Mapping the Future of In-Demand Tech Skills: Insights from Global Developer Data

Kulwadee Jirachaithorn
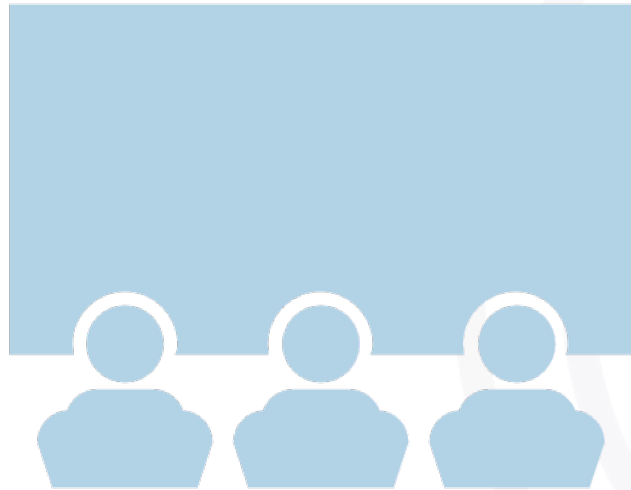
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OUTLINE

- Executive Summary
- Introduction
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- Discussion
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EXECUTIVE SUMMARY

- **Market snapshot:** Python/JavaScript/SQL remain anchors; TypeScript is surging; Go/Rust interest outpaces experience → clear skills gap.

- **Priority actions (next 12 months):**
  - Adopt TypeScript-by-default for web.
  - Pilot Go/Rust for high-performance services.
  - Launch a skills roadmap with quarterly KPIs.

- **Data platform direction:** Keep relational core; add **MongoDB/Redis** for real-time; assess migration from legacy proprietary DBs to **open-source/cloud-native**.

- **Talent strategy**: Close the TS/Go/Rust gap via targeted upskilling and hiring.

- **Expected impact:** Faster delivery, lower license/infra cost, stronger talent attraction & retention.

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INTRODUCTION

- **Background and Context**
  - Evolving Tech Landscape: Rapid shifts in demand for programming, data, and analytics skills.
  - Strategic Value: IT firms must track trends and align services with market needs.

- **Purpose of the Study**
  - Skill Demand: Identify and highlight the most in-demand technical skills.
  - Future Readiness: Deliver insights to guide training, hiring, and long-term strategy.

- **Scope of Data Sources**
  - Primary: Stack Overflow Developer Survey – global developer perspectives.
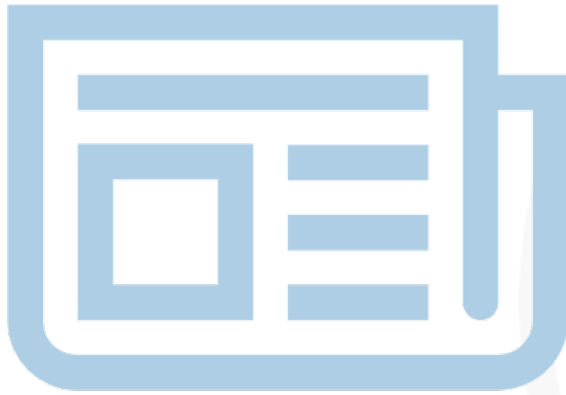 - Secondary: Job postings and training portals validating skill trends.

- **Analytical Approach**
  - Data Processing: Collecting, cleaning, and preparing datasets from multiple formats.
  - Visualization: Applying analytics and dashboards to present clear, data-driven insights.

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METHODOLOGY

- **Data Collection**
  - APIs and Web Scraping – Gathering raw data from online sources such as APIs and websites.
  - Survey and Job Data – Utilizing datasets like the Stack Overflow Developer Survey and job postings for trend analysis.
- **Data Wrangling**
  - Handling Data Quality Issues – Detecting and resolving duplicates, missing values, and inconsistencies in datasets.
  - Data Transformation – Normalizing, formatting, and preparing data for accurate analysis and visualization.
- **Exploratory Data Analysis**
  - Statistical Exploration – Examining distributions, correlations, and patterns within the dataset.
  - Outlier Detection – Identifying unusual values that may impact analysis accuracy.
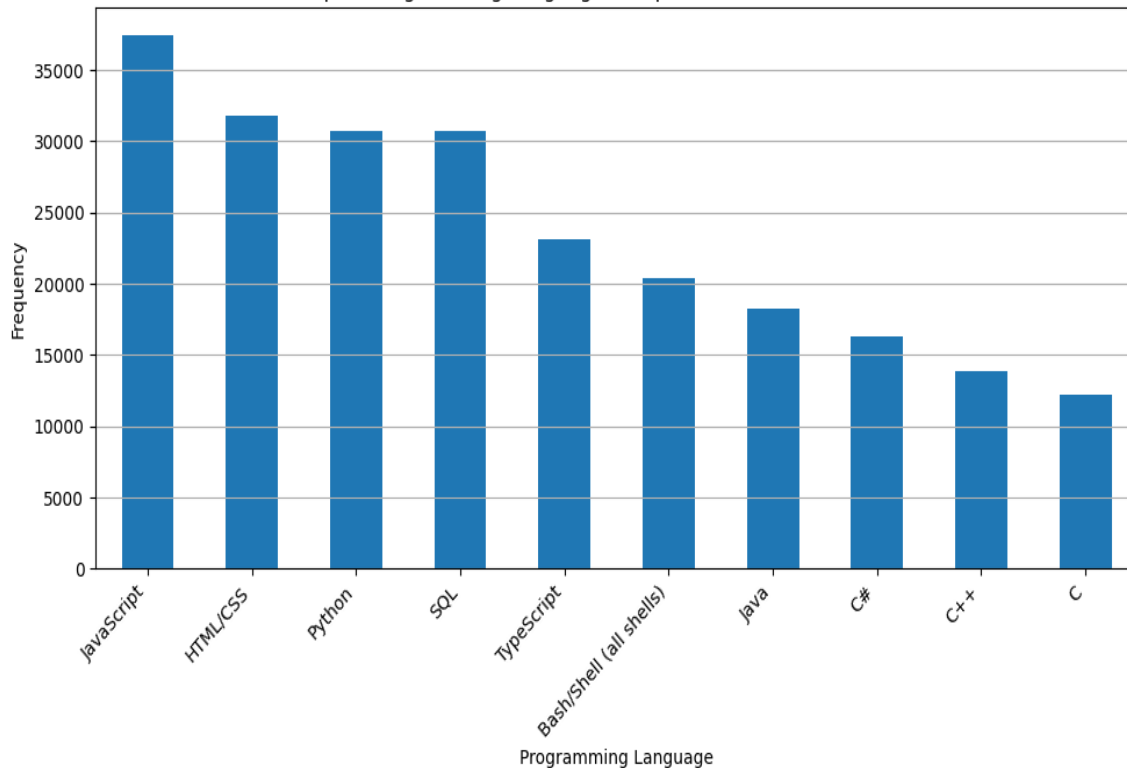- **Visualization & Reporting**
  - Statistical Analysis
  - Dashboard Development
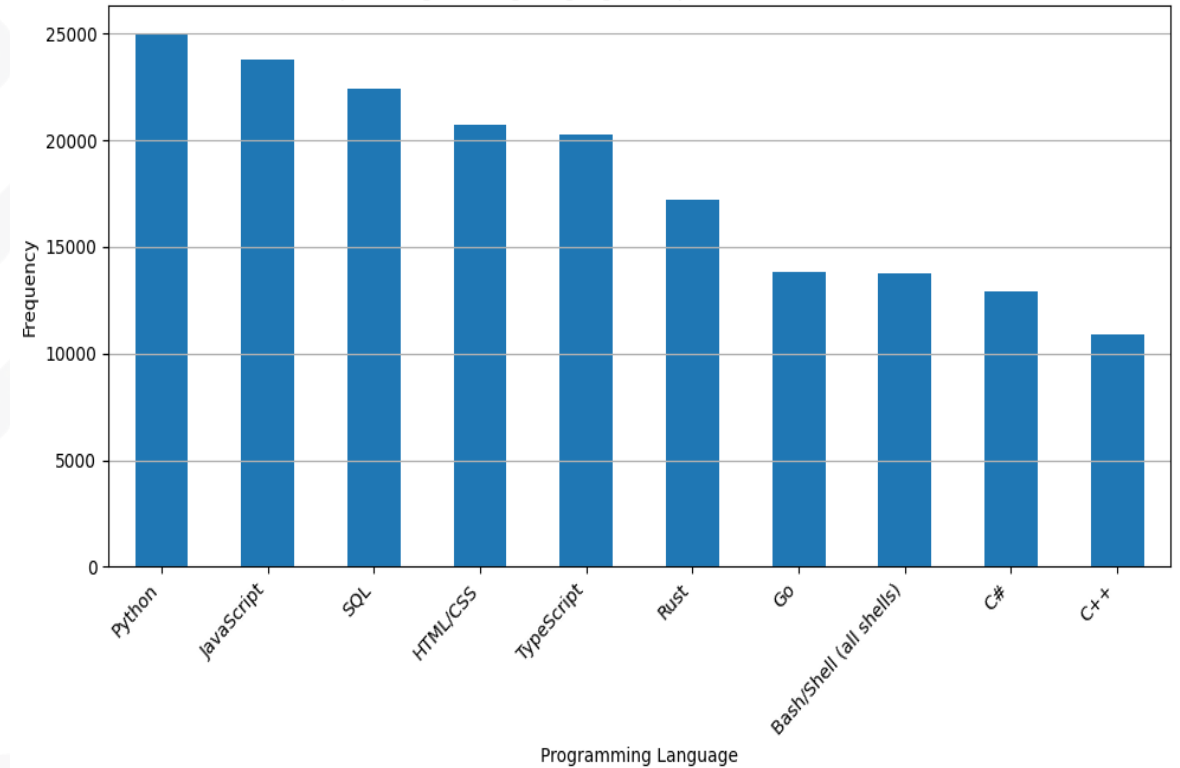
PROGRAMMING LANGUAGE TRENDS

Current Year

Top 10 Programming Languages Respondents Have Worked With

Next Year

Top 10 Programming Languages Respondents Want to Work With

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Note: These charts use the dataset from the original source.

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Python, JavaScript, and SQL are consistently top-ranked in both current use and future desire.

- Languages like Rust and Go are more desired for future work than current experience suggests.

- TypeScript shows strong and stable demand, being ranked 5th in both current use and future desire.
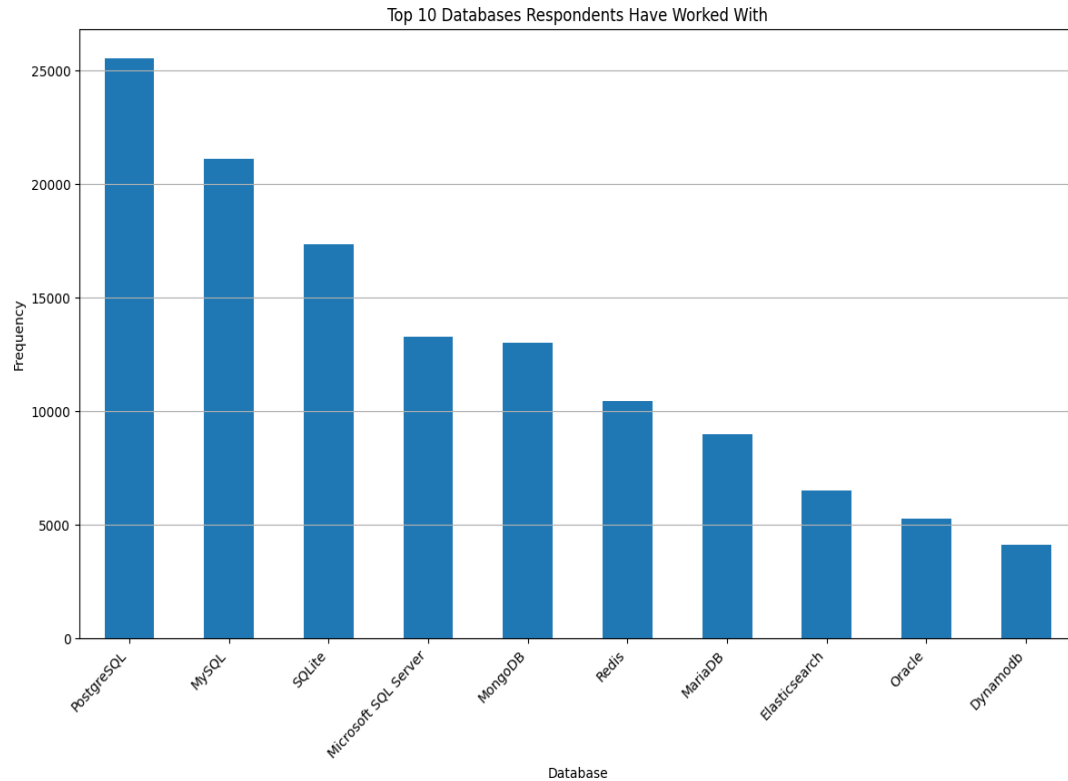
Implications

- These languages represent fundamental and enduring skills highly valued in the job market.

- This points to emerging languages gaining traction, potentially driven by their performance or modern features

- TypeScript is a growing and established language, indicating its increasing importance for robust and scalable applications.
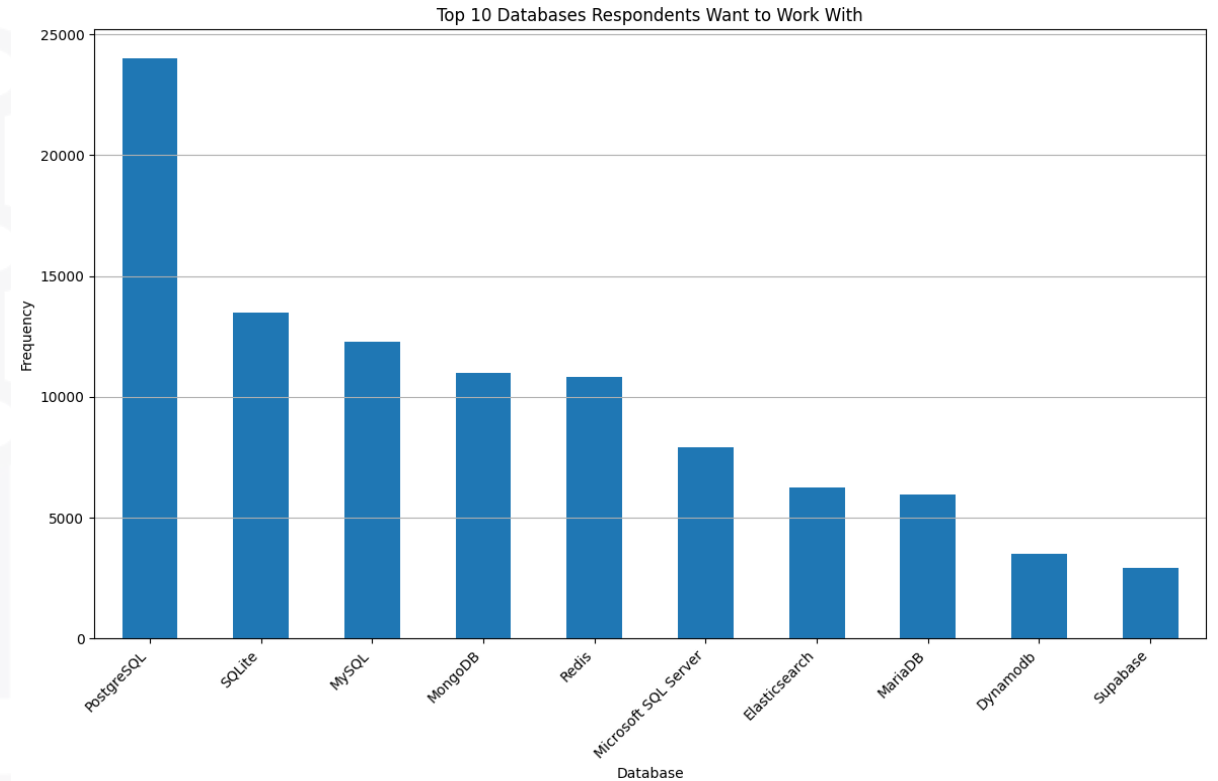
DATABASE TRENDS

Current Year

Top 10 Databases Respondents Have Worked With

Next Year

Top 10 Databases Respondents Want to Work With

Note: These charts use the dataset from the original source.

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DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- Relational databases like PostgreSQL, MySQL, and SQLite are widely used and remain popular for future work.

- NoSQL databases like MongoDB and Redis are also in high demand, both currently and for future projects.

- While Oracle is present in the top databases developers have worked with, it does not appear in the top 10 for those they want to work with.
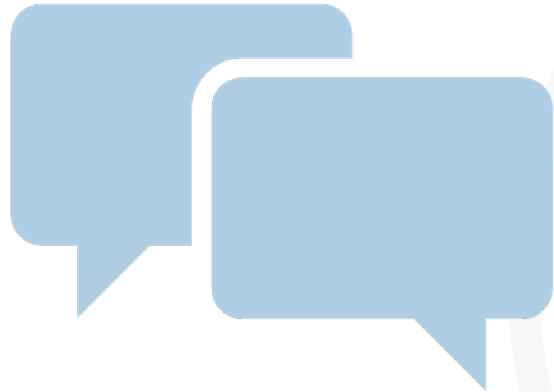
Implications

- SQL skills are a core competency with enduring relevance.

- Proficiency in NoSQL and specialized data stores is increasingly valuable.

- This suggests a potential shift away from some traditional enterprise databases towards newer or more developer-friendly alternatives for future projects.

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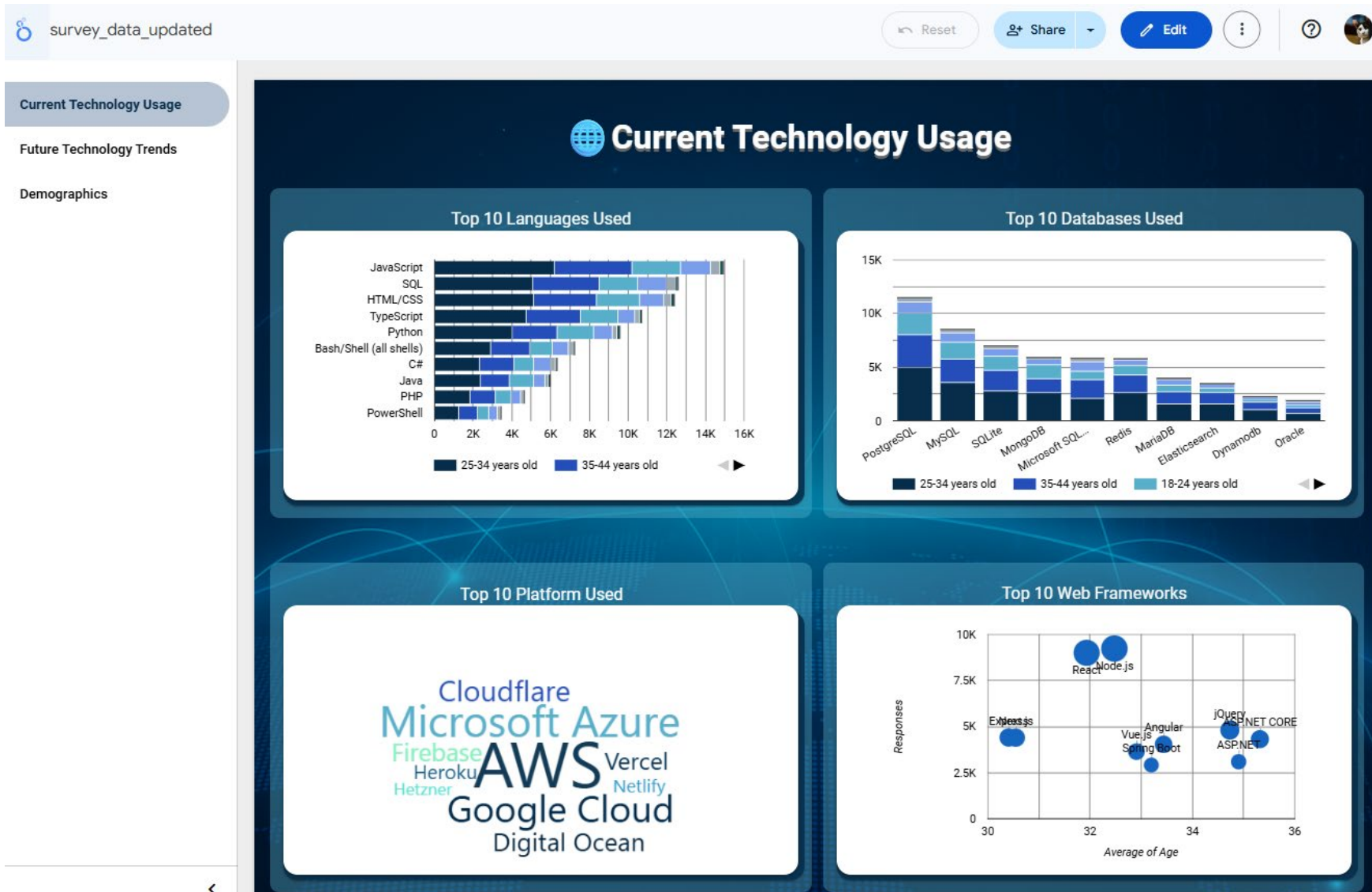# DASHBOARD

https://lookerstudio.google.com/s/mjZSiU0ltc8

This dashboard is based on a modified subset of the Stack Overflow Developer Survey; https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/HLOosvsPgIwt5dgOOh1RSg/survey-data-updated.csv

