





ElifSurucu /  
Analyzing-E-Commerce-Sales-Performance
















<> Code


 Issues


 Pull requests


 Actions

 Projects

 Wiki

 Security

 In



 main ▾



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# Project Overview

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This project aims to analyze e-commerce sales data to uncover insights into sales performance, product category trends, seasonality, and customer preferences. By exploring patterns in order fulfillment, promotions, and geographic sales distribution, the project will provide actionable recommendations to help businesses optimize marketing strategies, enhance customer targeting, and boost sales performance.

## Scope of the Project:

The analysis is designed to be exhaustive and insights-driven, covering detailed descriptive and inferential investigations. The goal is to explore the dataset to extract meaningful trends, test hypotheses, and derive data-driven insights that contribute to business decision-making processes.

## Key Areas of Focus

### Sales Performance Analysis:

- Evaluating total sales, revenue, and order quantity.
- Identifying top-performing product categories, SKUs, and sales channels.
- Measuring average order value and revenue trends.

### Seasonality and Time Trends:

- Uncovering monthly and seasonal trends in sales performance.
- Analyzing peak sales periods and high cancellation months.

### Customer and Geographic Insights:

- Analyzing customer behavior based on location (city/state).
- Understanding the relationship between shipping service levels and geographic regions.

### Promotions and Discounts:

- Evaluating the impact of promotions on order volume and revenue.
- Comparing performance between promoted and non-promoted orders.

### Order Fulfillment Insights:

- Assessing the differences in performance between orders fulfilled by Amazon and merchants.

- Analyzing the impact of shipping service levels (Standard vs. Expedited) on sales performance.

### **Inferential Analysis and Hypothesis Testing:**

*Testing relationships and significant differences across key variables:*

- Promotion effectiveness
- Fulfillment method impact
- Geographic variations in sales and cancellations

## **Expected Outcomes**

*By conducting this analysis, the project will deliver:*

- Comprehensive insights into sales trends, customer preferences, and product performance.
- Key findings on the effectiveness of promotions, fulfillment strategies, and time-based sales patterns.
- Data-driven recommendations to optimize marketing strategies, reduce cancellations, and improve sales performance.

### **Business Impact:**

*The findings will empower businesses to:*

- Improve product targeting and inventory management.
- Enhance marketing strategies through insights on seasonality and promotions.
- Optimize fulfillment methods to increase customer satisfaction and reduce cancellations.
- Identify high-performing categories and target locations to maximize revenue growth.

### **Tools and Techniques**

*The project will employ:*

- Data Analysis: Python (Pandas, NumPy), statistical methods, and hypothesis testing.
- Visualization: Matplotlib, Seaborn for trends and distribution analysis.
- Statistical Tests: Comparative tests, correlation analysis, and significance testing.
- Reporting: Actionable insights with visualized results for clarity and decision-making.

---

## **Imports**

---

```
## [2]:  
  
# Standard Data Science Toolkit  
import pandas as pd  
import numpy as np  
import matplotlib.pyplot as plt; plt.style.use("ggplot")  
import seaborn as sns  
  
# Inferential Statistical Tests  
from scipy.stats import f_oneway  
from statsmodels.stats.multicomp import pairwise_tukeyhsd
```

## Data

```
In [3]:  
  
file_path = "cleaned_ecommerce_data.csv"  
  
ecommerce_data = pd.read_csv(file_path)  
  
ecommerce_data.head()
```

Out[3]:

	index	Order ID	Date	Status	Fulfilment	Sales Channel	ship-service-level	Style	
0	1	171-9198151-1101146	2022-04-30	Shipped - Delivered to Buyer	Merchant	Amazon.in	Standard	JNE3781	JNE3 KR-
1	7	406-7807733-3785945	2022-04-30	Shipped - Delivered to Buyer	Merchant	Amazon.in	Standard	JNE3405	JNE3
2	12	405-5513694-8146768	2022-04-30	Shipped - Delivered to Buyer	Merchant	Amazon.in	Standard	JNE3405	JNE3 K
3	14	408-1298370-1920302	2022-04-30	Shipped - Delivered to Buyer	Merchant	Amazon.in	Standard	J0351	JC (
4	15	403-4965581-9520319	2022-04-30	Shipped - Delivered to Buyer	Merchant	Amazon.in	Standard	PJNE3368	PJNE3 KF

5 rows × 23 columns

In [4]: `ecommerce_data.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 32395 entries, 0 to 32394
Data columns (total 23 columns):
#   Column                Non-Null Count  Dtype
---  -
0   index                 32395 non-null  int64
1   Order ID              32395 non-null  object
2   Date                  32395 non-null  object
3   Status                 32395 non-null  object
4   Fulfilment            32395 non-null  object
5   Sales Channel         32395 non-null  object
6   ship-service-level    32395 non-null  object
7   Style                  32395 non-null  object
8   SKU                    32395 non-null  object
9   Category              32395 non-null  object
10  Size                   32395 non-null  object
11  ASIN                   32395 non-null  object
12  Courier Status         32395 non-null  object
13  Qty                    32395 non-null  int64
14  currency               32395 non-null  object
15  Amount                 32395 non-null  float64
16  ship-city              32395 non-null  object
17  ship-state             32395 non-null  object
18  ship-postal-code       32395 non-null  float64
19  ship-country           32395 non-null  object
20  promotion-ids          32395 non-null  object
21  B2B                    32395 non-null  bool
22  fulfilled-by           32395 non-null  object
dtypes: bool(1), float64(2), int64(2), object(18)
memory usage: 5.5+ MB
```

In [5]: `ecommerce_data.describe()`

Out[5]:

	index	Qty	Amount	ship-postal-code
<b>count</b>	32395.000000	32395.000000	32395.000000	32395.000000
<b>mean</b>	60956.478160	1.004846	650.522920	462097.701096
<b>std</b>	36843.686311	0.085035	284.913465	194276.943115
<b>min</b>	1.000000	1.000000	0.000000	110001.000000
<b>25%</b>	27188.500000	1.000000	459.000000	370001.000000
<b>50%</b>	63461.000000	1.000000	631.000000	500017.000000
<b>75%</b>	91761.500000	1.000000	771.000000	600037.000000
<b>max</b>	128891.000000	5.000000	5495.000000	855115.000000

- Qty (quantity): Average 1.00, maximum 5.00.
- Amount (amount): Average 650.52, standard deviation 284.91, maximum 5495.00

- Ship-postal-code: Average 462097.70.

## Descriptive Analysis Questions

Category	Questions
General Sales Insights	<div>1. What is the total number of orders placed?</div> <div>2. What is the total revenue generated?</div> <div>3. What is the average order value across all orders?</div> <div>4. What are the top 10 best-selling product categories by total sales?</div> <div>5. Which SKUs (product codes) have the highest total quantity sold?</div> <div>6. Which SKUs generate the highest revenue?</div> <div>7. What are the monthly sales trends over time? (group by Date)</div> <div>8. Which fulfillment method (Fulfilment) contributes the most to sales?</div> <div>9. What is the distribution of Status (shipped, canceled, etc.)?</div> <div>10. Which Sales Channel generates the most sales and revenue?</div> <div>11. What is the average order quantity (Qty) across different categories?</div>
Seasonality & Time Trends	<div>12. What are the peak sales months and seasons?</div> <div>13. Is there a weekly or daily pattern in sales volume?</div> <div>14. Which months show the highest cancellation rates?</div>
Customer Location Trends	<div>15. Which ship-city and ship-state have the most orders?</div> <div>16. What is the average revenue per shipping state or city?</div> <div>17. Which states or cities have the highest cancellation rates?</div>
Promotions & Discounts	<div>18. How many orders included promotion-ids?</div> <div>19. What is the average revenue of promoted vs. non-promoted orders?</div> <div>20. Which promotions were the most frequently used?</div>
Fulfillment Methods	<div>21. What is the split between orders fulfilled by Amazon and merchants?</div>

22. What is the average order value for Amazon-fulfilled orders vs. Merchant-fulfilled?

23. What is the distribution of ship-service-level (Standard vs. Expedited)?

```
In [6]: #1.What is the total number of orders placed?
total_orders = len(ecommerce_data)
print("Total number of orders placed:", total_orders)
```

Total number of orders placed: 32395

```
In [7]: #2.What is the total revenue generated?
total_revenue = ecommerce_data['Amount'].sum()
print("Total revenue generated:", total_revenue)
```

Total revenue generated: 21073690.0

```
In [8]: #3.What is the average order value across all orders?
average_order_value = ecommerce_data['Amount'].mean()
print("Average Order Value:", round(average_order_value, 2))
```

Average Order Value: 650.52

```
In [9]: #4.What are the top 10 best-selling product categories by total sales?
top_categories = ecommerce_data.groupby('Category')['Amount'].sum().sort_value
print("Top 10 Best-Selling Product Categories by Total Sales:")
print(top_categories)
```

Top 10 Best-Selling Product Categories by Total Sales:

Category	
Set	10020659.0
kurta	5281253.0
Western Dress	4355042.0
Top	1070390.0
Ethnic Dress	178964.0
Blouse	93390.0
Bottom	54067.0
Saree	19925.0

Name: Amount, dtype: float64

```
In [10]: #5.Which SKUs (product codes) have the highest total quantity sold?
top_skus = ecommerce_data.groupby('SKU')['Qty'].sum().sort_values(ascending=False)
print("Top 20 SKUs with the Highest Total Quantity Sold:")
print(top_skus)
```

Top 20 SKUs with the Highest Total Quantity Sold:

SKU	
JNE3797-KR-L	456
JNE3797-KR-M	423
JNE3797-KR-S	307
SET183-KR-DH-M	288
JNE3797-KR-XL	284
JNE3797-KR-XXL	192

```

JNE3797-KR-XXXL      180
J0003-SET-M          179
JNE3797-KR-XS        169
JNE3405-KR-M         161
J0003-SET-XL         103
J0003-SET-XXL         97
J0341-DR-M           96
J0003-SET-L           94
J0003-SET-S           90
JNE3798-KR-M          89
JNE3798-KR-XL          89
J0341-DR-L           88
SET324-KR-NP-M        86
SET397-KR-NP -M       81
Name: Qty, dtype: int64

```

In [11]:

```

#6.Which SKUs generate the highest revenue?
top_revenue_skus = ecommerce_data.groupby('SKU')['Amount'].sum().sort_values(ascending=False)
print("Top 10 SKUs Generating the Highest Revenue:")
print(top_revenue_skus)

```

Top 10 SKUs Generating the Highest Revenue:

SKU

```

JNE3797-KR-L          329992.0
JNE3797-KR-M          305375.0
JNE3797-KR-S          224607.0
SET183-KR-DH-M        217050.0
JNE3797-KR-XL         210574.0
JNE3797-KR-XXL        135132.0
JNE3797-KR-XXXL       132219.0
JNE3797-KR-XS         125019.0
J0003-SET-M           117322.0
SET397-KR-NP -M       86632.0
Name: Amount, dtype: float64

```

In [12]:

```

#7.What are the monthly sales trends over time? (group by Date)

ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'], errors='coerce')
ecommerce_data['Year-Month'] = ecommerce_data['Date'].dt.to_period('M')

monthly_sales_trends = ecommerce_data.groupby('Year-Month')['Amount'].sum().reset_index()
monthly_sales_trends['Year-Month'] = monthly_sales_trends['Year-Month'].astype(str)

print("Monthly Sales Trends:")
print(monthly_sales_trends)

```

Monthly Sales Trends:

```

Year-Month  Amount
0    2022-03   10797.0
1    2022-04  8020286.0
2    2022-05  7415300.0
3    2022-06  5627307.0

```

In [13]:

```
import matplotlib.pyplot as plt
```



```

import pandas as pd

plt.figure(figsize=(12, 6))

plt.plot(monthly_sales_trends['Year-Month'], monthly_sales_trends['Amount'], m

monthly_sales_trends['Moving Average'] = monthly_sales_trends['Amount'].rollin
plt.plot(monthly_sales_trends['Year-Month'], monthly_sales_trends['Moving Avera

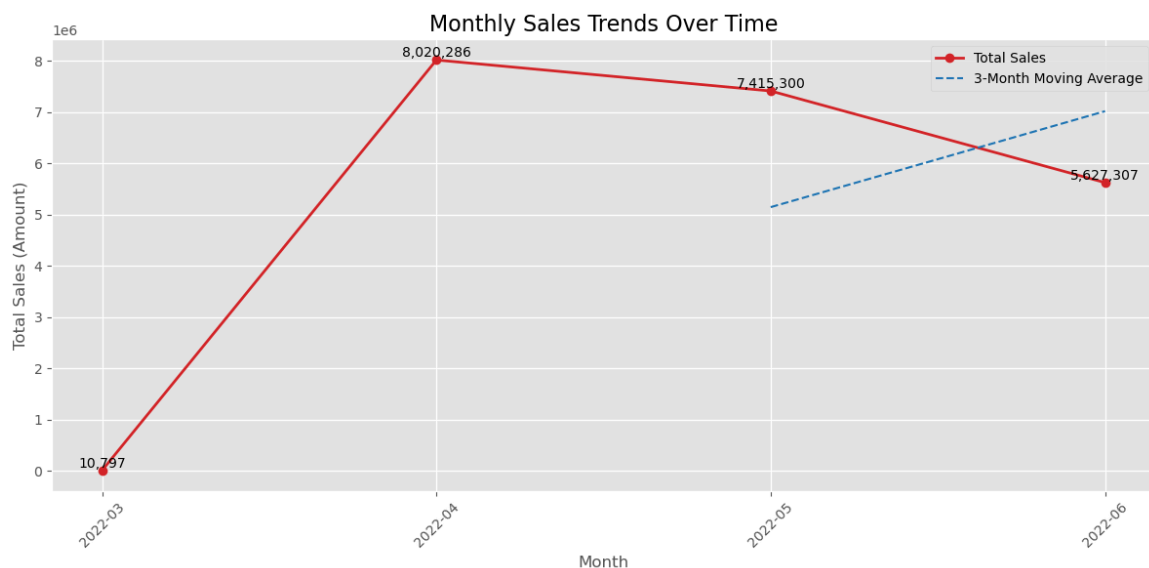
plt.xticks(rotation=45)
plt.title("Monthly Sales Trends Over Time", fontsize=16)
plt.xlabel("Month", fontsize=12)
plt.ylabel("Total Sales (Amount)", fontsize=12)

for i in range(len(monthly_sales_trends)):
    plt.text(monthly_sales_trends['Year-Month'][i], monthly_sales_trends['Amou

plt.grid(True)
plt.legend()

plt.tight_layout()
plt.show()

```



- The red line represents the total sales amount for each month from March 2022 to June 2022. There is a significant spike in April 2022, where the sales reached 8,020,286. Following that peak, sales decline and stabilize by June 2022 at 5,627,307.
- 3-Month Moving Average (Blue Dashed Line): The dashed blue line shows the 3-month moving average of the sales, which smooths out the fluctuations in the data to show the trend more clearly.

```
In [14]: #8.Which fulfillment method (Fulfilment) contributes the most to sales?

fulfilment_sales = ecommerce_data.groupby('Fulfilment')['Amount'].sum().reset_

fulfilment_sales = fulfilment_sales.sort_values(by='Amount', ascending=False)

print("Sales Contribution by Fulfilment Method:")
print(fulfilment_sales)
```

Sales Contribution by Fulfilment Method:

	Fulfilment	Amount
0	Merchant	21073690.0

```
In [15]: #9.What is the distribution of Status?

status_distribution = ecommerce_data['Status'].value_counts()
print("Distribution of Order Status:")
print(status_distribution)
```

Distribution of Order Status:

Status	
Shipped - Delivered to Buyer	28754
Shipped - Returned to Seller	1947
Shipped - Picked Up	973
Pending - Waiting for Pick Up	281
Pending	243
Shipped - Returning to Seller	145
Shipped - Out for Delivery	35
Shipped - Rejected by Buyer	11
Shipped - Lost in Transit	5
Shipped - Damaged	1

Name: count, dtype: int64

```
In [16]: import matplotlib.pyplot as plt
import seaborn as sns

# List of selected statuses to analyze
selected_status = ['Shipped - Delivered to Buyer', 'Shipped - Returned to Sell
                  'Shipped - Picked Up', 'Pending - Waiting for Pick Up',
                  'Pending', 'Shipped - Returning to Seller', 'Shipped - Out

# Assuming 'status_distribution' is a pandas Series with order statuses as the
filtered_status = status_distribution[selected_status]

# Sorting the values in descending order for better clarity
filtered_status = filtered_status.sort_values(ascending=False)

# Plotting
plt.figure(figsize=(10, 6))
sns.barplot(x=filtered_status.index, y=filtered_status.values, palette="Set2")
plt.xticks(rotation=45, ha="right")
plt.title("Selected Distribution of Order Status")
plt.xlabel("Order Status")
plt.ylabel("Number of Orders")
plt.yscale('log') # Apply log scale to the y-axis to handle large differences
plt.tight_layout()

# Adding annotations
for i, value in enumerate(filtered_status.values):
```

```

for i, value in enumerate(filtered_status.values):
    plt.text(i, value + 100, str(value), ha="center", va="bottom", fontsize=10)

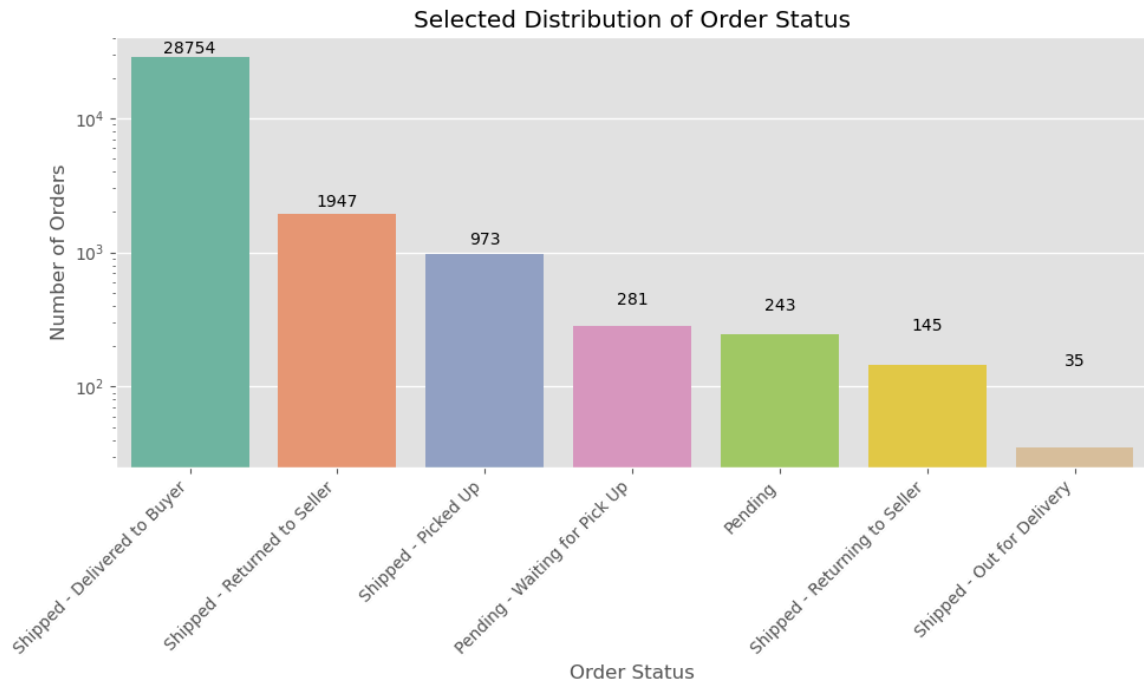
plt.show()

```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\4171158543.py:17: Future Warning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x=filtered_status.index, y=filtered_status.values, palette="Set2")
```



### The highest order status:

"Shipped - Delivered to Buyer" has a much higher number of orders than any other status, with a total of 28,754. This typically indicates that the delivery was completed successfully and the customer received their order.

### Business Perspective:

- Biggest focus: Since "Shipped - Delivered to Buyer" is the most common, much of a business's marketing strategy and operational processes can be optimized to address this status.
- Return rates: "Shipped - Returned to Seller" status should be carefully considered. High return rates may indicate issues with product quality or customer satisfaction.

In [17]:

```

ecommerce_data.columns = ecommerce_data.columns.str.strip()
print(ecommerce_data.columns)

```

```
Index(['index', 'Order ID', 'Date', 'Status', 'Fulfilment', 'Sales Channel',
```

```
'ship-service-level', 'Style', 'SKU', 'Category', 'Size', 'ASIN',
'Courier Status', 'Qty', 'currency', 'Amount', 'ship-city',
'ship-state', 'ship-postal-code', 'ship-country', 'promotion-ids',
'B2B', 'fulfilled-by', 'Year-Month'],
dtype='object')
```

In [18]:

```
#10.Which Sales Channel generates the most sales and revenue?
```

```
ecommerce_data.columns = ecommerce_data.columns.str.strip()
sales_channel_revenue = ecommerce_data.groupby('Sales Channel')['Amount'].sum()
sales_channel_revenue = sales_channel_revenue.sort_values(by='Amount', ascending=False)

print("Total Revenue by Sales Channel:")
print(sales_channel_revenue)
```

Total Revenue by Sales Channel:

	Sales Channel	Amount
0	Amazon.in	21073690.0

In [19]:

```
#11.What is the average order quantity (Qty) across different categories?
```

```
avg_order_qty = ecommerce_data.groupby('Category')['Qty'].mean().reset_index()

# Sort the results by 'Qty' in descending order
avg_order_qty = avg_order_qty.sort_values(by='Qty', ascending=False)

# Display the average order quantity by category
print("Average Order Quantity by Category:")
print(avg_order_qty)
```

Average Order Quantity by Category:

	Category	Qty
3	Saree	1.041667
1	Bottom	1.019108
0	Blouse	1.016304
2	Ethnic Dress	1.011811
7	kurta	1.005834
6	Western Dress	1.004955
5	Top	1.004165
4	Set	1.003387

In [20]:

```
avg_order_qty = ecommerce_data.groupby('Category')['Qty'].mean().reset_index()
avg_order_qty = avg_order_qty.sort_values(by='Qty', ascending=False)

# Create a Line plot
plt.figure(figsize=(10, 6))
sns.lineplot(x='Category', y='Qty', data=avg_order_qty, marker='o', color='b',

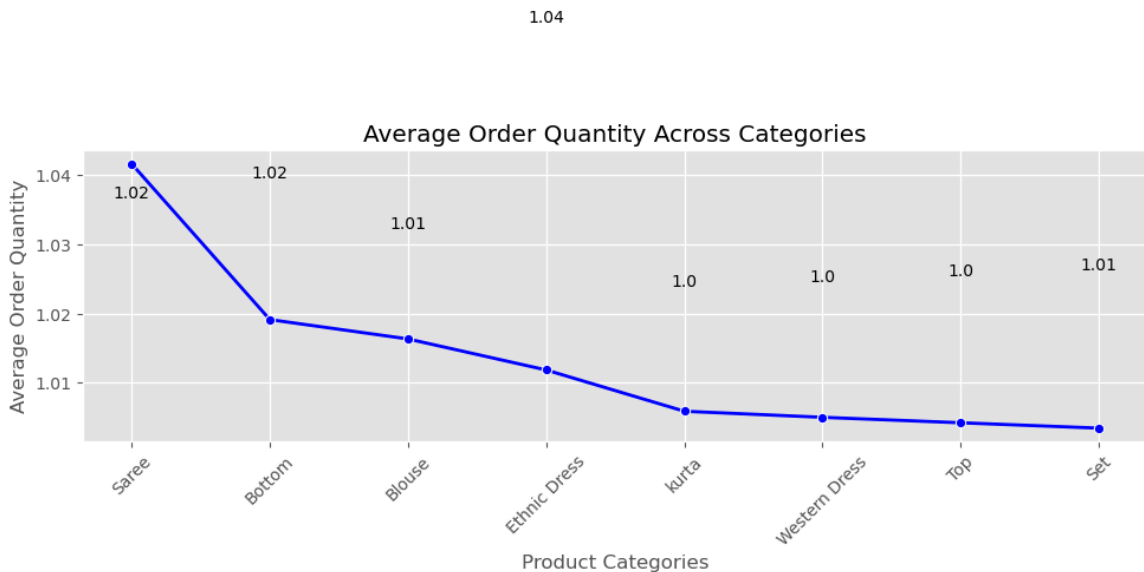
# Add titles and labels
plt.title("Average Order Quantity Across Categories")
plt.xlabel("Product Categories")
plt.ylabel("Average Order Quantity")

# Rotate x-axis labels for better readability
plt.xticks(rotation=45)
plt.grid(True)

# Annotate each point with its value
for index, row in avg_order_qty.iterrows():
```

```
plt.text(row.name, row['Qty'] + 0.02, round(row['Qty'], 2), ha='center', v

# Show the plot
plt.tight_layout()
plt.show()
```



- Saree and Bottom categories show the highest average order quantities, around 1.02. This suggests that these product categories tend to be ordered in higher quantities per transaction compared to others.

### Inventory Management:

- If Saree and Bottom categories are selling in larger quantities, businesses can consider ensuring higher stock levels of these items to avoid running out of stock.

### Targeted Marketing:

- Categories with lower order quantities (like Set or Top) could be targeted differently through promotional campaigns or discounts to boost sales.

In [21]:

```
#12.What are the peak sales weeks and seasons?

ecommerce_data['Month'] = pd.to_datetime(ecommerce_data['Date']).dt.month
ecommerce_data['Year'] = pd.to_datetime(ecommerce_data['Date']).dt.year

monthly_sales = ecommerce_data.groupby('Month')['Amount'].sum().reset_index()

month_names = ["January", "February", "March", "April", "May", "June",
               "July", "August", "September", "October", "November", "December"]

monthly_sales['Month'] = monthly_sales['Month'].apply(lambda x: month_names[x-

# Sort by total sales to highlight peak months
monthly_sales = monthly_sales.sort_values(by='Amount', ascending=False)
```

```
In [22]: ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'])

ecommerce_data['Month'] = ecommerce_data['Date'].dt.month

month_sales = ecommerce_data.groupby('Month')['Amount'].sum().reset_index()

plt.figure(figsize=(12, 6))
sns.barplot(x='Month', y='Amount', data=month_sales, palette='viridis') # 'da

plt.title("Peak Sales by Month", fontsize=16)
plt.xlabel("Month", fontsize=12)
plt.ylabel("Total Sales (Amount)", fontsize=12)

# Çubuklara değer ekleme
for p in plt.gca().patches:
    plt.gca().annotate(f'{p.get_height():.0f}', (p.get_x() + p.get_width() /
        ha='center', va='center', fontsize=12, color='black', f
        textcoords='offset points')

plt.xticks(rotation=45)

plt.grid(True, axis='y', linestyle='--', alpha=0.7)

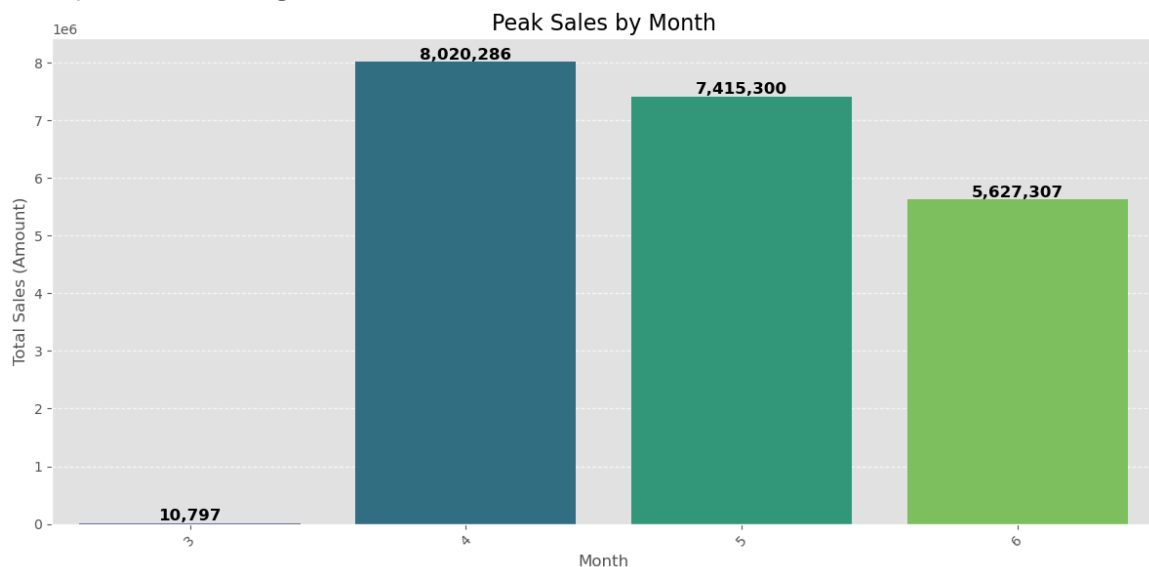
plt.tight_layout()

plt.show()
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\2075240169.py:8: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

sns.barplot(x='Month', y='Amount', data=month\_sales, palette='viridis') # 'data' parametresi doğru şekilde kullanıldı.



The sales amount follows a peak in April, with significant but slightly reduced figures in May and June. The March sales represent a smaller volume, which could suggest a

seasonal variation or initial slow sales. You might consider investigating marketing efforts, promotions, and seasonality factors further to optimize sales strategies for future months.

In [23]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

season_mapping = {
    1: 'Winter', 2: 'Winter', 12: 'Winter',
    3: 'Spring', 4: 'Spring', 5: 'Spring',
    6: 'Summer', 7: 'Summer', 8: 'Summer',
    9: 'Fall', 10: 'Fall', 11: 'Fall'
}

ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'])

ecommerce_data['Month'] = ecommerce_data['Date'].dt.month

ecommerce_data['Season'] = ecommerce_data['Month'].map(season_mapping)

seasonal_sales = ecommerce_data.groupby('Season')['Amount'].sum().reset_index()

seasonal_sales = seasonal_sales.sort_values(by='Amount', ascending=False)
```

