Data Analyst Capstone Project

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EXECUTIVE SUMMARY

Key Findings

- JavaScript, Python, and SQL are currently the most widely used programming languages.

- Python and modern development technologies are expected to grow in the future.
  - Python remains the most desired language among developers
  - Interest in TypeScript, Rust, and Go is increasing
  - Modern development tools continue to gain popularity

- PostgreSQL remains the most widely used and desired database both now and for the future.

- Cloud platforms, especially AWS, Azure, and Google Cloud, continue to dominate the technology ecosystem.

- Most developers are in the 25–34 age group and hold a bachelor's degree, indicating a high level of education in the industry.
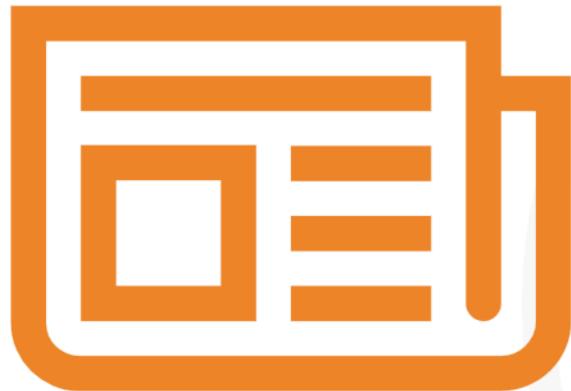
INTRODUCTION

Purpose of the report, Target Audience & Value of the analysis

- The purpose of this project is to analyze current and future technology trends in the software development industry.

- The analysis focuses on identifying the most widely used programming languages, databases, platforms, and tools

- The target audience includes aspiring and professional developers, analysts, and IT specialists.

- The results help understand which technologies are in demand today and which skills will be important in the future.

METHODOLOGY

Data sources, Data collection & Data wrangling steps
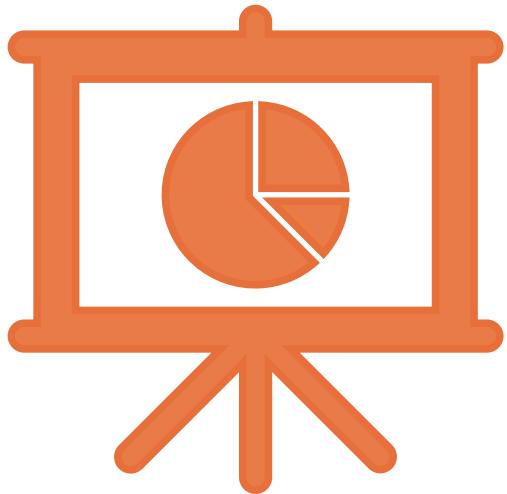
- **Data Sources**
  - Data was obtained from IBM Cloud datasets in CSV format
  - The data represents real-world developer and technology usage information

- **Data Preparation**
  - Missing values were cleaned
  - Data types were converted when needed

- **Data Analysis**
  - Data was grouped and summarized
  - Trends and comparisons were analyzed

- **Visualization & Dashboard**
  - Bar charts were used to show key trends
 - A dashboard was created to present insights

IBM
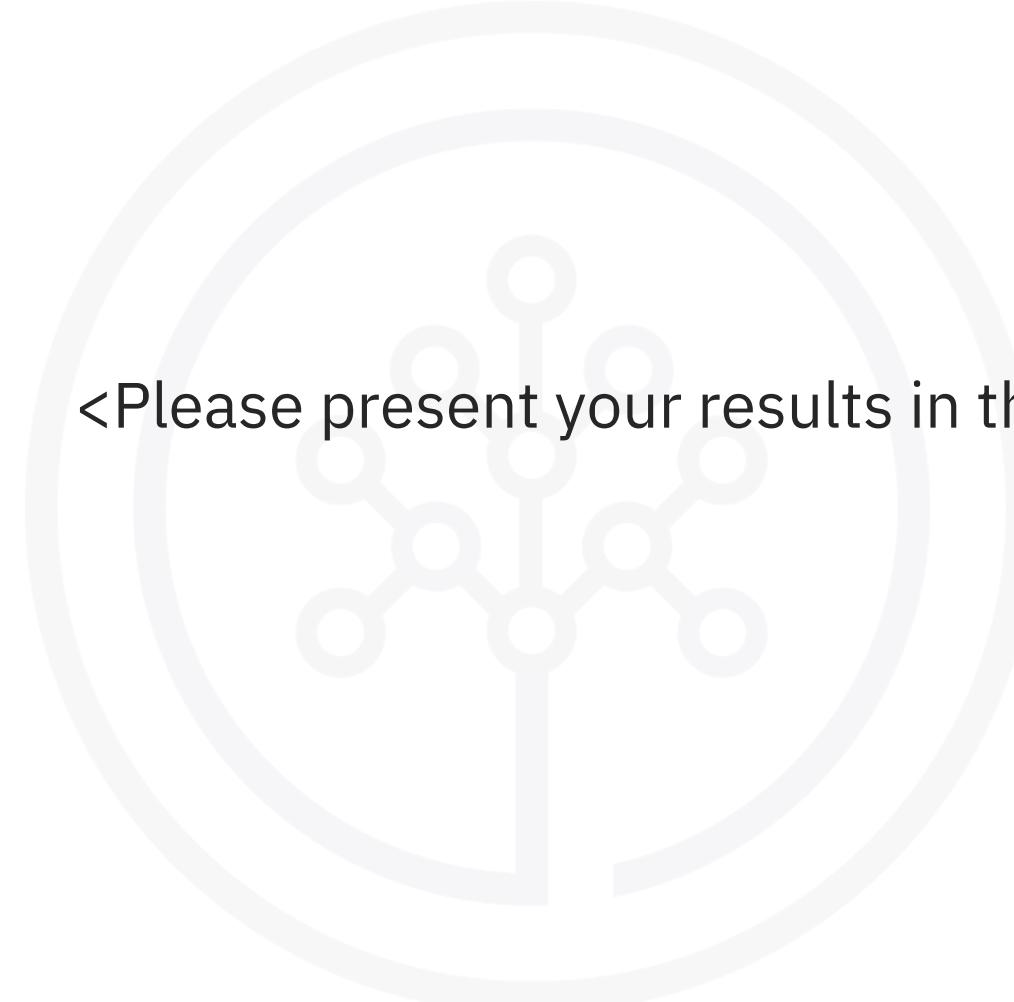
Results

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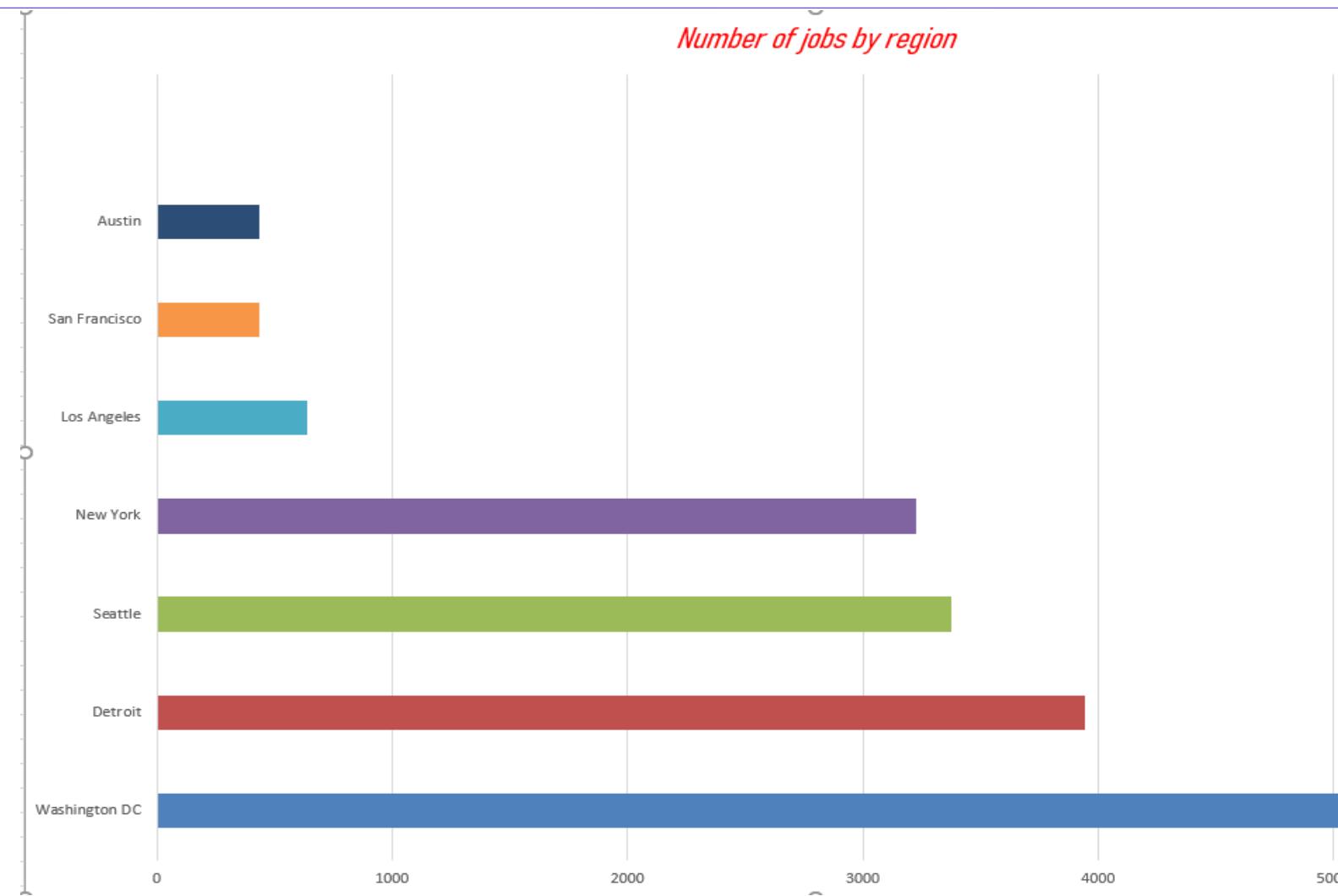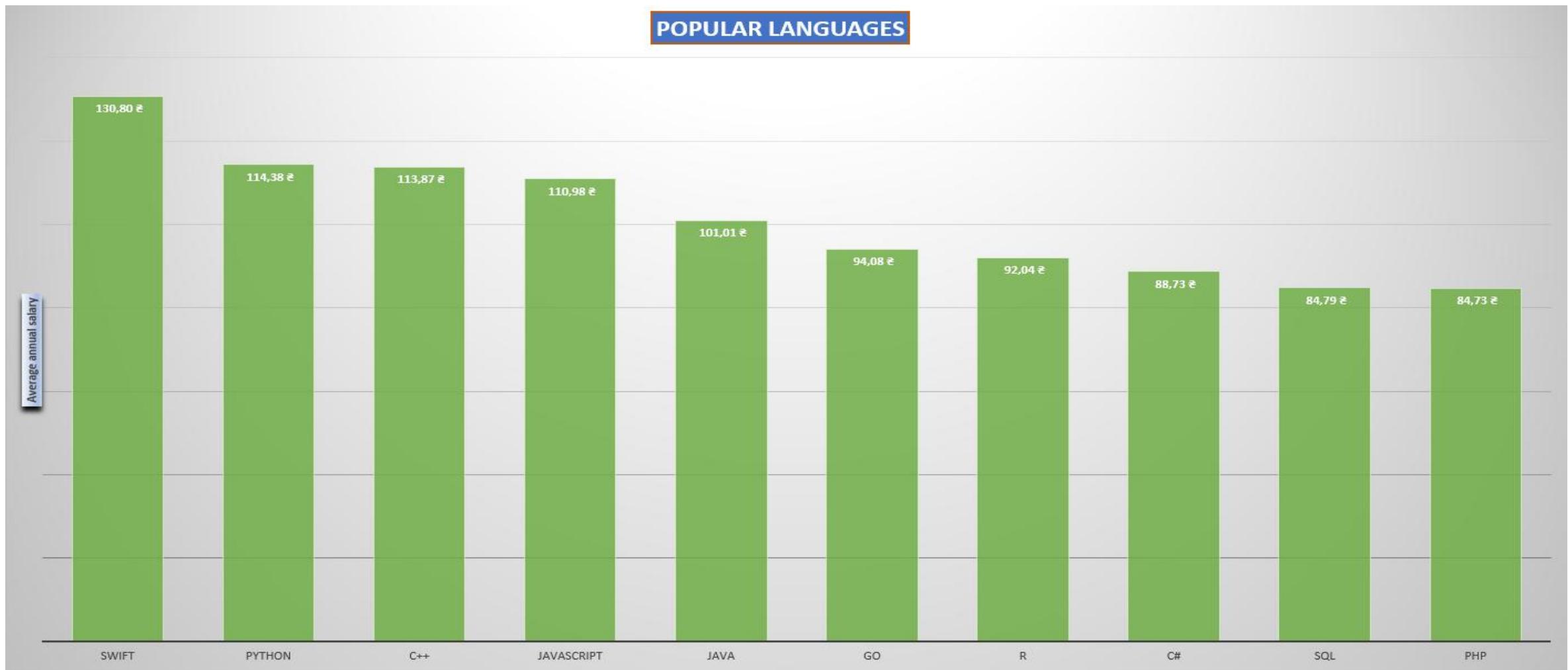
JOB POSTINGS

