In [1]: import numpy as np import pandas as pd

In [5]: x=pd.read_csv(r"C:\Users\user\Downloads\fiat500_VehicleSelection_Dataset - fiat
x

Out[5]:

| | ID | model | engine_power | age_in_days | km | previous_owners | lat | le |
|------|-----|--------|--------------|-------------|----------|-----------------|-----------|-----------|
| 0 | 1.0 | lounge | 51.0 | 882.0 | 25000.0 | 1.0 | 44.907242 | 8.6115598 |
| 1 | 2.0 | pop | 51.0 | 1186.0 | 32500.0 | 1.0 | 45.666359 | 12.241889 |
| 2 | 3.0 | sport | 74.0 | 4658.0 | 142228.0 | 1.0 | 45.503300 | 11.417 |
| 3 | 4.0 | lounge | 51.0 | 2739.0 | 160000.0 | 1.0 | 40.633171 | 17.634609 |
| 4 | 5.0 | pop | 73.0 | 3074.0 | 106880.0 | 1.0 | 41.903221 | 12.495650 |
| | | | | | | | | |
| 1544 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | lenç |
| 1545 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | conc |
| 1546 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | Null valu |
| 1547 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | fi |
| 1548 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | sear |
| | | | | | | | | |

1549 rows × 11 columns

In [6]: x.dtypes

Out[6]: ID float64 object model float64 engine_power float64 age_in_days km float64 float64 previous_owners lat float64 lon object object price Unnamed: 9 float64 Unnamed: 10 object

dtype: object

```
x.head()
 In [7]:
 Out[7]:
              ID
                 model engine_power age_in_days
                                                       km previous_owners
                                                                                  lat
                                                                                              lon p
              1.0
                  lounge
                                 51.0
                                             882.0
                                                    25000.0
                                                                        1.0 44.907242 8.611559868
              2.0
                                            1186.0
                                                    32500.0
                                                                        1.0 45.666359
                                 51.0
                                                                                      12.24188995
                    pop
              3.0
                   sport
                                  74.0
                                            4658.0 142228.0
                                                                           45.503300
                                                                                         11.41784
              4.0
                                  51.0
                                            2739.0 160000.0
                                                                           40.633171
                                                                                      17.63460922
                  lounge
                                                                        1.0
              5.0
                    pop
                                  73.0
                                            3074.0 106880.0
                                                                        1.0 41.903221
                                                                                      12.49565029
 In [8]: x.tail()
 Out[8]:
                                                                                                Un
                  ID model engine_power age_in_days
                                                       km previous_owners
                                                                                           price
                                                                                    lon
                                                                              lat
           1544 NaN
                        NaN
                                     NaN
                                                                                              5
                                                 NaN
                                                       NaN
                                                                       NaN
                                                                            NaN
                                                                                  length
           1545 NaN
                        NaN
                                     NaN
                                                 NaN
                                                       NaN
                                                                       NaN
                                                                            NaN
                                                                                  concat Ionprice
                                                                                    Null
           1546 NaN
                        NaN
                                     NaN
                                                 NaN
                                                       NaN
                                                                       NaN
                                                                            NaN
                                                                                            NO
                                                                                  values
                                                      NaN
                                                                                    find
           1547 NaN
                                     NaN
                                                                       NaN NaN
                        NaN
                                                 NaN
                                                                                              1
           1548 NaN
                                     NaN
                        NaN
                                                 NaN
                                                       NaN
                                                                       NaN
                                                                            NaN
                                                                                 search
 In [9]: |x.columns
 Out[9]: Index(['ID', 'model', 'engine_power', 'age_in_days', 'km', 'previous_owners',
                  'lat', 'lon', 'price', 'Unnamed: 9', 'Unnamed: 10'],
                 dtype='object')
In [10]: x.index
Out[10]: RangeIndex(start=0, stop=1549, step=1)
```

```
In [11]:
           x.describe()
Out[11]:
                                                                                                           U
                            ID
                                engine_power
                                               age_in_days
                                                                            previous_owners
                                                                                                      lat
                                                                       km
                                                1538.000000
            count
                   1538.000000
                                  1538.000000
                                                               1538.000000
                                                                                1538.000000
                                                                                             1538.000000
                    769.500000
                                    51.904421
                                                1650.980494
                                                              53396.011704
                                                                                   1.123537
                                                                                                43.541361
            mean
              std
                    444.126671
                                     3.988023
                                                1289.522278
                                                              40046.830723
                                                                                   0.416423
                                                                                                2.133518
                      1.000000
                                    51.000000
                                                366.000000
                                                              1232.000000
                                                                                   1.000000
                                                                                                36.855839
              min
             25%
                    385.250000
                                    51.000000
                                                670.000000
                                                              20006.250000
                                                                                   1.000000
                                                                                                41.802990
             50%
                    769.500000
                                    51.000000
                                                1035.000000
                                                              39031.000000
                                                                                   1.000000
                                                                                                44.394096
             75%
                   1153.750000
                                    51.000000
                                                              79667.750000
                                                                                   1.000000
                                                                                                45.467960
                                               2616.000000
                   1538.000000
                                    77.000000
                                               4658.000000
                                                            235000.000000
                                                                                   4.000000
                                                                                                46.795612
              max
In [12]: x["km"]
Out[12]:
           0
                      25000.0
           1
                      32500.0
           2
                     142228.0
           3
                     160000.0
           4
                     106880.0
           1544
                           NaN
           1545
                           NaN
           1546
                           NaN
           1547
                           NaN
           1548
                           NaN
           Name: km, Length: 1549, dtype: float64
In [13]: x[0:2]
Out[13]:
                    model engine_power age_in_days
                                                                previous_owners
                                                                                         lat
                                                                                                     lon
                                                                                                          рі
            0
               1.0
                   lounge
                                    51.0
                                                 882.0
                                                       25000.0
                                                                                  44.907242
                                                                                             8.611559868
                                                                                                          8
                                                                             1.0
               2.0
                      pop
                                     51.0
                                                1186.0
                                                       32500.0
                                                                                  45.666359
                                                                                            12.24188995
                                                                                                          8
In [14]:
          x.loc[0:2]
Out[14]:
                   model engine_power age_in_days
                                                                                                      lon p
                ID
                                                             km
                                                                 previous_owners
                                                                                          lat
               1.0
                    lounge
                                     51.0
                                                 882.0
                                                         25000.0
                                                                                   44.907242
                                                                                              8.611559868
            0
                                                                               1.0
               2.0
                                     51.0
                                                1186.0
                                                         32500.0
                                                                                   45.666359
                                                                                              12.24188995
                      pop
               3.0
                     sport
                                     74.0
                                                4658.0
                                                       142228.0
                                                                               1.0 45.503300
                                                                                                 11.41784
```

