

Decoding IT: Global Insights & U.S. Market Dynamics

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 - Charts
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EXECUTIVE SUMMARY

Languages & Databases

- **Leaders Tools:** JavaScript, Python, SQL & PostgreSQL remain dominant and trusted in the tech landscape.
- **Emerging Stars:** Go, Rust, Redis & Supabase rise to meet modern demands for performance and innovation.
- **Declining:** Java & Oracle face sharp drops, reflecting shifts towards contemporary tools.

Participation & Demographics

- **Decline:** 2024 sees a 26.6% drop in participation.
- **Consistency:** U.S. still leads (17% participation).

U.S. IT Market Insights

- **Skill Gap:** U.S. developer expertise falls short of market demands.
- **Python:** High demand, top salaries, unmatched opportunities—*the ultimate leader*.
- **PostgreSQL:** Most experienced database, yet low market demand.
- **Job Concentration:** 74.5% IT jobs in Northern U.S., Washington, D.C. leading as the hub.



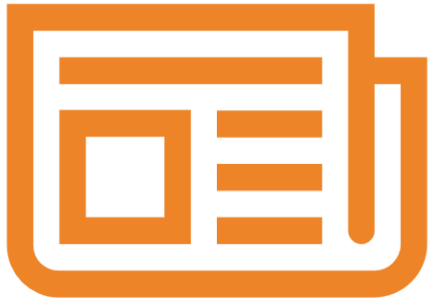
INTRODUCTION



- **Purpose:** To uncover global IT trends and analyze U.S. market dynamics using insights from the Stack Overflow 2024 survey and complementary data.
- **Target Audience:** Technology leaders, hiring managers, and decision-makers in the IT industry.
- **Value:** Offers actionable insights to inform strategic decisions, address talent gaps, and stay ahead in an evolving tech landscape.
- **Worldwide Insights:** Trends in programming languages, databases, and emerging tools.
- **U.S. Focus:** Employment analysis—top hiring cities, supply vs. demand, and salary comparison for top 10 programming languages.



METHODOLOGY



Data Sources:

- Stack Overflow 2024 Survey dataset.
- Web scraping & API integration for U.S. job postings and salary data.

Tools: Python, VS Code, IBM Cognos, Jupyter Notebook, Google Drive.

Data Preparation:

- Python script for wrangling and splitting multi-choice responses.
- VS Code to create multiple CSV files for better data organization.
- Optimized datasets for IBM Cognos dashboard & Jupyter Notebook charts.

Challenges:

- Addressed large dataset volume and kernel limitations with modular processing.

Approach: Identified global trends, analyzed U.S. job market supply vs. demand, and compared salaries for top programming languages.

WORLDWIDE IT TRENDS: CURRENT & FUTURE INSIGHTS FROM STACK OVERFLOW 2024 SURVEY



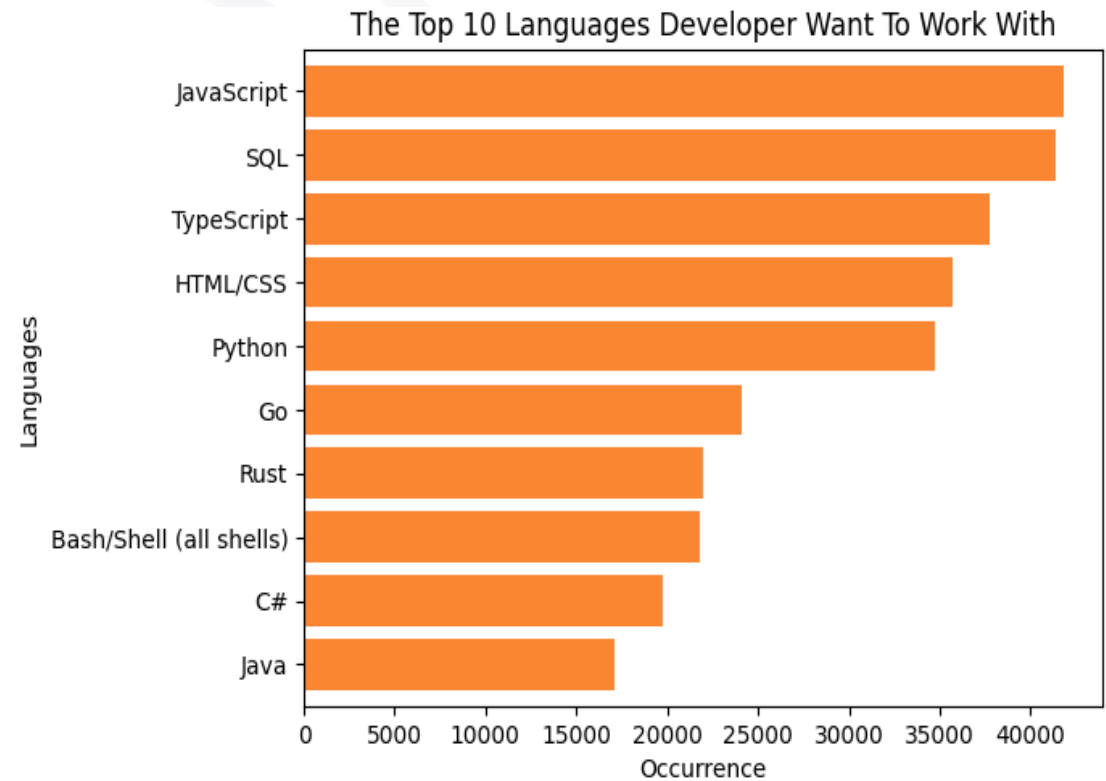
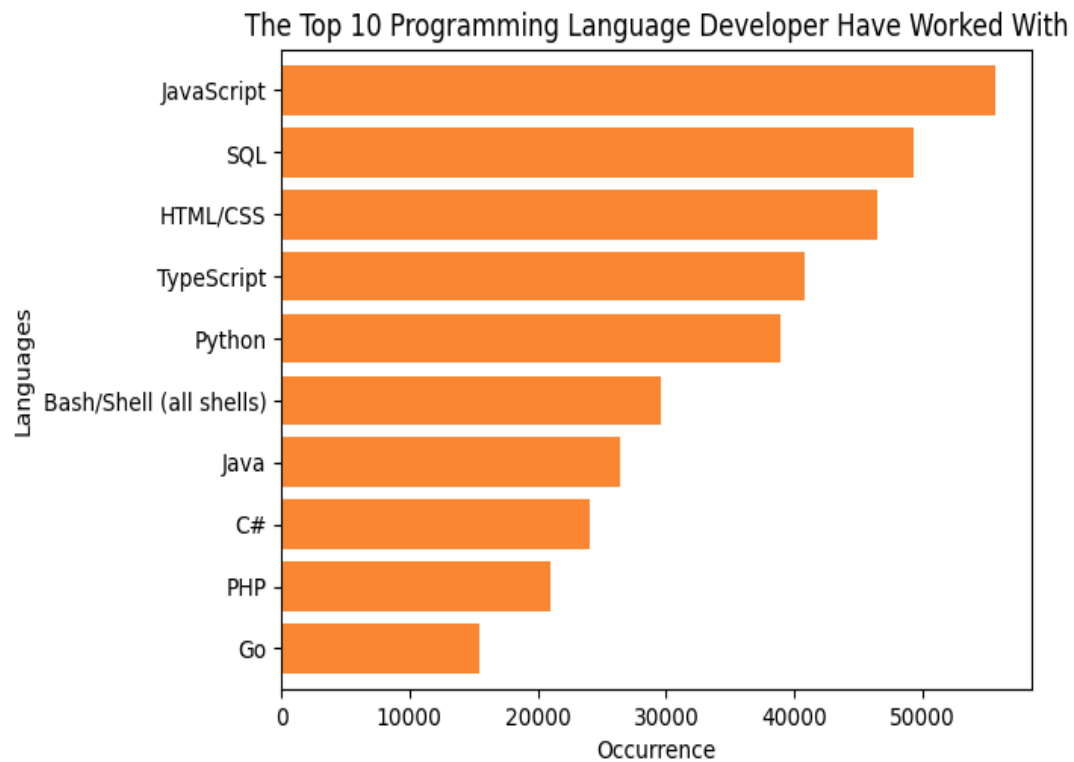
Analysis of survey responses from over **65,000 participants** worldwide to uncover current IT trends and **tackle future technological challenges.**



PROGRAMMING LANGUAGE DYNAMICS WORLDWIDE

Current Trends

Future Trends



PROGRAMMING LANGUAGE DYNAMICS - FINDINGS & IMPLICATIONS

Findings

- **JavaScript, SQL, Python :** Consistent Leaders at the top
- **Java:** Declining popularity (7th → 10th).
- **Rise of Go:** 10th → 6th
- **Emergence of Rust:** Rust enters the spotlight (enters 7th)

Implications

Stability in Current Leaders: consistent relevance in the tech industry.

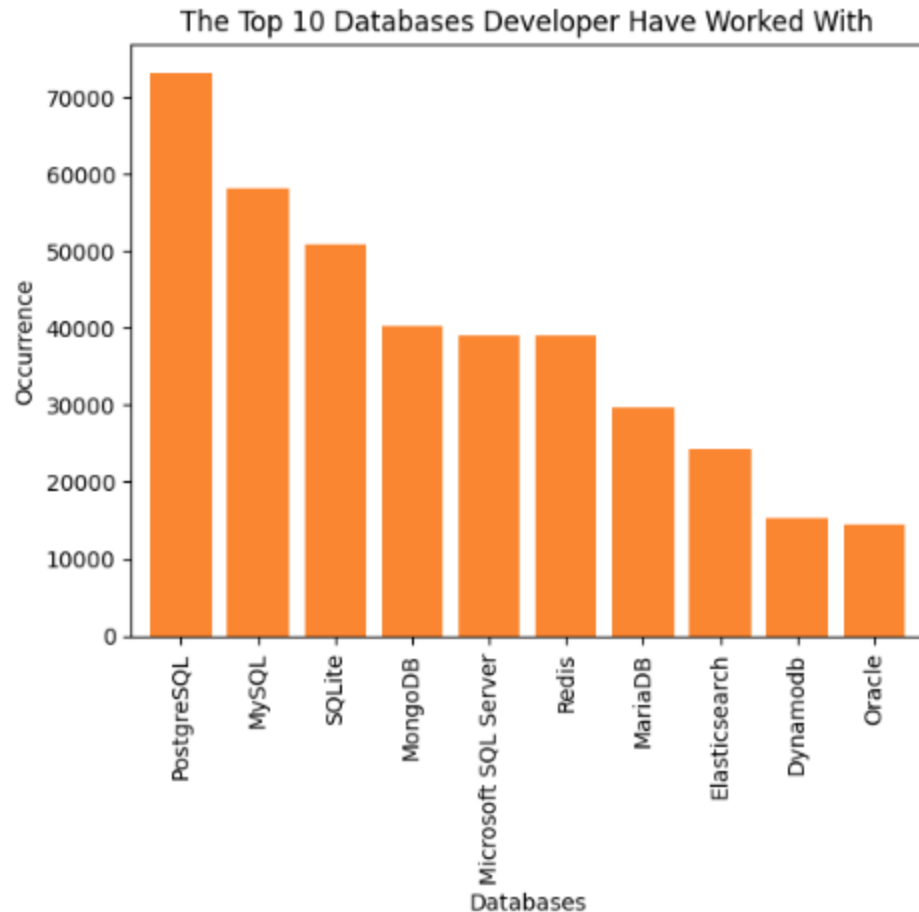
Technological Transition: shift towards modern languages better suited for emerging industry needs.

Rise of Modern Languages: reflecting demand for performance, security, and efficiency in software development.

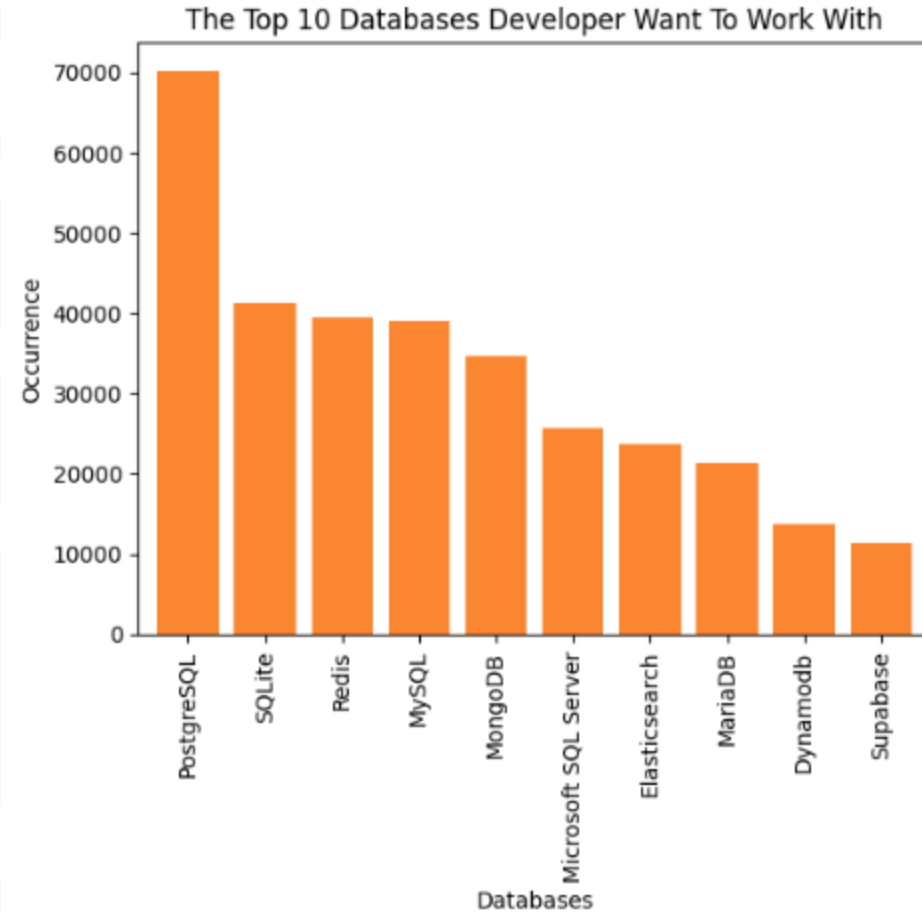


DATABASE DYNAMICS WORLDWIDE

Current Trends



Future Trends



DATABASE DYNAMICS - FINDINGS & IMPLICATIONS

Findings

- **PostgreSQL:** Remains at the top
- **MySQL:** Drops in ranking (2nd → 4th).
- **Redis:** Climbs significantly (6th → 3rd).
- **Oracle:** Falls out of the top 10 future trends.
- **Supabase:** Makes a debut in future trends (enters at 10th).

