IBM Capstone Project Data Analyst

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Skills Network

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OUTLINE

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EXECUTIVE SUMMARY

- The purpose of this presentation is to explore the various technologies being deployed in the IT sector and the future technologies that are in demand in the job market to make informed hiring and developing decisions.

- This analysis is made using survey data from the StackOverflow database and provided via Coursera. It was used several methods to clean the data and statistical methods to identify trends and provide insights:
  - The Top Technologies already in use on the job market (Programming Languages, Databases Programs and Platforms)
  - The technologies most desired to learn for next year
  - Information about the demographics of the survey and also included compensation information
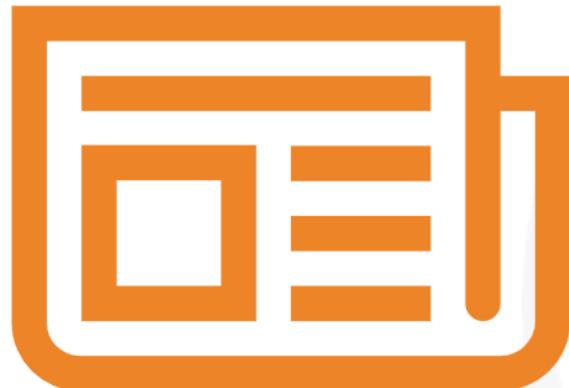
INTRODUCTION

- This report was made using a parcel of a large dataset of the StackOverflow Developer Survey. The small dataset was provided by Coursera Skills Network. It was the result of collecting and analyzing data survey's about popular languages and salaries in the IT industry.

- This report was made with the purpose to identify the technologies that are being used right now and the next year technologies that are going be relevant. It also serves the purpose to view the differences in terms of compensation and their demographics (age, education and country).

- This report as value to HR Specialists, students, educators to identify the skills and trends in the IT job market that is constantly evolving.

METHODOLOGY

- **Data Sources:**
  - Job postings
  - Training portals
  - Developer surveys, such as the latest Stack Overflow Developer Survey

- **Data Cleaning and Exploration Languages and Libraries used:**
  - Python
  - Pandas
  - Matplotlib
  - Seaborn
  - Numpy

- **Software Used for Visualization:**
  - IBM Cognos Data Analytics
  - Google Looker Studio

- **Key Wrangling Points of the data:**
  - LanguageHaveWorkedWith; LanguageWantToWorkWith;
  - DatabasesHaveWorkedWith; DatabaseWantToWorkWith;
  - PlatformHaveWorkedWith; PlatformWantToWorkWith;
  - WebframeHaveWorkedWith; WebframeWantToWorkWith;
  - Age; Country; EdLevel; JobSat; ConvertedCompYearly;
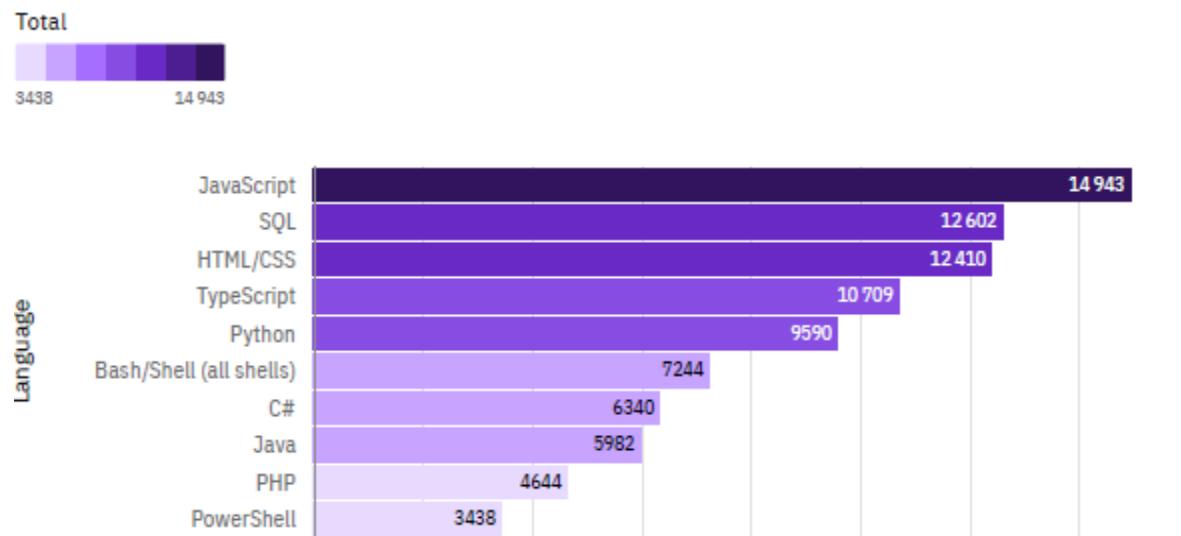
RESULTS

- The biggest age group of the respondents are from 25-34 years old representing 41,3% and the majority of the respondents (84,5%) are under 35 years old.

- The Education Level that most of the respondents have are Bachelor's degree and Masters degree, being that the age of those respondents are from 25 to 44 years of age.

- The biggest number of respondents are from the USA, India, UK, France, Germany, Ukraine and Brazil.

- The average of Yearly Compensation rises as the age of the respondents also rises starting in the $39,617 per year for the 18-24 years old and reaching its peak at the 55-64 years old being the average of compensation $143,919 per year.

- The job satisfaction increases sharply as the age increases, reaching its peak in the 25-34 age group and then starts to drop as the ages increases

PROGRAMMING LANGUAGE TRENDS
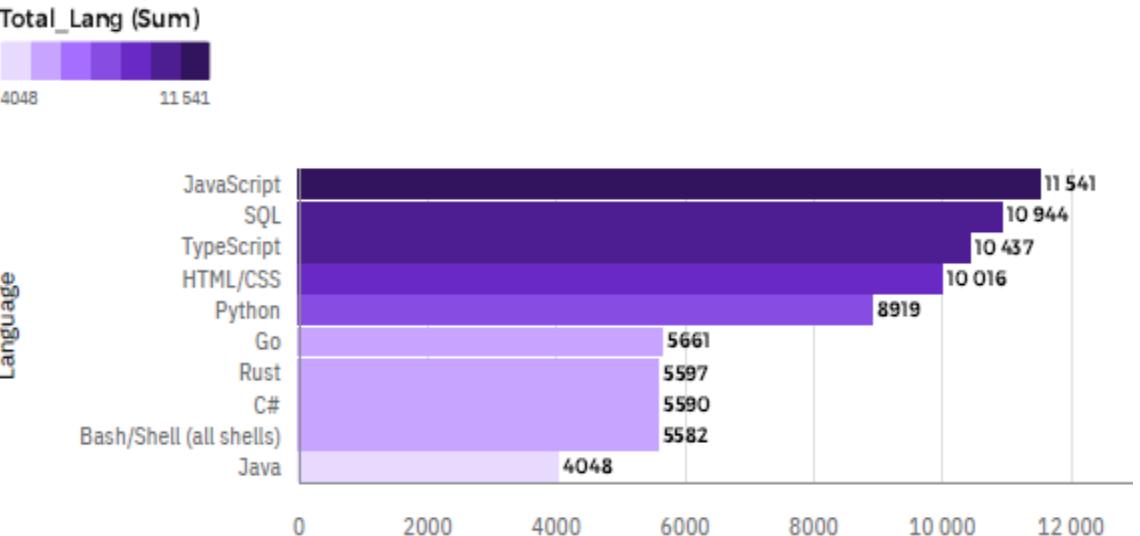
Current Year

Top 10 Programming Languages Most Used Professionaly

Total
3438   14 943

Language	Total
JavaScript	14 943
SQL	12 602
HTML/CSS	12 410
TypeScript	10 709
Python	9590
Bash/Shell (all shells)	7244
C#	6340
Java	5982
PHP	4644
PowerShell	3438

Next Year

Top 10 Programming Languages Desired to learn

Total_Lang (Sum)
4048   11 541

Language	Total
JavaScript	11 541
SQL	10 944
TypeScript	10 437
HTML/CSS	10 016
Python	8919
Go	5661
Rust	5597
C#	5590
Bash/Shell (all shells)	5582
Java	4048

