# Technology Trends Analysis Using Stack Overflow Developer Survey

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# OUTLINE



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# EXECUTIVE SUMMARY
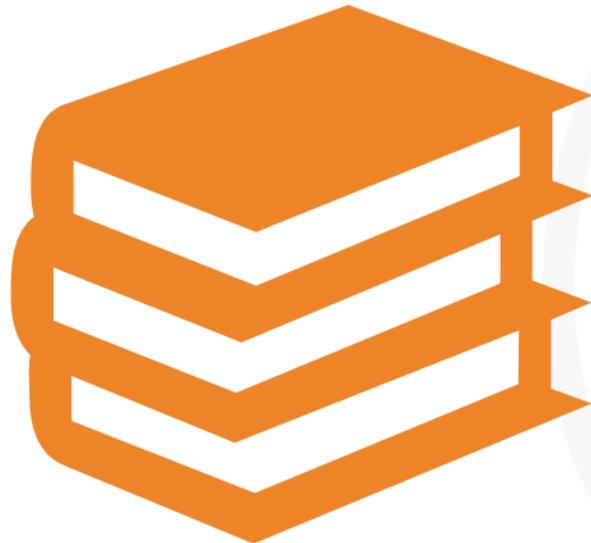
- This project analyzes the **Stack Overflow Developer Survey** to uncover insights into current and future technology trends among developers worldwide.

- Using **IBM Cognos Analytics**, data visualizations were created to highlight popular programming languages, databases, and demographic patterns.

- The study provides actionable insights for technology strategists, educators, and recruiters.

  Key Highlights
  - Python, JavaScript, and SQL dominate developer usage.
  - Future trends indicate continued growth in full-stack and cloud technologies.
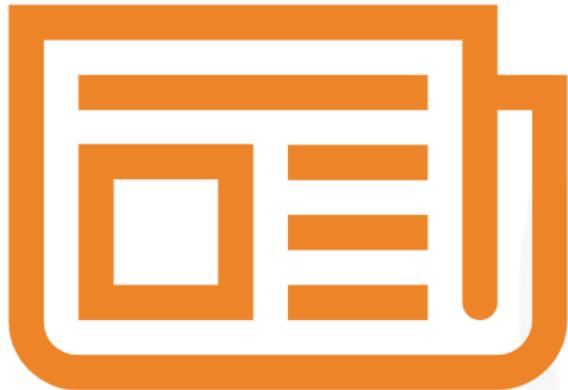
# INTRODUCTION

- It **Purpose** to analyze developer survey data to understand technology usage and emerging trends.

- **Target audience** are tech managers, recruiters, educators, and IT strategists

- It helps to **value** forecast hiring trends, training focus areas, and technology adoption strategies.
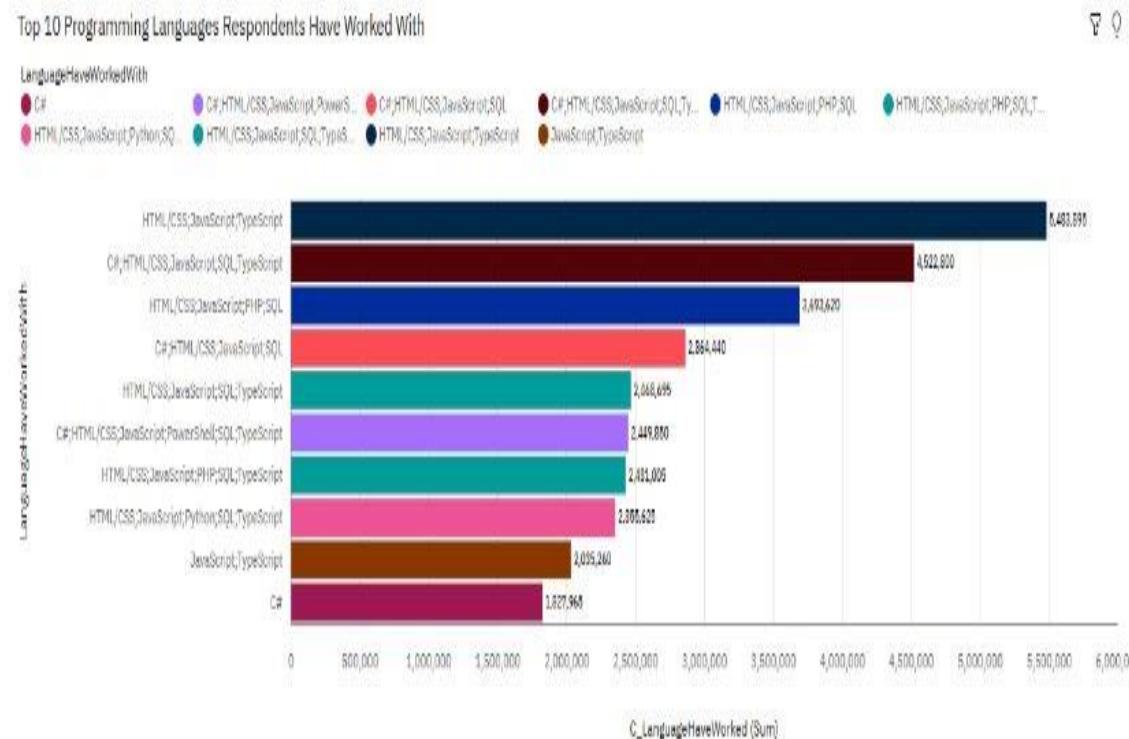
# METHODOLOGY
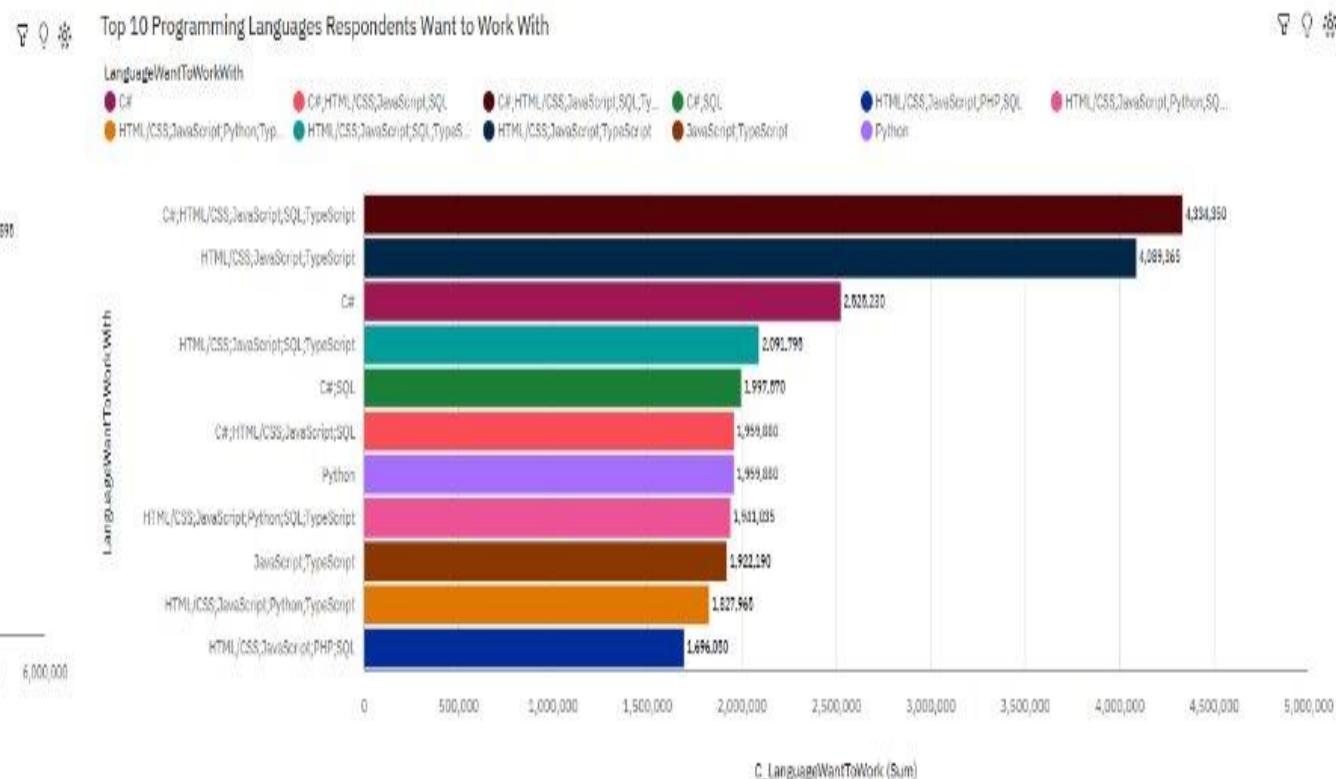
- **Data Source:**
  **Stack Overflow Developer Survey (CSV dataset:**
  `survey_data_updated.csv`).

- **Tools Used:**

- IBM Cognos Analytics (Dashboard creation)

- SQLite (Data wrangling & aggregation)

- Excel/Pandas (Data preprocessing)

- **Key Steps:**

- Imported and cleaned dataset (handled missing values, converted categorical data).

- Aggregated responses for top technologies.

- Built interactive dashboards to visualize trends in usage and demographics.

# PROGRAMMING LANGUAGE TRENDS

Current Year (Bar Chart)

Next Year (Bar Chart)



Top 10 Programming Languages Respondents Have Worked With



Top 10 Programming Languages Respondents Want to Work With

# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- **C#, JavaScript** and **SQL** are the top languages that most developers have worked with, reflecting their versatility across web development, data analysis, and automation.

- Future trends show growing developer interest in **JavaScript**, **TypeScript** and **HTML/CSS,** which offer performance, reliability, and maintainability advantages.

- Traditional languages like **PHP**, **C**, and **Perl** are seeing reduced popularity, especially among younger developers aiming for cloud-native and full-stack development.

## Implications
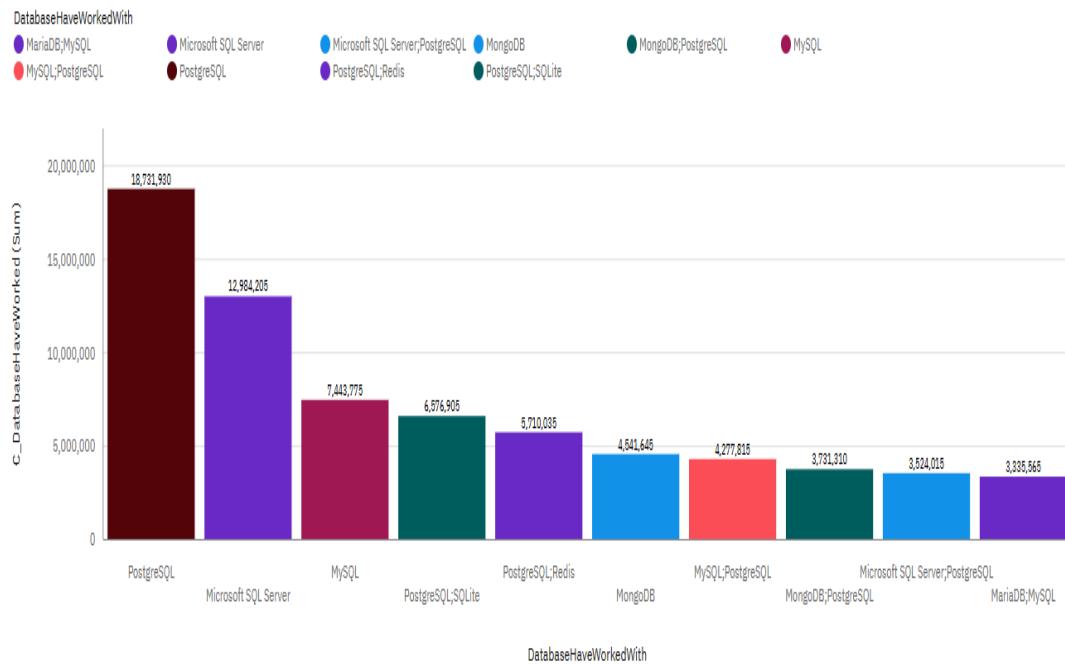
- Organizations should continue investing in **Python- and JavaScript-based projects**, as they represent the most accessible and scalable ecosystems with large developer communities and libraries.

- Developers and companies should prioritize **upskilling** in these modern languages to align with emerging technology stacks and future-proof their technical capabilities.

- Teams maintaining legacy systems should plan **migration strategies** toward more modern frameworks and languages to enhance performance, security, and integration with current tools.

# DATABASE TRENDS
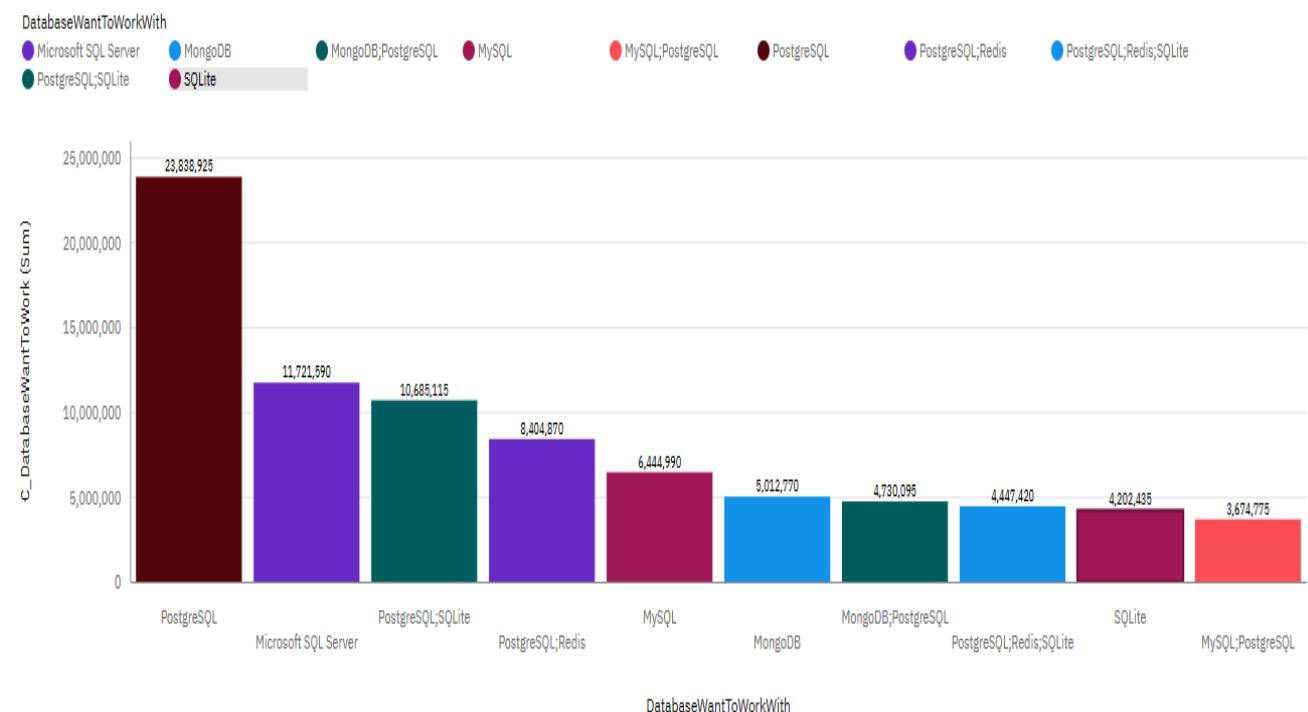


Current Year — Top 10 Databases Used by Respondents
Next Year — Top 10 Database Want To Work With

# DATABASE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- Traditional relational databases such as **MySQL**, **PostgreSQL**, and **Microsoft SQL Server** remain the most widely used among respondents in current technology usage.

- **PostgreSQL, Microsoft SQL Server,** and **PostgreSQL;SQLite** are projected to grow, signaling stronger preference for open-source and cloud-ready databases.

- Developers are showing interest in managed cloud platforms like **AWS RDS**, **Azure SQL**, and **Snowflake**, highlighting a preference for simplified maintenance and scalability.

## Implications

- Businesses continue to rely heavily on **structured data management** and **transactional consistency**, making SQL expertise essential for data engineers and analysts.

- Organizations should consider **adopting hybrid database strategies** that combine relational and NoSQL databases to handle both structured and unstructured data efficiently

- Companies can **reduce operational costs** and improve performance by **migrating to managed cloud databases**, aligning with the broader digital transformation trend.

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# DASHBOARD

**IBM Cognos Dashboard Tabs** are:

Current Technology Usage

Future Technology Trend
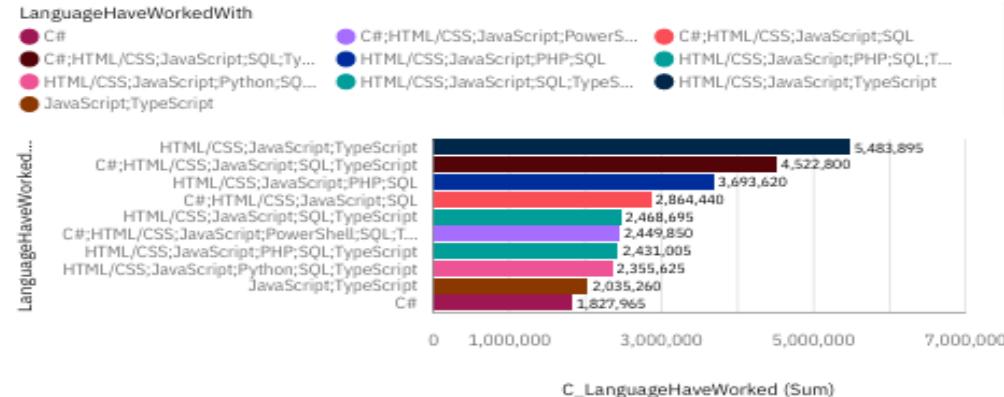
Demographics
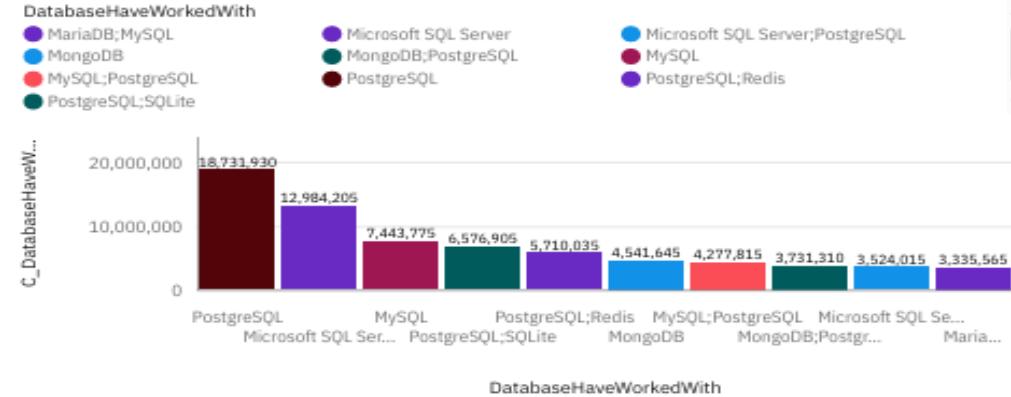
# DASHBOARD TAB 1(CRRENT TECHNOLOGY USAGE)

# DASHBOARD TAB 2(FUTURE TECHNOLOGY TREND)

## Future Technology Trend
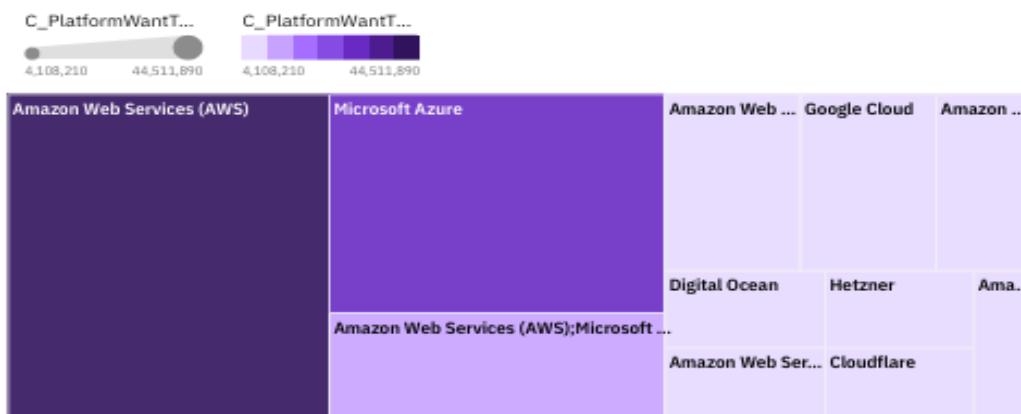
### Top 10 Programming Languages Respondents Want to Work With
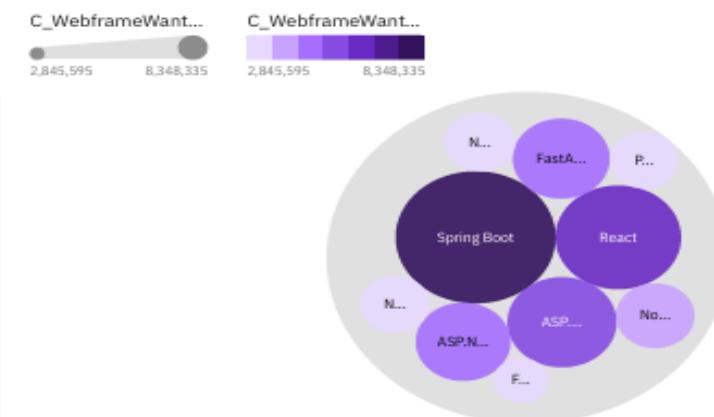


### Top 10 Database Want To Work With



### Top 10 Platform Want To Work With
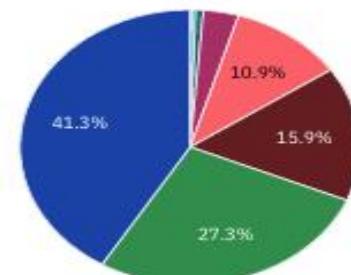


### Top 10 Web frame Want To Work With
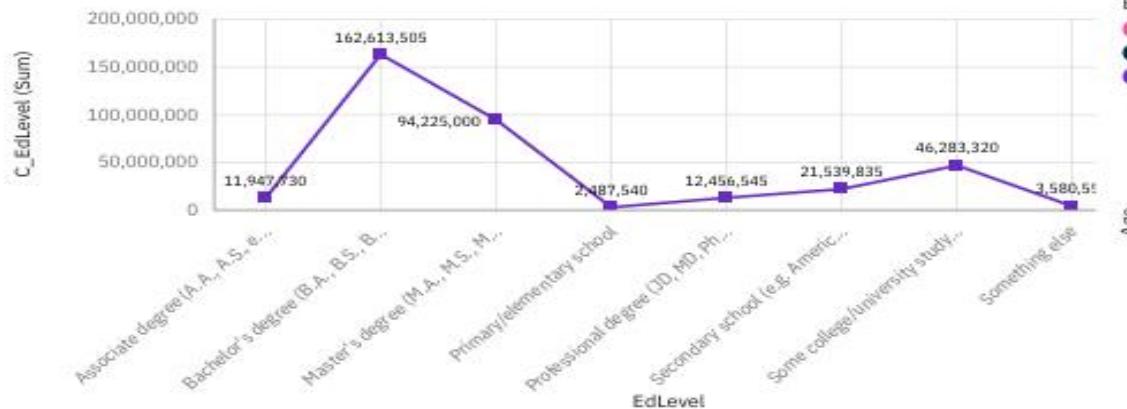
# DASHBOARD TAB 3(DEMOGRAPHICS)
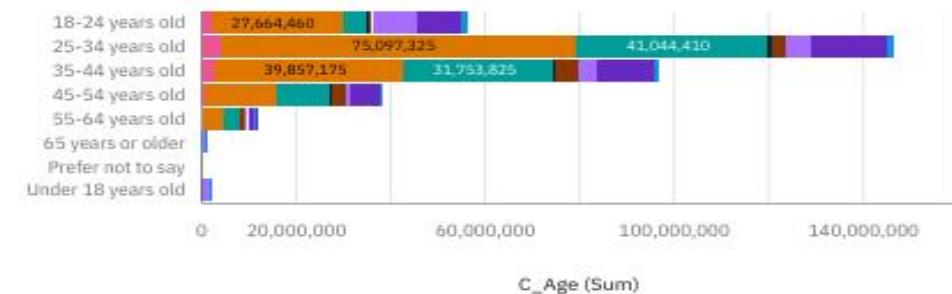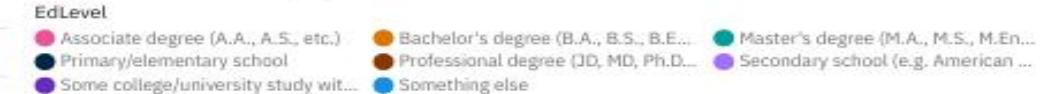
# INSIGHTS FROM DASHBOARDS

- **Developers under 35** dominate responses and prefer **modern, open-source tools**.

- **Python** and **JavaScript** remain universal across all industries.

- **PostgreSQL** and **SQL Server** are future favorites for cloud-native development.

- **Higher education** correlates with **higher compensation** and diverse tech stacks.

# OVERALL FINDINGS & IMPLICATIONS

## Findings

- Developers prefer flexible, scalable technologies.

- Open-source tools continue to replace legacy systems.

- Cloud adoption is reshaping platform and database choices.

## Implications

- **Employers** should focus on upskilling teams in Python, Go, and cloud tech.

- **Educators** should emphasize full-stack and AI/ML-ready tools.

- **Recruiters** can align job descriptions with these technology preferences.
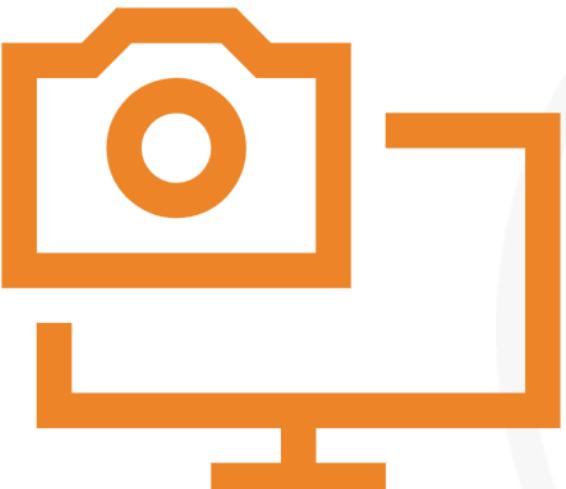
# CONCLUSION
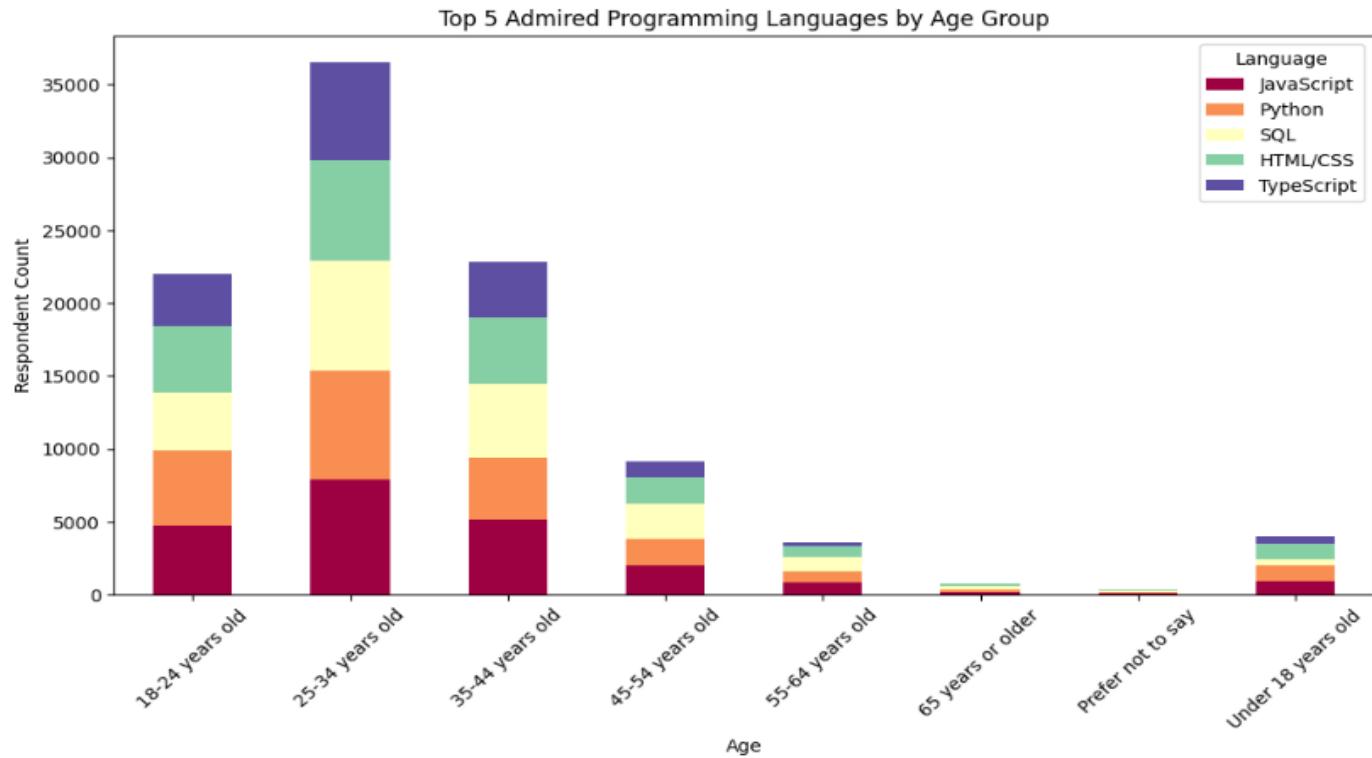
- **JavaScript, Python, and SQL** continue to dominate developer ecosystems.

- Strong interest in modern frameworks like **React and Node.js**.