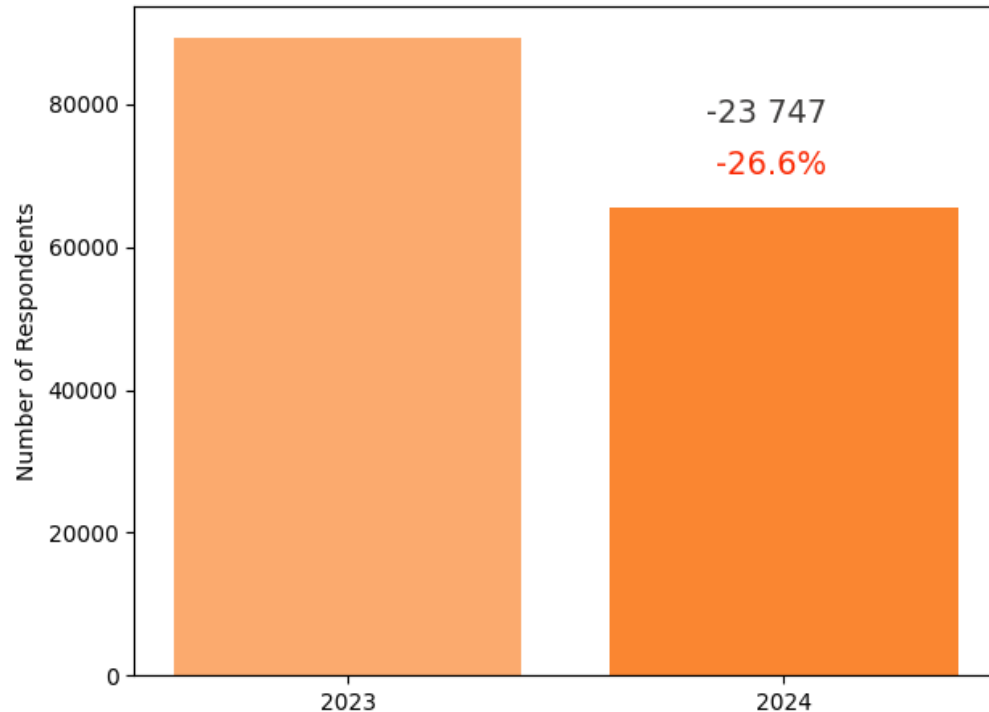
Implications

- **PostgreSQL Dominance:** top position solidifies it as a reliable, versatile choice for developers, likely driving more long-term investment in this technology.
- **Shift in MySQL Demand:** potential decline in preference or competition from newer, more modern alternatives.
- **Redis Rising:** increasing adoption for use cases like caching and real-time applications.
- **Oracle's Decline:** may reflect developers favoring open-source or more accessible database solutions.
- **Supabase Opportunity:** growing interest in platforms offering simplicity and integration for modern workflows.

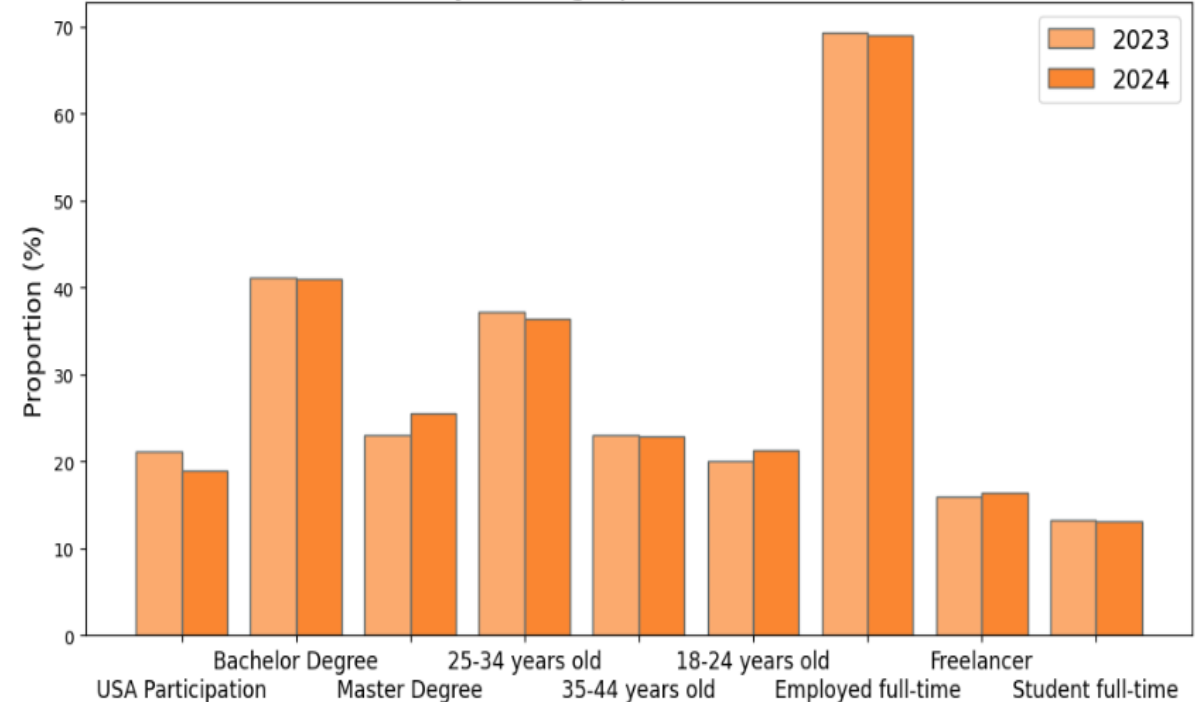


YEAR-OVER-YEAR INSIGHTS: DEVELOPER REPRESENTATION AND DEMOGRAPHICS

Comparison of Survey Respondents 2023 vs. 2024



Survey Demographics 2023 vs 2024

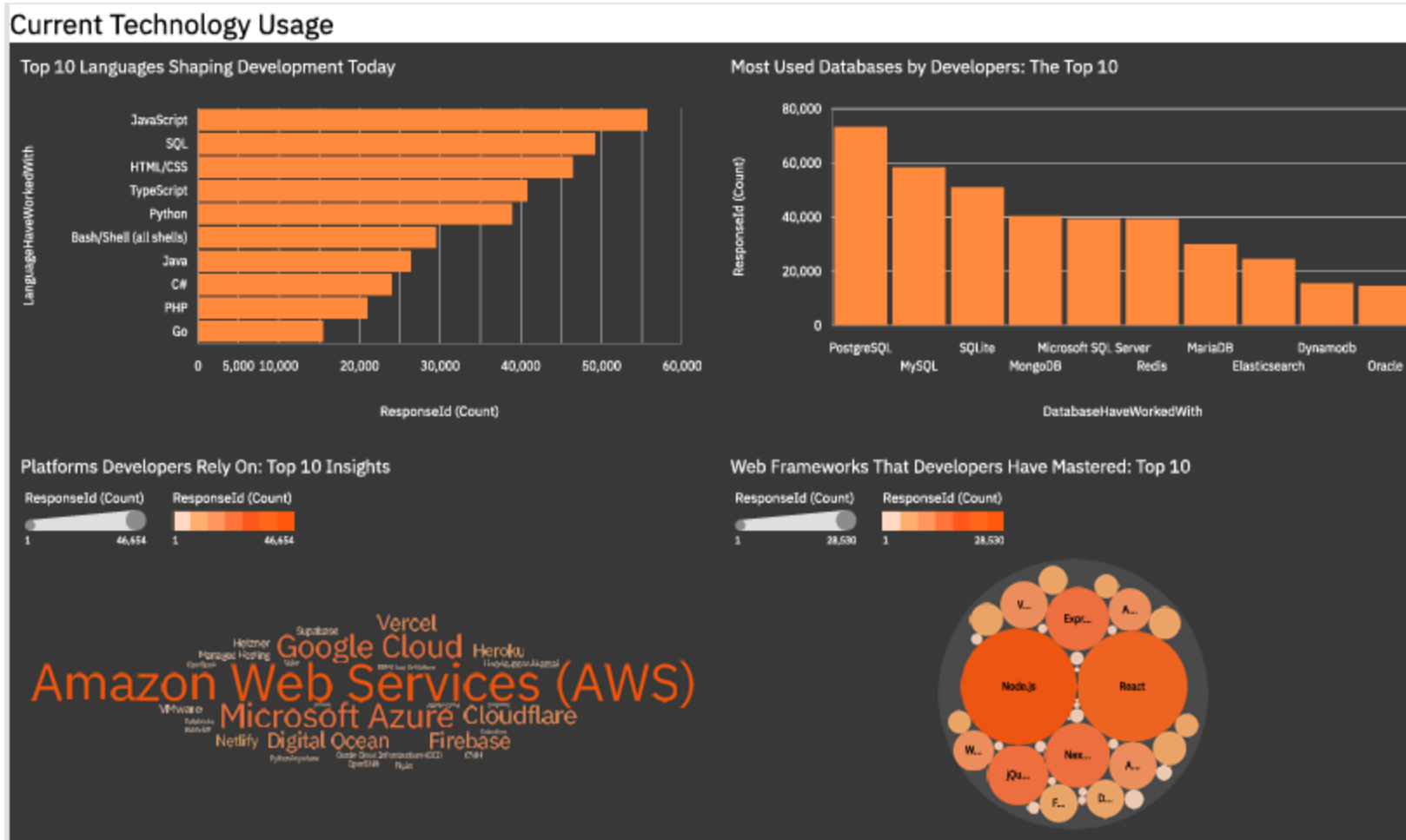


PARTICIPATION TRENDS AND DEMOGRAPHIC PROFILES: SUMMARY AND DISCUSSION



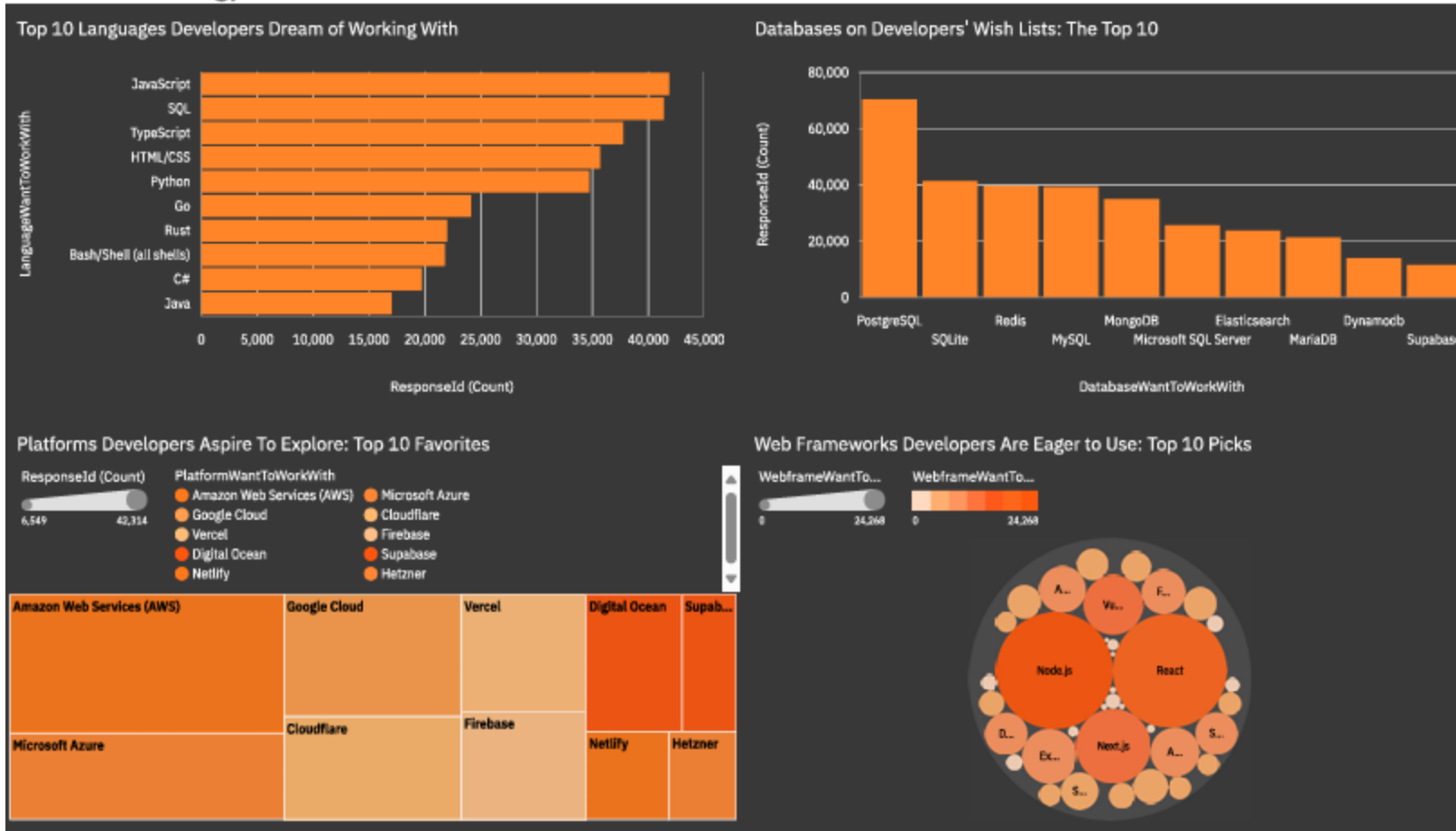
- Participation down **26.6%** (-23,747) in 2024 vs. 2023.
- Demographics unchanged; **U.S. developers still lead** (17% vs. 21.21% in 2023).
- Potential causes of drop in participation: **disengagement, weaker promotion**, external factors.
- **Further investigation** needed to clarify reasons.

DASHBOARD TAB 1 : CURRENT TECHNOLOGY USAGE



DASHBOARD TAB 2 : FUTURE TECHNOLOGY TRENDS

Future Technology Trends



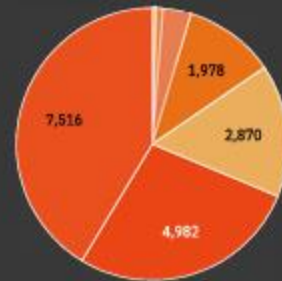
DASHBOARD TAB 3 : DEMOGRAPHICS

Demographic

Generational Snapshot of the IT World: Respondent Age Distribution

Age

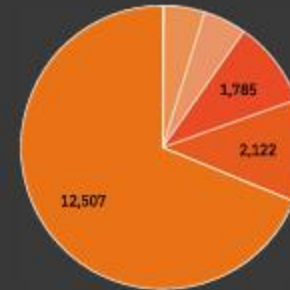
- Prefer not to say
- 65 years or older
- Under 18 years old
- 55-64 years old
- 45-54 years old
- 18-24 years old
- 35-44 years old
- 25-34 years old



Employment Status Across Developers: Full-time, Freelance, and More

Employment_status

- Retired
- Part-time Employment
- Full-time Student
- Freelancer/Full-time Employment
- Freelancer
- Full-time Employment



Mapping Developers Around the World: Country Insights

ResponseId (Count)

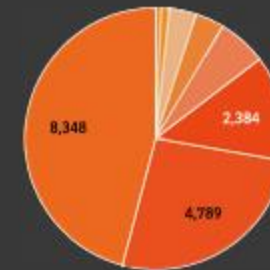
1 3,379



How Education Shapes the IT Industry: Developer Survey Insights

EdLevel

- Primary/elementary school
- Something else
- Associate degree (A.A., A.S., etc.)
- Professional degree (JD, MD, Ph.D...)
- Secondary school (e.g. American ...)
- Some college/university study wit...
- Master's degree (M.A., M.S., M.Ed...)
- Bachelor's degree (B.A., B.S., B.E...)



UNVEILING DEVELOPER TRENDS: PLATFORMS, FRAMEWORKS, DEMOGRAPHICS & FUTURE INSIGHTS



- **Demographics:** Majority of developers are aged 18–44, primarily employed full-time, freelance, or full-time students. Most hold a bachelor's or master's degree.
- **Platforms: Amazon AWS** and **Microsoft Azure** dominate current and future usage.
- **Web Frameworks: Node.js** and **React** remain top choices for both current tools and future trends.