In [24]:

```
plt.figure(figsize=(8, 5))

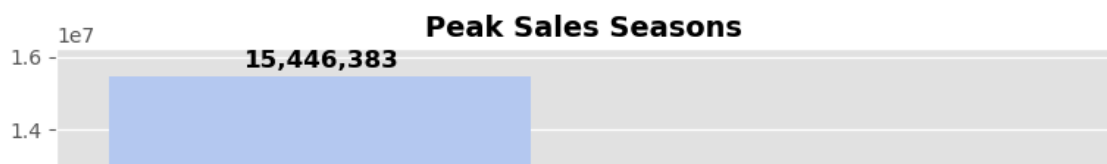
sns.barplot(x='Season', y='Amount', data=seasonal_sales, hue='Season', palette=

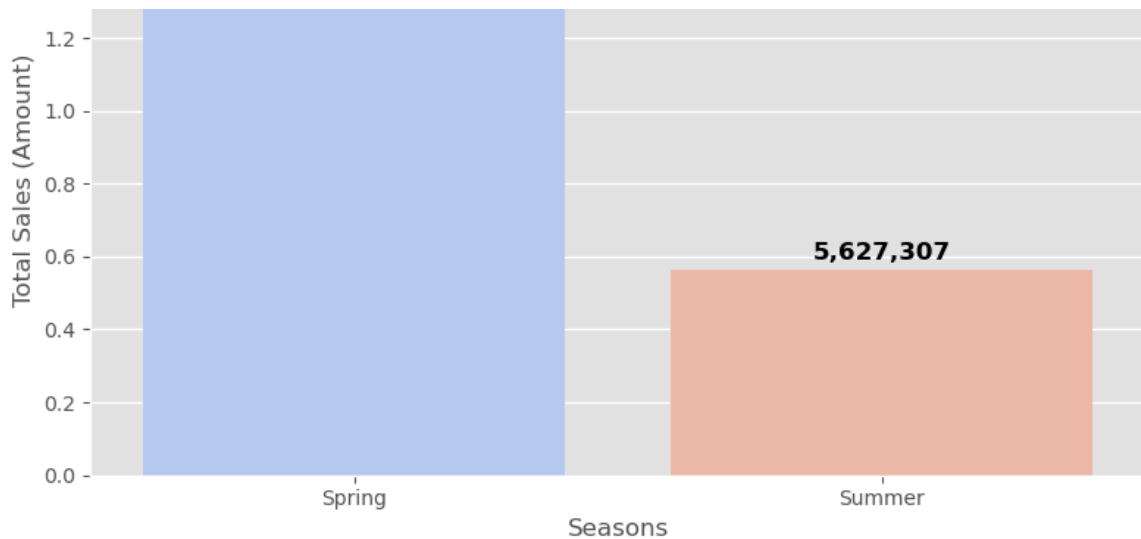
for p in plt.gca().patches:
    plt.gca().annotate(f'{p.get_height():.0f}',
                       (p.get_x() + p.get_width() / 2., p.get_height()),
                       ha = 'center', va = 'center',
                       fontsize=12, color='black', fontweight='bold',
                       xytext=(0, 8), textcoords='offset points')

plt.title("Peak Sales Seasons", fontsize=14, fontweight='bold')
plt.xlabel("Seasons", fontsize=12)
plt.ylabel("Total Sales (Amount)", fontsize=12)

plt.tight_layout()
plt.show()

print("Total Sales by Season:")
print(seasonal_sales)
```





Total Sales by Season:

	Season	Amount
0	Spring	15446383.0
1	Summer	5627307.0

In [25]:

```
#13.Is there a weekly or daily pattern in sales volume?

ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'])

ecommerce_data['Day of Week'] = ecommerce_data['Date'].dt.dayofweek # 0=Monday
ecommerce_data['Day Name'] = ecommerce_data['Date'].dt.day_name()

daily_sales = ecommerce_data.groupby('Day Name')['Amount'].sum().reindex(
    ['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday']).reset_index()
```

In [26]:

```
plt.figure(figsize=(12, 6))

sns.lineplot(x='Day Name', y='Amount', data=daily_sales, marker='o', color='blue')

plt.title('Sales Volume by Day of the Week', fontsize=16)
plt.xlabel('Day of the Week', fontsize=12)
plt.ylabel('Total Sales (Amount)', fontsize=12)

for x, y in zip(daily_sales['Day Name'], daily_sales['Amount']):
    plt.text(x, y, f'{y:,.0f}', ha='center', va='bottom', fontsize=12, color='blue')

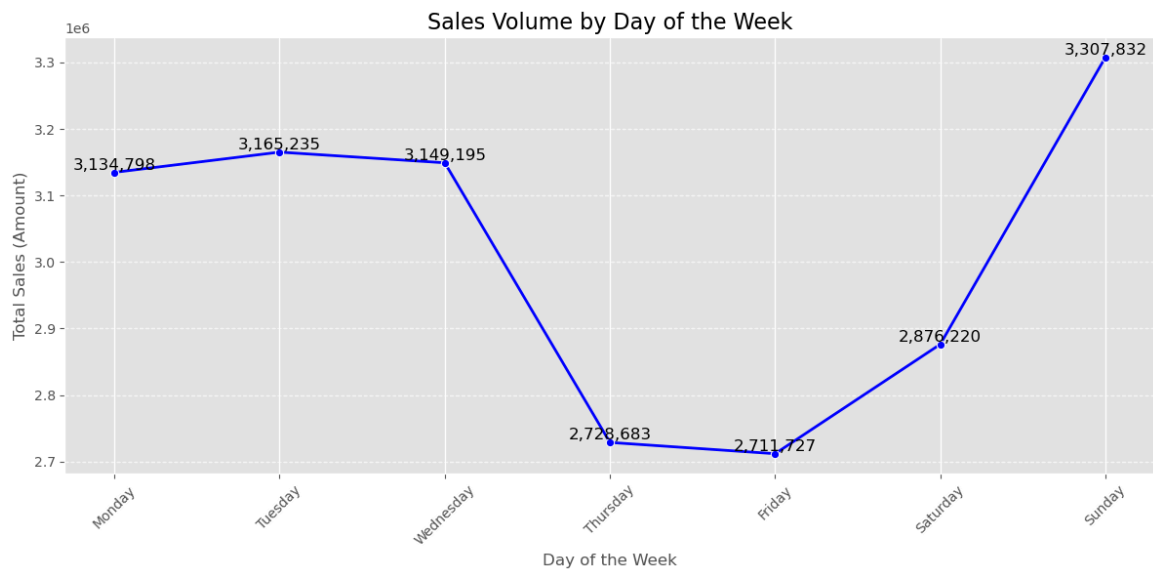
plt.xticks(rotation=45)
plt.grid(True, axis='y', linestyle='--', alpha=0.7)

plt.tight_layout()

plt.show()

print("Sales by Day of the Week:")
print(daily_sales)
```





Sales by Day of the Week:

	Day Name	Amount
0	Monday	3134798.0
1	Tuesday	3165235.0
2	Wednesday	3149195.0
3	Thursday	2728683.0
4	Friday	2711727.0
5	Saturday	2876220.0
6	Sunday	3307832.0

Sunday has the highest sales amount at approximately 3.3 million. This suggests that customers are most likely to make purchases at the end of the week, possibly due to more leisure time or special promotions that encourage spending.

### Potential Business Insights:

- **Weekend Promotions:** The peak on Sunday suggests that running targeted marketing campaigns or offering exclusive weekend deals might enhance sales further.
- **Steady Mid-Week Sales:** Given the consistency in sales on Monday to Wednesday, businesses might want to focus on maintaining or boosting customer engagement during these days, possibly through promotions or email campaigns.
- **Promotions on Saturdays:** Although Saturday sees fewer sales than Sunday, there is potential for improvement by testing promotional efforts, making it a strategic day for targeting customers.

In [27]:

```
ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'])

daily_trends = ecommerce_data.groupby('Date')['Amount'].sum().reset_index()

daily_trends['7-Day Rolling Average'] = daily_trends['Amount'].rolling(window=7)

peak_sales = daily_trends[daily_trends['Amount'] == daily_trends['Amount'].max]

plt.figure(figsize=(14, 6))
plt.plot(daily_trends['Date'], daily_trends['Amount'], marker='o', linestyle='solid')
plt.plot(daily_trends['Date'], daily_trends['7-Day Rolling Average'], linestyle='dashed')
```

```

plt.plot(daily_trends['Date'], daily_trends['7-Day Rolling Average'], linestyle='--', color='g', zorder=5, label='7-Day Rolling Average')
plt.scatter(peak_sales['Date'], peak_sales['Amount'], color='r', zorder=5, label='Peak Sales')

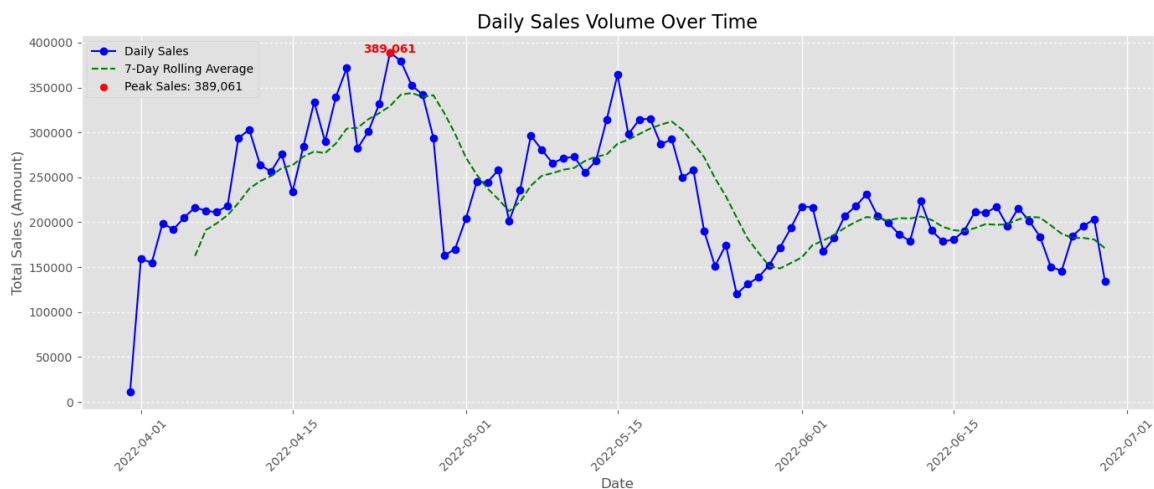
for index, row in peak_sales.iterrows():
    plt.text(row['Date'], row['Amount'], f'{row["Amount"]:.0f}', color='r', h=10)

plt.title('Daily Sales Volume Over Time', fontsize=16)
plt.xlabel('Date', fontsize=12)
plt.ylabel('Total Sales (Amount)', fontsize=12)
plt.xticks(rotation=45)
plt.legend(loc='upper left')

plt.grid(True, axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()

daily_trends.head()

```



Out[27]:

	Date	Amount	7-Day Rolling Average
0	2022-03-31	10797.0	NaN
1	2022-04-01	159098.0	NaN
2	2022-04-02	154924.0	NaN
3	2022-04-03	198900.0	NaN
4	2022-04-04	192028.0	NaN

**Observations:**

- *Sales Growth:* There's a sharp increase in sales from early April, reaching a peak around mid-May (around 2022-05-15), indicating a significant surge in total sales.
- *Fluctuations:* After the peak, the sales volume shows fluctuations, suggesting that the sales volume varies over time, possibly due to factors like promotions, product launches, or seasonal demand.
- *Sales Decline:* After reaching the peak, the sales volume begins to decline, but it still remains relatively high, indicating the presence of steady demand even during the later part of the period.

- *Seasonal Pattern:* The graph shows a clear upward trend followed by a decrease in the mid-to-late period. This could suggest a seasonal fluctuation, which might be tied to marketing strategies or market conditions, and may be indicative of certain months having higher sales volumes (such as April and May).

In [28]:

```
# Print summarized data for clarity
print("Total Sales by Day of the Week:")
print(daily_sales)

print("\nDaily Sales Trend Overview:")
print(daily_trends.head())
```

Total Sales by Day of the Week:

	Day Name	Amount
0	Monday	3134798.0
1	Tuesday	3165235.0
2	Wednesday	3149195.0
3	Thursday	2728683.0
4	Friday	2711727.0
5	Saturday	2876220.0
6	Sunday	3307832.0

Daily Sales Trend Overview:

	Date	Amount	7-Day Rolling Average
0	2022-03-31	10797.0	NaN
1	2022-04-01	159098.0	NaN
2	2022-04-02	154924.0	NaN
3	2022-04-03	198900.0	NaN
4	2022-04-04	192028.0	NaN

In [29]:

```
#14. Which months show the highest cancellation rates?
# Ensure 'Date' column is in datetime format
ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'])

# Extract Month Name and Month Number
ecommerce_data['Month'] = ecommerce_data['Date'].dt.month_name()
ecommerce_data['Month_Num'] = ecommerce_data['Date'].dt.month

# Define cancellation statuses
cancellation_statuses = [
    "Shipped - Returned to Seller",
    "Shipped - Rejected by Buyer",
    "Shipped - Lost in Transit",
    "Pending - Waiting for Pick Up",
    "Pending"
]

canceled_orders = ecommerce_data[ecommerce_data['Status'].isin(cancellation_statuses)]

total_orders_per_month = ecommerce_data.groupby('Month')['Order ID'].count()

canceled_orders_per_month = canceled_orders.groupby('Month')['Order ID'].count()

cancellation_rate = (canceled_orders_per_month / total_orders_per_month) * 100
cancellation_rate = cancellation_rate.reset_index().rename(columns={'Order ID': 'Order ID'})

cancellation_rate['Month_Num'] = cancellation_rate['Month'].apply(lambda x: pd.to_datetime('2022-01-01').dt.month)
cancellation_rate = cancellation_rate.sort_values(by='Month_Num')
```

```
# Print the Cancellation Rate data
print("Cancellation Rates by Month:")
print(cancellation_rate[['Month', 'Cancellation Rate (%)']])
```

Cancellation Rates by Month:

	Month	Cancellation Rate (%)
2	March	5.882353
0	April	6.933744
3	May	6.339358
1	June	10.643953

```
In [30]: cancellation_rate_sorted = cancellation_rate.sort_values(by='Cancellation Rate')

plt.figure(figsize=(14, 7))
sns.barplot(x='Cancellation Rate (%)', y='Month', data=cancellation_rate_sorted)

plt.title('Monthly Cancellation Rates', fontsize=18, fontweight='bold')
plt.xlabel('Cancellation Rate (%)', fontsize=14)
plt.ylabel('Month', fontsize=14)

for i, row in cancellation_rate_sorted.iterrows():
    plt.text(row['Cancellation Rate (%)'] + 0.2, i, f'{row["Cancellation Rate (%)"]}',
             verticalalignment='center', fontsize=14, color='black', fontweight='bold')

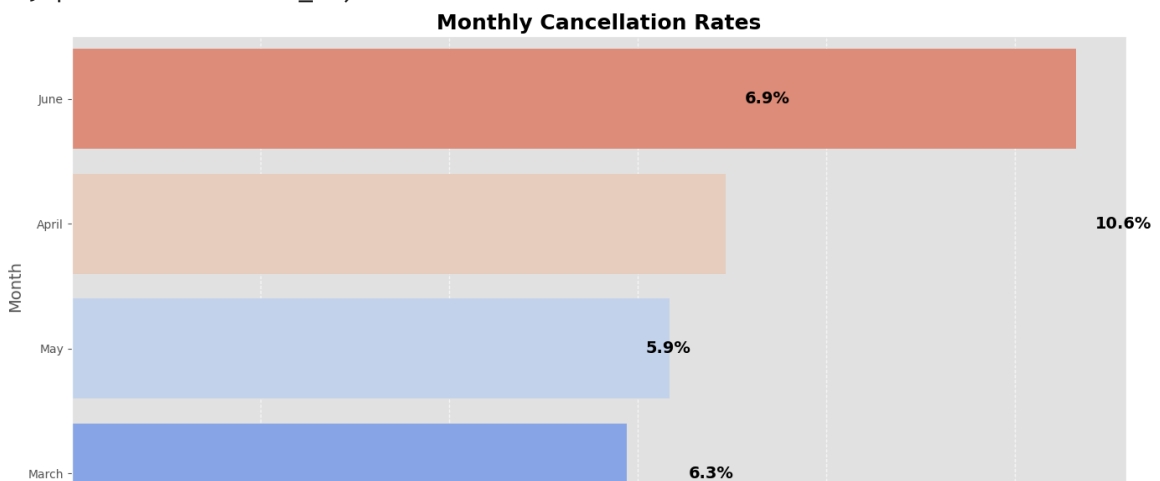
plt.grid(True, axis='x', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()

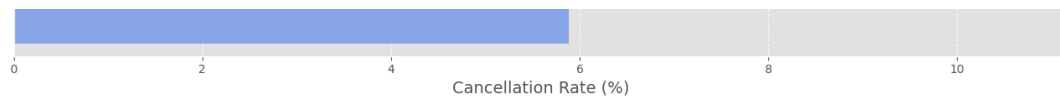
print("Sorted Monthly Cancellation Rates:")
print(cancellation_rate_sorted)
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\2016408417.py:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x='Cancellation Rate (%)', y='Month', data=cancellation_rate_sorted, palette='coolwarm_r')
```





Sorted Monthly Cancellation Rates:

	Month	Cancellation Rate (%)	Month_Num
1	June	10.643953	6
0	April	6.933744	4
3	May	6.339358	5
2	March	5.882353	3

- June has the highest cancellation rate at 6.9%.
- April follows closely behind with a cancellation rate of 6.3%.
- March has the next highest rate at 5.9%.
- May has the lowest cancellation rate at 5.9%, making it the best-performing month.

These observations highlight a trend where June experiences the highest cancellation rates, possibly due to factors such as end-of-season returns or customer dissatisfaction. On the other hand, March and May show more favorable cancellation rates.

For businesses, this data suggests the importance of focusing on the months with higher cancellation rates (June and April) and possibly analyzing customer behavior during these periods to reduce cancellations in the future. This could involve improving product quality, streamlining the shipping process, or adjusting return policies to create a better customer experience.

In [31]:

```
#15.Which ship-city and ship-state have the most orders?

# Group by ship-city and count the number of orders
city_orders = ecommerce_data.groupby('ship-city')['Order ID'].count().reset_index()
city_orders = city_orders.rename(columns={'Order ID': 'Total Orders'})
city_orders = city_orders.sort_values(by='Total Orders', ascending=False).head(10)

# Group by ship-state and count the number of orders
state_orders = ecommerce_data.groupby('ship-state')['Order ID'].count().reset_index()
state_orders = state_orders.rename(columns={'Order ID': 'Total Orders'})
state_orders = state_orders.sort_values(by='Total Orders', ascending=False).head(10)

print("Top 10 Ship-Cities with the Most Orders:")
print(city_orders)

print("\nTop 10 Ship-States with the Most Orders:")
print(state_orders.head(10))
```

Top 10 Ship-Cities with the Most Orders:

	ship-city	Total Orders
387	BENGALURU	2553
1392	HYDERABAD	1885
2353	MUMBAI	1516
2647	NEW DELHI	1463
707	CHENNAI	1200
3025	PUNE	944
1820	KOLKATA	573
1249	GURUGRAM	416

2129	LUCKNOW	395
3706	THANE	393

Top 10 Ship-States with the Most Orders:

	ship-state	Total Orders
26	MAHARASHTRA	5429
21	KARNATAKA	4008
49	UTTAR PRADESH	2810
47	TELANGANA	2708
46	TAMIL NADU	2702
22	KERALA	1860
12	DELHI	1706
51	WEST BENGAL	1405
1	ANDHRA PRADESH	1366
16	Gujarat	1206

In [32]:

```
plt.figure(figsize=(14, 8))
sns.lineplot(x='Total Orders', y='ship-city', data=city_orders, marker='o', co

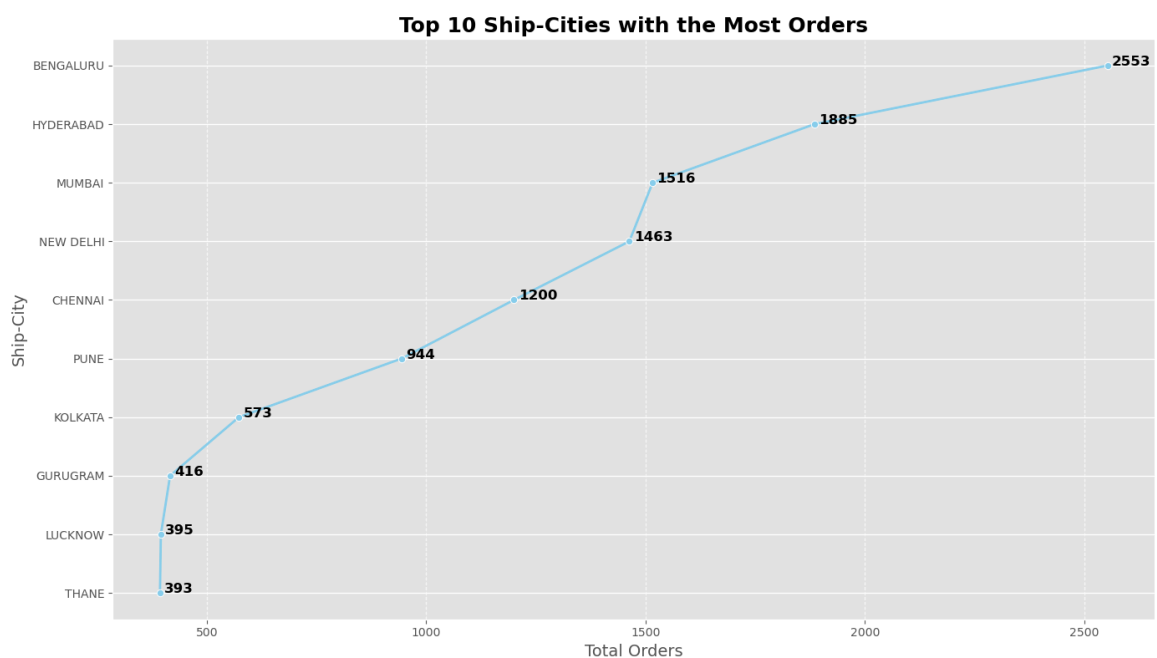
plt.title('Top 10 Ship-Cities with the Most Orders', fontsize=18, fontweight='
plt.xlabel('Total Orders', fontsize=14)
plt.ylabel('Ship-City', fontsize=14)

for i in range(len(city_orders)):
    plt.text(city_orders['Total Orders'].iloc[i] + 10, i, f'{city_orders["Tota
        horizontalalignment='left', fontsize=12, color='black', fontweigh

plt.grid(True, axis='x', linestyle='--', alpha=0.7)

plt.tight_layout()

plt.show()
```



In [33]:

```
# Visualizing the top 10 ship-states with a line plot for clearer trends
plt.figure(figsize=(14, 8))
sns.lineplot(x='Total Orders', y='ship-state', data=state_orders.head(10), mar
```

```

# Adding titles and Labels
plt.title('Top 10 Ship-States with the Most Orders', fontsize=18, fontweight='bold')
plt.xlabel('Total Orders', fontsize=14)
plt.ylabel('Ship-State', fontsize=14)

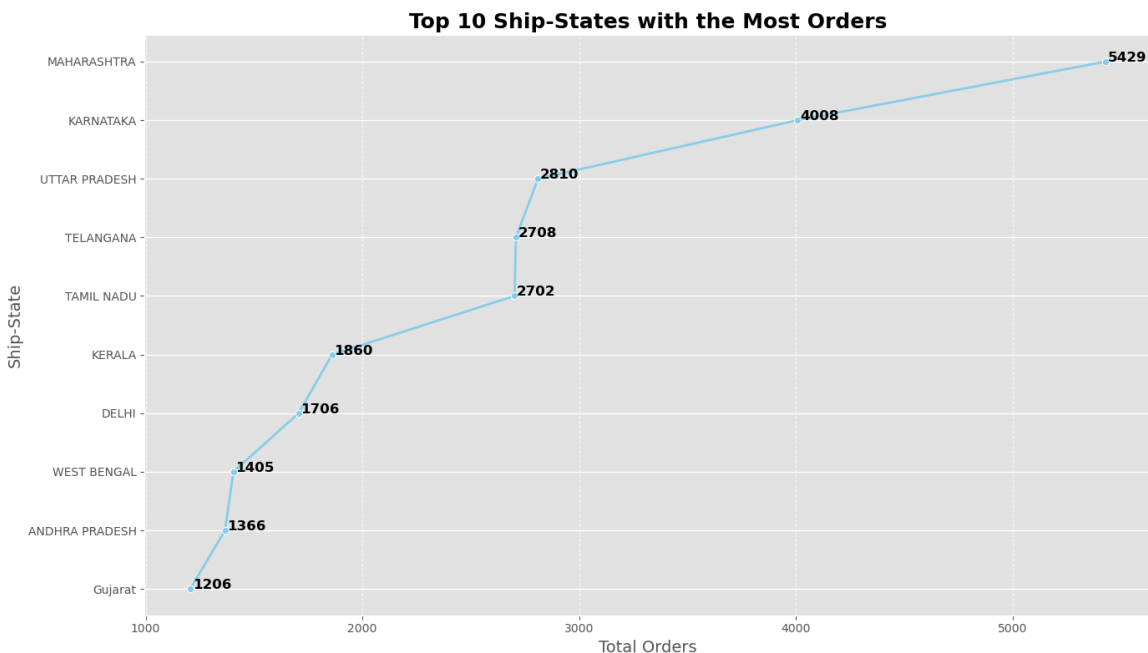
# Annotate the points with their values for better clarity
for i in range(len(state_orders.head(10))):
    plt.text(state_orders['Total Orders'].iloc[i] + 10, i, f'{state_orders["Total Orders"].iloc[i]}',
             horizontalalignment='left', fontsize=12, color='black', fontweight='normal')

# Show grid lines for better visualization
plt.grid(True, axis='x', linestyle='--', alpha=0.7)

# Adjust layout for better spacing
plt.tight_layout()

# Show the plot
plt.show()

```



In [34]:

```

#16.What is the average revenue per shipping state or city?

```

```

state_avg_revenue = ecommerce_data.groupby('ship-state')['Amount'].mean().reset_index()
state_avg_revenue = state_avg_revenue.rename(columns={'Amount': 'Average Revenue'})
state_avg_revenue = state_avg_revenue.sort_values(by='Average Revenue', ascending=False)

city_avg_revenue = ecommerce_data.groupby('ship-city')['Amount'].mean().reset_index()
city_avg_revenue = city_avg_revenue.rename(columns={'Amount': 'Average Revenue'})
city_avg_revenue = city_avg_revenue.sort_values(by='Average Revenue', ascending=False)

print("Top 10 Ship-States by Average Revenue:")
print(state_avg_revenue.head(10))

print("\nTop 10 Ship-Cities by Average Revenue:")
print(city_avg_revenue.head(10))

```

Top 10 Ship-States by Average Revenue:

ship-state	Average Revenue
MAHARASHTRA	1206
KARNATAKA	1366
UTTAR PRADESH	1405
TELANGANA	1706
TAMIL NADU	1860
KERALA	2702
DELHI	2708
WEST BENGAL	2810
ANDHRA PRADESH	4008
Gujarat	5429

52	bihar	1432.000000
45	Sikkim	1186.000000
23	LADAKH	934.250000
24	LAKSHADWEEP	798.000000
44	SIKKIM	787.352941
53	delhi	778.000000
32	NAGALAND	764.305085
36	Orissa	764.000000
55	punjab	752.500000
10	Chandigarh	737.666667

Top 10 Ship-Cities by Average Revenue:

	ship-city	Average Revenue
3364	SARDARSHAHAR	2598.000000
3180	RAJGARH CHURU DISTRICT	2372.000000
3329	SAINTHIA	1695.000000
2179	MAHENDRAGARH	1602.166667
1782	KHATRA	1593.000000
3284	Ramgarh	1523.000000
1580	Jajpur road	1523.000000
1574	Jadcherla	1523.000000
2282	MAZBAT	1523.000000
250	BADARPUR RLY TOWN	1523.000000

In [35]:

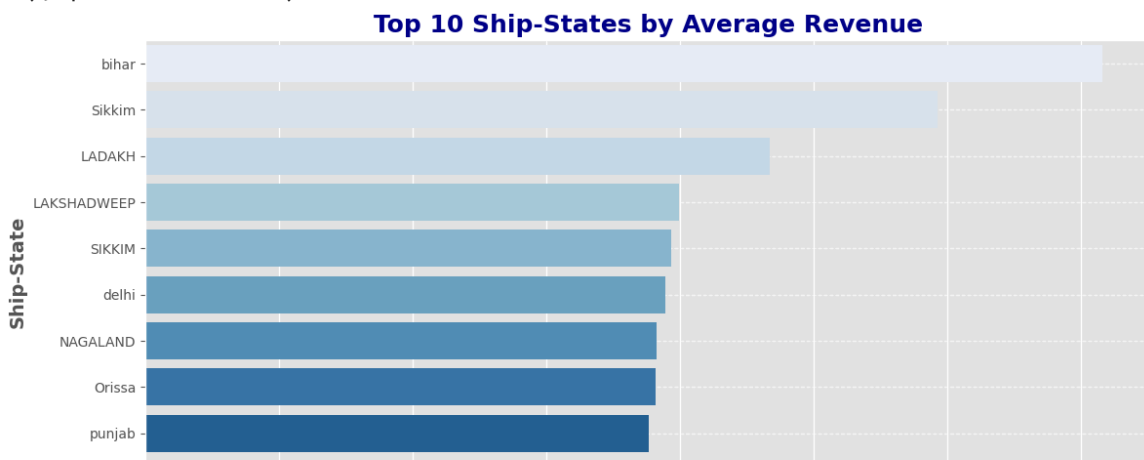
```
plt.figure(figsize=(12, 6))
sns.barplot(x='Average Revenue', y='ship-state', data=state_avg_revenue.head(10))
plt.title('Top 10 Ship-States by Average Revenue', fontsize=18, weight='bold')
plt.xlabel('Average Revenue', fontsize=14, weight='bold')
plt.ylabel('Ship-State', fontsize=14, weight='bold')

plt.xticks(rotation=45, ha='right')
plt.grid(True, axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\1759006496.py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x='Average Revenue', y='ship-state', data=state_avg_revenue.head(10), palette='Blues')
```







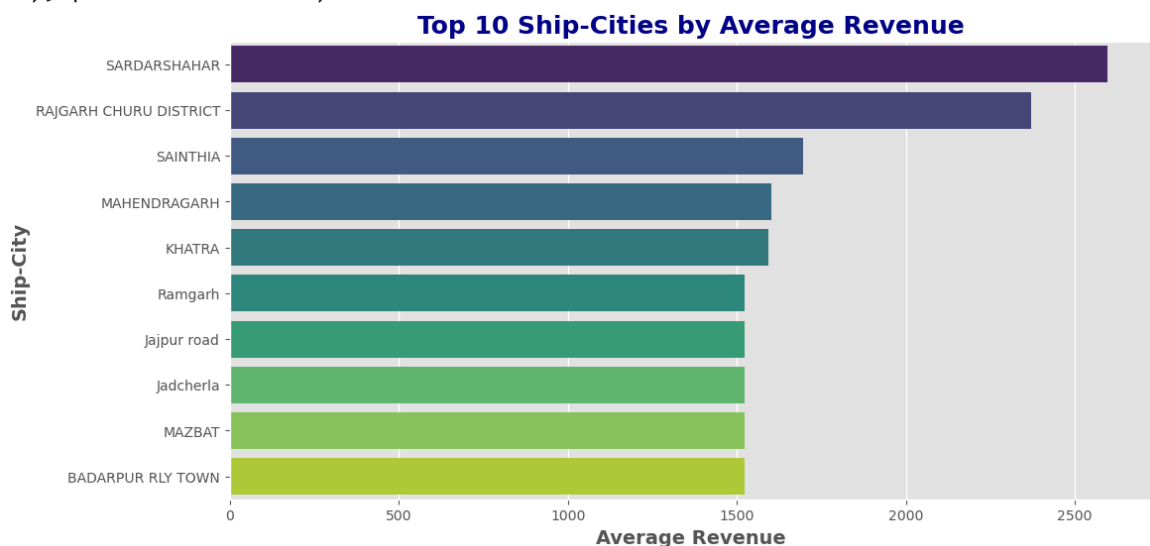
In [36]:

```
# Visualize Top 10 ship-cities by average revenue
plt.figure(figsize=(12, 6))
sns.barplot(x='Average Revenue', y='ship-city', data=city_avg_revenue.head(10))
plt.title('Top 10 Ship-Cities by Average Revenue', fontsize=18, weight='bold',
plt.xlabel('Average Revenue', fontsize=14, weight='bold')
plt.ylabel('Ship-City', fontsize=14, weight='bold')
plt.show()
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\2763975611.py:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x='Average Revenue', y='ship-city', data=city_avg_revenue.head(10), palette='viridis')
```



In [37]:

```
#17.Which states or cities have the highest cancellation rates?
cancelled_data = ecommerce_data[ecommerce_data['Status'].str.contains('Returned')]

state_cancellations = ecommerce_data.groupby('ship-state').size().reset_index(name='state_size')
cancelled_by_state = cancelled_data.groupby('ship-state').size().reset_index(name='cancelled_size')

# Merge the two datasets
state_cancellation_rate = state_cancellations.merge(cancelled_by_state, on='ship-state')
state_cancellation_rate['Cancelled Orders'].fillna(0, inplace=True)
state_cancellation_rate['Cancellation Rate'] = (state_cancellation_rate['Cancelled Orders'] / state_cancellation_rate['Total Orders'])

state_cancellation_rate = state_cancellation_rate.sort_values(by='Cancellation Rate', ascending=False)

city_cancellations = ecommerce_data.groupby('ship-city').size().reset_index(name='city_size')
cancelled_by_city = cancelled_data.groupby('ship-city').size().reset_index(name='cancelled_size')
```

```
# Merge the two datasets
city_cancellation_rate = city_cancellations.merge(cancelled_by_city, on='ship-
city_cancellation_rate['Cancelled Orders'].fillna(0, inplace=True)
city_cancellation_rate['Cancellation Rate'] = (city_cancellation_rate['Cancell
city_cancellation_rate['Total C

city_cancellation_rate = city_cancellation_rate.sort_values(by='Cancellation R
```

In [38]:

```
print("Top 10 Ship-States by Cancellation Rate:")
print(state_cancellation_rate.head(10))

print("\nTop 10 Ship-Cities by Cancellation Rate:")
print(city_cancellation_rate.head(10))
```

Top 10 Ship-States by Cancellation Rate:

	ship-state	Total Orders	Cancelled Orders	Cancellation Rate
7	Bihar	7	3.0	42.857143
10	Chandigarh	3	1.0	33.333333
35	Odisha	4	1.0	25.000000
23	LADAKH	8	2.0	25.000000
53	delhi	5	1.0	20.000000
29	MIZORAM	19	3.0	15.789474
3	ASSAM	474	60.0	12.658228
44	SIKKIM	51	6.0	11.764706
20	JHARKHAND	394	46.0	11.675127
19	JAMMU & KASHMIR	197	20.0	10.152284

Top 10 Ship-Cities by Cancellation Rate:

	ship-city	Total Orders	Cancelled Orders	\
2007	Kendrapara	1	1.0	
3556	Saoner	1	1.0	
2141	Lathi	1	1.0	
1540	JAYGAON	1	1.0	
1074	EGARKUNR	1	1.0	
2013	Kharagpur	1	1.0	
2914	PATHANKOT	2	2.0	
1215	GOLLAPUDI VIJAYAWADA RURAL	1	1.0	
173	Akola	1	1.0	
2245	MANIPAL	1	1.0	

	Cancellation Rate
2007	100.0
3556	100.0
2141	100.0
1540	100.0
1074	100.0
2013	100.0
2914	100.0
1215	100.0
173	100.0
2245	100.0

In [39]:

```
state_cancellation_rate_df = state_cancellation_rate[['ship-state', 'Cancellat

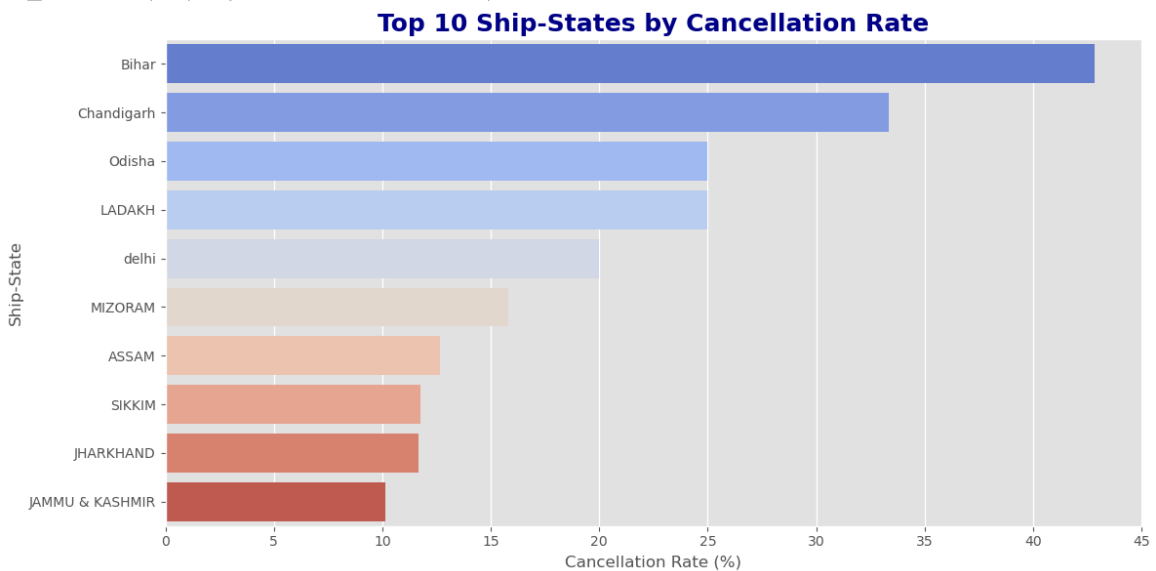
plt.figure(figsize=(12, 6))
sns.barplot(x='Cancellation Rate', y='ship-state', data=state_cancellation_rat
plt.title('Top 10 Ship-States by Cancellation Rate', fontsize=18, weight='bold
```

```
plt.xlabel('Cancellation Rate (%)')
plt.ylabel('Ship-State')
plt.tight_layout()
plt.show()
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\3735290128.py:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x='Cancellation Rate', y='ship-state', data=state_cancellation_rate_df.head(10), palette='coolwarm')
```



In [40]:

```
#18.How many orders included promotion-ids?

orders_with_promotions = ecommerce_data[ecommerce_data['promotion-ids'].notna(
    (ecommerce_data['promotion-ids'] != '')

# Count the total number of such orders
num_orders_with_promotions = len(orders_with_promotions)

# Display the result
print(f"Total number of orders that included promotion-ids: {num_orders_with_p
```

Total number of orders that included promotion-ids: 32395

In [41]:

```
#19.What is the average revenue of promoted vs. non-promoted orders?
ecommerce_data['Is_Promoted'] = ecommerce_data['promotion-ids'].apply(
    lambda x: False if x in ['No Promotion', None, ''] else True
)

# Group by promotion status and calculate average revenue
promotion_comparison = ecommerce_data.groupby('Is_Promoted')['Amount'].mean().
promotion_comparison = promotion_comparison.rename(columns={'Amount': 'Average

# Display the results
print("Average Revenue for Promoted vs. Non-Promoted Orders:")
```

```
print(promotion_comparison)
```

Average Revenue for Promoted vs. Non-Promoted Orders:

	Is_Promoted	Average Revenue
0	False	217.614035
1	True	651.285979

In [42]:

```
plt.figure(figsize=(10, 6))
sns.barplot(x='Is_Promoted', y='Average Revenue', data=promotion_comparison, p

plt.grid(axis='y', linestyle='--', alpha=0.7)

plt.title("Comparison of Average Revenue: Promoted vs. Non-Promoted Orders", f
plt.xlabel("Promotion Status", fontsize=12)
plt.ylabel("Average Revenue ($)", fontsize=12)
plt.xticks([0, 1], ["Non-Promoted", "Promoted"], fontsize=11)

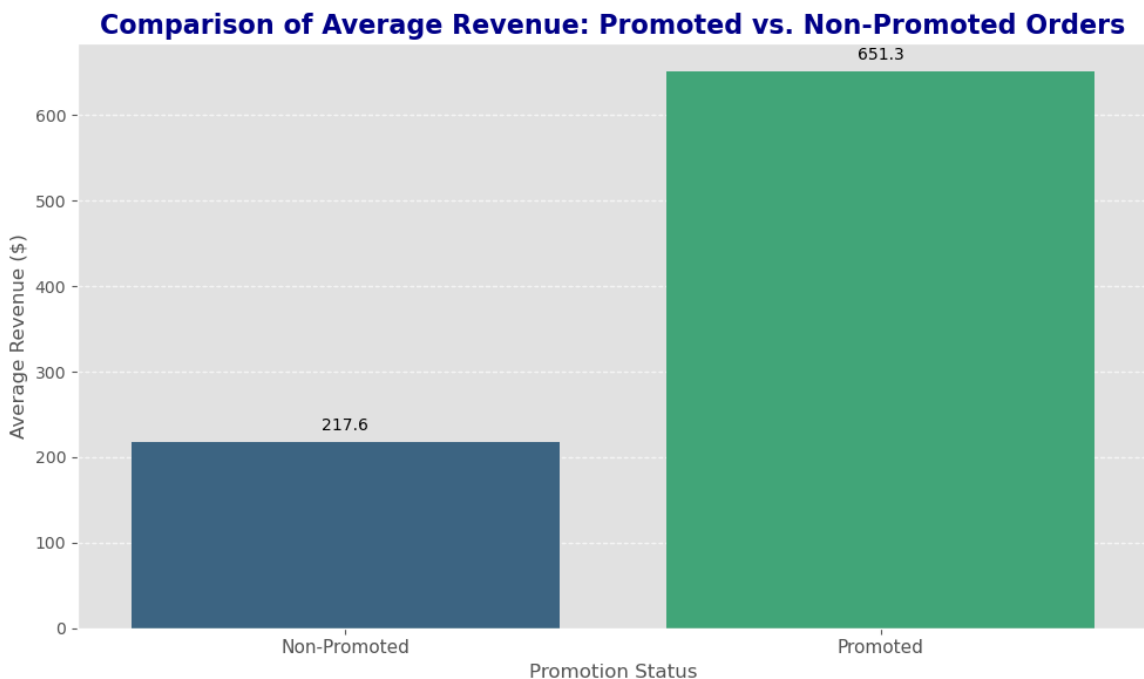
for index, value in enumerate(promotion_comparison['Average Revenue']):
    plt.text(index, value + 10, f"{value:.1f}", ha='center', va='bottom', font

plt.tight_layout()
plt.show()
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\1223020854.py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x='Is_Promoted', y='Average Revenue', data=promotion_comparison, p
alette='viridis')
```



In [43]:

```
#20.Which promotions were the most frequently used?
promotion_usage = ecommerce_data['promotion-ids'].value_counts().reset_index()
```

```

promotion_usage.columns = ['Promotion ID', 'Usage Count']

top_promotions = promotion_usage.head(10)
print("Top 10 Most Frequently Used Promotions:")
print(top_promotions)

```

Top 10 Most Frequently Used Promotions:

	Promotion ID	Usage Count
0	Amazon PLCC Free-Financing Universal Merchant ...	458
1	Amazon PLCC Free-Financing Universal Merchant ...	316
2	Amazon PLCC Free-Financing Universal Merchant ...	305
3	Amazon PLCC Free-Financing Universal Merchant ...	230
4	Amazon PLCC Free-Financing Universal Merchant ...	206
5	Amazon PLCC Free-Financing Universal Merchant ...	201
6	Amazon PLCC Free-Financing Universal Merchant ...	198
7	Amazon PLCC Free-Financing Universal Merchant ...	171
8	Amazon PLCC Free-Financing Universal Merchant ...	163
9	Amazon PLCC Free-Financing Universal Merchant ...	146

In [44]:

```

#21.What is the split between orders fulfilled by Amazon and merchants?
fulfilment_split = ecommerce_data['Fulfilment'].value_counts().reset_index()
fulfilment_split.columns = ['Fulfilment Method', 'Order Count']

# Print the split between Amazon and Merchant fulfilled orders
print("Split Between Orders Fulfilled by Amazon and Merchants:")
print(fulfilment_split)

```

Split Between Orders Fulfilled by Amazon and Merchants:

	Fulfilment Method	Order Count
0	Merchant	32395

In [45]:

```

#22.What is the average order value for Amazon-fulfilled orders vs. Merchant-f
ecommerce_data['Fulfilment'] = ecommerce_data['Fulfilment'].str.lower()

# Group by 'Fulfilment' and calculate the average order value (AOV)
average_order_value = ecommerce_data.groupby('Fulfilment')['Amount'].mean().re

# Rename columns for clarity
average_order_value.columns = ['Fulfilment Method', 'Average Order Value']

# Print the result
print("Average Order Value for Amazon-fulfilled vs. Merchant-fulfilled:")
print(average_order_value)

```

Average Order Value for Amazon-fulfilled vs. Merchant-fulfilled:

	Fulfilment Method	Average Order Value
0	merchant	650.52292

In [46]:

```

#23.What is the distribution of ship-service-level (Standard vs. Expedited)?
print("Unique values in 'ship-service-level' column before cleaning:")
print(ecommerce_data['ship-service-level'].unique())

# Clean column for consistent casing (if needed)
ecommerce_data['ship-service-level'] = ecommerce_data['ship-service-level'].st

# Calculate the distribution of ship-service-level
ship_service_distribution = ecommerce_data['ship-service-level'].value_counts(
ship_service_distribution.columns = ['Ship Service Level', 'Order Count']

```

```
ship_service_distribution.columns = ['ship_service_level', 'order_count']

# Print the distribution
print("\nDistribution of Ship Service Levels:")
print(ship_service_distribution)
```

Unique values in 'ship-service-level' column before cleaning:  
['Standard']

Distribution of Ship Service Levels:

	Ship Service Level	Order Count
0	standard	32395

## Inferential Analysis Questions

Question	Type of Analysis	Statistical Test
1. Is there a significant difference in average revenue across different product categories?	Compare means	ANOVA
2. Is there a significant difference in sales (revenue) across months for standard shipping orders?	Compare two means	ANOVA
3. Are orders with promotions significantly different in revenue compared to those without promotions?	Compare two means	ANOVA
4. Is there a difference in average Qty sold across product categories?	Compare means	ANOVA
5. Does the order cancellation rate vary significantly across ship-state or ship-city?	Compare proportions	Chi-Square test
6. Is there a correlation between Qty and Amount?	Relationship	Pearson Correlation
7. Does the Status of an order relate to fulfillment methods?	Association	Chi-Square test
8. Is there a relationship between the month of order placement and order cancellations?	Association	Chi-Square test
9. Do revenue and average order value differ significantly between product categories?	Compare means	ANOVA or t-test
10. Are monthly or seasonal revenue trends statistically significant?	Trend analysis	ANOVA
11. Does the effect of promotions on total quantity sold vary across different product categories?	Compare means	t-test
12. Is there a significant relationship between promotion-ids and order cancellation rates?	Association	Chi-Square test
13. Are there statistically significant differences in revenue across different states or cities?	Compare means	ANOVA

14. Does the shipping location influence the use of expedited service levels?	Association	Chi-Square test
15. Do different ship-states or ship-cities result in different average order values?	Compare means	t-test
16. Is there a significant difference in cancellation rates across states or cities?	Compare proportions	Chi-Square test
17. #17 Group by category and have significantly higher average income?	Compare means	t-test
18. Are there significant differences in average order quantity across product categories?	Compare means	ANOVA
19. Is there a relationship between order quantity and order value?	Relationship	Pearson Correlation
20. Are certain ship-service-level options associated with higher cancellation rates?	Association	Chi-Square test

In [47]:

```
#1. Is there a significant difference in average revenue across different product categories?

import pandas as pd
from scipy.stats import f_oneway

category_groups = [group['Amount'].values for name, group in ecommerce_data.groupby('Category')]

# ANOVA Test
f_statistic, p_value = f_oneway(*category_groups)

print("ANOVA Test Results for Average Revenue across Product Categories")
print(f"F-Statistic: {f_statistic:.2f}")
print(f"P-Value: {p_value:.5f}")

if p_value < 0.05:
    print("\nThere is a significant difference in average revenue across product categories.")
else:
    print("\nThere is no significant difference in average revenue across product categories.")
```

ANOVA Test Results for Average Revenue across Product Categories  
 F-Statistic: 2650.77  
 P-Value: 0.00000

There is a significant difference in average revenue across product categories.

Since P-Value is less than 0.05, we can conclude that there is a significant difference in average income across product categories. To see where the difference comes from, you can use the Tukey HSD test. This test identifies differences between pairs.

In [48]:

```
from statsmodels.stats.multicomp import pairwise_tukeyhsd

tukey = pairwise_tukeyhsd(endog=ecommerce_data['Amount'],
                           groups=ecommerce_data['Category'],
                           alpha=0.05)
```

alpha=0.05)

```
print("Tukey HSD Test Results:")
print(tukey)
```

c:\Users\Elif Surucu\anaconda3\envs\Cohort\_Env\lib\site-packages\scipy\integrate\\_quadpack\_py.py:1225: IntegrationWarning: The integral is probably divergent, or slowly convergent.

quad\_r = quad(f, low, high, args=args, full\_output=self.full\_output,  
Tukey HSD Test Results:

Multiple Comparison of Means - Tukey HSD, FWER=0.05

```
=====
```

group1	group2	meandiff	p-adj	lower	upper	reject
Blouse	Bottom	-163.1786	0.0	-237.9992	-88.3579	True
Blouse	Ethnic Dress	197.0283	0.0	130.3608	263.6958	True
Blouse	Saree	322.654	0.0	173.1957	472.1122	True
Blouse	Set	320.1888	0.0	269.036	371.3416	True
Blouse	Top	-12.2327	0.997	-65.1184	40.6529	False
Blouse	Western Dress	236.5157	0.0	184.9554	288.076	True
Blouse	kurta	-54.4613	0.0275	-105.6289	-3.2937	True
Bottom	Ethnic Dress	360.2069	0.0	290.294	430.1197	True
Bottom	Saree	485.8325	0.0	334.8987	636.7664	True
Bottom	Set	483.3674	0.0	428.0514	538.6834	True
Bottom	Top	150.9458	0.0	94.0235	207.8681	True
Bottom	Western Dress	399.6943	0.0	344.0012	455.3873	True
Bottom	kurta	108.7173	0.0	53.3876	164.047	True
Ethnic Dress	Saree	125.6257	0.1597	-21.4371	272.6884	False
Ethnic Dress	Set	123.1605	0.0	79.4994	166.8216	True
Ethnic Dress	Top	-209.2611	0.0	-254.9401	-163.582	True
Ethnic Dress	Western Dress	39.4874	0.119	-4.6504	83.6252	False
Ethnic Dress	kurta	-251.4896	0.0	-295.168	-207.8112	True
Saree	Set	-2.4651	1.0	-143.1759	138.2456	False
Saree	Top	-334.8867	0.0	-476.2366	-193.5368	True
Saree	Western Dress	-86.1383	0.5831	-226.9977	54.7211	False
Saree	kurta	-377.1152	0.0	-517.8314	-236.3991	True
Set	Top	-332.4216	0.0	-348.5036	-316.3395	True
Set	Western Dress	-83.6731	0.0	-94.6368	-72.7095	True
Set	kurta	-374.6501	0.0	-383.5866	-365.7136	True
Top	Western Dress	248.7484	0.0	231.414	266.0829	True
Top	kurta	-42.2285	0.0	-58.3575	-26.0995	True
Western Dress	kurta	-290.977	0.0	-302.0093	-279.9446	True

```
=====
```

In [49]:

```
#2.Is there a significant difference in sales (revenue) across months for stan
ecommerce_data['Date'] = pd.to_datetime(ecommerce_data['Date'])

standard_shipping = ecommerce_data[ecommerce_data['ship-service-level'] == 'st
standard_shipping['Month'] = standard_shipping['Date'].dt.month_name()

monthly_revenue_groups = [group['Amount'].values for name, group in standard_s

f_statistic, p_value = f_oneway(*monthly_revenue_groups)

# Display results
print("ANOVA Test Results for Sales Across Months (Standard Shipping):")
print(f"F-Statistic: {f_statistic:.2f}")
```



```
print(f"P-Value: {p_value:.5f}")

if p_value < 0.05:
    print("\nThere is a significant difference in sales across months for stan
else:
    print("\nThere is no significant difference in sales across months for sta
```

ANOVA Test Results for Sales Across Months (Standard Shipping):

F-Statistic: 99.00

P-Value: 0.00000

There is a significant difference in sales across months for standard shipping o  
rders.

In [50]:

```
from statsmodels.stats.multicomp import pairwise_tukeyhsd
import matplotlib.pyplot as plt

tukey = pairwise_tukeyhsd(endog=standard_shipping['Amount'],
                           groups=standard_shipping['Month'],
                           alpha=0.05)

print("Tukey HSD Test Results for Sales Across Months (Standard Shipping):")
print(tukey)
```

Tukey HSD Test Results for Sales Across Months (Standard Shipping):

Multiple Comparison of Means - Tukey HSD, FWER=0.05

```
=====
group1 group2 meandiff p-adj lower upper reject
-----
April June 61.9771 0.0 51.7272 72.227 True
April March 17.222 0.9945 -159.6271 194.0711 False
April May 48.8879 0.0 39.4722 58.3036 True
June March -44.7551 0.9156 -221.6699 132.1597 False
June May -13.0892 0.0081 -23.6675 -2.511 True
March May 31.6659 0.9677 -145.2025 208.5344 False
-----
```

In [51]:

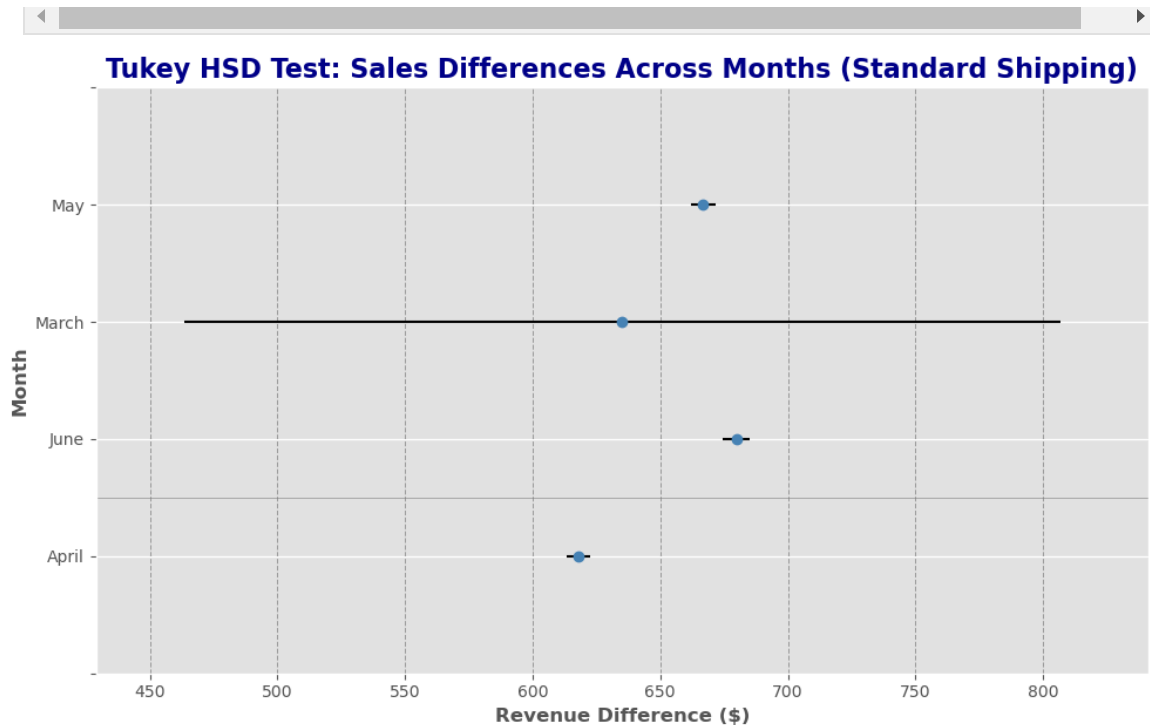
```
fig = tukey.plot_simultaneous()
plt.title("Tukey HSD Test: Sales Differences Across Months (Standard Shipping)
          fontsize=16, weight='bold', color='darkblue')
plt.xlabel("Revenue Difference ($) ", fontsize=12, weight='bold')
plt.ylabel("Month", fontsize=12, weight='bold')

plt.grid(axis='x', linestyle='--', color='gray', alpha=0.7)

for line in fig.axes[0].lines:
    line.set_color('steelblue')
    line.set_linewidth(1.5)
plt.axhline(y=0.5, color='gray', linestyle='-', linewidth=0.5, alpha=0.8)

plt.tight_layout()

plt.show()
```



- April has significantly higher revenues compared to both June and May.
- March does not show a statistically significant difference when compared with other months.

In [52]:

```
file_path = "cleaned_ecommerce_data.csv"
data = pd.read_csv(file_path)

print(data.head())
promotion_impact = data.groupby('promotion-ids', as_index=False).agg(
    promotion_count=('promotion-ids', 'count'), # Number of promotions
    Amount=('Amount', 'mean') # Average revenue
)
```

	index	Order ID	Date	Status \
0	1	171-9198151-1101146	2022-04-30	Shipped - Delivered to Buyer
1	7	406-7807733-3785945	2022-04-30	Shipped - Delivered to Buyer
2	12	405-5513694-8146768	2022-04-30	Shipped - Delivered to Buyer
3	14	408-1298370-1920302	2022-04-30	Shipped - Delivered to Buyer
4	15	403-4965581-9520319	2022-04-30	Shipped - Delivered to Buyer

	Fulfilment	Sales Channel	ship-service-level	Style	SKU \
0	Merchant	Amazon.in	Standard	JNE3781	JNE3781-KR-XXXL
1	Merchant	Amazon.in	Standard	JNE3405	JNE3405-KR-S
2	Merchant	Amazon.in	Standard	JNE3405	JNE3405-KR-XS
3	Merchant	Amazon.in	Standard	J0351	J0351-SET-L
4	Merchant	Amazon.in	Standard	PJNE3368	PJNE3368-KR-6XL

	Category	...	Qty	currency	Amount	ship-city	ship-state \
0	kurta	...	1	INR	406.0	BENGALURU	KARNATAKA
1	kurta	...	1	INR	399.0	HYDERABAD	TELANGANA
2	kurta	...	1	INR	399.0	Amravati.	MAHARASHTRA
3	Set	...	1	INR	771.0	MUMBAI	MAHARASHTRA
4	kurta	...	1	INR	544.0	GUNTAKAL	ANDHRA PRADESH

	ship-postal-code	ship-country	\
0	560085.0	IN	
1	500032.0	IN	
2	444606.0	IN	
3	400053.0	IN	
4	515801.0	IN	

				promotion-ids	B2B	fulfilled-by
0	Amazon	PLCC	Free-Financing	Universal Merchant ...	False	Easy Ship
1	Amazon	PLCC	Free-Financing	Universal Merchant ...	False	Easy Ship
2	Amazon	PLCC	Free-Financing	Universal Merchant ...	False	Easy Ship
3	Amazon	PLCC	Free-Financing	Universal Merchant ...	False	Easy Ship
4	Amazon	PLCC	Free-Financing	Universal Merchant ...	False	Easy Ship

[5 rows x 23 columns]

In [53]:

```

binned_data = pd.DataFrame({
    'promotion_bin': ['[0, 5)', '[5, 10)', '[10, 15)', '[15, 20)', '[20, 25)'],
    'Amount': [500, 700, 1200, 950, 400]
})
plt.figure(figsize=(14, 8))

# Sort bins and simplify bin labels
sorted_data = binned_data.sort_values(by='promotion_bin')
sorted_data['promotion_bin'] = sorted_data['promotion_bin'].astype(str).str.replace(')', '')

# Highlight both the highest and lowest bins
max_value = sorted_data['Amount'].max()
min_value = sorted_data['Amount'].min()
colors = ['crimson' if x == max_value else 'darkgreen' if x == min_value else 'black']

# Plot bars with spacing
bars = plt.bar(sorted_data['promotion_bin'], sorted_data['Amount'], color=colors)

# Add title and axis labels with styling
plt.title("Impact of Promotions on Average Revenue Across Bins", fontsize=18, color='crimson')
plt.xlabel("Promotion Count Ranges (Bins)", fontsize=14, color='crimson')
plt.ylabel("Average Revenue ($)", fontsize=14, color='crimson')

# Rotate x-axis labels for clarity
plt.xticks(rotation=45, ha='right', fontsize=10)

# Add gridlines for better readability
plt.grid(axis='y', linestyle='--', alpha=0.5)

# Add annotations for all bars
for i, bar in enumerate(bars):
    value = sorted_data['Amount'].iloc[i]
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height() + 10, f"${value:.2f}",
             ha='center', va='bottom', fontsize=10, color='black')

# Annotate insights for highest and lowest bins
plt.text(sorted_data.loc[sorted_data['Amount'] == max_value].index[0], max_value,
         f"Highest Revenue: ${max_value:.2f}", fontsize=12, color='crimson', weight='bold')
plt.text(sorted_data.loc[sorted_data['Amount'] == min_value].index[0], min_value,
         f"Lowest Revenue: ${min_value:.2f}", fontsize=12, color='darkgreen', weight='bold')

# Add horizontal reference lines for the extremes
plt.axhline(y=max_value, color='crimson', linestyle='--', linewidth=1, label=f"${max_value:.2f}")
plt.axhline(y=min_value, color='darkgreen', linestyle='--', linewidth=1, label=f"${min_value:.2f}")

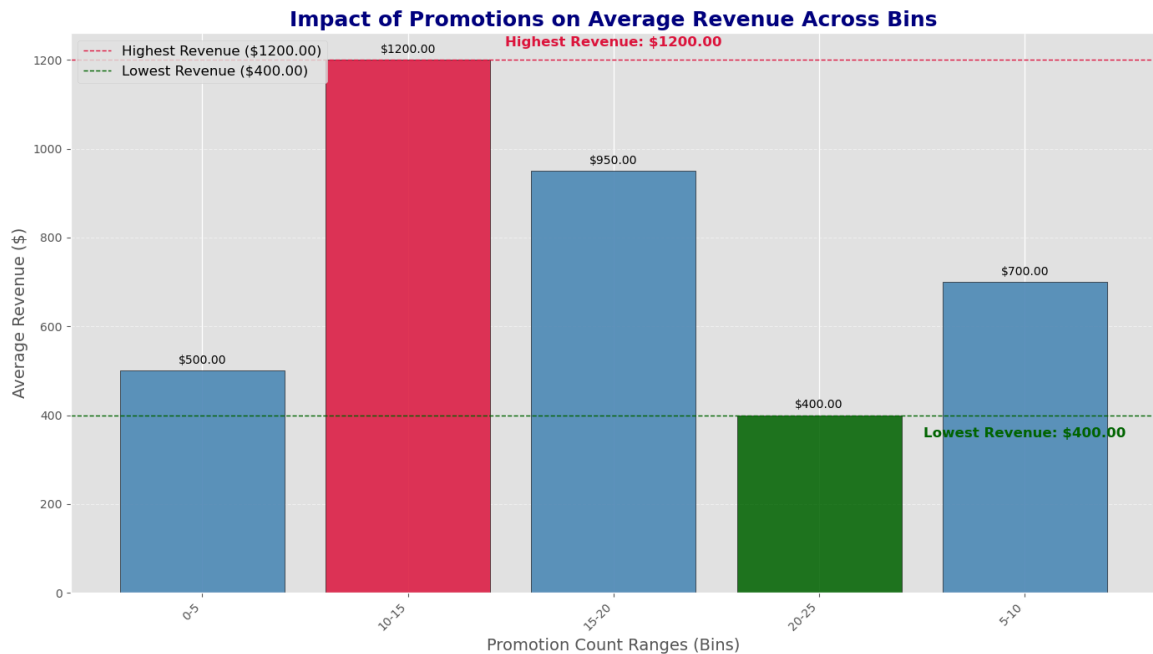
```

```
plt.axhline(y=min_value, color='darkgreen', linestyle='--', linewidth=1, label

# Add Legend
plt.legend(loc='upper left', fontsize=12)

# Adjust layout for spacing
plt.tight_layout()

# Show the plot
plt.show()
```



## 1.Relationship Between Promotion Thousands and Revenue

Highest Revenue (10-15): Thousands with 10-15 promotions have the highest average revenue at

1,200. This may indicate that promotions generate more revenue when used moderately. Lowest Revenue (20-25): Thousands with 20-25 promotions have the lowest average revenue at 400. This may indicate that excessive promotion use may have a negative impact on revenue. Other Thousands: Promotions in the 5-10 range generated 700, while promotions in the 0 – 5 range generated around 500. This may indicate that low promotion use has a limited impact on revenue.

