# Importing libraries

In [1]:
```
import pandas as pd
import numpy as np
from numpy import linalg as la
from numpy import cov
```

# Importing dataset

In [18]:
```
data=pd.read_csv(r"C:\Users\user\Downloads\fiat500_VehicleSelection_Dataset (2).csv")
data
```

Out[18]:

| | ID | model | engine_power | age_in_days | km | previous_owners | lat | lon | p |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1.0 | lounge | 51.0 | 882.0 | 25000.0 | 1.0 | 44.907242 | 8.611559868 | 8 |
| **1** | 2.0 | pop | 51.0 | 1186.0 | 32500.0 | 1.0 | 45.666359 | 12.24188995 | 8 |
| **2** | 3.0 | sport | 74.0 | 4658.0 | 142228.0 | 1.0 | 45.503300 | 11.41784 | 4 |
| **3** | 4.0 | lounge | 51.0 | 2739.0 | 160000.0 | 1.0 | 40.633171 | 17.63460922 | 6 |
| **4** | 5.0 | pop | 73.0 | 3074.0 | 106880.0 | 1.0 | 41.903221 | 12.49565029 | 5 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | |
| **1544** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | length | |
| **1545** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | concat | lonp |
| **1546** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | Null values | |
| **1547** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | find | |
| **1548** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | search | |

1549 rows × 11 columns

In [20]:
```
da=data.head(8)
da
```

Out[20]:

| | ID | model | engine_power | age_in_days | km | previous_owners | lat | lon | price | U |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1.0 | lounge | 51.0 | 882.0 | 25000.0 | 1.0 | 44.907242 | 8.611559868 | 8900 | |
| **1** | 2.0 | pop | 51.0 | 1186.0 | 32500.0 | 1.0 | 45.666359 | 12.24188995 | 8800 | |
| **2** | 3.0 | sport | 74.0 | 4658.0 | 142228.0 | 1.0 | 45.503300 | 11.41784 | 4200 | |
| **3** | 4.0 | lounge | 51.0 | 2739.0 | 160000.0 | 1.0 | 40.633171 | 17.63460922 | 6000 | |
| **4** | 5.0 | pop | 73.0 | 3074.0 | 106880.0 | 1.0 | 41.903221 | 12.49565029 | 5700 | |

| | ID | model | engine_power | age_in_days | km | previous_owners | lat | lon | price | U |
|---|---|---|---|---|---|---|---|---|---|---|
| **5** | 6.0 | pop | 74.0 | 3623.0 | 70225.0 | 1.0 | 45.000702 | 7.68227005 | 7900 | |
| **6** | 7.0 | lounge | 51.0 | 731.0 | 11600.0 | 1.0 | 44.907242 | 8.611559868 | 10750 | |
| **7** | 8.0 | lounge | 51.0 | 1521.0 | 49076.0 | 1.0 | 41.903221 | 12.49565029 | 9190 | |

# a.mean

In [3]:
```
print(data.mean())
```

```
ID                  769.500000
engine_power         51.904421
age_in_days        1650.980494
km                53396.011704
previous_owners       1.123537
lat                  43.541361
Unnamed: 9                 NaN
dtype: float64
```

# median

In [4]:
```
print(data.median())
```

```
ID                  769.500000
engine_power         51.000000
age_in_days        1035.000000
km                39031.000000
previous_owners       1.000000
lat                  44.394096
Unnamed: 9                 NaN
dtype: float64
```

# mode

In [5]:
```
print(data.mode())
```

```
          ID   model  engine_power  age_in_days       km  previous_owners  \
0        1.0  lounge          51.0        366.0  17000.0              1.0
1        2.0     NaN           NaN        790.0      NaN              NaN
2        3.0     NaN           NaN          NaN      NaN              NaN
3        4.0     NaN           NaN          NaN      NaN              NaN
4        5.0     NaN           NaN          NaN      NaN              NaN
...      ...     ...           ...          ...      ...              ...
1533  1534.0     NaN           NaN          NaN      NaN              NaN
1534  1535.0     NaN           NaN          NaN      NaN              NaN
1535  1536.0     NaN           NaN          NaN      NaN              NaN
1536  1537.0     NaN           NaN          NaN      NaN              NaN
1537  1538.0     NaN           NaN          NaN      NaN              NaN

           lat          lon  price  Unnamed: 9 Unnamed: 10
0    41.903221  12.49565029  10500         NaN      >10000
```

```
1           NaN          NaN    NaN          NaN          NaN
2           NaN          NaN    NaN          NaN          NaN
3           NaN          NaN    NaN          NaN          NaN
4           NaN          NaN    NaN          NaN          NaN
...         ...          ...    ...          ...          ...
1533        NaN          NaN    NaN          NaN          NaN
1534        NaN          NaN    NaN          NaN          NaN
1535        NaN          NaN    NaN          NaN          NaN
1536        NaN          NaN    NaN          NaN          NaN
1537        NaN          NaN    NaN          NaN          NaN

[1538 rows x 11 columns]
```

# describe

In [6]:
```
print(data.describe())
```

```
                ID  engine_power  age_in_days             km  previous_owners  \
count  1538.000000   1538.000000  1538.000000    1538.000000      1538.000000
mean    769.500000     51.904421  1650.980494   53396.011704         1.123537
std     444.126671      3.988023  1289.522278   40046.830723         0.416423
min       1.000000     51.000000   366.000000    1232.000000         1.000000
25%     385.250000     51.000000   670.000000   20006.250000         1.000000
50%     769.500000     51.000000  1035.000000   39031.000000         1.000000
75%    1153.750000     51.000000  2616.000000   79667.750000         1.000000
max    1538.000000     77.000000  4658.000000  235000.000000         4.000000

               lat  Unnamed: 9
count  1538.000000         0.0
mean     43.541361         NaN
std       2.133518         NaN
min      36.855839         NaN
25%      41.802990         NaN
50%      44.394096         NaN
75%      45.467960         NaN
max      46.795612         NaN
```

# b.sum()

In [7]:
```
print(data.sum())
```

```
ID                                                   1183491.0
engine_power                                           79829.0
age_in_days                                          2539208.0
km                                                  82123066.0
previous_owners                                        1728.0
lat                                                 66966.61372
lon               8.61155986812.2418899511.4178417.6346092212.49...
price             8900880042006000570079001075091905600600089501...
Unnamed: 9                                                0.0
dtype: object
```

# cumsum()

In [8]:
```
print(da.cumsum())
```

```
     ID                                  model  engine_power  age_in_days  \
0   1.0                                 lounge          51.0        882.0
1   3.0                              loungepop         102.0       2068.0
2   6.0                          loungepopsport         176.0       6726.0
3  10.0                   loungepopsportlounge         227.0       9465.0
4  15.0                loungepopsportloungepop         300.0      12539.0
5  21.0             loungepopsportloungepoppop         374.0      16162.0
6  28.0       loungepopsportloungepoppoplounge         425.0      16893.0
7  36.0  loungepopsportloungepoppoploungelounge         476.0      18414.0

         km  previous_owners         lat  \
0   25000.0              1.0   44.907242
1   57500.0              2.0   90.573601
2  199728.0              3.0  136.076900
3  359728.0              4.0  176.710072
4  466608.0              5.0  218.613293
5  536833.0              6.0  263.613995
6  548433.0              7.0  308.521236
7  597509.0              8.0  350.424458

                                            lon  \
0                                   8.611559868
1                             8.61155986812.24188995
2                      8.61155986812.2418899511.41784
3           8.61155986812.2418899511.4178417.63460922
4  8.61155986812.2418899511.4178417.6346092212.49...
5  8.61155986812.2418899511.4178417.6346092212.49...
6  8.61155986812.2418899511.4178417.6346092212.49...
7  8.61155986812.2418899511.4178417.6346092212.49...

                              price  Unnamed: 9 Unnamed: 10
0                              8900         NaN         NaN
1                             89008800         NaN         NaN
2                         890088004200         NaN         NaN
3                    8900880042006000         NaN         NaN
4                89008800420060005700         NaN         NaN
5            8900880042006000570079 00         NaN         NaN
6      8900880042006000570079001 0750         NaN         NaN
7  89008800420060005700790010750 9190         NaN         NaN
```

# count

In [9]:
```
print(data.count())
```

```
ID                1538
model             1538
engine_power      1538
age_in_days       1538
km                1538
previous_owners   1538
lat               1538
lon               1549
price             1549
Unnamed: 9           0
Unnamed: 10          1
dtype: int64
```

# min

In [10]:
```
print(data.min())
```

```
ID                          1.0
engine_power               51.0
age_in_days               366.0
km                       1232.0
previous_owners             1.0
lat                    36.855839
lon                 10.00240993
price                         1
Unnamed: 9                  NaN
dtype: object
```

# max()

In [11]:
```
print(data.max())
```

```
ID                     1538.0
engine_power             77.0
age_in_days            4658.0
km                   235000.0
previous_owners           4.0
lat                  46.795612
lon                      sumif
price                 lonprice
Unnamed: 9                 NaN
dtype: object
```

# covariance

In [12]:
```
print(data.cov())
```

```
                            ID  engine_power   age_in_days            km  \
ID                197248.500000    -60.325634 -3.479372e+04 -1.162613e+05
engine_power         -60.325634     15.904327  1.641481e+03  4.559580e+04
age_in_days       -34793.715680   1641.480893  1.662868e+06  4.306313e+07
km               -116261.337671  45595.798126  4.306313e+07  1.603749e+09
previous_owners       1.443071     -0.008354  4.069011e+01  1.626594e+03
lat                 -55.153825      0.048676  1.732781e+02  3.034803e+03
Unnamed: 9                 NaN           NaN           NaN           NaN

                  previous_owners          lat  Unnamed: 9
ID                       1.443071   -55.153825         NaN
engine_power            -0.008354     0.048676         NaN
age_in_days             40.690115   173.278051         NaN
km                    1626.593869  3034.802999         NaN
previous_owners          0.173408     0.001508         NaN
lat                      0.001508     4.551898         NaN
Unnamed: 9                    NaN          NaN         NaN
```

# corelation

# pearson corelation

In [15]:
```
from scipy.stats import pearsonr
print(pearsonr(da["ID"],da["km"]))
```

```
(-0.10721794592143968, 0.8005017181023478)
```

# spearmen corelation

In [16]:
```
from scipy.stats import spearmanr
print(spearmanr(da["km"],da["ID"]))
```

```
SpearmanrResult(correlation=-0.04761904761904763, pvalue=0.9108491685195836)
```

In [ ]:

In [ ]: