```
In [2]: data=pd.read_csv(r"C:\Users\Bhavya's Surface\Documents\pandas\CarsData.csv")
 In [4]: data
 Out[4]:
                Make
                         Model
                                 Type
                                       Origin DriveTrain
                                                        MSRP Invoice EngineSize Cylinders Horsepower MPG_City MPG_High
                          MDX
                                  SUV
                                                    All $36,945 $33,337
             0 Acura
                                         Asia
                                                                              3.5
                                                                                       6.0
                                                                                                 265.0
                                                                                                           17.0
                       RSX Type
                                                                                                 200.0
             1 Acura
                                Sedan
                                         Asia
                                                  Front $23,820 $21,761
                                                                              2.0
                                                                                       4.0
                                                                                                           24.0
                          S 2dr
                                                  Front $26,990 $24,647
                                                                              2.4
                                                                                       4.0
                                                                                                 200.0
                                                                                                           22.0
             2 Acura
                        TSX 4dr Sedan
                                         Asia
                         TL 4dr Sedan
                                                  Front $33,195 $30,299
                                                                                                 270.0
                                                                                                           20.0
             3 Acura
                                         Asia
                                                                              3.2
                                                                                       6.0
             4 Acura 3.5 RL 4dr Sedan
                                         Asia
                                                  Front $43,755 $39,014
                                                                              3.5
                                                                                       6.0
                                                                                                 225.0
                                                                                                           18.0
                        C70 LPT
           427 Volvo convertible Sedan Europe
                                                  Front $40,565 $38,203
                                                                              2.4
                                                                                       5.0
                                                                                                 197.0
                                                                                                           21.0
                            2dr
                       C70 HPT
                                                                                                 242.0
                                                                                                           20.0
           428 Volvo
                      convertible
                                Sedan Europe
                                                  Front $42,565 $40,083
                                                                              2.3
                                                                                       5.0
                           2dr
                         S80 T6
                                Sedan Europe
                                                                                                 268.0
                                                                                                           19.0
            429 Volvo
                                                  Front $45,210 $42,573
                                                                                       6.0
                                                                              2.9
                            4dr
                                                  Front $26,135 $24,641
            430 Volvo
                           V40 Wagon Europe
                                                                              1.9
                                                                                       4.0
                                                                                                 170.0
                                                                                                           22.0
           431 Volvo
                          XC70 Wagon Europe
                                                    All $35,145 $33,112
                                                                              2.5
                                                                                       5.0
                                                                                                 208.0
                                                                                                           20.0
          432 rows × 15 columns
 In [5]: data.shape
 Out[5]: (432, 15)
 In [7]: data.isnull().sum()
 Out[7]: Make
                            4
          Model
                            4
          Type
                            4
          Origin
                            4
          DriveTrain
                            4
          MSRP
                            4
          Invoice
                            4
          EngineSize
                            4
                            6
          Cylinders
           Horsepower
          MPG_City
          MPG_Highway
          Weight
                            4
          Wheelbase
                            4
          Length
          dtype: int64
 In [9]: #filling the null with the mean of the respective column
           data['Cylinders'].fillna(data['Cylinders'].mean(), inplace=True)
          data
In [10]:
Out[10]:
                Make
                         Model
                                  Type
                                       Origin DriveTrain
                                                         MSRP Invoice EngineSize Cylinders Horsepower MPG_City MPG_Higl
             O Acura
                          MDX
                                  SUV
                                         Asia
                                                    All $36,945 $33,337
                                                                              3.5
                                                                                       6.0
                                                                                                 265.0
                                                                                                           17.0
             1 Acura
                                                  Front $23,820 $21,761
                                                                                       4.0
                                                                                                 200.0
                                                                                                           24.0
                                Sedan
                                         Asia
                          S 2dr
                                                  Front $26,990 $24,647
                                                                                       4.0
                                                                                                 200.0
                                                                                                           22.0
                        TSX 4dr Sedan
                                                                              2.4
             2 Acura
                                         Asia
                         TL 4dr Sedan
                                                  Front $33,195 $30,299
                                                                              3.2
                                                                                       6.0
                                                                                                 270.0
                                                                                                           20.0
             3 Acura
                                         Asia
                                                                              3.5
                                                                                       6.0
                                                                                                 225.0
                                                                                                           18.0
             4 Acura 3.5 RL 4dr Sedan
                                         Asia
                                                  Front $43,755 $39,014
                        C70 LPT
            427 Volvo convertible
                                Sedan Europe
                                                  Front $40,565 $38,203
                                                                              2.4
                                                                                       5.0
                                                                                                 197.0
                                                                                                           21.0
                            2dr
                       C70 HPT
                                                  Front $42,565 $40,083
                                                                              2.3
                                                                                       5.0
                                                                                                 242.0
                                                                                                           20.0
           428 Volvo convertible
                                Sedan Europe
                         S80 T6
            429 Volvo
                                Sedan Europe
                                                  Front $45,210 $42,573
                                                                                                 268.0
                                                                                                           19.0
                                                                              2.9
                                                                                       6.0
                                                  Front $26,135 $24,641
            430 Volvo
                           V40 Wagon Europe
                                                                              1.9
                                                                                       4.0
                                                                                                 170.0
                                                                                                           22.0
            431 Volvo
                          XC70 Wagon Europe
                                                    All $35,145 $33,112
                                                                              2.5
                                                                                                 208.0
                                                                                                           20.0
           432 rows × 15 columns
In [14]: #total no. of manufacturers
           data['Make'].value_counts()
Out[14]: Toyota
                              28
          Chevrolet
                              27
          Mercedes-Benz
                              26
                              23
          Ford
          BMW
                              20
          Audi
                              19
                              17
          Honda
                              17
          Nissan
          Chrysler
                              15
          Volkswagen
                              15
                              13
          Dodge
          Mitsubishi
                              13
                              12
          Jaguar
                              12
          Hyundai
          Volvo
                              12
                              11
          Lexus
          Subaru
                              11
          Kia
                              11
          Mazda
                              11
          Pontiac
                              11
          Lincoln
          Mercury
          Buick
          Infiniti
          GMC
          Suzuki
          Cadillac
          Saturn
          Acura
          Porsche
          Saab
           Jeep
          Land Rover
                               3
          Oldsmobile
          MINI
          Scion
          Isuzu
          Hummer
          Name: Make, dtype: int64
In [19]: #origin is asia or europe
           data[(data['Origin']=='Asia') & (data['Origin']=='Europe')].sum().value_counts()
Out[19]: 0.0
          dtype: int64
In [17]: data[data['Origin'].isin(['Asia', 'Europe'])]
Out[17]:
                                 Type Origin DriveTrain MSRP Invoice EngineSize Cylinders Horsepower MPG_City MPG_Higl
                Make
                         Model
             O Acura
                          MDX
                                                    All $36,945 $33,337
                                                                                                 265.0
                                                                                                           17.0
                                  SUV
                                                                              3.5
                                                                                       6.0
                       RSX Type
             1 Acura
                                Sedan
                                                  Front $23,820 $21,761
                                                                              2.0
                                                                                       4.0
                                                                                                 200.0
                                                                                                           24.0
                                         Asia
                          S 2dr
                                                                                                 200.0
                        TSX 4dr Sedan
                                                  Front $26,990 $24,647
                                                                              2.4
                                                                                       4.0
                                                                                                           22.0
             2 Acura
                                         Asia
                                                  Front $33,195 $30,299
                                                                                       6.0
                                                                                                 270.0
                                                                                                           20.0
             3 Acura
                         TL 4dr
                                Sedan
                                         Asia
                                                                              3.2
                                                                                                 225.0
                                                                                                           18.0
             4 Acura 3.5 RL 4dr Sedan
                                                  Front $43,755 $39,014
                                                                              3.5
                                                                                       6.0
                                         Asia
                        C70 LPT
                                                  Front $40,565 $38,203
            427 Volvo convertible Sedan Europe
                                                                                       5.0
                                                                                                 197.0
                                                                                                           21.0
                       C70 HPT
                                                                                       5.0
                                                                                                 242.0
                                                                                                           20.0
           428 Volvo convertible Sedan Europe
                                                  Front $42,565 $40,083
                                                                              2.3
                         S80 T6
            429 Volvo
                                Sedan Europe
                                                  Front $45,210 $42,573
                                                                                       6.0
                                                                                                 268.0
                                                                                                           19.0
                                                                              2.9
                           4dr
                           V40 Wagon Europe
                                                                                                 170.0
            430
                Volvo
                                                  Front $26,135 $24,641
                                                                              1.9
                                                                                       4.0
                                                                                                           22.0
           431 Volvo
                          XC70 Wagon Europe
                                                    All $35,145 $33,112
                                                                              2.5
                                                                                       5.0
                                                                                                 208.0
                                                                                                           20.0
           281 rows × 15 columns
In [24]: data[~(data['Weight']>4000)]
Out[24]:
                Make
                           Model Type Origin DriveTrain MSRP Invoice EngineSize Cylinders Horsepower MPG_City MPG_Hi
                      RSX Type S
2dr
                                  Sedan
             1 Acura
                                                    Front $23,820 $21,761
                                                                                         4.0
                                                                                                  200.0
                                                                                                             24.0
                                          Asia
                                                                               2.0
             2 Acura
                         TSX 4dr Sedan
                                                    Front $26,990 $24,647
                                                                                         4.0
                                                                                                  200.0
                                                                                                             22.0
                                          Asia
                          TL 4dr Sedan
                                                    Front $33,195 $30,299
                                                                               3.2
                                                                                         6.0
                                                                                                  270.0
                                                                                                             20.0
             3 Acura
                                          Asia
                        3.5 RL 4dr
                                                    Front $43,755 $39,014
                                                                                                  225.0
                                                                                                             18.0
             4 Acura
                                 Sedan
                                          Asia
                          3.5 RL
                                                    Front $46,100 $41,100
                                                                                                  225.0
                                                                                                             18.0
             5 Acura w/Navigation Sedan
                                          Asia
                             4dr
                         C70 LPT
                                                    Front $40,565 $38,203
                                                                                                  197.0
            427 Volvo
                       convertible Sedan Europe
                                                                                         5.0
                                                                                                             21.0
                             2dr
                         C70 HPT
                                                                                                  242.0
                                                                                                             20.0
           428 Volvo
                        convertible
                                  Sedan Europe
                                                    Front $42,565 $40,083
                                                                               2.3
                                                                                        5.0
                             2dr
                       S80 T6 4dr Sedan Europe
                                                                                                  268.0
                                                                                                             19.0
            429 Volvo
                                                    Front $45,210 $42,573
                                                                               2.9
                                                                                         6.0
                                                    Front $26,135 $24,641
                                                                                                  170.0
                                                                                                             22.0
            430
                                 Wagon Europe
                                                                               1.9
                                                                                         4.0
                                                      All $35,145 $33,112
                                                                                                  208.0
                                                                                                             20.0
           431 Volvo
                           XC70 Wagon Europe
           329 rows × 15 columns
```

In []:

In [1]: import pandas as pd