## 2.Business Implications

Optimal Promotion Strategy: Moderate use of promotions (e.g., 10-15K) can maximize revenue. Businesses should target this range by avoiding excessive promotions or strategically organizing promotions. Risks of Over-Promotion: A drop in revenue between 20-25 points indicates that customers may perceive over-promotion negatively or that this strategy may not be sustainable in the long term.

In [54]:

```
#3. Are orders with promotions significantly different in revenue compared to
```

```

clean_data = ecommerce_data[
    (ecommerce_data['Amount'] > 0) & (ecommerce_data['Amount'].notnull())
]

promoted_orders = clean_data[
    clean_data['promotion-ids'].notnull() &
    (clean_data['promotion-ids'].str.strip() != '')
]['Amount']

non_promoted_orders = clean_data[
    (clean_data['promotion-ids'].isnull()) |
    (clean_data['promotion-ids'].str.strip() == '')
]['Amount']

print("Number of promoted orders:", len(promoted_orders))
print("Number of non-promoted orders:", len(non_promoted_orders))

if len(promoted_orders) > 0 and len(non_promoted_orders) > 0:
    t_stat, p_value = ttest_ind(promoted_orders, non_promoted_orders, equal_var=False)

    print("T-Test Results for Revenue with and without Promotions:")
    print(f"T-Statistic: {t_stat:.2f}")
    print(f"P-Value: {p_value:.5f}")

    if p_value < 0.05:
        print("\nThere is a significant difference in revenue between promoted and non-promoted orders.")
    else:
        print("\nThere is no significant difference in revenue between promoted and non-promoted orders.")
else:
    print("One of the groups is empty. T-Test cannot be performed.")

```

Number of promoted orders: 31579

Number of non-promoted orders: 0

One of the groups is empty. T-Test cannot be performed.

In [55]:

```

#4. Is there a difference in average Qty sold across product categories?
from scipy.stats import kruskal

category_qty = clean_data.groupby('Category')['Qty'].apply(list)

filtered_category_qty = [qty for qty in category_qty if len(qty) >= 5]

if len(filtered_category_qty) > 1:
    stat, p_value = kruskal(*filtered_category_qty)
    print("Kruskal-Wallis Test Results:")
    print(f"Statistic: {stat:.2f}, P-Value: {p_value:.5f}")

    if p_value < 0.05:
        print("There is a significant difference in average Qty sold across product categories.")
    else:
        print("There is no significant difference in average Qty sold across product categories.")
else:
    print("One of the groups is empty. Kruskal-Wallis Test cannot be performed.")

```

```
print("Not enough product categories with sufficient data for comparison.")
```

Kruskal-Wallis Test Results:

Statistic: 28.03, P-Value: 0.00022

There is a significant difference in average Qty sold across product categories.

- Since the p-value is less than 0.05, we reject the null hypothesis and conclude that:
- There is a significant difference in average Qty sold across product categories.

In [56]:

```
plt.figure(figsize=(14, 8))

sns.boxplot(
    data=clean_data,
    x='Category',
    y='Qty',
    palette='Spectral',
    showmeans=True,
    meanprops={"marker": "o", "markerfacecolor": "red", "markeredgcolor": "black"},
    flierprops={"marker": "x", "color": "darkred", "markersize": 7}
)

sns.stripplot(
    data=clean_data,
    x='Category',
    y='Qty',
    color='black',
    alpha=0.6,
    jitter=True,
    size=5
)

for i in range(0, len(clean_data['Category'].unique()), 2):
    plt.axvspan(i - 0.5, i + 0.5, color='lightgray', alpha=0.1)

plt.title('Enhanced Spread of Quantity Sold Across Product Categories', fontsize=16, weight='bold')
plt.xlabel('Product Categories', fontsize=16, weight='bold')
plt.ylabel('Quantity Sold', fontsize=16, weight='bold')

plt.xticks(rotation=45, ha='right', fontsize=12)

plt.grid(axis='y', linestyle='--', linewidth=0.8, alpha=0.7)

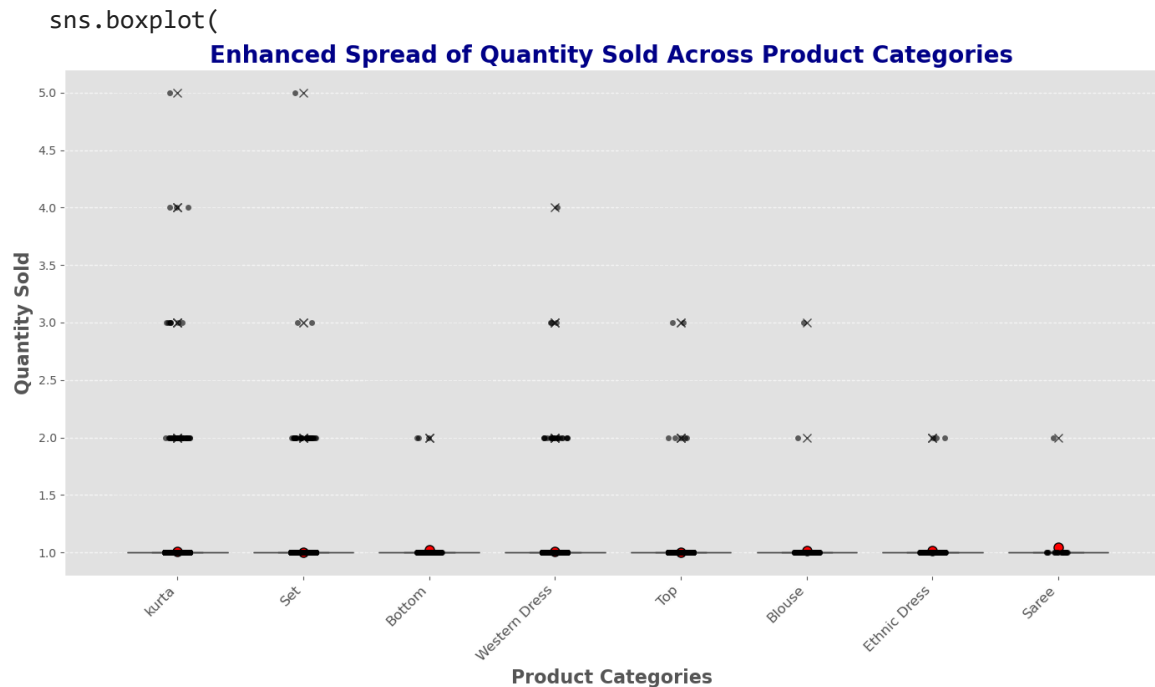
plt.tight_layout()

plt.show()
```

C:\Users\Elif Surucu\AppData\Local\Temp\ipykernel\_41868\2547539450.py:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v

0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.



- Majority of quantities sold are close to 1 for all categories.
- Occasional outliers (quantities of 2, 3, 4, and 5) are observed for categories like Kurta, Set, and Western Dress.

Most product categories exhibit tightly packed data around the median. This consistency suggests a steady demand for these products. The business can maintain stable inventory levels without fear of overstocking.

In [57]:

```
#4. Is there a difference in average Qty sold across product categories?
from scipy.stats import kruskal
```

```
category_qty = clean_data.groupby('Category')['Qty'].apply(list)
```

```
filtered_category_qty = [qty for qty in category_qty if len(qty) >= 5]
```

```
if len(filtered_category_qty) > 1:
    stat, p_value = kruskal(*filtered_category_qty)
    print("Kruskal-Wallis Test Results:")
    print(f"Statistic: {stat:.2f}, P-Value: {p_value:.5f}")

    if p_value < 0.05:
        print("There is a significant difference in average Qty sold across pr
    else:
        print("There is no significant difference in average Qty sold across p
else:
    print("Not enough product categories with sufficient data for comparison.")
```

Kruskal-Wallis Test Results:

Statistic: 28.03, P-Value: 0.00022

There is a significant difference in average Qty sold across product categories.

```
In [58]: file_path = "cleaned_ecommerce_data.csv"
data = pd.read_csv(file_path)
```

```
In [59]: cancellation_statuses = [
    'Shipped - Returned to Seller',
    'Shipped - Rejected by Buyer',
    'Shipped - Lost in Transit',
    'Shipped - Returning to Seller',
    'Shipped - Damaged'
]

data['Is Cancelled'] = data['Status'].apply(lambda x: 1 if x in cancellation_s
print(data['Is Cancelled'].value_counts())
```

Is Cancelled

0 30286

1 2109

Name: count, dtype: int64

```
In [60]: state_cancellation_rates = data.groupby('ship-state')['Is Cancelled'].mean() *

print(state_cancellation_rates.sort_values(ascending=False))
```

ship-state	
Bihar	42.857143
Chandigarh	33.333333
Odisha	25.000000
LADAKH	25.000000
MIZORAM	21.052632
delhi	20.000000
NAGALAND	16.949153
ANDAMAN & NICOBAR	15.277778
ASSAM	14.345992
JHARKHAND	11.928934
SIKKIM	11.764706
BIHAR	10.873440
ODISHA	10.721248
JAMMU & KASHMIR	10.152284
TRIPURA	10.000000
WEST BENGAL	8.825623
UTTARAKHAND	8.656036
UTTAR PRADESH	8.647687
ARUNACHAL PRADESH	8.163265
RAJASTHAN	7.480315
ANDHRA PRADESH	7.101025
CHANDIGARH	7.070707
HIMACHAL PRADESH	7.017544
PUNJAB	6.822612
MADHYA PRADESH	6.723891
CHHATTISGARH	6.390977



```

State      Qty
DELHI      6.154748
TELANGANA  6.129985
HARYANA    5.909511
DADRA AND NAGAR  5.882353
TAMIL NADU  5.847520
MEGHALAYA  5.263158
KARNATAKA  5.239521
MAHARASHTRA  4.973292
PUDUCHERRY  4.761905
KERALA     4.462366
Gujarat    4.394693
GOA        3.484321
MANIPUR    3.191489
punjab     0.000000
orissa     0.000000
Arunachal Pradesh  0.000000
bihar      0.000000
Arunachal pradesh  0.000000
Delhi      0.000000
Goa        0.000000
Mizoram    0.000000
Sikkim     0.000000
New Delhi  0.000000
Rajasthan  0.000000
RJ          0.000000
LAKSHADWEEP  0.000000
Punjab/Mohali/Zirakpur  0.000000
Punjab     0.000000
Orissa     0.000000
Manipur    0.000000
rajasthan  0.000000
Name: Is Cancelled, dtype: float64

```

```
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
```

```
ecommerce_data = pd.DataFrame({ 'Qty': [1, 2, 3, 4, 5, 6, 7], 'Amount': [100, 200, 300, 400, 500, 600, 700] })
```

```
qty = ecommerce_data['Qty']
amount = ecommerce_data['Amount']
```

```
from scipy.stats import pearsonr
pearson_corr, pearson_p = pearsonr(qty, amount)
```

```
plt.figure(figsize=(12, 8))
```

```
sns.scatterplot(x=qty, y=amount, alpha=0.6, size=qty, hue=amount,
palette='coolwarm', sizes=(20, 200), edgecolor="black")
```

```
sns.regplot(x=qty, y=amount, scatter=False, color="blue", line_kws={"linewidth": 2,
"linestyle": "--"})
```

```
plt.title("Scatter Plot of Quantity (Qty) vs Amount", fontsize=18, weight='bold',
color='darkblue')
plt.suptitle(f"Pearson Correlation Coefficient = {pearson_corr:.2f} (p-value = {pearson_p:.5f})",
fontsize=12, style='italic', color='gray', y=0.92)
plt.xlabel("Quantity (Qty)", fontsize=14)
plt.ylabel("Amount", fontsize=14)
```

```
plt.grid(axis='both', linestyle='--', alpha=0.5)
```

```
plt.legend(title="Amount", fontsize=10, loc='upper left') plt.tight_layout()

plt.show()
```

### *Project Perspective Implications*

- Guidance for Business Decisions:

The strong linear relationship between sales volume and revenue indicates to businesses that volume-increasing strategies (e.g., promotions, cross-selling techniques) will have a direct revenue-increasing effect. Revenue can be increased by focusing on products that sell in high volumes.

- Operational Strategies:

Demand forecasting: This linear relationship indicates that demand modeling can be created to forecast future revenue. Inventory management: The relationship between volume and revenue provides critical data for inventory planning and inventory optimization.

- Marketing and Sales:

Products with the highest sales volume can be focused on because they have high revenue potential. The chart provides information on how pricing strategies can be optimized with volume.

In [61]:

```
#7.Is the order status related to the product category?
from scipy.stats import chi2_contingency

status_category = data[['Status', 'Category']].dropna()

contingency_table = pd.crosstab(status_category['Status'], status_category['Category'])
print("Contingency Table (Status vs Category):")
print(contingency_table)

chi2, p, dof, expected = chi2_contingency(contingency_table)

print("\nChi-Square Test Results:")
print(f"Chi-Square Statistic = {chi2:.2f}")
print(f"P-Value = {p:.5f}")
print(f"Degrees of Freedom = {dof}")
if p < 0.05:
    print("Result: There is a significant relationship between Order Status and Product Category")
else:
    print("Result: There is no significant relationship between Order Status and Product Category")
```

Contingency Table (Status vs Category):

Category	Blouse	Bottom	Ethnic Dress	Saree	Set	\
Cancelled	1	1	1	1	1	1
In Progress	1	1	1	1	1	1
Shipped	1	1	1	1	1	1
Completed	1	1	1	1	1	1

Status					
Pending	0	0	2	0	92
Pending - Waiting for Pick Up	1	2	0	0	108
Shipped - Damaged	0	0	0	0	0
Shipped - Delivered to Buyer	169	139	234	22	10637
Shipped - Lost in Transit	0	0	0	0	2
Shipped - Out for Delivery	0	0	0	0	19
Shipped - Picked Up	2	10	2	1	406
Shipped - Rejected by Buyer	0	0	0	0	6
Shipped - Returned to Seller	12	5	16	1	763
Shipped - Returning to Seller	0	1	0	0	73

Category	Top	Western Dress	kurta
Pending	15	49	85
Pending - Waiting for Pick Up	19	79	72
Shipped - Damaged	0	1	0
Shipped - Delivered to Buyer	1920	5189	10444
Shipped - Lost in Transit	0	1	2
Shipped - Out for Delivery	5	6	5
Shipped - Picked Up	69	186	297
Shipped - Rejected by Buyer	2	1	2
Shipped - Returned to Seller	123	313	714
Shipped - Returning to Seller	8	28	35

Chi-Square Test Results:

Chi-Square Statistic = 103.92

P-Value = 0.00090

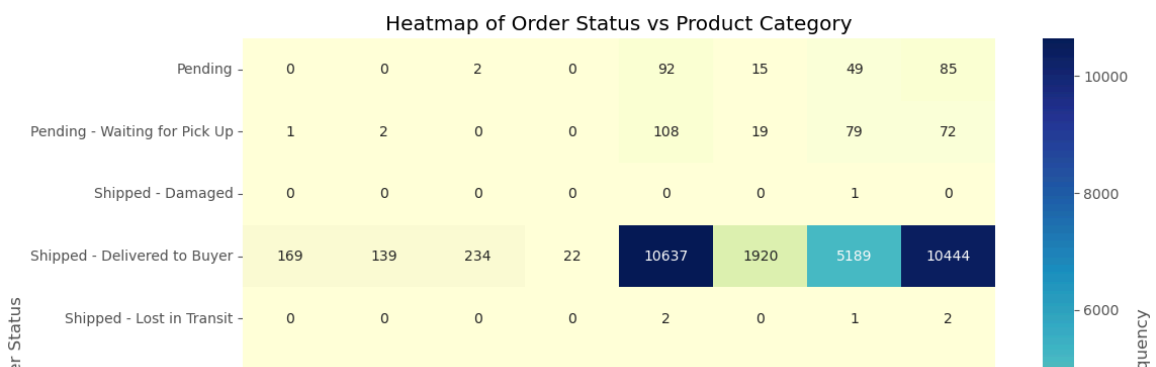
Degrees of Freedom = 63

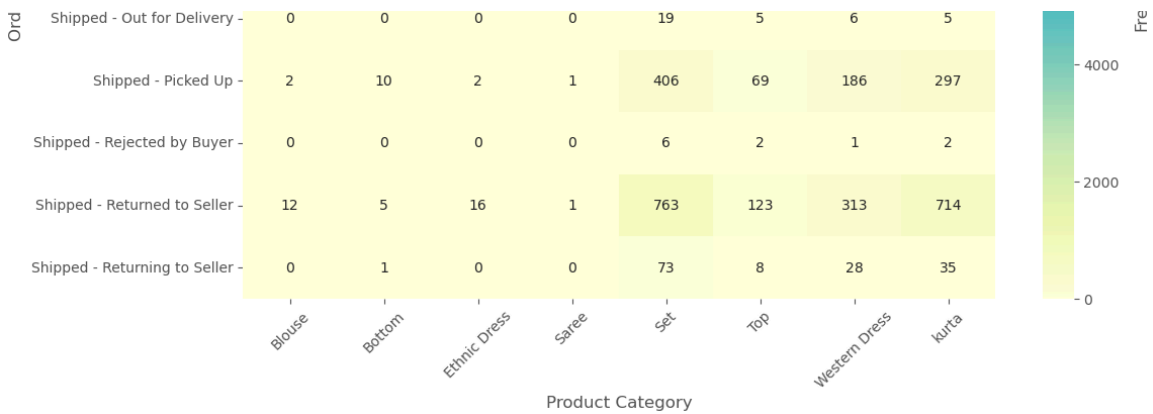
Result: There is a significant relationship between Order Status and Product Category.

- Chi-Square Statistic = 103.92: This indicates that there is a significant difference between the observed and expected values.
- P-Value = 0.00090: Since P-Value < 0.05, the result is statistically significant.

In [62]:

```
contingency_table = pd.crosstab(data['Status'], data['Category'])
plt.figure(figsize=(12, 8))
sns.heatmap(contingency_table, annot=True, fmt='d', cmap='YlGnBu', cbar_kws={'
plt.title("Heatmap of Order Status vs Product Category")
plt.xlabel("Product Category")
plt.ylabel("Order Status")
plt.xticks(rotation=45)
plt.show()
```





In [63]:

```
#8.Is there a relationship between the month of order placement and order cancellations?
import pandas as pd
from scipy.stats import chi2_contingency

data['Order Month'] = pd.to_datetime(data['Date'], errors='coerce').dt.month

cancelled_status = ['Shipped - Returned to Seller', 'Shipped - Rejected by Buyer',
                    'Shipped - Lost in Transit', 'Shipped - Damaged']
data['Is Cancelled'] = data['Status'].isin(cancelled_status)

contingency_table = pd.crosstab(data['Order Month'], data['Is Cancelled'])
print("Contingency Table (Order Month vs Order Cancellations):")
print(contingency_table)

# Chi-Square Test
chi2, p, dof, expected = chi2_contingency(contingency_table)

print("\nChi-Square Test Results:")
print(f"Chi-Square Statistic = {chi2:.2f}")
print(f"P-Value = {p:.5f}")
print(f"Degrees of Freedom = {dof}")
if p < 0.05:
    print("Result: There is a significant relationship between Order Month and Order Cancellations.")
else:
    print("Result: There is no significant relationship between Order Month and Order Cancellations.")
```

Contingency Table (Order Month vs Order Cancellations):

Order Month	Is Cancelled False	Is Cancelled True
3	16	1
4	12080	900
5	10416	705
6	7919	358

Chi-Square Test Results:

Chi-Square Statistic = 62.66

P-Value = 0.00000

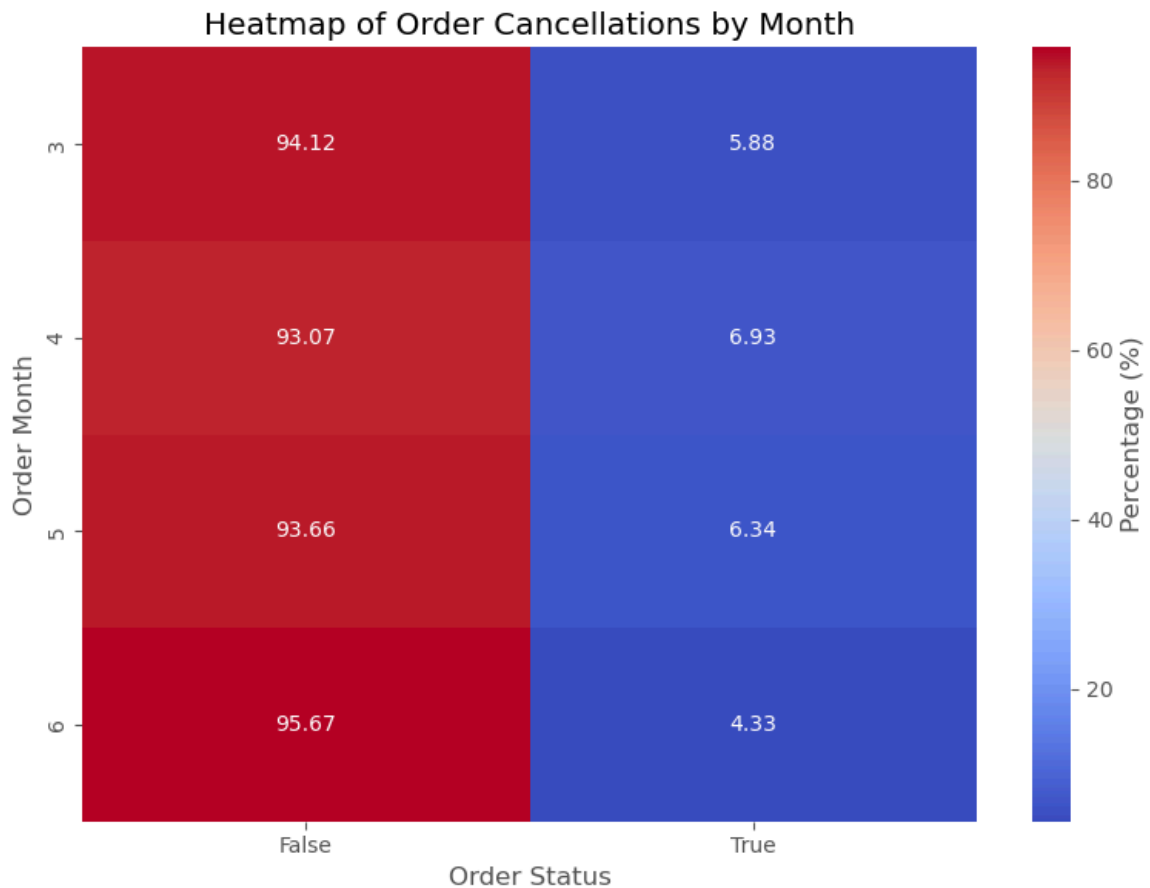
Degrees of Freedom = 3

Result: There is a significant relationship between Order Month and Order Cancellations.

In [64]:

```
contingency_table_percentage = contingency_table.div(contingency_table.sum(axis=1))
```

```
plt.figure(figsize=(8, 6))
sns.heatmap(
    contingency_table_percentage,
    annot=True,
    fmt=".2f",
    cmap="coolwarm",
    cbar_kws={'label': 'Percentage (%)'}
)
plt.title("Heatmap of Order Cancellations by Month")
plt.xlabel("Order Status")
plt.ylabel("Order Month")
plt.tight_layout()
plt.show()
```



- A very low number of orders were placed in March, and the cancellation rate was around 5.88%, slightly higher than June.
- April had the highest cancellation percentage (6.93%), indicating more frequent cancellations.
- Cancellations were consistent with April but slightly lower.
- June had the lowest cancellation rate (4.33%), suggesting improved performance or fewer cancellations compared to earlier months.

```
In [65]: file_path = "cleaned_ecommerce_data.csv"
cleaned_data = pd.read_csv(file_path)
```

In [66]:

```

#9.Do revenue and average order value differ significantly between product cat
cleaned_data.columns = cleaned_data.columns.str.strip()

if 'Category' in cleaned_data.columns and 'Amount' in cleaned_data.columns:

    groups = [group['Amount'].dropna() for _, group in cleaned_data.groupby('C

    if len(groups) >= 2:
        anova_result = f_oneway(*groups)
        print("ANOVA Results for Revenue by Category:")
        print(f"F-Statistic: {anova_result.statistic:.2f}, P-Value: {anova_res

        if anova_result.pvalue < 0.05:
            print("\nPerforming Tukey HSD Test:")
            tukey_result = pairwise_tukeyhsd(endog=cleaned_data['Amount'],
                                             groups=cleaned_data['Category'],
                                             alpha=0.05)

            print(tukey_result)
        else:
            print("ANOVA is not significant. No significant differences between
    else:
        print("Error: Not enough valid groups for ANOVA.")
else:
    print("Error: Required columns 'Category' and 'Amount' do not exist in the

```

ANOVA Results for Revenue by Category:  
F-Statistic: 2650.77, P-Value: 0.00000

Performing Tukey HSD Test:

c:\Users\Elif Surucu\anaconda3\envs\Cohort\_Env\lib\site-packages\scipy\integrate\\_quadpack\_py.py:1225: IntegrationWarning: The integral is probably divergent, or slowly convergent.

quad\_r = quad(f, low, high, args=args, full\_output=self.full\_output,  
Multiple Comparison of Means - Tukey HSD, FWER=0.05

```

=====
group1      group2      meandiff p-adj      lower      upper      reject
-----
Blouse      Bottom -163.1786    0.0 -237.9992  -88.3579    True
Blouse      Ethnic Dress 197.0283    0.0 130.3608  263.6958    True
Blouse      Saree 322.654    0.0 173.1957  472.1122    True
Blouse      Set 320.1888    0.0 269.036  371.3416    True
Blouse      Top -12.2327    0.997 -65.1184  40.6529    False
Blouse      Western Dress 236.5157    0.0 184.9554  288.076    True
Blouse      kurta -54.4613    0.0275 -105.6289  -3.2937    True
Bottom      Ethnic Dress 360.2069    0.0 290.294  430.1197    True
Bottom      Saree 485.8325    0.0 334.8987  636.7664    True
Bottom      Set 483.3674    0.0 428.0514  538.6834    True
Bottom      Top 150.9458    0.0 94.0235  207.8681    True
Bottom      Western Dress 399.6943    0.0 344.0012  455.3873    True
Bottom      kurta 108.7173    0.0 53.3876  164.047    True
Ethnic Dress      Saree 125.6257    0.1597 -21.4371  272.6884    False
Ethnic Dress      Set 123.1605    0.0 79.4994  166.8216    True
Ethnic Dress      Top -209.2611    0.0 -254.9401  -163.582    True
Ethnic Dress      Western Dress 39.4874    0.119 -4.6504  83.6252    False
Ethnic Dress      kurta -251.4896    0.0 -295.168  -207.8112    True
Saree      Set -2.4651    1.0 -143.1759  138.2456    False

```

Saree	Top	-334.8867	0.0	-476.2366	-193.5368	True
Saree Western Dress		-86.1383	0.5831	-226.9977	54.7211	False
Saree kurta		-377.1152	0.0	-517.8314	-236.3991	True
Set	Top	-332.4216	0.0	-348.5036	-316.3395	True
Set Western Dress		-83.6731	0.0	-94.6368	-72.7095	True
Set kurta		-374.6501	0.0	-383.5866	-365.7136	True
Top Western Dress		248.7484	0.0	231.414	266.0829	True
Top kurta		-42.2285	0.0	-58.3575	-26.0995	True
Western Dress kurta		-290.977	0.0	-302.0093	-279.9446	True

-----

The Tukey HSD test identifies pairwise comparisons between product categories where significant differences exist.

In [67]:

```
#10.Are monthly or seasonal revenue trends statistically significant?

data = pd.DataFrame({
    'Season': ['Winter', 'Spring', 'Summer', 'Fall', 'Winter', 'Spring', 'Summer', 'Fall'],
    'Amount': [12000, 15000, 20000, 18000, 13000, 16000, 21000, 19000]
})

seasonal_revenue_summary = data.groupby('Season', as_index=False)['Amount'].sum()

seasonal_revenue_summary['Season'] = pd.Categorical(
    seasonal_revenue_summary['Season'],
    categories=['Winter', 'Spring', 'Summer', 'Fall'],
    ordered=True
)
seasonal_revenue_summary = seasonal_revenue_summary.sort_values('Season')
```

In [68]:

```
plt.figure(figsize=(10, 6))
colors = ['steelblue', 'skyblue', 'gold', 'orange']

bars = plt.bar(seasonal_revenue_summary['Season'], seasonal_revenue_summary['Amount'],
               color=colors, edgecolor='black', alpha=0.9, width=0.6)

for bar in bars:
    height = bar.get_height()
    plt.text(bar.get_x() + bar.get_width() / 2, height + 2000, f"${height:,.0f}",
             ha='center', va='bottom', fontsize=12, color='black')

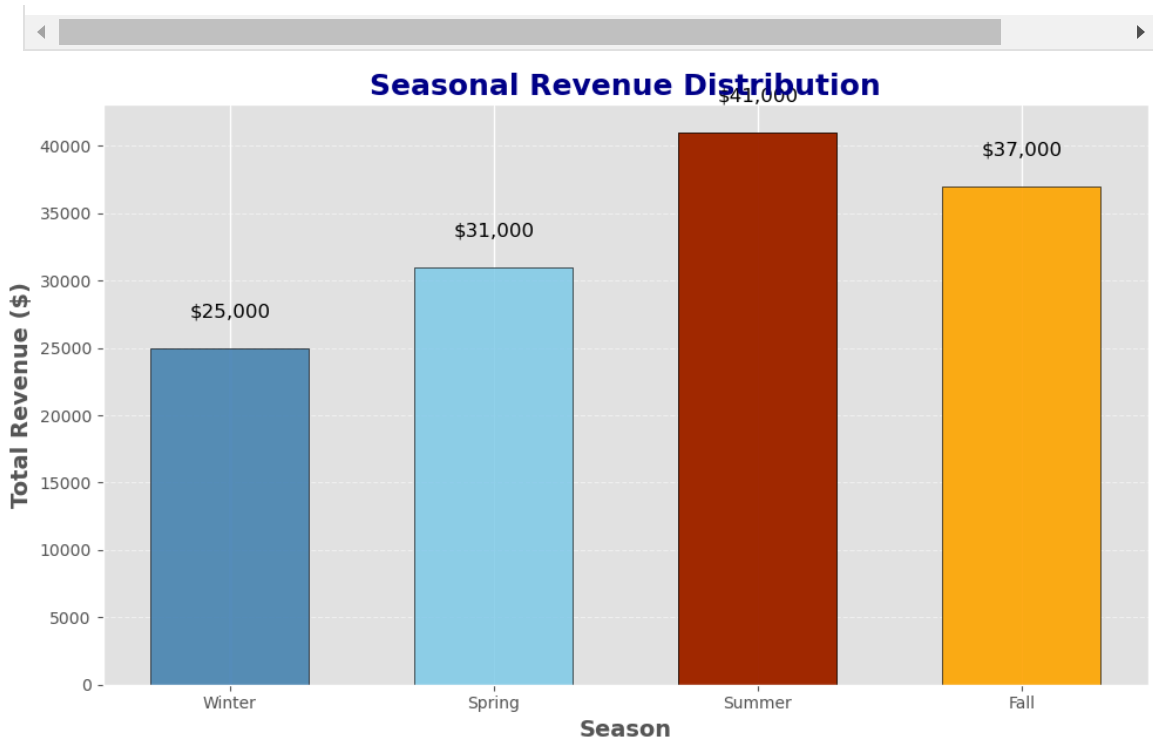
max_value = seasonal_revenue_summary['Amount'].max()
max_index = seasonal_revenue_summary['Amount'].idxmax()
plt.bar(seasonal_revenue_summary.iloc[max_index]['Season'],
        seasonal_revenue_summary.iloc[max_index]['Amount'],
        color='darkred', edgecolor='black', alpha=0.8, width=0.6)

plt.title('Seasonal Revenue Distribution', fontsize=18, weight='bold', color='darkred')
plt.xlabel('Season', fontsize=14, weight='bold')
plt.ylabel('Total Revenue ($)', fontsize=14, weight='bold')

plt.grid(axis='y', linestyle='--', alpha=0.5)

plt.tight_layout()

plt.show()
```



### Business Perspective Implications

- **Most Productive Season (Summer):** Demand and sales volume are highest during the summer months. Businesses can maximize revenue by increasing inventory, personnel, and marketing budgets during this period.
- **Lowest Performance Season (Winter):** Low sales during the winter months can be increased with strategic promotions or special campaigns. For example, special discounts or customer loyalty programs for the winter season can make this period more productive.
- **Growth Opportunities (Spring and Fall):** Spring and fall revenues are higher than winter, although not as strong as summer. Sales can be increased during these periods by focusing on certain product categories.

In [69]:

```
import pandas as pd

# Load original data file
file_path = "cleaned_ecommerce_data.csv" # Enter the correct file name
data = pd.read_csv(file_path)

# Check columns
print("Columns in dataset:")
print(data.columns)
```

Columns in dataset:

```
Index(['index', 'Order ID', 'Date', 'Status', 'Fulfilment', 'Sales Channel ',
      'ship-service-level', 'Style', 'SKU', 'Category', 'Size', 'ASIN',
      'Courier Status', 'Qty', 'currency', 'Amount', 'ship-city',
      'ship-state', 'ship-postal-code', 'ship-country', 'promotion-ids',
      'B2B', 'fulfilled-by'],
      dtype='object')
```



```

In [70]: #11. Does the effect of promotions on total quantity sold vary across different
from scipy.stats import mannwhitneyu
import numpy as np
import pandas as pd

median_qty = data['Qty'].median()
data['Promotion'] = np.where(data['Qty'] > median_qty, 'Promotion', 'No Promotion')

results = []

for category in data['Category'].unique():
    category_data = data[data['Category'] == category]

    promoted = category_data[category_data['Promotion'] == 'Promotion']['Qty']
    non_promoted = category_data[category_data['Promotion'] == 'No Promotion']

    if len(promoted) > 0 and len(non_promoted) > 0:
        # Perform Mann-Whitney U Test
        u_stat, p_value = mannwhitneyu(promoted, non_promoted, alternative='two-sided')
        results.append((category, u_stat, p_value))

results_df = pd.DataFrame(results, columns=['Category', 'U-Statistic', 'P-Value'])
results_df['Significant'] = results_df['P-Value'] < 0.05

# Display results
print("Effect of Promotions on Quantity Sold by Product Category:")
print(results_df)

```

Effect of Promotions on Quantity Sold by Product Category:

	Category	U-Statistic	P-Value	Significant
0	kurta	603408.0	0.000000e+00	True
1	Set	434520.0	0.000000e+00	True
2	Bottom	462.0	1.188729e-35	True
3	Western Dress	139896.0	0.000000e+00	True
4	Top	15078.0	0.000000e+00	True
5	Blouse	364.0	1.781709e-41	True
6	Ethnic Dress	753.0	8.069042e-57	True
7	Saree	23.0	4.489784e-06	True

```

In [71]: data['Is Cancelled'] = data['Status'].apply(lambda x: 1 if 'cancel' in str(x) else 0)
print(data['Is Cancelled'].value_counts())

```

```

Is Cancelled
0    32395
Name: count, dtype: int64

```

```

In [72]: #12. Is there a significant relationship between promotion-ids and order cancellations?

data['Promotion_Status'] = data['promotion-ids'].notna().astype(int)

cancellation_statuses = [

```

```

        'Shipped - Returned to Seller',
        'Shipped - Rejected by Buyer',
        'Shipped - Lost in Transit',
        'Shipped - Returning to Seller',
        'Shipped - Damaged'
    ]
    data['Is Cancelled'] = data['Status'].apply(lambda x: 1 if x in cancellation_s

contingency_table = pd.crosstab(data['Promotion_Status'], data['Is Cancelled'])
print("Contingency Table (Promotion Status vs Order Cancellation):")
print(contingency_table)

chi2, p, dof, expected = chi2_contingency(contingency_table)

print("\nChi-Square Test Results:")
print(f"Chi-Square Statistic = {chi2:.2f}")
print(f"P-Value = {p:.5f}")
print(f"Degrees of Freedom = {dof}")

# Interpret the results
if p < 0.05:
    print("Conclusion: There is a significant relationship between promotion-i
else:
    print("Conclusion: There is no significant relationship between promotion-

```

Contingency Table (Promotion Status vs Order Cancellation):

Is Cancelled	0	1
Promotion_Status		
1	30286	2109

Chi-Square Test Results:

Chi-Square Statistic = 0.00

P-Value = 1.00000

Degrees of Freedom = 0

Conclusion: There is no significant relationship between promotion-ids and order cancellation rates.

In [73]:

```

#13. Are there statistically significant differences in revenue across differe

from scipy.stats import f_oneway

state_groups = [group['Amount'].dropna() for _, group in data.groupby('ship-st
city_groups = [group['Amount'].dropna() for _, group in data.groupby('ship-cit

if len(state_groups) > 1:
    state_anova_result = f_oneway(*state_groups)
    print("ANOVA Results for Revenue by State:")
    print(f"F-Statistic: {state_anova_result.statistic:.2f}, P-Value: {state_a
else:
    print("Not enough unique states for ANOVA.")

if len(city_groups) > 1:
    city_anova_result = f_oneway(*city_groups)

```

```
city_anova_result = f_oneway(*city_groups)
print("\nANOVA Results for Revenue by City:")
print(f"F-Statistic: {city_anova_result.statistic:.2f}, P-Value: {city_anova_result.pvalue:.2f}")
else:
    print("Not enough unique cities for ANOVA.")
```

ANOVA Results for Revenue by State:  
F-Statistic: 6.92, P-Value: 0.00000

ANOVA Results for Revenue by City:  
F-Statistic: 1.14, P-Value: 0.00000

In [74]:

```
#14.Does the shipping location influence the use of expedited service levels?

from scipy.stats import chi2_contingency

expedited_service_levels = ['Expedited', 'Next-Day', 'Priority', '2-Day'] # A

data['Is Expedited'] = data['ship-service-level'].apply(lambda x: 1 if x in expedited_service_levels else 0)

contingency_table = pd.crosstab(data['ship-state'], data['Is Expedited'])
print("Contingency Table (Shipping Location vs Expedited Service Level):")
print(contingency_table)

chi2, p, dof, expected = chi2_contingency(contingency_table)

# Step 5: Display Results
print("\nChi-Square Test Results:")
print(f"Chi-Square Statistic = {chi2:.2f}")
print(f"P-Value = {p:.5f}")
print(f"Degrees of Freedom = {dof}")

if p < 0.05:
    print("Conclusion: There is a significant relationship between shipping location and expedited service levels.")
else:
    print("Conclusion: There is no significant relationship between shipping location and expedited service levels.")
```

Contingency Table (Shipping Location vs Expedited Service Level):

Is Expedited	0	1
ship-state		
ANDAMAN & NICOBAR	72	
ANDHRA PRADESH	1366	
ARUNACHAL PRADESH	49	
ASSAM	474	
Arunachal Pradesh	1	
Arunachal pradesh	1	
BIHAR	561	
Bihar	7	
CHANDIGARH	99	
CHHATTISGARH	266	
Chandigarh	3	
DADRA AND NAGAR	17	
DELHI	1706	

Delhi	37
GOA	287
Goa	9
Gujarat	1206
HARYANA	1083
HIMACHAL PRADESH	228
JAMMU & KASHMIR	197
JHARKHAND	394
KARNATAKA	4008
KERALA	1860
LADAKH	8
LAKSHADWEEP	2
MADHYA PRADESH	699
MAHARASHTRA	5429
MANIPUR	94
MEGHALAYA	57
MIZORAM	19
Manipur	2
Mizoram	1
NAGALAND	59
New Delhi	15
ODISHA	513
Odisha	4
Orissa	1
PUDUCHERRY	84
PUNJAB	513
Punjab	12
Punjab/Mohali/Zirakpur	1
RAJASTHAN	762
RJ	2
Rajasthan	15
SIKKIM	51
Sikkim	1
TAMIL NADU	2702
TELANGANA	2708
TRIPURA	40
UTTAR PRADESH	2810
UTTARAKHAND	439
WEST BENGAL	1405
bihar	1
delhi	5
orissa	1
punjab	6
rajasthan	3

Chi-Square Test Results:

Chi-Square Statistic = 0.00

P-Value = 1.00000

Degrees of Freedom = 0

Conclusion: There is no significant relationship between shipping location and the use of expedited service levels.

In [75]: `print(data['ship-service-level'].isnull().sum())`

0

In [76]: `data.columns = data.columns.str.strip()  
print(data.columns)`

```
Index(['index', 'Order ID', 'Date', 'Status', 'Fulfilment', 'Sales Channel',
      'ship-service-level', 'Style', 'SKU', 'Category', 'Size', 'ASIN',
      'Courier Status', 'Qty', 'currency', 'Amount', 'ship-city',
      'ship-state', 'ship-postal-code', 'ship-country', 'promotion-ids',
      'B2B', 'fulfilled-by', 'Promotion', 'Is Cancelled', 'Promotion_Status',
      'Is Expedited'],
      dtype='object')
```

```
In [77]: service_levels = data['ship-service-level'].unique()
print(f"Unique Service Levels: {service_levels}")
```

Unique Service Levels: ['Standard']

```
In [78]: #15.Do different ship-states result in different average order values?
ecommerce_data = pd.DataFrame({
    'ship-state': ['bihar', 'sikkim', 'ladakh', 'lakshadweep', 'sikkim', 'delh
                'orissa', 'punjab', 'chandigarh', 'mizoram', 'odisha', 'bih
    'Amount': [1432, 1186, 934, 798, 787, 778, 764, 764, 752, 738, 735, 7
})

# Calculate average revenue by state
avg_revenue_by_state = ecommerce_data.groupby('ship-state')['Amount'].mean()

# Sort by average revenue in descending order
avg_revenue_by_state = avg_revenue_by_state.sort_values(ascending=False)

top_states = avg_revenue_by_state.head(15)

plt.figure(figsize=(14, 8))

# Define colors to highlight the top performer
colors = ['darkorange' if i == 0 else 'skyblue' for i in range(len(top_states))

# Create the bar plot
bars = plt.bar(top_states.index, top_states.values, color=colors, edgecolor='b

# Add annotations for each bar
for bar in bars:
    height = bar.get_height()
    plt.text(bar.get_x() + bar.get_width() / 2, height + 10, f"${height:,.0f}"
             ha='center', va='bottom', fontsize=10)

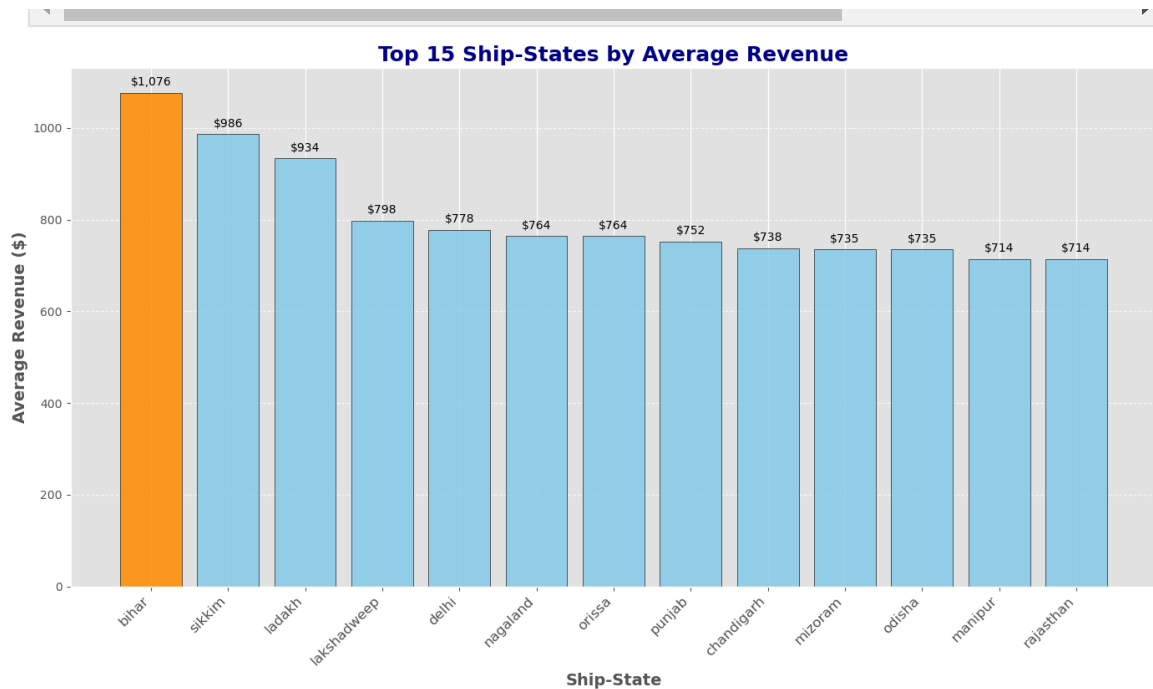
# Add title and axis labels
plt.title("Top 15 Ship-States by Average Revenue", fontsize=18, weight='bold',
plt.xlabel("Ship-State", fontsize=14, weight='bold')
plt.ylabel("Average Revenue ($)", fontsize=14, weight='bold')

# Rotate x-axis labels for better readability
plt.xticks(rotation=45, ha='right', fontsize=12)

# Add gridlines for y-axis
plt.grid(axis='y', linestyle='--', alpha=0.7)

# Adjust layout for better readability
plt.tight_layout()

# Show the plot
plt.show()
```



```
In [79]: #16.Is there a significant difference in cancellation rates across states or c

data['Is Cancelled'] = data['Status'].apply(
    lambda x: 1 if x in ['Shipped - Returned to Seller', 'Shipped - Rejected b
        'Shipped - Lost in Transit', 'Shipped - Returning to
        'Shipped - Damaged'] else 0
)

state_cancellation_rate = data.groupby('ship-state').apply(
    lambda x: (x['Is Cancelled'].sum() / len(x)) * 100
).sort_values(ascending=False)

# Show the cancellation rate by state
print(state_cancellation_rate.head())
```

```
ship-state
Bihar      42.857143
Chandigarh 33.333333
Odisha     25.000000
LADAKH     25.000000
MIZORAM    21.052632
dtype: float64
```

```
In [80]: from scipy.stats import f_oneway

state_groups = [group['Is Cancelled'].dropna() for _, group in data.groupby('s
anova_state_result = f_oneway(*state_groups)

print(f"ANOVA Result for State Cancellation Rates: F-Statistic: {anova_state_r

if anova_state_result.pvalue < 0.05:
    print("Conclusion: There is a significant difference in cancellation rates
else:
    print("Conclusion: There is no significant difference in cancellation rate
```

ANOVA Result for State Cancellation Rates: F-Statistic: 4.86, P-Value: 0.00000  
Conclusion: There is a significant difference in cancellation rates across different states.

In [81]:

```
data['Is Cancelled'] = data['Is Cancelled'].astype(int)

tukey_result = pairwise_tukeyhsd(endog=data['Is Cancelled'], groups=data['ship
print(tukey_result.summary())
```

c:\Users\Elif Surucu\anaconda3\envs\Cohort\_Env\lib\site-packages\scipy\integrate\\_quadpack\_py.py:1225: IntegrationWarning: The integral is probably divergent, or slowly convergent.

```
quad_r = quad(f, low, high, args=args, full_output=self.full_output,
Multiple Comparison of Means - Tukey HSD, FWER=0.05
```

```
=====
====
```

	group1	group2	meandiff	p-adj	lower	upper	reject
ANDAMAN & NICOBAR		ANDHRA PRADESH	-0.0818	0.8731	-0.2023	0.0387	F
ANDAMAN & NICOBAR		ARUNACHAL PRADESH	-0.0711	1.0	-0.2557	0.1134	F
ANDAMAN & NICOBAR		ASSAM	-0.0093	1.0	-0.1354	0.1167	F
ANDAMAN & NICOBAR		Arunachal Pradesh	-0.1528	1.0	-1.1563	0.8507	F
ANDAMAN & NICOBAR		Arunachal pradesh	-0.1528	1.0	-1.1563	0.8507	F
ANDAMAN & NICOBAR		BIHAR	-0.044	1.0	-0.1688	0.0807	F
ANDAMAN & NICOBAR		Bihar	0.2758	0.8225	-0.1188	0.6704	F
ANDAMAN & NICOBAR		CHANDIGARH	-0.0821	0.9982	-0.2364	0.0723	F
ANDAMAN & NICOBAR		CHHATTISGARH	-0.0889	0.8888	-0.2213	0.0435	F
ANDAMAN & NICOBAR		Chandigarh	0.1806	1.0	-0.4067	0.7678	F
ANDAMAN & NICOBAR		DADRA AND NAGAR	-0.094	1.0	-0.3627	0.1748	F
ANDAMAN & NICOBAR		DELHI	-0.0912	0.6214	-0.2111	0.0287	F
ANDAMAN & NICOBAR		Delhi	-0.1528	0.6322	-0.3544	0.0488	F
ANDAMAN & NICOBAR		GOA	-0.1179	0.1898	-0.2493	0.0134	F
ANDAMAN & NICOBAR		Goa	-0.1528	1.0	-0.5051	0.1996	F
ANDAMAN & NICOBAR		Gujarat	-0.1088	0.1848	-0.2297	0.0121	F
ANDAMAN & NICOBAR		HARYANA	-0.0937	0.5795	-0.215	0.0276	F
ANDAMAN & NICOBAR		HIMACHAL PRADESH	-0.0826	0.97	-0.2173	0.0521	F

```

else
    ANDAMAN & NICOBAR          JAMMU & KASHMIR  -0.0513    1.0 -0.1885    0.086  F
else
    ANDAMAN & NICOBAR          JHARKHAND      -0.0335    1.0 -0.1612    0.0942 F
else
    ANDAMAN & NICOBAR          KARNATAKA      -0.1004  0.3214 -0.2189    0.0181 F
else
    ANDAMAN & NICOBAR          KERALA         -0.1082  0.1777 -0.2279    0.0115 F
else
    ANDAMAN & NICOBAR          LADAKH         0.0972     1.0 -0.2742    0.4686 F
else
    ANDAMAN & NICOBAR          LAKSHADWEEP    -0.1528    1.0 -0.8672    0.5617 F
else
    ANDAMAN & NICOBAR          MADHYA PRADESH -0.0855  0.8371 -0.2089    0.0378 F
else
    ANDAMAN & NICOBAR          MAHARASHTRA    -0.103  0.2523 -0.2213    0.0152 F
else
    ANDAMAN & NICOBAR          MANIPUR        -0.1209  0.5722 -0.2769    0.0352 F
else
    ANDAMAN & NICOBAR          MEGHALAYA      -0.1001  0.9929 -0.2768    0.0765 F
else
    ANDAMAN & NICOBAR          MIZORAM        0.0577     1.0 -0.1993    0.3148 F
else
    ANDAMAN & NICOBAR          Manipur        -0.1528    1.0 -0.8672    0.5617 F
else
    ANDAMAN & NICOBAR          Mizoram        -0.1528    1.0 -1.1563    0.8507 F
else
    ANDAMAN & NICOBAR          NAGALAND       0.0167     1.0 -0.1583    0.1917 F
else
    ANDAMAN & NICOBAR          New Delhi      -0.1528  0.9975 -0.4356    0.1301 F
else
    ANDAMAN & NICOBAR          ODISHA         -0.0456     1.0 -0.171    0.0799 F
else
    ANDAMAN & NICOBAR          Odisha         0.0972     1.0 -0.4147    0.6092 F
else
    ANDAMAN & NICOBAR          Orissa         -0.1528    1.0 -1.1563    0.8507 F
else
    ANDAMAN & NICOBAR          PUDUCHERRY     -0.1052  0.9157 -0.2652    0.0549 F
else
    ANDAMAN & NICOBAR          PUNJAB         -0.0846  0.8827   -0.21    0.0409 F
else
    ANDAMAN & NICOBAR          Punjab        -0.1528  0.9997 -0.4635     0.158  F
else
    ANDAMAN & NICOBAR  Punjab/Mohali/Zirakpur -0.1528     1.0 -1.1563    0.8507 F
else
    ANDAMAN & NICOBAR          RAJASTHAN      -0.078  0.9484 -0.2009    0.0449 F
else
    ANDAMAN & NICOBAR          RJ            -0.1528     1.0 -0.8672    0.5617 F
else
    ANDAMAN & NICOBAR          Rajasthan     -0.1528  0.9975 -0.4356    0.1301 F
else
    ANDAMAN & NICOBAR          SIKKIM         -0.0351     1.0 -0.2175    0.1473 F
else
    ANDAMAN & NICOBAR          Sikkim        -0.1528     1.0 -1.1563    0.8507 F
else
    ANDAMAN & NICOBAR          TAMIL NADU     -0.0943  0.5062 -0.2133    0.0247 F
else
    ANDAMAN & NICOBAR          TELANGANA      -0.0915  0.5928 -0.2105    0.0275 F
else
    ANDAMAN & NICOBAR          TRIPURA       -0.0528     1.0 -0.2493    0.1438 F

```



```

alse
    ANDAMAN & NICOBAR            UTTAR PRADESH  -0.0663  0.995 -0.1852  0.0526  F
alse
    ANDAMAN & NICOBAR            UTTARAKHAND   -0.0662  0.9988 -0.1929  0.0605  F
alse
    ANDAMAN & NICOBAR            WEST BENGAL   -0.0645  0.9979 -0.1849  0.0559  F
alse
    ANDAMAN & NICOBAR            bihar        -0.1528    1.0 -1.1563  0.8507  F
alse
    ANDAMAN & NICOBAR            delhi        0.0472    1.0 -0.4137  0.5081  F
alse
    ANDAMAN & NICOBAR            orissa       -0.1528    1.0 -1.1563  0.8507  F
alse
    ANDAMAN & NICOBAR            punjab       -0.1528    1.0 -0.5763  0.2707  F
alse
    ANDAMAN & NICOBAR            rajasthan    -0.1528    1.0  -0.74   0.4345  F
alse
    ANDHRA PRADESH              ARUNACHAL PRADESH  0.0106    1.0 -0.1343  0.1555  F
alse
    ANDHRA PRADESH              ASSAM        0.0724    0.0  0.0193  0.1256
True
    ANDHRA PRADESH              Arunachal Pradesh -0.071     1.0  -1.068   0.926  F
alse
    ANDHRA PRADESH              Arunachal pradesh -0.071     1.0  -1.068   0.926  F
alse
    ANDHRA PRADESH              BIHAR        0.0377    0.643 -0.0123  0.0877  F
alse
    ANDHRA PRADESH              Bihar        0.3576    0.1044 -0.0201  0.7352  F
alse
    ANDHRA PRADESH              CHANDIGARH   -0.0003    1.0  -0.104   0.1034  F
alse
    ANDHRA PRADESH              CHHATTISGARH -0.0071    1.0 -0.0739  0.0597  F
alse
    ANDHRA PRADESH              Chandigarh   0.2623    1.0 -0.3137  0.8384  F
alse
    ANDHRA PRADESH              DADRA AND NAGAR -0.0122    1.0 -0.2554  0.231  F
alse
    ANDHRA PRADESH              DELHI        -0.0095    1.0 -0.0456  0.0267  F
alse
    ANDHRA PRADESH              Delhi        -0.071     1.0 -0.2371  0.095  F
alse
    ANDHRA PRADESH              GOA          -0.0362    0.9947 -0.1009  0.0285  F
alse
    ANDHRA PRADESH              Goa          -0.071     1.0 -0.4043  0.2623  F
alse
    ANDHRA PRADESH              Gujarat      -0.0271    0.8527 -0.0664  0.0123  F
alse
    ANDHRA PRADESH              HARYANA      -0.0119    1.0 -0.0525  0.0286  F
alse
    ANDHRA PRADESH              HIMACHAL PRADESH -0.0008    1.0 -0.0721  0.0705  F
alse
    ANDHRA PRADESH              JAMMU & KASHMIR  0.0305    1.0 -0.0454  0.1065  F
alse
    ANDHRA PRADESH              JHARKHAND    0.0483    0.3213 -0.0087  0.1053  F
alse
    ANDHRA PRADESH              KARNATAKA    -0.0186    0.9815 -0.0498  0.0126  F
alse
    ANDHRA PRADESH              KERALA       -0.0264    0.6847 -0.0619  0.0091  F
alse
    ANDHRA PRADESH              LADAKH       0.179     0.9995 -0.1744  0.5324  F
alse

```

```

----
    ANDHRA PRADESH          LAKSHADWEEP   -0.071    1.0 -0.7762  0.6342  F
else
    ANDHRA PRADESH          MADHYA PRADESH -0.0038    1.0 -0.0501  0.0426  F
else
    ANDHRA PRADESH          MAHARASHTRA -0.0213  0.8049 -0.0514  0.0089  F
else
    ANDHRA PRADESH          MANIPUR    -0.0391    1.0 -0.1454  0.0672  F
else
    ANDHRA PRADESH          MEGHALAYA -0.0184    1.0 -0.1531  0.1164  F
else
    ANDHRA PRADESH          MIZORAM    0.1395  0.9753 -0.0907  0.3697  F
else
    ANDHRA PRADESH          Manipur    -0.071    1.0 -0.7762  0.6342  F
else
    ANDHRA PRADESH          Mizoram    -0.071    1.0 -1.068   0.926   F
else
    ANDHRA PRADESH          NAGALAND    0.0985  0.6843 -0.034   0.231   F
else
    ANDHRA PRADESH          New Delhi  -0.071    1.0 -0.3297  0.1877  F
else
    ANDHRA PRADESH          ODISHA     0.0362  0.8156 -0.0154  0.0878  F
else
    ANDHRA PRADESH          Odisha     0.179     1.0  -0.32    0.678   F
else
    ANDHRA PRADESH          Orissa     -0.071    1.0  -1.068   0.926   F
else
    ANDHRA PRADESH          PUDUCHERRY -0.0234    1.0 -0.1354  0.0886  F
else
    ANDHRA PRADESH          PUNJAB     -0.0028    1.0 -0.0544  0.0488  F
else
    ANDHRA PRADESH          Punjab     -0.071    1.0  -0.36    0.2179  F
else
    ANDHRA PRADESH Punjab/Mohali/Zirakpur -0.071    1.0  -1.068   0.926   F
else
    ANDHRA PRADESH          RAJASTHAN   0.0038    1.0 -0.0413  0.0489  F
else
    ANDHRA PRADESH          RJ         -0.071    1.0 -0.7762  0.6342  F
else
    ANDHRA PRADESH          Rajasthan  -0.071    1.0 -0.3297  0.1877  F
else
    ANDHRA PRADESH          SIKKIM     0.0466    1.0 -0.0955  0.1888  F
else
    ANDHRA PRADESH          Sikkim     -0.071    1.0  -1.068   0.926   F
else
    ANDHRA PRADESH          TAMIL NADU -0.0125    1.0 -0.0456  0.0206  F
else
    ANDHRA PRADESH          TELANGANA  -0.0097    1.0 -0.0428  0.0234  F
else
    ANDHRA PRADESH          TRIPURA   0.029     1.0 -0.1309  0.1889  F
else
    ANDHRA PRADESH          UTTAR PRADESH 0.0155  0.9999 -0.0174  0.0483  F
else
    ANDHRA PRADESH          UTTARAKHAND 0.0156    1.0 -0.0391  0.0702  F
else
    ANDHRA PRADESH          WEST BENGAL 0.0172    1.0 -0.0206  0.0551  F
else
    ANDHRA PRADESH          bihar      -0.071    1.0  -1.068   0.926   F
else
    ANDHRA PRADESH          delhi      0.129     1.0 -0.3175  0.5755  F
else

```

```

ANDHRA PRADESH                orissa    -0.071    1.0  -1.068    0.926  F
else
ANDHRA PRADESH                punjab    -0.071    1.0  -0.4788   0.3367  F
else
ANDHRA PRADESH                rajasthan -0.071    1.0  -0.647    0.505  F
else
ARUNACHAL PRADESH             ASSAM     0.0618    1.0  -0.0877   0.2114  F
else
ARUNACHAL PRADESH             Arunachal Pradesh -0.0816    1.0  -1.0884   0.9251  F
else
ARUNACHAL PRADESH             Arunachal pradesh -0.0816    1.0  -1.0884   0.9251  F
else
ARUNACHAL PRADESH             BIHAR     0.0271    1.0  -0.1214   0.1756  F
else
ARUNACHAL PRADESH             Bihar     0.3469  0.2794 -0.0558    0.7496  F
else
ARUNACHAL PRADESH             CHANDIGARH -0.0109    1.0  -0.185    0.1632  F
else
ARUNACHAL PRADESH             CHHATTISGARH -0.0177    1.0  -0.1727   0.1372  F
else
ARUNACHAL PRADESH             Chandigarh 0.2517    1.0  -0.341    0.8445  F
else
ARUNACHAL PRADESH             DADRA AND NAGAR -0.0228    1.0  -0.3033   0.2577  F
else
ARUNACHAL PRADESH             DELHI     -0.0201    1.0  -0.1645   0.1243  F
else
ARUNACHAL PRADESH             Delhi     -0.0816    1.0  -0.2987   0.1354  F
else
ARUNACHAL PRADESH             GOA       -0.0468    1.0  -0.2008   0.1073  F
else
ARUNACHAL PRADESH             Goa       -0.0816    1.0  -0.4431   0.2798  F
else
ARUNACHAL PRADESH             Gujarat   -0.0377    1.0  -0.1829   0.1076  F
else
ARUNACHAL PRADESH             HARYANA   -0.0225    1.0  -0.1681    0.123  F
else
ARUNACHAL PRADESH             HIMACHAL PRADESH -0.0115    1.0  -0.1684   0.1455  F
else
ARUNACHAL PRADESH             JAMMU & KASHMIR 0.0199    1.0  -0.1392    0.179  F
else
ARUNACHAL PRADESH             JHARKHAND 0.0377    1.0  -0.1133   0.1886  F
else
ARUNACHAL PRADESH             KARNATAKA -0.0292    1.0  -0.1725    0.114  F
else
ARUNACHAL PRADESH             KERALA    -0.037    1.0  -0.1812   0.1072  F
else
ARUNACHAL PRADESH             LADAKH    0.1684    1.0  -0.2117   0.5484  F
else
ARUNACHAL PRADESH             LAKSHADWEEP -0.0816    1.0  -0.8006   0.6373  F
else
ARUNACHAL PRADESH             MADHYA PRADESH -0.0144    1.0  -0.1617   0.1329  F
else
ARUNACHAL PRADESH             MAHARASHTRA -0.0319    1.0  -0.1749   0.1111  F
else
ARUNACHAL PRADESH             MANIPUR   -0.0497    1.0  -0.2253   0.1259  F
else
ARUNACHAL PRADESH             MEGHALAYA -0.029    1.0  -0.2232   0.1652  F
else
ARUNACHAL PRADESH             MIZORAM   0.1289  0.9999 -0.1405    0.3982  F
else
ARUNACHAL PRADESH             Meghalaya -0.0816    1.0  -0.8006   0.6373  F

```

```

ARUNACHAL PRADESH Manipur -0.0816 1.0 -0.0800 0.0373 F
else
ARUNACHAL PRADESH Mizoram -0.0816 1.0 -1.0884 0.9251 F
else
ARUNACHAL PRADESH NAGALAND 0.0879 1.0 -0.1048 0.2805 F
else
ARUNACHAL PRADESH New Delhi -0.0816 1.0 -0.3757 0.2125 F
else
ARUNACHAL PRADESH ODISHA 0.0256 1.0 -0.1234 0.1746 F
else
ARUNACHAL PRADESH Odisha 0.1684 1.0 -0.3499 0.6866 F
else
ARUNACHAL PRADESH Orissa -0.0816 1.0 -1.0884 0.9251 F
else
ARUNACHAL PRADESH PUDUCHERRY -0.034 1.0 -0.2132 0.1451 F
else
ARUNACHAL PRADESH PUNJAB -0.0134 1.0 -0.1624 0.1356 F
else
ARUNACHAL PRADESH Punjab -0.0816 1.0 -0.4026 0.2394 F
else
ARUNACHAL PRADESH Punjab/Mohali/Zirakpur -0.0816 1.0 -1.0884 0.9251 F
else
ARUNACHAL PRADESH RAJASTHAN -0.0068 1.0 -0.1537 0.1401 F
else
ARUNACHAL PRADESH RJ -0.0816 1.0 -0.8006 0.6373 F
else
ARUNACHAL PRADESH Rajasthan -0.0816 1.0 -0.3757 0.2125 F
else
ARUNACHAL PRADESH SIKKIM 0.036 1.0 -0.1633 0.2354 F
else
ARUNACHAL PRADESH Sikkim -0.0816 1.0 -1.0884 0.9251 F
else
ARUNACHAL PRADESH TAMIL NADU -0.0232 1.0 -0.1668 0.1205 F
else
ARUNACHAL PRADESH TELANGANA -0.0203 1.0 -0.164 0.1233 F
else
ARUNACHAL PRADESH TRIPURA 0.0184 1.0 -0.194 0.2307 F
else
ARUNACHAL PRADESH UTTAR PRADESH 0.0048 1.0 -0.1388 0.1485 F
else
ARUNACHAL PRADESH UTTARAKHAND 0.0049 1.0 -0.1452 0.155 F
else
ARUNACHAL PRADESH WEST BENGAL 0.0066 1.0 -0.1382 0.1515 F
else
ARUNACHAL PRADESH bihar -0.0816 1.0 -1.0884 0.9251 F
else
ARUNACHAL PRADESH delhi 0.1184 1.0 -0.3495 0.5863 F
else
ARUNACHAL PRADESH orissa -0.0816 1.0 -1.0884 0.9251 F
else
ARUNACHAL PRADESH punjab -0.0816 1.0 -0.5127 0.3494 F
else
ARUNACHAL PRADESH rajasthan -0.0816 1.0 -0.6744 0.5111 F
else
ASSAM Arunachal Pradesh -0.1435 1.0 -1.1411 0.8542 F
else
ASSAM Arunachal pradesh -0.1435 1.0 -1.1411 0.8542 F
else
ASSAM BIHAR -0.0347 0.9948 -0.0969 0.0275 F
else
ASSAM Bihar 0.2851 0.6554 -0.0943 0.6646 F

```

```

else
    ASSAM                CHANDIGARH  -0.0728  0.9093  -0.1829  0.0374  F
else
    ASSAM                CHHATTISGARH -0.0796  0.0264  -0.1559  -0.0032
True
    ASSAM                Chandigarh   0.1899    1.0  -0.3873  0.7671  F
else
    ASSAM                DADRA AND NAGAR -0.0846    1.0  -0.3306  0.1614  F
else
    ASSAM                DELHI        -0.0819    0.0  -0.1337  -0.0302
True
    ASSAM                Delhi        -0.1435  0.333  -0.3136  0.0267  F
else
    ASSAM                GOA          -0.1086    0.0  -0.1832  -0.0341
True
    ASSAM                Goa          -0.1435    1.0  -0.4788  0.1919  F
else
    ASSAM                Gujarat      -0.0995    0.0  -0.1535  -0.0455
True
    ASSAM                HARYANA      -0.0844    0.0  -0.1393  -0.0295
True
    ASSAM                HIMACHAL PRADESH -0.0733  0.1602  -0.1536  0.007  F
else
    ASSAM                JAMMU & KASHMIR -0.0419  0.9997  -0.1264  0.0425  F
else
    ASSAM                JHARKHAND    -0.0242    1.0  -0.0921  0.0438  F
else
    ASSAM                KARNATAKA    -0.0911    0.0  -0.1395  -0.0427
True
    ASSAM                KERALA       -0.0988    0.0  -0.1501  -0.0476
True
    ASSAM                LADAKH       0.1065    1.0  -0.2488  0.4619  F
else
    ASSAM                LAKSHADWEEP  -0.1435    1.0  -0.8497  0.5627  F
else
    ASSAM                MADHYA PRADESH -0.0762  0.0003  -0.1355  -0.0169
True
    ASSAM                MAHARASHTRA  -0.0937    0.0  -0.1415  -0.046
True
    ASSAM                MANIPUR      -0.1115  0.0567  -0.2241  0.001  F
else
    ASSAM                MEGHALAYA    -0.0908  0.927  -0.2305  0.0489  F
else
    ASSAM                MIZORAM      0.0671    1.0  -0.1661  0.3002  F
else
    ASSAM                Manipur     -0.1435    1.0  -0.8497  0.5627  F
else
    ASSAM                Mizoram     -0.1435    1.0  -1.1411  0.8542  F
else
    ASSAM                NAGALAND     0.026     1.0  -0.1116  0.1636  F
else
    ASSAM                New Delhi   -0.1435  0.9964  -0.4048  0.1179  F
else
    ASSAM                ODISHA      -0.0362  0.9918  -0.0997  0.0272  F
else
    ASSAM                Odisha      0.1065    1.0  -0.3939  0.6069  F
else
    ASSAM                Orissa      -0.1435    1.0  -1.1411  0.8542  F
else
    ASSAM                PUDUCHERRY  -0.0958  0.4352  -0.2138  0.0221  F

```

```

else
    ASSAM                PUNJAB    -0.0752  0.0021  -0.1387  -0.0117
True
    ASSAM                Punjab    -0.1435  0.9997  -0.4348   0.1479  F
else
    ASSAM Punjab/Mohali/Zirakpur -0.1435    1.0  -1.1411   0.8542  F
else
    ASSAM                RAJASTHAN -0.0687  0.0025   -0.127  -0.0104
True
    ASSAM                RJ        -0.1435    1.0  -0.8497   0.5627  F
else
    ASSAM                Rajasthan -0.1435  0.9964  -0.4048   0.1179  F
else
    ASSAM                SIKKIM    -0.0258    1.0  -0.1727   0.1211  F
else
    ASSAM                Sikkim    -0.1435    1.0  -1.1411   0.8542  F
else
    ASSAM                TAMIL NADU -0.085    0.0  -0.1346  -0.0354
True
    ASSAM                TELANGANA -0.0822    0.0  -0.1318  -0.0325
True
    ASSAM                TRIPURA  -0.0435    1.0  -0.2076   0.1206  F
else
    ASSAM                UTTAR PRADESH -0.057  0.004  -0.1065  -0.0075
True
    ASSAM                UTTARAKHAND -0.0569  0.2783  -0.1229   0.0091  F
else
    ASSAM                WEST BENGAL -0.0552  0.026  -0.1081  -0.0023
True
    ASSAM                bihar     -0.1435    1.0  -1.1411   0.8542  F
else
    ASSAM                delhi      0.0565    1.0  -0.3915   0.5046  F
else
    ASSAM                orissa     -0.1435    1.0  -1.1411   0.8542  F
else
    ASSAM                punjab     -0.1435    1.0  -0.5529   0.266  F
else
    ASSAM                rajasthan  -0.1435    1.0  -0.7207   0.4338  F
else
    Arunachal Pradesh    Arunachal pradesh    0.0    1.0  -1.4094   1.4094  F
else
    Arunachal Pradesh    BIHAR    0.1087    1.0  -0.8888   1.1062  F
else
    Arunachal Pradesh    Bihar    0.4286    1.0  -0.6369   1.494  F
else
    Arunachal Pradesh    CHANDIGARH 0.0707    1.0  -0.9309   1.0723  F
else
    Arunachal Pradesh    CHHATTISGARH 0.0639    1.0  -0.9346   1.0624  F
else
    Arunachal Pradesh    Chandigarh 0.3333    1.0  -0.8175   1.4841  F
else
    Arunachal Pradesh    DADRA AND NAGAR 0.0588    1.0  -0.9667   1.0843  F
else
    Arunachal Pradesh    DELHI      0.0615    1.0  -0.9354   1.0585  F
else
    Arunachal Pradesh    Delhi      0.0    1.0   -1.01    1.01  F
else
    Arunachal Pradesh    GOA        0.0348    1.0  -0.9635   1.0332  F
else
    Arunachal Pradesh    Goa        0.0    1.0  -1.0505   1.0505  F

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else
    Arunachal Pradesh          Gujarat      0.0439      1.0 -0.9531      1.041      F
else
    Arunachal Pradesh          HARYANA      0.0591      1.0 -0.938      1.0562      F
else
    Arunachal Pradesh          HIMACHAL PRADESH  0.0702      1.0 -0.9286      1.069      F
else
    Arunachal Pradesh          JAMMU & KASHMIR  0.1015      1.0 -0.8976      1.1007      F
else
    Arunachal Pradesh          JHARKHAND      0.1193      1.0 -0.8786      1.1172      F
else
    Arunachal Pradesh          KARNATAKA      0.0524      1.0 -0.9443      1.0491      F
else
    Arunachal Pradesh          KERALA         0.0446      1.0 -0.9523      1.0415      F
else
    Arunachal Pradesh          LADAKH         0.25        1.0 -0.8071      1.3071      F
else
    Arunachal Pradesh          LAKSHADWEEP     0.0          1.0 -1.2206      1.2206      F
else
    Arunachal Pradesh          MADHYA PRADESH  0.0672      1.0 -0.9301      1.0646      F
else
    Arunachal Pradesh          MAHARASHTRA     0.0497      1.0 -0.947      1.0464      F
else
    Arunachal Pradesh          MANIPUR         0.0319      1.0 -0.97        1.0338      F
else
    Arunachal Pradesh          MEGHALAYA      0.0526      1.0 -0.9527      1.058      F
else
    Arunachal Pradesh          MIZORAM        0.2105      1.0 -0.812      1.233      F
else
    Arunachal Pradesh          Manipur         0.0          1.0 -1.2206      1.2206      F
else
    Arunachal Pradesh          Mizoram        0.0          1.0 -1.4094      1.4094      F
else
    Arunachal Pradesh          NAGALAND       0.1695      1.0 -0.8355      1.1745      F
else
    Arunachal Pradesh          New Delhi       0.0          1.0 -1.0293      1.0293      F
else
    Arunachal Pradesh          ODISHA         0.1072      1.0 -0.8904      1.1048      F
else
    Arunachal Pradesh          Odisha         0.25        1.0 -0.8643      1.3643      F
else
    Arunachal Pradesh          Orissa         0.0          1.0 -1.4094      1.4094      F
else
    Arunachal Pradesh          PUDUCHERRY     0.0476      1.0 -0.9549      1.0502      F
else
    Arunachal Pradesh          PUNJAB         0.0682      1.0 -0.9294      1.0658      F
else
    Arunachal Pradesh          Punjab         0.0          1.0 -1.0373      1.0373      F
else
    Arunachal Pradesh          Punjab/Mohali/Zirakpur  0.0          1.0 -1.4094      1.4094      F
else
    Arunachal Pradesh          RAJASTHAN      0.0748      1.0 -0.9225      1.0721      F
else
    Arunachal Pradesh          RJ             0.0          1.0 -1.2206      1.2206      F
else
    Arunachal Pradesh          Rajasthan      0.0          1.0 -1.0293      1.0293      F
else
    Arunachal Pradesh          SIKKIM         0.1176      1.0 -0.8887      1.124      F
else
    Arunachal Pradesh          Sikkim         0.0          1.0 -1.4094      1.4094      F
else

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Arunachal Pradesh          TAMIL NADU    0.0585    1.0 -0.9383    1.0553    F
else
Arunachal Pradesh          TELANGANA     0.0613    1.0 -0.9355    1.0581    F
else
Arunachal Pradesh          TRIPURA      0.1       1.0 -0.909     1.109     F
else
Arunachal Pradesh          UTTAR PRADESH 0.0865    1.0 -0.9103    1.0833    F
else
Arunachal Pradesh          UTTARAKHAND   0.0866    1.0 -0.9112    1.0843    F
else
Arunachal Pradesh          WEST BENGAL   0.0883    1.0 -0.9087    1.0852    F
else
Arunachal Pradesh          bihar         0.0       1.0 -1.4094    1.4094    F
else
Arunachal Pradesh          delhi         0.2       1.0 -0.8917    1.2917    F
else
Arunachal Pradesh          orissa        0.0       1.0 -1.4094    1.4094    F
else
Arunachal Pradesh          punjab        0.0       1.0 -1.0765    1.0765    F
else
Arunachal Pradesh          rajasthan     0.0       1.0 -1.1508    1.1508    F
else
Arunachal pradesh          BIHAR         0.1087    1.0 -0.8888    1.1062    F
else
Arunachal pradesh          Bihar         0.4286    1.0 -0.6369    1.494     F
else
Arunachal pradesh          CHANDIGARH    0.0707    1.0 -0.9309    1.0723    F
else
Arunachal pradesh          CHHATTISGARH  0.0639    1.0 -0.9346    1.0624    F
else
Arunachal pradesh          Chandigarh    0.3333    1.0 -0.8175    1.4841    F
else
Arunachal pradesh          DADRA AND NAGAR 0.0588    1.0 -0.9667    1.0843    F
else
Arunachal pradesh          DELHI         0.0615    1.0 -0.9354    1.0585    F
else
Arunachal pradesh          Delhi         0.0       1.0 -1.01     1.01     F
else
Arunachal pradesh          GOA           0.0348    1.0 -0.9635    1.0332    F
else
Arunachal pradesh          Goa           0.0       1.0 -1.0505    1.0505    F
else
Arunachal pradesh          Gujarat       0.0439    1.0 -0.9531    1.041     F
else
Arunachal pradesh          HARYANA       0.0591    1.0 -0.938     1.0562    F
else
Arunachal pradesh          HIMACHAL PRADESH 0.0702    1.0 -0.9286    1.069     F
else
Arunachal pradesh          JAMMU & KASHMIR 0.1015    1.0 -0.8976    1.1007    F
else
Arunachal pradesh          JHARKHAND     0.1193    1.0 -0.8786    1.1172    F
else
Arunachal pradesh          KARNATAKA     0.0524    1.0 -0.9443    1.0491    F
else
Arunachal pradesh          KERALA        0.0446    1.0 -0.9523    1.0415    F
else
Arunachal pradesh          LADAKH        0.25     1.0 -0.8071    1.3071    F
else
Arunachal pradesh          LAKSHADWEEP   0.0       1.0 -1.2206    1.2206    F
else

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Arunachal pradesh	MADHYA PRADESH	0.0672	1.0	-0.9301	1.0646	F
else						
Arunachal pradesh	MAHARASHTRA	0.0497	1.0	-0.947	1.0464	F
else						
Arunachal pradesh	MANIPUR	0.0319	1.0	-0.97	1.0338	F
else						
Arunachal pradesh	MEGHALAYA	0.0526	1.0	-0.9527	1.058	F
else						
Arunachal pradesh	MIZORAM	0.2105	1.0	-0.812	1.233	F
else						
Arunachal pradesh	Manipur	0.0	1.0	-1.2206	1.2206	F
else						
Arunachal pradesh	Mizoram	0.0	1.0	-1.4094	1.4094	F
else						
Arunachal pradesh	NAGALAND	0.1695	1.0	-0.8355	1.1745	F
else						
Arunachal pradesh	New Delhi	0.0	1.0	-1.0293	1.0293	F
else						
Arunachal pradesh	ODISHA	0.1072	1.0	-0.8904	1.1048	F
else						
Arunachal pradesh	Odisha	0.25	1.0	-0.8643	1.3643	F
else						
Arunachal pradesh	Orissa	0.0	1.0	-1.4094	1.4094	F
else						
Arunachal pradesh	PUDUCHERRY	0.0476	1.0	-0.9549	1.0502	F
else						
Arunachal pradesh	PUNJAB	0.0682	1.0	-0.9294	1.0658	F
else						
Arunachal pradesh	Punjab	0.0	1.0	-1.0373	1.0373	F
else						
Arunachal pradesh	Punjab/Mohali/Zirakpur	0.0	1.0	-1.4094	1.4094	F
else						
Arunachal pradesh	RAJASTHAN	0.0748	1.0	-0.9225	1.0721	F
else						
Arunachal pradesh	RJ	0.0	1.0	-1.2206	1.2206	F
else						
Arunachal pradesh	Rajasthan	0.0	1.0	-1.0293	1.0293	F
else						
Arunachal pradesh	SIKKIM	0.1176	1.0	-0.8887	1.124	F
else						
Arunachal pradesh	Sikkim	0.0	1.0	-1.4094	1.4094	F
else						
Arunachal pradesh	TAMIL NADU	0.0585	1.0	-0.9383	1.0553	F
else						
Arunachal pradesh	TELANGANA	0.0613	1.0	-0.9355	1.0581	F
else						
Arunachal pradesh	TRIPURA	0.1	1.0	-0.909	1.109	F
else						
Arunachal pradesh	UTTAR PRADESH	0.0865	1.0	-0.9103	1.0833	F
else						
Arunachal pradesh	UTTARAKHAND	0.0866	1.0	-0.9112	1.0843	F
else						
Arunachal pradesh	WEST BENGAL	0.0883	1.0	-0.9087	1.0852	F
else						
Arunachal pradesh	bihar	0.0	1.0	-1.4094	1.4094	F
else						
Arunachal pradesh	delhi	0.2	1.0	-0.8917	1.2917	F
else						
Arunachal pradesh	orissa	0.0	1.0	-1.4094	1.4094	F
else						
Arunachal pradesh	nuniah	0.0	1.0	-1.0765	1.0765	F

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# Arunachal Pradesh
else
    Arunachal Pradesh      rajasthan      0.0      1.0 -1.1508      1.1508      F
else
    BIHAR                  Bihar      0.3198 0.3314 -0.0592      0.6989      F
else
    BIHAR                  CHANDIGARH -0.038      1.0 -0.1467      0.0706      F
else
    BIHAR                  CHHATTISGARH -0.0448 0.9766 -0.119      0.0294      F
else
    BIHAR                  Chandigarh      0.2246      1.0 -0.3523      0.8015      F
else
    BIHAR                  DADRA AND NAGAR -0.0499      1.0 -0.2953      0.1954      F
else
    BIHAR                  DELHI      -0.0472 0.0736 -0.0957      0.0013      F
else
    BIHAR                  Delhi      -0.1087 0.9377 -0.2779      0.0604      F
else
    BIHAR                  GOA      -0.0739 0.0362 -0.1462 -0.0016
True
    BIHAR                  Goa      -0.1087      1.0 -0.4436      0.2261      F
else
    BIHAR                  Gujarat      -0.0648 0.0004 -0.1157 -0.0139
True
    BIHAR                  HARYANA      -0.0496 0.0907 -0.1015      0.0022      F
else
    BIHAR                  HIMACHAL PRADESH -0.0386 0.9997 -0.1168      0.0397      F
else
    BIHAR                  JAMMU & KASHMIR -0.0072      1.0 -0.0897      0.0753      F
else
    BIHAR                  JHARKHAND      0.0106      1.0 -0.055      0.0761      F
else
    BIHAR                  KARNATAKA      -0.0563 0.0005 -0.1013 -0.0114
True
    BIHAR                  KERALA      -0.0641 0.0001 -0.1121 -0.0161
True
    BIHAR                  LADAKH      0.1413      1.0 -0.2136      0.4961      F
else
    BIHAR                  LAKSHADWEEP -0.1087      1.0 -0.8147      0.5972      F
else
    BIHAR                  MADHYA PRADESH -0.0415 0.7137 -0.098      0.015      F
else
    BIHAR                  MAHARASHTRA      -0.059 0.0001 -0.1032 -0.0148
True
    BIHAR                  MANIPUR      -0.0768 0.8418 -0.1879      0.0343      F
else
    BIHAR                  MEGHALAYA      -0.0561      1.0 -0.1947      0.0824      F
else
    BIHAR                  MIZORAM      0.1018      1.0 -0.1307      0.3343      F
else
    BIHAR                  Manipur      -0.1087      1.0 -0.8147      0.5972      F
else
    BIHAR                  Mizoram      -0.1087      1.0 -1.1062      0.8888      F
else
    BIHAR                  NAGALAND      0.0608      1.0 -0.0756      0.1972      F
else
    BIHAR                  New Delhi      -0.1087      1.0 -0.3695      0.152      F
else
    BIHAR                  ODISHA      -0.0015      1.0 -0.0624      0.0594      F
else
    BIHAR                  Odisha      0.1413      1.0 -0.3588      0.6413      F

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else
    BIHAR Orissa -0.1087 1.0 -1.1062 0.8888 F
else
    BIHAR PUDUCHERRY -0.0611 0.9987 -0.1777 0.0555 F
else
    BIHAR PUNJAB -0.0405 0.9005 -0.1014 0.0204 F
else
    BIHAR Punjab -0.1087 1.0 -0.3995 0.182 F
else
    BIHAR Punjab/Mohali/Zirakpur -0.1087 1.0 -1.1062 0.8888 F
else
    BIHAR RAJASTHAN -0.0339 0.9709 -0.0894 0.0215 F
else
    BIHAR RJ -0.1087 1.0 -0.8147 0.5972 F
else
    BIHAR Rajasthan -0.1087 1.0 -0.3695 0.152 F
else
    BIHAR SIKKIM 0.0089 1.0 -0.1368 0.1547 F
else
    BIHAR Sikkim -0.1087 1.0 -1.1062 0.8888 F
else
    BIHAR TAMIL NADU -0.0503 0.0126 -0.0965 -0.004
True
    BIHAR TELANGANA -0.0474 0.0338 -0.0937 -0.0012
True
    BIHAR TRIPURA -0.0087 1.0 -0.1718 0.1544 F
else
    BIHAR UTTAR PRADESH -0.0223 0.9998 -0.0683 0.0238 F
else
    BIHAR UTTARAKHAND -0.0222 1.0 -0.0857 0.0413 F
else
    BIHAR WEST BENGAL -0.0205 1.0 -0.0703 0.0293 F
else
    BIHAR bihar -0.1087 1.0 -1.1062 0.8888 F
else
    BIHAR delhi 0.0913 1.0 -0.3564 0.5389 F
else
    BIHAR orissa -0.1087 1.0 -1.1062 0.8888 F
else
    BIHAR punjab -0.1087 1.0 -0.5178 0.3003 F
else
    BIHAR rajasthan -0.1087 1.0 -0.6857 0.4682 F
else
    Bihar CHANDIGARH -0.3579 0.1496 -0.7476 0.0319 F
else
    Bihar CHHATTISGARH -0.3647 0.093 -0.7463 0.0169 F
else
    Bihar Chandigarh -0.0952 1.0 -0.783 0.5925 F
else
    Bihar DADRA AND NAGAR -0.3697 0.3882 -0.8173 0.0778 F
else
    Bihar DELHI -0.367 0.0741 -0.7445 0.0104 F
else
    Bihar Delhi -0.4286 0.0258 -0.8393 -0.0178
True
    Bihar GOA -0.3937 0.0305 -0.775 -0.0125
True
    Bihar Goa -0.4286 0.3029 -0.9308 0.0737 F
else
    Bihar Gujarat -0.3846 0.0382 -0.7624 -0.0068

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true
    Bihar                HARYANA  -0.3695  0.0688  -0.7474  0.0084  F
else
    Bihar                HIMACHAL PRADESH  -0.3584  0.1182  -0.7408  0.024  F
else
    Bihar                JAMMU & KASHMIR  -0.327  0.3032  -0.7104  0.0563  F
else
    Bihar                JHARKHAND  -0.3093  0.4299  -0.6893  0.0707  F
else
    Bihar                KARNATAKA  -0.3762  0.0517  -0.7532  0.0008  F
else
    Bihar                KERALA  -0.3839  0.0386  -0.7613  -0.0066
True
    Bihar                LADAKH  -0.1786  1.0  -0.6944  0.3372  F
else
    Bihar                LAKSHADWEEP  -0.4286  0.9978  -1.2276  0.3705  F
else
    Bihar                MADHYA PRADESH  -0.3613  0.0944  -0.7399  0.0172  F
else
    Bihar                MAHARASHTRA  -0.3788  0.0464  -0.7558  -0.0019
True
    Bihar                MANIPUR  -0.3967  0.0395  -0.7871  -0.0062
True
    Bihar                MEGHALAYA  -0.3759  0.1113  -0.7751  0.0232  F
else
    Bihar                MIZORAM  -0.218  0.9997  -0.6587  0.2226  F
else
    Bihar                Manipur  -0.4286  0.9978  -1.2276  0.3705  F
else
    Bihar                Mizoram  -0.4286  1.0  -1.494  0.6369  F
else
    Bihar                NAGALAND  -0.2591  0.9266  -0.6575  0.1393  F
else
    Bihar                New Delhi  -0.4286  0.1148  -0.8848  0.0276  F
else
    Bihar                ODISHA  -0.3214  0.3206  -0.7006  0.0579  F
else
    Bihar                Odisha  -0.1786  1.0  -0.8032  0.4461  F
else
    Bihar                Orissa  -0.4286  1.0  -1.494  0.6369  F
else
    Bihar                PUDUCHERRY  -0.381  0.0748  -0.773  0.0111  F
else
    Bihar                PUNJAB  -0.3603  0.0999  -0.7396  0.0189  F
else
    Bihar                Punjab  -0.4286  0.1764  -0.9026  0.0454  F
else
    Bihar Punjab/Mohali/Zirakpur  -0.4286  1.0  -1.494  0.6369  F
else
    Bihar                RAJASTHAN  -0.3538  0.1217  -0.7322  0.0246  F
else
    Bihar                RJ  -0.4286  0.9978  -1.2276  0.3705  F
else
    Bihar                Rajasthan  -0.4286  0.1148  -0.8848  0.0276  F
else
    Bihar                SIKKIM  -0.3109  0.5734  -0.7126  0.0908  F
else
    Bihar                Sikkim  -0.4286  1.0  -1.494  0.6369  F
else
    Bihar                TAMIL NADU  -0.3701  0.0655  -0.7473  0.0071  F
else

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- - -
Bihar          TELANGANA  -0.3673  0.0727  -0.7444  0.0099  F
else
Bihar          TRIPURA   -0.3286  0.4621  -0.7369  0.0797  F
else
Bihar          UTTAR PRADESH -0.3421  0.1706  -0.7192  0.0351  F
else
Bihar          UTTARAKHAND  -0.342  0.1834  -0.7217  0.0377  F
else
Bihar          WEST BENGAL  -0.3403  0.1825  -0.7179  0.0373  F
else
Bihar          bihar      -0.4286   1.0   -1.494  0.6369  F
else
Bihar          delhi      -0.2286   1.0  -0.8121   0.355  F
else
Bihar          orissa     -0.4286   1.0   -1.494  0.6369  F
else
Bihar          punjab     -0.4286  0.5773  -0.983   0.1259  F
else
Bihar          rajasthan  -0.4286  0.961  -1.1163  0.2592  F
else
CHANDIGARH     CHHATTISGARH -0.0068   1.0  -0.1241  0.1105  F
else
CHANDIGARH     Chandigarh   0.2626   1.0  -0.3214  0.8467  F
else
CHANDIGARH     DADRA AND NAGAR -0.0119   1.0  -0.2735  0.2498  F
else
CHANDIGARH     DELHI       -0.0092   1.0  -0.1122  0.0939  F
else
CHANDIGARH     Delhi       -0.0707   1.0  -0.2627  0.1213  F
else
CHANDIGARH     GOA        -0.0359   1.0   -0.152  0.0803  F
else
CHANDIGARH     Goa        -0.0707   1.0  -0.4177  0.2763  F
else
CHANDIGARH     Gujarat    -0.0268   1.0   -0.131  0.0774  F
else
CHANDIGARH     HARYANA    -0.0116   1.0  -0.1163   0.093  F
else
CHANDIGARH     HIMACHAL PRADESH -0.0005   1.0  -0.1205  0.1194  F
else
CHANDIGARH     JAMMU & KASHMIR  0.0308   1.0   -0.092  0.1536  F
else
CHANDIGARH     JHARKHAND   0.0486   1.0  -0.0635  0.1606  F
else
CHANDIGARH     KARNATAKA  -0.0183   1.0  -0.1197  0.0831  F
else
CHANDIGARH     KERALA     -0.0261   1.0  -0.1289  0.0767  F
else
CHANDIGARH     LADAKH     0.1793  0.9998  -0.187   0.5456  F
else
CHANDIGARH     LAKSHADWEEP -0.0707   1.0  -0.7825  0.6411  F
else
CHANDIGARH     MADHYA PRADESH -0.0035   1.0  -0.1105  0.1036  F
else
CHANDIGARH     MAHARASHTRA -0.021    1.0   -0.122  0.0801  F
else
CHANDIGARH     MANIPUR    -0.0388   1.0  -0.1823  0.1047  F
else
CHANDIGARH     MEGHALAYA  -0.0181   1.0  -0.1838  0.1476  F
else

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	CHANDIGARH	MIZORAM	0.1398	0.9944	-0.1098	0.3894	F
else	CHANDIGARH	Manipur	-0.0707	1.0	-0.7825	0.6411	F
else	CHANDIGARH	Mizoram	-0.0707	1.0	-1.0723	0.9309	F
else	CHANDIGARH	NAGALAND	0.0988	0.9776	-0.0651	0.2627	F
else	CHANDIGARH	New Delhi	-0.0707	1.0	-0.3468	0.2054	F
else	CHANDIGARH	ODISHA	0.0365	1.0	-0.0729	0.1459	F
else	CHANDIGARH	Odisha	0.1793	1.0	-0.329	0.6876	F
else	CHANDIGARH	Orissa	-0.0707	1.0	-1.0723	0.9309	F
else	CHANDIGARH	PUDUCHERRY	-0.0231	1.0	-0.1709	0.1248	F
else	CHANDIGARH	PUNJAB	-0.0025	1.0	-0.1119	0.1069	F
else	CHANDIGARH	Punjab	-0.0707	1.0	-0.3753	0.2339	F
else	CHANDIGARH	Punjab/Mohali/Zirakpur	-0.0707	1.0	-1.0723	0.9309	F
else	CHANDIGARH	RAJASTHAN	0.0041	1.0	-0.1024	0.1106	F
else	CHANDIGARH	RJ	-0.0707	1.0	-0.7825	0.6411	F
else	CHANDIGARH	Rajasthan	-0.0707	1.0	-0.3468	0.2054	F
else	CHANDIGARH	SIKKIM	0.0469	1.0	-0.1248	0.2187	F
else	CHANDIGARH	Sikkim	-0.0707	1.0	-1.0723	0.9309	F
else	CHANDIGARH	TAMIL NADU	-0.0122	1.0	-0.1142	0.0898	F
else	CHANDIGARH	TELANGANA	-0.0094	1.0	-0.1114	0.0926	F
else	CHANDIGARH	TRIPURA	0.0293	1.0	-0.1574	0.216	F
else	CHANDIGARH	UTTAR PRADESH	0.0158	1.0	-0.0861	0.1177	F
else	CHANDIGARH	UTTARAKHAND	0.0159	1.0	-0.095	0.1267	F
else	CHANDIGARH	WEST BENGAL	0.0175	1.0	-0.0861	0.1212	F
else	CHANDIGARH	bihar	-0.0707	1.0	-1.0723	0.9309	F
else	CHANDIGARH	delhi	0.1293	1.0	-0.3275	0.5861	F
else	CHANDIGARH	orissa	-0.0707	1.0	-1.0723	0.9309	F
else	CHANDIGARH	punjab	-0.0707	1.0	-0.4897	0.3483	F
else	CHANDIGARH	rajasthan	-0.0707	1.0	-0.6548	0.5133	F
else	CHHATTISGARH	Chandigarh	0.2694	0.9999	-0.3092	0.8481	F
else	CHHATTISGARH	DADRA AND NAGAR	-0.0051	1.0	-0.2544	0.2442	F
else	CHHATTISGARH	DELHI	0.0024	1.0	-0.0681	0.0622	F

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CHHATTISGARH Delhi -0.0024 1.0 -0.0001 0.0033 F
else
CHHATTISGARH Delhi -0.0639 1.0 -0.2388 0.111 F
else
CHHATTISGARH GOA -0.0291 1.0 -0.1139 0.0558 F
else
CHHATTISGARH Goa -0.0639 1.0 -0.4017 0.2739 F
else
CHHATTISGARH Gujarat -0.02 1.0 -0.0875 0.0475 F
else
CHHATTISGARH HARYANA -0.0048 1.0 -0.073 0.0634 F
else
CHHATTISGARH HIMACHAL PRADESH 0.0063 1.0 -0.0837 0.0962 F
else
CHHATTISGARH JAMMU & KASHMIR 0.0376 1.0 -0.0561 0.1313 F
else
CHHATTISGARH JHARKHAND 0.0554 0.8191 -0.0237 0.1345 F
else
CHHATTISGARH KARNATAKA -0.0115 1.0 -0.0746 0.0516 F
else
CHHATTISGARH KERALA -0.0193 1.0 -0.0846 0.046 F
else
CHHATTISGARH LADAKH 0.1861 0.9989 -0.1715 0.5437 F
else
CHHATTISGARH LAKSHADWEEP -0.0639 1.0 -0.7713 0.6434 F
else
CHHATTISGARH MADHYA PRADESH 0.0033 1.0 -0.0685 0.0751 F
else
CHHATTISGARH MAHARASHTRA -0.0142 1.0 -0.0768 0.0484 F
else
CHHATTISGARH MANIPUR -0.032 1.0 -0.1516 0.0876 F
else
CHHATTISGARH MEGHALAYA -0.0113 1.0 -0.1567 0.1342 F
else
CHHATTISGARH MIZORAM 0.1466 0.9645 -0.09 0.3833 F
else
CHHATTISGARH Manipur -0.0639 1.0 -0.7713 0.6434 F
else
CHHATTISGARH Mizoram -0.0639 1.0 -1.0624 0.9346 F
else
CHHATTISGARH NAGALAND 0.1056 0.7081 -0.0378 0.249 F
else
CHHATTISGARH New Delhi -0.0639 1.0 -0.3284 0.2006 F
else
CHHATTISGARH ODISHA 0.0433 0.9905 -0.032 0.1186 F
else
CHHATTISGARH Odisha 0.1861 1.0 -0.316 0.6881 F
else
CHHATTISGARH Orissa -0.0639 1.0 -1.0624 0.9346 F
else
CHHATTISGARH PUDUCHERRY -0.0163 1.0 -0.141 0.1084 F
else
CHHATTISGARH PUNJAB 0.0043 1.0 -0.071 0.0796 F
else
CHHATTISGARH Punjab -0.0639 1.0 -0.358 0.2302 F
else
CHHATTISGARH Punjab/Mohali/Zirakpur -0.0639 1.0 -1.0624 0.9346 F
else
CHHATTISGARH RAJASTHAN 0.0109 1.0 -0.0601 0.0819 F
else
CHHATTISGARH RJ -0.0639 1.0 -0.7713 0.6434 F

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else
    CHHATTISGARH          Rajasthan -0.0639    1.0 -0.3284    0.2006    F
else
    CHHATTISGARH          SIKKIM    0.0537    1.0 -0.0986    0.2061    F
else
    CHHATTISGARH          Sikkim  -0.0639    1.0 -1.0624    0.9346    F
else
    CHHATTISGARH          TAMIL NADU -0.0054    1.0 -0.0695    0.0586    F
else
    CHHATTISGARH          TELANGANA -0.0026    1.0 -0.0666    0.0614    F
else
    CHHATTISGARH          TRIPURA  0.0361    1.0 -0.1329    0.2051    F
else
    CHHATTISGARH          UTTAR PRADESH 0.0226    1.0 -0.0414    0.0865    F
else
    CHHATTISGARH          UTTARAKHAND 0.0227    1.0 -0.0548    0.1001    F
else
    CHHATTISGARH          WEST BENGAL 0.0243    1.0 -0.0423    0.091    F
else
    CHHATTISGARH          bihar  -0.0639    1.0 -1.0624    0.9346    F
else
    CHHATTISGARH          delhi   0.1361    1.0 -0.3138    0.586    F
else
    CHHATTISGARH          orissa  -0.0639    1.0 -1.0624    0.9346    F
else
    CHHATTISGARH          punjab  -0.0639    1.0 -0.4753    0.3475    F
else
    CHHATTISGARH          rajasthan -0.0639    1.0 -0.6425    0.5147    F
else
    Chandigarh            DADRA AND NAGAR -0.2745    1.0 -0.8986    0.3496    F
else
    Chandigarh            DELHI    -0.2718    0.9999 -0.8477    0.3041    F
else
    Chandigarh            Delhi    -0.3333    0.995 -0.9316    0.2649    F
else
    Chandigarh            GOA     -0.2985    0.9991 -0.8769    0.2799    F
else
    Chandigarh            Goa     -0.3333    0.9996 -0.9977    0.3311    F
else
    Chandigarh            Gujarat -0.2894    0.9996 -0.8655    0.2867    F
else
    Chandigarh            HARYANA -0.2742    0.9999 -0.8504    0.302    F
else
    Chandigarh            HIMACHAL PRADESH -0.2632    1.0 -0.8423    0.316    F
else
    Chandigarh            JAMMU & KASHMIR -0.2318    1.0 -0.8116    0.348    F
else
    Chandigarh            JHARKHAND -0.214    1.0 -0.7916    0.3635    F
else
    Chandigarh            KARNATAKA -0.2809    0.9998 -0.8566    0.2947    F
else
    Chandigarh            KERALA  -0.2887    0.9996 -0.8646    0.2872    F
else
    Chandigarh            LADAKH  -0.0833    1.0 -0.758    0.5914    F
else
    Chandigarh            LAKSHADWEEP -0.3333    1.0 -1.2431    0.5764    F
else
    Chandigarh            MADHYA PRADESH -0.2661    1.0 -0.8427    0.3105    F
else
    Chandigarh            MAHARASHTRA -0.2836    0.9997 -0.8592    0.292    F

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else
    Chandigarh MANIPUR -0.3014 0.9991 -0.8859 0.2831 F
else
    Chandigarh MEGHALAYA -0.2807 0.9999 -0.871 0.3096 F
else
    Chandigarh MIZORAM -0.1228 1.0 -0.742 0.4964 F
else
    Chandigarh Manipur -0.3333 1.0 -1.2431 0.5764 F
else
    Chandigarh Mizoram -0.3333 1.0 -1.4841 0.8175 F
else
    Chandigarh NAGALAND -0.1638 1.0 -0.7537 0.426 F
else
    Chandigarh New Delhi -0.3333 0.9984 -0.9636 0.297 F
else
    Chandigarh ODISHA -0.2261 1.0 -0.8032 0.351 F
else
    Chandigarh Odisha -0.0833 1.0 -0.8445 0.6778 F
else
    Chandigarh Orissa -0.3333 1.0 -1.4841 0.8175 F
else
    Chandigarh PUDUCHERRY -0.2857 0.9998 -0.8713 0.2999 F
else
    Chandigarh PUNJAB -0.2651 1.0 -0.8422 0.312 F
else
    Chandigarh Punjab -0.3333 0.999 -0.9766 0.31 F
else
    Chandigarh Punjab/Mohali/Zirakpur -0.3333 1.0 -1.4841 0.8175 F
else
    Chandigarh RAJASTHAN -0.2585 1.0 -0.8351 0.318 F
else
    Chandigarh RJ -0.3333 1.0 -1.2431 0.5764 F
else
    Chandigarh Rajasthan -0.3333 0.9984 -0.9636 0.297 F
else
    Chandigarh SIKKIM -0.2157 1.0 -0.8078 0.3764 F
else
    Chandigarh Sikkim -0.3333 1.0 -1.4841 0.8175 F
else
    Chandigarh TAMIL NADU -0.2749 0.9999 -0.8506 0.3009 F
else
    Chandigarh TELANGANA -0.272 0.9999 -0.8477 0.3037 F
else
    Chandigarh TRIPURA -0.2333 1.0 -0.8299 0.3633 F
else
    Chandigarh UTTAR PRADESH -0.2469 1.0 -0.8226 0.3288 F
else
    Chandigarh UTTARAKHAND -0.2468 1.0 -0.8241 0.3306 F
else
    Chandigarh WEST BENGAL -0.2451 1.0 -0.8211 0.3309 F
else
    Chandigarh bihar -0.3333 1.0 -1.4841 0.8175 F
else
    Chandigarh delhi -0.1333 1.0 -0.8612 0.5945 F
else
    Chandigarh orissa -0.3333 1.0 -1.4841 0.8175 F
else
    Chandigarh punjab -0.3333 0.9999 -1.038 0.3714 F
else
    Chandigarh rajasthan -0.3333 1.0 -1.1471 0.4804 F
else

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DADRA AND NAGAR DELHI 0.0027 1.0 -0.2402 0.2456 F
else
DADRA AND NAGAR Delhi -0.0588 1.0 -0.3508 0.2332 F
else
DADRA AND NAGAR GOA -0.024 1.0 -0.2728 0.2248 F
else
DADRA AND NAGAR Goa -0.0588 1.0 -0.4697 0.352 F
else
DADRA AND NAGAR Gujarat -0.0149 1.0 -0.2583 0.2285 F
else
DADRA AND NAGAR HARYANA 0.0003 1.0 -0.2433 0.2439 F
else
DADRA AND NAGAR HIMACHAL PRADESH 0.0114 1.0 -0.2392 0.2619 F
else
DADRA AND NAGAR JAMMU & KASHMIR 0.0427 1.0 -0.2092 0.2946 F
else
DADRA AND NAGAR JHARKHAND 0.0605 1.0 -0.1864 0.3073 F
else
DADRA AND NAGAR KARNATAKA -0.0064 1.0 -0.2487 0.2358 F
else
DADRA AND NAGAR KERALA -0.0142 1.0 -0.257 0.2286 F
else
DADRA AND NAGAR LADAKH 0.1912 1.0 -0.2361 0.6185 F
else
DADRA AND NAGAR LAKSHADWEEP -0.0588 1.0 -0.8038 0.6862 F
else
DADRA AND NAGAR MADHYA PRADESH 0.0084 1.0 -0.2362 0.2531 F
else
DADRA AND NAGAR MAHARASHTRA -0.0091 1.0 -0.2512 0.233 F
else
DADRA AND NAGAR MANIPUR -0.0269 1.0 -0.2896 0.2358 F
else
DADRA AND NAGAR MEGHALAYA -0.0062 1.0 -0.2816 0.2692 F
else
DADRA AND NAGAR MIZORAM 0.1517 1.0 -0.181 0.4844 F
else
DADRA AND NAGAR Manipur -0.0588 1.0 -0.8038 0.6862 F
else
DADRA AND NAGAR Mizoram -0.0588 1.0 -1.0843 0.9667 F
else
DADRA AND NAGAR NAGALAND 0.1107 1.0 -0.1637 0.385 F
else
DADRA AND NAGAR New Delhi -0.0588 1.0 -0.4119 0.2942 F
else
DADRA AND NAGAR ODISHA 0.0484 1.0 -0.1973 0.2941 F
else
DADRA AND NAGAR Odisha 0.1912 1.0 -0.3627 0.745 F
else
DADRA AND NAGAR Orissa -0.0588 1.0 -1.0843 0.9667 F
else
DADRA AND NAGAR PUDUCHERRY -0.0112 1.0 -0.2763 0.2538 F
else
DADRA AND NAGAR PUNJAB 0.0094 1.0 -0.2363 0.2551 F
else
DADRA AND NAGAR Punjab -0.0588 1.0 -0.4346 0.3169 F
else
DADRA AND NAGAR Punjab/Mohali/Zirakpur -0.0588 1.0 -1.0843 0.9667 F
else
DADRA AND NAGAR RAJASTHAN 0.016 1.0 -0.2284 0.2604 F
else

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DADRA AND NAGAR          RJ -0.0588    1.0 -0.8038  0.6862  F
else
DADRA AND NAGAR          Rajasthan -0.0588    1.0 -0.4119  0.2942  F
else
DADRA AND NAGAR          SIKKIM  0.0588    1.0 -0.2203  0.3379  F
else
DADRA AND NAGAR          Sikkim -0.0588    1.0 -1.0843  0.9667  F
else
DADRA AND NAGAR          TAMIL NADU -0.0003    1.0 -0.2428  0.2421  F
else
DADRA AND NAGAR          TELANGANA  0.0025    1.0  -0.24  0.2449  F
else
