

JOB MARKET TRENDS ANALYSIS REPORT

1. Introduction

The goal of this project is to analyze **job market trends for Data Science and related roles in India** using job postings data. This report highlights **hiring patterns, salary distributions, skill demand, experience impact, and job locations**.

Objectives:

- ✓ Identify **top hiring companies** in the Data Science job market.
- ✓ Determine the **most in-demand skills** for Data Science roles.
- ✓ Analyze **salary distribution** and variations by **seniority level**.
- ✓ Examine the relationship between **experience and salary**.
- ✓ Identify **top job locations** in India for Data Science roles.

This analysis is beneficial for **job seekers, hiring managers, and businesses** to understand **hiring trends, salary expectations, and skill demands** in the industry.

2. Exploratory Data Analysis (EDA)

Dataset Overview

- **Dataset Used:** [processed_jobs.csv](#)
- **Key Features:**
 - **Job Title** → Title of the job (e.g., "Data Scientist")
 - **Company** → Name of the employer
 - **Location** → City and country
 - **Experience Required** → Required years of experience
 - **Salary** → Salary range in LPA
 - **Skills** → Required technical skills

TOP 5 ROWS OF DATASET `processed_jobs.csv`

Job Title	Company	Location	Skills	Experience	Salary	Date Posted	Experience Years	Salary Category	Seniority	Data Wrangling	Deep Learning	Excel	Machine Learning	Numpy	Pandas	Power Bi	Python	R	Sql	Tableau
Data Scientist	Amazon	Mumbai	['Tableau', 'Excel', 'R']	6	1	Posted 9 days ago	6	Low	Mid-Level	0	0	1	0	0	0	0	1	0	1	
Data Scientist	Google	Chennai	['Data Wrangling', 'Pandas', 'Numpy']	6	1	Posted 13 days ago	6	Low	Mid-Level	1	0	0	0	1	1	0	0	0	0	
Data Scientist	Flipkart	Chennai	['Machine Learning', 'Deep Learning']	9	9	Posted 7 days ago	9	High	Senior	0	1	0	1	0	0	0	0	0	0	
Machine Learning Engineer	Infosys	Pune	['Machine Learning', 'Deep Learning']	4	1	Posted 5 days ago	4	Low	Mid-Level	0	1	0	1	0	0	0	0	0	0	
Machine Learning Engineer	Deloitte	Pune	['Python', 'Sql', 'Power Bi']	3	6	Posted 9 days ago	3	High	Junior	0	0	0	0	0	0	1	1	0	1	

3. Data Cleaning & Feature Engineering

Steps Performed:

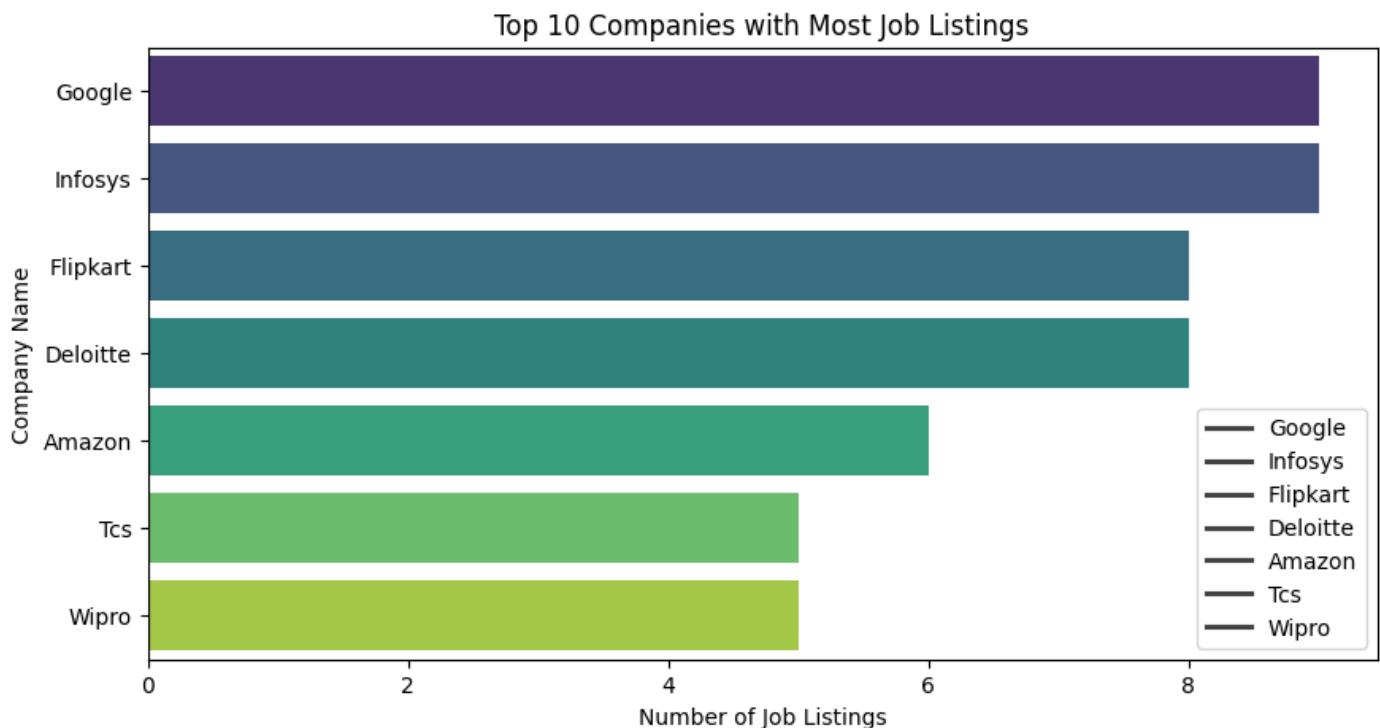
1. Cleaned and formatted job titles, company names, and skills.
2. Extracted numeric values from experience & salary columns.
3. Categorized salaries into "Low", "Medium", and "High".
4. Created seniority levels (Junior, Mid-Level, Senior) based on experience.
5. Applied one-hot encoding on skills for better analysis.

4. Key Insights from Data Analysis

4.1 Top Hiring Companies

- Google, Infosys, and other tech giants are leading recruiters.
- Job seekers should focus on these major hiring companies.

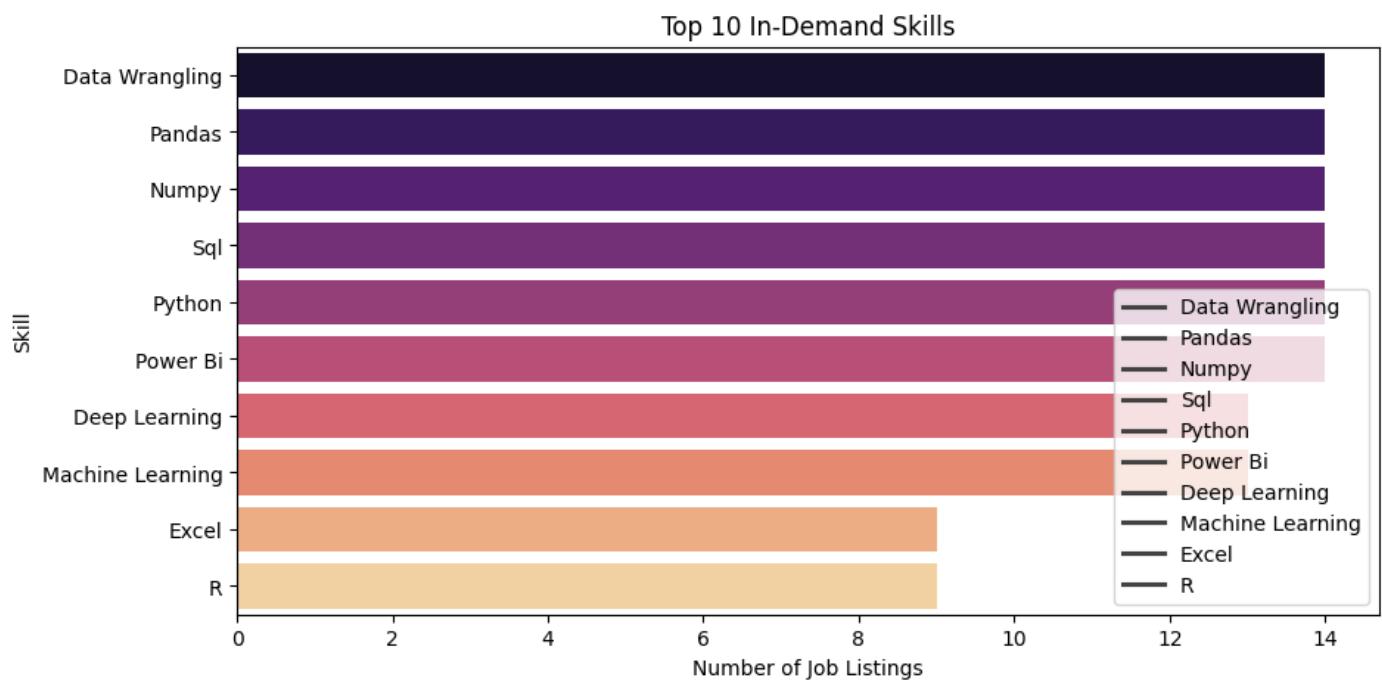
Graph:



4.2 Most In-Demand Skills

1. Python, SQL, Machine Learning, and Data Wrangling are the most required skills.
2. Data Visualization tools (Power BI, Tableau) are also highly in demand.

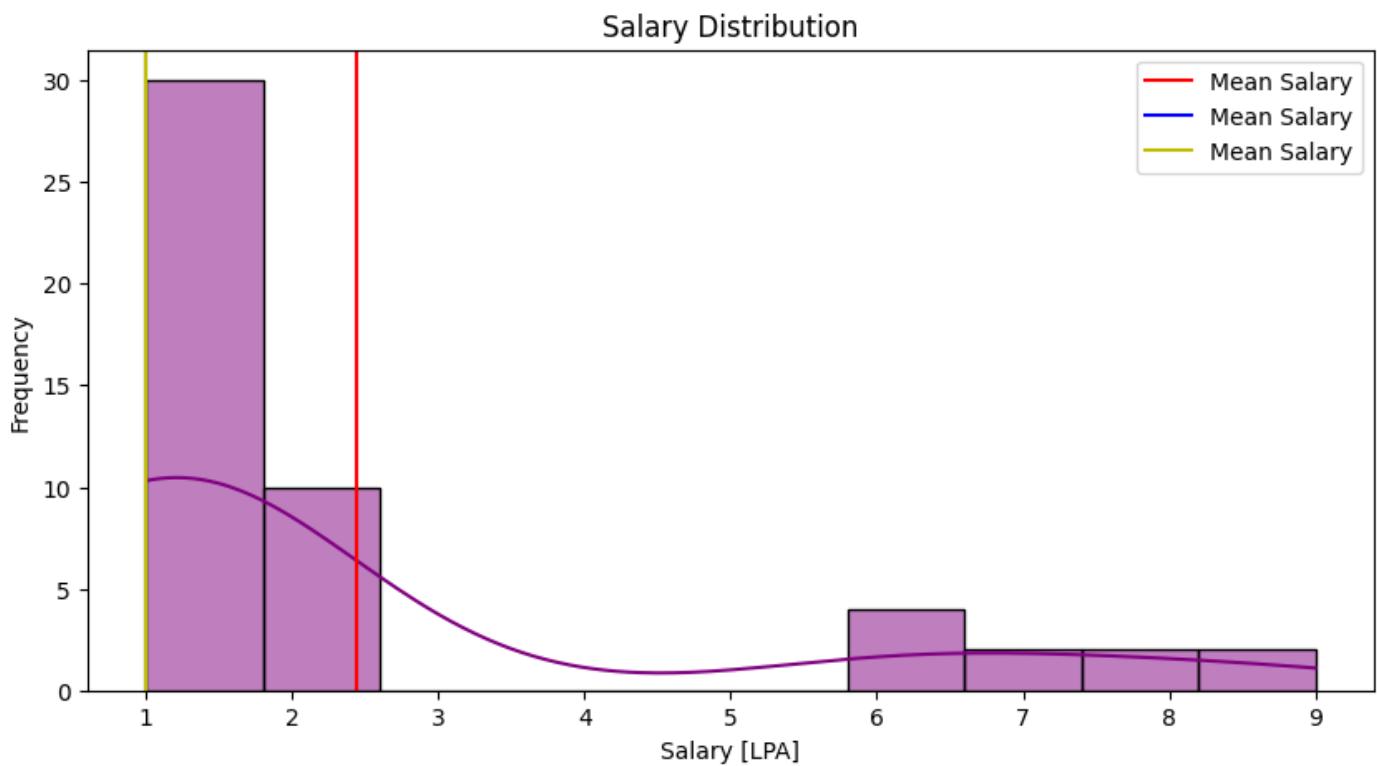
Graph:



4.3 Salary Distribution

1. The average salary is ~2.44 LPA, but the most common salary is 1 LPA.
2. Senior positions offer significantly higher salaries than Mid-Level and Junior roles.

Graph:



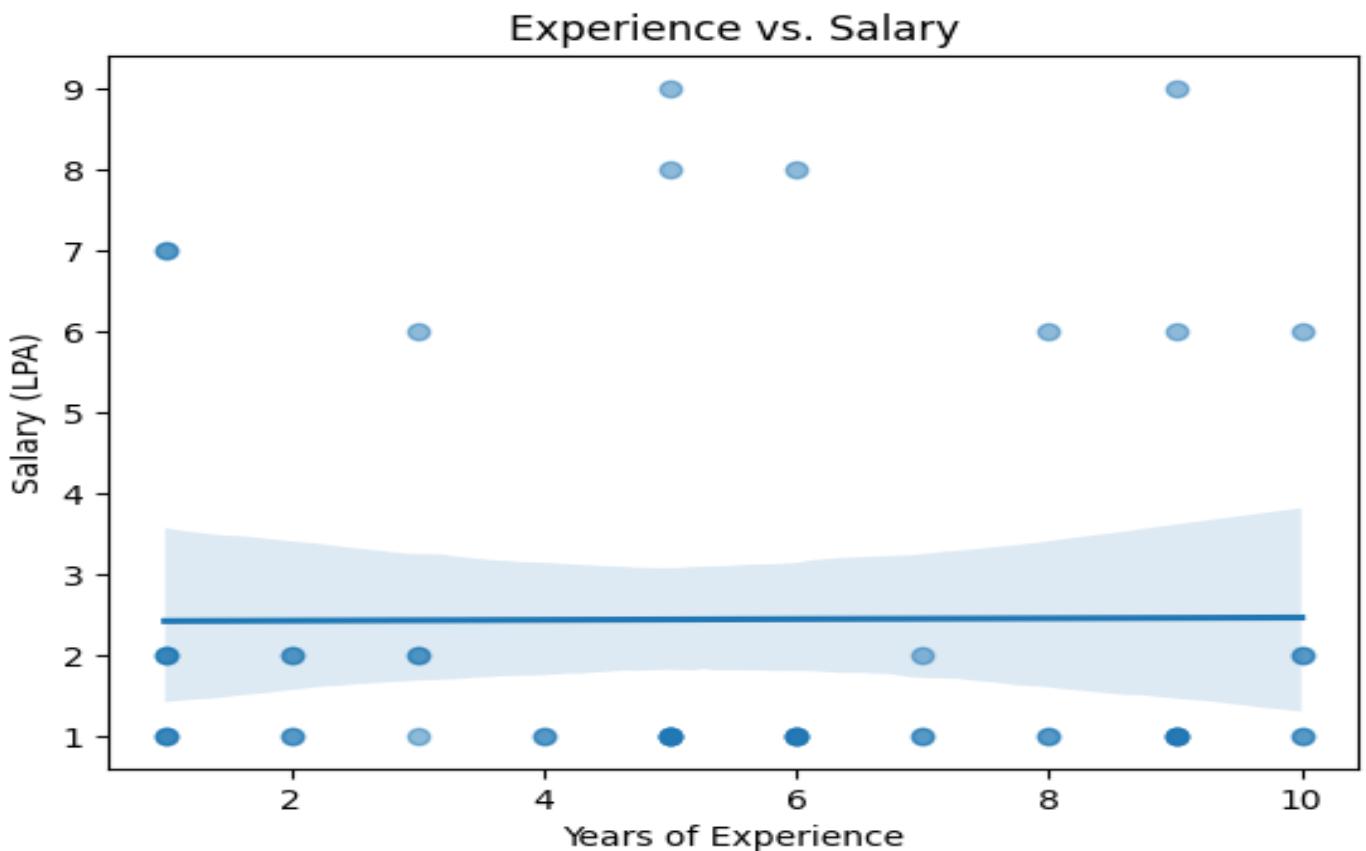
Graph:



4.4 Experience vs. Salary

1. No strong correlation between experience and salary.
2. Skills and specialization have more impact on salaries than experience.

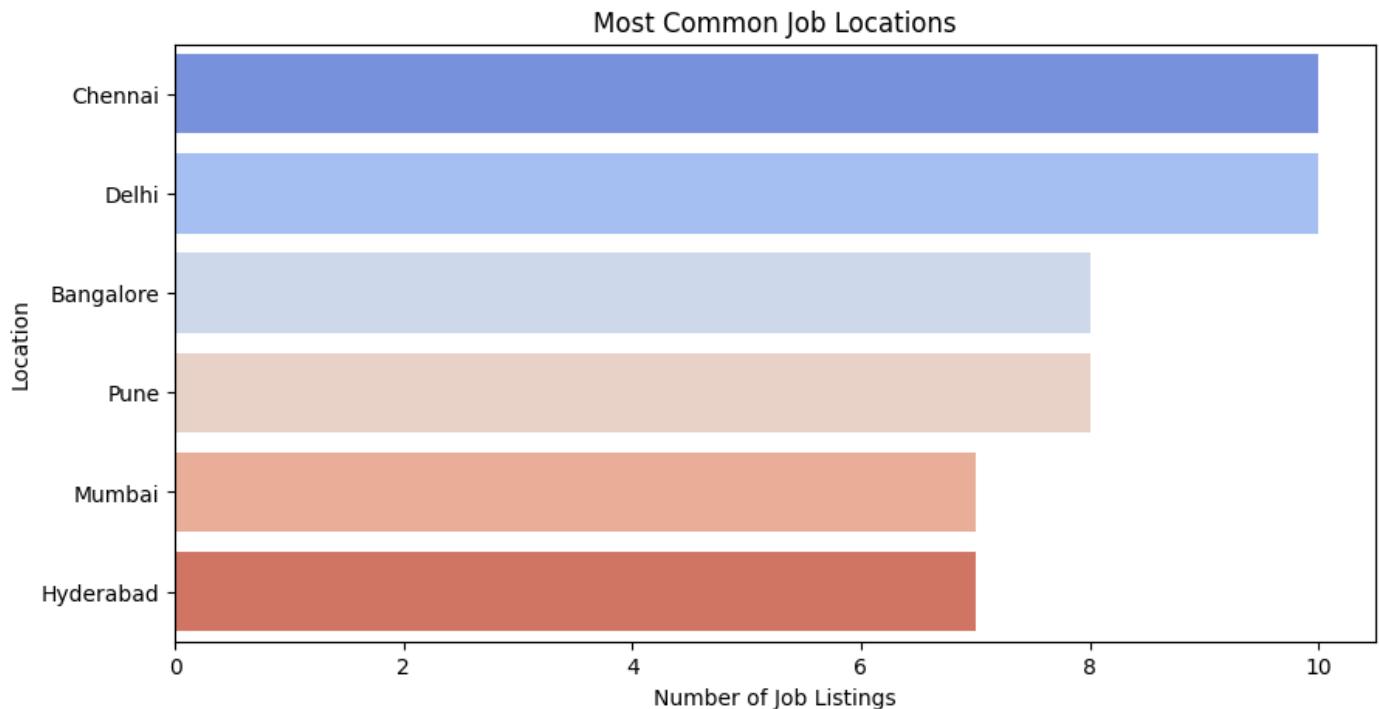
Graph:



4.5 Most Common Job Locations

1. **Chennai, Delhi, and Mumbai** are top cities for Data Science jobs.
2. **Bangalore has fewer job postings in this dataset, possibly due to niche data collection.**

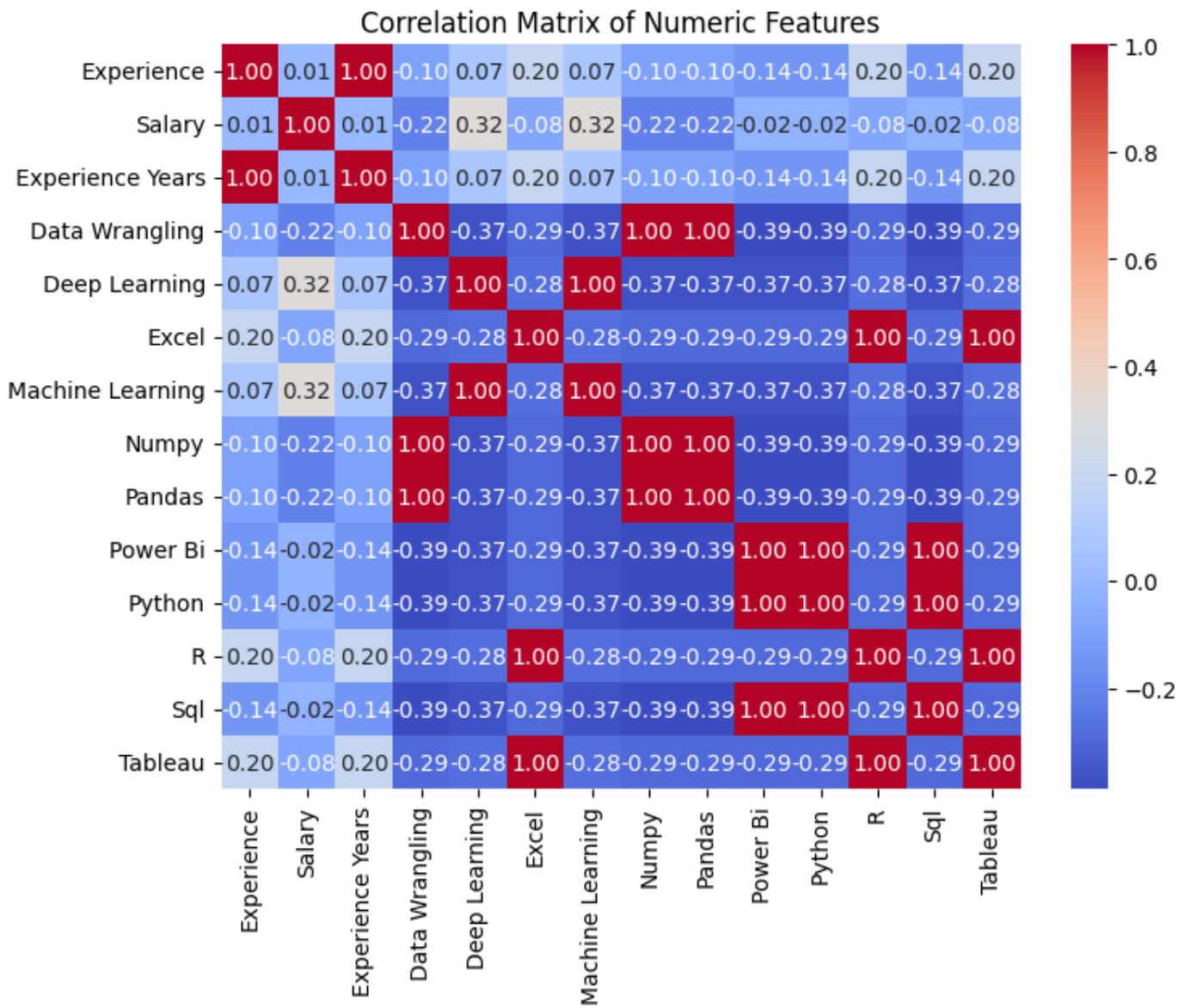
Graph:



4.6 Correlation Analysis

1. **Machine Learning, Deep Learning, and Python** have a moderate positive correlation with higher salaries.
2. **Experience alone is not enough to guarantee salary growth.**

Graph:



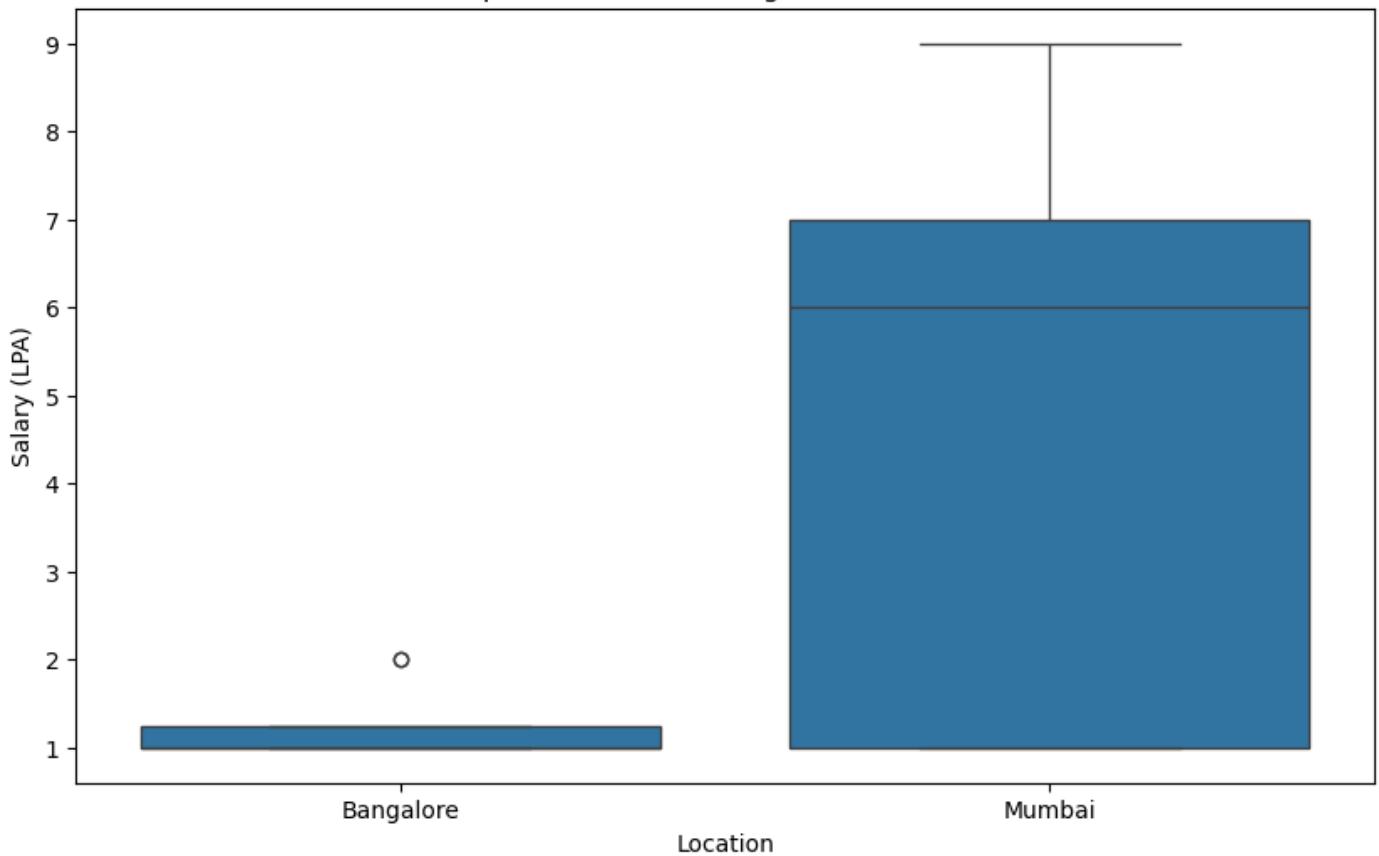
5. Hypothesis Testing & A/B Testing

5.1 Salary Differences by Location (T-Test)

1. Salaries in Bangalore and Mumbai are significantly different (P-Value: 0.01805).
2. Bangalore may require competitive salaries to attract talent.

Graph:

Boxplot of Salaries: Bangalore vs. Mumbai

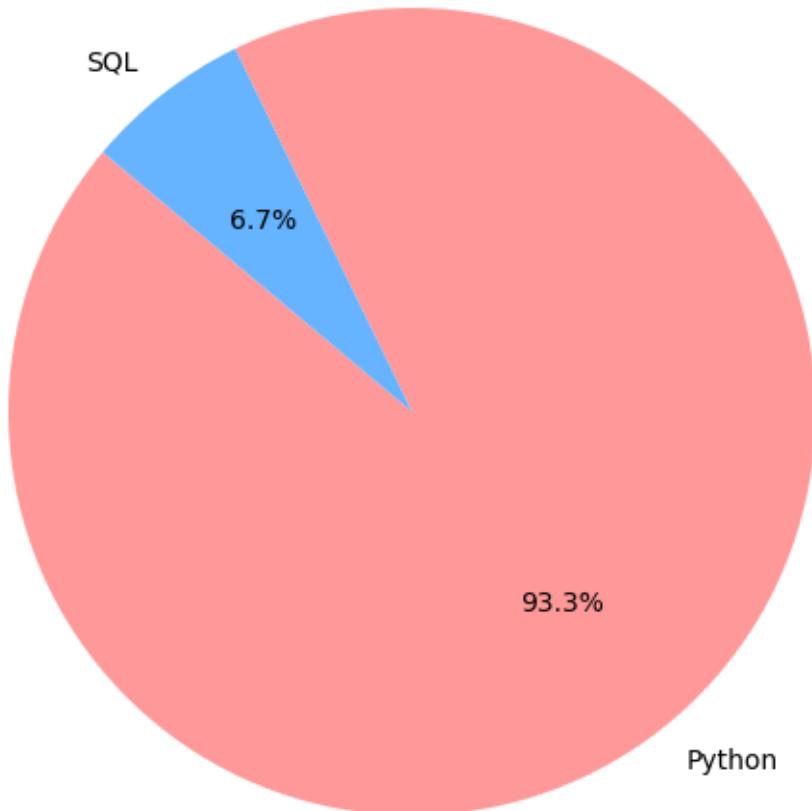


5.2 Skill Demand (Chi-Square Test)

- ❖ Python and SQL are equally in demand (P-Value: 1.00000).
- ❖ Candidates should focus on learning both languages.

❖ Graph:

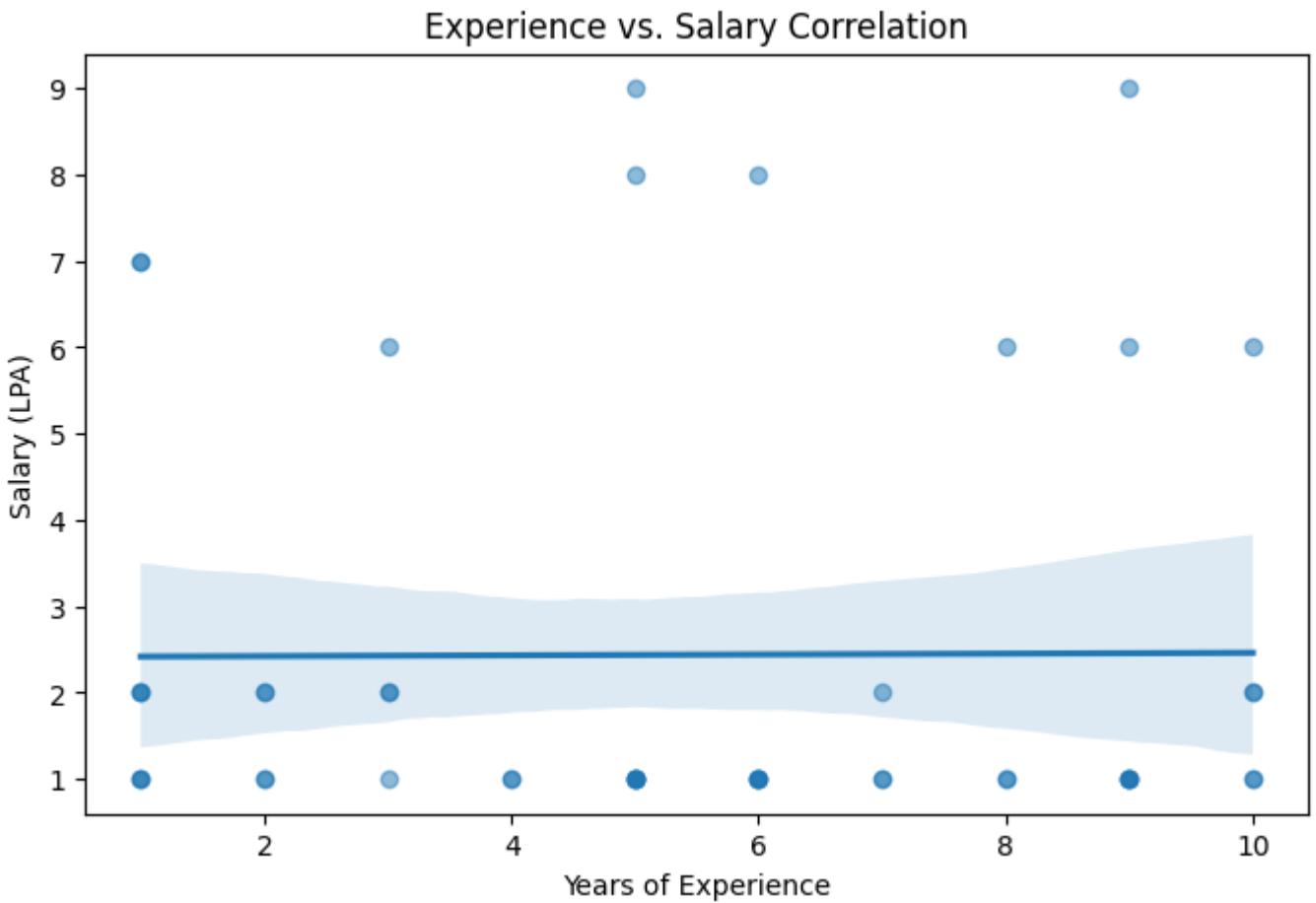
Python vs. SQL Demand



5.3 Experience vs. Salary Correlation (Pearson Correlation)

1. Experience does not significantly impact salary (P-Value: 0.96753).
2. Specialized skills and certifications are more valuable than years of experience.

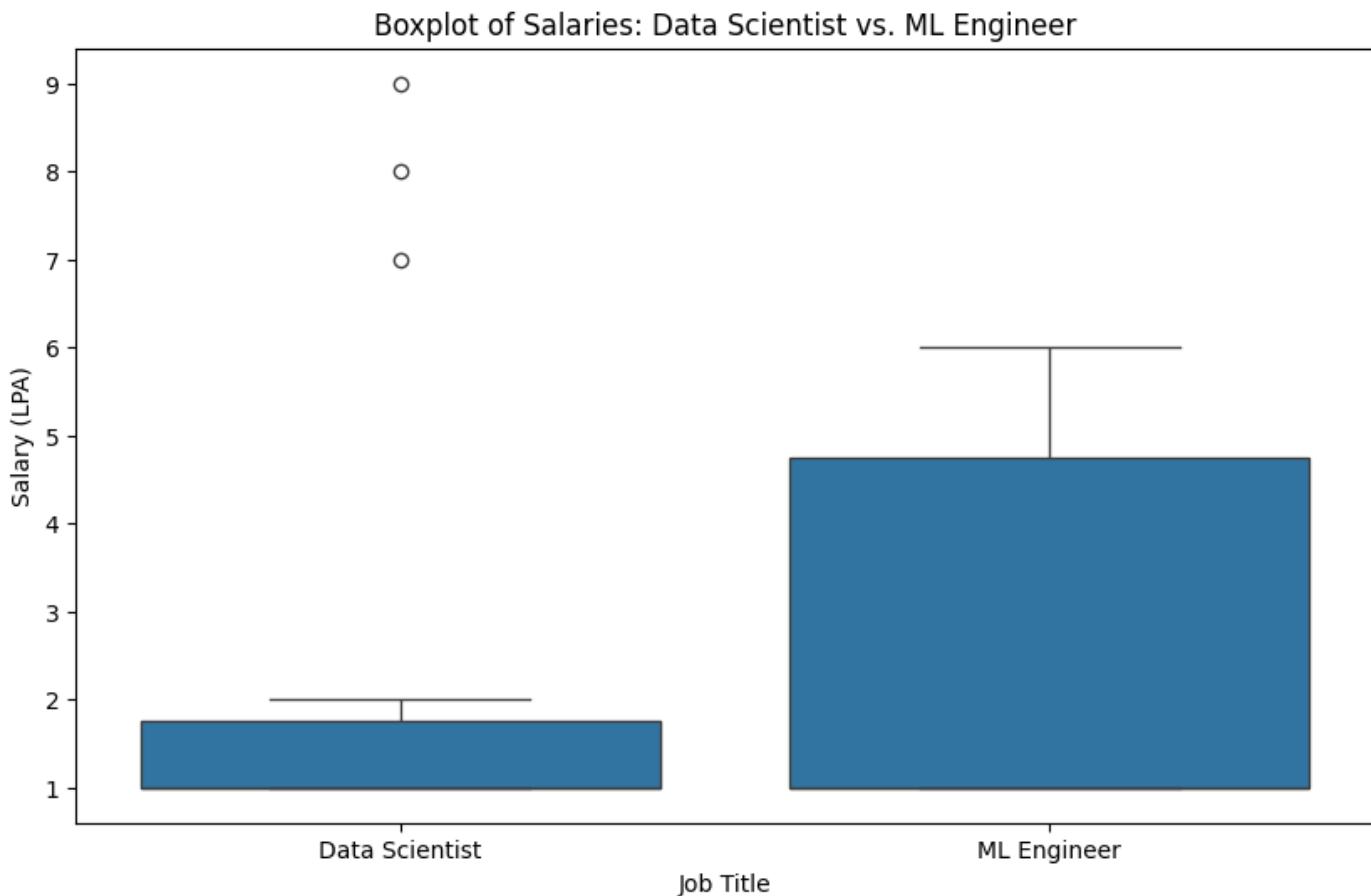
 Graph:



5.4 A/B Testing on Job Salaries (T-Test: Data Scientist vs. ML Engineer)

1. No significant salary difference between Data Scientists and ML Engineers (P-Value: 0.95077).
2. Job seekers can choose based on interest rather than salary expectations.

Graph:



6. Summary of Findings

Hypothesis	P-Value	Conclusion
Salary Differences by Location	0.018	✓ Significant difference
Skill Demand (Python vs. SQL)	1.000	✗ No difference in demand
Experience vs. Salary Correlation	0.968	✗ No correlation
Data Scientist vs. ML Engineer Salaries	0.951	✗ No significant difference

7. Key Takeaways & Business Implications

- ❖ **Hiring Trends & Locations:**
 - Google, Infosys, and other major firms are top recruiters.
 - Chennai, Delhi, and Mumbai are prime locations for Data Science roles.
- ❖ **Skill Demand & Career Growth:**
 - Python, SQL, ML, and Data Wrangling are essential skills.
 - Power BI, Tableau, and Deep Learning are also valuable.
- ❖ **Salary Trends & Experience Impact:**
 - Salaries are not strongly correlated with experience; skillset matters more.
 - Senior roles offer higher pay, but some Mid-Level salaries overlap with Senior roles.
- ❖ **Recommendations for Job Seekers:**
 - Master technical skills → Focus on Python, SQL, Machine Learning, and Data Visualization.
 - Target high-demand locations → Apply in Chennai, Delhi, Mumbai, and Hyderabad.
 - Specialize in niche skills → Cloud Computing, AI, NLP, and Deep Learning offer high salary potential.

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