3

140.80

5.0

nan 17.74

```
1)Question
import pandas as pd
df = pd.read_csv("/content/train.csv")
Double-click (or enter) to edit
missing_values = df.isnull().sum()
vs = df.dropna()
vs = df.drop(columns=['New Price'])
vs.to_csv("cleaned_data.csv", index=False)
2) Question
# Converting · 'Mileage' · column · to · string · to · remove · from · the · table
df['Mileage'] = df['Mileage'].astype(str)
# Remove "kmpl" from the 'Mileage' column
df['Mileage'] = df['Mileage'].str.replace(' kmpl', '')
\mbox{\#-Handle-missing-or-empty-values-by-converting-them-to-NaN}
df['Mileage'] = df['Mileage'].replace('', None)
# Remove non-numeric characters from 'Mileage'
df['Mileage'] = df['Mileage'].str.replace(' km/kg', '', regex=True)
# Convert to float
df['Mileage'] = df['Mileage'].astype(float)
print (df)
          Unnamed: 0
                                                  Name
                                                         Location Year \
     0
                   1 Hyundai Creta 1.6 CRDi SX Option
                                                           Pune 2015
     1
                   2
                                          Honda Jazz V
                                                          Chennai 2011
     2
                   3
                                     Maruti Ertiga VDI
                                                          Chennai
                                                                   2012
     3
                     Audi A4 New 2.0 TDI Multitronic Coimbatore 2013
     4
                  6
                              Nissan Micra Diesel XV
                                                         Jaipur 2013
     5842
                6014
                                      Maruti Swift VDI
                                                            Delhi 2014
     5843
                6015
                              Hyundai Xcent 1.1 CRDi S
                                                           Jaipur 2015
                                                          Jaipur 2012
     5844
                6016
                                 Mahindra Xylo D4 BSIV
     5845
                6017
                                   Maruti Wagon R VXI
                                                          Kolkata 2013
     5846
                6018
                                 Chevrolet Beat Diesel Hyderabad 2011
          Kilometers_Driven Fuel_Type Transmission Owner_Type Mileage Engine \
     0
                      41000
                               Diesel
                                           Manual
                                                       First
                                                                19.67 1582.0
                      46000
                               Petrol
                                                       First
                                                                13.00 1199.0
     1
                                            Manual
     2
                      87000
                               Diesel
                                           Manual
                                                       First
                                                                20.77 1248.0
     3
                      40670
                               Diesel
                                        Automatic
                                                      Second
                                                                15.20 1968.0
                                                       First
                      86999
                               Diesel
                                         Manual
                                                                23.08 1461.0
                                                         . . .
     5842
                      27365
                               Diesel
                                            Manual
                                                       First
                                                                28.40 1248.0
                     100000
                                            Manual
                                                                24.40 1120.0
     5843
                               Diesel
                                                       First
                      55000
                                                                14.00 2498.0
     5844
                               Diesel
                                            Manual
                                                      Second
     5845
                      46000
                               Petrol
                                            Manual
                                                       First
                                                                18.90
                                                                        998.0
     5846
                      47000
                               Diesel
                                            Manual
                                                       First
                                                                25.44
                                                                        936.0
           Power Seats New_Price Price
     0
          126.20
                    5.0
                             nan 12.50
     1
           88.70
                    5.0
                            8.61
                                    4.50
     2
           88.76
                                   6.00
                    7.0
                             nan
```

```
63.10
                      5.0
                                      3.50
                                nan
     5842
            74.00
                      5.0
                              7.88
                                       4.75
     5843
            71.00
                      5.0
                                nan
                                       4.00
     5844
           112.00
                      8.0
                                       2.90
                                nan
     5845
            67.10
                      5.0
                                nan
                                      2.65
     5846
            57.60
                      5.0
                                nan
                                      2.50
     [5847 rows x 14 columns]
df['Engine'] = df['Engine'].astype(str)
df['Engine'] = df['Engine'].str.replace(' CC', '').astype(float)
print(df)
           Unnamed: 0
                                                     Name
                                                              Location
                                                                        Year
     0
                       Hyundai Creta 1.6 CRDi SX Option
                     1
                                                                 Pune
                                                                        2015
     1
                     2
                                             Honda Jazz V
                                                               Chennai
                                                                        2011
                                        Maruti Ertiga VDI
     2
                     3
                                                              Chennai
                         Audi A4 New 2.0 TDI Multitronic
                                                                        2013
     3
                     4
                                                           Coimbatore
     4
                     6
                                  Nissan Micra Diesel XV
                                                               Jaipur
                                                                        2013
     5842
                 6014
                                         Maruti Swift VDI
                                                                Delhi
                                                                        2014
     5843
                 6015
                                Hvundai Xcent 1.1 CRDi S
                                                                        2015
                                                               Jaipur
     5844
                  6016
                                   Mahindra Xylo D4 BSIV
                                                               Jaipur
                                                                        2012
     5845
                 6017
                                       Maruti Wagon R VXI
                                                              Kolkata
                                                                        2013
                                   Chevrolet Beat Diesel
     5846
                 6018
                                                            Hyderabad
                                                                        2011
           Kilometers_Driven Fuel_Type Transmission Owner_Type
                                                                  Mileage
                                                                           Engine
     0
                        41000
                                 Diesel