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# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings
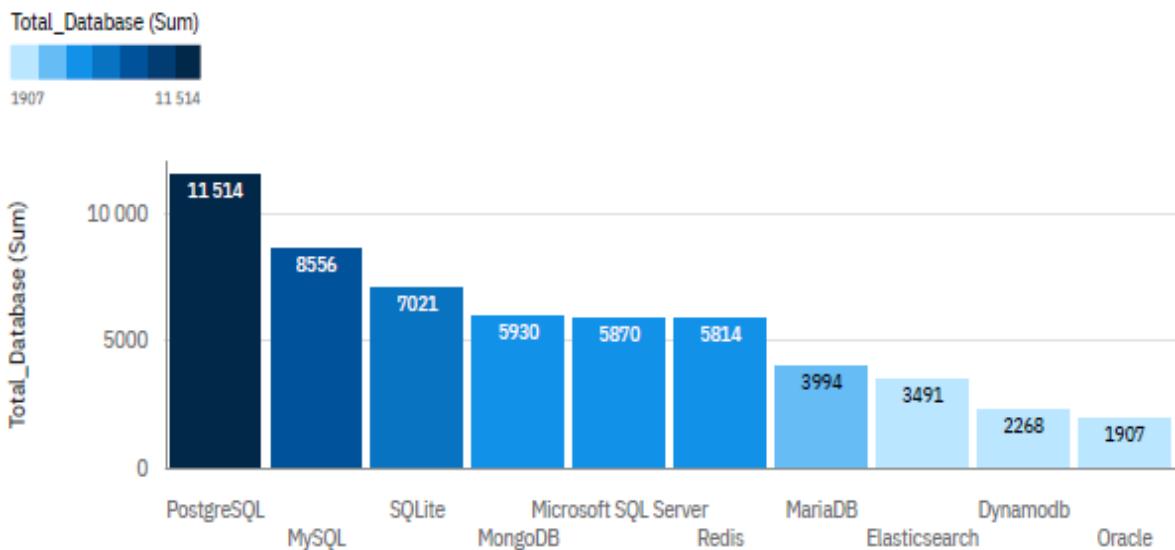
- JavaScript is the most used language professionaly

- SQL, HTML/CSS, TypeScript and Python are also very much used professionally amongst the respondents

Implications
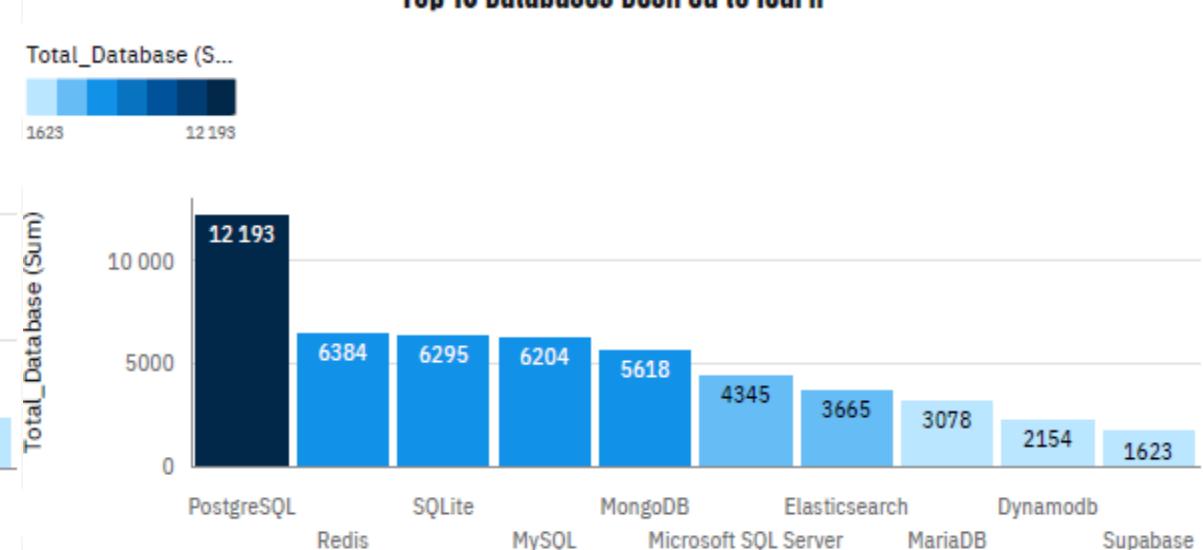
- JavaScript is going to continue to be the most desirable programming language to be learned

- Also continue demand for SQL, Python, HTML/CSS

- Increased interest in the programming languages Go and Rust

DATABASE TRENDS

Top 10 Databases Most Used Professionaly

Total_Database (Sum)

1907 — 11 514

Database	Total_Database (Sum)
PostgreSQL	11 514
MySQL	8556
SQLite	7021
MongoDB	5930
Microsoft SQL Server	5870
Redis	5814
MariaDB	3994
Elasticsearch	3491
Dynamodb	2268
Oracle	1907

Top 10 Databases Desired to learn

Total_Database (S...