Number of jobs by region

POPULAR LANGUAGES
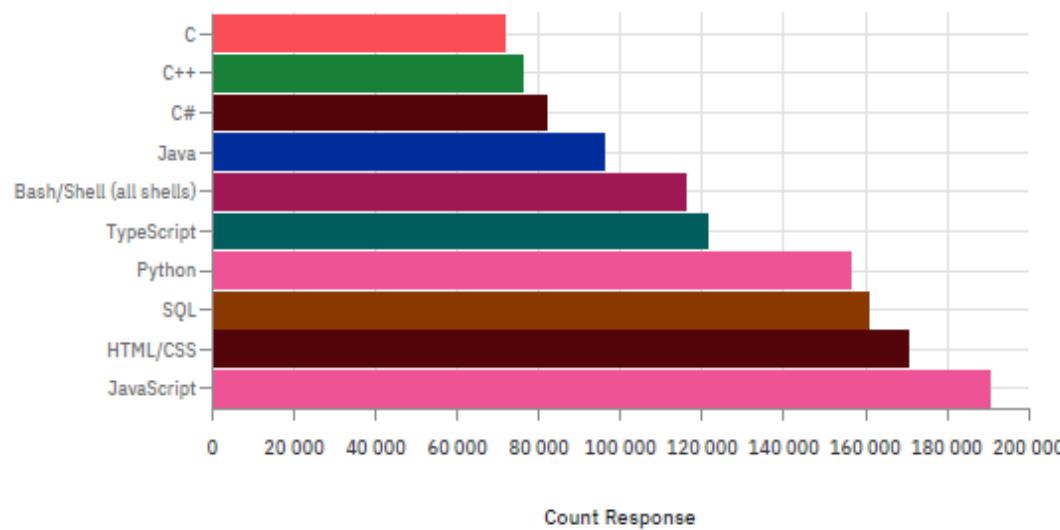
PROGRAMMING LANGUAGE TRENDS
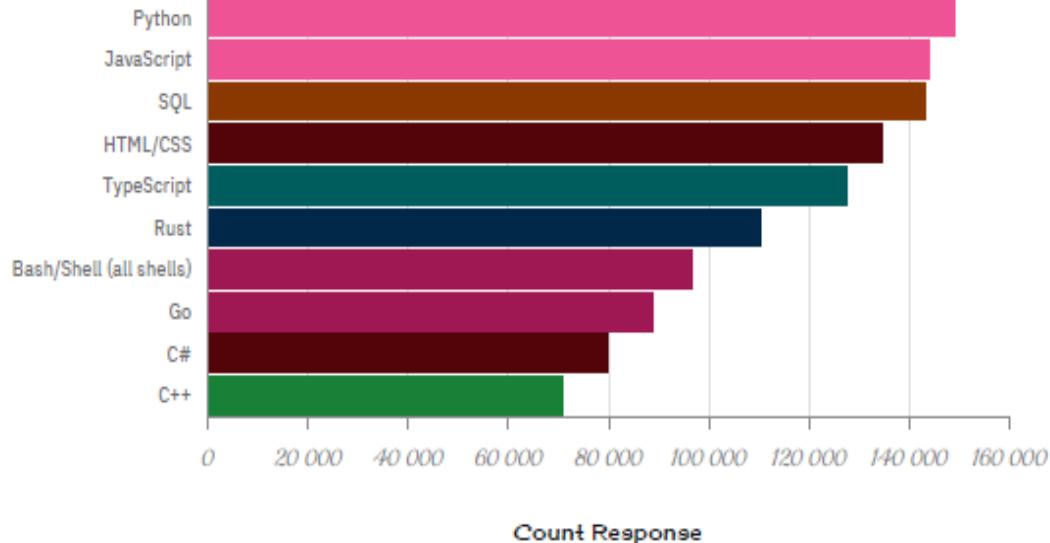
JavaScript, CSS, SQL, and Python are trending, showing growing demand for web development and big data

Current Year

Next Year

Top 10 Programming Languages Respondents to Have Worked With

Skills Network

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PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript, CSS, SQL, and Python are the most popular programming languages.

- Their popularity reflects current IT trends.

- Developers are increasingly focusing on web development and data-related skills.

Implications
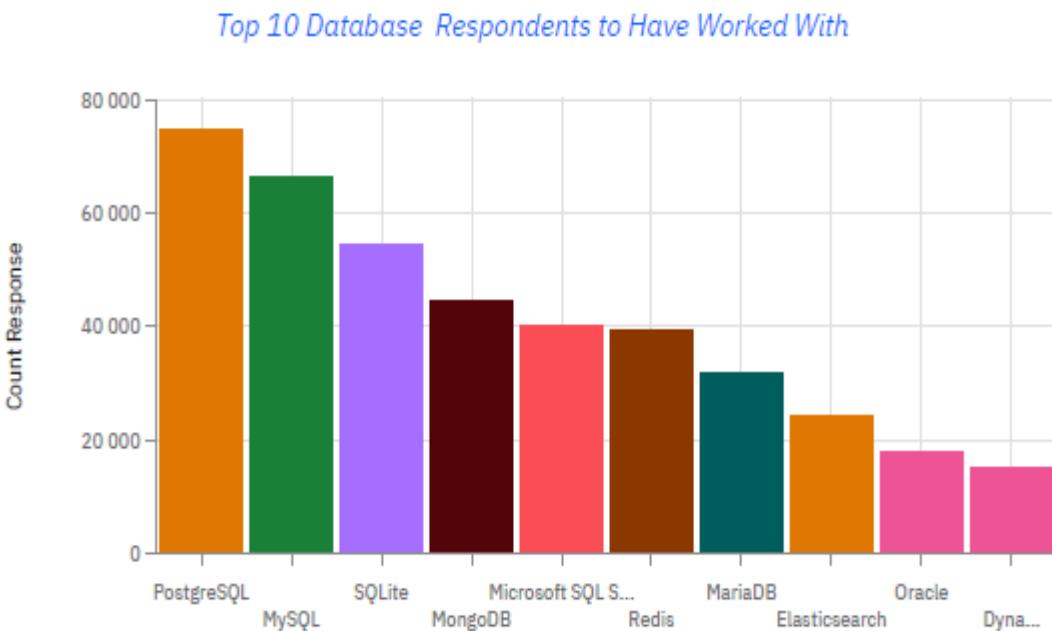
- There is a growing demand for web development specialists.

- There is a rising need for big data expertise.

- These areas represent key IT market trends for future career opportunities.
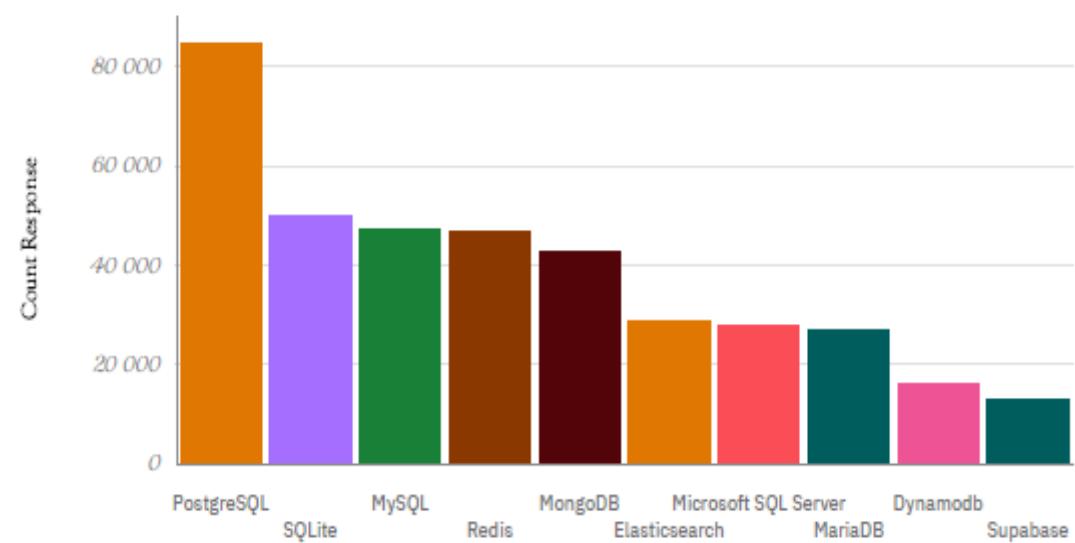
DATABASE TRENDS

PostgreSQL is the leader in both usage and interest in learning, with a significant gap; MySQL and SQLite rank second and third

Current Year

Next Year

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- PostgreSQL is perceived as the most technologically advanced database, which drives the strongest growth in interest and adoption.

- Microsoft-related database technologies show gradual growth, reflecting their later-stage ecosystem expansion.

- Lightweight databases like MySQL and SQLite remain widely used due to simplicity, but their growth in interest is more moderate compared to PostgreSQL.

Implications
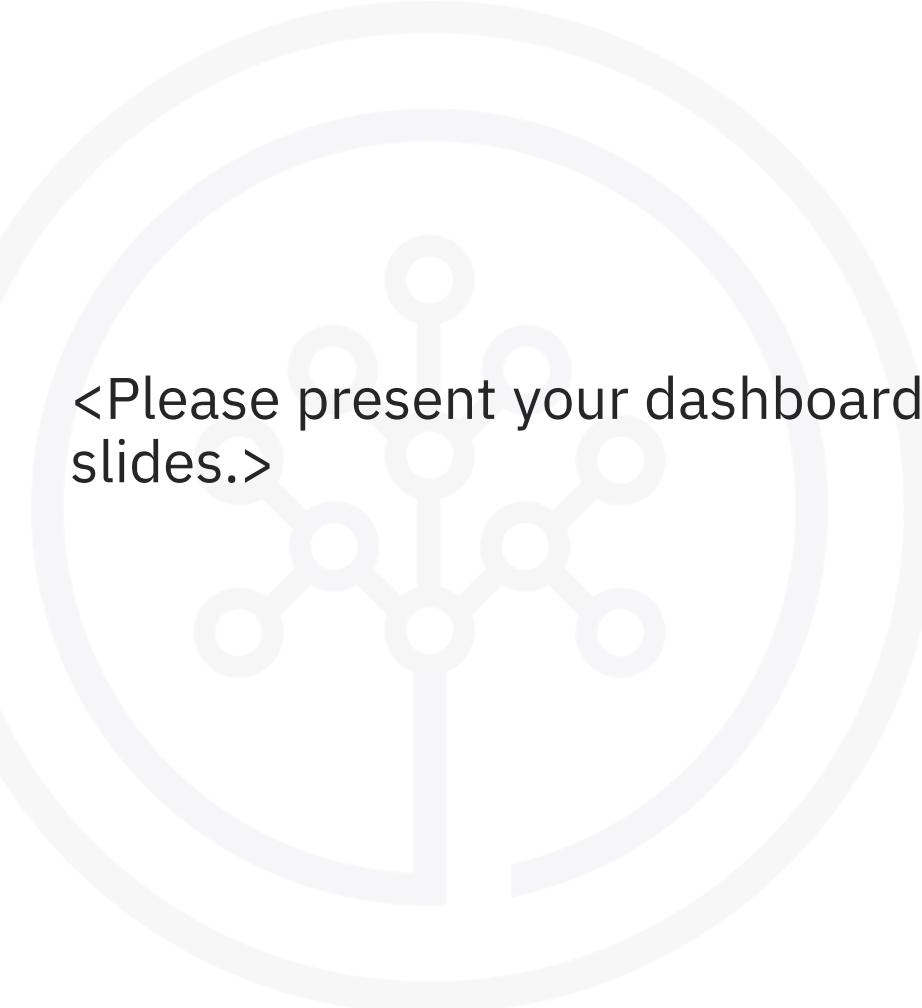
- The increasing dominance of PostgreSQL suggests a shift toward more powerful, feature-rich database systems.

- Growing interest in Microsoft database technologies indicates expanding enterprise and cloud-driven adoption.

- Stable use of MySQL and SQLite shows continued demand for simple, lightweight database solutions despite slower innovation-driven growth.

DASHBOARD

<Please present your dashboard in the following slides.>

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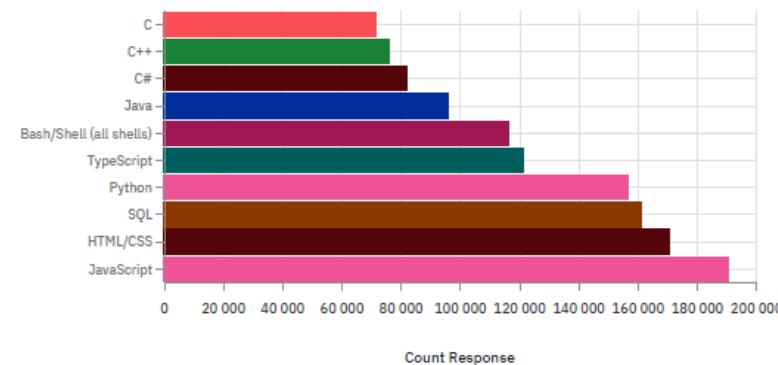
DASHBOARD 1: Current Technology Usage
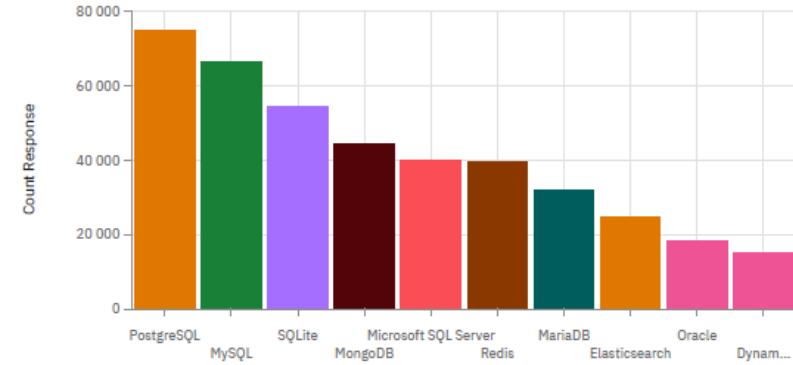
This dashboard presents the most widely used technologies across programming languages, databases, platforms, and frameworks, reflecting current industry practices and real-world adoption.

Current Technology Usage

Top 10 Programming Languages Respondents to Have Worked With
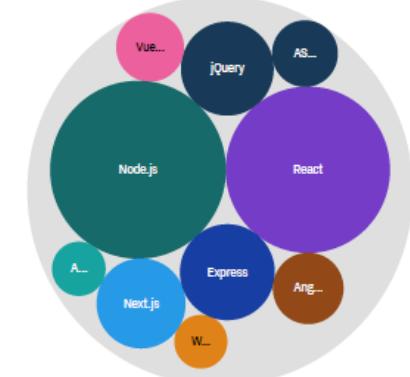
Top 10 Database Respondents to Have Worked With

The best Platform Respondents to Have Worked With

Top 10 Web Framework Respondents to Have Worked With
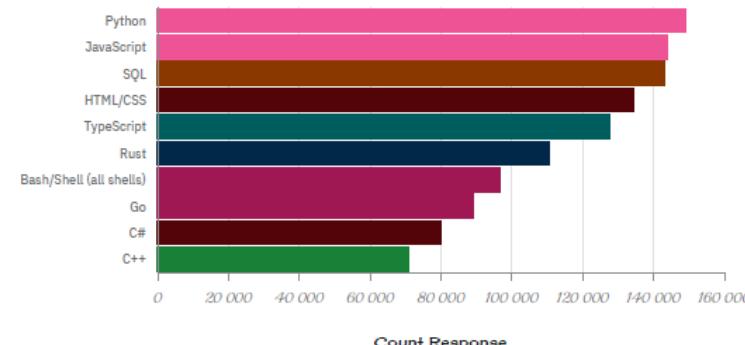
DASHBOARD 2: Future Technology Trends
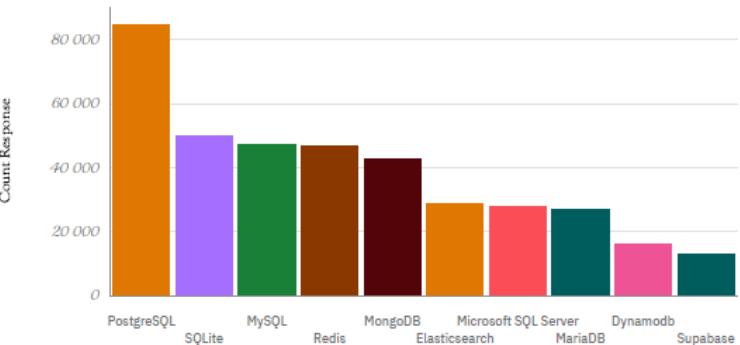
This dashboard shows the technologies respondents plan to learn in the future across programming languages, databases, platforms, and frameworks, highlighting emerging trends and areas of growing interest.


Future Technology Trend
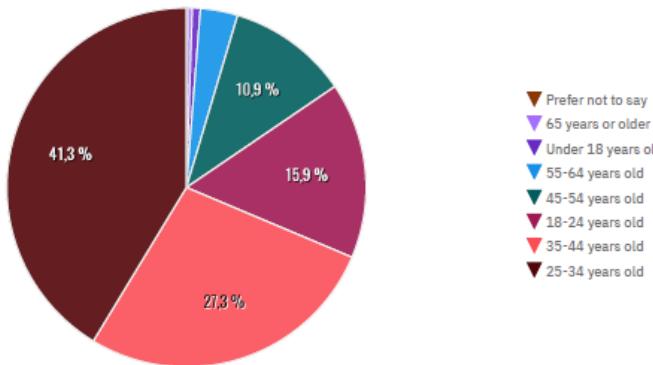
# DASHBOARD TAB 3: Demographics
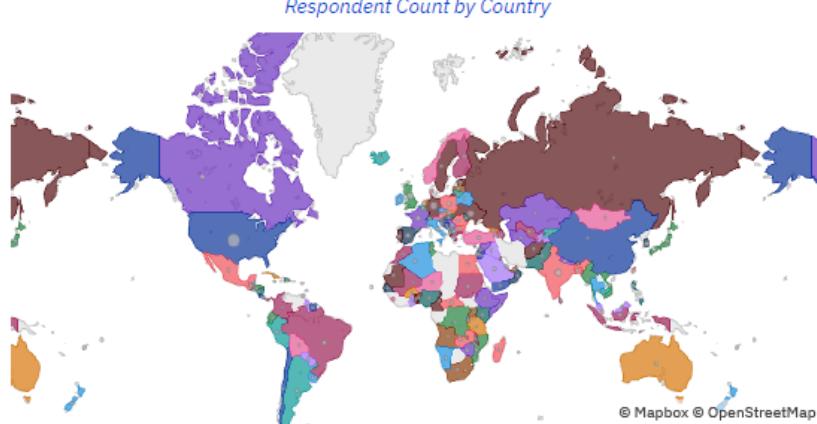
This dashboard illustrates respondent demographics, including age, education, and geographic distribution, providing context for understanding technology usage patterns and preferences.
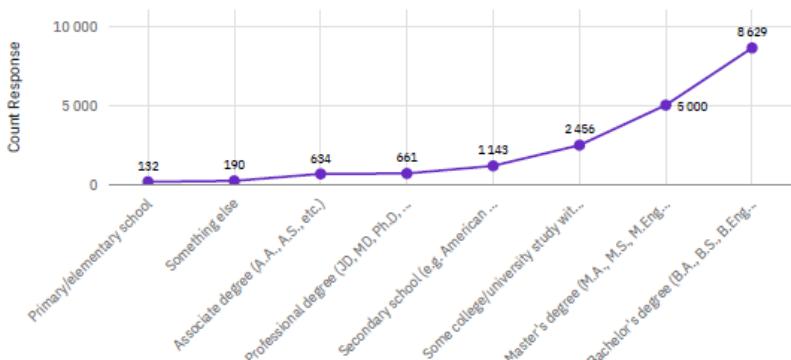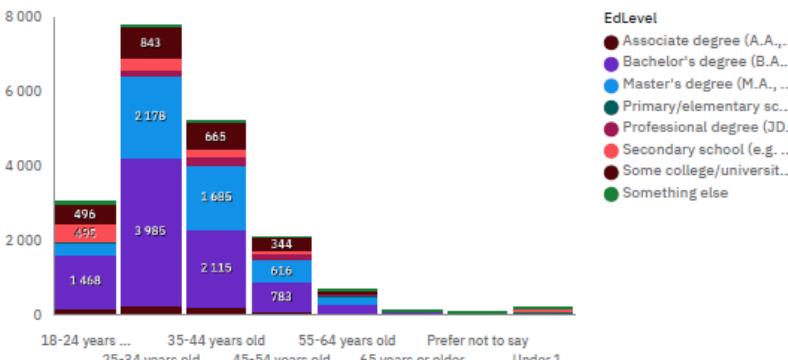
DISCUSSION