                                                           First
                                                                     19.67
                                               Manual
                                                                           1582.0
                        46000
     1
                                 Petrol
                                               Manual
                                                           First
                                                                     13.00
                                                                           1199.0
     2
                        87000
                                 Diesel
                                               Manual
                                                           First
                                                                     20.77
                                                                            1248.0
                        40670
     3
                                 Diesel
                                            Automatic
                                                           Second
                                                                     15.20
                                                                           1968.0
                        86999
     4
                                 Diesel
                                               Manual
                                                           First
                                                                     23.08
                                                                           1461.0
     5842
                        27365
                                 Diesel
                                               Manual
                                                           First
                                                                     28.40
                                                                            1248.0
     5843
                       100000
                                 Diesel
                                               Manual
                                                           First
                                                                     24.40
                                                                            1120.0
     5844
                        55000
                                 Diesel
                                               Manual
                                                          Second
                                                                     14.00
                                                                            2498.0
     5845
                        46000
                                 Petrol
                                               Manual
                                                           First
                                                                     18.90
                                                                             998.0
     5846
                        47000
                                 Diesel
                                               Manual
                                                           First
                                                                     25.44
                                                                             936.0
            Power
                    Seats New_Price
                                     Price
     0
           126.20
                                     12.50
                      5.0
                                nan
            88.70
                                       4.50
     1
                      5.0
                              8.61
     2
            88.76
                      7.0
                                nan
                                      6.00
     3
           140.80
                      5.0
                                nan
                                     17.74
            63.10
                      5.0
                                      3.50
                                nan
     5842
            74.00
                      5.0
                              7.88
                                       4.75
     5843
            71.00
                      5.0
                                       4.00
                                nan
     5844
           112.00
                      8.0
                                       2.90
                                nan
                                      2.65
     5845
            67.10
                      5.0
                                nan
     5846
            57.60
                                      2.50
     [5847 rows x 14 columns]
df['Power'] = df['Power'].astype(str)
df['Power'] = df['Power'].str.replace(' bhp', '', regex=True)
df['Power'] = df['Power'].str.replace('null', '0', regex=True).astype(float)
print(df)
           Unnamed: 0
                                                     Name
                                                              Location
                                                                        Year
     0
                     1
                        Hyundai Creta 1.6 CRDi SX Option
                                                                 Pune
                                                                        2015
     1
                     2
                                            Honda Jazz V
                                                               Chennai
                                                                        2011
     2
                     3
                                       Maruti Ertiga VDI
                                                              Chennai
                                                                        2012
     3
                     4
                         Audi A4 New 2.0 TDI Multitronic
                                                           Coimbatore
                                                                        2013
     4
                                  Nissan Micra Diesel XV
                                                               Jaipur
                                         Maruti Swift VDI
     5842
                  6014
                                                                Delhi
                                                                        2014
     5843
                  6015
                                Hyundai Xcent 1.1 CRDi S
                                                               Jaipur
                                                                        2015
     5844
                  6016
                                   Mahindra Xylo D4 BSIV
                                                               Jaipur
                                                                        2012
     5845
                 6017
                                      Maruti Wagon R VXI
                                                              Kolkata
                                                                        2013
     5846
                 6018
                                   Chevrolet Beat Diesel
                                                            Hyderabad
                                                                       2011
           Kilometers_Driven Fuel_Type Transmission Owner_Type Mileage
                                                                           Engine
     0
                        41000
                                 Diesel
                                               Manual
                                                           First
                                                                     19.67
                                                                           1582.0
     1
                        46000
                                 Petrol
                                               Manual
                                                           First
                                                                     13.00
                                                                            1199.0
     2
                        87000
                                                                     20.77
                                                                            1248.0
                                 Diesel
                                               Manual
                                                           First
                        40670
                                                                            1968.0
     3
                                 Diesel
                                            Automatic
                                                           Second
                                                                     15.20
     4
                        86999
                                 Diesel
                                               Manual
                                                           First
                                                                     23.08
                                                                            1461.0
                          . . .
