In [1]:

```python
import pandas as pd
print("Setup successful ✅", pd.__version__)
```

```
Setup successful ✅ 2.3.2
```

In [ ]:

```python
cursor = conn.cursor()
cursor.execute("SELECT DATABASE();")
result = cursor.fetchone()
print("You are connected to database:", result[0])

cursor.close()
conn.close()
```

```
You are connected to database: uber_analytics
```

In [1]:

```python
import pandas as pd
from sqlalchemy import create_engine
import matplotlib.pyplot as plt
import seaborn as sns
engine = create_engine("mysql+pymysql://root:Poojadeep@231@localhost/uber_analyt
```

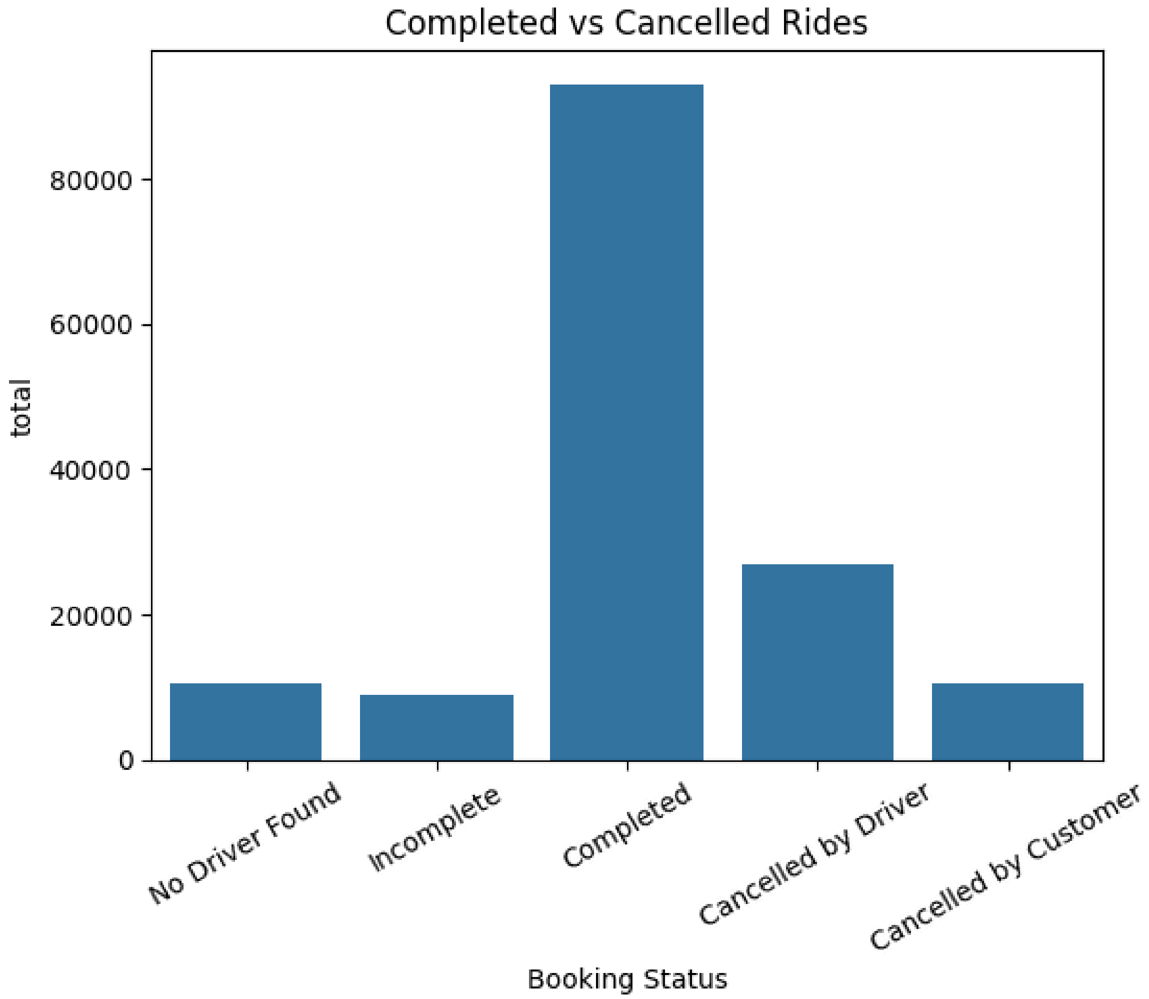
In [10]:

```python
import pandas as pd
from sqlalchemy import create_engine
from urllib.parse import quote_plus

# credentials
user = "root"
password = "Poojadeep@231"
host = "localhost"
database = "uber_analytics"

# encode password safely
password_enc = quote_plus(password)

# connect to MySQL
engine = create_engine(f"mysql+pymysql://{user}:{password_enc}@{host}/{database}

# test query
df = pd.read_sql("SELECT COUNT(*) AS total_rides FROM ncr_ride_bookings;", engin
print(df)
```

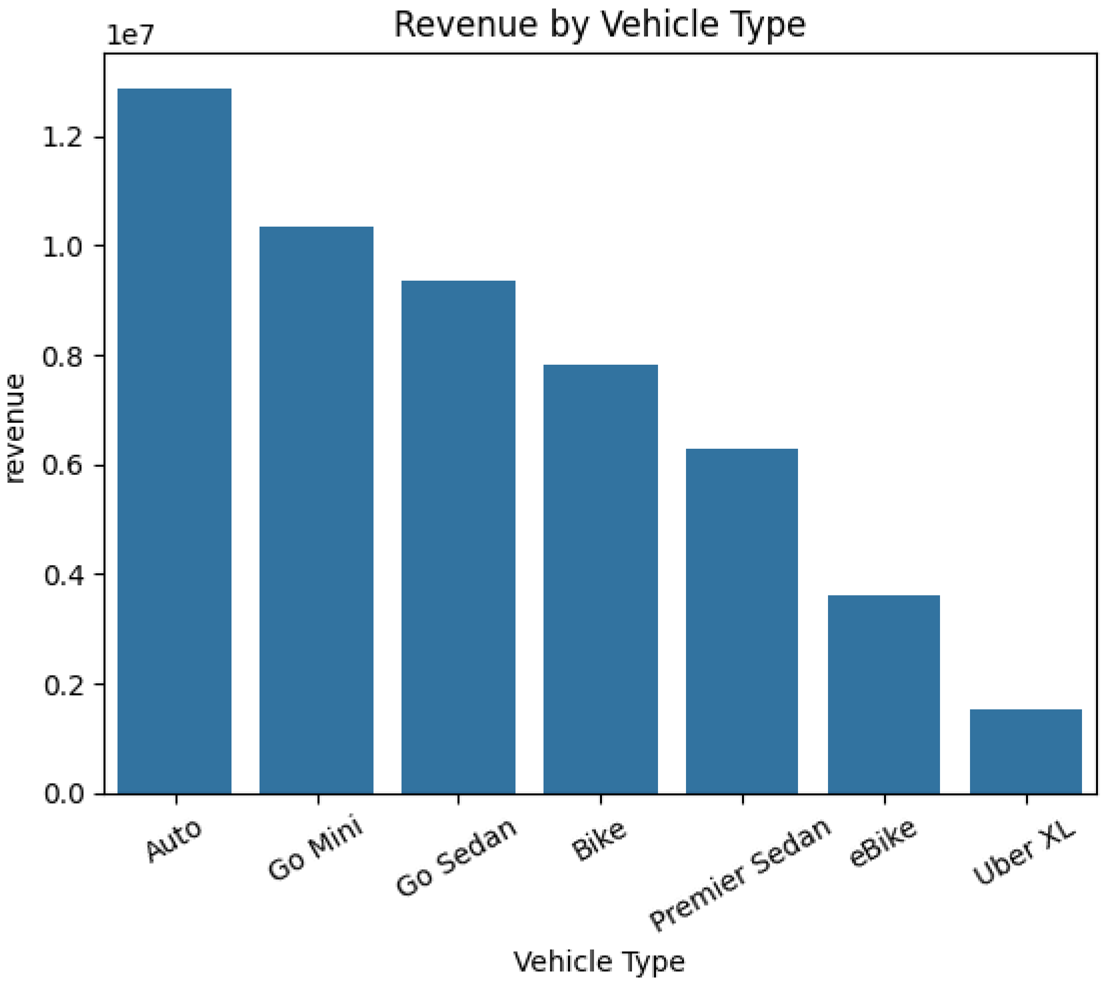
```
   total_rides
0       150000
```

In [14]:

```python
sns.barplot(data=df_status, x="Booking Status", y="total")
plt.title("Completed vs Cancelled Rides")
plt.xticks(rotation=30)
plt.show()
```



```
In [ ]: query = """
        SELECT `Vehicle Type`, SUM(`Booking Value`) AS revenue
        FROM ncr_ride_bookings
        GROUP BY `Vehicle Type`
        ORDER BY revenue DESC;
        """
        df_vehicle = pd.read_sql(query, engine)
        sns.barplot(data=df_vehicle, x="Vehicle Type", y="revenue")
        plt.title("Revenue by Vehicle Type")
        plt.xticks(rotation=30)
        plt.show()
```