General Dashboard Insights

- **Popularity of Technologies and Tools**
  - Dashboards show that certain programming languages (e.g., Python, SQL, JavaScript) remain the most in-demand, reflecting the growing trend in data analytics and web development.
  - Frameworks and platforms such as React, Node.js, and Power BI are widely used, indicating mature and popular ecosystems for development and data analysis.

- **Labor Market Trends**
  - Most job openings are concentrated around specific technologies, highlighting the priority skills for specialists.
  - Dashboards indicate that employers increasingly value multidisciplinary skills, such as a combination of data analytics and programming.

- **Geographical Distribution**
  - Based on city and regional data, it is clear that job opportunities and specialists are concentrated in major IT hubs.
  - This can influence relocation decisions or remote work options for both job seekers and companies.

- **Future Technologies**
  - Dashboards with forecasts show growing interest in AI/ML, cloud technologies, and Big Data.
  - Such insights help plan training and strategic skill development for professionals.

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OVERALL FINDINGS & IMPLICATIONS

Findings

- **Finding :** Certain programming languages such as Python, SQL, and JavaScript remain the most in-demand, reflecting the growing importance of data analytics and web development.

- **Finding :** Frameworks and platforms like React, Node.js, and Power BI are widely used, showing the maturity and popularity of development and analytics ecosystems.

- **Finding :** Job opportunities are concentrated in specific technologies, and employers increasingly value multidisciplinary skills combining programming and data analytics.

- **Finding :** Geographical data highlights major IT hubs where most specialists and vacancies are located, while forecasts indicate rising interest in AI/ML, cloud computing, and Big Data.

Implications

- **Implication :** Professionals should focus on mastering high-demand languages and technologies to remain competitive in the job market.

- **Implication :** Gaining experience with popular frameworks and platforms can increase employability and career growth opportunities.

- **Implication :** Developing multidisciplinary skills enhances adaptability and appeal to employers looking for versatile specialists.

- **Implication :** Awareness of geographical concentrations and future technology trends can guide career planning, upskilling, and decisions regarding relocation or remote work.

CONCLUSION
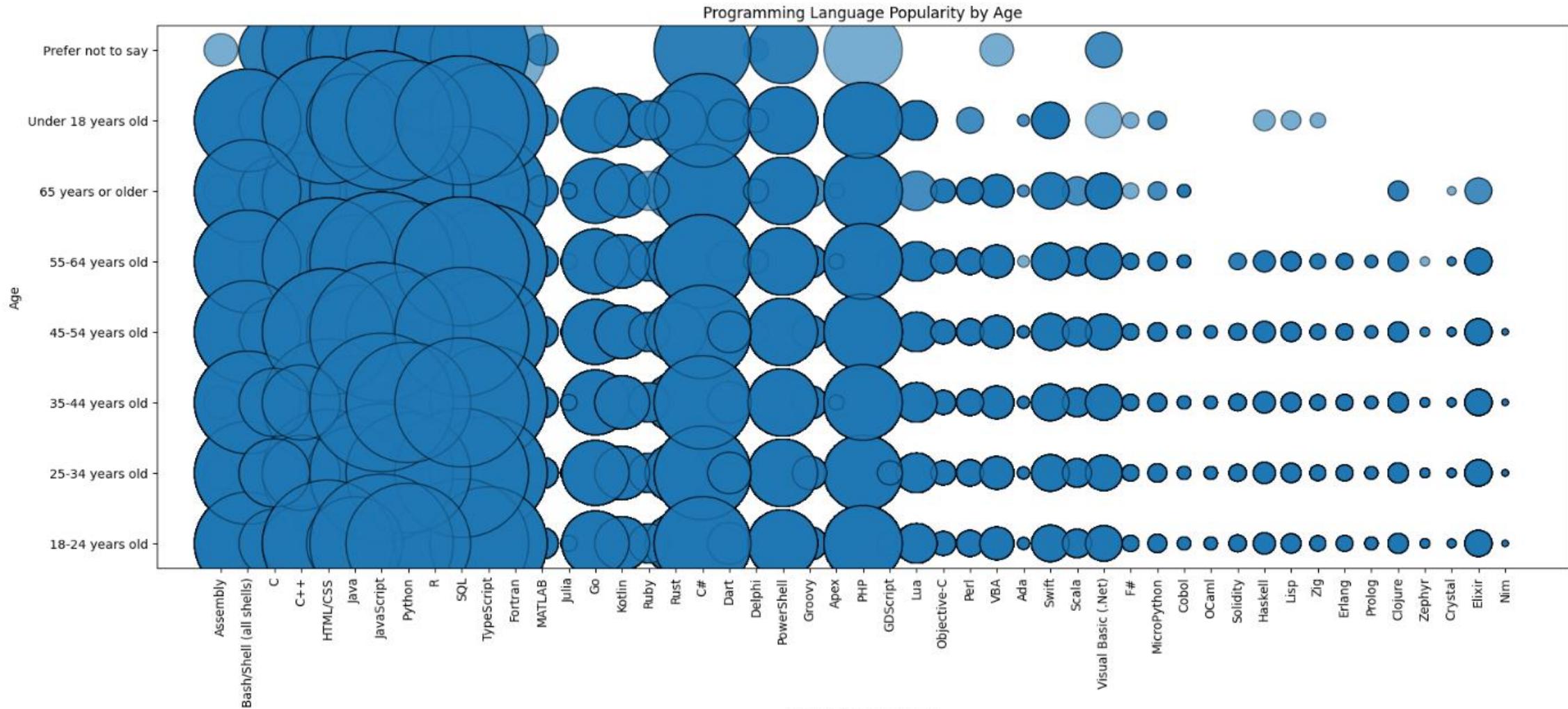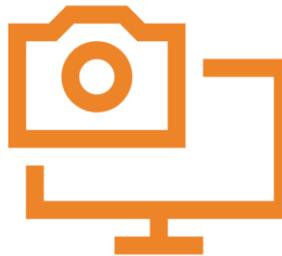
- **Rapid Development of AI and Technologies**
  - The world is being filled with massive amounts of data due to the rapid growth of artificial intelligence technologies.
- **Big Data Growth and Demand for Specialists**
  - The increase in data volume drives higher demand for web systems, web development, cloud storage, and professionals working with data.
- **Key Roles in the Job Market**
  - Web engineers, data engineers, and analysts are in demand, handling data collection, processing, analysis, and web systems operations.
- **Technologies Used and Their Significance**
  - The programming languages and systems in use are versatile and advanced, enabling monitoring, in-depth analysis, and forecasting of future technological trends.

