# Trends and future skill requirements in Information Technologies

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# OUTLINE



- Executive Summary

- Introduction

- Methodology

- Results
  - Visualization – Charts
  - Dashboard

- Discussion
  - Findings & Implications

- Conclusion

- Appendix

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# EXECUTIVE SUMMARY

- Analysis of StackOverflow developer survey.
    - Programming languages trends.
        - Most popular and desired languages. Findings and implications.
    - Databases trends.
        - Most popular and desired databases. Findings and implications.
    - Current technology usage.
        - Platforms, web frameworks, languages and databases.
    - Future technology usage.
        - Platforms, web frameworks, languages and databases.
    - Demographics.
- Github job posting data review.
- Salary by programming language.

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# INTRODUCTION



- Identifying current and future skills demand in the data analysis field is crucial for both individuals and organizations.

- Keeping up with the latest trends and technologies in these fields can give professionals an edge in the job market and help organizations stay competitive.

- This report aims to identify trends for this year's report on emerging skills and future skill requirements.

- Why is this important?
  - Staying current with in-demand skills can lead to better job opportunities, higher salaries, and greater job satisfaction.
  - For organizations, having a workforce with the skills needed to meet current and future demands

# METHODOLOGY

- Collecting data from various sources.
  - GitHub job-postings (acquired using API)
  - Programming language annual sallary (web-scrapping)
  - StackOverflow developer survey 2019 (available under a ODbL) examination of a subset of the dataset

- Data wrangling.
  - Duplicates removal, data imputation, data normalization.

- Data mining using Pandas and SQL.
  - Exploratory analysis.
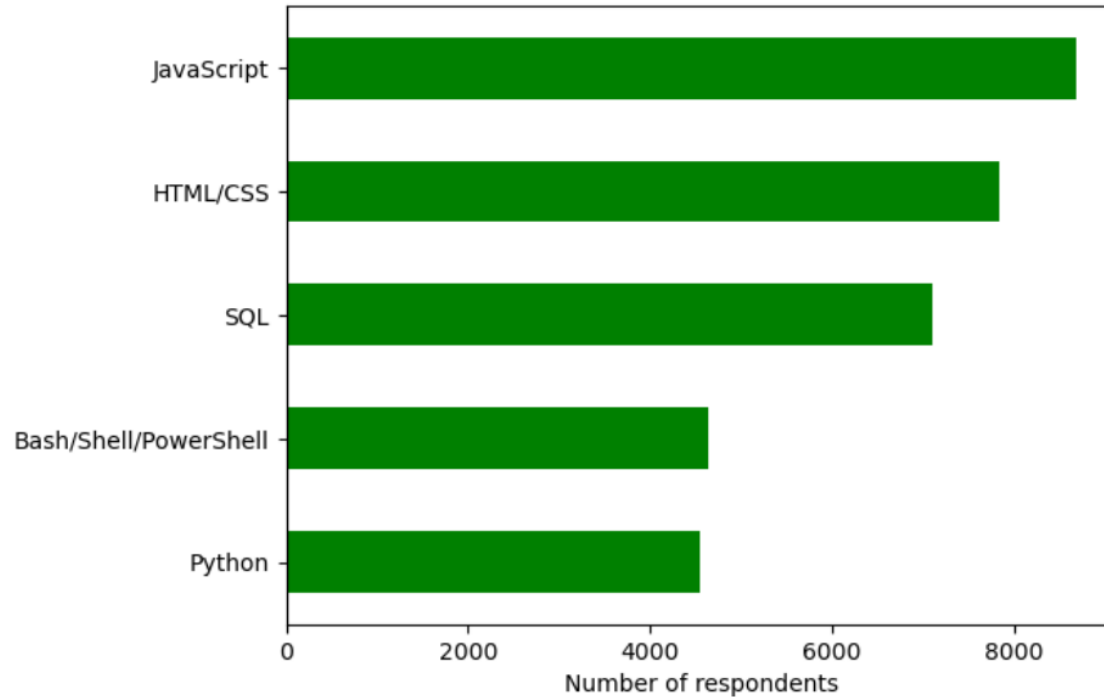  - Descriptive statistics.

- Data visualization.
  - Matplotlib.
  - IBM Cognos dashboard.

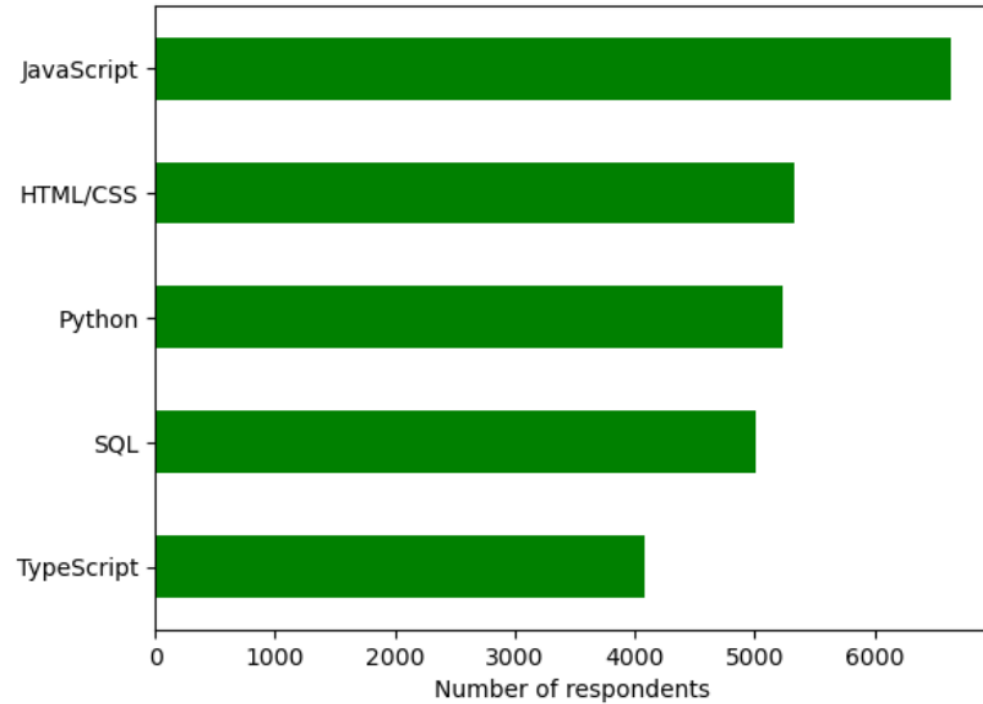# RESULTS

# PROGRAMMING LANGUAGE TRENDS

| Current Year | Next Year |
|---|---|



Top 5 most popular programming languages this year



Top 5 programming languages for the next year

# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- JavaScript is the most commonly used programming language.
- Demand for type script is also growing.
- SQL is the most popular language for managing data held in a RDBMS.
- Python became fifth top trending language and it's one of the most desired tools.

## Implications

- Python is the fastest-growing major programming language, in part due to its use in data analysis, including emerging AI technologies.
- JavaScript remains critical in web development and its superset TypeScript will also be in high demand.
- Frontend tools such as HTML and CSS are some of the most in-demand skills.
- SQL remains one of the leading database technologies

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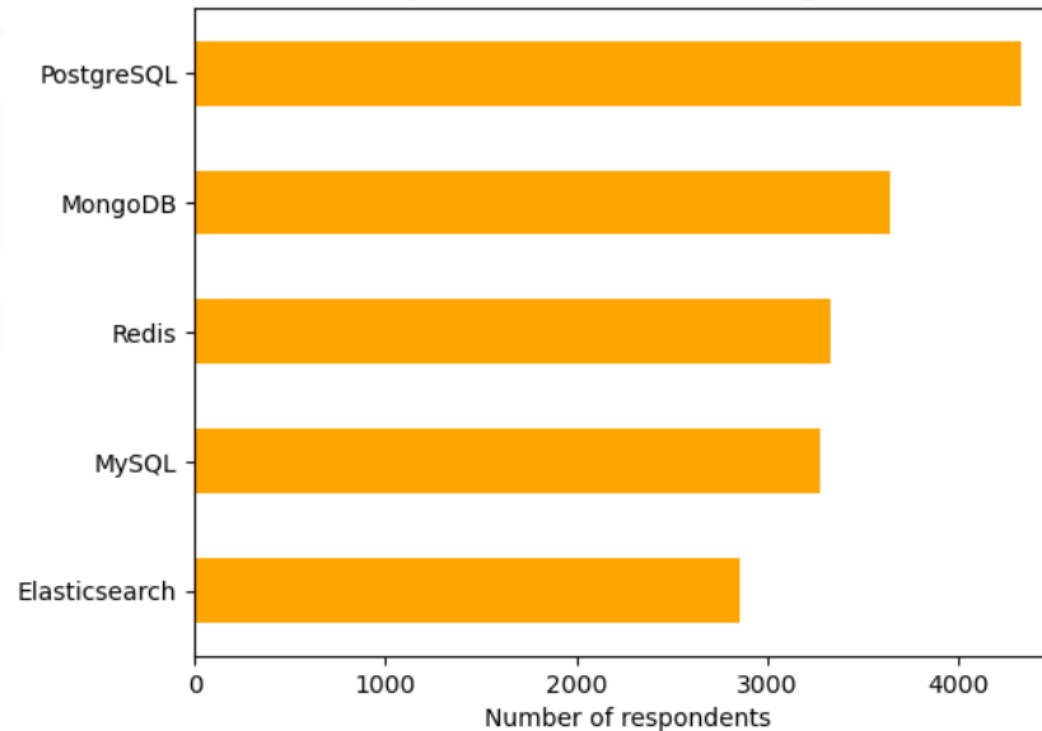
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# DATABASE TRENDS

Top 5 most popular databases this year
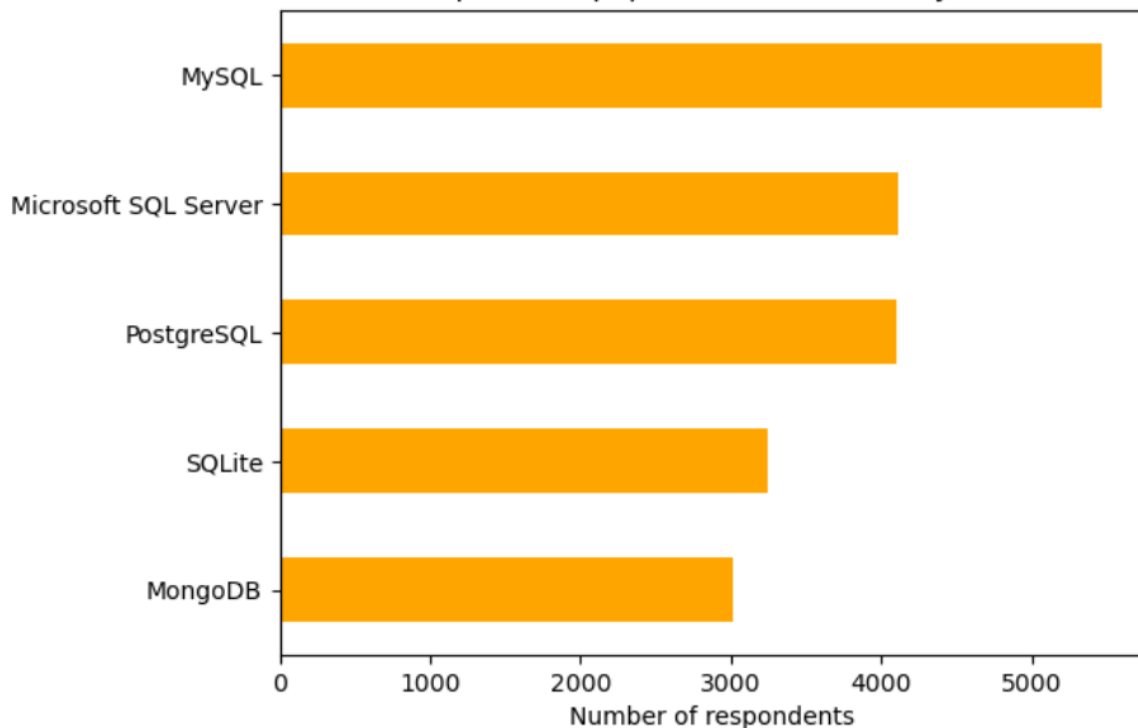


Top 5 databases for the next year

# DATABASE TRENDS - FINDINGS & IMPLICATIONS

| Findings | Implications |
| --- | --- |

- MySQL is yet again the most commonly used database.

- PostgreSQL is becoming more and more popular.

- MongoDB is also gaining traction.

- Microsoft SQL Server is losing a little bit of popularity

- NoSQL databases like MongoDB Elasticsearch and Redis are in high demand.

- Open-source relational database management systems are preferable.

- Despite popularity of MySQL there is a need for new solutions.

- PostgreSQL is more desired as a future tool than MySQL

# DASHBOARD





Link to interactive dashboard:

[Dashboard link](#) (Ctrl + LPM)

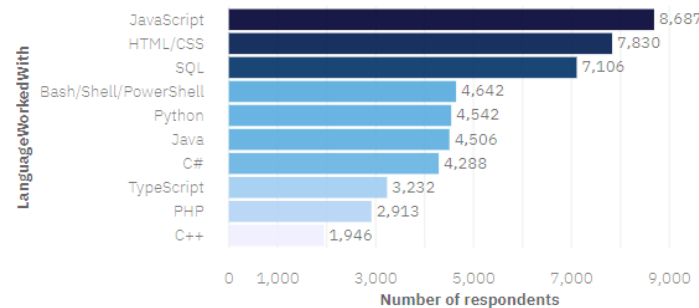Dashboard overview presented in the next section.

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# CURRENT TECHNOLOGY USAGE

Current Technology Usage    Future Technology Trend    Demographics

## Top 10 Most popular languages

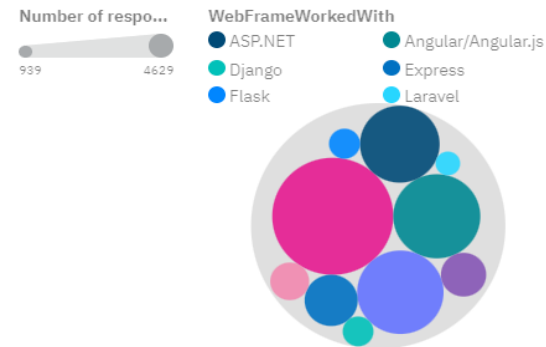| Language | Number of respondents |
|---|---|
| JavaScript | 8,687 |
| HTML/CSS | 7,830 |
| SQL | 7,106 |
| Bash/Shell/PowerShell | 4,642 |
| Python | 4,542 |
| Java | 4,506 |
| C# | 4,288 |
| TypeScript | 3,232 |
| PHP | 2,913 |
| C++ | 1,946 |