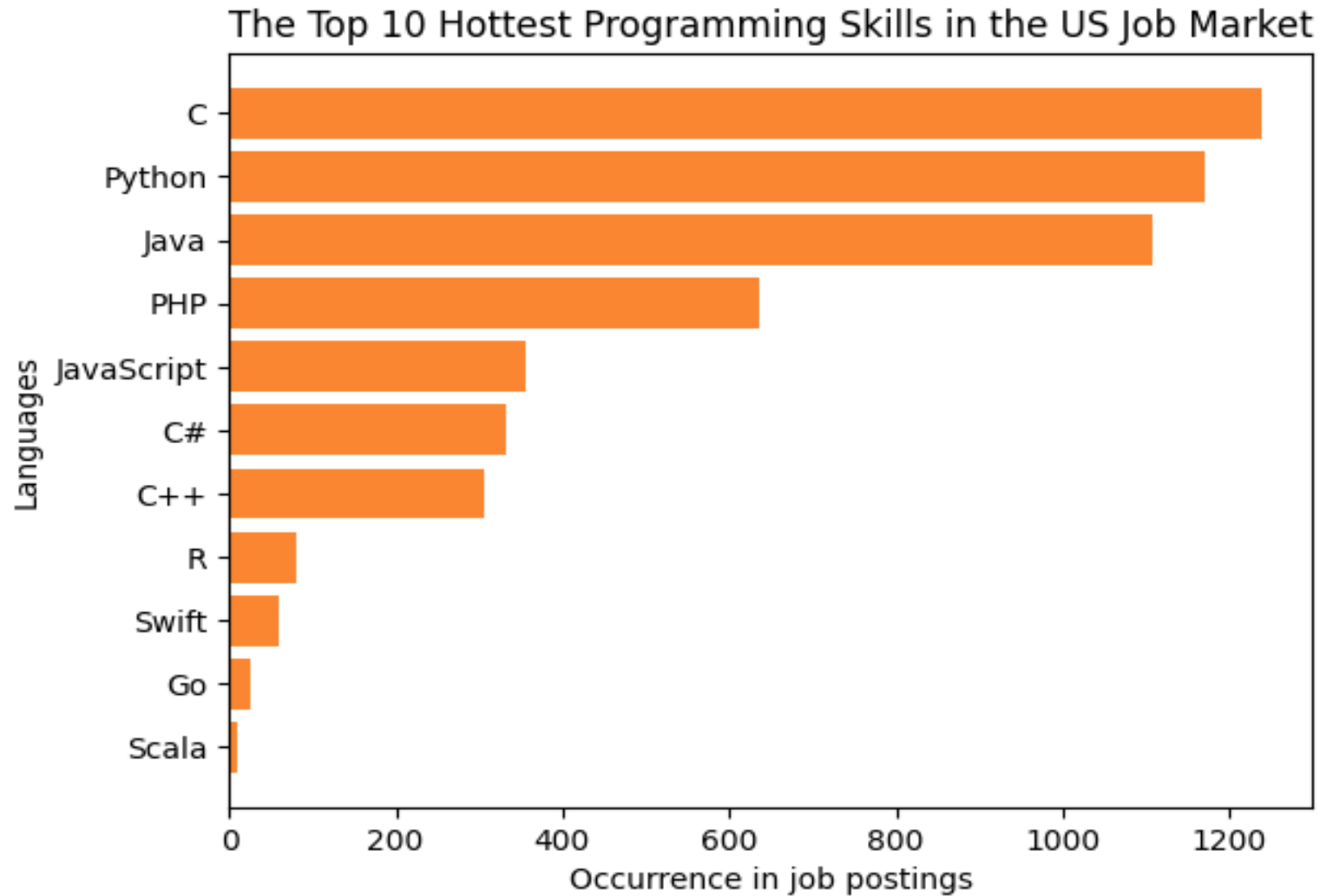


U.S TECH MARKET PULSE: MOST WANTED IT SKILLS & TOOLS

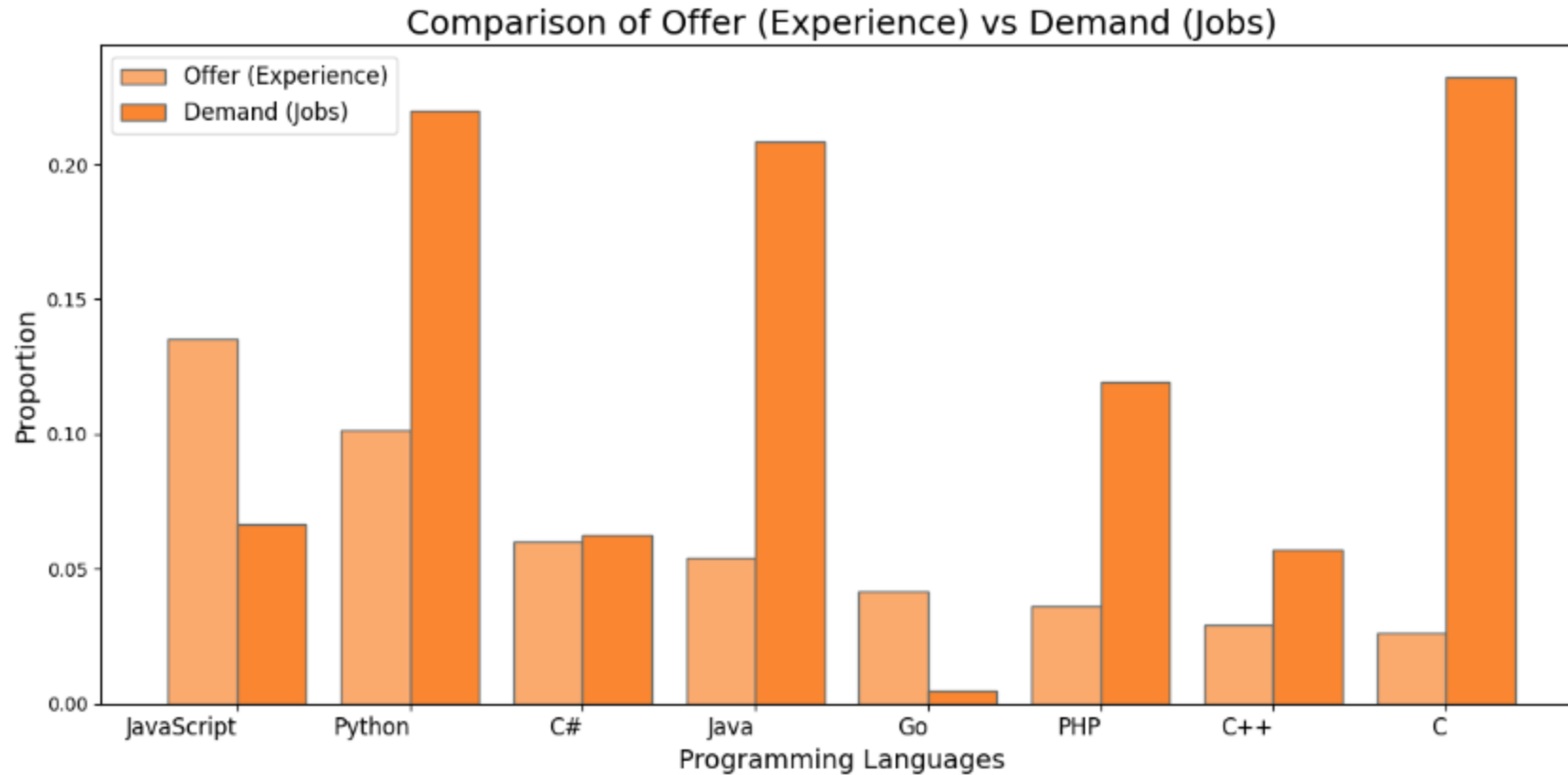
Analyzing **U.S. job market trends** to highlights the demand for IT roles, developer expertise, and salary dynamics while **revealing gaps** between skills supply and market needs.



TOP 10 HOTTEST PROGRAMMING SKILLS IN THE U.S JOB MARKET



TOP 10 U.S PROGRAMMING SKILLS : EMPLOYER DEMAND VS DEVELOPER SUPPLY



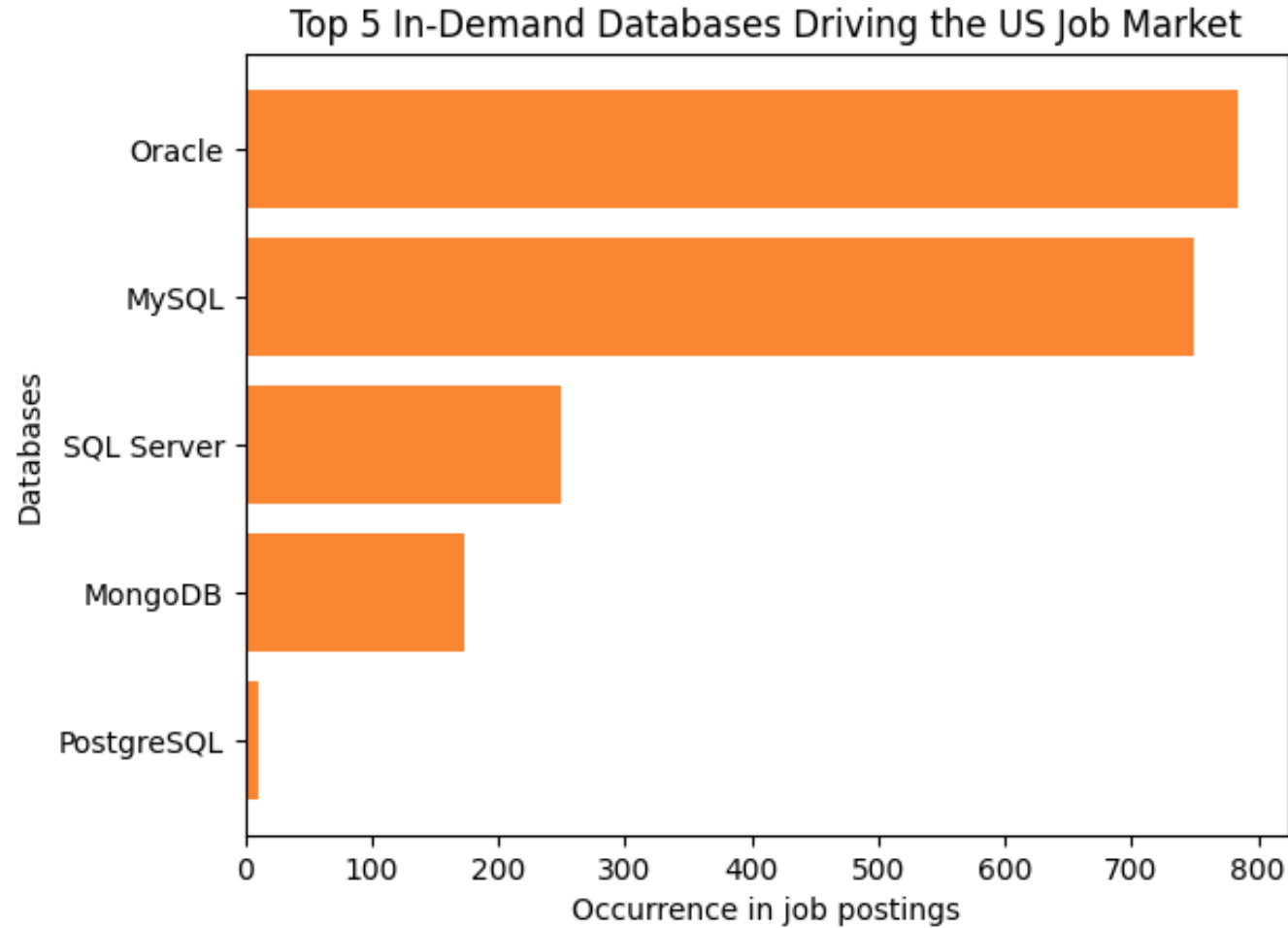
IN-DEMAND PROGRAMMING LANGUAGES: WHERE THE U.S. MARKET FALLS SHORT



- **Skill gap:** U.S. developers' expertise vs. market demand.
- Top languages in-demand: **C**, **Python**, and **Java** highly sought after.
- Supply **2-4 times lower** than demand; **largest gap for C**.



TOP 5 IN-DEMAND DATABASES DRIVING THE U.S JOB MARKET



TOP 5 DATABASES: U.S JOB MARKET INSIGHTS AND DEVELOPER SKILL GAP



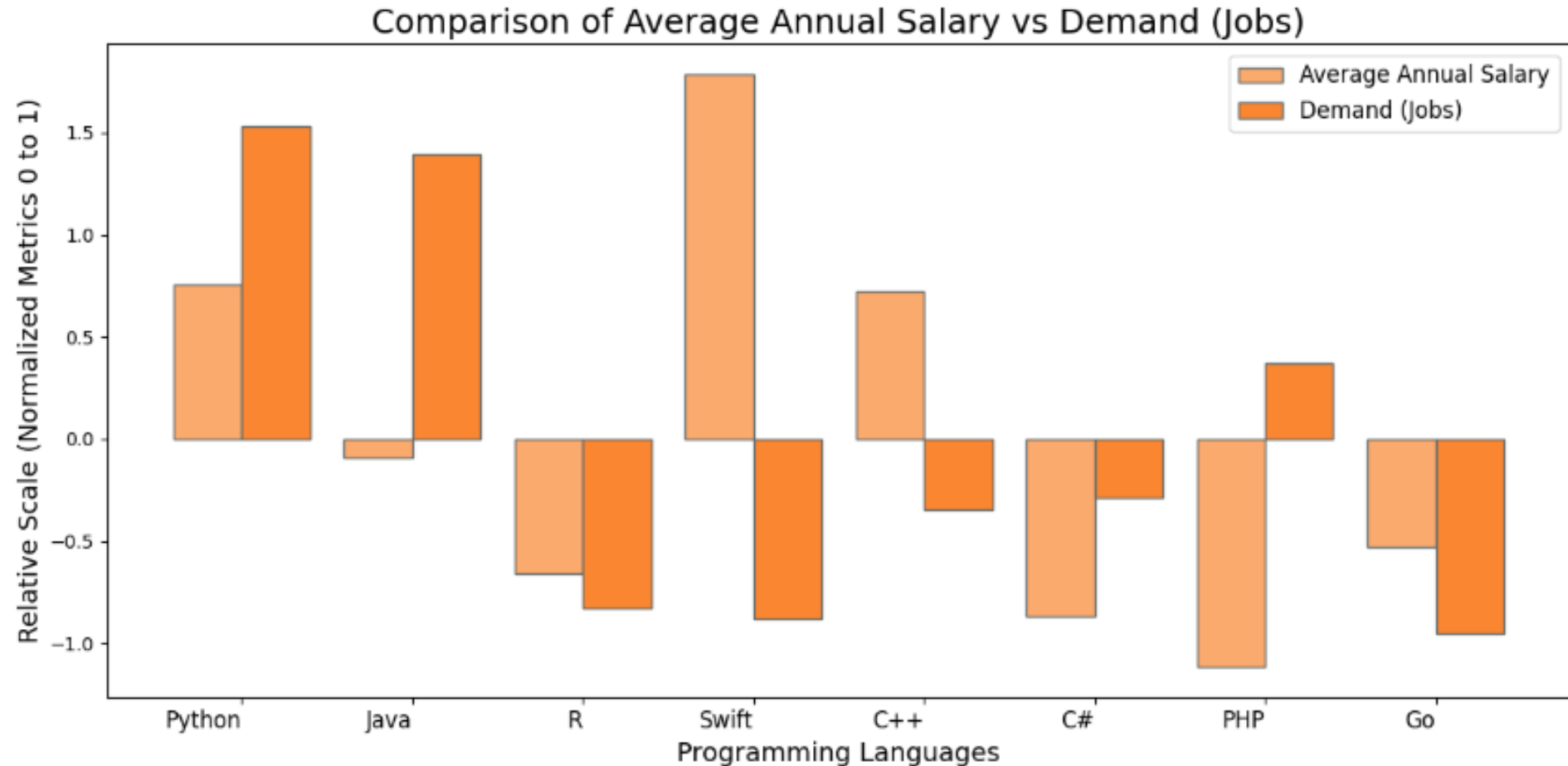
THE IMBALANCE IN THE TOP 5 DATABASES U.S MARKET



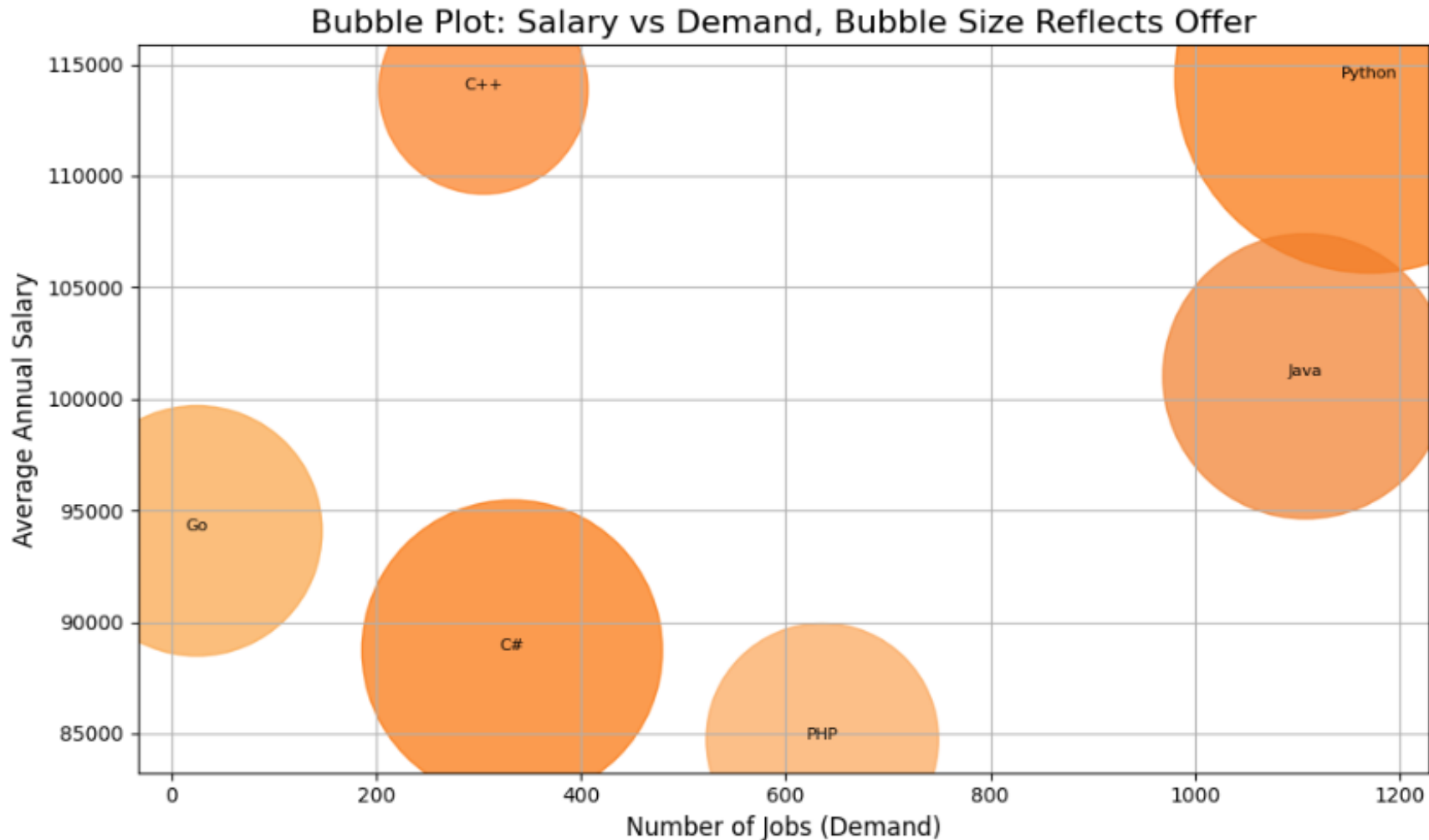
- **Oracle & MySQL:** High demand, but **supply about 12x and 3x lower.**
- **PostgreSQL:** Most experienced database among developers, **least in demand.**



