Name : Anirudha Laxman Gapat

Roll No : 416

Div : D(1)

PRN No : 202201040067

Dataset used

Manufacturer	Model	Sales_in_thousands	Vehicle_type	Price_in_thousands		Engine_size	Ho
Acura	Integra	17	Passenger		21.5	1.8	
Acura	TL	39	Passenger		28.4	3.2	
Audi	A8	1	Passenger		62	4.2	
BMW	323i	20	Passenger		26.99	2.5	
Buick	LeSabre	83	Passenger		27.885	3.8	
Cadillac	DeVille	64	Passenger		39.895	4.6	
Chevrolet	Cavalier	146	Passenger		13.26	2.2	
Chevrolet	Malibu	135	Passenger		16.535	3.1	
Chevrolet	Metro	22	Passenger		9.235	1	
Chevrolet	Impala	108	Passenger		18.89	3.4	
Chrysler	Sebring Coupe	8	Passenger		19.84	2.5	
Chrysler	LHS	13	Passenger		28.34	3.5	
Chrysler	300M	31	Passenger		29.185	3.5	
Dodge	Neon	76	Passenger		12.64	2	
Dodge	Ram Van	31	Car		18.575	3.9	
Dodge	Dakota	111	Car		16.98	2.5	
Dodge	Durango	101	Car		26.31	5.2	
Dodge	Caravan	182	Car		19.565	2.4	
Ford	Escort	70	Passenger		12.07	2	
Ford	Mustang	113	Passenger		21.56	3.8	
Ford	Contour	35	Passenger		17.035	2.5	
Ford	Taurus	246	Passenger		17.885	3	
Ford	Ranger	221	Car		12.05	2.5	
Ford	F-Series	541	Car		26.935	4.6	
Honda	Civic	200	Passenger		12.885	1.6	
Honda	Accord	231	Passenger		15.35	2.3	
Honda	CR-V	73	Car		20.55	2	
Honda	Passport	13	Car		26.6	3.2	
Honda	Odyssey	76	Car		26	3.5	

Horsepower	Wheelbase	Width	Length	Curb_weight	Fuel_capacity	Fuel_efficiency	Latest_Launch
140	101.2	67.3	172.4	2.639	13.2	28	########
225	108.1	70.3	192.9	3.517	17.2	25	########
310	113	74	198.2	3.902	23.7	21	2/27/2012
170	107.3	68.4	176	3.179	16.6	26	6/28/2011
205	112.2	73.5	200	3.591	17.5	25	7/23/2011
275	115.3	74.5	207.2	3.978	18.5	22	2/23/2012
115	104.1	67.9	180.9	2.676	14.3	27	8/17/2011
170	107	69.4	190.4	3.051	15	25	3/19/2012
55	93.1	62.6	149.4	1.895	10.3	45	4/13/2012
180	110.5	73	200	3.389	17	27	6/18/2011
163	103.7	69.7	190.9	2.967	15.9	24	1/16/2012
253	113	74.4	207.7	3.564	17	23	########
253	113	74.4	197.8	3.567	17	23	########
132	105	74.4	174.4	2.567	12.5	29	########
175	127.2	78.8	208.5	4.298	32	16	7/26/2012
120	131	71.5	215	3.557	22	19	11/25/2011
230	115.7	71.7	193.5	4.394	25	17	6/27/2012
150	113.3	76.8	186.3	3.533	20	24	########
110	98.4	67	174.7	2.468	12.7	30	3/31/2012
190	101.3	73.1	183.2	3.203	15.7	24	1/31/2012
170	106.5	69.1	184.6	2.769	15	25	8/20/2012
155	108.5	73	197.6	3.368	16	24	12/20/2011
119	117.5	69.4	200.7	3.086	20	23	1/14/2012
220	138.5	79.1	224.5	4.241	25.1	18	8/16/2012
106	103.2	67.1	175.1	2.339	11.9	32	10/21/2011
135	106.9	70.3	188.8	2.932	17.1	27	5/20/2012
146	103.2	68.9	177.6	3.219	15.3	24	3/21/2012
205	106.4	70.4	178.2	3.857	21.1	19	########
210	118.1	75.6	201.2	4.288	20	23	########

1) Find the statistical Analysis on CAR Sale data **(Refer Data Set 2)**
    a. Find the most expensive car
    b. Calculate average sale of all cars
    c. Find the total no of passenger cars
    d. Find the car who has maximum engine size
    e. Find the car who has minimum horsepower
    f. Find the all passenger cars details which is manufacturing by ‘Ford’
    g. Convert “Width” column values into integer values

a) Find the most expensive car

Input code :

```
    most_expensive_car = dtf.loc[dtf['Price_in_thousands'].idxmax()]

print(most_expensive_car)
```