## Top 10 Most popular databases

| Database | Number of respondents |
|---|---|
| MySQL | 5,469 |
| Microsoft SQL | 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 |

## Platforms worked with

Number of respo... 215 — 5,811

Number of respo... 215 — 5,811

AWS  Linux  Arduino  Docker  Windows  Android  WordPress  Kubernetes  iOS  MacOS  Google Cloud Platform  Raspberry Pi  Heroku  Microsoft Azure  Slack

## Top 10 web frames worked with

Number of respo... 939 — 4629

WebFrameWorkedWith
● ASP.NET       ● Angular/Angular.js
● Django        ● Express
● Flask         ● Laravel

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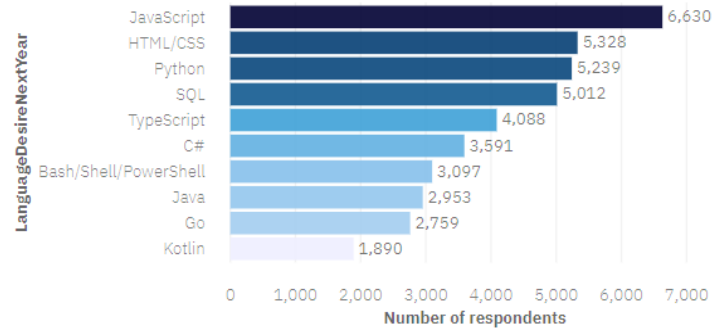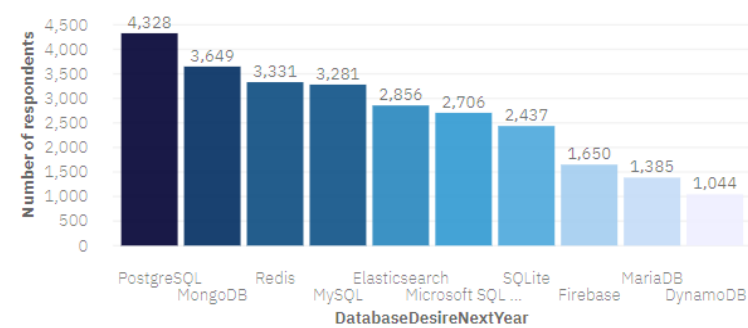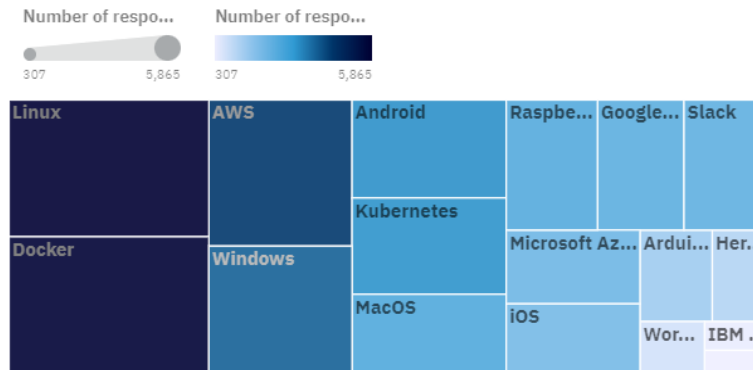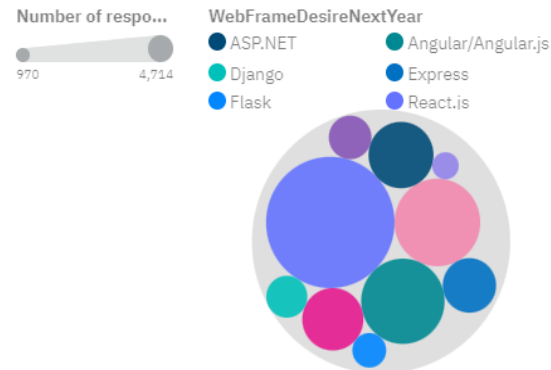
# FUTURE TECHNOLOGY TREND



Top 10 most desired languages Next Year

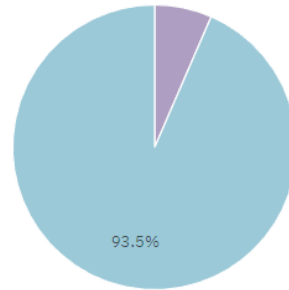Top 10 most desired databases Next Year

The most desired platforms Next Year
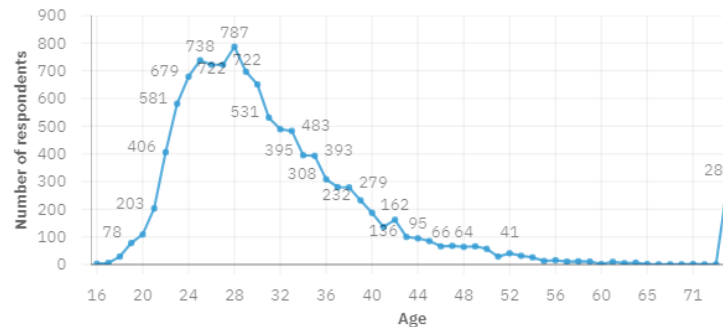
Top 10 most desired web frames Next Year

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# DEMOGRAPHIC
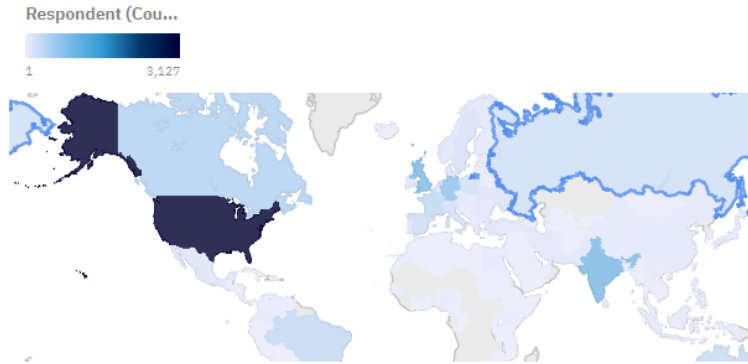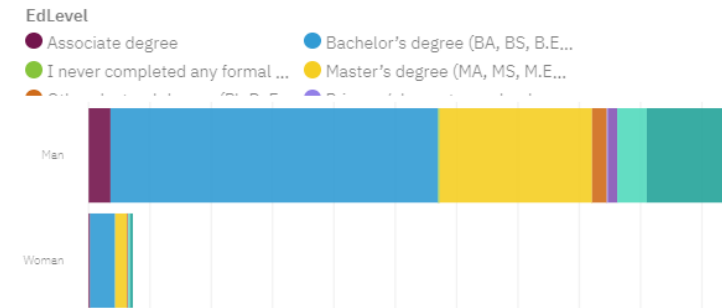
# DISCUSSION



- In the next section, the key findings will be presented. It is worth noting that the analysis was conducted on a subsection of the full survey, and the residents of the USA were by far more numerous than respondents from other countries.
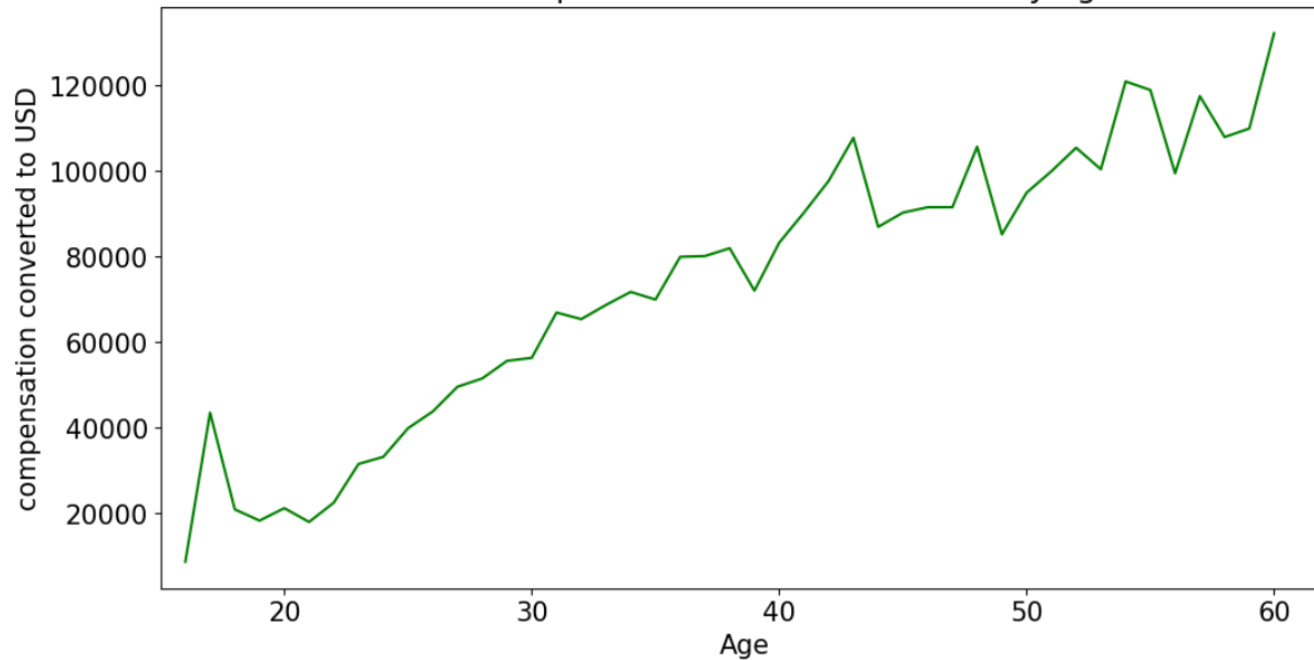
# OVERALL FINDINGS & IMPLICATIONS

| Findings | Implications |
| --- | --- |
| • Due to its simplicity, vast libraries as well as rapid development of data science field, Python becomes one of the world most popular languages. | • Growth of fields such as AI and big data will continue to increase demand for skills like No SQL databases, Python and conteiner technologies. |
| • NoSQL databases and container technologies gain more and more traction in recent years althoug SQL technologies continue play major role. | • Relational databases expertise is still in high demand. |
| • JavaScript and HTML/CSS remain very influential tools critical for frontend developement. | • HTML, CSS and JavaScript remain the backbone of the web and TypeScript is expected to gain more popularity in this domain. |

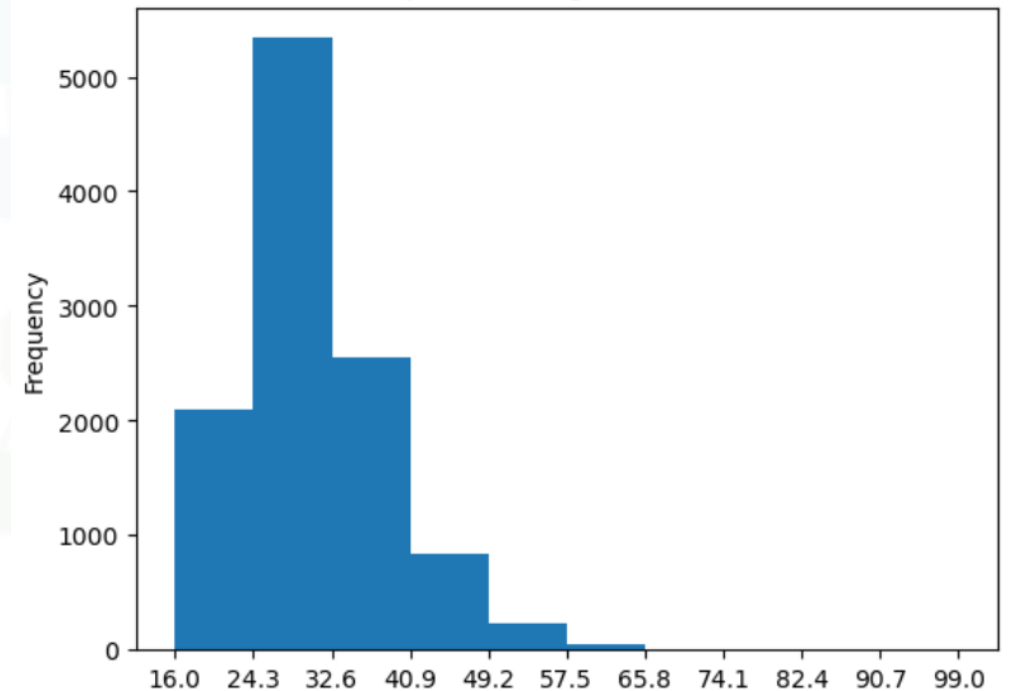**IBM Developer**

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# CONCLUSION

- The StackOverflow developer survey highlights the importance of staying current with in-demand skills in the data analysis field.

- Programming languages such as Python and TypeScript are becoming increasingly popular and desired by developers.

- Similarly, databases such as MySQL, PostgreSQL, and MongoDB are also in high demand.

- Additionally, the survey suggests that the use of NoSQL databases and container technologies is on the rise.