APPENDIX

Additional charts created during the analysis phase of this project

Programming Language Popularity by Age

Compensation and job satisfaction are related, with age
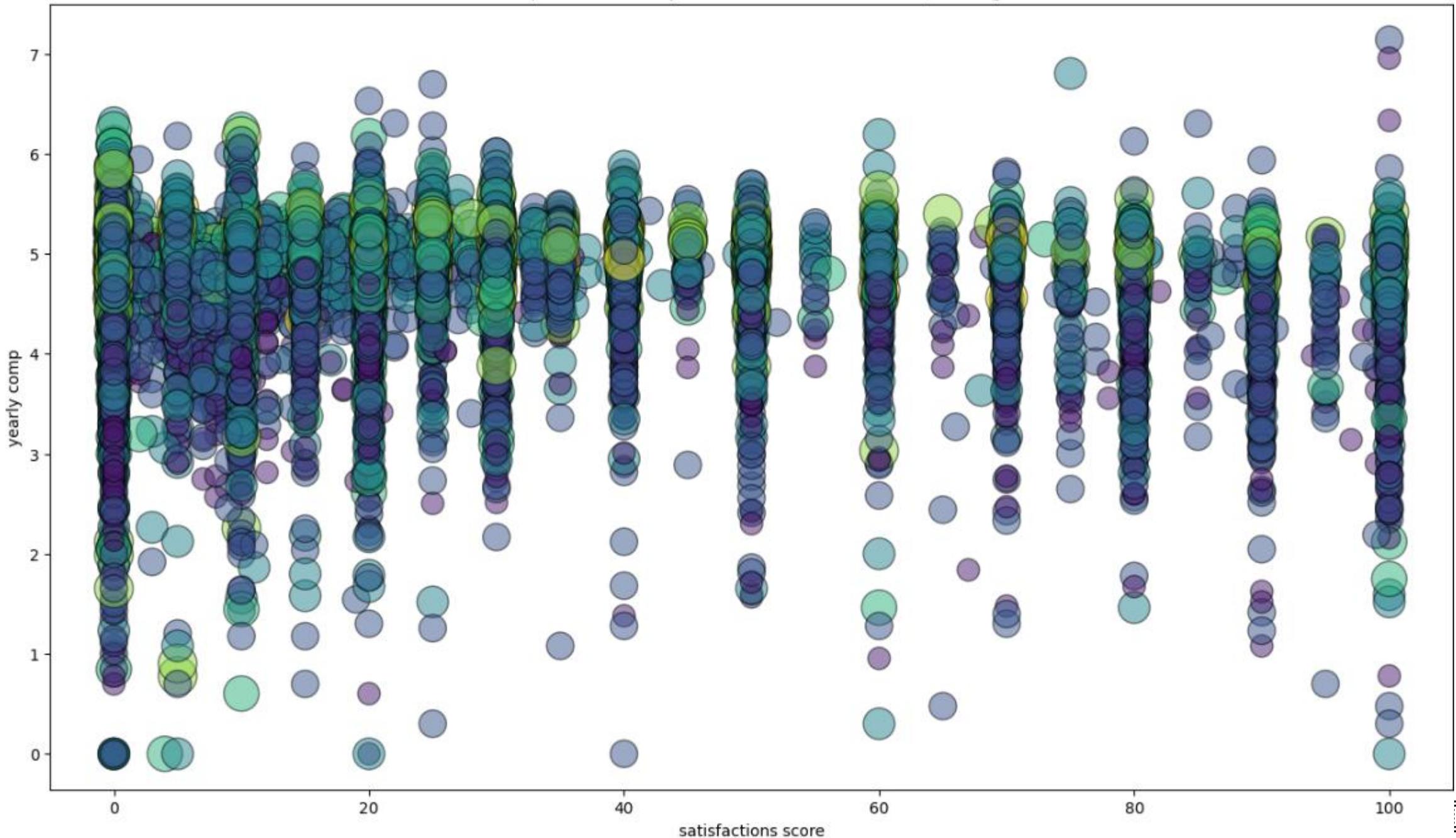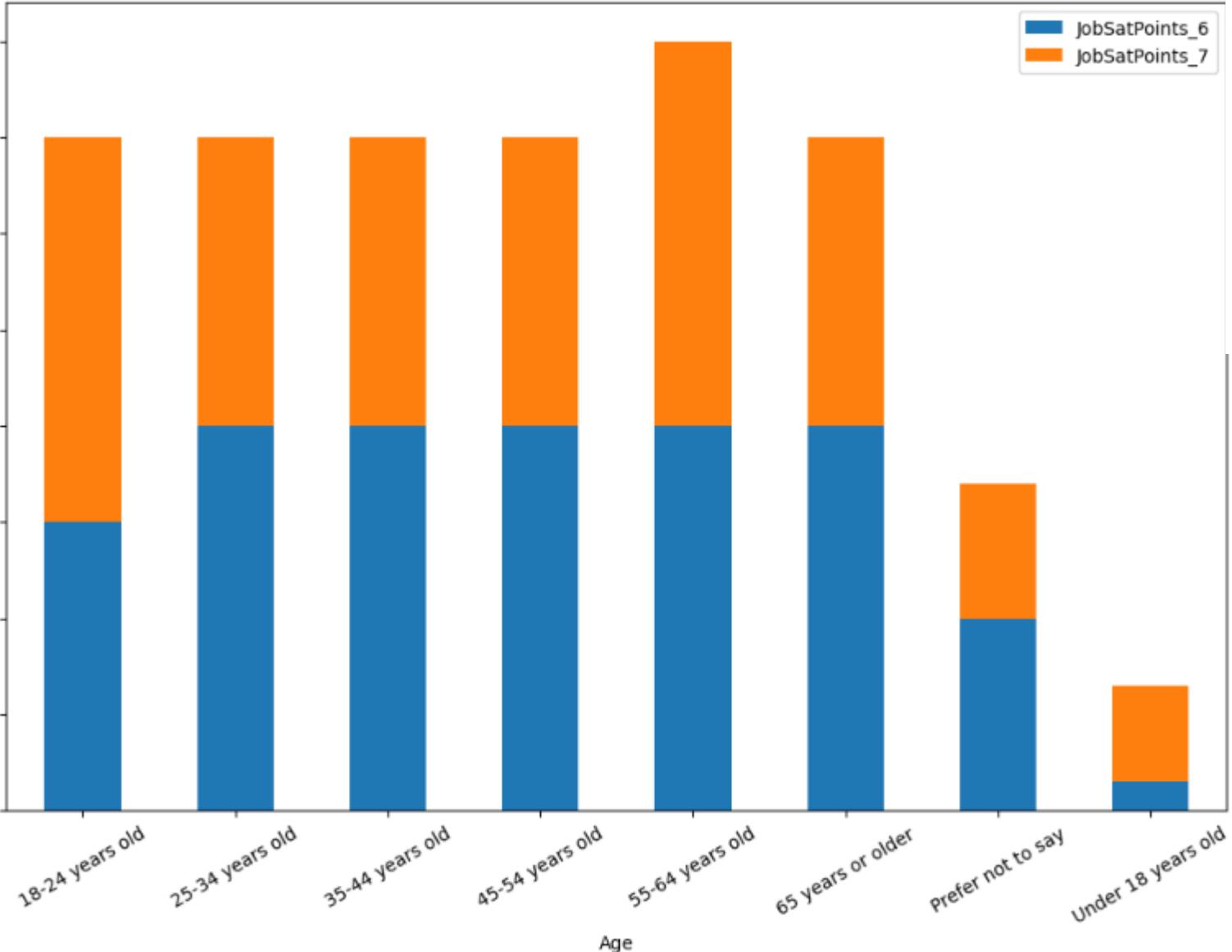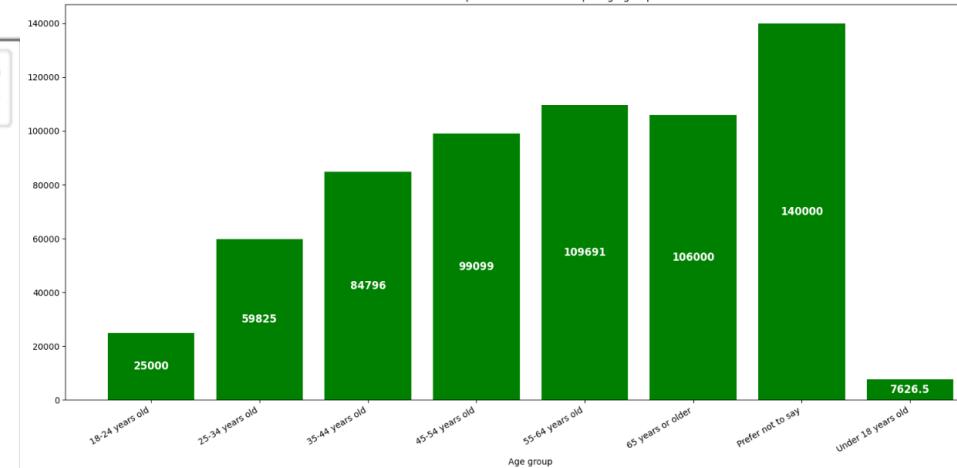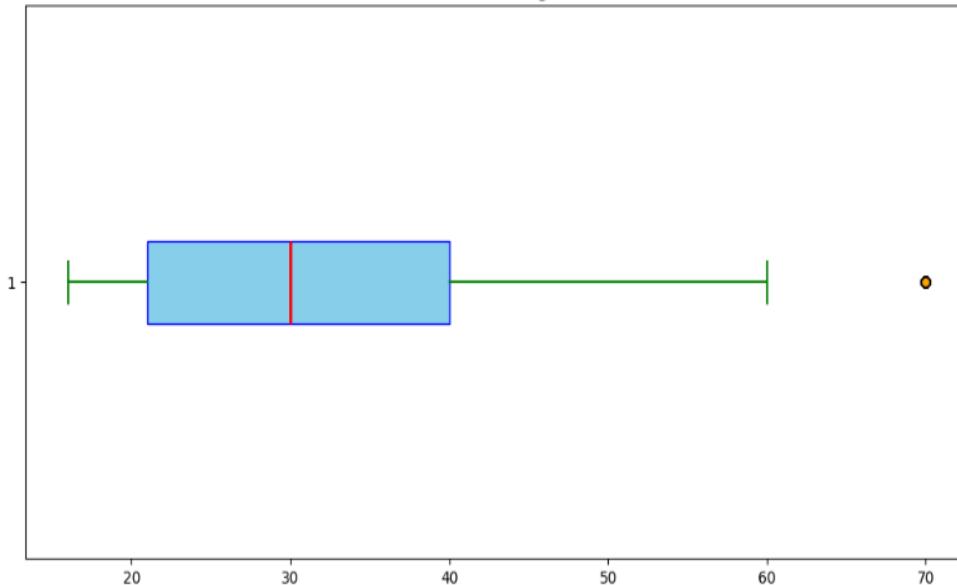
Chart for Composition of Job Satisfaction Across Age Groups

Median compensation across multiple age groups

Box Plot of Age

Trends in Job Satisfaction by Experience Level