| |) m | odel en | gine_power | age_in_days | km pre | vious_owner | s | lat | lon p |
|---|---|--|---|---|---|-------------|--|---|---|
| 0 1.0 |) lo | ınge | 51.0 | 882.0 25 | 5000.0 | 1. | 0 44. | .907242 8. | 611559868 8 |
| 1 2.0 |) | рор | 51.0 | 1186.0 32 | 2500.0 | 1. | 0 45. | .666359 12 | .24188995 |
| 4 | | | | | | | | | > |
| x.loc | ["mc | del":" | km"] | | | | | | |
| ID | mod | el engi | ne power ag | e_in_days km | previous | owners lat | lon | price Unn | amed: Unna |
| | | | | | | | | · | 9 |
| | | | | | | | | | |
| x[x[" | km"] | <= 2] | | | | | | | |
| ID | mod | el engi | ne_power ag | e_in_days km | previous_ | owners lat | lon | price Unn | amed: Unna 9 |
| 1 | | | | | | | | | → |
| | | | | | | | | | |
| · x fil | lna(| value= | 5) | | | | | | |
| | lna(| value= | 5) | | | | | | |
| x.fil | lna(| | | er age_in_days | km | previous_o | wners | la | i lo |
| x.fil | | | | | km 25000.0 | previous_o | wners | | t Ic |
| 0 | ID | model | engine_powe | 0 882.0 | | previous_o | 1.0 | | 8.61155986 |
| 0 | ID | model lounge | engine_powe | 0 882.0 0 1186.0 | 25000.0 | previous_o | 1.0 | 44.907242 45.666359 | 2 8.61155986 12.2418899 |
| 0 1 2 3 | 1.0 2.0 3.0 4.0 | model lounge | engine_powe 51. 51. 74. 51. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 | 25000.0 32500.0 142228.0 160000.0 | previous_o | 1.0 1.0 1.0 | 44.907242 45.666359 45.503300 40.633171 | 2 8.61155986 9 12.2418899 9 11.4178 17.6346092 |
| 0 1 2 3 | 1.0 2.0 3.0 | model lounge pop sport | engine_powe 51. 51. 74. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 | 25000.0 32500.0 142228.0 | previous_o | 1.0 1.0 1.0 | 44.907242 45.666359 45.503300 40.633171 | 2 8.61155986 12.2418899 11.4178 17.6346092 |
| 0 1 2 3 4 | 1.0 2.0 3.0 4.0 5.0 | model lounge pop sport lounge pop | engine_powe 51. 51. 74. 51. 73. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 |
| 0 1 2 3 4 | 1.0 2.0 3.0 4.0 5.0 | model lounge pop sport lounge pop 5 | engine_powe 51. 51. 74. 51. 73. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 |
| 0 1 2 3 4 1544 1545 | 1.0 2.0 3.0 4.0 5.0 5.0 | model lounge pop sport lounge pop 5 | engine_power 51. 51. 74. 51. 73. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 0 5.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 |
| 0 1 2 3 4 | 1.0 2.0 3.0 4.0 5.0 5.0 5.0 | model lounge pop sport lounge pop 5 | engine_powe 51. 51. 74. 51. 73. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 0 5.0 0 5.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 leng |
| 0 1 2 3 4 1544 1545 1546 | 1.0 2.0 3.0 4.0 5.0 5.0 5.0 5.0 | model lounge pop sport lounge pop 5 5 | engine_power 51. 51. 74. 51. 73. 5. 5. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 0 5.0 0 5.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 5.000000 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 . leng 0 conc |
| 0 1 2 3 4 1544 1545 1546 1547 | 1.0 2.0 3.0 4.0 5.0 5.0 5.0 5.0 5.0 | model lounge pop sport lounge pop 5 5 5 5 | engine_power 51. 51. 74. 51. 73. 5. 5. 5. 5. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 0 5.0 0 5.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 5.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 5.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 5.000000 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 . leng 0 conc |
| 0 1 2 3 4 1544 1545 1546 1547 | 1.0 2.0 3.0 4.0 5.0 5.0 5.0 5.0 5.0 | model lounge pop sport lounge pop 5 5 5 | engine_power 51. 51. 74. 51. 73. 5. 5. 5. 5. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 0 5.0 0 5.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 5.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 5.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 5.000000 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 . leng 0 conc |
| 0 1 2 3 4 1544 1545 1546 1547 | 1.0 2.0 3.0 4.0 5.0 5.0 5.0 5.0 5.0 | model lounge pop sport lounge pop 5 5 5 5 × 11 co | engine_power 51. 51. 74. 51. 73. 5. 5. 5. 5. | 0 882.0 0 1186.0 0 4658.0 0 2739.0 0 3074.0 0 5.0 0 5.0 | 25000.0 32500.0 142228.0 160000.0 106880.0 5.0 5.0 5.0 | previous_o | 1.0 1.0 1.0 1.0 1.0 5.0 5.0 5.0 | 44.907242 45.666359 45.503300 40.633171 41.903221 5.000000 5.000000 5.000000 | 2 8.61155986 12.2418899 11.4178 17.6346092 12.4956502 . leng 0 conc |

In [21]: x.fillna(value=5) Out[21]: ID model engine_power age_in_days km previous_owners lat loı **0** 1.0 lounge 51.0 882.0 25000.0 1.0 44.907242 8.61155986 1 2.0 51.0 1186.0 32500.0 1.0 45.666359 12.2418899! pop 3.0 74.0 4658.0 142228.0 45.503300 sport 11.41784 51.0 2739.0 160000.0 40.633171 17.6346092; 3 4.0 lounge 3074.0 106880.0 5.0 pop 73.0 41.903221 12.49565029 ... 1544 5.0 5.0 5.0 5.000000 5 5.0 5.0 lengtl **1545** 5.0 5.0 5.000000 5.0 5.0 5.0 conca **1546** 5.0 5 5.0 5.0 5.0 5.0 5.000000 Null value: **1547** 5.0 5 5.0 5.0 5.0 5.0 5.000000 fine **1548** 5.0 5 5.0 5.0 5.0 5.0 5.000000 searcl 1549 rows × 11 columns In [22]: x.dropna() Out[22]: Unnamed: Unna ID model engine_power age_in_days km previous_owners lat lon price 9 In []: