In [1]:

```python
import pandas as pd
import glob
import os
```

In [25]:

```python
path = r"C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study"
all_files = glob.glob(os.path.join(path, "*.csv"))
```

In [26]:

```python
print(f"Found {len(all_files)} CSV files.")
```

```
Found 12 CSV files.
```

In [27]:

```python
#combining all files
df_list = []
for file in all_files:
    print(f"Reading {file} ...")
    df = pd.read_csv(file)
    df['source_file'] = os.path.basename(file)  # Add filename column
    df_list.append(df)
```

```
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202307-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202308-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202309-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202310-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202311-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202312-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202401-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202402-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202403-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202404-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202405-divvy-tripdat
a.csv ...
Reading C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-study\202406-divvy-tripdat
a.csv ...
```

In [28]:

```python
combined_df = pd.concat(df_list, ignore_index=True)
print(f"Combined DataFrame shape: {combined_df.shape}")
```

```
Combined DataFrame shape: (5734381, 14)
```

In [29]:

```python
output_path = r"C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-Study\Combined Dat
```

In [30]:

```python
os.makedirs(os.path.dirname(output_path), exist_ok=True)
```

In [3]:

```python
df = pd.read_csv("cyclistic_tripdata_12months.csv")
```

In [31]:

```
combined_df.to_csv(output_path, index=False)
```

In [32]:

```
print(f"Combined dataset saved at:\n{output_path}")
```

```
Combined dataset saved at:
C:\Users\SREEMOYEE\Downloads\Cyclistic-Case-Study\Combined Data\cyclistic_tripd
ata_12months.csv
```

In [33]:

```
df.head()
```

Out[33]:

	ride_id	rideable_type	started_at	ended_at	start_station_nar
0	CDE6023BE6B11D2F	electric_bike	2024-06-11 17:20:06.289	2024-06-11 17:21:39.464	N
1	462B48CD292B6A18	electric_bike	2024-06-11 17:19:21.567	2024-06-11 17:19:36.377	N
2	9CFB6A858D23ABF7	electric_bike	2024-06-11 17:25:27.089	2024-06-11 17:30:13.035	N
3	6365EFEB64231153	electric_bike	2024-06-11 11:53:50.769	2024-06-11 12:08:13.382	N
4	BA0323C33134CBA8	electric_bike	2024-06-11 00:11:08.237	2024-06-11 00:11:22.998	N

In [34]:

```
# Remove rows with null values
df.dropna(inplace=True)
```

In [35]:

```
# Convert started_at and ended_at with mixed formats
df['started_at'] = pd.to_datetime(df['started_at'], errors='coerce')
df['ended_at'] = pd.to_datetime(df['ended_at'], errors='coerce')
```

In [36]:

```
df = df.dropna(subset=['started_at', 'ended_at'])
```

In [37]:

```
# Create 'ride_length' in minutes
df['ride_length'] = (df['ended_at'] - df['started_at']).dt.total_seconds() / 6
```

In [38]:

```
# Remove rows with negative ride_length
df = df[df['ride_length'] >= 0]
```

In [39]:

```
# Add 'day_of_week' column
df['day_of_week'] = df['started_at'].dt.day_name()
```

In [40]:

```
print(" Data cleaned and new columns added!")
df.head()
```

```
Data cleaned and new columns added!
```

Out[40]:

	ride_id	rideable_type	started_at	ended_at	start_station_
841	7FED56E160AFB564	classic_bike	2024-06-17 15:10:56.895	2024-06-17 15:12:30.744	California Divi
842	84260B28A7C9BBA1	classic_bike	2024-06-17 15:10:35.545	2024-06-17 15:12:12.398	California Divi
1306	95367640BB007C8D	classic_bike	2024-06-08 16:11:10.249	2024-06-08 16:21:25.419	California Divi
1327	4DF083CCDC1B950F	electric_bike	2024-06-07 21:33:36.986	2024-06-07 21:45:23.864	California Divi
1374	BFAD51AB1A4887B2	classic_bike	2024-06-24 17:51:13.687	2024-06-24 17:56:09.707	California Milwauk

In [41]:

```
df.to_csv("C:/Users/SREEMOYEE/Documents/cyclistic_tripdata_cleaned.csv", index
```

In [42]:

```
# Summary stats: total rides, avg, median, max, min ride_length
summary = df.groupby('member_casual')['ride_length'].agg(['count', 'mean', 'me
summary.columns = ['User Type', 'Total Rides', 'Avg Ride Length (min)', 'Media
summary
```

Out[42]:

	User Type	Total Rides	Avg Ride Length (min)	Median Ride Length (min)	Max Ride Length (min)	Min Ride Length (min)
0	casual	208367	26.399290	15.136383	1496.330933	0.002583
1	member	285959	13.683851	9.903900	1488.204667	0.004383

In [43]:

```
# Total rides per weekday by user type
rides_per_day = df.groupby(['member_casual', 'day_of_week']).size().reset_inde
# Sort weekdays
days_order = ['Sunday', 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday'
rides_per_day['day_of_week'] = pd.Categorical(rides_per_day['day_of_week'], ca
rides_per_day = rides_per_day.sort_values('day_of_week')

rides_per_day
```

Out[43]:

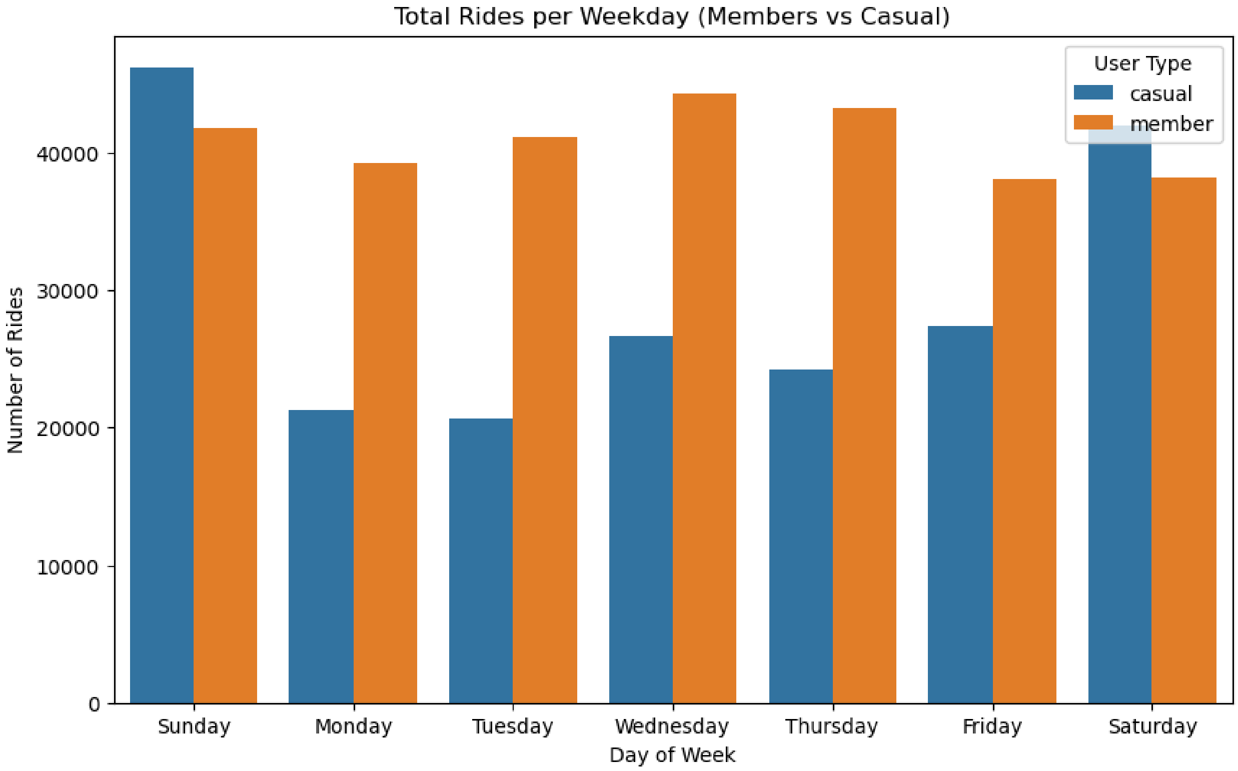
	member_casual	day_of_week	num_rides
3	casual	Sunday	46209
10	member	Sunday	41800
1	casual	Monday	21290
8	member	Monday	39202
5	casual	Tuesday	20627
12	member	Tuesday	41147
6	casual	Wednesday	26660
13	member	Wednesday	44298
4	casual	Thursday	24207
11	member	Thursday	43205
0	casual	Friday	27353
7	member	Friday	38057
2	casual	Saturday	42021
9	member	Saturday	38250

In [44]:

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

In [45]:

```
# Bar chart: Total rides per weekday
plt.figure(figsize=(10,6))
sns.barplot(data=rides_per_day, x='day_of_week', y='num_rides', hue='member_ca
plt.title('Total Rides per Weekday (Members vs Casual)')
plt.xlabel('Day of Week')
plt.ylabel('Number of Rides')
plt.legend(title='User Type')
plt.show()
```

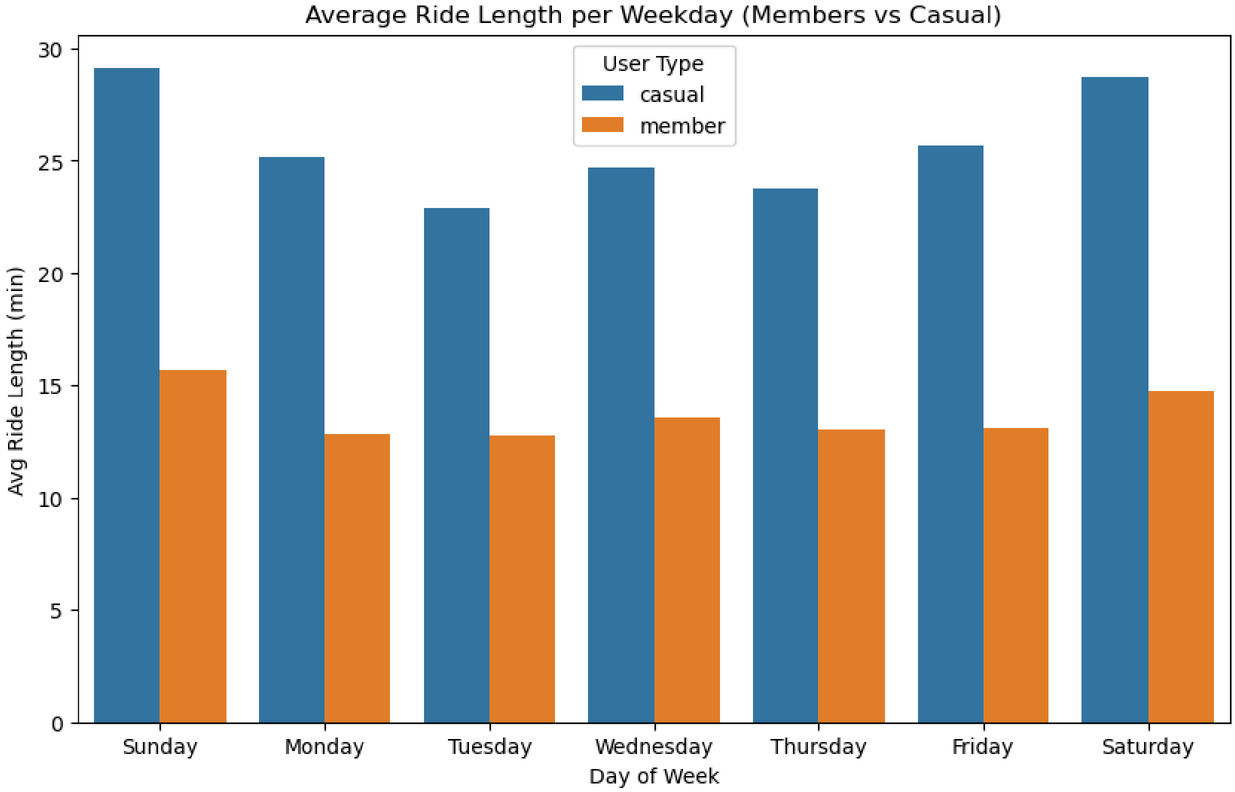


In [46]:

```
# Avg ride length per weekday
avg_ride_length_day = df.groupby(['member_casual', 'day_of_week'])['ride_lengt
avg_ride_length_day['day_of_week'] = pd.Categorical(avg_ride_length_day['day_c
avg_ride_length_day = avg_ride_length_day.sort_values('day_of_week')
```

