

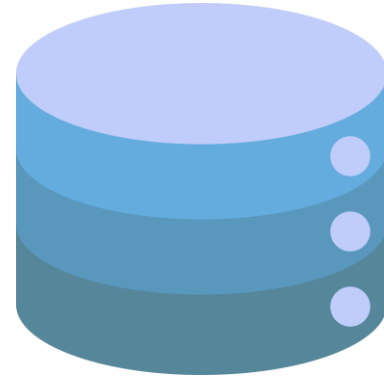
UNLOCKING CURRENT OPPORTUNITIES IN BUSINESS ANALYTICS

MARKET TRENDS, INSIGHTS AND AI APPLICATIONS

BAN 612 DATA ANALYTICS
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Sanjana Paluru

PROJECT WORKFLOW



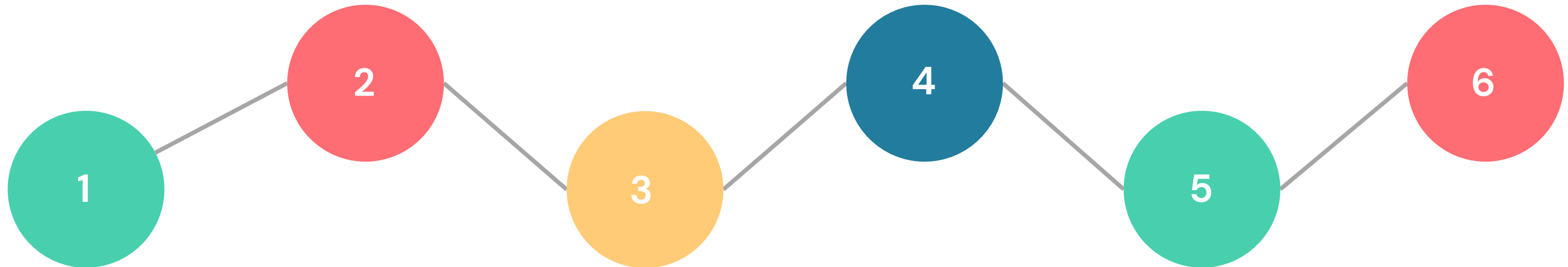
DATA COLLECTION



DATA VISUALISATION



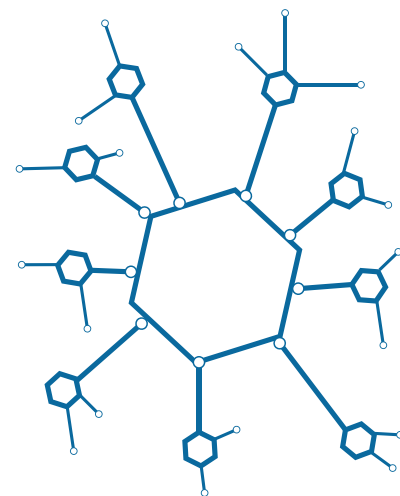
AI APPLICATIONS



DEFINE OBJECTIVES

DATA EXPLORATION

ANALYSIS



OBJECTIVE



- Analyse the relationship between salary, experience, industry, and job location for Business Analyst roles
- To analyse salary variations by job type and location(Remote, Hybrid, Onsite)
- To Evaluate salary differences across industries for Business Analyst roles.

DATA SOURCE



1

BUSINESSANALYST.COM

The dataset includes (e.g., job postings for Business Analyst roles across industries, locations, and experience levels).

2

- Job Title
- Industry
- Location (Remote, Hybrid, Onsite)
- Salary Range
- Experience Level
- Date of Posting

1	Job Title	Company	Location	Workplace	Experience	Industry	Salary	Published Date
2	Senior Business Analyst	Marathon Health	Denver, CO	Hybrid	5 - 10 years	Healthcare	\$90,000 - \$120,000	7-Oct-24
3	Senor Business Analyst, Product	Fubo	New York, NY	Hybrid	5 - 10 years	Entertainment	\$95,000 - \$135,000	7-Oct-24
4	2025 Launch Program Business Analyst	Red Ventures	Charlotte, NC	Onsite	0 - 3 years	Tech	\$80,000 - \$80,000	7-Oct-24
5	Business Analyst	LivePerson	Remote	Remote	3 - 5 years	Tech	\$80,000 - \$92,000	7-Oct-24
6	Business Analyst	GoNetspeed	Remote	Remote	0 - 3 years	Communications	\$50,000 - \$70,000	7-Oct-24
7	Business Analyst, Health	WTW	Boston, MA	Hybrid	3 - 5 years	Financial	\$82,000 - \$95,000	4-Oct-24
8	Business Analyst	City of Atlanta	Atlanta, GA	Hybrid	0 - 3 years	Other	\$72,000 - \$90,000	4-Oct-24
9	Business Analyst	Elevance Health	Norfolk, VA	Hybrid	3 - 5 years	Healthcare	\$61,000 - \$91,500	4-Oct-24
10	Senior Business Analyst	Conduent	Baltimore, MD	Onsite	5 - 10 years	Consulting	\$101,062 - \$131,000	4-Oct-24
11	Senior Business Analyst	Perseus Group	Remote	Remote	5 - 10 years	Tech	\$64,000 - \$96,000	4-Oct-24
12	Business Analyst, Operations	Rover.com	Seattle, WA	Hybrid	3 - 5 years	Retail	\$109,000 - \$136,000	3-Oct-24
13	Senior Business Analyst	The Brattle Group	Boston, MA	Hybrid	5 - 10 years	Consulting	\$100,000 - \$125,000	3-Oct-24



BusinessAnalyst.com

DATA EXPLORATION

- code scrapes job listings from BusinessAnalyst.com across 35 pages and saves the data into a CSV file for further analysis.
- Cleaned the Salary column by parsing minimum and maximum values, calculating the average salary, and standardizing the Location field by extracting cities and handling "Remote" entries.
- Applied the Interquartile Range (IQR) method to the Avg_Salary column to remove outliers, retaining only values within 1.5 times the IQR for cleaner data analysis.

```
# Loop through each job listing and extract details
for job in job_listings:
    # Extract the job title
    job_title = job.find('h3', class_='title h6-size card-job').text.strip() if job.find('h3', class_='title h6-size card-job') else 'N/A'

    # Extract the company name
    company = job.find('div', class_='card-link-home').text.strip() if job.find('div', class_='card-link-home') else 'N/A'

    # Extract each detail with error handling for missing elements
    location = job.find('div', class_='text-block-21')
    location = location.find_next('div', class_='card-job-category-text').text.strip() if location else 'N/A'

    workplace = job.find('div', class_='text-block-22')
    workplace = workplace.find_next('div', class_='card-job-category-text').text.strip() if workplace else 'N/A'

    experience = job.find('div', class_='text-block-23')
    experience = experience.find_next('div', class_='card-job-category-text').text.strip() if experience else 'N/A'

    industry = job.find('div', class_='text-block-24')
    industry = industry.find_next('div', class_='card-job-category-text').text.strip() if industry else 'N/A'
```

```
# Clean the Salary column to extract minimum and maximum values
data['Min_Salary'] = data['Salary'].apply(lambda x: float(x.split('-')[0].replace('$', '').replace(', ', '').strip()) if pd.notnull(x) else np.nan)
data['Max_Salary'] = data['Salary'].apply(lambda x: float(x.split('-')[1].replace('$', '').replace(', ', '').strip()) if '-' in x else np.nan)
data['Avg_Salary'] = (data['Min_Salary'] + data['Max_Salary']) / 2
```

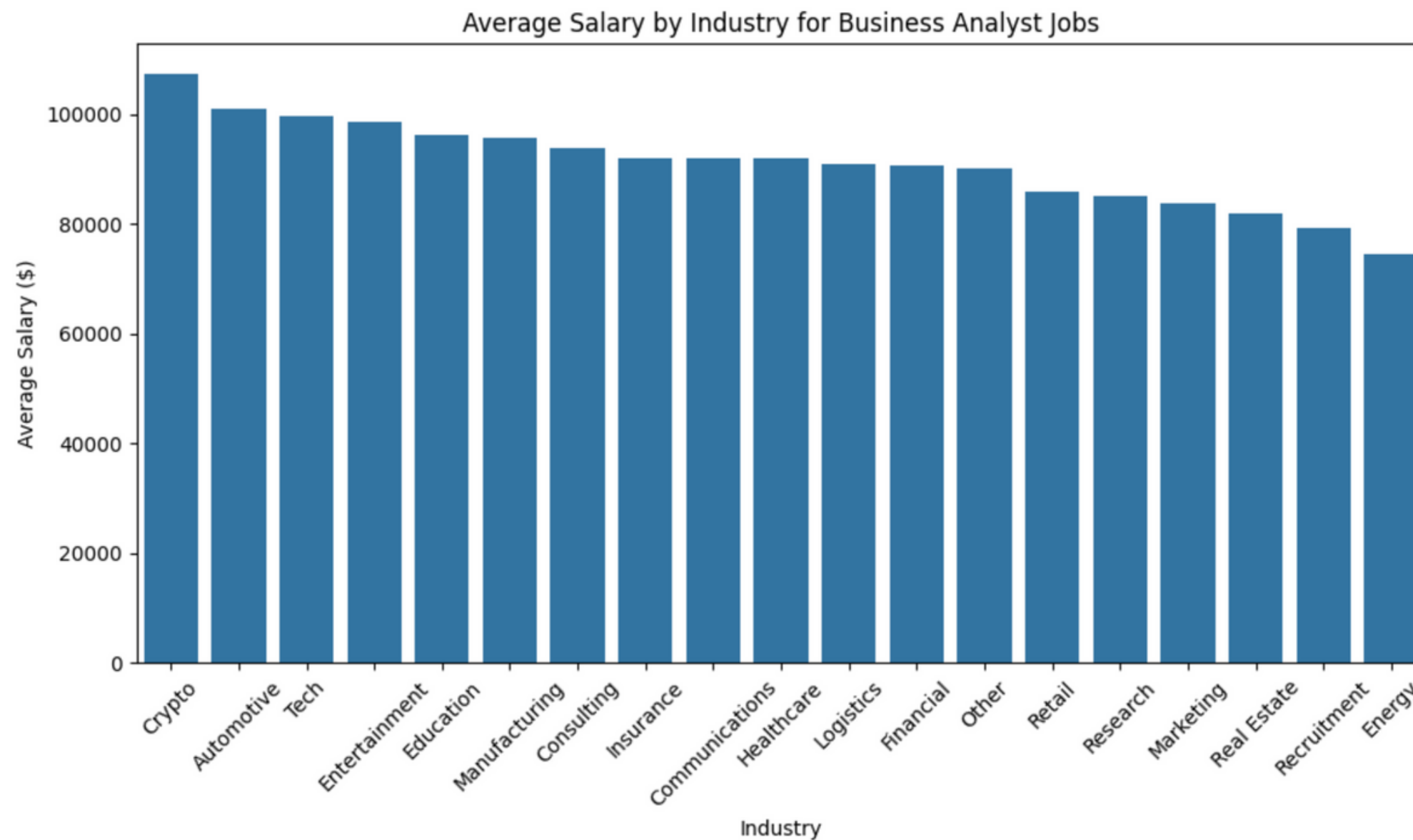
```
# Function to remove outliers using IQR
def remove_outliers(df, column):
    Q1 = df[column].quantile(0.25)
    Q3 = df[column].quantile(0.75)
    IQR = Q3 - Q1
    lower_bound = Q1 - 1.5 * IQR
    upper_bound = Q3 + 1.5 * IQR
    return df[(df[column] >= lower_bound) & (df[column] <= upper_bound)]

# Remove outliers for the salary range by experience
data_cleaned = remove_outliers(data, 'Avg_Salary')
```

SALARY VS. INDUSTRY

Which industries offer the highest salaries for the Business Analyst roles?