BATTLE OF THE LANGUAGES: COMPARISON BETWEEN SALARY AND DEMAND IN U.S



U.S : MAPPING SALARIES, DEMAND, AND DEVELOPER SUPPLY IN LANGUAGES



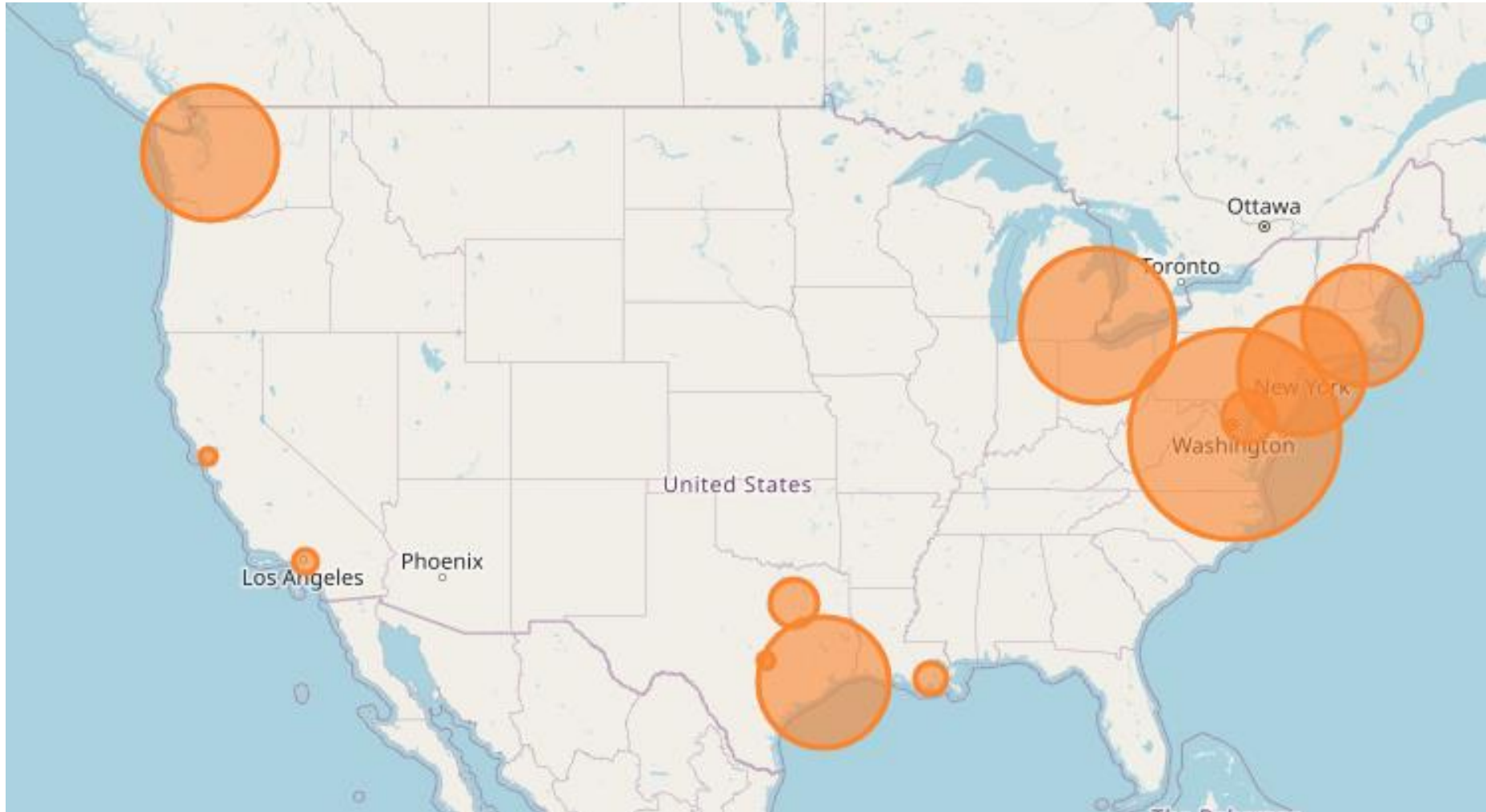
PYTHON TAKES THE CROWN: SALARY, DEMAND, AND OPPORTUNITY IN U.S



- **Python:** High demand, above-average salary, top in opportunities.
- **Swift:** Highest salary, but below-average demand (**niche/specialized**).
- **Java:** Moderate demand, salary slightly below average.
- **Python** emerges as the **ultimate winner**.



TOP TECH HUBS FOR IT PROFESSIONALS



A SHIFT IN THE IT LANDSCAPE: NORTHERN U.S. CITIES TAKE THE LEAD



- **Washington, D.C.:** Top hub with **19.7%** of IT job postings.
- 82% of IT jobs concentrated in: **Washington, Detroit, Seattle, Houston, NY, Boston.**
- **Major Concentration:** 74.5% of IT jobs are located in **Northern U.S. cities.**



OVERALL FINDINGS & IMPLICATIONS

Findings

- **Global Leaders:** JavaScript, Python, SQL, and PostgreSQL remain dominant.
- **Emerging Players:** Go, Rust, Redis, and Supabase gain traction.
- **Declining Tools:** Java and Oracle see reduced relevance.
- **Skill Gaps:** U.S. developers struggle to meet demand for C, Python, and Java expertise.
- **High Demand Tools:** Oracle and MySQL face critical talent shortages in U.S.
- **Python's Advantage:** High salaries and opportunities make it a leader.
- **Job Hubs:** Washington, D.C. & Northern U.S. cities lead IT hiring.

Implications

- **Adapt to Shifts:** Invest in modern and emerging languages/tools to stay competitive and drive innovation.
- **Flexibility Wins:** Supporting diverse tools attracts talent, fosters innovation, and ensures competitiveness.
- **Upskilling Priority:** Close U.S. skill gaps in critical tools (C, Oracle, MySQL) through targeted training and certifications to align with market demands.



CONCLUSION



Stack Overflow's 2024 survey remains a crucial benchmark for understanding current and future IT trends. The U.S. continues to lead in developer participation, showcasing a strong IT ecosystem. However, skill gaps between market demand and developer expertise pose **critical challenges**. A significant 26.6% drop in global survey participation raises **concerns** about engagement and visibility—calling for deeper investigation to preserve this **essential portrait of IT evolution**.

