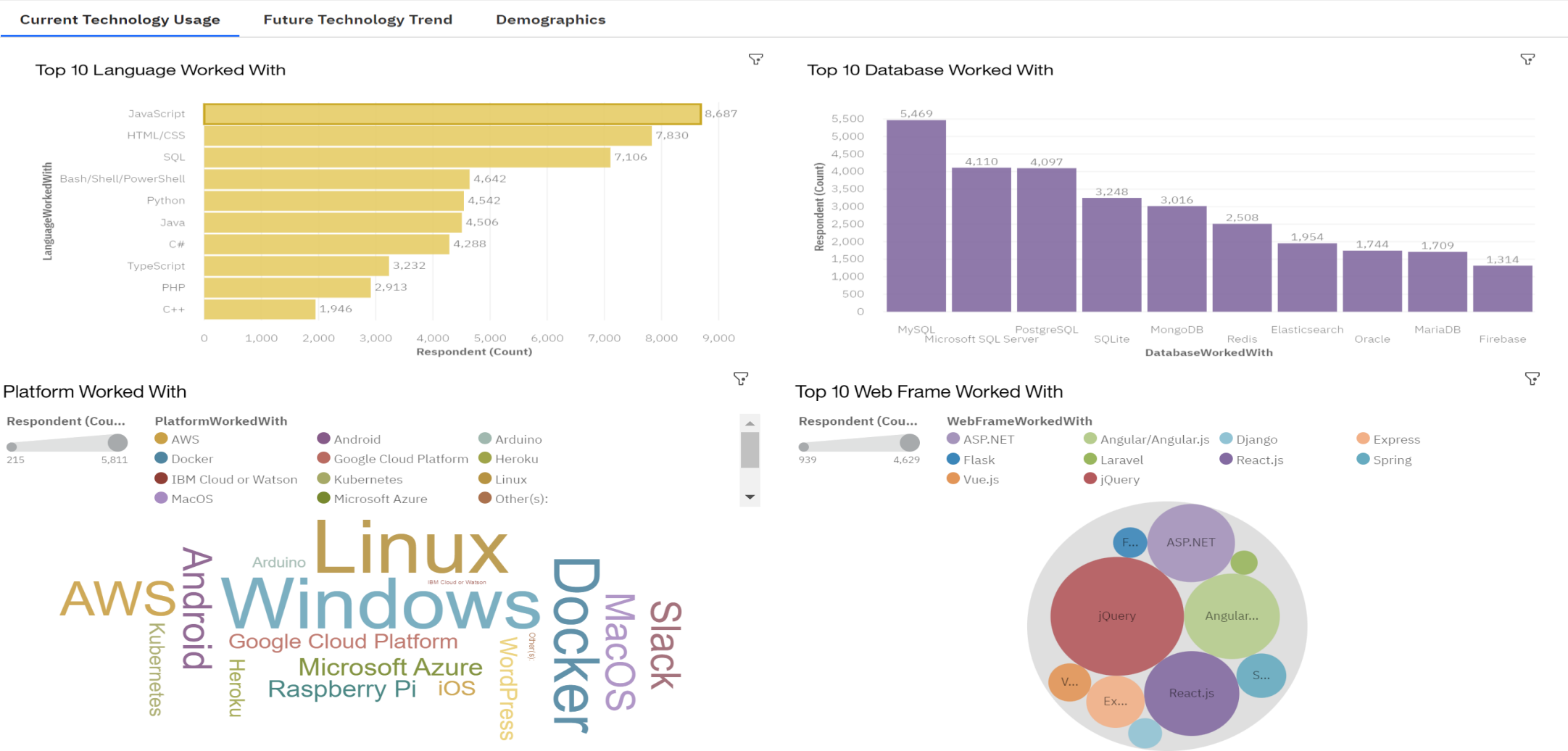
- As Microsoft SQL Server and SQLite are facing a decreasing popularity, the company may wish to hire fewer staff that are knowledgeable in either of these 2 databases
- As Redis and Elasticsearch are quickly emerging for the next year, the company may wish to hire or train more staff to meet the demand for these skills

DASHBOARD



[Click here to view the
Dashboard](#)

DASHBOARD TAB 1 - Current Technology Usage



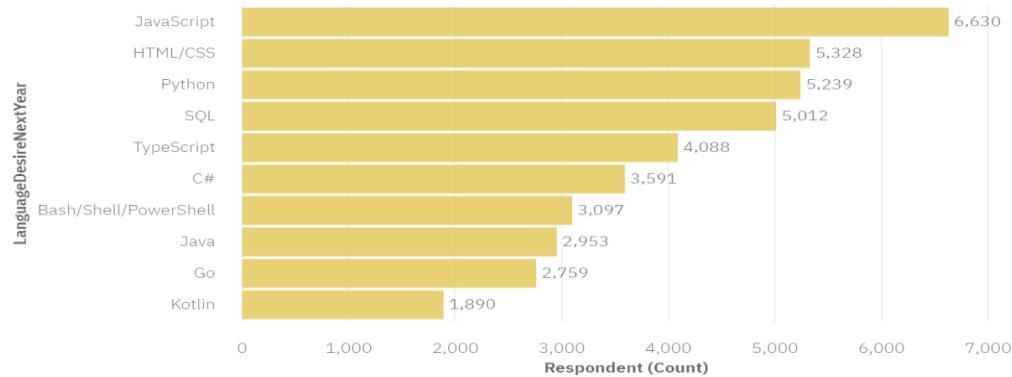
DASHBOARD TAB 2 – Future Technology Usage

Current Technology Usage

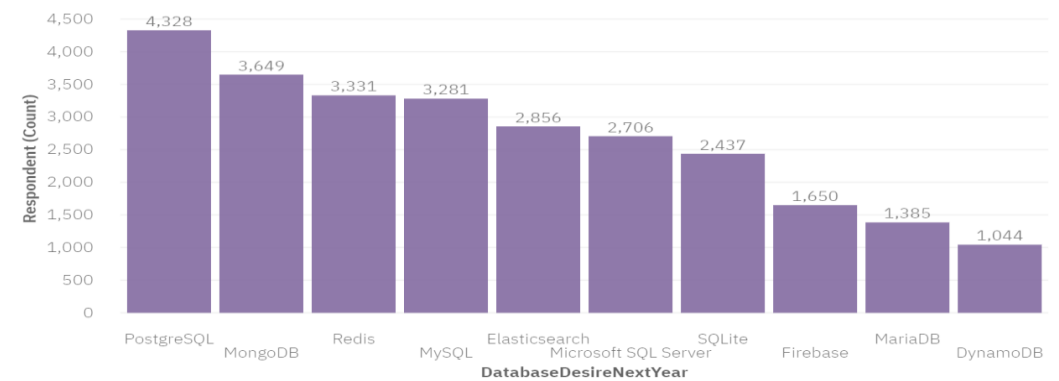
Future Technology Trend

Demographics

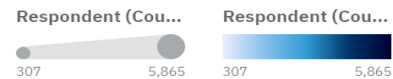
Top 10 Language Desire Next Year



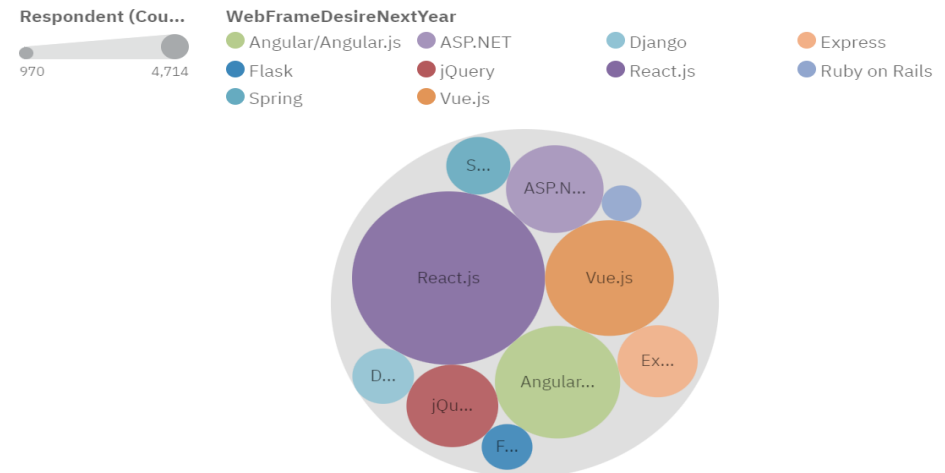
Top 10 Database Desire Next Year



Platform Desire Next Year



Top 10 Web Frame Desire Next Year



DASHBOARD TAB 3 - Demographics

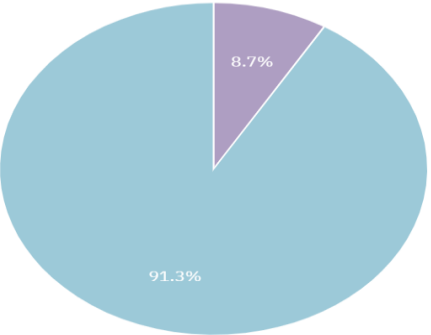
Current Technology Usage

Future Technology Trend

Demographics

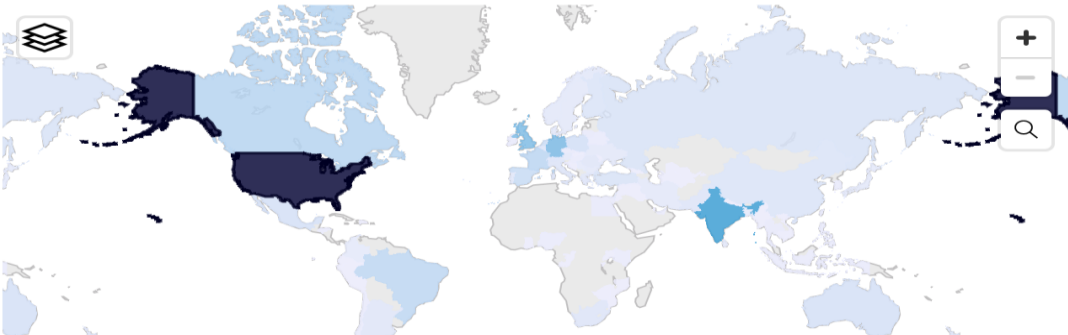
Respondent Classified by Gender

Gender
Woman Man

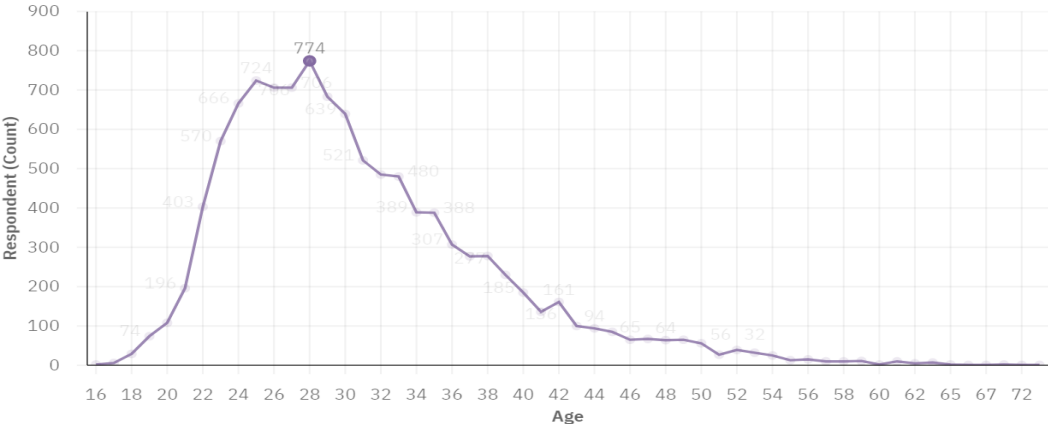


Respondent Count for Countries

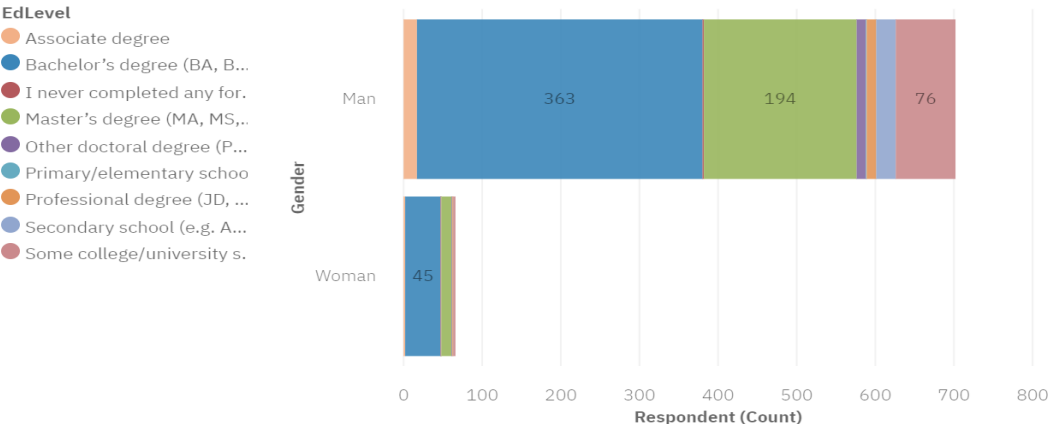
Respondent (Cou...
1 187



Respondent Count by Age



Respondent Count by Gender, classified by Formal Education Level



DISCUSSION



OVERALL FINDINGS & IMPLICATIONS

Findings

Programming Languages

- Python and TypeScript are having an increasing demand

Databases

- Postgre SQL, MongoDB, Redis, and Elasticsearch are facing an upward trend in popularity

Implications

Programming Languages

- Hire or train more staff to meet the increasing demand for Python and TypeScript and keep sufficient labor for JavaScript, HTML/CSS, and SQL; hire fewer staff for Bash/Shell/PowerShell

Databases

- Hire or train more staff to meet the increasing demand for Postgre SQL, MongoDB, Redis, and Elasticsearch; hire fewer staff for MySQL, Microsoft SQL Server, and SQLite

OVERALL FINDINGS & IMPLICATIONS

Findings

Platforms

- While Android is making its way to the top 5 platforms next year, Linux, Docker, and AWS are amount the 5 most popular platforms this year and will remain popular for next year
- Windows and Slack are having a significant drop in popularity for next year

Web Frames

- React.js and Vue.js are increasing in popularity and are making their way to the top 2 web frames for the next year, while Angular/Angular.js and ASP.NET are quite popular this year and is like to remain about the same level of popularity next year

Implications

Platforms

- Hire or train more staff to meet the increasing demand for Android and keep sufficient labor for Linux, Docker, and AWS; hire fewer staff for Windows and Slack

Web Frames

- Hire or train more staff to meet the increasing demand for React.js and Vue.js and also keep sufficient labor for Angular/Angular.js and ASP.NET

CONCLUSION



- ❖ As the Big Data world keeps expanding, the demand for tools and technologies that can rapidly process huge amounts of data increases significantly
- ❖ Since NoSQL is a better choice for businesses whose data workloads are more geared towards the rapid processing and analyzing of vast amounts of varied and unstructured data, aka Big Data, the demand for NoSQL databases increases drastically as well
- ❖ As a result, more NoSQL databases (ex. MongoDB, Redis, and Elasticsearch) are making it to the top 5 for the coming year, and fewer SQL databases (ex. MySQL, Microsoft SQL Server, and SQLite) will remain in the top 5 next year. Non-relational (NoSQL) databases is having an increasing significance while on the other hand relational (SQL) databases seem to be losing its popularity in the coming year

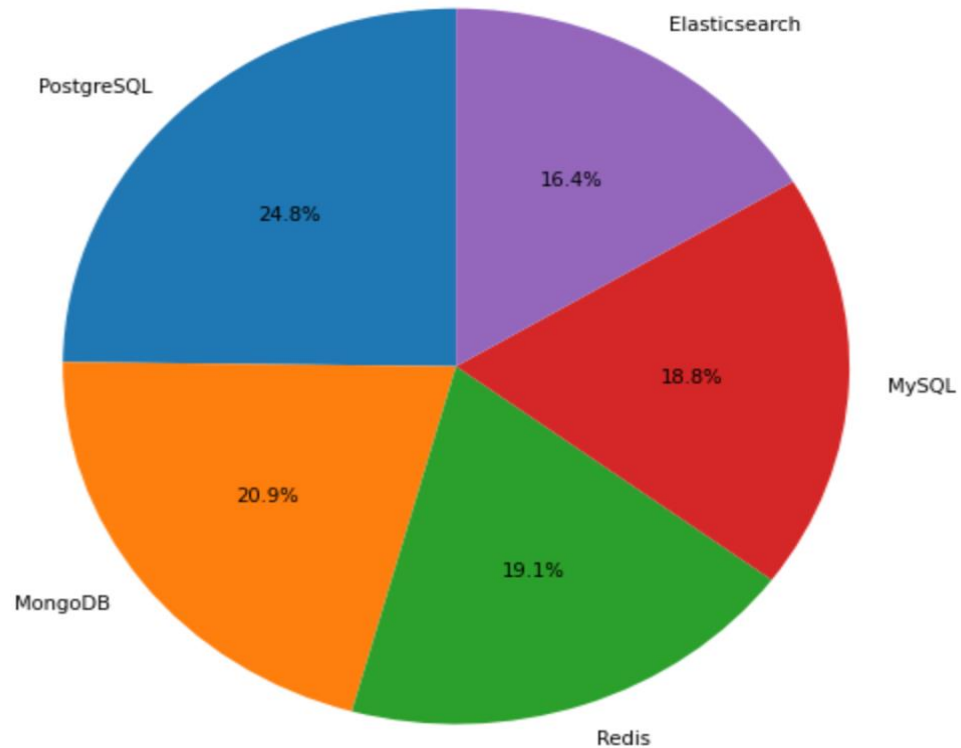
CONCLUSION



- ❖ JavaScript-based web frames such as React.js and Vue.js are having a rapid increase in demand and will dominate the market next year as they are said to be the best frameworks for Big Data development
- ❖ As the Big Data trend keeps emerging, the company should allocate more human capital and technical resources on the Big Data aspect to keep up with the trend

APPENDIX (1)

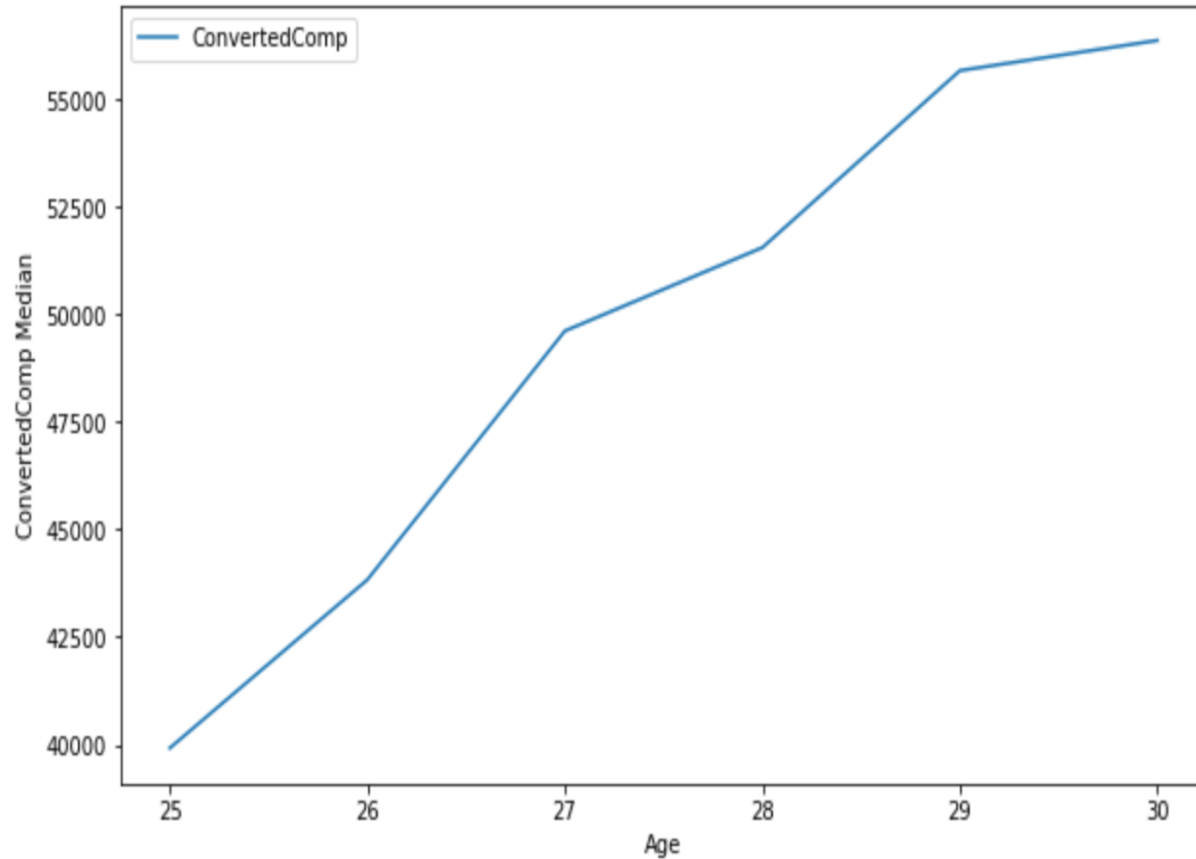
The top 5 databases that respondents wish to learn next year



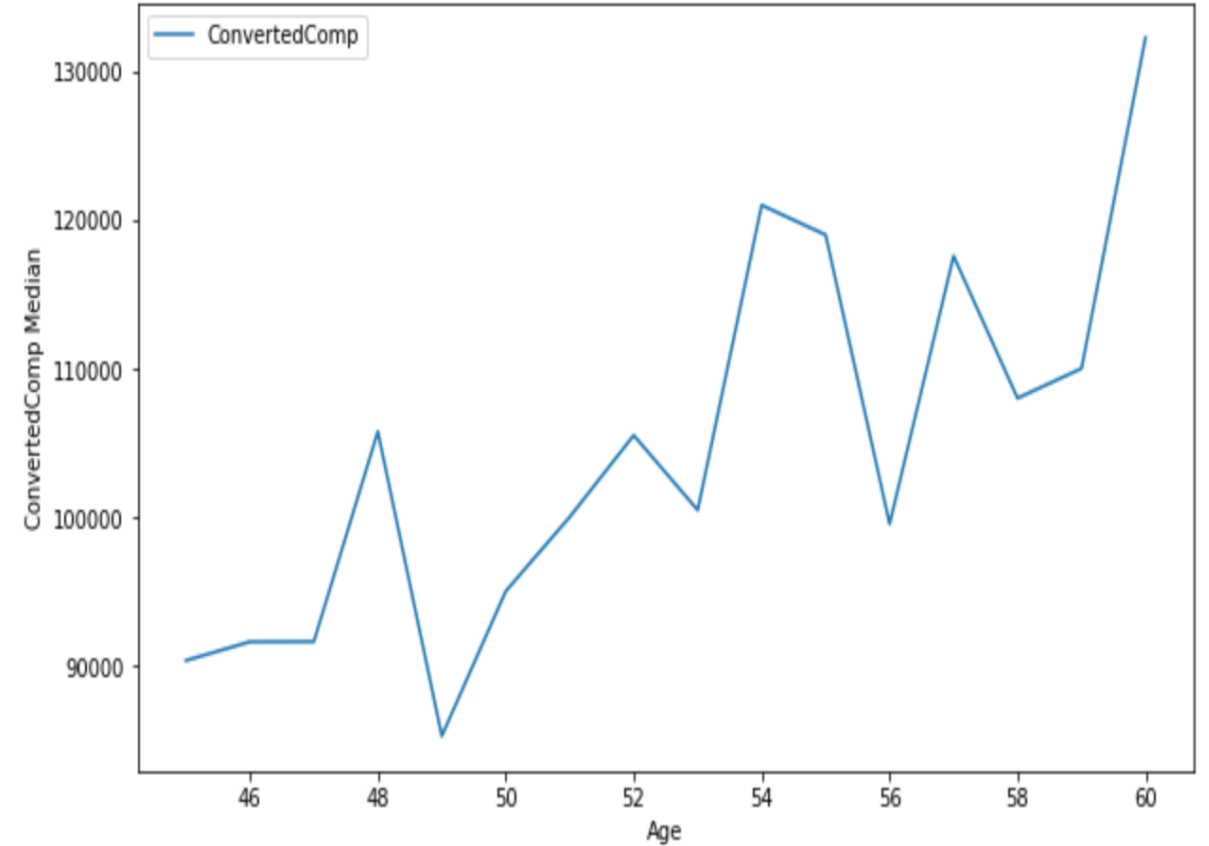
	WebFrameDesireNextYear	number
0	React.js	4714
1	Vue.js	3143
2	Angular/Angular.js	3059
3	ASP.NET	2382
4	jQuery	2241
5	Express	1957
6	Spring	1564
7	Django	1504
8	Flask	1240
9	Ruby on Rails	970

APPENDIX (2)

Median Compensation by Age for the Age Group 25-30



Median Compensation by Age for the Age Group 45-60



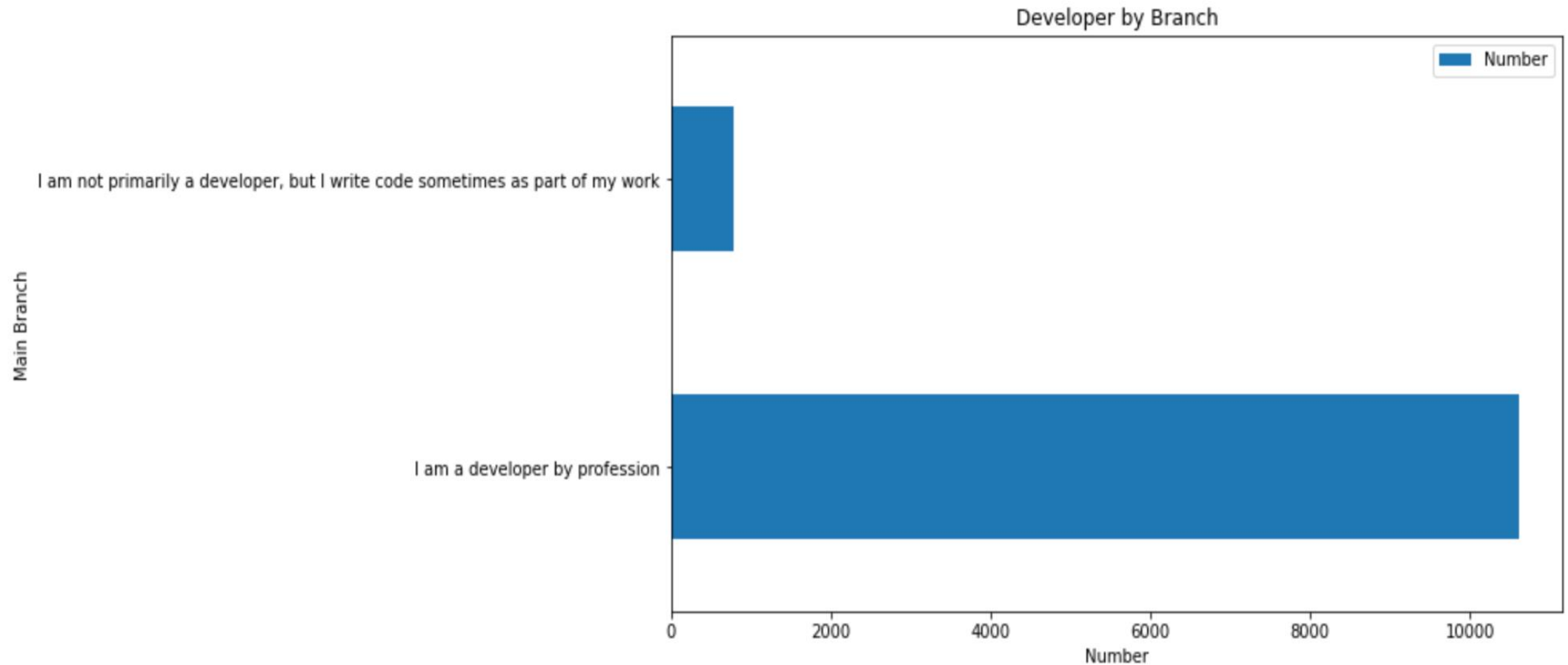
APPENDIX (3)

Majority of the survey responders are

	DevType	Number
0	Developer, full-stack	6928
1	Developer, back-end	6290
2	Developer, front-end	3920
3	Developer, desktop or enterprise applications	2575
4	Developer, mobile	1959

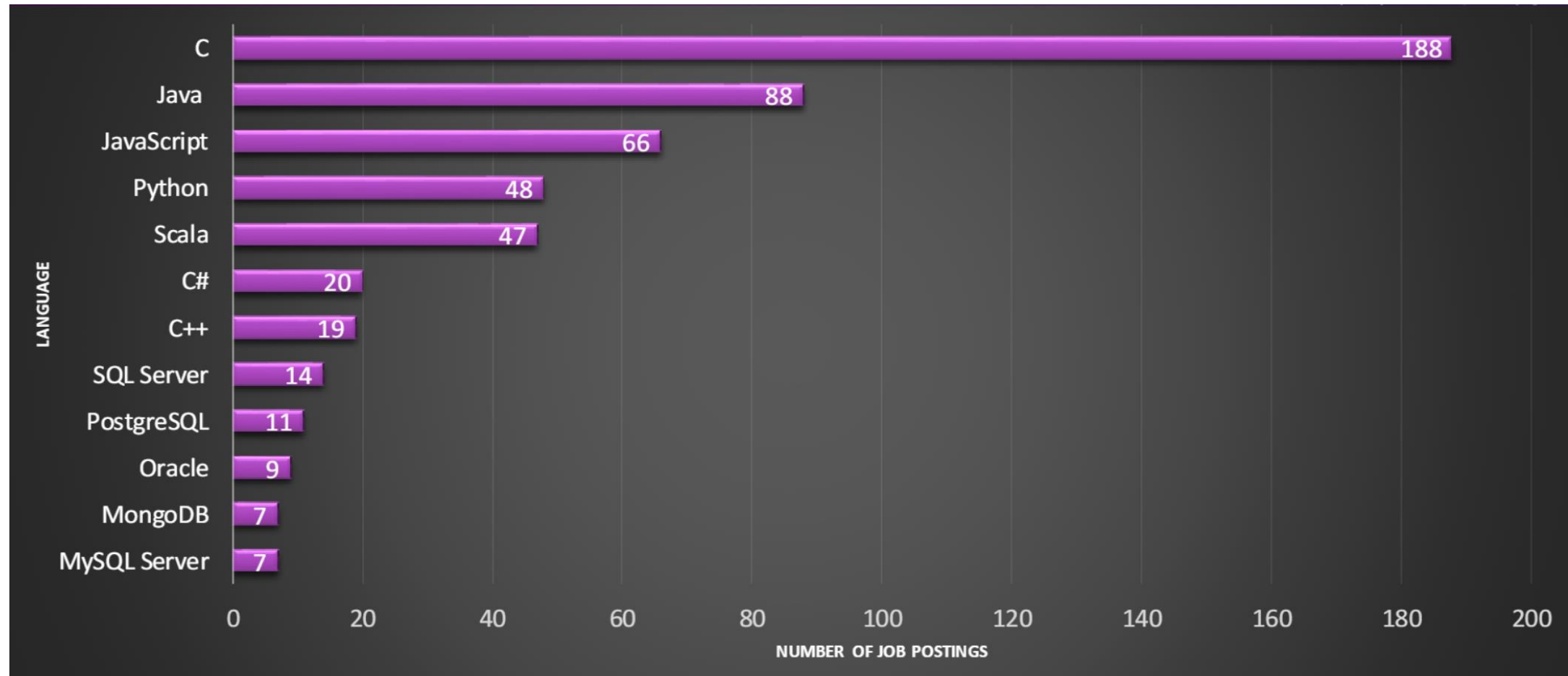
APPENDIX (4)

Developer by Branch



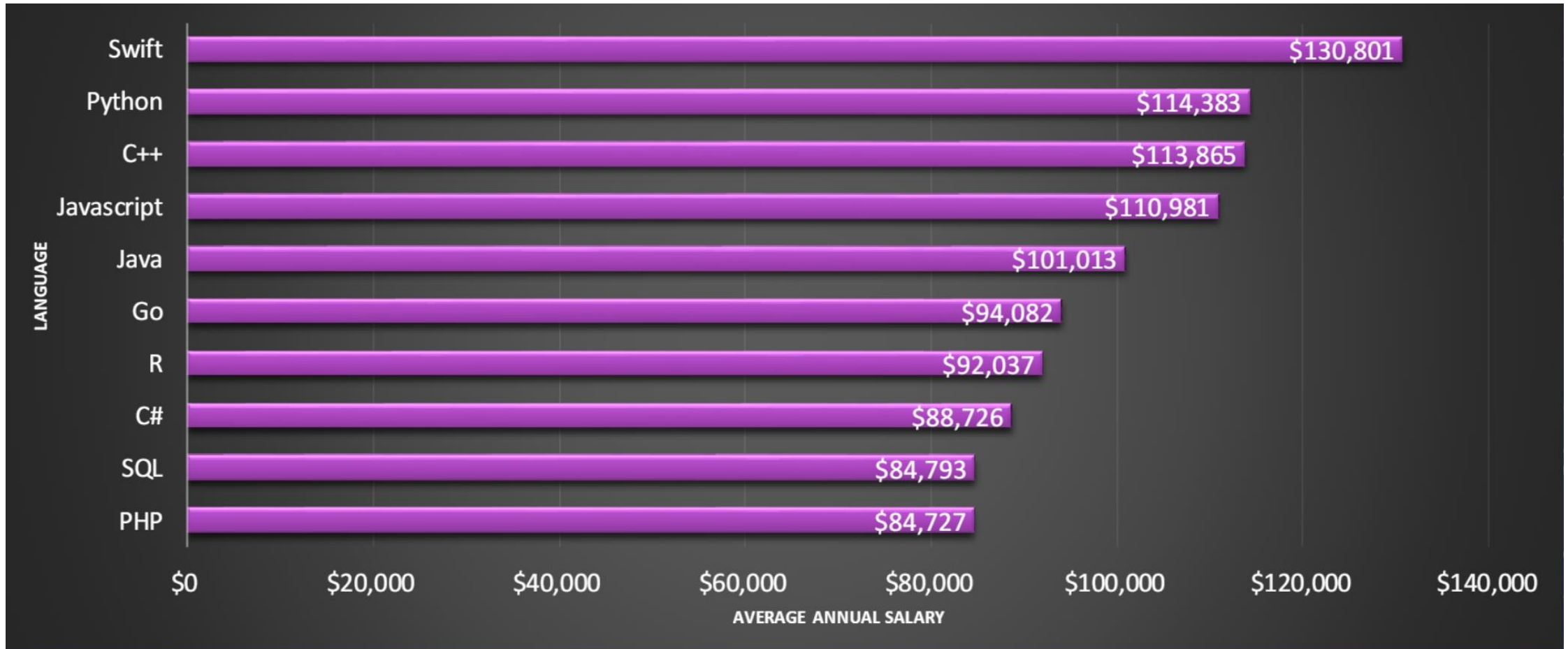
APPENDIX (5)

JOB POSTINGS



APPENDIX (6)

POPULAR LANGUAGES



APPENDIX (7)

Resources

<https://www.mongodb.com/>

<https://redis.io/>

<https://www.elastic.co/what-is/elasticsearch>

<https://reactjs.org/>

<https://vuejs.org/>

<https://stackify.com/angular-vs-angularjs-differences-between-angular-and-angularjs/>

<https://www.gubole.com/blog/nosql-databases#:~:text=NoSQL%20is%20a%20better%20choice,of%20a%20fixed%20schema%20model.>

<https://www.smartdatacollective.com/which-js-framework-best-for-big-data-development/>

Thank
you