Output:

```
   Manufacturer                Audi

Model                          A8
Sales_in_thousands              1
Vehicle_type            Passenger
Price_in_thousands           62.0
Engine_size                   4.2
Horsepower                    310
Wheelbase                   113.0
Width                        74.0
Length                      198.2
Curb_weight                 3.902
Fuel_capacity                23.7
Fuel_efficiency                21
Latest_Launch           2/27/2012

Name: 2, dtype: object
```

b) Calculate average sale of all cars

Input code :

```
 average_sale = dtf['Sales_in_thousands'].mean()

 print (average_sale)
```

Output :

```
103.6896551724138
```

c) Find the total no of passenger cars

Input Code :

```
 total_passenger_cars = dtf.loc[dtf['Vehicle_type'] ==
'Passenger'].shape[0]

print (total_passenger_cars)
```

Output :

20

d) Find the car who has maximum engine size

input code :

```
car_with_max_engine = dtf.loc[dtf['Engine_size'].idxmax()]
print (car_with_max_engine )
```

Output :

```
 Manufacturer              Dodge

Model                   Durango
Sales_in_thousands          101
Vehicle_type                Car
Price_in_thousands        26.31
Engine_size                 5.2
Horsepower                  230
Wheelbase                 115.7
Width                      71.7
Length                    193.5
Curb_weight               4.394
Fuel_capacity              25.0
Fuel_efficiency              17
Latest_Launch          6/27/2012
Name: 16
```

e) Find the car who has minimum horsepower

Input code :

```
car_with_min_horsepower = dtf.loc[dtf['Horsepower'].idxmin()]
print (car_with_min_horsepower)
```

Output :

```
Manufacturer          Chevrolet
Model                     Metro
Sales_in_thousands           22
Vehicle_type          Passenger
Price_in_thousands        9.235
Engine_size                 1.0
Horsepower                   55
Wheelbase                  93.1
Width                      62.6
Length                    149.4
Curb_weight               1.895
Fuel_capacity              10.3
Fuel_efficiency              45
Latest_Launch         4/13/2012
Name: 8, dtype: object
```

f) Find the all passenger cars details which is manufacturing by 'Ford'

Input code :

```
ford_passenger_cars = dtf.loc[(dtf['Vehicle_type'] == 'Passenger') &
(dtf['Manufacturer'] == 'Ford')]
print(ford_passenger_cars)
print ("\nPassenger Cars Manufactured by Ford:")
```

Output :

```
   Manufacturer    Model  Sales_in_thousands Vehicle_type
Price_in_thousands  \
18         Ford   Escort                  70    Passenger
12.070
19         Ford  Mustang                 113    Passenger
21.560
20         Ford  Contour                  35    Passenger
17.035
21         Ford   Taurus                 246    Passenger
17.885

    Engine_size  Horsepower  Wheelbase  Width  Length  Curb_weight  \
18          2.0         110       98.4   67.0   174.7        2.468
19          3.8         190      101.3   73.1   183.2        3.203
20          2.5         170      106.5   69.1   184.6        2.769
21          3.0         155      108.5   73.0   197.6        3.368

    Fuel_capacity  Fuel_efficiency Latest_Launch
18           12.7               30     3/31/2012
19           15.7               24     1/31/2012
20           15.0               25     8/20/2012
21           16.0               24    12/20/2011

Passenger Cars Manufactured by Ford:
```

g) Convert “Width” column values into integer values

Input Code :

```
dtf['Width'] = dtf['Width'].astype(int)
print (dtf['Width'] )
```

Output :

```
0     67
1     70
2     74
3     68
4     73
5     74
6     67
7     69
8     62
9     73
10    69
11    74
12    74
13    74
14    78
15    71
16    71
17    76
18    67
19    73
20    69
21    73
22    69
23    79
24    67
25    70
26    68
27    70
28    75
Name: Width, dtype: int64
```

```
   Manufacturer    Model  Sales_in_thousands Vehicle_type
Price_in_thousands  \
18         Ford   Escort                  70    Passenger
12.070
19         Ford  Mustang                 113    Passenger
21.560
20         Ford  Contour                  35    Passenger
17.035
21         Ford   Taurus                 246    Passenger
17.885

    Engine_size  Horsepower  Wheelbase  Width  Length  Curb_weight  \
18          2.0         110       98.4   67.0   174.7        2.468
19          3.8         190      101.3   73.1   183.2        3.203
20          2.5         170      106.5   69.1   184.6        2.769
21          3.0         155      108.5   73.0   197.6        3.368

    Fuel_capacity  Fuel_efficiency Latest_Launch
18           12.7               30     3/31/2012
19           15.7               24     1/31/2012
20           15.0               25     8/20/2012
21           16.0               24    12/20/2011
```

Passenger Cars Manufactured by Ford: