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PROBLEM STATEMENTS FOR GIVEN DATASET

- 1. What is the total number of vehicles in the dataset?
- 2. Which manufacturer has the highest sales?
- 3. Which vehicle has the highest price?
- 4. What is the average engine size across all vehicles?
- 5. Which vehicle has the highest horsepower?
- 6. What is the average curb weight of passenger vehicles?
- 7. How many vehicles have a fuel efficiency greater than 25 miles per gallon?
- 8. Which vehicle has the longest wheelbase?
- 9. What is the average length of all vehicles?
- 10. How many vehicles were launched in 2012?

- 11. Which vehicle has the highest fuel capacity?
- 12. What is the average width of all vehicles?
- 13. Which manufacturer has the highest average fuel efficiency?
- 14. How many passenger cars have a curb weight below 3,000 pounds?
- 15. Which vehicle has the highest sales among cars?
- 16. What is the average price of vehicles with a fuel efficiency greater than 20 miles per gallon?
- 17. Which manufacturer has the highest average horsepower?
- 18. How many vehicles have a launch date in the second half of the year?
- 19. What is the average sales of vehicles with an engine size greater than 3.0?
- 20. Which vehicle has the highest sales-to-price ratio?

▼ Reading the dataset in Python



```
[ ] import pandas as pd
    data = pd.read_csv('/content/data.csv')
    print(data)
```

1) What is the total number of vehicles in the dataset?

```
[ ] total_vehicles = len(data)
    print("Total number of vehicles:", total_vehicles)
```

Total number of vehicles: 29

Which manufacturer has the highest sales?

```
[ ] manufacturer_highest_sales = data.groupby('Manufacturer')['Sales_in_thousands'].sum().idxmax()
    print("Manufacturer with the highest sales:", manufacturer_highest_sales)
```

Manufacturer with the highest sales: Ford

Which vehicle has the highest price?

```
[ ] vehicle_highest_price = data.loc[data['Price_in_thousands'].idxmax(), 'Model']
    print("Vehicle with the highest price:", vehicle_highest_price)
```

Vehicle with the highest price: A8

What is the average engine size across all vehicles?

```

average_engine_size = data['Engine_size'].mean()
print("Average engine size across all vehicles:", average_engine_size)

```

Average engine size across all vehicles: 2.9758620689655166

Which vehicle has the highest horsepower?

```

[ ] vehicle_highest_horsepower = data.loc[data['Horsepower'].idxmax(), 'Model']
    print("Vehicle with the highest horsepower:", vehicle_highest_horsepower)

```

Vehicle with the highest horsepower: A8

What is the average curb weight of passenger vehicles?

```

[ ] average_curb_weight = data[data['Vehicle_type'] == 'Passenger']['Curb_weight'].mean()
    print("Average curb weight of passenger vehicles:", average_curb_weight)

```

Average curb weight of passenger vehicles: 3.07805

How many vehicles have a fuel efficiency greater than 25 miles per gallon?

```

[ ] vehicles_greater_than_25_mpg = len(data[data['Fuel_efficiency'] > 25])
    print("Number of vehicles with fuel efficiency greater than 25 MPG:", vehicles_greater_than_25_mpg)

```

Number of vehicles with fuel efficiency greater than 25 MPG: 9

Which vehicle has the longest wheelbase?

```
[ ] vehicle_longest_wheelbase = data.loc[data['Wheelbase'].idxmax(), 'Model']  
    print("Vehicle with the longest wheelbase:", vehicle_longest_wheelbase)
```

Vehicle with the longest wheelbase: F-Series

What is the average length of all vehicles?

```
▶ average_length = data['Length'].mean()  
  print("Average length of all vehicles:", average_length)
```

⌘ Average length of all vehicles: 190.6103448275862

How many vehicles were launched in 2012?

```
[ ] vehicles_launched_2012 = len(data[data['Latest_Launch'].str.contains('2012')])  
    print("Number of vehicles launched in 2012:", vehicles_launched_2012)
```

Number of vehicles launched in 2012: 19

Which vehicle has the highest fuel capacity?

```
[ ] vehicle_highest_fuel_capacity = data.loc[data['Fuel_capacity'].idxmax(), 'Model']  
    print("Vehicle with the highest fuel capacity:", vehicle_highest_fuel_capacity)
```

Vehicle with the highest fuel capacity: Ram Van

What is the average width of all vehicles?

```
[ ] average_width = data['Width'].mean()  
    print("Average width of all vehicles:", average_width)
```

Average width of all vehicles: 71.57241379310346

Which manufacturer has the highest average fuel efficiency?

```
[ ] manufacturer_highest_avg_fuel_efficiency = data.groupby('Manufacturer')['Fuel_efficiency'].mean().idxmax()
    print("Manufacturer with the highest average fuel efficiency:", manufacturer_highest_avg_fuel_efficiency)
```

Manufacturer with the highest average fuel efficiency: Chevrolet

How many passenger cars have a curb weight below 3,000 pounds?

```
[ ] passenger_cars_below_3000lbs = len(data[(data['Vehicle_type'] == 'Passenger') & (data['Curb_weight'] < 3000)])
    print("Number of passenger cars with curb weight below 3,000 pounds:", passenger_cars_below_3000lbs)
```

Number of passenger cars with curb weight below 3,000 pounds: 20

Which vehicle has the highest sales among cars?

```
[ ] vehicle_highest_sales_cars = data[data['Vehicle_type'] == 'Car'].loc[data[data['Vehicle_type'] == 'Car']['Sales_in_thousands'].idxmax(), 'Model']
    print("Vehicle with the highest sales among cars:", vehicle_highest_sales_cars)
```

Vehicle with the highest sales among cars: F-Series

What is the average price of vehicles with a fuel efficiency greater than 20 miles per gallon?

```
[ ] average_price_greater_than_20mpg = data[data['Fuel_efficiency'] > 20]['Price_in_thousands'].mean()
    print("Average price of vehicles with fuel efficiency greater than 20 MPG:", average_price_greater_than_20mpg)
```

Average price of vehicles with fuel efficiency greater than 20 MPG: 22.064375000000002

Which manufacturer has the highest average horsepower?

```
0s ✓ [20] manufacturer_highest_avg_horsepower = data.groupby('Manufacturer')['Horsepower'].mean().idxmax()  
      print("Manufacturer with the highest average horsepower:", manufacturer_highest_avg_horsepower)
```

```
↳ Manufacturer with the highest average horsepower: Audi
```



How many vehicles have a launch date in the second half of the year?

```
0s ✓ [20] vehicles_launched_second_half = len(data[data['Latest_Launch'].str.split('/').str[0].astype(int) > 6])  
      print("Number of vehicles launched in the second half of the year:", vehicles_launched_second_half)
```

```
Number of vehicles launched in the second half of the year: 11
```

What is the average sales of vehicles with an engine size greater than 3.0?

```
0s ✓ [21] average_sales_engine_greater_than_3 = data[data['Engine_size'] > 3.0]['Sales_in_thousands'].mean()  
      print("Average sales of vehicles with an engine size greater than 3.0:", average_sales_engine_greater_than_3)
```

```
Average sales of vehicles with an engine size greater than 3.0: 96.35714285714286
```

Which vehicle has the highest sales-to-price ratio?

```
0s ✓ [22] data['Sales_to_Price_Ratio'] = data['Sales_in_thousands'] / data['Price_in_thousands']  
      vehicle_highest_sales_to_price_ratio = data.loc[data['Sales_to_Price_Ratio'].idxmax(), 'Model']  
      print("Vehicle with the highest sales-to-price ratio:", vehicle_highest_sales_to_price_ratio)
```

```
Vehicle with the highest sales-to-price ratio: F-Series
```