DASHBOARD TAB 1

DASHBOARD TAB 2
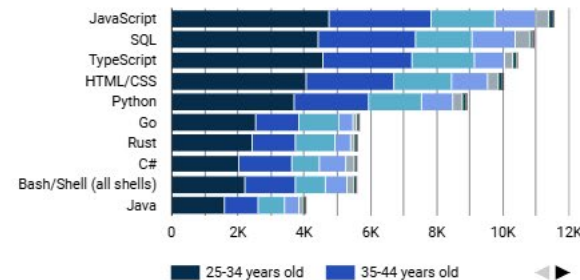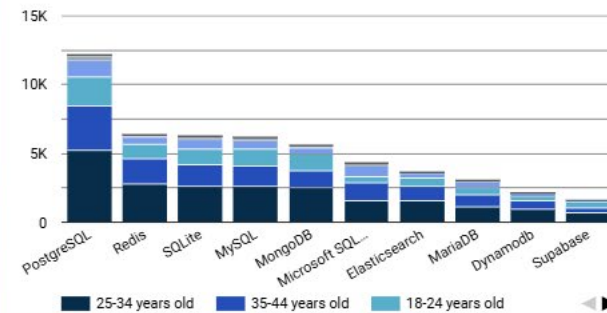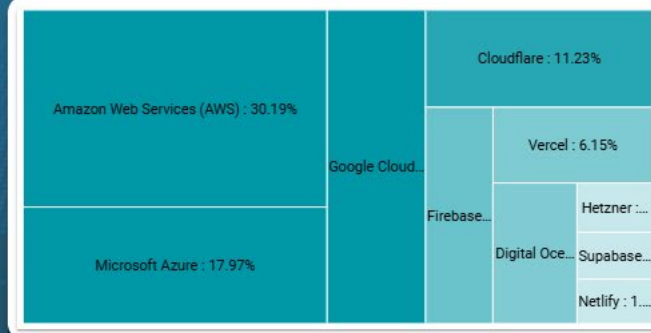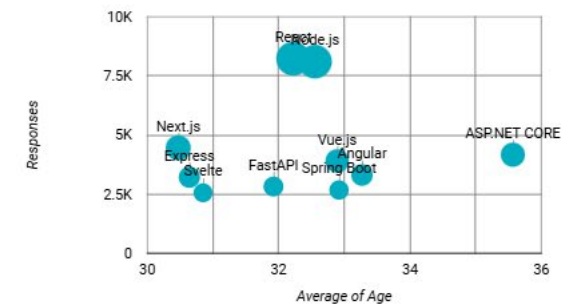
DASHBOARD TAB 3
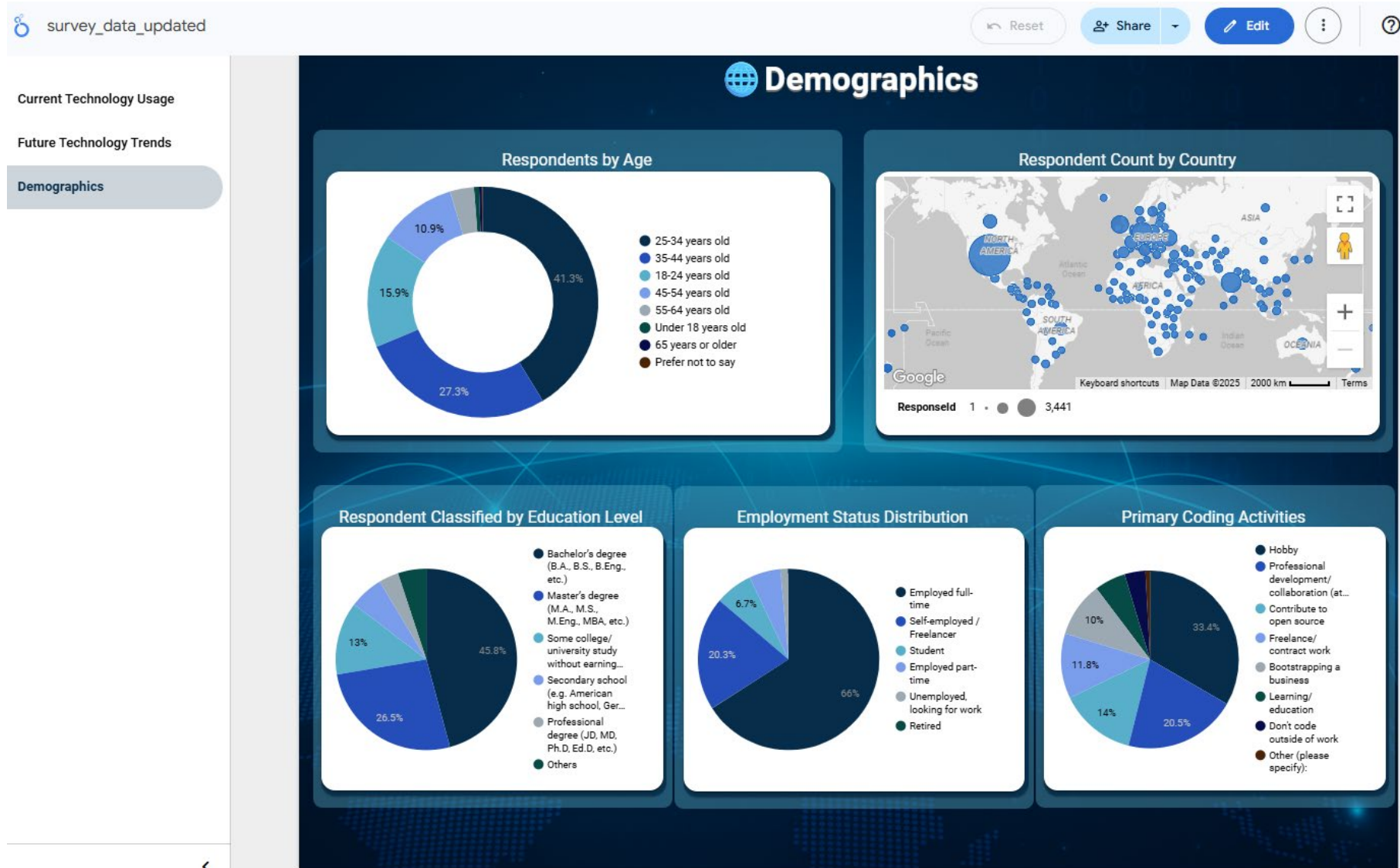
DISCUSSION

- **Market signals:** Python/JavaScript/SQL remain anchors; TypeScript is surging; Go/Rust show high intent-to-use vs experience → clear skills gap.

- **Data platforms:** Relational (PostgreSQL/MySQL/SQLite) stays foundational; MongoDB/Redis grow for real-time; assess migration of legacy workloads to open-source/cloud-native DBs.

- **Caveats:** Survey/self-selection bias; multi-select counts ≠ respondents; "want to use" reflects interest more than deployment; snapshot in time.

- **Action in Next 12 months:** Publish a skills roadmap (prioritize TS/Go/Rust), run pilots (Go/Rust services; TS-by-default for web), pair SQL+NoSQL in architecture, and track adoption KPIs quarterly.

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OVERALL FINDINGS & IMPLICATIONS

Findings

- Python, JavaScript, and SQL remain the dominant core skills.

- TypeScript is accelerating; Go/Rust show high intent-to-use vs experience → clear skills gap.

- Relational DBs (PostgreSQL/MySQL/SQLite) stay foundational while MongoDB/Redis grow; legacy proprietary DB usage skews toward the past.

Implications

- Maintain core proficiency; set TypeScript-by-default for web and pilot Go/Rust for high-performance services.

- Close the gap with targeted upskilling and hiring plans focused on TS/Go/Rust.

- Adopt a hybrid SQL + NoSQL data architecture and evaluate migrations to open-source/cloud-native databases to lower cost and increase agility.

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CONCLUSION

- **Core remains stable**: Python/JavaScript/SQL continue to anchor delivery and should be maintained as foundational skills.

- **Emerging priorities**: TypeScript is surging; Go/Rust show the largest interest–experience gap—our key upskilling and hiring focus.

- **Data platform direction**: Keep relational as the base while pairing with MongoDB/Redis for real-time needs; assess migrations from legacy proprietary DBs to open-source/cloud-native.

- **Execution**: Adopt TypeScript-by-default for web, pilot Go/Rust for high-performance services, and run a 12-month skills roadmap with quarterly KPI tracking.
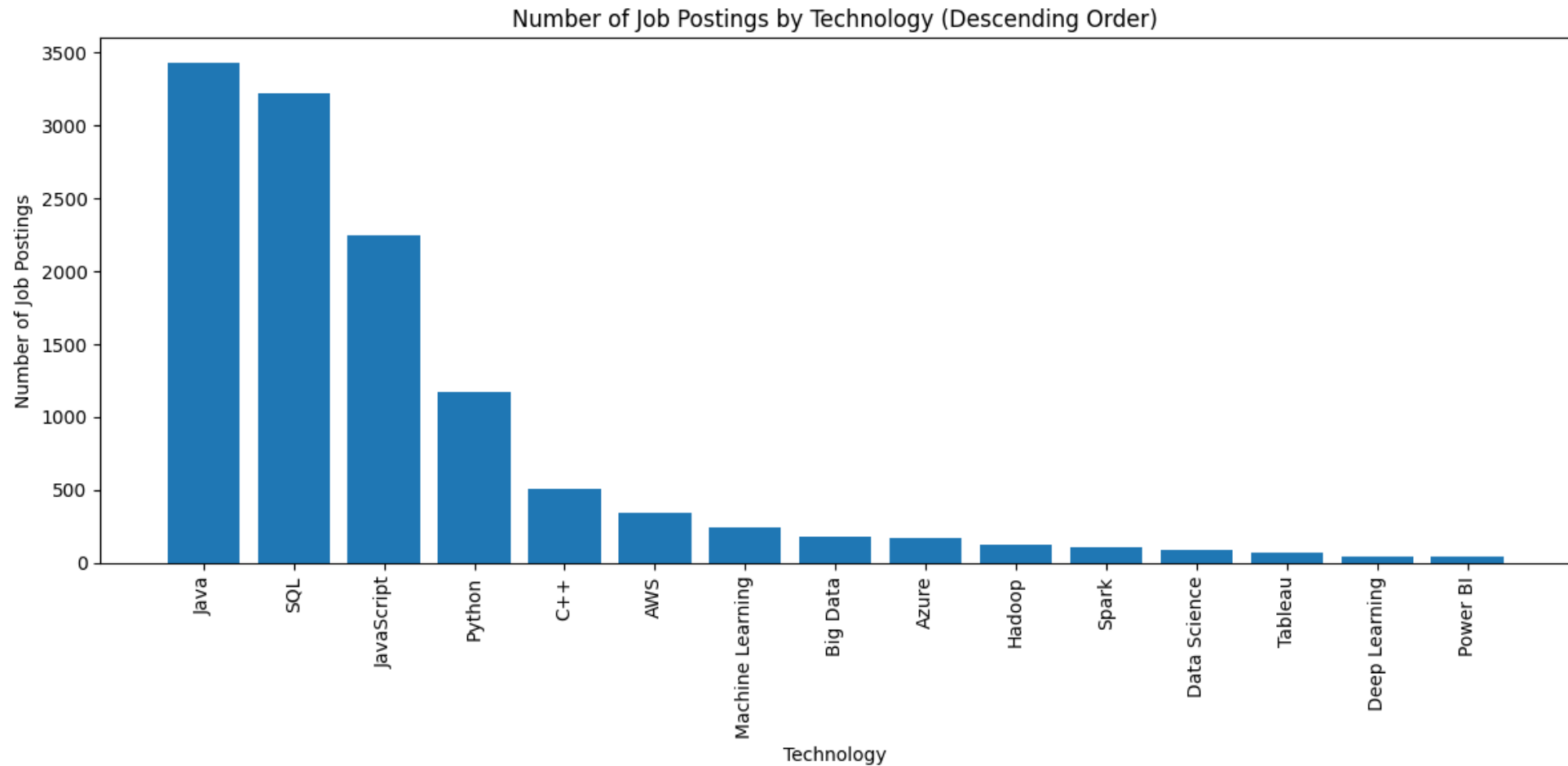
APPENDIX

- Include any relevant additional charts, or tables that you may have created during the analysis phase.

JOB POSTINGS

Number of Job Postings by Technology (Descending Order)
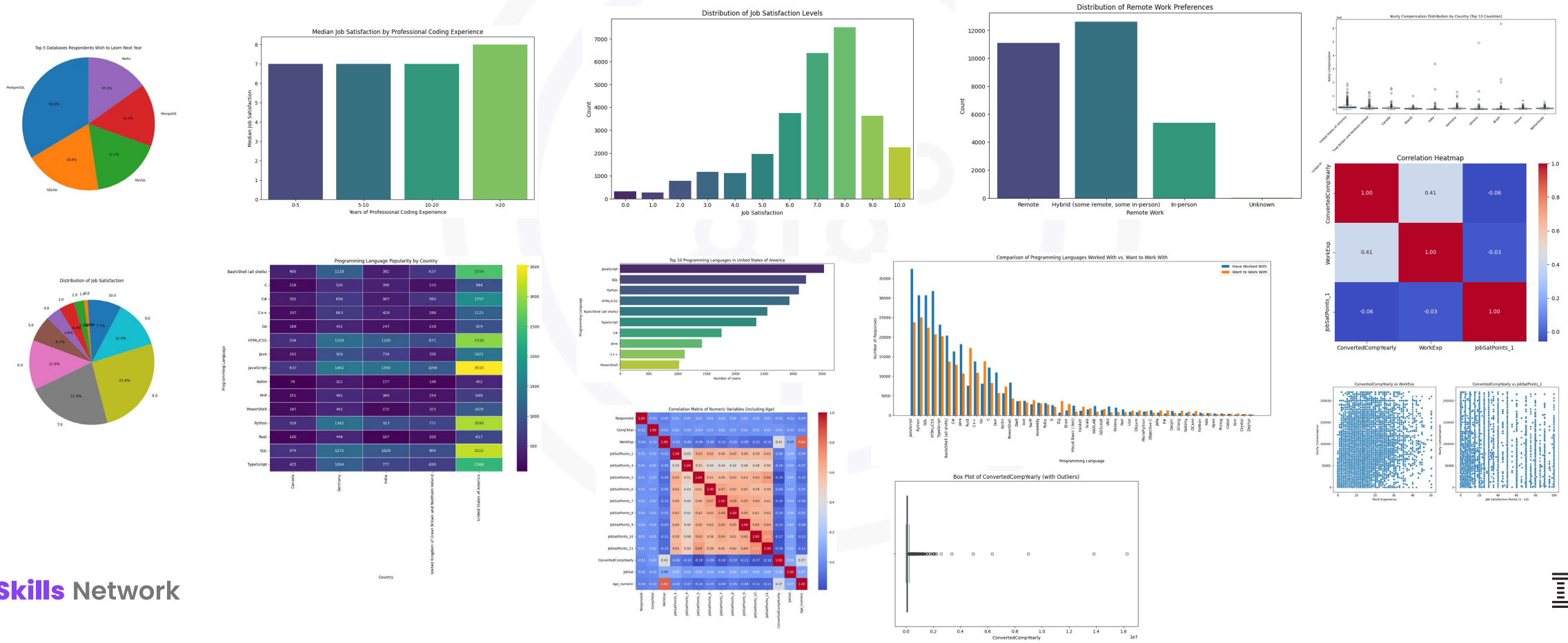
POPULAR LANGUAGES

In Module 1 you have collected the job postings data using web scraping in a file named "popular-languages.csv". Present that data using a bar chart here. Order the bar chart in the descending order of salary.

Average Annual Salary by Programming Language

Programming 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