1623 — 12 193

Database	Total_Database (Sum)
PostgreSQL	12 193
Redis	6384
SQLite	6295
MySQL	6204
MongoDB	5618
Microsoft SQL Server	4345
Elasticsearch	3665
MariaDB	3078
Dynamodb	2154
Supabase	1623

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL and MySQL are the most used databases programs

- MongoDB, Microsoft SQL Server and Redis have practically the same number of users

Implications

- PostgreSQL, Redis and SQLite will be at the top of the databases programs to be learned

- All the preferred databases to use and to be learned next year are all Open Source

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DASHBOARD

IBM Capstone Project Dashboard made in Cognos

IBM Capstone Project Dashboard made in Google Looker
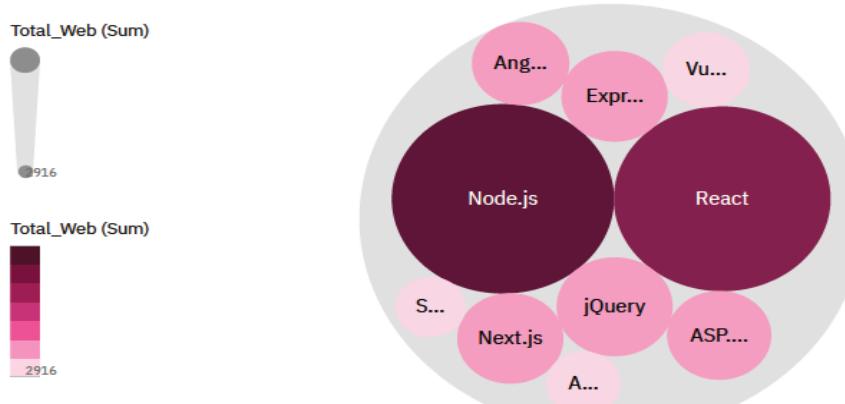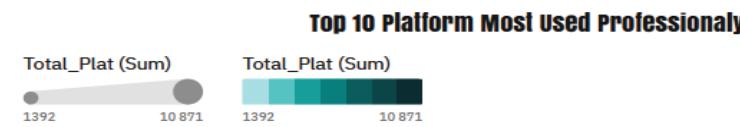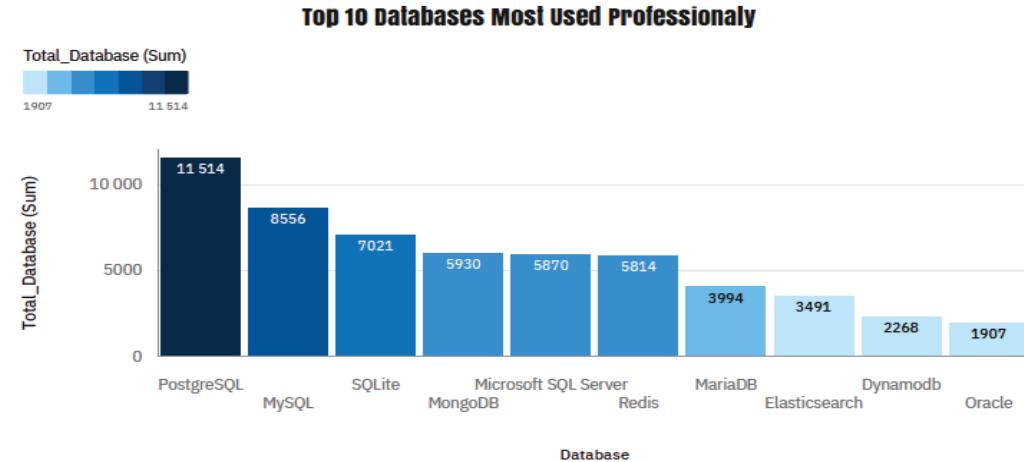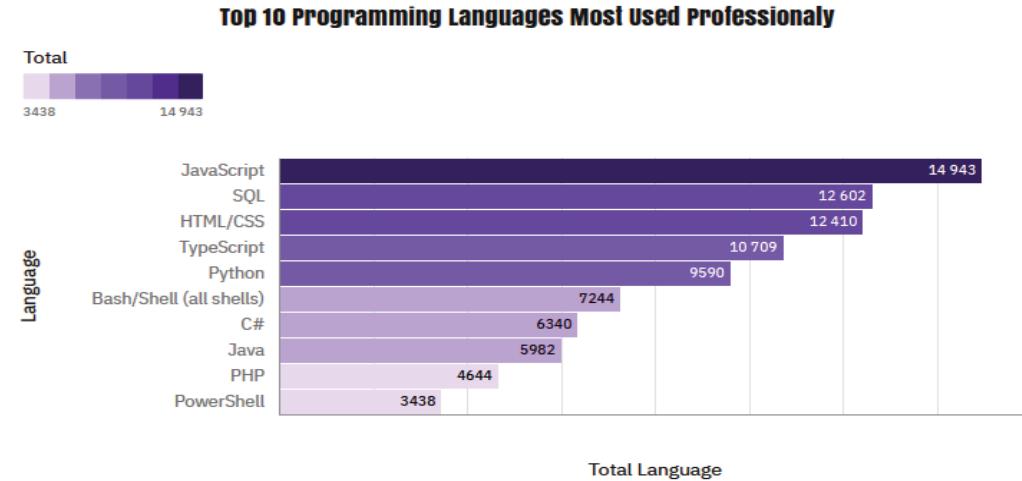
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DASHBOARD TAB 1 – Current Technology In Use