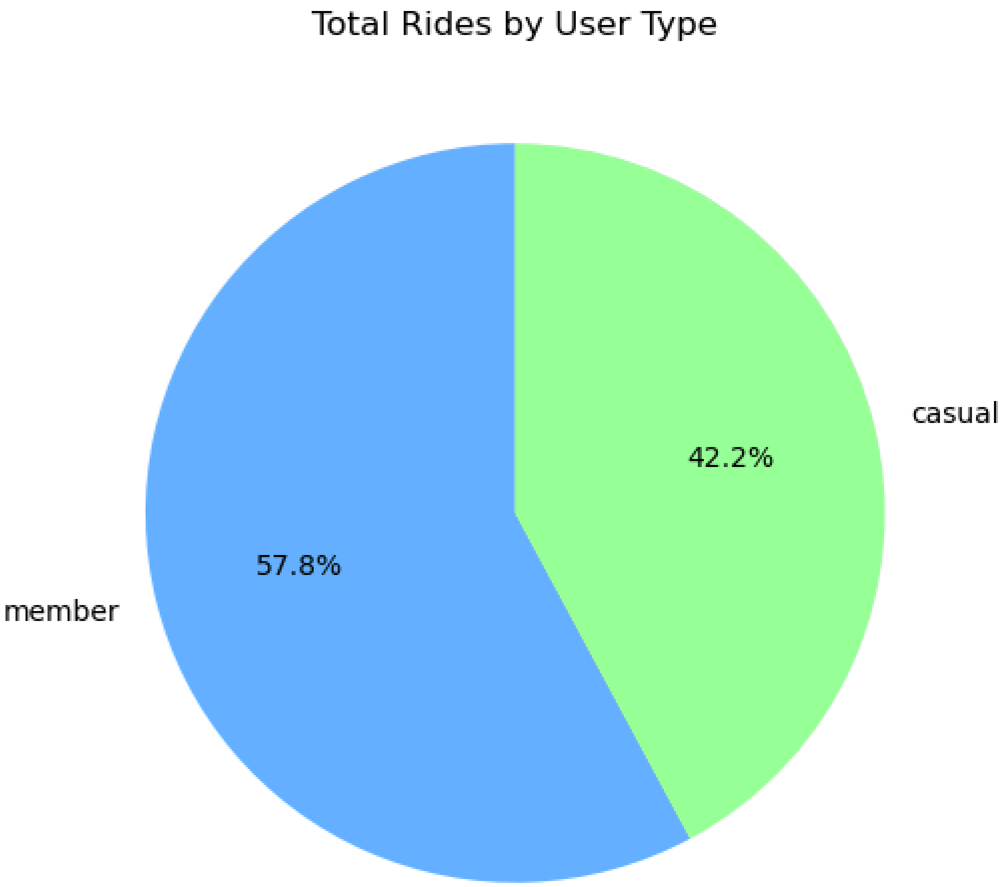
In [47]:

```
# Bar chart: Avg ride length per weekday
plt.figure(figsize=(10,6))
sns.barplot(data=avg_ride_length_day, x='day_of_week', y='ride_length', hue='m
plt.title('Average Ride Length per Weekday (Members vs Casual)')
plt.xlabel('Day of Week')
plt.ylabel('Avg Ride Length (min)')
plt.legend(title='User Type')
plt.show()
```



In [48]:

```
# Pie chart
#total rides by user type
user_counts = df['member_casual'].value_counts()
plt.figure(figsize=(6,6))
plt.pie(user_counts, labels=user_counts.index, autopct='%1.1f%%', startangle=9
plt.title('Total Rides by User Type')
plt.show()
```



```
In [ ]:
```