**import** pandas **as** pd

**import** matplotlib.pyplot **as** plt

data **=** {

'timestamp': ['2025-11-01 08:00', '2025-11-01 08:00', '2025-11-01 09:00'],

'location\_id': [101, 102, 101],

'vehicle\_count': [25, 12, 30],

'average\_speed': [32.5, 41.2, 28.5],

'congestion\_level': ['High', 'Low', 'High']

}

df **=** pd**.**DataFrame(data)

print("Sample Data:")

display(df**.**head())

print("Summary Statistics:")

display(df**.**describe())

congestion\_counts **=** df**.**groupby(['location\_id', 'congestion\_level'])**.**size()**.**unstack(fill\_value**=**0)

print("Congestion Counts by Location:")

display(congestion\_counts)

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

**for** location **in** df['location\_id']**.**unique():

subset **=** df[df['location\_id'] **==** location]

plt**.**plot(subset['timestamp'], subset['vehicle\_count'], marker**=**'o', label**=**f'Location {location}')

plt**.**xlabel('Timestamp')

plt**.**ylabel('Vehicle Count')

plt**.**title('Vehicle Count Over Time')

plt**.**legend()

plt**.**xticks(rotation**=**45)

plt**.**show()

plt**.**figure(figsize**=**(6,4))

df**.**boxplot(column**=**'average\_speed', by**=**'congestion\_level')

plt**.**title('Average Speed by Congestion Level')

plt**.**suptitle('')

plt**.**xlabel('Congestion Level')

plt**.**ylabel('Average Speed')

plt**.**show()