Current Technology Usage

Top 10 Programming Languages Most Used Professionaly

Total
3438 — 14 943

Language	Total
JavaScript	14 943
SQL	12 602
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TypeScript	10 709
Python	9590
Bash/Shell (all shells)	7244
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PHP	4644
PowerShell	3438

Total Language

Top 10 Databases Most Used Professionaly

Total_Database (Sum)
1907 — 11 514

Database	Total_Database (Sum)
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MongoDB	5930
Microsoft SQL Server	5870
Redis	5814
MariaDB	3994
Elasticsearch	3491
Dynamodb	2268
Oracle	1907

Top 10 Platform Most Used Professionaly

Total_Plat (Sum) 1392 — 10 871
Total_Plat (Sum) 1392 — 10 871

Amazon Web Services (AWS)
Google Cloud
Microsoft Azure
Firebase
Vercel
Cloudflare
Digital Ocean

Top 10 WebFrame Most Used Professionaly

Total_Web (Sum) 2916
Total_Web (Sum) 2916

Ang... Expr... Vu...
Node.js React
S... Next.js jQuery ASP....
A...

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DASHBOARD TAB 2-Future Technology Trend

Future Technology Trend
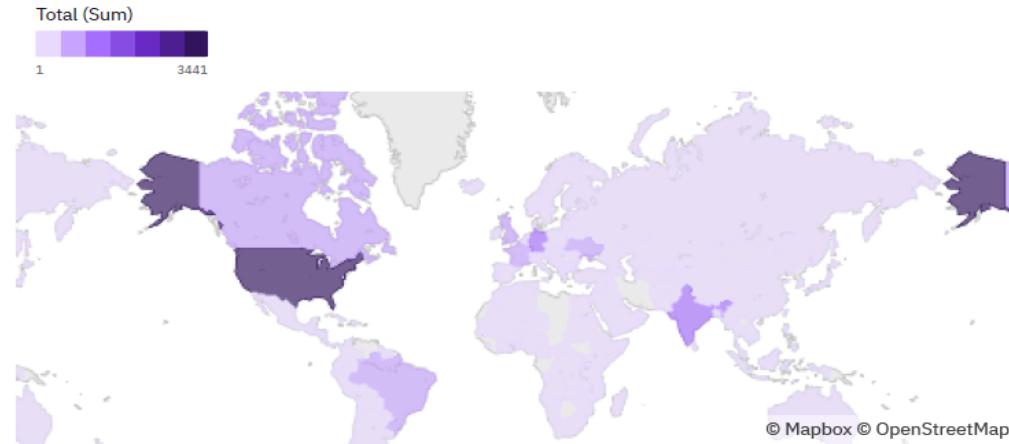
DASHBOARD TAB 3-Demographics
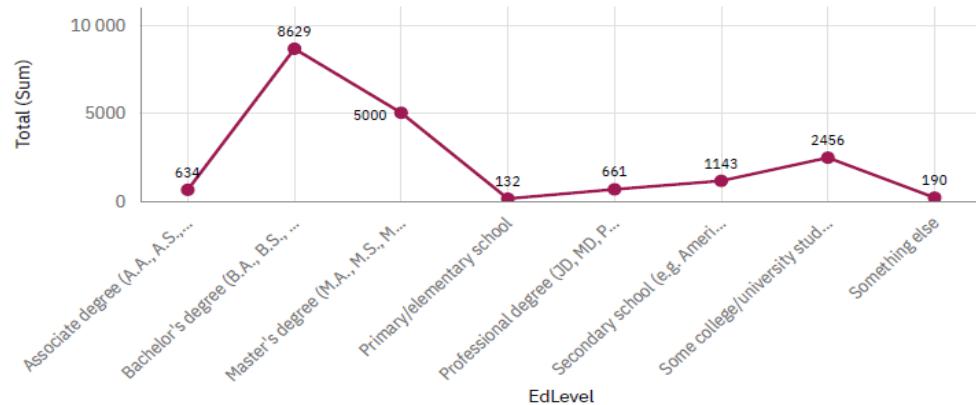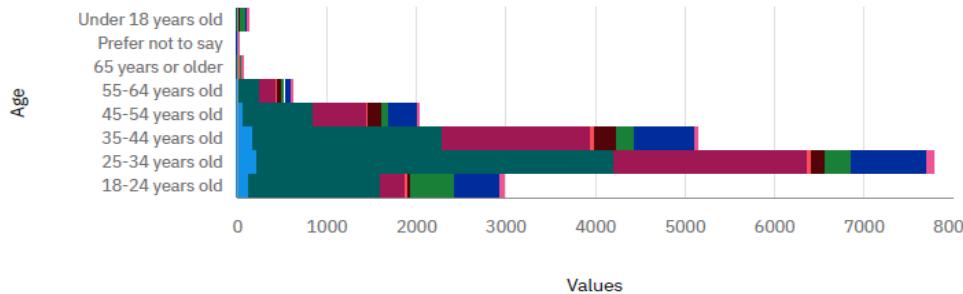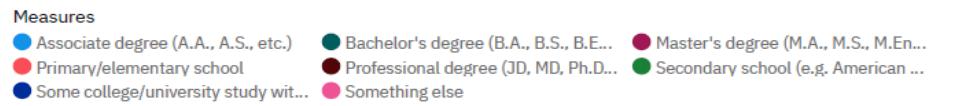
OVERALL FINDINGS & IMPLICATIONS

Findings

- The IT Trends in the various areas used have multiple tools already deployed
- JavaScript, Python, SQL and HTML/CSS are the most popular languages both in use and also most wanted to learn
- More young people (under 35) are the bigger users of this various tools (Programming languages, databases, web frames)
- There an increasing dissipation of the various tools trough out the world, including 3rd world countries.

Implications

- With the increasing variety of Programming Languages, Databases, platforms and Web Frame platforms, companies need to adapt to the new demands for qualified personal
- Proficiency in the various tools can lead to new opportunities in the job market

DISCUSSION

- Initially it was put this questions to answer:
  - Which programming languages are most in demand?
  - Which database technologies are currently most sought after?
 - Which Integrated Development Environments (IDEs) are the most popular?
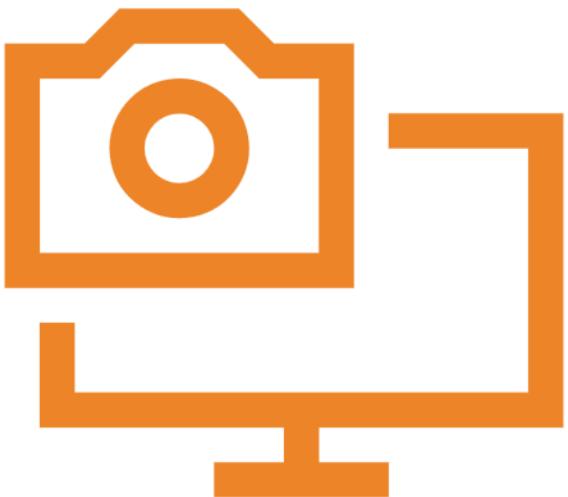
CONCLUSION

- JavaScript, SQL, Python will continue to be at the top of the future preferences amongst the programming languages

- Amazon Web Services is deniable the backbone of the most used Platform used and will continue to be

- Node.js and React will continue to be the most used Web Frame

- The Education level of the respondents is increasingly high so the companies have to adapt the compensation accordingly
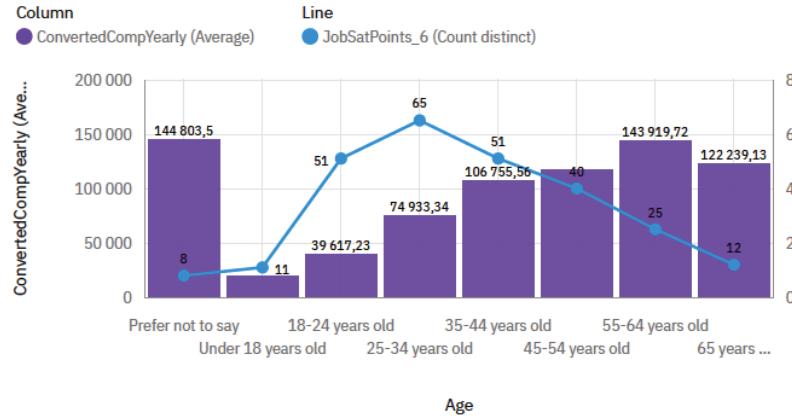
APPENDIX
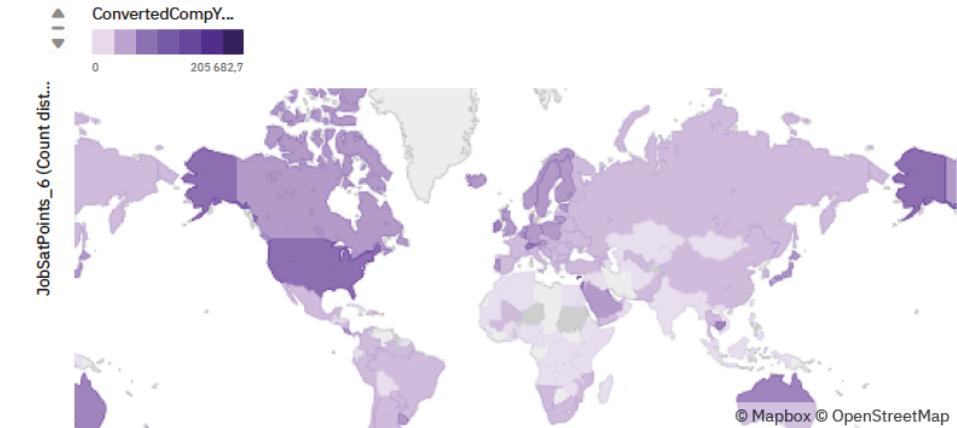
Compensation
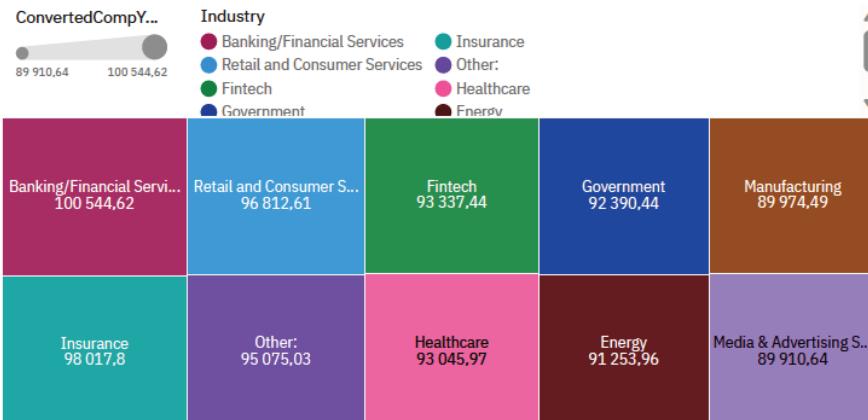
Average Compensation By Age and Job Satisfaction

Column
● ConvertedCompYearly (Average)

Line
● JobSatPoints_6 (Count distinct)
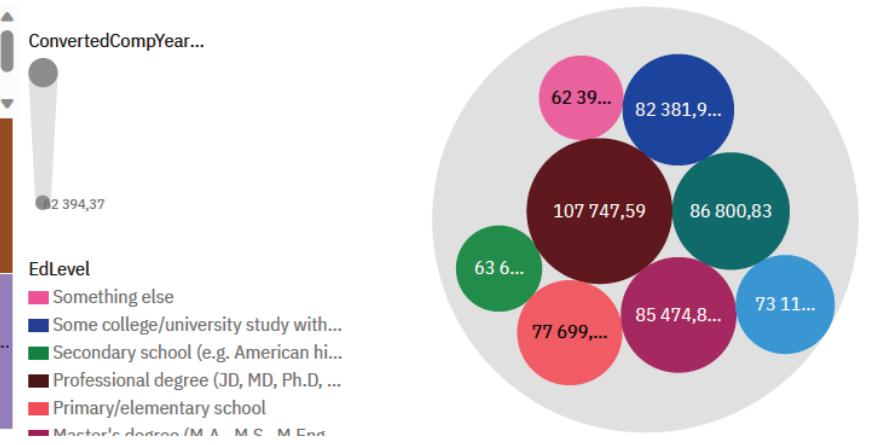
Average Compensation by Country

ConvertedCompY...

0   205 682,7

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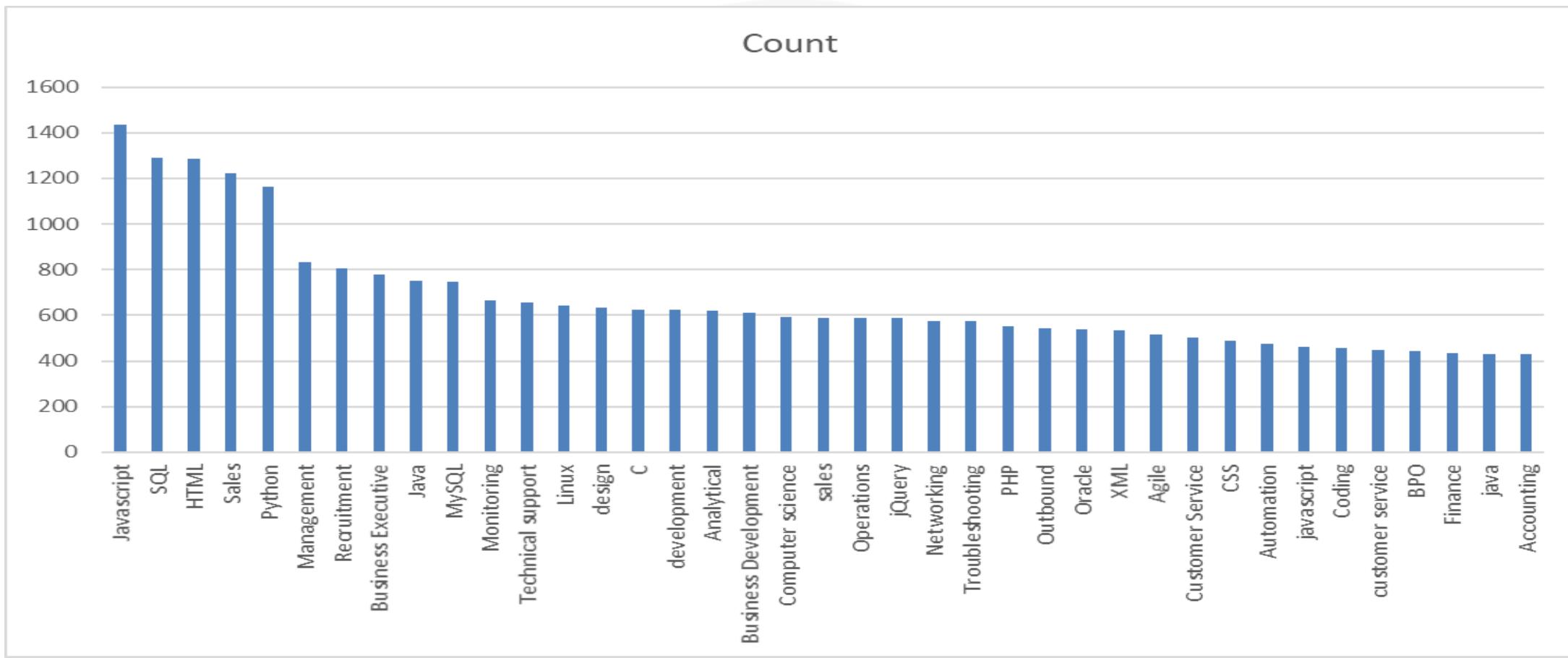
Average Compensation for the Top 10 Industry's

ConvertedCompY...

89 910,64   100 544,62

Industry
● Banking/Financial Services   ● Insurance
● Retail and Consumer Services   ● Other:
● Fintech   ● Healthcare
● Government   ● Energy

| Banking/Financial Servi... 100 544,62 | Retail and Consumer S... 96 812,61 | Fintech 93 337,44 | Government 92 390,44 | Manufacturing 89 974,49 |
| Insurance 98 017,8 | Other: 95 075,03 | Healthcare 93 045,97 | Energy 91 253,96 | Media & Advertising S... 89 910,64 |

Average Compensation by Education Level

ConvertedCompYear...

2 394,37

EdLevel
● Something else
● Some college/university study with...
● Secondary school (e.g. American hi...
● Professional degree (JD, MD, Ph.D, ...
● Primary/elementary school
● Master's degree (M.A., M.S., M.Eng...

JOB POSTINGS

POPULAR LANGUAGES

Average Annual Salary