```

```
27365
     5842
                              Diesel
                                           Manual
                                                       First
                                                                28.40 1248.0
                     100000
                                                                24.40 1120.0
     5843
                              Diesel
                                                       First
                                           Manual
     5844
                      55000
                              Diesel
                                           Manual
                                                      Second
                                                                14.00 2498.0
                                                                       998.0
     5845
                      46000
                               Petrol
                                           Manual
                                                       First
                                                                18.90
     5846
                      47000
                              Diesel
                                           Manual
                                                       First
                                                                25.44
                                                                       936.0
           Power Seats New_Price Price
     0
          126.20
                   5.0
                             nan 12.50
     1
           88.70
                    5.0
                            8.61
                                    4.50
                           nan 6.00
nan 17.74
     2
           88.76
                    7.0
     3
          140.80
                    5.0
     4
                            nan 3.50
           63.10
                    5.0
     5842
          74.00
                            7.88
                                  4.75
     5843
           71.00
                    5.0
                           nan
                                   4.00
     5844 112.00
                    8.0
                             nan 2.90
     5845
           67.10
                    5.0
                             nan 2.65
     5846
           57.60
                    5.0
                             nan
                                   2.50
     [5847 rows x 14 columns]
# Convert the 'New_Price' column to a string type
df['New_Price'] = df['New_Price'].astype(str)
# Now, you can use the .str accessor for string operations
df['New_Price'] = df['New_Price'].str.replace('Lakh', '').str.replace('Cr', '', regex=True)
# Handle empty strings by converting them to 0
df['New_Price'] = df['New_Price'].replace('', '0')
# Now, the 'New_Price' column should be processed correctly
print(df)
          Unnamed: 0
                                                         Location Year \
                                                 Name
     a
                   1 Hyundai Creta 1.6 CRDi SX Option
                                                          Pune 2015
     1
                                         Honda Jazz V
                                                          Chennai
                                                                  2011
     2
                                    Maruti Ertiga VDI
                                                          Chennai
                                                                   2012
     3
                      Audi A4 New 2.0 TDI Multitronic Coimbatore
                                                                  2013
     4
                  6
                               Nissan Micra Diesel XV
                                                           Jaipur 2013
     5842
                6014
                                     Maruti Swift VDI
                                                           Delhi 2014
                             Hyundai Xcent 1.1 CRDi S
     5843
                6015
                                                           Jaipur
                                                                  2015
     5844
                6016
                                Mahindra Xylo D4 BSIV
                                                           Jaipur
                                                                  2012
     5845
                6017
                                   Maruti Wagon R VXI
                                                          Kolkata 2013
     5846
                6018
                                 Chevrolet Beat Diesel Hyderabad 2011
           Kilometers_Driven Fuel_Type Transmission Owner_Type Mileage Engine \
     0
                      41000
                              Diesel
                                           Manual
                                                       First
                                                               19.67 1582.0
                      46000
     1
                              Petrol
                                           Manual
                                                       First
                                                               13.00 1199.0
     2
                      87000
                               Diesel
                                           Manual
                                                       First
                                                               20.77 1248.0
                                                                      1968.0
     3
                      40670
                               Diesel
                                       Automatic
                                                      Second
                                                               15.20
                      86999
                                                      First
     4
                                                               23.08 1461.0
                              Diesel
                                       Manual
                                           Manual
     5842
                      27365
                               Diesel
                                                       First
                                                                28.40 1248.0
                     100000
                                                                24.40 1120.0
     5843
                              Diesel
                                           Manual
                                                       First
     5844
                      55000
                                                                14.00 2498.0
                              Diesel
                                           Manual
                                                      Second
     5845
                      46000
                              Petrol
                                           Manual
                                                      First
                                                                18.90
                                                                       998.0
     5846
                      47000
                              Diesel
                                           Manual
                                                       First
                                                                25.44
                                                                       936.0
           Power
                  Seats New_Price Price
     0
          126.20
     1
           88.70
                    5.0
                            8.61
                                    4.50
     2
           88.76
                    7.0
                            nan 6.00
     3
          140.80
                             nan 17.74
                    5.0
     4
           63.10
                    5.0
                             nan
                                  3.50
     5842
           74.00
                    5.0
                           7.88
                                   4.75
     5843
           71.00
                    5.0
                             nan
                                   4.00
     5844
          112.00
                                   2.90
                    8.0
                             nan
     5845
           67.10
                    5.0
                             nan
                                   2.65
     5846
           57.60
                    5.0
                             nan
                                   2.50
     [5847 rows x 14 columns]
df.to_csv("Modified_data.csv", index=False)
```

Question

```
# Convert categorical variables to one-hot encoded values
print(df.columns)
     'Seats', 'New_Price', 'Price'],
          dtype='object')
df = pd.get_dummies(vs, columns=['Fuel_Type', 'Transmission'], prefix=['Fuel_Type', 'Transmission'])
# The columns 'Fuel_Type' and 'Transmission' should be one-hot encoded
print(df)
          Unnamed: 0
                                                        Location Year
                                                 Name
     0
                      Hyundai Creta 1.6 CRDi SX Option
                                                                  2015
                   1
                                                            Pune
                                                         Chennai
     1
                   2
                                         Honda Jazz V
                                                                  2011
     2
                   3
                                    Maruti Ertiga VDI
                                                          Chennai
                                                                  2012
                       Audi A4 New 2.0 TDI Multitronic Coimbatore
     3
                                                                  2013
     4
                   6
                               Nissan Micra Diesel XV
                                                          Jaipur
                                                                  2013
     5842
                6014
                                     Maruti Swift VDI
                                                            Delhi
                                                                  2014
                              Hyundai Xcent 1.1 CRDi S
                                                          Jaipur
     5843
                6015
                                                                  2015
     5844
                6016
                                Mahindra Xylo D4 BSIV
                                                          Jaipur
                                                                  2012
     5845
                                   Maruti Wagon R VXI
                6017
                                                          Kolkata 2013
     5846
                                Chevrolet Beat Diesel Hyderabad 2011
                6018
          Kilometers_Driven Owner_Type
                                          Mileage Engine
                                                               Power
                                                                      Seats
     0
                      41000
                                First 19.67 kmpl 1582 CC 126.2 bhp
                                                                        5.0
                      46000
                                                            88.7 bhp
     1
                                 First
                                         13 km/kg
                                                   1199 CC
                                                                        5.0
                                First 20.77 kmpl 1248 CC 88.76 bhp
     2
                      87000
                                                                        7.0
     3
                      40670
                                        15.2 kmpl
                                                   1968 CC
                                Second
                                                           140.8 bhp
                                                                        5.0
                                First 23.08 kmpl 1461 CC
     4
                      86999
                                                            63.1 bhp
                                                                        5.0
                                                   1248 CC
                                                               74 bhp
                      27365
                                 First
                                        28.4 kmpl
     5842
     5843
                     100000
                                        24.4 kmpl
                                                   1120 CC
                                                              71 bhp
                                                                        5.0
                                 First
                                        14.0 kmpl
     5844
                      55000
                                                   2498 CC
                                                             112 bhp
                                                                        8.0
                                Second
     5845
                      46000
                                First
                                        18.9 kmpl
                                                    998 CC
                                                            67.1 bhp
                                                                        5.0
                      47000
                                 First 25.44 kmpl
     5846
                                                    936 CC
                                                           57.6 bhp
          Price Fuel_Type_Diesel Fuel_Type_Electric Fuel_Type_Petrol
     0
          12.50
                               1
                                                   0
                                                                    0
     1
           4.50
                               0
                                                   0
                                                                    1
     2
           6.00
                               1
                                                   0
                                                                    0
     3
          17.74
                               1
                                                   0
                                                                    0
     4
           3.50
                               1
                                                   0
                                                                    0
           4.75
     5842
                               1
                                                   a
                                                                    а
     5843
           4.00
                                                   0
                                                                    0
     5844
           2.90
                                                   0
                                                                    0
                               1
           2.65
     5845
                               0
                                                   0
                                                                    1
     5846
           2.50
                               1
                                                   0
                                                                    a
          Transmission_Automatic Transmission_Manual
     0
                               0
                                                   1
     1
                               0
                                                   1
     2
                              0
                                                   1
     3
                              1
                                                   0
     4
                               0
                                                   1
     5842
                              0
                                                   1
     5843
                              0
                                                   1
     5844
                               0
     5845
                               0
                                                   1
     5846
                               0
                                                   1
     [5847 rows x 16 columns]
df.to_csv("Allocated.csv", index=False)
4) Question
import pandas as pd
import datetime
# Calculate the current year
current_year = datetime.datetime.now().year
```

print(df)

```
# Create a new column for the car's age
df['Car_Age'] = current_year - df['Year']
# Print the updated DataFrame
```

```
Location Year
     Unnamed: 0
0
              1 Hyundai Creta 1.6 CRDi SX Option
                                                          Pune
                                                                2015
1
              2
                                      Honda Jazz V
                                                       Chennai
                                                                2011
                                 Maruti Ertiga VDI
                                                       Chennai
                                                                2012
3
                  Audi A4 New 2.0 TDI Multitronic Coimbatore
                                                                2013
4
              6
                           Nissan Micra Diesel XV
                                                        Jaipur
                                                                2013
5842
            6014
                                  Maruti Swift VDI
                                                         Delhi
                                                                2014
5843
           6015
                          Hyundai Xcent 1.1 CRDi S
                                                                2015
                                                        Jaipur
5844
            6016
                            Mahindra Xylo D4 BSIV
                                                        Jaipur
                                                                2012
5845
            6017
                                Maruti Wagon R VXI
                                                       Kolkata
                                                                2013
                            Chevrolet Beat Diesel
5846
           6018
                                                    Hyderabad 2011
     Kilometers_Driven Fuel_Type Transmission Owner_Type Mileage
                                                                   Engine
0
                                                    First
                                                             19.67
                 41000
                          Diesel
                                        Manual
                                                                   1582.0
1
                 46000
                          Petrol
                                        Manual
                                                    First
                                                             13.00 1199.0
2
                  87000
                          Diesel
                                        Manual
                                                    First
                                                             20.77
                                                                   1248.0
3
                  40670
                           Diesel
                                     Automatic
                                                   Second
                                                             15.20
                                                                   1968.0
4
                  86999
                          Diesel
                                        Manual
                                                    First
                                                             23.08
                                                                   1461.0
5842
                  27365
                           Diesel
                                        Manual
                                                    First
                                                             28.40 1248.0
5843
                 100000
                          Diesel
                                        Manual
                                                    First
                                                             24.40
                                                                    1120.0
5844
                  55000
                          Diesel
                                        Manual
                                                   Second
                                                             14.00
                                                                    2498.0
5845
                  46000
                          Petrol
                                        Manual
                                                    First
                                                             18.90
                                                                     998.0
5846
                  47000
                          Diesel
                                        Manual
                                                    First
                                                             25.44
                                                                     936.0
             Seats New_Price Price Car_Age
      Power
0
     126.20
               5.0
                         nan
                              12.50
      88.70
               5.0
                        8.61
                                4.50
1
                                           12
                               6.00
2
      88.76
               7.0
                         nan
                                           11
3
     140.80
               5.0
                          nan
                               17.74
                                           10
      63.10
               5.0
                               3.50
                                           10
                         nan
      74.00
5842
               5.0
                        7.88
                                4.75
                                           9
5843
      71.00
               5.0
                                4.00
                                           8
                         nan
5844
     112.00
               8.0
                                2.90
                                           11
                         nan
5845
      67.10
               5.0
                          nan
                                2.65
                                           10
5846
      57.60
               5.0
                          nan
                               2.50
                                           12
```

[5847 rows x 15 columns]

df.to_csv("added_column.csv", index=False)