- As the field of data science and AI continue to grow, it is crucial for professionals and organizations to stay up-to-date with the latest trends and technologies
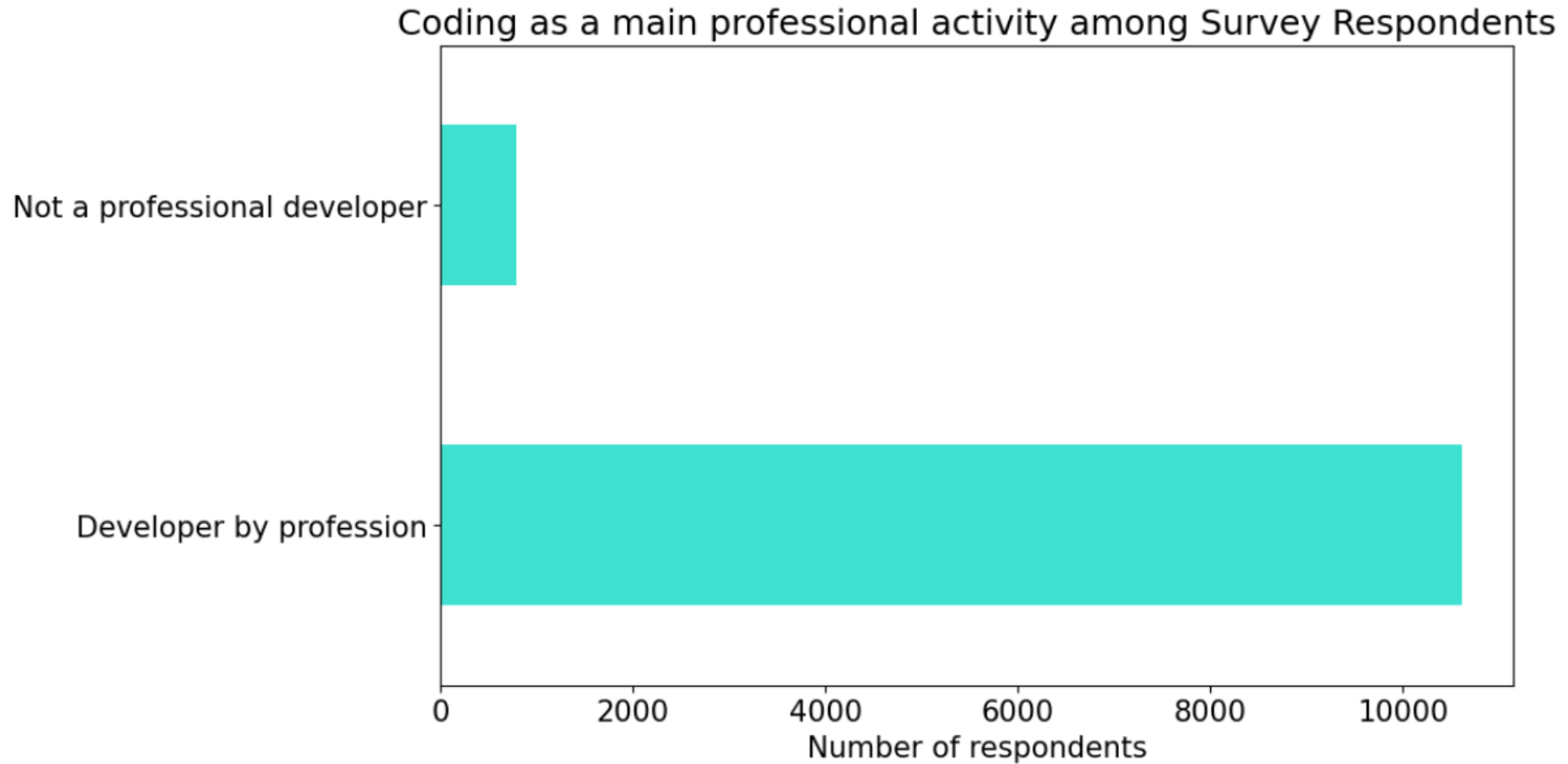
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# APPENDIX