- **Cloud and open-source databases** lead the next wave of digital transformation.

- Cognos dashboards provided clear, **data-driven insights** into evolving tech trends.
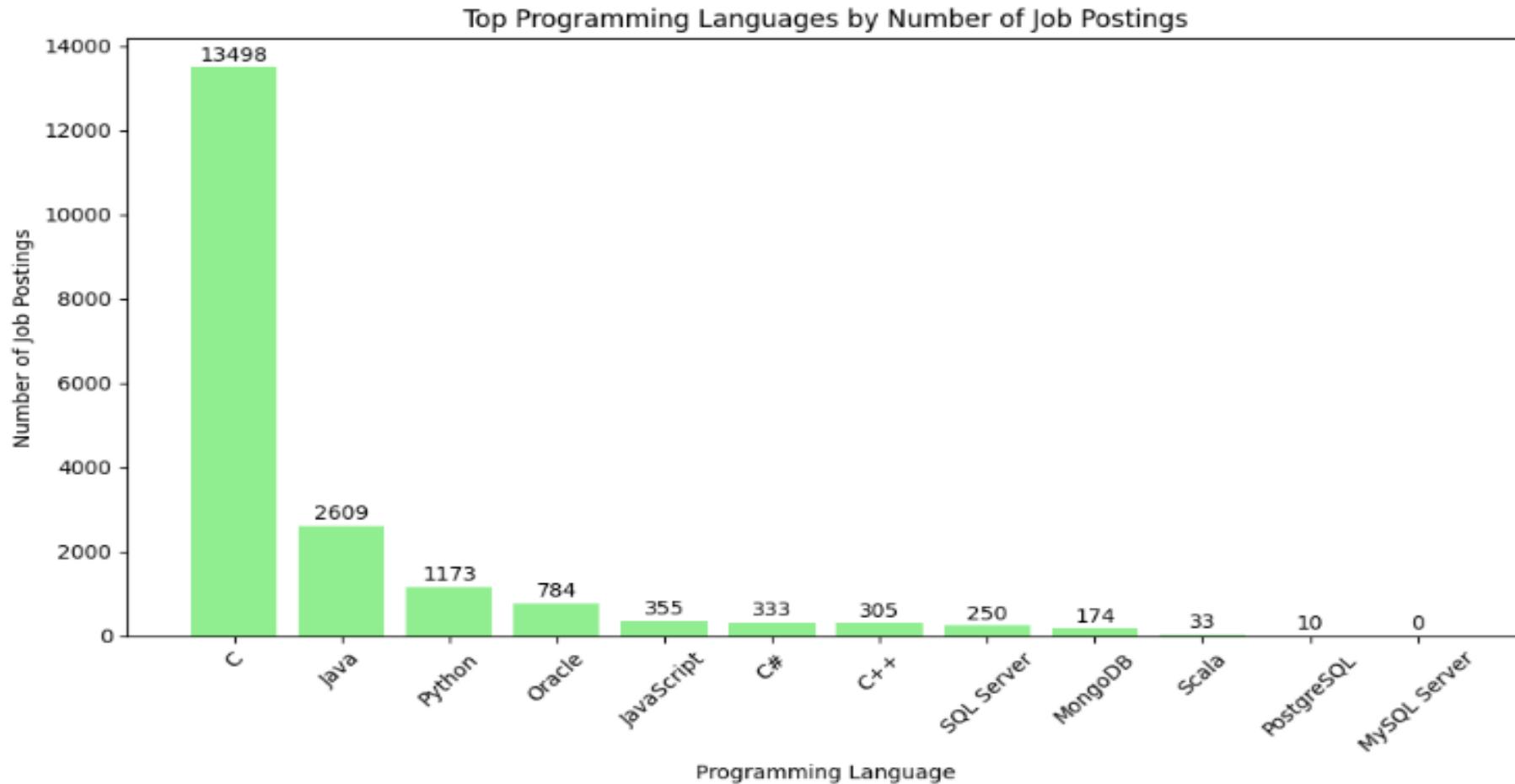
# APPENDIX

Stacked Chart for Preferred Programming Languages by Age Group

# JOB POSTINGS (BAR CHART)

# POPULAR LANGUAGES(BAR CHART)



Popular Languages Based on Average Annual salary

**Languages**
- C#
- C++
- Go
- Java
- Javascript
- PHP
- Python
- R
- SQL
- Swift

| Language | Average Annual Salary |
|---|---|
| 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 |

Average Annual Salary (Average)

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