Analysis



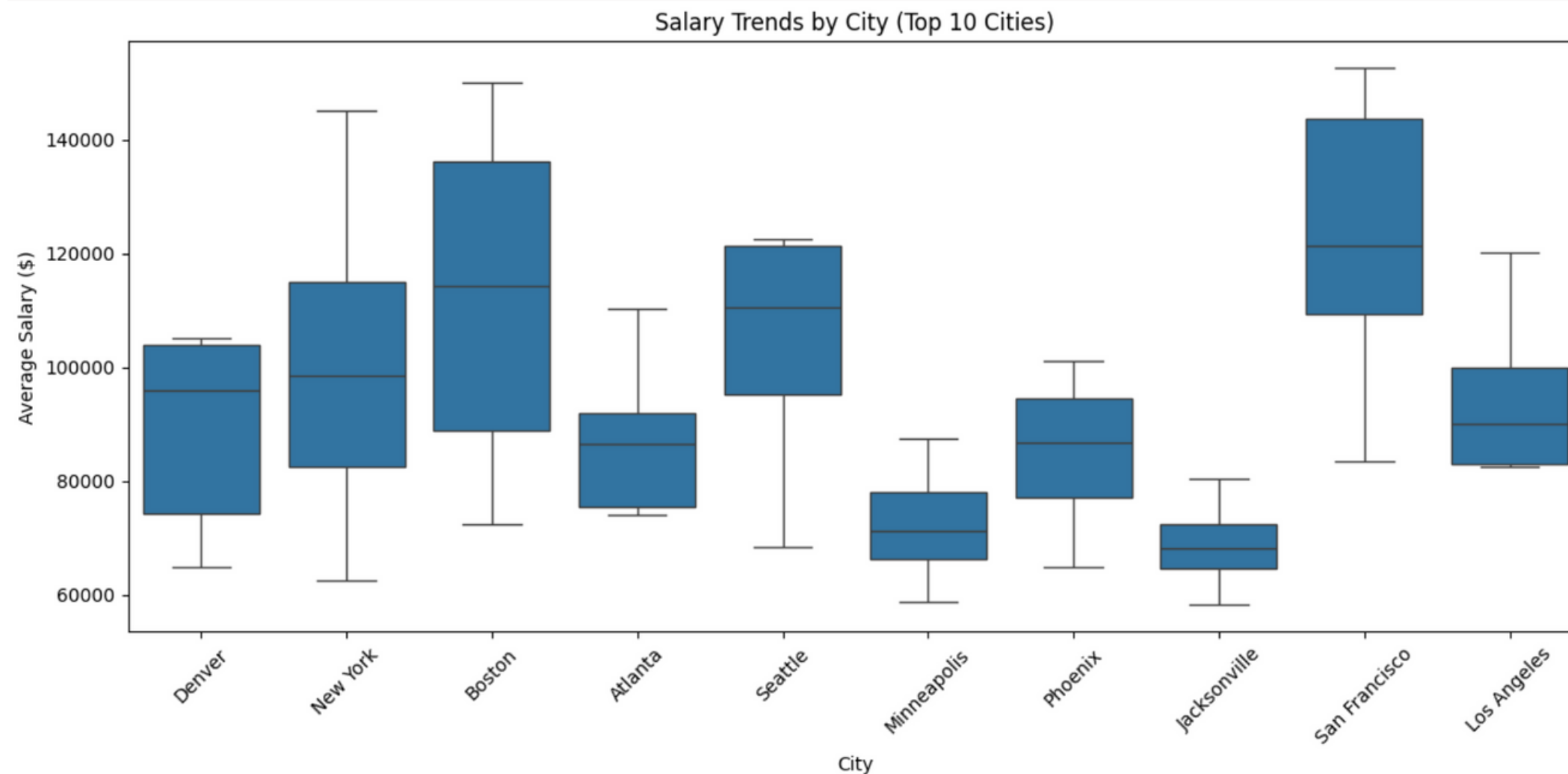
- Industries like crypto, Automotive and Tech offer the highest average salaries, while Energy and Recruitment offer comparatively lower salaries
- Healthcare, Financial and consulting fall in the mid range.

SALARY TRENDS BY CITY(TOP 10)

Which cities offer highest average salaries for Business Analysts, and what are the notable trends?

Analysis

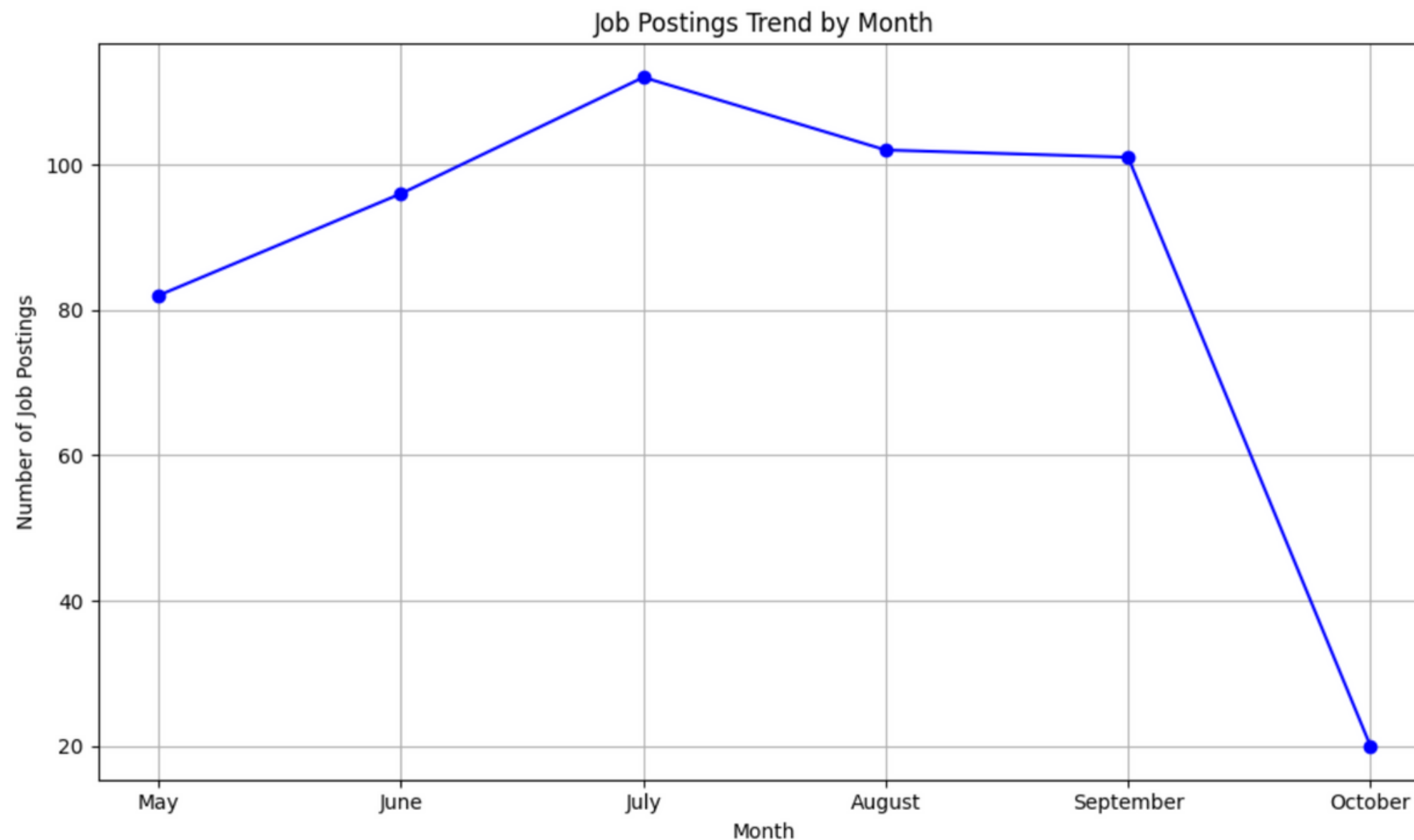
- The box plot reveals that cities like San Francisco, New York and Boston offer higher salary ranges, with SFO having highest median salary.
- Cities like Jacksonville and Minneapolis fall on the lower end of the spectrum.