DADRA AND NAGAR          TRIPURA  0.0412    1.0 -0.2474  0.3297  F
else
DADRA AND NAGAR          UTTAR PRADESH  0.0277    1.0 -0.2148  0.2701  F
else
DADRA AND NAGAR          UTTARAKHAND  0.0277    1.0 -0.2186  0.2741  F
else
DADRA AND NAGAR          WEST BENGAL  0.0294    1.0 -0.2137  0.2726  F
else
DADRA AND NAGAR          bihar -0.0588    1.0 -1.0843  0.9667  F
else
DADRA AND NAGAR          delhi  0.1412    1.0 -0.3658  0.6482  F
else
DADRA AND NAGAR          orissa -0.0588    1.0 -1.0843  0.9667  F
else
DADRA AND NAGAR          punjab -0.0588    1.0 -0.5321  0.4144  F
else
DADRA AND NAGAR          rajasthan -0.0588    1.0 -0.6829  0.5653  F
else
DELHI                    Delhi -0.0615    1.0 -0.2272  0.1041  F
else
DELHI                    GOA -0.0267    1.0 -0.0903  0.0369  F
else
DELHI                    Goa -0.0615    1.0 -0.3946  0.2715  F
else
DELHI                    Gujarat -0.0176  0.9999 -0.0551  0.0199  F
else
DELHI                    HARYANA -0.0025    1.0 -0.0412  0.0363  F
else
DELHI                    HIMACHAL PRADESH  0.0086    1.0 -0.0616  0.0789  F
else
DELHI                    JAMMU & KASHMIR  0.04  0.9981 -0.035  0.115  F
else
DELHI                    JHARKHAND  0.0577  0.0287  0.002  0.1134
True
DELHI                    KARNATAKA -0.0092    1.0 -0.038  0.0197  F
else
DELHI                    KERALA -0.0169  0.9994 -0.0503  0.0165  F
else
DELHI                    LADAKH  0.1885  0.9981 -0.1647  0.5416  F
else
DELHI                    LAKSHADWEEP -0.0615    1.0 -0.7667  0.6436  F
else
DELHI                    MADHYA PRADESH  0.0057    1.0 -0.0391  0.0504  F
else
DELHI                    MAHARASHTRA -0.0118    1.0 -0.0395  0.0158  F
else
DELHI                    MANIPUR -0.0296    1.0 -0.1352  0.076  F
else

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DELHI                MEGHALAYA    -0.0089    1.0 -0.1431    0.1253    F
else
DELHI                MIZORAM      0.149    0.9302 -0.0809    0.3789    F
else
DELHI                Manipur    -0.0615    1.0 -0.7667    0.6436    F
else
DELHI                Mizoram    -0.0615    1.0 -1.0585    0.9354    F
else
DELHI                NAGALAND    0.1079    0.4159 -0.024    0.2399    F
else
DELHI                New Delhi  -0.0615    1.0   -0.32    0.1969    F
else
DELHI                ODISHA      0.0457    0.1649 -0.0045    0.0958    F
else
DELHI                Odisha     0.1885    1.0 -0.3104    0.6873    F
else
DELHI                Orissa     -0.0615    1.0 -1.0585    0.9354    F
else
DELHI                PUDUCHERRY -0.0139    1.0 -0.1253    0.0975    F
else
DELHI                PUNJAB      0.0067    1.0 -0.0435    0.0569    F
else
DELHI                Punjab     -0.0615    1.0 -0.3503    0.2272    F
else
DELHI Punjab/Mohali/Zirakpur -0.0615    1.0 -1.0585    0.9354    F
else
DELHI                RAJASTHAN    0.0133    1.0 -0.0302    0.0567    F
else
DELHI                RJ          -0.0615    1.0 -0.7667    0.6436    F
else
DELHI                Rajasthan -0.0615    1.0   -0.32    0.1969    F
else
DELHI                SIKKIM      0.0561    1.0 -0.0855    0.1977    F
else
DELHI                Sikkim     -0.0615    1.0 -1.0585    0.9354    F
else
DELHI                TAMIL NADU -0.0031    1.0 -0.0339    0.0277    F
else
DELHI                TELANGANA   -0.0002    1.0 -0.0311    0.0306    F
else
DELHI                TRIPURA    0.0385    1.0   -0.121    0.1979    F
else
DELHI                UTTAR PRADESH 0.0249    0.426 -0.0057    0.0555    F
else
DELHI                UTTARAKHAND  0.025    0.9999 -0.0283    0.0783    F
else
DELHI                WEST BENGAL  0.0267    0.6817 -0.0092    0.0626    F
else
DELHI                bihar      -0.0615    1.0 -1.0585    0.9354    F
else
DELHI                delhi      0.1385    1.0 -0.3079    0.5848    F
else
DELHI                orissa     -0.0615    1.0 -1.0585    0.9354    F
else
DELHI                punjab     -0.0615    1.0 -0.4691    0.346    F
else
DELHI                rajasthan  -0.0615    1.0 -0.6375    0.5144    F
else
Delhi                GOA         0.0348    1.0 -0.1392    0.2089    F
else
Delhi                Goa         0.0      1.0 -0.3704    0.3704    F

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else
Delhi Gujarat 0.0439 1.0 -0.1224 0.2103 F
else
Delhi HARYANA 0.0591 1.0 -0.1075 0.2257 F
else
Delhi HIMACHAL PRADESH 0.0702 1.0 -0.1065 0.2468 F
else
Delhi JAMMU & KASHMIR 0.1015 0.9925 -0.077 0.2801 F
else
Delhi JHARKHAND 0.1193 0.8301 -0.0521 0.2907 F
else
Delhi KARNATAKA 0.0524 1.0 -0.1122 0.217 F
else
Delhi KERALA 0.0446 1.0 -0.1208 0.2101 F
else
Delhi LADAKH 0.25 0.9369 -0.1386 0.6386 F
else
Delhi LAKSHADWEEP 0.0 1.0 -0.7235 0.7235 F
else
Delhi MADHYA PRADESH 0.0672 1.0 -0.1009 0.2354 F
else
Delhi MAHARASHTRA 0.0497 1.0 -0.1147 0.2141 F
else
Delhi MANIPUR 0.0319 1.0 -0.1615 0.2253 F
else
Delhi MEGHALAYA 0.0526 1.0 -0.1578 0.263 F
else
Delhi MIZORAM 0.2105 0.6657 -0.0708 0.4918 F
else
Delhi Manipur 0.0 1.0 -0.7235 0.7235 F
else
Delhi Mizoram 0.0 1.0 -1.01 1.01 F
else
Delhi NAGALAND 0.1695 0.4399 -0.0395 0.3785 F
else
Delhi New Delhi 0.0 1.0 -0.3051 0.3051 F
else
Delhi ODISHA 0.1072 0.9515 -0.0624 0.2769 F
else
Delhi Odisha 0.25 0.9999 -0.2746 0.7746 F
else
Delhi Orissa 0.0 1.0 -1.01 1.01 F
else
Delhi PUDUCHERRY 0.0476 1.0 -0.149 0.2443 F
else
Delhi PUNJAB 0.0682 1.0 -0.1014 0.2379 F
else
Delhi Punjab 0.0 1.0 -0.3311 0.3311 F
else
Delhi Punjab/Mohali/Zirakpur 0.0 1.0 -1.01 1.01 F
else
Delhi RAJASTHAN 0.0748 1.0 -0.093 0.2426 F
else
Delhi RJ 0.0 1.0 -0.7235 0.7235 F
else
Delhi Rajasthan 0.0 1.0 -0.3051 0.3051 F
else
Delhi SIKKIM 0.1176 0.9967 -0.0976 0.3329 F
else
Delhi Sikkim 0.0 1.0 -1.01 1.01 F

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else
    Delhi          TAMIL NADU    0.0585    1.0 -0.1065    0.2234    F
else
    Delhi          TELANGANA    0.0613    1.0 -0.1037    0.2263    F
else
    Delhi          TRIPURA     0.1       1.0 -0.1273    0.3273    F
else
    Delhi          UTTAR PRADESH  0.0865    0.9987 -0.0784    0.2514    F
else
    Delhi          UTTARAKHAND  0.0866    0.9994  -0.084     0.2572    F
else
    Delhi          WEST BENGAL   0.0883    0.9982 -0.0777    0.2542    F
else
    Delhi          bihar         0.0       1.0  -1.01      1.01      F
else
    Delhi          delhi         0.2       1.0 -0.2749    0.6749    F
else
    Delhi          orissa        0.0       1.0  -1.01      1.01      F
else
    Delhi          punjab        0.0       1.0 -0.4386    0.4386    F
else
    Delhi          rajasthan     0.0       1.0 -0.5983    0.5983    F
else
    GOA            Goa          -0.0348    1.0 -0.3722    0.3025    F
else
    GOA            Gujarat       0.0091    1.0 -0.0564    0.0746    F
else
    GOA            HARYANA       0.0243    1.0 -0.0419    0.0904    F
else
    GOA            HIMACHAL PRADESH  0.0353    1.0 -0.0531    0.1237    F
else
    GOA            JAMMU & KASHMIR  0.0667    0.751 -0.0255    0.1589    F
else
    GOA            JHARKHAND     0.0844    0.0116    0.0071    0.1618
True
    GOA            KARNATAKA     0.0176    1.0 -0.0433    0.0785    F
else
    GOA            KERALA        0.0098    1.0 -0.0534    0.073     F
else
    GOA            LADAKH        0.2152    0.9778 -0.1421    0.5724    F
else
    GOA            LAKSHADWEEP   -0.0348    1.0  -0.742     0.6723    F
else
    GOA            MADHYA PRADESH  0.0324    1.0 -0.0375    0.1023    F
else
    GOA            MAHARASHTRA   0.0149    1.0 -0.0455    0.0753    F
else
    GOA            MANIPUR       -0.0029    1.0 -0.1214    0.1155    F
else
    GOA            MEGHALAYA     0.0178    1.0 -0.1267    0.1623    F
else
    GOA            MIZORAM       0.1757    0.6808 -0.0604    0.4118    F
else
    GOA            Manipur       -0.0348    1.0  -0.742     0.6723    F
else
    GOA            Mizoram       -0.0348    1.0 -1.0332    0.9635    F
else
    GOA            NAGALAND      0.1346    0.1067 -0.0078    0.2771    F
else
    GOA            New Delhi     -0.0348    1.0 -0.2988    0.2291    F

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else
GOA                ODISHA    0.0724  0.062 -0.0011  0.1458  F
else
GOA                Odisha    0.2152   1.0 -0.2866  0.7169  F
else
GOA                Orissa    -0.0348   1.0 -1.0332  0.9635  F
else
GOA                PUDUCHERRY 0.0128   1.0 -0.1109  0.1364  F
else
GOA                PUNJAB     0.0334   1.0 -0.0401  0.1068  F
else
GOA                Punjab    -0.0348   1.0 -0.3285  0.2588  F
else
GOA Punjab/Mohali/Zirakpur -0.0348   1.0 -1.0332  0.9635  F
else
GOA                RAJASTHAN   0.04  0.9892 -0.0291   0.109  F
else
GOA                RJ        -0.0348   1.0  -0.742  0.6723  F
else
GOA                Rajasthan -0.0348   1.0 -0.2988  0.2291  F
else
GOA                SIKKIM     0.0828  0.9967 -0.0686  0.2343  F
else
GOA                Sikkim    -0.0348   1.0 -1.0332  0.9635  F
else
GOA                TAMIL NADU  0.0236   1.0 -0.0382  0.0855  F
else
GOA                TELANGANA  0.0265   1.0 -0.0354  0.0883  F
else
GOA                TRIPURA   0.0652   1.0  -0.103  0.2334  F
else
GOA                UTTAR PRADESH 0.0516  0.3558 -0.0101  0.1134  F
else
GOA                UTTARAKHAND 0.0517  0.8614 -0.0239  0.1274  F
else
GOA                WEST BENGAL 0.0534  0.3841 -0.0111   0.118  F
else
GOA                bihar     -0.0348   1.0 -1.0332  0.9635  F
else
GOA                delhi     0.1652   1.0 -0.2844  0.6147  F
else
GOA                orissa    -0.0348   1.0 -1.0332  0.9635  F
else
GOA                punjab    -0.0348   1.0 -0.4459  0.3763  F
else
GOA                rajasthan -0.0348   1.0 -0.6132  0.5436  F
else
Goa                Gujarat   0.0439   1.0 -0.2895  0.3774  F
else
Goa                HARYANA  0.0591   1.0 -0.2745  0.3927  F
else
Goa                HIMACHAL PRADESH 0.0702   1.0 -0.2685  0.4089  F
else
Goa                JAMMU & KASHMIR 0.1015   1.0 -0.2382  0.4412  F
else
Goa                JHARKHAND 0.1193   1.0 -0.2167  0.4553  F
else
Goa                KARNATAKA 0.0524   1.0 -0.2802   0.385  F
else
Goa                KERALA   0.0446   1.0 -0.2884  0.3776  F
else

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	Goa	LADAKH	0.25	0.9991	-0.2343	0.7343	F
else							
	Goa	LAKSHADWEEP	0.0	1.0	-0.7791	0.7791	F
else							
	Goa	MADHYA PRADESH	0.0672	1.0	-0.2671	0.4016	F
else							
	Goa	MAHARASHTRA	0.0497	1.0	-0.2827	0.3822	F
else							
	Goa	MANIPUR	0.0319	1.0	-0.3158	0.3797	F
else							
	Goa	MEGHALAYA	0.0526	1.0	-0.3048	0.4101	F
else							
	Goa	MIZORAM	0.2105	0.9988	-0.1928	0.6138	F
else							
	Goa	Manipur	0.0	1.0	-0.7791	0.7791	F
else							
	Goa	Mizoram	0.0	1.0	-1.0505	1.0505	F
else							
	Goa	NAGALAND	0.1695	0.9999	-0.1872	0.5261	F
else							
	Goa	New Delhi	0.0	1.0	-0.4202	0.4202	F
else							
	Goa	ODISHA	0.1072	1.0	-0.2279	0.4423	F
else							
	Goa	Odisha	0.25	1.0	-0.3489	0.8489	F
else							
	Goa	Orissa	0.0	1.0	-1.0505	1.0505	F
else							
	Goa	PUDUCHERRY	0.0476	1.0	-0.3019	0.3972	F
else							
	Goa	PUNJAB	0.0682	1.0	-0.2669	0.4033	F
else							
	Goa	Punjab	0.0	1.0	-0.4395	0.4395	F
else							
	Goa	Punjab/Mohali/Zirakpur	0.0	1.0	-1.0505	1.0505	F
else							
	Goa	RAJASTHAN	0.0748	1.0	-0.2594	0.409	F
else							
	Goa	RJ	0.0	1.0	-0.7791	0.7791	F
else							
	Goa	Rajasthan	0.0	1.0	-0.4202	0.4202	F
else							
	Goa	SIKKIM	0.1176	1.0	-0.2427	0.478	F
else							
	Goa	Sikkim	0.0	1.0	-1.0505	1.0505	F
else							
	Goa	TAMIL NADU	0.0585	1.0	-0.2743	0.3912	F
else							
	Goa	TELANGANA	0.0613	1.0	-0.2715	0.3941	F
else							
	Goa	TRIPURA	0.1	1.0	-0.2677	0.4677	F
else							
	Goa	UTTAR PRADESH	0.0865	1.0	-0.2463	0.4192	F
else							
	Goa	UTTARAKHAND	0.0866	1.0	-0.249	0.4222	F
else							
	Goa	WEST BENGAL	0.0883	1.0	-0.245	0.4215	F
else							
	Goa	bihar	0.0	1.0	-1.0505	1.0505	F
else							



	Goa	delhi	0.2	1.0	-0.3559	0.7559	F
else							
	Goa	orissa	0.0	1.0	-1.0505	1.0505	F
else							
	Goa	punjab	0.0	1.0	-0.5253	0.5253	F
else							
	Goa	rajasthan	0.0	1.0	-0.6644	0.6644	F
else							
	Gujarat	HARYANA	0.0151	1.0	-0.0266	0.0569	F
else							
	Gujarat	HIMACHAL PRADESH	0.0262	1.0	-0.0457	0.0982	F
else							
	Gujarat	JAMMU & KASHMIR	0.0576	0.6539	-0.019	0.1342	F
else							
	Gujarat	JHARKHAND	0.0753	0.0002	0.0175	0.1332	
True							
	Gujarat	KARNATAKA	0.0084	1.0	-0.0243	0.0412	F
else							
	Gujarat	KERALA	0.0007	1.0	-0.0362	0.0375	F
else							
	Gujarat	LADAKH	0.2061	0.9878	-0.1475	0.5596	F
else							
	Gujarat	LAKSHADWEEP	-0.0439	1.0	-0.7492	0.6614	F
else							
	Gujarat	MADHYA PRADESH	0.0233	0.9997	-0.0241	0.0707	F
else							
	Gujarat	MAHARASHTRA	0.0058	1.0	-0.0259	0.0375	F
else							
	Gujarat	MANIPUR	-0.012	1.0	-0.1188	0.0947	F
else							
	Gujarat	MEGHALAYA	0.0087	1.0	-0.1264	0.1438	F
else							
	Gujarat	MIZORAM	0.1666	0.7518	-0.0639	0.397	F
else							
	Gujarat	Manipur	-0.0439	1.0	-0.7492	0.6614	F
else							
	Gujarat	Mizoram	-0.0439	1.0	-1.041	0.9531	F
else							
	Gujarat	NAGALAND	0.1255	0.1072	-0.0073	0.2584	F
else							
	Gujarat	New Delhi	-0.0439	1.0	-0.3029	0.215	F
else							
	Gujarat	ODISHA	0.0633	0.0015	0.0107	0.1158	
True							
	Gujarat	Odisha	0.2061	1.0	-0.2931	0.7052	F
else							
	Gujarat	Orissa	-0.0439	1.0	-1.041	0.9531	F
else							
	Gujarat	PUDUCHERRY	0.0037	1.0	-0.1088	0.1161	F
else							
	Gujarat	PUNJAB	0.0243	1.0	-0.0283	0.0768	F
else							
	Gujarat	Punjab	-0.0439	1.0	-0.3331	0.2452	F
else							
	Gujarat	Punjab/Mohali/Zirakpur	-0.0439	1.0	-1.041	0.9531	F
else							
	Gujarat	RAJASTHAN	0.0309	0.8932	-0.0153	0.077	F
else							
	Gujarat	RJ	-0.0439	1.0	-0.7492	0.6614	F
else							
	Gujarat	Rajasthan	-0.0439	1.0	-0.3029	0.215	F

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Gujarat      rajasthan  -0.0439      1.0 -0.5929      0.2162  F
else
Gujarat      SIKKIM      0.0737 0.9991 -0.0688      0.2162  F
else
Gujarat      Sikkim     -0.0439      1.0 -1.041      0.9531  F
else
Gujarat      TAMIL NADU  0.0145      1.0 -0.02      0.049   F
else
Gujarat      TELANGANA   0.0174 0.9995 -0.0171      0.0519  F
else
Gujarat      TRIPURA    0.0561      1.0 -0.1041      0.2162  F
else
Gujarat      UTTAR PRADESH 0.0425 0.0007  0.0082      0.0768
True
Gujarat      UTTARAKHAND 0.0426 0.5987 -0.0129      0.0982  F
else
Gujarat      WEST BENGAL 0.0443 0.0057  0.0052      0.0834
True
Gujarat      bihar      -0.0439      1.0 -1.041      0.9531  F
else
Gujarat      delhi       0.1561      1.0 -0.2906      0.6027  F
else
Gujarat      orissa     -0.0439      1.0 -1.041      0.9531  F
else
Gujarat      punjab     -0.0439      1.0 -0.4518      0.3639  F
else
Gujarat      rajasthan  -0.0439      1.0 -0.6201      0.5322  F
else
HARYANA      HIMACHAL PRADESH 0.0111      1.0 -0.0615      0.0837  F
else
HARYANA      JAMMU & KASHMIR 0.0424 0.9963 -0.0348      0.1196  F
else
HARYANA      JHARKHAND   0.0602 0.0335  0.0016      0.1188
True
HARYANA      KARNATAKA  -0.0067      1.0 -0.0408      0.0274  F
else
HARYANA      KERALA     -0.0145      1.0 -0.0526      0.0236  F
else
HARYANA      LADAKH     0.1909 0.9975 -0.1628      0.5446  F
else
HARYANA      LAKSHADWEEP -0.0591      1.0 -0.7645      0.6463  F
else
HARYANA      MADHYA PRADESH 0.0081      1.0 -0.0402      0.0565  F
else
HARYANA      MAHARASHTRA -0.0094      1.0 -0.0425      0.0238  F
else
HARYANA      MANIPUR    -0.0272      1.0 -0.1343      0.08    F
else
HARYANA      MEGHALAYA  -0.0065      1.0 -0.1419      0.129   F
else
HARYANA      MIZORAM    0.1514 0.9164 -0.0792      0.3821  F
else
HARYANA      Manipur    -0.0591      1.0 -0.7645      0.6463  F
else
HARYANA      Mizoram    -0.0591      1.0 -1.0562      0.938   F
else
HARYANA      NAGALAND   0.1104 0.3801 -0.0228      0.2436  F
else
HARYANA      New Delhi  -0.0591      1.0 -0.3182      0.2     F
else
HARYANA      ODISHA     0.0481 0.1834 -0.0053      0.1015  F

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else
    HARYANA Odisha 0.1909 1.0 -0.3083 0.6901 F
else
    HARYANA Orissa -0.0591 1.0 -1.0562 0.938 F
else
    HARYANA PUDUCHERRY -0.0115 1.0 -0.1244 0.1014 F
else
    HARYANA PUNJAB 0.0091 1.0 -0.0443 0.0625 F
else
    HARYANA Punjab -0.0591 1.0 -0.3484 0.2302 F
else
    HARYANA Punjab/Mohali/Zirakpur -0.0591 1.0 -1.0562 0.938 F
else
    HARYANA RAJASTHAN 0.0157 1.0 -0.0314 0.0628 F
else
    HARYANA RJ -0.0591 1.0 -0.7645 0.6463 F
else
    HARYANA Rajasthan -0.0591 1.0 -0.3182 0.2 F
else
    HARYANA SIKKIM 0.0586 1.0 -0.0843 0.2014 F
else
    HARYANA Sikkim -0.0591 1.0 -1.0562 0.938 F
else
    HARYANA TAMIL NADU -0.0006 1.0 -0.0365 0.0352 F
else
    HARYANA TELANGANA 0.0022 1.0 -0.0336 0.038 F
else
    HARYANA TRIPURA 0.0409 1.0 -0.1196 0.2014 F
else
    HARYANA UTTAR PRADESH 0.0274 0.5948 -0.0083 0.063 F
else
    HARYANA UTTARAKHAND 0.0275 0.9998 -0.0289 0.0839 F
else
    HARYANA WEST BENGAL 0.0292 0.7495 -0.0111 0.0695 F
else
    HARYANA bihar -0.0591 1.0 -1.0562 0.938 F
else
    HARYANA delhi 0.1409 1.0 -0.3058 0.5876 F
else
    HARYANA orissa -0.0591 1.0 -1.0562 0.938 F
else
    HARYANA punjab -0.0591 1.0 -0.4671 0.3489 F
else
    HARYANA rajasthan -0.0591 1.0 -0.6353 0.5171 F
else
    HIMACHAL PRADESH JAMMU & KASHMIR 0.0313 1.0 -0.0656 0.1283 F
else
    HIMACHAL PRADESH JHARKHAND 0.0491 0.9835 -0.0338 0.132 F
else
    HIMACHAL PRADESH KARNATAKA -0.0178 1.0 -0.0856 0.0501 F
else
    HIMACHAL PRADESH KERALA -0.0256 1.0 -0.0955 0.0444 F
else
    HIMACHAL PRADESH LADAKH 0.1798 0.9996 -0.1787 0.5383 F
else
    HIMACHAL PRADESH LAKSHADWEEP -0.0702 1.0 -0.778 0.6376 F
else
    HIMACHAL PRADESH MADHYA PRADESH -0.0029 1.0 -0.0789 0.0731 F
else
    HIMACHAL PRADESH MAHARASHTRA -0.0204 1.0 -0.0878 0.0469 F

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alse
    HIMACHAL PRADESH                MANIPUR    -0.0383    1.0 -0.1604    0.0839    F
alse
    HIMACHAL PRADESH                MEGHALAYA  -0.0175    1.0 -0.1651    0.13      F
alse
    HIMACHAL PRADESH                MIZORAM    0.1404    0.9848 -0.0976    0.3783    F
alse
    HIMACHAL PRADESH                Manipur    -0.0702    1.0  -0.778    0.6376    F
alse
    HIMACHAL PRADESH                Mizoram    -0.0702    1.0  -1.069    0.9286    F
alse
    HIMACHAL PRADESH                NAGALAND   0.0993    0.8646 -0.0463    0.2449    F
alse
    HIMACHAL PRADESH                New Delhi  -0.0702    1.0 -0.3358    0.1955    F
alse
    HIMACHAL PRADESH                ODISHA      0.037    0.9999 -0.0423    0.1164    F
alse
    HIMACHAL PRADESH                Odisha     0.1798    1.0 -0.3228    0.6825    F
alse
    HIMACHAL PRADESH                Orissa     -0.0702    1.0  -1.069    0.9286    F
alse
    HIMACHAL PRADESH                PUDUCHERRY -0.0226    1.0 -0.1498    0.1046    F
alse
    HIMACHAL PRADESH                PUNJAB     -0.0019    1.0 -0.0813    0.0774    F
alse
    HIMACHAL PRADESH                Punjab     -0.0702    1.0 -0.3653    0.225     F
alse
    HIMACHAL PRADESH Punjab/Mohali/Zirakpur -0.0702    1.0  -1.069    0.9286    F
alse
    HIMACHAL PRADESH                RAJASTHAN   0.0046    1.0 -0.0706    0.0799    F
alse
    HIMACHAL PRADESH                RJ          -0.0702    1.0  -0.778    0.6376    F
alse
    HIMACHAL PRADESH                Rajasthan  -0.0702    1.0 -0.3358    0.1955    F
alse
    HIMACHAL PRADESH                SIKKIM      0.0475    1.0 -0.1069    0.2018    F
alse
    HIMACHAL PRADESH                Sikkim     -0.0702    1.0  -1.069    0.9286    F
alse
    HIMACHAL PRADESH                TAMIL NADU  -0.0117    1.0 -0.0804    0.057     F
alse
    HIMACHAL PRADESH                TELANGANA   -0.0089    1.0 -0.0776    0.0598    F
alse
    HIMACHAL PRADESH                TRIPURA    0.0298    1.0  -0.141    0.2007    F
alse
    HIMACHAL PRADESH                UTTAR PRADESH 0.0163    1.0 -0.0523    0.0849    F
alse
    HIMACHAL PRADESH                UTTARAKHAND 0.0164    1.0  -0.065    0.0977    F
alse
    HIMACHAL PRADESH                WEST BENGAL 0.0181    1.0 -0.0531    0.0892    F
alse
    HIMACHAL PRADESH                bihar       -0.0702    1.0  -1.069    0.9286    F
alse
    HIMACHAL PRADESH                delhi       0.1298    1.0 -0.3207    0.5804    F
alse
    HIMACHAL PRADESH                orissa      -0.0702    1.0  -1.069    0.9286    F
alse
    HIMACHAL PRADESH                punjab      -0.0702    1.0 -0.4824    0.342     F
alse
    HIMACHAL PRADESH                rajasthan   -0.0702    1.0 -0.6493    0.509     F
alse

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JAMMU & KASHMIR          JHARKHAND    0.0178    1.0 -0.0692  0.1047  F
else
JAMMU & KASHMIR          KARNATAKA   -0.0491  0.8798 -0.1219  0.0236  F
else
JAMMU & KASHMIR          KERALA     -0.0569  0.6172 -0.1316  0.0178  F
else
JAMMU & KASHMIR          LADAKH     0.1485    1.0  -0.211  0.5079  F
else
JAMMU & KASHMIR          LAKSHADWEEP -0.1015    1.0 -0.8098  0.6068  F
else
JAMMU & KASHMIR          MADHYA PRADESH -0.0343    1.0 -0.1147  0.0461  F
else
JAMMU & KASHMIR          MAHARASHTRA -0.0518  0.7718 -0.1241  0.0205  F
else
JAMMU & KASHMIR          MANIPUR    -0.0696  0.995 -0.1945  0.0553  F
else
JAMMU & KASHMIR          MEGHALAYA  -0.0489    1.0 -0.1988  0.101  F
else
JAMMU & KASHMIR          MIZORAM    0.109     1.0 -0.1304  0.3484  F
else
JAMMU & KASHMIR          Manipur    -0.1015    1.0 -0.8098  0.6068  F
else
JAMMU & KASHMIR          Mizoram    -0.1015    1.0 -1.1007  0.8976  F
else
JAMMU & KASHMIR          NAGALAND   0.068     1.0 -0.0799  0.2159  F
else
JAMMU & KASHMIR          New Delhi  -0.1015    1.0 -0.3685  0.1654  F
else
JAMMU & KASHMIR          ODISHA     0.0057    1.0 -0.0778  0.0892  F
else
JAMMU & KASHMIR          Odisha     0.1485    1.0 -0.3549  0.6518  F
else
JAMMU & KASHMIR          Orissa     -0.1015    1.0 -1.1007  0.8976  F
else
JAMMU & KASHMIR          PUDUCHERRY -0.0539    1.0 -0.1838  0.076  F
else
JAMMU & KASHMIR          PUNJAB     -0.0333    1.0 -0.1168  0.0502  F
else
JAMMU & KASHMIR          Punjab     -0.1015    1.0 -0.3979  0.1948  F
else
JAMMU & KASHMIR Punjab/Mohali/Zirakpur -0.1015    1.0 -1.1007  0.8976  F
else
JAMMU & KASHMIR          RAJASTHAN  -0.0267    1.0 -0.1064  0.0529  F
else
JAMMU & KASHMIR          RJ         -0.1015    1.0 -0.8098  0.6068  F
else
JAMMU & KASHMIR          Rajasthan  -0.1015    1.0 -0.3685  0.1654  F
else
JAMMU & KASHMIR          SIKKIM     0.0161    1.0 -0.1405  0.1727  F
else
JAMMU & KASHMIR          Sikkim     -0.1015    1.0 -1.1007  0.8976  F
else
JAMMU & KASHMIR          TAMIL NADU -0.043     0.9868 -0.1166  0.0305  F
else
JAMMU & KASHMIR          TELANGANA  -0.0402  0.9966 -0.1138  0.0333  F
else
JAMMU & KASHMIR          TRIPURA   -0.0015    1.0 -0.1744  0.1713  F
else
JAMMU & KASHMIR          UTTAR PRADESH -0.015     1.0 -0.0885  0.0584  F
else

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	JAMMU & KASHMIR	UTTARAKHAND	-0.015	1.0	-0.1004	0.0705	F
else	JAMMU & KASHMIR	WEST BENGAL	-0.0133	1.0	-0.0891	0.0626	F
else	JAMMU & KASHMIR	bihar	-0.1015	1.0	-1.1007	0.8976	F
else	JAMMU & KASHMIR	delhi	0.0985	1.0	-0.3528	0.5498	F
else	JAMMU & KASHMIR	orissa	-0.1015	1.0	-1.1007	0.8976	F
else	JAMMU & KASHMIR	punjab	-0.1015	1.0	-0.5145	0.3115	F
else	JAMMU & KASHMIR	rajasthan	-0.1015	1.0	-0.6813	0.4782	F
	JHARKHAND	KARNATAKA	-0.0669	0.0004	-0.1195	-0.0143	
True	JHARKHAND	KERALA	-0.0747	0.0001	-0.1299	-0.0194	
True	JHARKHAND	LADAKH	0.1307	1.0	-0.2252	0.4866	F
else	JHARKHAND	LAKSHADWEEP	-0.1193	1.0	-0.8258	0.5872	F
else	JHARKHAND	MADHYA PRADESH	-0.0521	0.3786	-0.1148	0.0107	F
else	JHARKHAND	MAHARASHTRA	-0.0696	0.0001	-0.1216	-0.0176	
True	JHARKHAND	MANIPUR	-0.0874	0.6108	-0.2018	0.027	F
else	JHARKHAND	MEGHALAYA	-0.0667	0.9999	-0.2079	0.0746	F
else	JHARKHAND	MIZORAM	0.0912	1.0	-0.1429	0.3253	F
else	JHARKHAND	Manipur	-0.1193	1.0	-0.8258	0.5872	F
else	JHARKHAND	Mizoram	-0.1193	1.0	-1.1172	0.8786	F
else	JHARKHAND	NAGALAND	0.0502	1.0	-0.0889	0.1893	F
else	JHARKHAND	New Delhi	-0.1193	1.0	-0.3815	0.1429	F
else	JHARKHAND	ODISHA	-0.0121	1.0	-0.0788	0.0547	F
else	JHARKHAND	Odisha	0.1307	1.0	-0.3701	0.6315	F
else	JHARKHAND	Orissa	-0.1193	1.0	-1.1172	0.8786	F
else	JHARKHAND	PUDUCHERRY	-0.0717	0.9802	-0.1914	0.0481	F
else	JHARKHAND	PUNJAB	-0.0511	0.6068	-0.1178	0.0157	F
else	JHARKHAND	Punjab	-0.1193	1.0	-0.4113	0.1728	F
else	JHARKHAND	Punjab/Mohali/Zirakpur	-0.1193	1.0	-1.1172	0.8786	F
else	JHARKHAND	RAJASTHAN	-0.0445	0.7629	-0.1063	0.0174	F
else	JHARKHAND	RJ	-0.1193	1.0	-0.8258	0.5872	F
else	JHARKHAND	Rajasthan	-0.1193	1.0	-0.3815	0.1429	F
else	JHARKHAND	UTTARAKHAND	-0.015	1.0	-0.1004	0.0705	F

	JHARKHAND	SIKKIM	-0.0016	1.0	-0.15	0.1467	F
alse	JHARKHAND	Sikkim	-0.1193	1.0	-1.1172	0.8786	F
alse	JHARKHAND	TAMIL NADU	-0.0608	0.0058	-0.1146	-0.0071	
True	JHARKHAND	TELANGANA	-0.058	0.0144	-0.1117	-0.0043	
True	JHARKHAND	TRIPURA	-0.0193	1.0	-0.1847	0.1461	F
alse	JHARKHAND	UTTAR PRADESH	-0.0328	0.9709	-0.0864	0.0208	F
alse	JHARKHAND	UTTARAKHAND	-0.0327	0.9999	-0.1019	0.0364	F
alse	JHARKHAND	WEST BENGAL	-0.031	0.9967	-0.0878	0.0258	F
alse	JHARKHAND	bihar	-0.1193	1.0	-1.1172	0.8786	F
alse	JHARKHAND	delhi	0.0807	1.0	-0.3678	0.5292	F
alse	JHARKHAND	orissa	-0.1193	1.0	-1.1172	0.8786	F
alse	JHARKHAND	punjab	-0.1193	1.0	-0.5292	0.2907	F
alse	JHARKHAND	rajasthan	-0.1193	1.0	-0.6969	0.4583	F
alse	KARNATAKA	KERALA	-0.0078	1.0	-0.0357	0.0202	F
alse	KARNATAKA	LADAKH	0.1976	0.9944	-0.1551	0.5503	F
alse	KARNATAKA	LAKSHADWEEP	-0.0524	1.0	-0.7573	0.6525	F
alse	KARNATAKA	MADHYA PRADESH	0.0148	1.0	-0.026	0.0557	F
alse	KARNATAKA	MAHARASHTRA	-0.0027	1.0	-0.0234	0.0181	F
alse	KARNATAKA	MANIPUR	-0.0205	1.0	-0.1245	0.0835	F
alse	KARNATAKA	MEGHALAYA	0.0002	1.0	-0.1327	0.1332	F
alse	KARNATAKA	MIZORAM	0.1581	0.8459	-0.071	0.3873	F
alse	KARNATAKA	Manipur	-0.0524	1.0	-0.7573	0.6525	F
alse	KARNATAKA	Mizoram	-0.0524	1.0	-1.0491	0.9443	F
alse	KARNATAKA	NAGALAND	0.1171	0.1938	-0.0136	0.2478	F
alse	KARNATAKA	New Delhi	-0.0524	1.0	-0.3102	0.2054	F
alse	KARNATAKA	ODISHA	0.0548	0.0027	0.0081	0.1016	
True	KARNATAKA	Odisha	0.1976	1.0	-0.301	0.6962	F
alse	KARNATAKA	Orissa	-0.0524	1.0	-1.0491	0.9443	F
alse	KARNATAKA	PUDUCHERRY	-0.0048	1.0	-0.1146	0.1051	F
alse	KARNATAKA	PUNJAB	0.0158	1.0	-0.0309	0.0626	F
alse	KARNATAKA	Punjab	-0.0524	1.0	-0.3405	0.2357	F

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else
    KARNATAKA Punjab/Mohali/Zirakpur -0.0524 1.0 -1.0491 0.9443 F
else
    KARNATAKA RAJASTHAN 0.0224 0.9924 -0.017 0.0618 F
else
    KARNATAKA RJ -0.0524 1.0 -0.7573 0.6525 F
else
    KARNATAKA Rajasthan -0.0524 1.0 -0.3102 0.2054 F
else
    KARNATAKA SIKKIM 0.0653 0.9999 -0.0752 0.2057 F
else
    KARNATAKA Sikkim -0.0524 1.0 -1.0491 0.9443 F
else
    KARNATAKA TAMIL NADU 0.0061 1.0 -0.0187 0.0309 F
else
    KARNATAKA TELANGANA 0.0089 1.0 -0.0159 0.0337 F
else
    KARNATAKA TRIPURA 0.0476 1.0 -0.1108 0.206 F
else
    KARNATAKA UTTAR PRADESH 0.0341 0.0 0.0096 0.0586
True
    KARNATAKA UTTARAKHAND 0.0342 0.8654 -0.0159 0.0843 F
else
    KARNATAKA WEST BENGAL 0.0359 0.0034 0.005 0.0668
True
    KARNATAKA bihar -0.0524 1.0 -1.0491 0.9443 F
else
    KARNATAKA delhi 0.1476 1.0 -0.2984 0.5936 F
else
    KARNATAKA orissa -0.0524 1.0 -1.0491 0.9443 F
else
    KARNATAKA punjab -0.0524 1.0 -0.4596 0.3548 F
else
    KARNATAKA rajasthan -0.0524 1.0 -0.628 0.5232 F
else
    KERALA LADAKH 0.2054 0.9882 -0.1477 0.5585 F
else
    KERALA LAKSHADWEEP -0.0446 1.0 -0.7497 0.6605 F
else
    KERALA MADHYA PRADESH 0.0226 0.9993 -0.0216 0.0668 F
else
    KERALA MAHARASHTRA 0.0051 1.0 -0.0217 0.0319 F
else
    KERALA MANIPUR -0.0127 1.0 -0.1181 0.0926 F
else
    KERALA MEGHALAYA 0.008 1.0 -0.126 0.142 F
else
    KERALA MIZORAM 0.1659 0.7548 -0.0639 0.3957 F
else
    KERALA Manipur -0.0446 1.0 -0.7497 0.6605 F
else
    KERALA Mizoram -0.0446 1.0 -1.0415 0.9523 F
else
    KERALA NAGALAND 0.1249 0.1035 -0.0069 0.2567 F
else
    KERALA New Delhi -0.0446 1.0 -0.303 0.2137 F
else
    KERALA ODISHA 0.0626 0.0005 0.0129 0.1123
True
    KERALA Odisha 0.2054 1.0 -0.2935 0.7042 F

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else
    KERALA          Orissa  -0.0446    1.0 -1.0415  0.9523  F
else
    KERALA          PUDUCHERRY  0.003    1.0 -0.1082  0.1142  F
else
    KERALA          PUNJAB    0.0236  0.9999 -0.0261  0.0733  F
else
    KERALA          Punjab   -0.0446    1.0 -0.3332  0.244   F
else
    KERALA Punjab/Mohali/Zirakpur -0.0446    1.0 -1.0415  0.9523  F
else
    KERALA          RAJASTHAN  0.0302  0.8085 -0.0127  0.073   F
else
    KERALA          RJ        -0.0446    1.0 -0.7497  0.6605  F
else
    KERALA          Rajasthan -0.0446    1.0  -0.303  0.2137  F
else
    KERALA          SIKKIM    0.073  0.9991 -0.0684  0.2145  F
else
    KERALA          Sikkim   -0.0446    1.0 -1.0415  0.9523  F
else
    KERALA          TAMIL NADU  0.0139    1.0 -0.0162  0.0439  F
else
    KERALA          TELANGANA  0.0167  0.9953 -0.0133  0.0467  F
else
```