Median compensation converted to USD by age

Respondents age distribution

# APPENDIX



Coding as a main professional activity among Survey Respondents

# GITHUB JOB POSTINGS



The most commonly required languages on github job-postings



Number of job posts for selected cities on github job-postings

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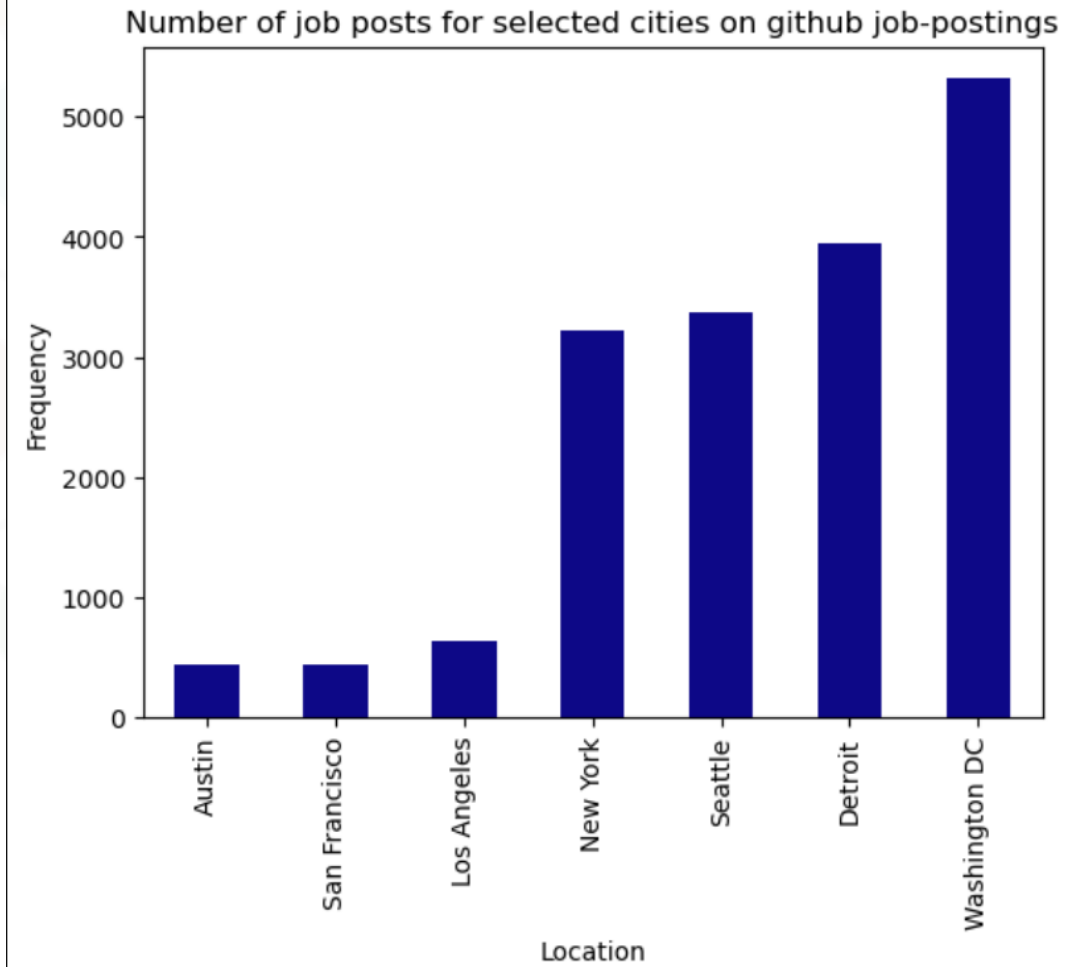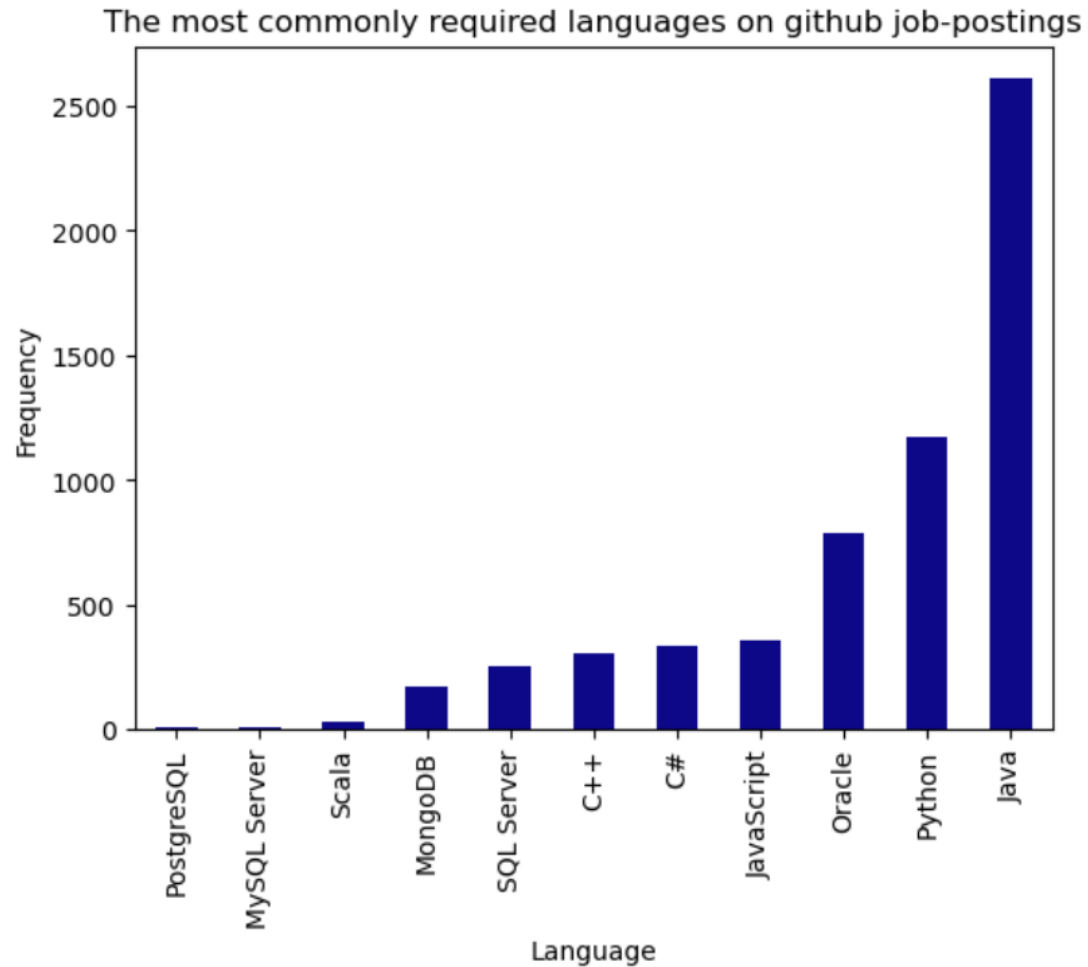
# POPULAR LANGUAGES AVERAGE SALARY

**Average Annual Salary in USD**

| Language | Average salary |
|----------|---------------:|
| SWIFT | 130801 |
| PYTHON | 114383 |
| C++ | 113865 |
| JAVASCRIPT | 110981 |
| JAVA | 101013 |
| GO | 94082 |
| R | 92037 |
| C# | 88726 |
| SQL | 84793 |
| PHP | 84727 |

Average salary