

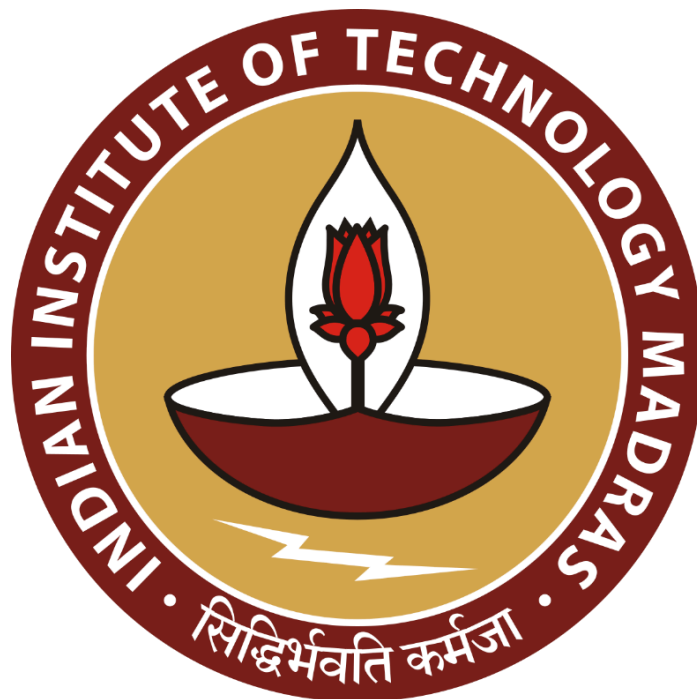
Driving Growth Through Enhanced Revenue, Reach, and Operational Efficiency

Mid-term Submission for the BDM capstone Project

Submitted by

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1. Executive Summary and Title

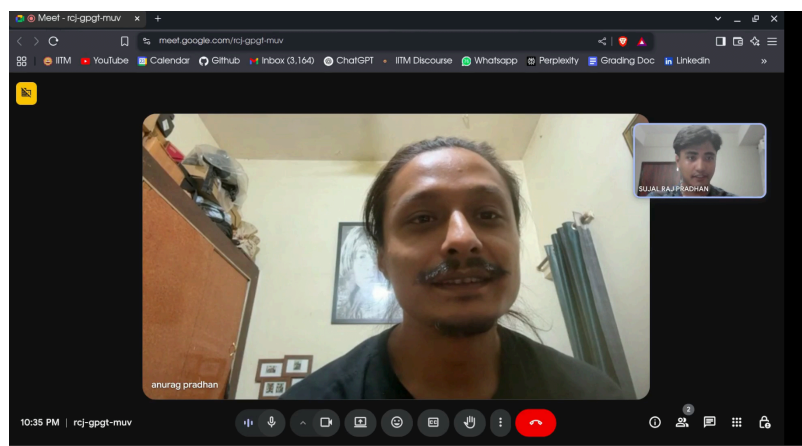
This report titled “**Driving Growth Through Enhanced Revenue, Reach, and Operational Efficiency**” presents a detailed analysis focused on data for Ink Over Matter, a tattoo studio located in Kodahalli, Bangalore since 2012. The investigation aims to solve issues like lack of presence online, operational constraints, and reliance on organic customer acquisition. The data in consideration is from 2018 to early 2024 . Data fields include client demographics, sessions, revenue generated, whether the client is returning or not and etc.

I had to pre-process and clean the data before doing data analysis. For the data pre-processing, cleansing and finding the descriptive statistics, I used Python libraries pandas, matplotlib, and seaborn. I calculated the mean session duration and average revenue per every visit. In addition, clients’ recorded genders and ages were analyzed to identify important demographic trends. Three major analyses were performed: income trends analyzed year-by-year between 2018 to 2024; appointment trends were assessed monthly for the years between 2022 to 2024; customer distribution by state was also analyzed for capture areas with seasonal behavior patterns.

Key insights revealed the studio is following a strong recovery following COVID-19 disruptions with 2024 being the peak revenue year for businesses overall. Significant revenue growth was observed mid-January through March , while July had increased revenues. Customers are primarily located in southern India especially in Kerala , Karnataka and Tamil Nadu. Featured recommendations include more seasonal marketing campaigns, introducing referral programs, improving digital presence, and expanding operational capacity to support continued growth.

2. Proof Of Originality

2.1 Video Interaction with the Founder



Link : [interaction_with_founder.mp4](#)

2.2 Letter from the Studio

INK OVER MATTER – TATTOO STUDIO

Kodihalli Main Road,
Indiranagar, Bangalore, Karnataka – 560008
+91 9731119546

Date: 23/06/2025

The Head of the Department,
Indian Institute of Technology Madras,
Chennai, Tamil Nadu – 600036

Subject: Proof of Data Provision for Business Data Management Project

Dear Sir/Madam,

This letter serves to confirm that **Ink Over Matter** of Kodihalli, Bangalore, Karnataka has authorized **Mr. Sujal Raj Pradhan** to utilize transactional appointment data for his **Business Data Management** project at IIT Madras. This data is extracted from Ink Over Matter's internal appointment and revenue records, and spans from 2018 to 2024

The data provided to Mr. Sujal Raj Pradhan includes details such as appointment dates, session durations, service costs, client demographics (age group, gender, location) and repeat visits. This data has been shared **strictly for academic purposes** upon his request.

We hope this dataset will help him successfully complete his project and contribute meaningfully to his academic work. If you require further information or confirmation, do not hesitate to get in touch.

Thank you.

Sincerely,
Anurag Pradhan,
Owner, Ink Over Matter,
+91 9731119546



2.3 Images from the Studio



3. Metadata

3.1 Origins of the data

The preprocessed dataset used for this analysis was originally derived from Ink Over Matter digitally stored transaction details. The appointment booking is done through a call or walk in and the data is store in an Excel sheet mentioning the time, the estimated cost and other details. The pre-processed CSV has details of the transactions on a daily basis such as Date, transaction ID, type of service availed and the revenue generated per

transaction. It is this structure that also allows for seasonality analysis, top services and revenue trends to be made.

Column Name	Data Type	Description
Session ID	String	Unique identifier for each tattoo appointment
Date of Appointment	Date	Date on which the client had the appointment
Time Spent (hrs)	Float	Duration of the session in hours
Total Cost (INR)	Integer	Total cost paid by the client for that session
Type of Tattoo	String	Indicates if the tattoo was Small, Sleeve etc
Body Part	String	The body part where the tattoo was inked
Is Revisit (0/1)	Binary	Whether the client is a returning customer where 1 is a returning client and 0 is a new client
Gender	String	Gender of the client
Age Group	String	Age bracket of the client
State	String	Indian state from which the client comes
Year	Numerical	Year where the appointment happened
Month of the year	Numerical	Month of appointment starting from 1 which represents January
Day of the Week	Numerical	Day of appointment starting from 0 which represents Monday

3.2 Data Cleaning and Preprocessing

I have cleaned and pre-processed the original data before conducting an analysis. The following steps were carried out:

i. Date Parsing and Breakdown

I changed the values in the **Date of Appointment** column to a more uniform format which is suitable for data analysis and from that format, I extracted **Year**, **Month of the Year**, **Day of the Week**.

- **Month of the Year** : 1 (January) - 12 (December)
- **Day of the Week** : This column follows a zero based indexing where 0 = Monday and 6 = Sunday

ii. Binary Conversion

I altered the **Is Revisit** column's mapping from the strings 'Yes' and 'No' to binary '1' and '0', to simplify aggregation.

iii. Categorical Normalization

- All string-based categorical fields (**Gender, Type of Tattoo, Body Part, State** etc.) were normalized by changing them to proper case (e.g., "male" → "Male").
- Different spellings but the same entries were combined into one normalized value (e.g., “forearm” and “Forearm” were unified).

4. Descriptive Statistics

4.1 Numerical Summary

Statistic	Time Spent (hrs)	Total Cost (INR)
Count	861.0	861.0
Mean	3.06	9172.40
Std Dev	1.15	3458.55
Min	1.0	3000.0
25%	2.1	6300.0
50%	3.1	9300.0
75%	4.0	12000.0
Max	5.0	15000.0

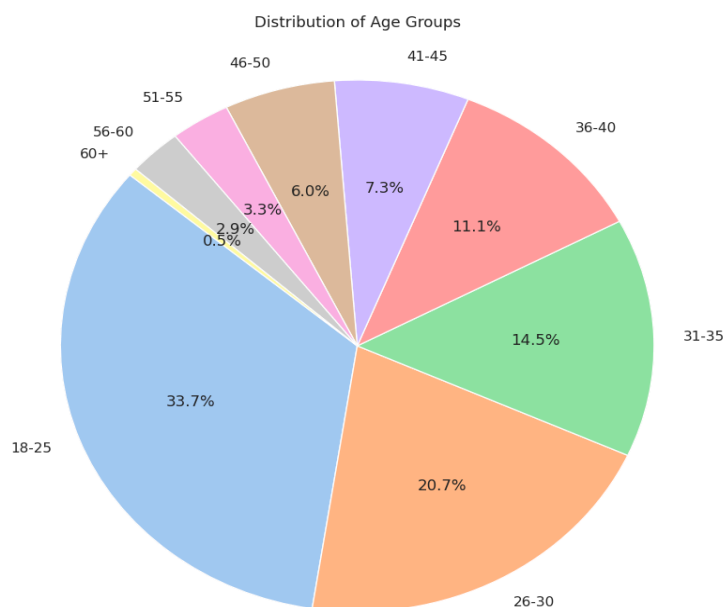
4.2 Categorical Distribution

a. Gender Distribution by Year (Post-COVID Focus)

Year	% Female	% Male	% Other
2018	30.0%	66.7%	3.3%
2019	25.2%	68.0%	6.8%
2021	37.5%	50.0%	12.5%
2022	30.7%	57.7%	11.7%
2025	25.7%	66.7%	7.6%

- **Post-COVID Recovery.** After a rapid fall in 2020 due to Covid-19 and a slow recovery in 2021, the number of sessions increased gradually, resulting in the highest point in 2024 with 179 appointments.
- **Male Clients Dominate.** Males are the majority of the clientele (~65–68%) throughout all the years, thus, they are showing strong and stable interest in tattoos over time.
- **Female Participation is Stable.** The percentage of female clients remains in the 25–30% range, which shows that there has been no dramatic growth after a consistent post-COVID engagement in the tattoo industry.
- **Notable Increase in ‘Other’ Gender Clients.** Apart from the majorities with the male and female genders, the Other group becomes more and more visible.

b. Age Group Distribution



- **Youth-Focused Market:** More than half of customers are between 18 and 30 years old, indicating that tattoos are popular with younger adults interested in fashion and self-expression.
- **Opportunity Beyond 45:** Older age groups comprise a smaller percentage, yet a significant chunk (12.7% from 46–60) — indicating potential to market to older clients designs that are customized or personally meaningful.

5. Explanation of Analysis Procedure

In this analysis, a combination of advanced methods have been used, each of which will contribute to addressing the challenges faced by **Ink Over Matter**. This analysis will try to uncover the appointment trends in years from the years 2018-2024, appointment trends in

months from the years post Covid-19 i.e 2022, 2023 and 2024 and Customer Geo-Mapping.

5.1 Income Trends over the years and Revenue Estimation (2018–2024)

Purpose:

To track how client appointment volumes changed annually, yearly revenue capturing the disruptive effects of COVID-19 and evaluating how business rebounded in the following years.

Methodology:

Incomes were grouped by year using the `groupby()` function, with unique sessions tallied via `nunique()`. These were visualized with Matplotlib's `plot()` to illustrate yearly trends—whether growth or decline. To estimate the yearly revenue, I have used the formula ***Total Revenue = Sum of all appointment prices***

5.2 Monthly Appointment Patterns (2022–2024)

Purpose:

This is done to uncover which months in the post-COVID period had experienced spikes or dips in booking activity, revealing patterns tied to seasonality, lifestyle behaviors, and culturally significant events (e.g., weddings, festivals).

Methodology:

I filtered the data for 2022 to 2024, then I aggregated the appointment counts using `groupby()` across the years and the month columns. Then I created plots using Matplotlib and enhanced it with Seaborn styling and these were used to visualize trends clearly.

5.3 Customer Geo-Mapping (State-wise)

Purpose:

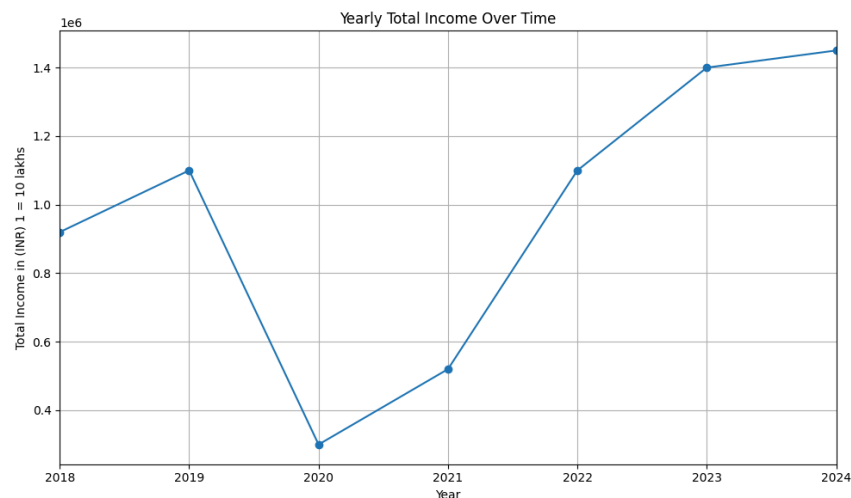
This was done to analyze the geographic distribution of Ink Over Matter's clients across Indian states, and to understand the balance between urban and rural demand.

Methodology:

I grouped the Data by state using `groupby()` and `count()` to quantify appointments. I used Bar charts to visualize the top-performing states. Where available, urban/rural segmentation was illustrated using grouped or stacked bar plots for comparison.

6. Results and Finding

6.1 Income trend over the years and Revenue Estimation(2018-2024)



This part presents the most important revenue and operational trends from 2018 to 2024 based on the appointment dataset. The founder told me that the studio has never done any advertisements and fixed operating expenses like month rent were included to note overall spending patterns. Studio rent was ₹20,000/month prior to COVID, went up to ₹21,000/month during COVID, and escalated to ₹28,000/month post-COVID. The cost of equipment remained low and was not monitored.

Pre-COVID Growth (2018–2019)

- There was a rise in yearly income from 2018 to 2019.
- The income had increased from an estimated ₹9.5 lakhs in 2018 to ₹11 lakhs in 2019, which also had led to an increase in revenue.

COVID-19 Decline (2020–2021)

- The income had fallen dramatically due to Covid-19.
- As a result the income had declined. The founder still had to bear the rental costs of the studio which led to the studio going at a loss during this time.

Post-COVID Growth (2022–2024)

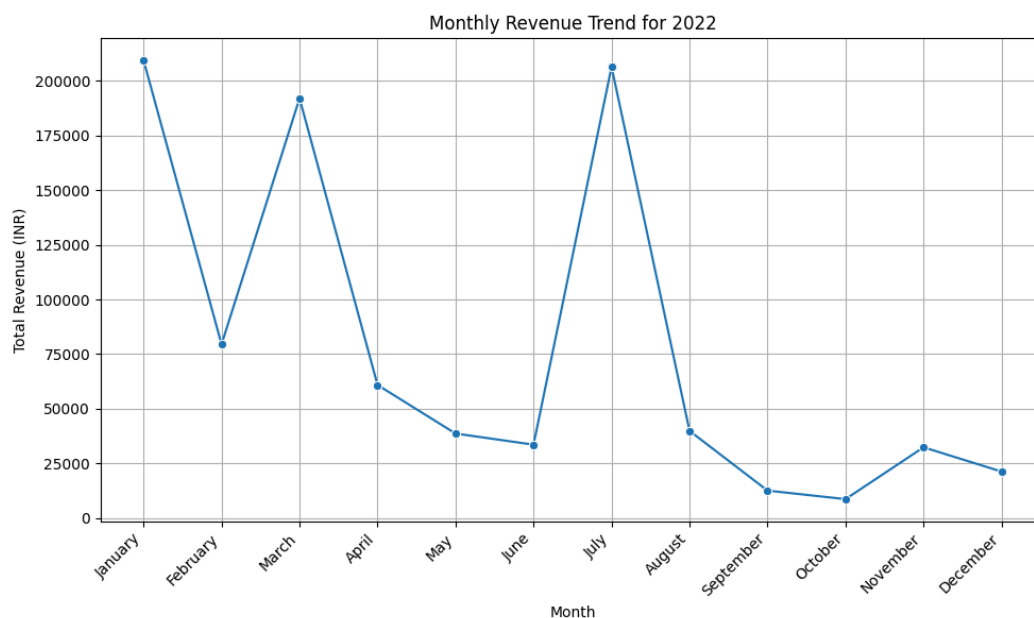
- 2022: The number of Appointments started recovering. Even though the rental costs had increased to 28000/month, the income generated made it up for the high rental cost of the studio. Therefore it is safe to say that the revenue had increased.
- 2023: Growth had continued appointments, which reflected the high in-person demand and also indicated a rise in revenue.

- 2024: The yearly income reached an all time high this year, indicating that not only was the studio had stable income, had great revenue but also had recovered from the decline it faced during Covid-19.

Insights from the founder:

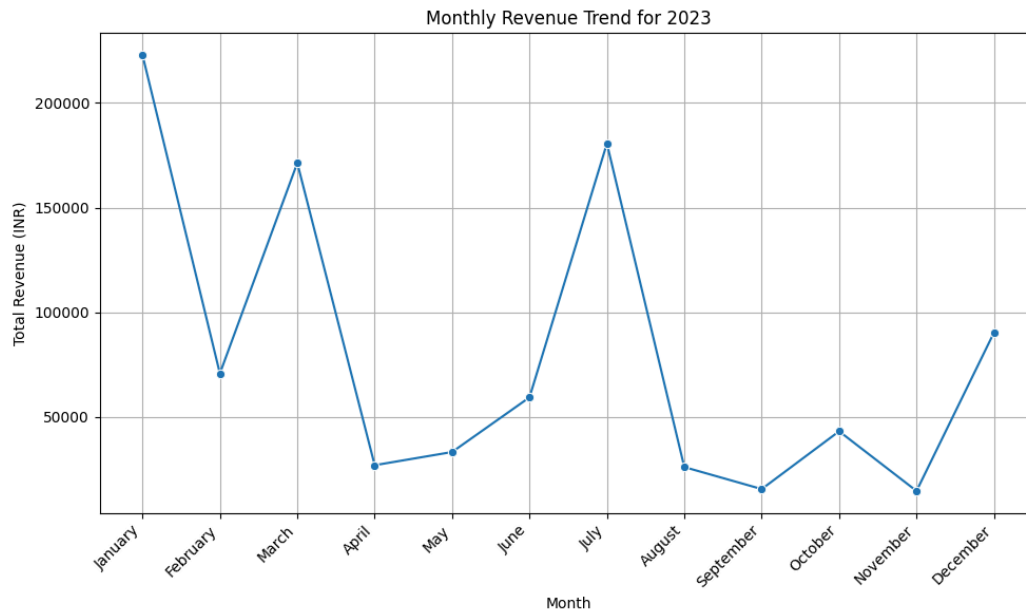
- No Advertisement Spend: Client acquisition is purely organic (word-of-mouth), with no ad spend logged.
- Rent as Fixed Cost: Altering rent levels provide a reference to measure breakeven and operational effectiveness, in the absence of variable advertising expenditure.

6.2 Monthly appointment patterns (Post Covid-19)



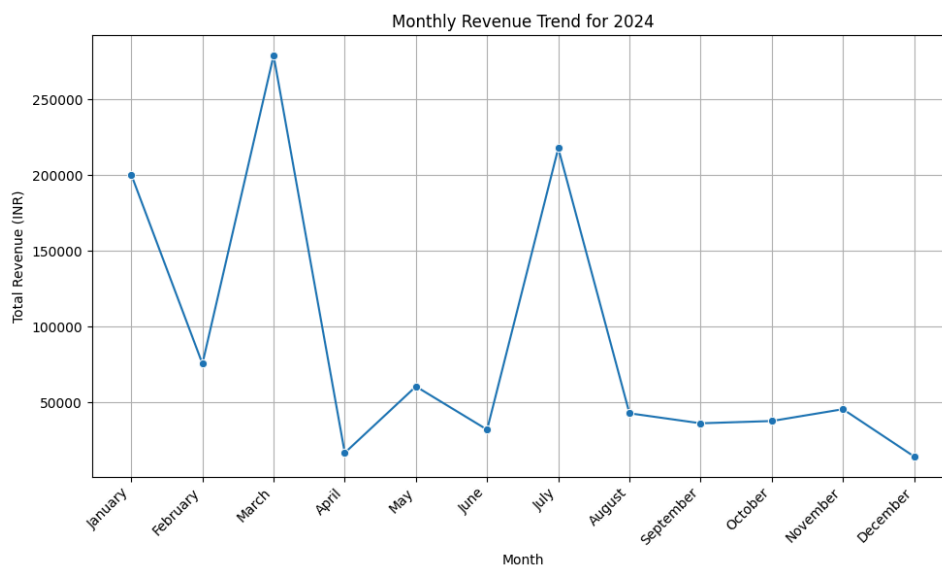
Monthly Revenue Analysis – 2022 (Summary)

- In January, March, and July we had peak months generating all over ₹1.9L in revenue – most likely due to the seasonal demand for product offering versus the availability of the shoppers.
- In September and October we had our low revenue months which suggest natural off-season or shopper engagement.
- The trend shows steep fluctuations in mid-year and end-of-year months, which opens up the door for seasonal campaign opportunities with targeted promotions during high-demand months.



Monthly Revenue Analysis – 2023 (Summary)

- Once again, January, March, and July were all highlighted as peak revenue months, with a consistent seasonal demand pattern (similar to 2022).
- April, September, and November showed us our revenue low points, suggesting that mid and late-year business cycles are slower.
- The evidence supports that the peaks in revenue in 2023 were associated with early-year and mid-year consumer interest, confirming the hypothesized value of timing our campaigns in those months.



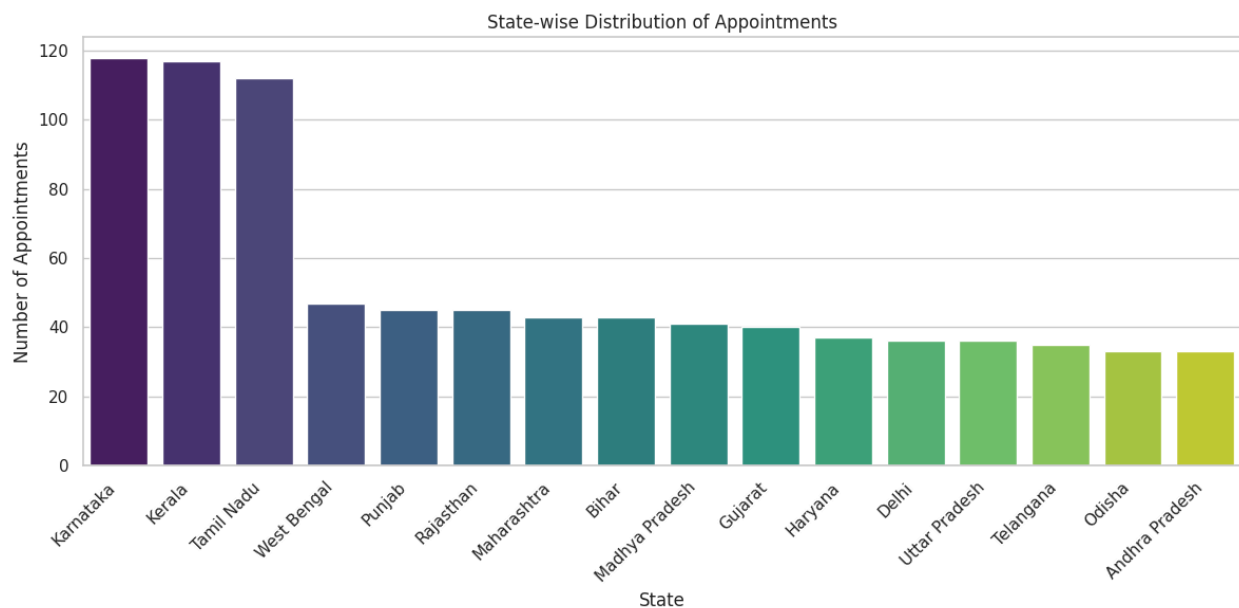
Monthly Revenue Highlights – 2024 (Summary)

- March was the highest revenue month at > ₹2.7L; July was the second highest with

₹2.34L in revenue.

- April and December were the lowest revenue months showing weak periods for campaigns (i.e., lower client interest).
- The trend is consistent with previous years' monthly revenue data, confirming early and mid-year as prime times for campaign targeting and resource planning.

6.3 Customer Geo-Mapping (State-wise)



- Karnataka, Kerala and Tamil Nadu dominate the figure with over 110 appointments in each state indicating positive resonance and regional traction due to geographic proximity/or local word-of-mouth/or better access to the studio in Bangalore.
- Moderate opportunities exist through regional marketing and overnight travel-based clientele in West Bengal, Punjab and Rajasthan (~40-50 appointments).
- Low reach will come from the North/East states of Delhi, Uttar Pradesh, Odisha and Bihar (~30-40 appointments). Limited reach could be attributed to distance/lack of outreach to clients across the country.