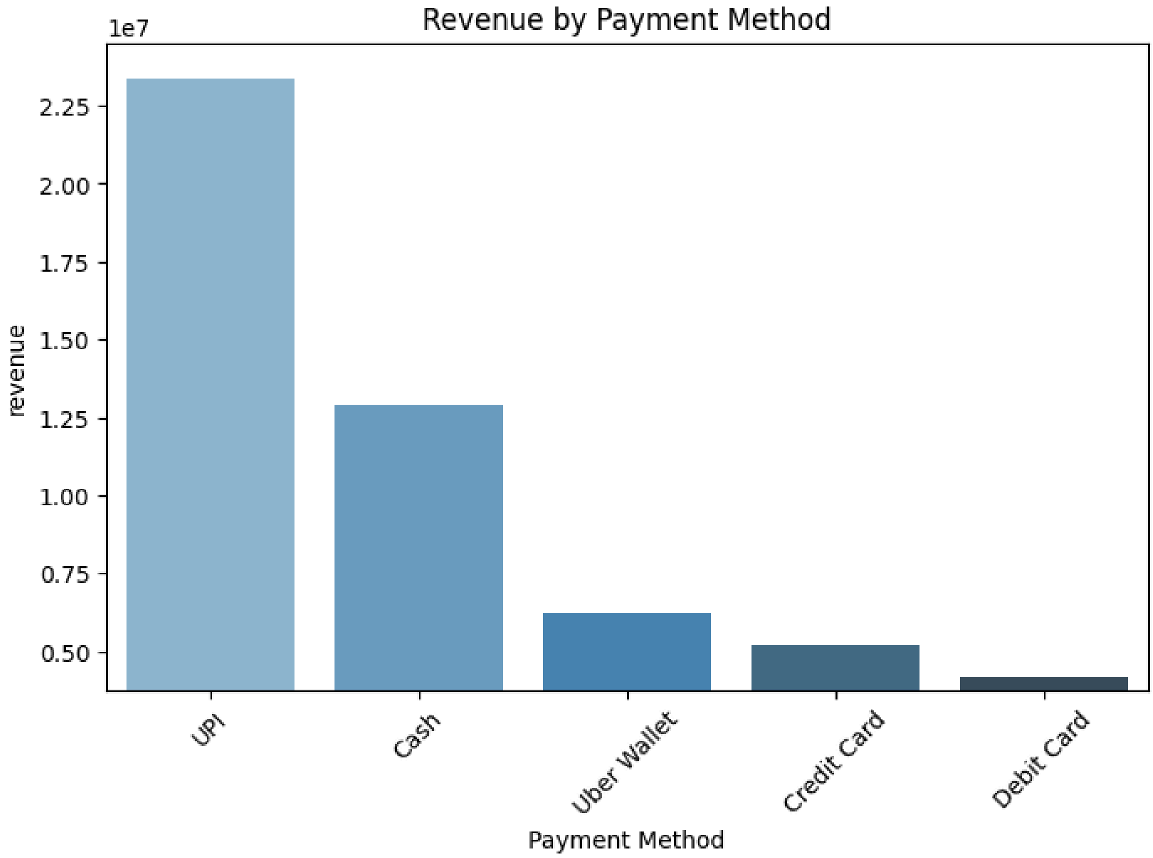


In [ ]:

In [ ]:

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

query = """
SELECT `Payment Method`, SUM(`Booking Value`) AS revenue
FROM ncr_ride_bookings
GROUP BY `Payment Method`
ORDER BY revenue DESC;
"""
df_payment = pd.read_sql(query, engine)

plt.figure(figsize=(8,5))
ax = sns.barplot(data=df_payment, x="Payment Method", y="revenue", palette="Blue

ax.set_ylim(df_payment["revenue"].min() * 0.9, df_payment["revenue"].max() * 1.0

plt.title("Revenue by Payment Method")
plt.xticks(rotation=45)
plt.show()
```

```
C:\Users\deepb\AppData\Local\Temp\ipykernel_15688\2818143199.py:14: FutureWarnin
g: 

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 effe
ct.

  ax = sns.barplot(data=df_payment, x="Payment Method", y="revenue", palette="Blu
es_d")
```

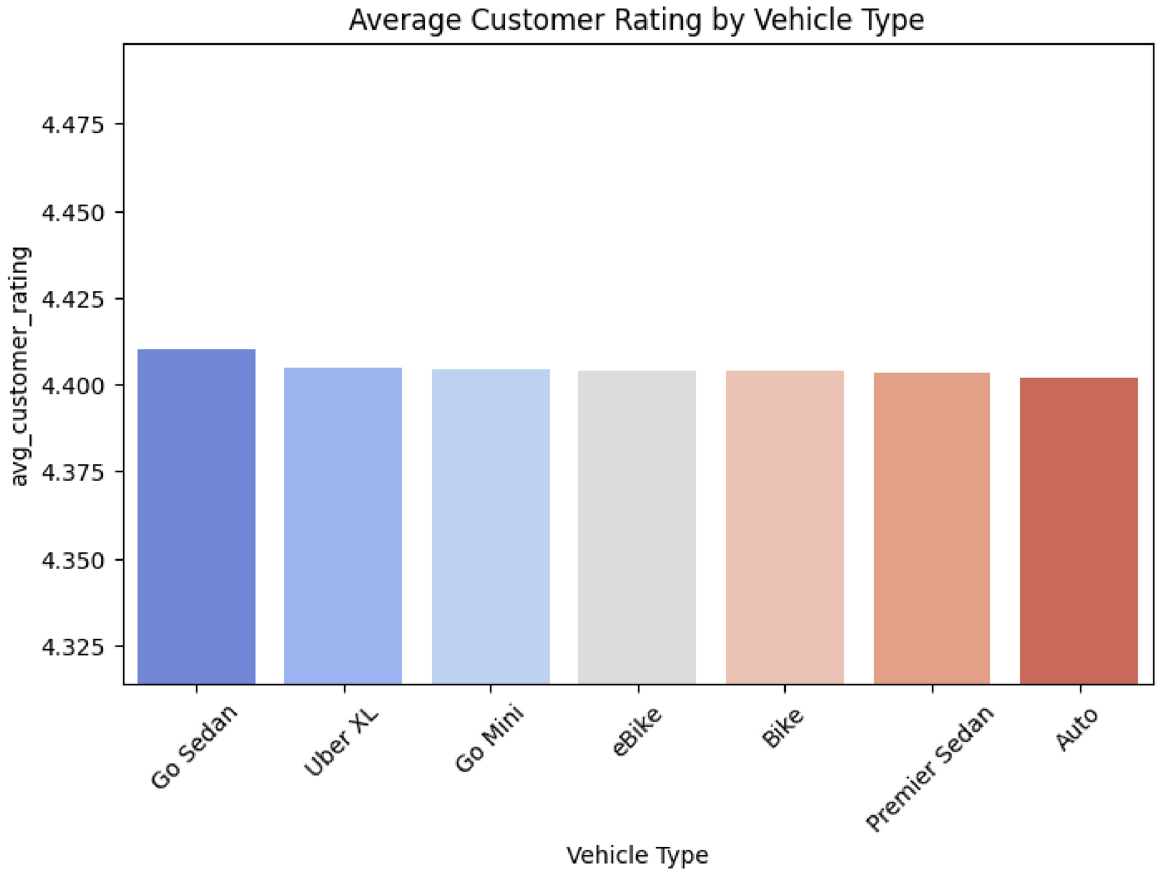


In [ ]:

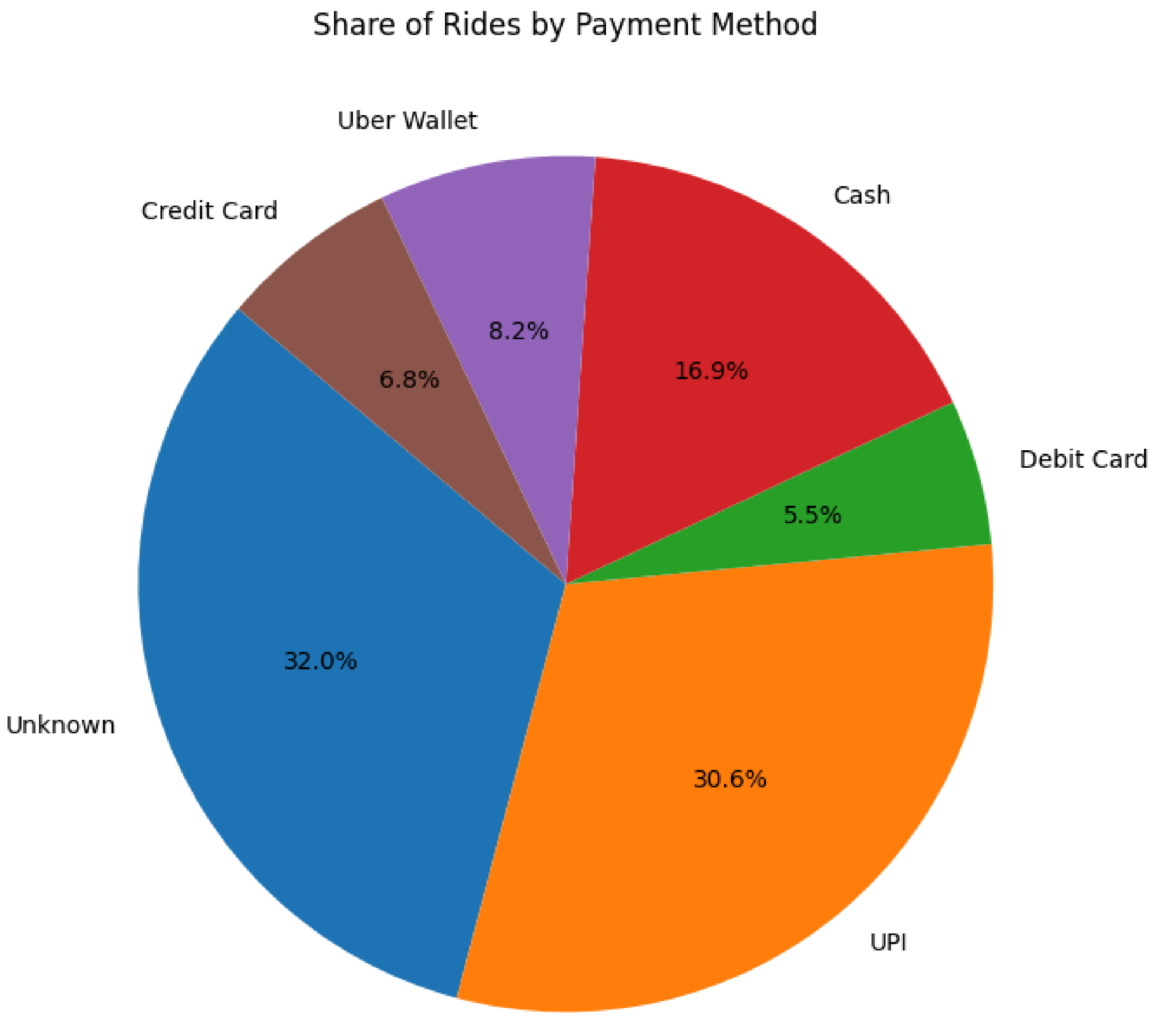
```
query = """
SELECT `Vehicle Type`, AVG(`Customer Rating`) AS avg_customer_rating
FROM ncr_ride_bookings
GROUP BY `Vehicle Type`
ORDER BY avg_customer_rating DESC;
"""
df_ratings = pd.read_sql(query, engine)
print(df_ratings)
plt.figure(figsize=(8,5))
ax = sns.barplot(data=df_ratings, x="Vehicle Type", y="avg_customer_rating", pal
ax.set_ylim(df_ratings["avg_customer_rating"].min() * 0.98,
            df_ratings["avg_customer_rating"].max() * 1.02)

plt.title("Average Customer Rating by Vehicle Type")
plt.xticks(rotation=45)
plt.show()
```

```
    Vehicle Type  avg_customer_rating
0       Go Sedan             4.409996
1       Uber XL              4.404851
2       Go Mini              4.404297
3          eBike             4.403954
4           Bike             4.403940
5  Premier Sedan             4.403457
6           Auto             4.402000
```

```
C:\Users\deepb\AppData\Local\Temp\ipykernel_15688\84968116.py:12: 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 effe
ct.

  ax = sns.barplot(data=df_ratings, x="Vehicle Type", y="avg_customer_rating", pa
lette="coolwarm")
```



```
In [ ]: query = """
        SELECT `Payment Method`, COUNT(*) AS total_rides
        FROM ncr_ride_bookings
        GROUP BY `Payment Method`;
        """
        df_pie = pd.read_sql(query, engine)
        df_pie['Payment Method'] = df_pie['Payment Method'].fillna('Unknown')
        plt.figure(figsize=(8,8))
        plt.pie(df_pie['total_rides'], labels=df_pie['Payment Method'], autopct='%1.1f%%
        plt.title('Share of Rides by Payment Method')
        plt.show()
```

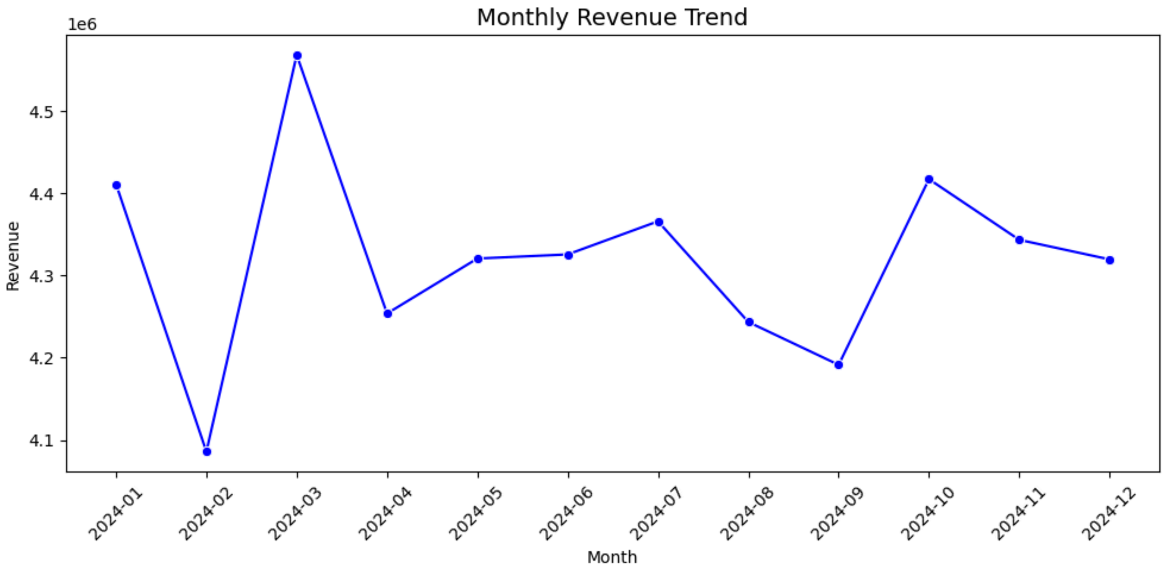


In [49]:

```
from urllib.parse import quote_plus
from sqlalchemy import create_engine

# Encode special characters in password
password = quote_plus("Poojadeep@231")  # @ becomes %40

# Create engine (replace host, port, database)
engine = create_engine(f"mysql+pymysql://root:{password}@localhost:3306/uber_ana
```

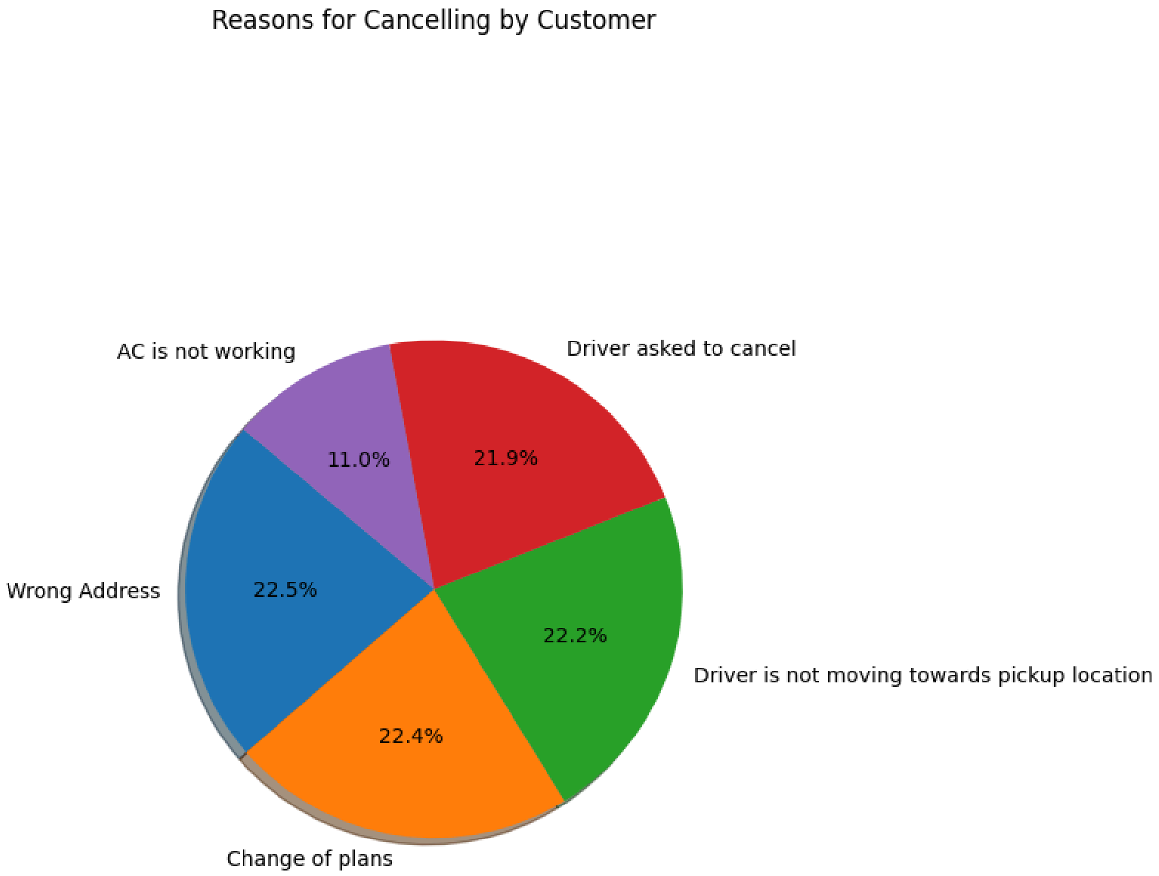
In [ ]:

```
query = """
SELECT DATE_FORMAT(Date, '%%Y-%%m') AS month,
       SUM(`Booking Value`) AS total_revenue
FROM ncr_ride_bookings
GROUP BY month
ORDER BY month;
"""
df_monthly = pd.read_sql(query, engine)

plt.figure(figsize=(10,5))
sns.lineplot(data=df_monthly, x="month", y="total_revenue", marker="o", color="b
plt.title("Monthly Revenue Trend", fontsize=14)
plt.xlabel("Month")
plt.ylabel("Revenue")
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