DATASET

Manufacturer	Model	Sales_in_t	Vehicle_ty	Price_in_t	Engine_si	Horsepow	Wheelbas	Width	Length	Curb_weig	Fuel_capa	Fuel_effic	Latest_Launch
Acura	Integra	17	Passenger	21.5	1.8	140	101.2	67.3	172.4	2.639	13.2	28	#####
Acura	TL	39	Passenger	28.4	3.2	225	108.1	70.3	192.9	3.517	17.2	25	#####
Audi	A8	1	Passenger	62	4.2	310	113	74	198.2	3.902	23.7	21	2/27/2012
BMW	323i	20	Passenger	26.99	2.5	170	107.3	68.4	176	3.179	16.6	26	6/28/2011
Buick	LeSabre	83	Passenger	27.885	3.8	205	112.2	73.5	200	3.591	17.5	25	7/23/2011
Cadillac	DeVille	64	Passenger	39.895	4.6	275	115.3	74.5	207.2	3.978	18.5	22	2/23/2012
Chevrolet	Cavalier	146	Passenger	13.26	2.2	115	104.1	67.9	180.9	2.676	14.3	27	8/17/2011
Chevrolet	Malibu	135	Passenger	16.535	3.1	170	107	69.4	190.4	3.051	15	25	3/19/2012
Chevrolet	Metro	22	Passenger	9.235	1	55	93.1	62.6	149.4	1.895	10.3	45	4/13/2012
Chevrolet	Impala	108	Passenger	18.89	3.4	180	110.5	73	200	3.389	17	27	6/18/2011
Chrysler	Sebring Co	8	Passenger	19.84	2.5	163	103.7	69.7	190.9	2.967	15.9	24	1/16/2012
Chrysler	LHS	13	Passenger	28.34	3.5	253	113	74.4	207.7	3.564	17	23	#####
Chrysler	300M	31	Passenger	29.185	3.5	253	113	74.4	197.8	3.567	17	23	#####
Dodge	Neon	76	Passenger	12.64	2	132	105	74.4	174.4	2.567	12.5	29	#####
Dodge	Ram Van	31	Car	18.575	3.9	175	127.2	78.8	208.5	4.298	32	16	7/26/2012
Dodge	Dakota	111	Car	16.98	2.5	120	131	71.5	215	3.557	22	19	11/25/2011
Dodge	Durango	101	Car	26.31	5.2	230	115.7	71.7	193.5	4.394	25	17	6/27/2012
Dodge	Caravan	182	Car	19.565	2.4	150	113.3	76.8	186.3	3.533	20	24	#####
Ford	Escort	70	Passenger	12.07	2	110	98.4	67	174.7	2.468	12.7	30	3/31/2012
Ford	Mustang	113	Passenger	21.56	3.8	190	101.3	73.1	183.2	3.203	15.7	24	1/31/2012
Ford	Contour	35	Passenger	17.035	2.5	170	106.5	69.1	184.6	2.769	15	25	8/20/2012
Ford	Taurus	246	Passenger	17.885	3	155	108.5	73	197.6	3.368	16	24	12/20/2011
Ford	Ranger	221	Car	12.05	2.5	119	117.5	69.4	200.7	3.086	20	23	1/14/2012
Ford	F-Series	541	Car	26.935	4.6	220	138.5	79.1	224.5	4.241	25.1	18	8/16/2012
Honda	Civic	200	Passenger	12.885	1.6	106	103.2	67.1	175.1	2.339	11.9	32	10/21/2011
Honda	Accord	231	Passenger	15.35	2.3	135	106.9	70.3	188.8	2.932	17.1	27	5/20/2012
Honda	CR-V	73	Car	20.55	2	146	103.2	68.9	177.6	3.219	15.3	24	3/21/2012
Honda	Passport	13	Car	26.6	3.2	205	106.4	70.4	178.2	3.857	21.1	19	#####
Honda	Odyssey	76	Car	26	3.5	210	118.1	75.6	201.2	4.288	20	23	#####