JOB POSTINGS TREND BY MONTH

Is there a seasonal trend in job postings, and if so, what months see the most demand?

Analysis

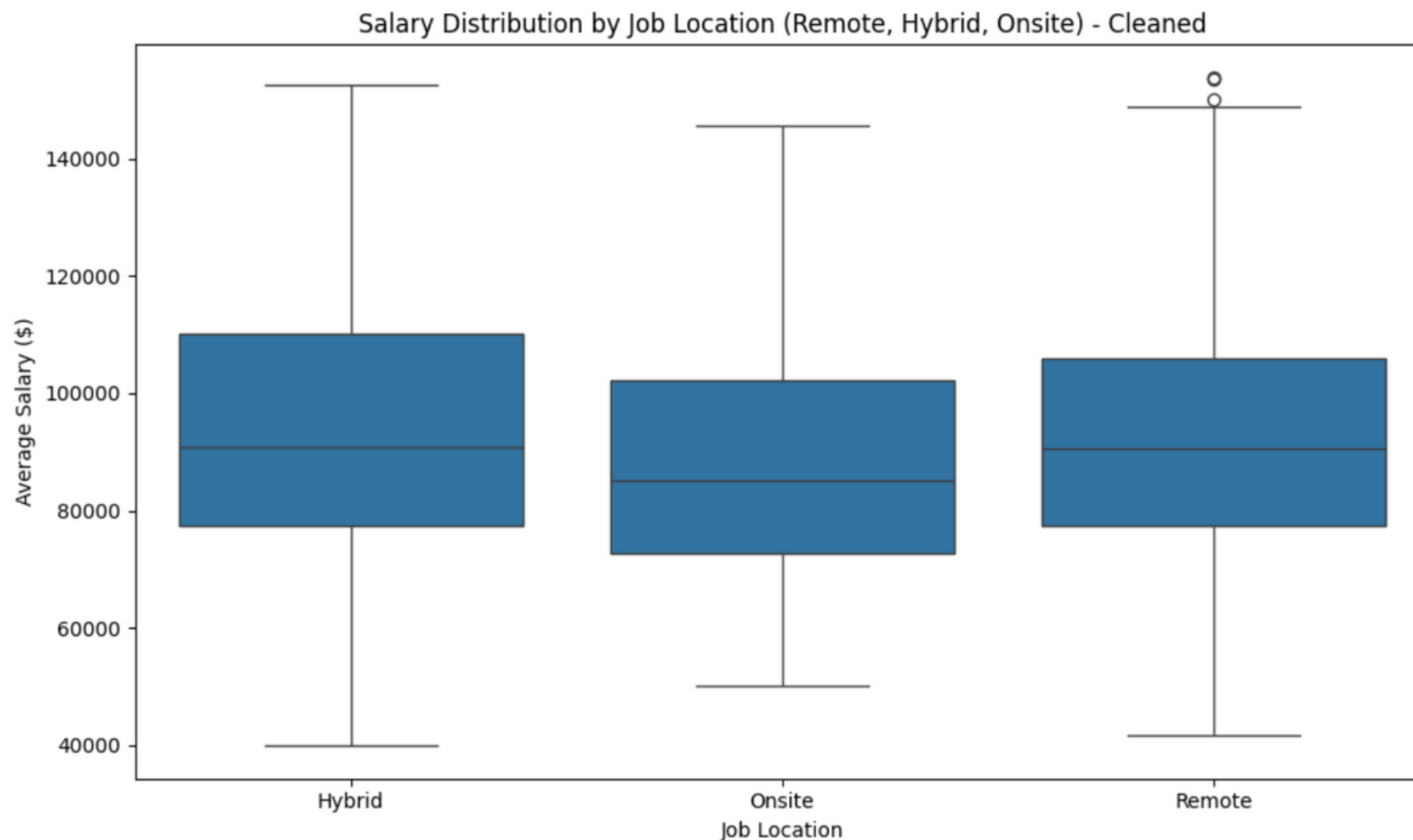


- The chart indicates that job postings peaked in July and then began to decline, especially in September and October
- May through August shows a steady increase, suggesting a mid-year hiring spike.
- This trend could indicate mid-year hiring cycles, possibly aligned with new budgets or business needs

JOB LOCATION VS. SALARY

How does the flexibility of remote or hybrid jobs impact salary compared to onsite roles?

Analysis



- Median salaries for Hybrid jobs appear higher, and range is wider, indicating more variability.
- Onsite jobs have narrowest range, with lowest median salary compared to other 2 categories
- Hybrid roles tend to offer higher median salaries but also show more variability.
- Remote roles have balanced distribution, while Onsite roles offer the least variation.

SALARY VS. EXPERIENCE

What is the correlation between experience level and salary for Business Analyst roles? Do higher experience levels consistently result in higher salaries?

Analysis

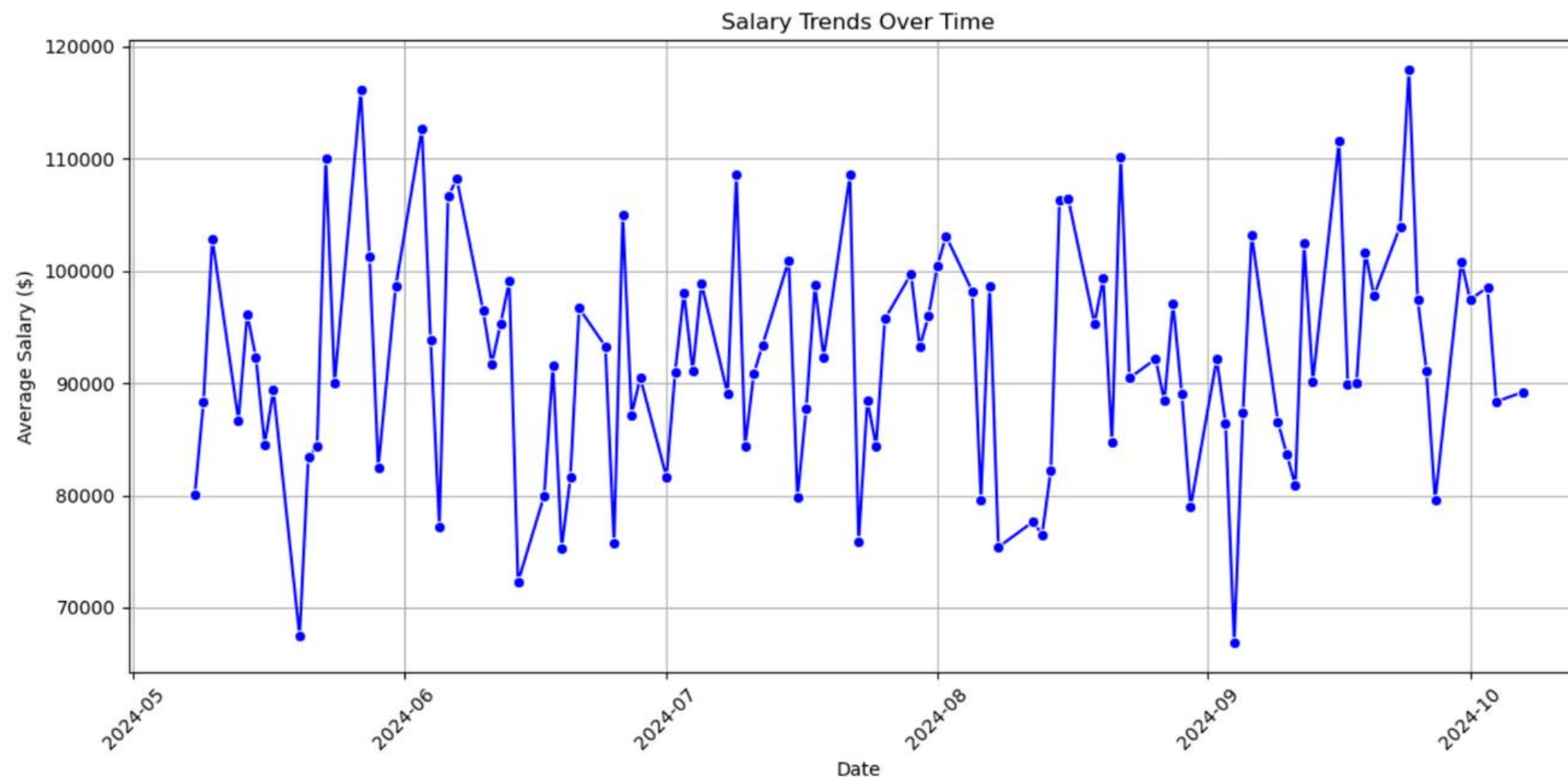
- The box plot illustrates that those with 5–10 years of experience have the highest median salary, followed by 3–5 years, while 0–3 years offer the lowest salary range.
- There is also more variation in the higher experience levers, with a wider salary range for 5–10 years.



SALARY TRENDS OVER TIME

How do salary trends vary over time across industries?

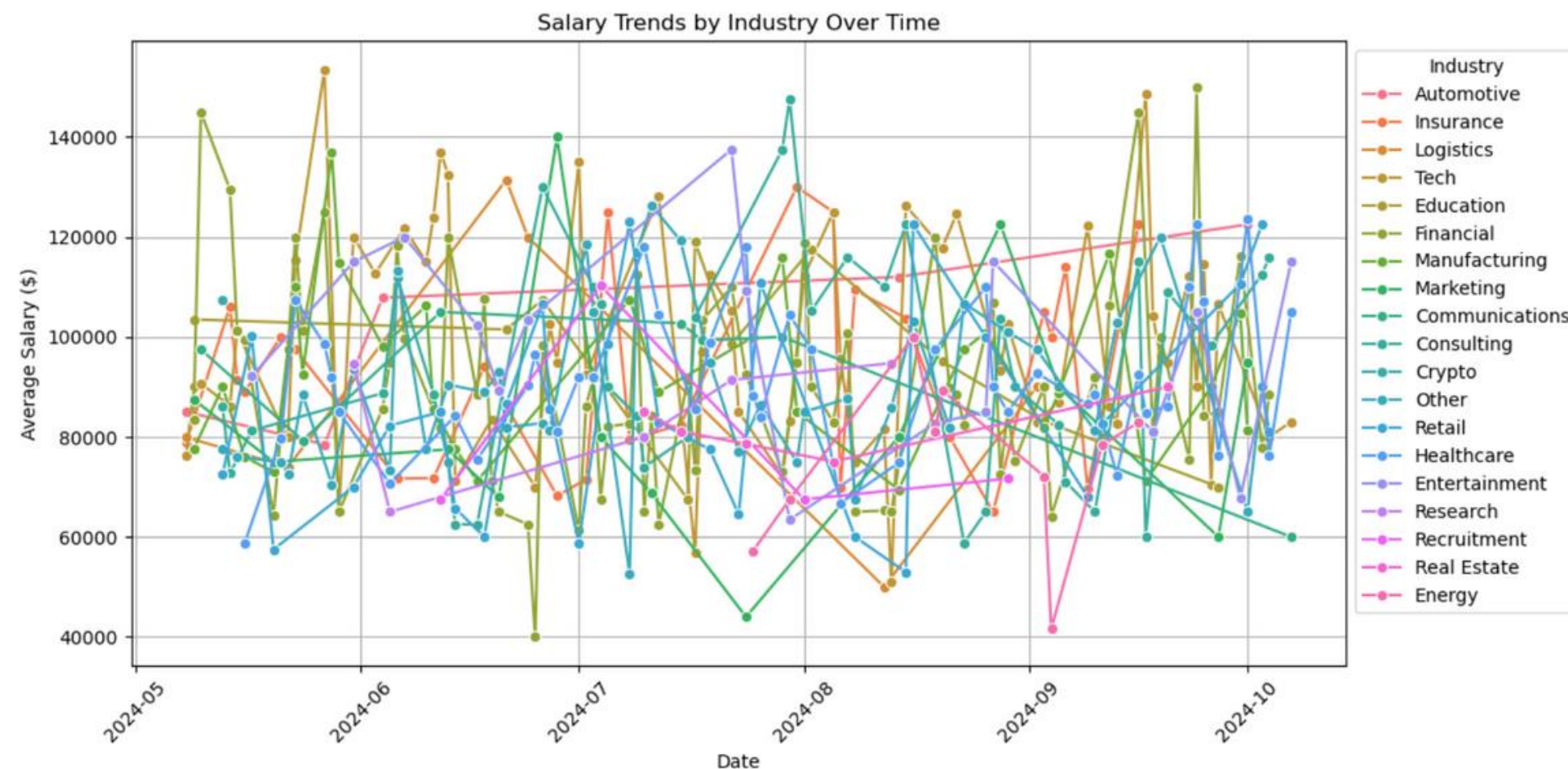
Analysis



- This graph shows a clear fluctuation in average salary over time. Salaries vary widely with peaks reaching above \$110,000 and dips below \$80,000
- There is no obvious long-term upward or downward trend in salary over the time shown. Instead, the salaries appear to oscillate frequently without a clear pattern of growth or decline

SALARY TRENDS BY INDUSTRY OVER TIME

What are the fluctuations on the salary trends across various industries over time?



Analysis

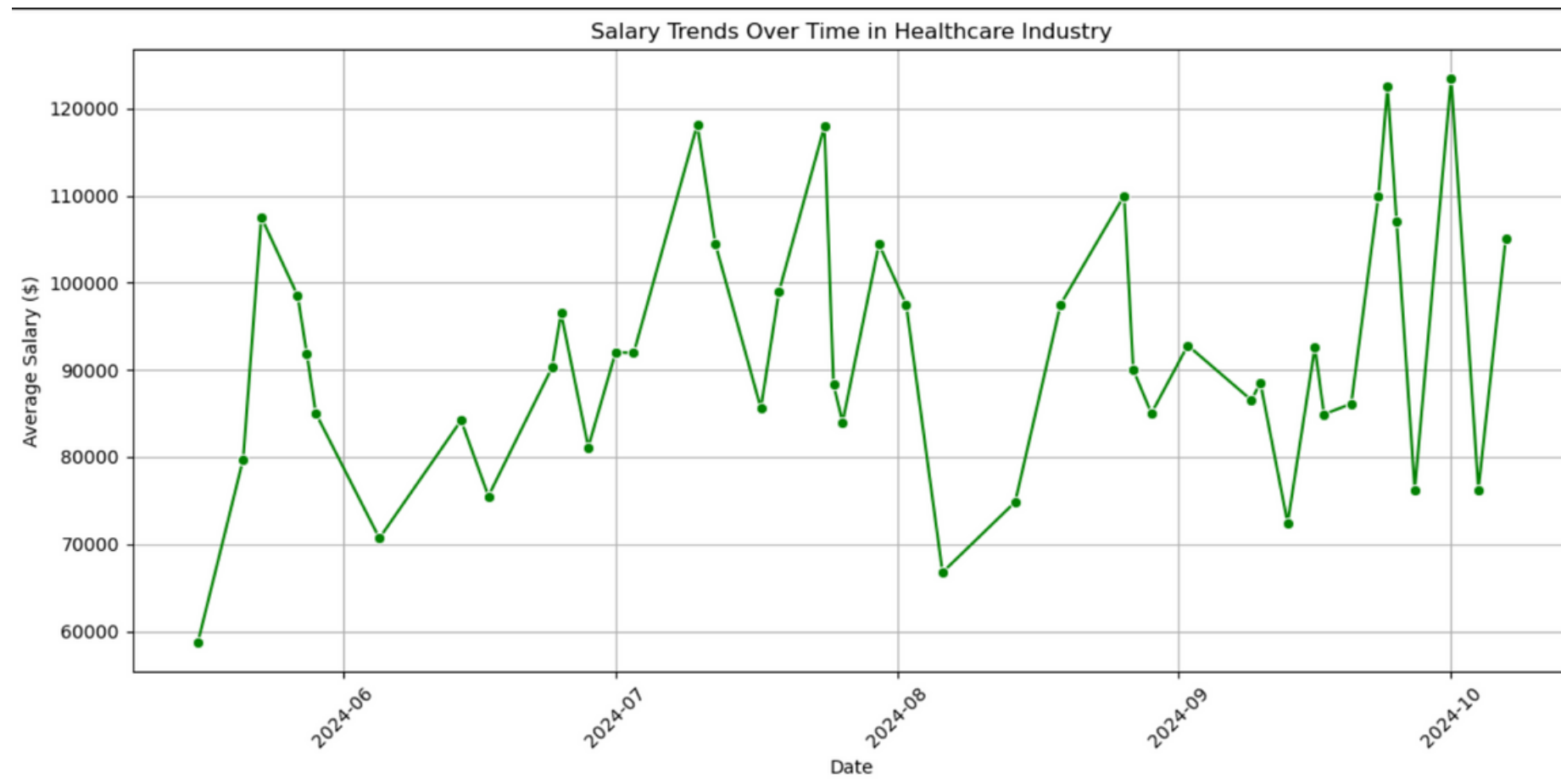
- **Complexity and Overlapping Data:** Due to a large number of industries, the data points overlap extensively, making it difficult to visually distinguish any clear patterns or trends for individual industries.
- The dense web of lines makes it challenging to identify which industries are experiencing salary increases, decreases, or consistent salaries. The noise in the data obscures potential insights.



HEALTHCARE INDUSTRY

SALARY TRENDS IN HEALTHCARE

What are the salary trends in Healthcare?



Analysis

- **Early Peak:** Around June 2024, there is a sharp rise in salaries, peaking at over \$100,000 before gradually declining.
- **Volatility in Salaries:** Throughout the entire period, salary trends demonstrate high volatility with frequent ups and downs. This suggests an unstable or rapidly changing compensation environment within the industry during this time frame.

SALARY DISTRIBUTION IN HEALTHCARE ROLES (REMOTE VS ONSITE)

Is there a significant difference in salaries between remote and onsite roles in the Healthcare Industry?

Analysis

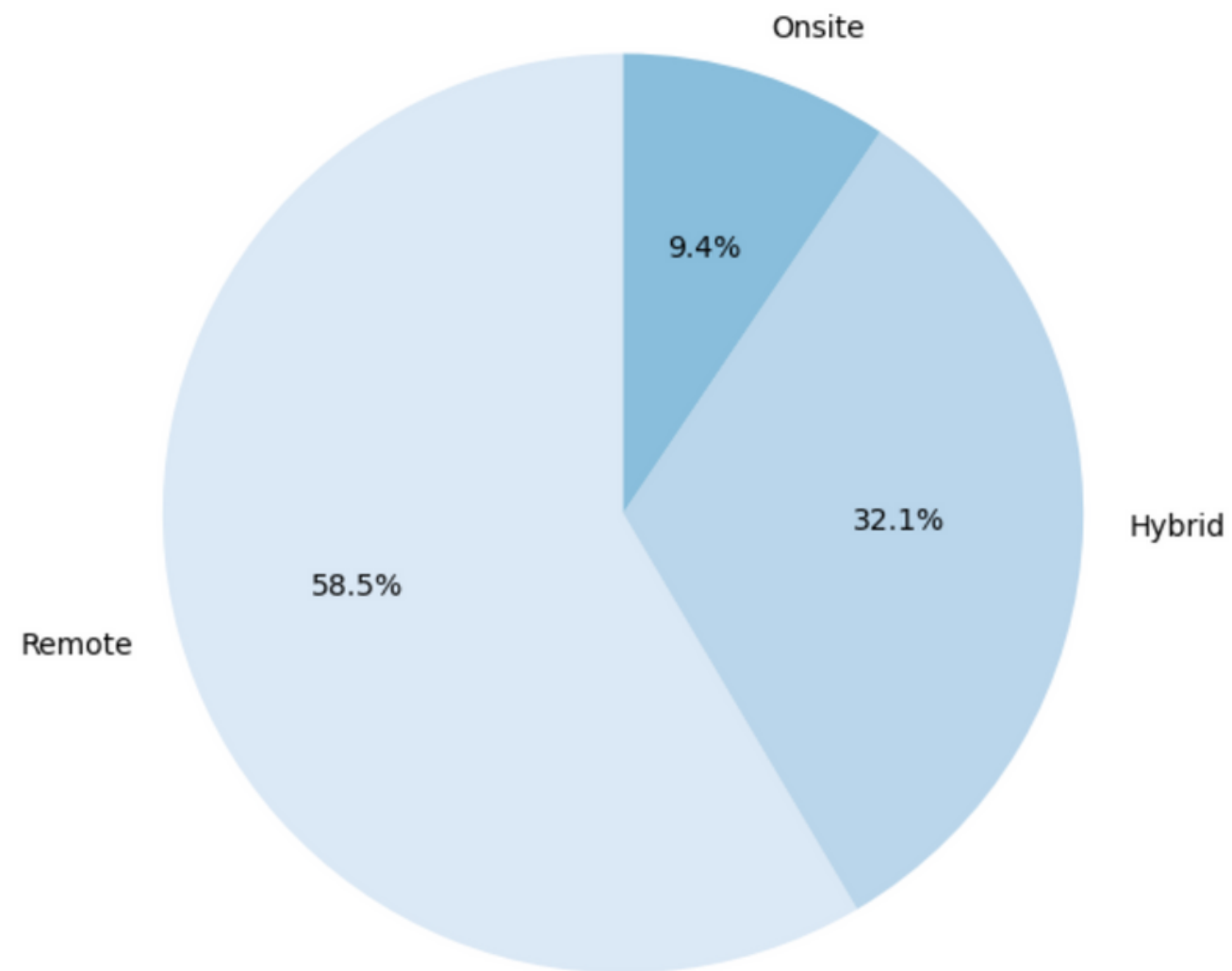
- **Remote Roles:** Employees with 3–5 years of experience dominate the remote roles, while those with 0–3 years also gave a fair presence but tend to earn lower salaries. Very few employees with 5–10 years of experience are represented in the remote roles
- **Onsite Roles:** Onsite jobs are represented by fewer data points. There is a slightly more balanced representation of all three experience levels. Those with 3–5 years of experience still earn higher salaries, while employees with 0–3 years of experience occupy the lower salary end. Notably there are very few earning \$100,000 in onsite positions



JOB TYPES DISTRIBUTION

How does the distribution of remote, hybrid and onsite role compare in Healthcare industry?

Job Types Distribution (Remote, Hybrid, Onsite) in Healthcare Roles



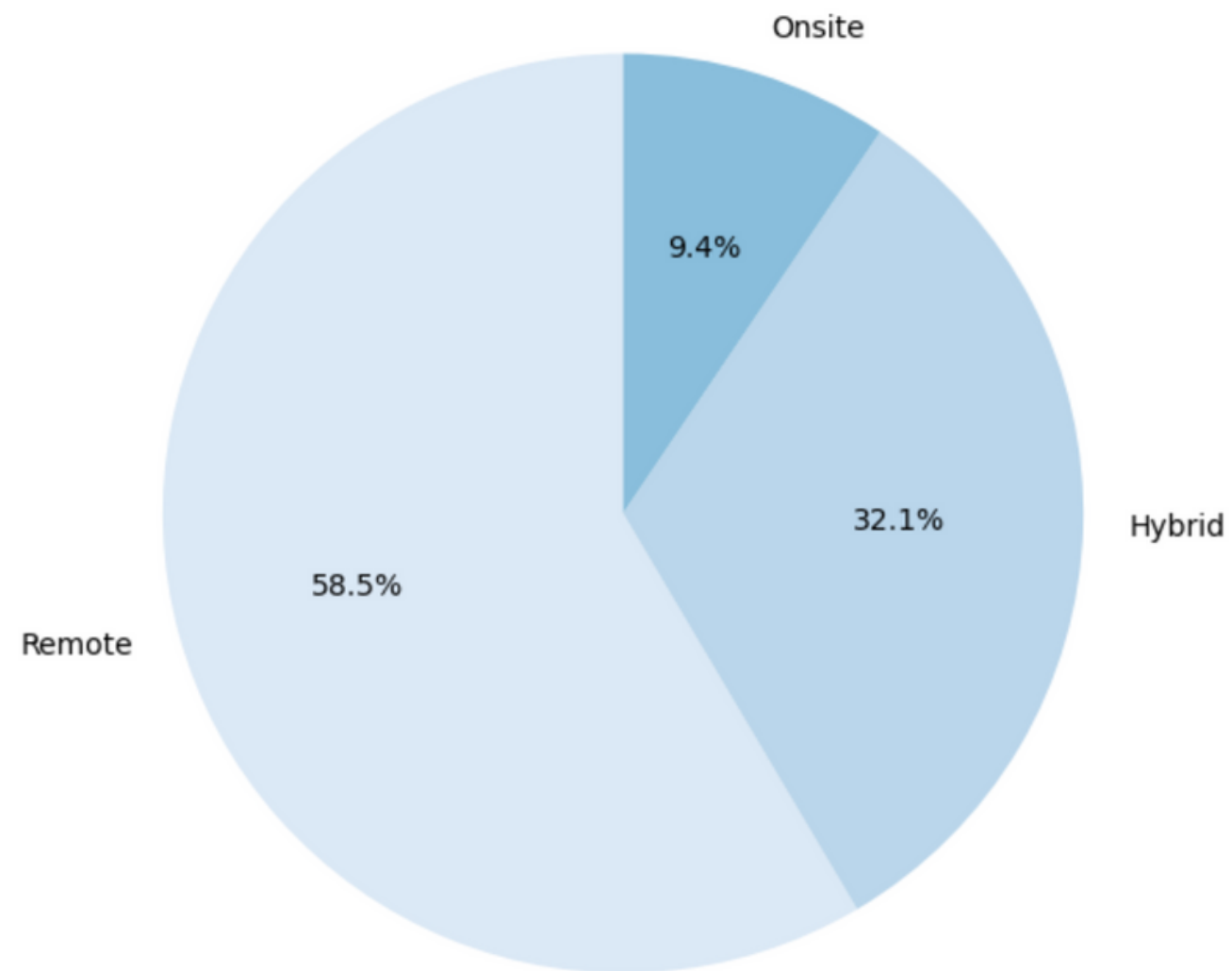
Analysis

- **Remote Role Dominance** : This reflects the growing trend in the healthcare industry, where many administrative, analytical and technical jobs have transitioned to remote work due to advancements in digital health and remote working infrastructure
- **Significant Hybrid presence** : A significant roles are hybrid indicating many companies still value a mix of in-office and remote work, possibly for team collaboration reflecting Healthcare need for on-site interaction while maintaining flexibility

JOB TYPES DISTRIBUTION

How does the distribution of remote, hybrid and onsite role compare in Healthcare industry?

Job Types Distribution (Remote, Hybrid, Onsite) in Healthcare Roles



Analysis

- **Relatively Low Onsite Roles:** Onsite roles make up 9.4% which suggests that the necessity for business analysts to be physically present in healthcare settings is much lower compared to other industries where on-site work may be critical.

The background features a large, faint graphic of a brain with circuit-like lines. The brain is rendered in light purple and pink tones. In the center of the brain, there is a white square containing the letters 'AI' in a bold, sans-serif font. The text 'AI APPLICATIONS' is overlaid on the brain graphic in a bold, dark blue, sans-serif font. The corners of the image are decorated with colorful geometric shapes: green diagonal lines in the top-left, and clusters of red, green, blue, and yellow semi-circles in the top-right, bottom-left, and bottom-right.

AI APPLICATIONS

WHAT IS AI?

Artificial intelligence is a field of science concerned with building computers and machines that can reason, learn, and act in such a way that would normally require human intelligence or that involves data whose scale exceeds what humans can analyze.



WHAT IS WEB SCRAPING?

Web scraping is the automated process of extracting large amounts of data from websites by mimicking human browsing behavior. This technique collects web content such as text, images, and other structured or unstructured data, and converts it into a usable format like a spreadsheet or database for further analysis or application.



AI application in web scraping and the future of web scraping.

- **Natural Language Processing (NLP):** AI uses NLP to extract, understand, and process data from unstructured sources like blogs, news articles, and product reviews, turning them into valuable insights
- **AI for Data Cleaning and Structuring:** AI scrapers can automatically clean and normalize data during extraction, converting messy or inconsistent data into structured, ready-to-use datasets, minimizing manual intervention.
- **Intelligent Automation and Learning:** Machine learning models are being trained to detect changes in website structures and adapt scraping techniques automatically, making the scraping process more resilient to frequent changes in website code.



AI applications in data visualization and its future:

Data visualization is the graphical representation of information and data using visual elements like charts, graphs, maps, and dashboards.

- **Automated Data Insights:** AI-powered tools can automatically analyze datasets and generate visualizations that highlight key patterns, trends, and outliers, saving time and providing deeper insights.
- **Future of Immersive Visualization:** The integration of AI with virtual reality (VR) and augmented reality (AR) technologies will revolutionize data visualization, creating immersive environments for data exploration.
- **Real-Time and Interactive Visuals:** The future of data visualization will see AI enabling real-time data streaming and interactive visuals that automatically update as new data comes in, allowing users to explore and manipulate data more intuitively.

The slide features four decorative geometric patterns in the corners. The top-left corner has a series of parallel teal lines forming a triangular shape. The top-right corner contains a cluster of overlapping quarter-circles in teal, orange, and dark blue. The bottom-left corner features a similar cluster of overlapping quarter-circles in red, teal, dark blue, and orange. The bottom-right corner shows a partial view of a large teal arc and parallel lines.

Q & A SESSION

The image features a light gray background with four decorative geometric patterns in the corners. The top-left corner has a series of parallel teal lines forming a triangular shape. The top-right corner features a cluster of overlapping quarter-circles in teal, orange, and dark blue. The bottom-left corner has a similar cluster of overlapping quarter-circles in teal, orange, and dark blue. The bottom-right corner shows a partial view of a teal arc and parallel lines.

THANK YOU!