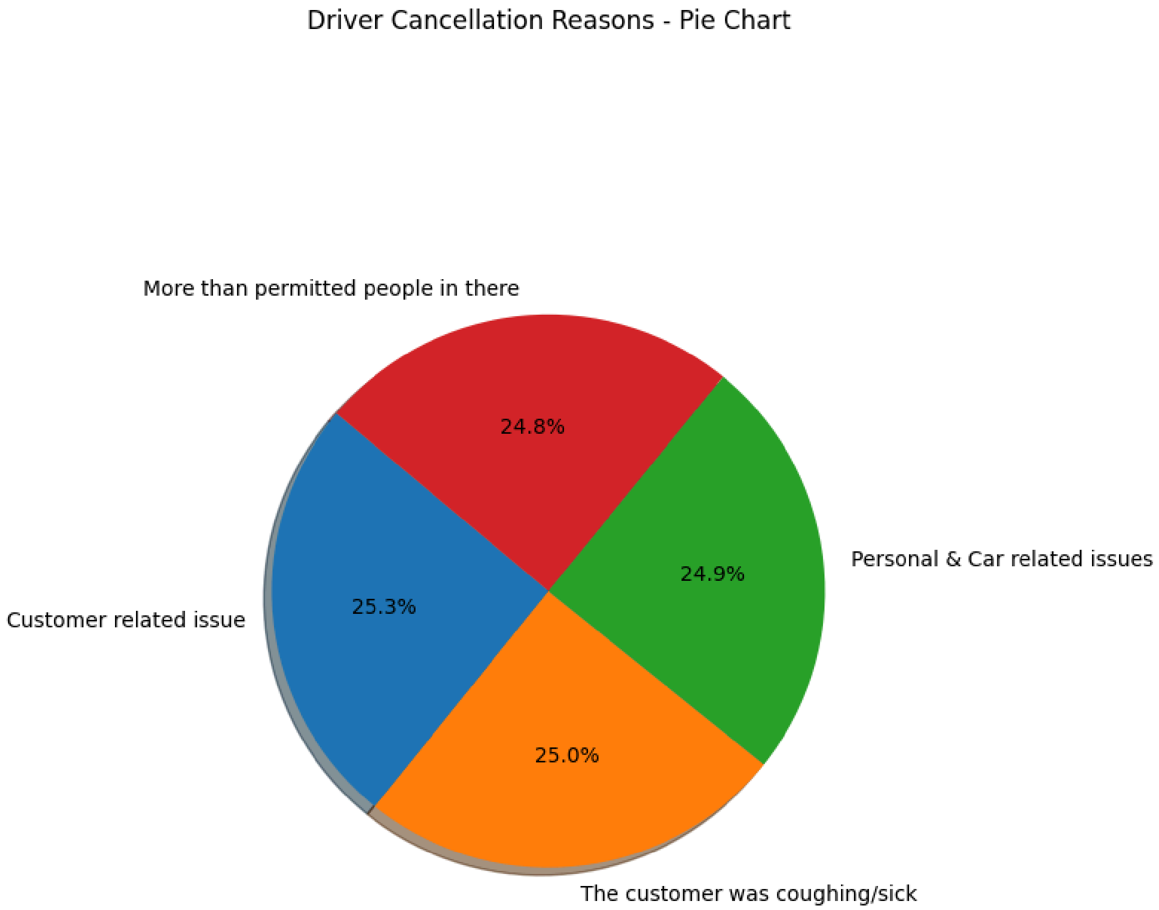
In [56]:

```
query = """
SELECT `Reason for cancelling by Customer`
FROM ncr_ride_bookings
WHERE `Reason for cancelling by Customer` IS NOT NULL;
"""
df_cancel = pd.read_sql(query, engine)
cancellation_counts = df_cancel['Reason for cancelling by Customer'].value_count
plt.figure(figsize=(8, 8))
plt.pie(
    cancellation_counts,
    labels=cancellation_counts.index,
    autopct='%1.1f%%',
    startangle=140,
    shadow=True
)
plt.title("Reasons for Cancelling by Customer")
plt.axis("equal")  # makes it a perfect circle
plt.tight_layout()
plt.show()
```



In [57]:

```
query = """
SELECT `Driver Cancellation Reason`
FROM ncr_ride_bookings
WHERE `Driver Cancellation Reason` IS NOT NULL;
"""
df_driver_cancel = pd.read_sql(query, engine)
cancellation_counts = df_driver_cancel['Driver Cancellation Reason'].value_count
plt.figure(figsize=(8, 8))
plt.pie(
    cancellation_counts,
    labels=cancellation_counts.index,
    autopct='%1.1f%%',
    startangle=140,
    shadow=True
)
plt.title("Driver Cancellation Reasons - Pie Chart")
plt.axis("equal")  # keeps the pie chart round
plt.tight_layout()
plt.show()
```

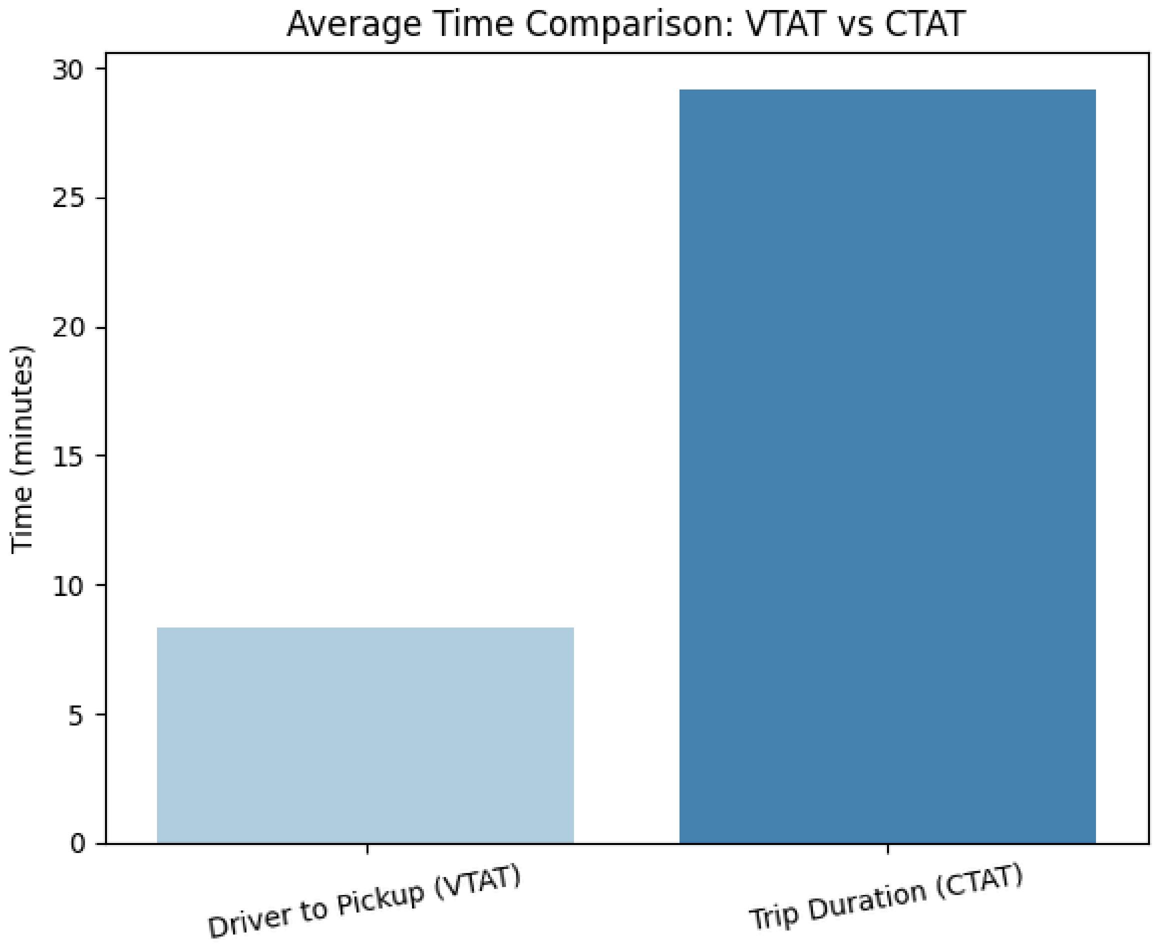


In [59]:

```
query = """
SELECT `Avg VTAT`, `Avg CTAT`
FROM ncr_ride_bookings
WHERE `Avg VTAT` IS NOT NULL AND `Avg CTAT` IS NOT NULL;
"""
df_time = pd.read_sql(query, engine)

df_time['Avg VTAT'] = pd.to_numeric(df_time['Avg VTAT'], errors='coerce')
df_time['Avg CTAT'] = pd.to_numeric(df_time['Avg CTAT'], errors='coerce')

avg_vtat = df_time['Avg VTAT'].mean()
avg_ctat = df_time['Avg CTAT'].mean()

print(f"Avg VTAT: {avg_vtat:.2f} minutes")
print(f"Avg CTAT: {avg_ctat:.2f} minutes")

avg_df = pd.DataFrame({
    'Type': ['Driver to Pickup (VTAT)', 'Trip Duration (CTAT)'],
    'Avg Time (min)': [avg_vtat, avg_ctat]
})

plt.figure(figsize=(6, 5))
sns.barplot(x='Type', y='Avg Time (min)', data=avg_df, palette='Blues')
plt.title("Average Time Comparison: VTAT vs CTAT")
plt.ylabel("Time (minutes)")
plt.xlabel("")
plt.xticks(rotation=10)
plt.tight_layout()
plt.show()
```

```
Avg VTAT: 8.29 minutes
Avg CTAT: 29.15 minutes
```

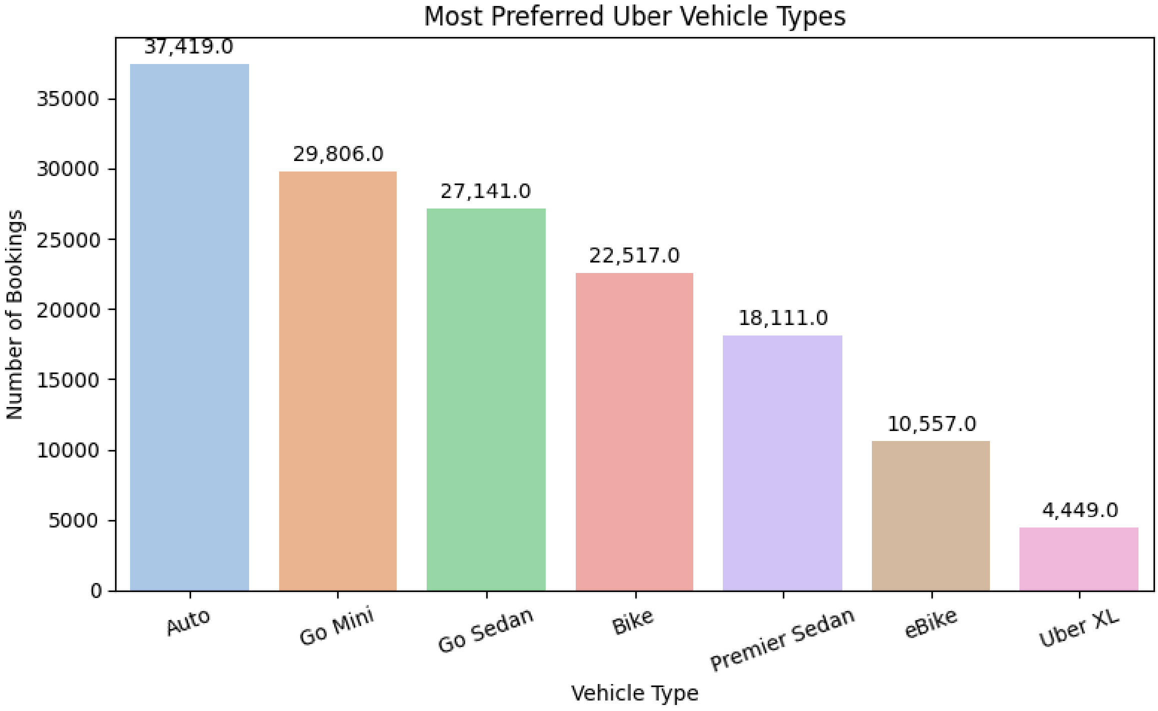
```
C:\Users\deepb\AppData\Local\Temp\ipykernel_15688\1287129420.py:23: FutureWarnin
g:

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 effe
ct.

  sns.barplot(x='Type', y='Avg Time (min)', data=avg_df, palette='Blues')
```



In [ ]:

```
query = "SELECT `Vehicle Type` FROM ncr_ride_bookings;"
df_vehicle = pd.read_sql(query, engine)
plt.figure(figsize=(8,5))
sns.countplot(
    x='Vehicle Type',
    data=df_vehicle,
    order=df_vehicle['Vehicle Type'].value_counts().index,
    palette='pastel'
)
plt.title("Most Preferred Uber Vehicle Types")
plt.ylabel("Number of Bookings")
plt.xlabel("Vehicle Type")
plt.xticks(rotation=20)
for p in plt.gca().patches:
    plt.gca().annotate(
        format(p.get_height(), ','),
        (p.get_x() + p.get_width() / 2., p.get_height()),
        ha='center', va='center',
        xytext=(0, 8),
        textcoords='offset points'
    )
plt.tight_layout()
plt.show()
```

```
C:\Users\deepb\AppData\Local\Temp\ipykernel_15688\3823284624.py:5: 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 effe
ct.

  sns.countplot(
```



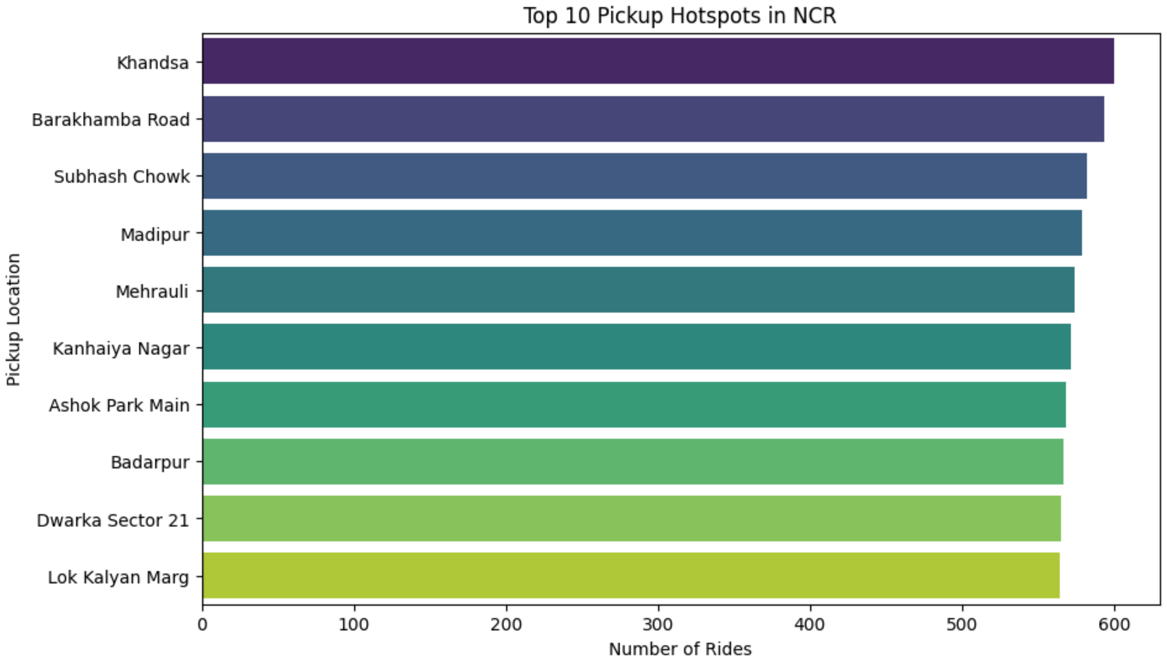
In [9]:

```
engine = create_engine("mysql+pymysql://root:Poojadeep%40231@localhost/uber_anal
```

In [10]:

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

# Query pickup locations
query = """
SELECT `Pickup Location`, COUNT(*) AS total_rides
FROM ncr_ride_bookings
WHERE `Booking Status` = 'Completed'
GROUP BY `Pickup Location`
ORDER BY total_rides DESC
LIMIT 10;
"""
df_pickup = pd.read_sql(query, engine)

# Plot top 10 pickup hotspots
plt.figure(figsize=(10,6))
sns.barplot(data=df_pickup, x="total_rides", y="Pickup Location", palette="virid
plt.title("Top 10 Pickup Hotspots in NCR")
plt.xlabel("Number of Rides")
plt.ylabel("Pickup Location")
plt.show()
```

```
C:\Users\deepb\AppData\Local\Temp\ipykernel_19168\199502623.py:18: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(data=df_pickup, x="total_rides", y="Pickup Location", palette="viri
dis")
```


Top 10 Pickup Hotspots in NCR
Pickup Location
Khandsa
Barakhamba Road
Subhash Chowk
Madipur
Mehrauli
Kanhaiya Nagar
Ashok Park Main
Badarpur
Dwarka Sector 21
Lok Kalyan Marg
Number of Rides