Solution 1:

In [1]:
```
import pandas as pd
import numpy as np
df = pd.read_csv("Toyota.csv")
print(df.head())
# we can use to_string method for reading csv file we can use head and tail funtion to read from bottom and top of the file,by
```

```
   Unnamed: 0  Price   Age     KM FuelType  HP  MetColor  Automatic    CC  \
0           0  13500  23.0  46986   Diesel  90       1.0          0  2000
1           1  13750  23.0  72937   Diesel  90       1.0          0  2000
2           2  13950  24.0  41711   Diesel  90       NaN          0  2000
3           3  14950  26.0  48000   Diesel  90       0.0          0  2000
4           4  13750  30.0  38500   Diesel  90       0.0          0  2000

   Doors  Weight
0  three    1165
1      3    1165
2      3    1165
3      3    1165
4      3    1170
```

Solution 2

In [2]:
```
new_string = df.replace("?", " ")
new_string1 = df.replace("***", " ")
new_string2 = df.replace("??", " ")
print(new_string)
print(new_string1)
print(new_string2)
```

```
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500   NaN  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0     ??   Petrol   86       0.0          0  1300
1433        1433   8500   NaN  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0     ??      NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

      Doors  Weight
0     three    1165
1         3    1165
2         3    1165
3         3    1165
4         3    1170
...     ...     ...
1431      3    1025
1432      3    1015
1433      3    1015
1434      3    1015
1435      5    1114

[1436 rows x 11 columns]
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500   NaN  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0     ??   Petrol   86       0.0          0  1300
1433        1433   8500   NaN  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0     ??      NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

      Doors  Weight
```

```
0     three    1165
1         3    1165
2         3    1165
3         3    1165
4         3    1170
...     ...     ...
1431      3    1025
1432      3    1015
1433      3    1015
1434      3    1015
1435      5    1114

[1436 rows x 11 columns]
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500   NaN  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0         Petrol   86       0.0          0  1300
1433        1433   8500   NaN  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0            NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

      Doors  Weight
0     three    1165
1         3    1165
2         3    1165
3         3    1165
4         3    1170
...     ...     ...
1431      3    1025
1432      3    1015
1433      3    1015
1434      3    1015
1435      5    1114

[1436 rows x 11 columns]
```

Solution 3:

In [3]:
```
print(" \nCount total NaN at each column in a DataFrame : \n\n", df.isnull().sum() )
```

```
Count total NaN at each column in a DataFrame :

 Unnamed: 0      0
Price            0
Age            100
KM               0
FuelType       100
HP               0
MetColor       150
Automatic        0
CC               0
Doors            0
Weight           0
dtype: int64
```

Solution : 4

In [4]:
```
df['Age'] = df['Age'].fillna(df['Age'].median())
print(df['Age'])
```

```
0       23.0
1       23.0
2       24.0
3       26.0
4       30.0
        ...
1431    60.0
1432    72.0
1433    60.0
1434    70.0
1435    76.0
Name: Age, Length: 1436, dtype: float64
```

Solution :5

In [5]:
```
new_string = df.replace("three", "3")
new_string1 = df.replace("four", "4")
new_string2= df.replace("two", "2")
new_string3 = df.replace("one", "1")
print(new_string)
print(new_string1)
print(new_string2)
print(new_string3)
```

```
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500  60.0  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0     ??   Petrol   86       0.0          0  1300
1433        1433   8500  60.0  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0     ??      NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

     Doors  Weight
0        3    1165
1        3    1165
2        3    1165
3        3    1165
4        3    1170
...    ...     ...
1431     3    1025
1432     3    1015
1433     3    1015
1434     3    1015
1435     5    1114

[1436 rows x 11 columns]
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500  60.0  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0     ??   Petrol   86       0.0          0  1300
1433        1433   8500  60.0  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0     ??      NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

      Doors  Weight
```

```
0     three    1165
1         3    1165
2         3    1165
3         3    1165
4         3    1170
...     ...     ...
1431      3    1025
1432      3    1015
1433      3    1015
1434      3    1015
1435      5    1114

[1436 rows x 11 columns]
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500  60.0  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0     ??   Petrol   86       0.0          0  1300
1433        1433   8500  60.0  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0     ??      NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

      Doors  Weight
0     three    1165
1         3    1165
2         3    1165
3         3    1165
4         3    1170
...     ...     ...
1431      3    1025
1432      3    1015
1433      3    1015
1434      3    1015
1435      5    1114

[1436 rows x 11 columns]
      Unnamed: 0  Price   Age     KM FuelType   HP  MetColor  Automatic    CC  \
```

```
0              0  13500  23.0  46986   Diesel   90       1.0          0  2000
1              1  13750  23.0  72937   Diesel   90       1.0          0  2000
2              2  13950  24.0  41711   Diesel   90       NaN          0  2000
3              3  14950  26.0  48000   Diesel   90       0.0          0  2000
4              4  13750  30.0  38500   Diesel   90       0.0          0  2000
...          ...    ...   ...    ...      ...  ...       ...        ...   ...
1431        1431   7500  60.0  20544   Petrol   86       1.0          0  1300
1432        1432  10845  72.0     ??   Petrol   86       0.0          0  1300
1433        1433   8500  60.0  17016   Petrol   86       0.0          0  1300
1434        1434   7250  70.0     ??      NaN   86       1.0          0  1300
1435        1435   6950  76.0      1   Petrol  110       0.0          0  1600

      Doors  Weight
0     three    1165
1         3    1165
2         3    1165
3         3    1165
4         3    1170
...     ...     ...
1431      3    1025
1432      3    1015
1433      3    1015
1434      3    1015
1435      5    1114

[1436 rows x 11 columns]
```

Solution : 6

In [6]:
```
df['FuelType'].value_counts()
```

Out[6]:
```
FuelType
Petrol    1177
Diesel     144
CNG         15
Name: count, dtype: int64
```

Solution 7

In [7]:
```
df['FuelType'] = df['FuelType'].fillna(df['FuelType'].mode())
print(df['FuelType'])
```

```
0       Diesel
1       Diesel
2       Diesel
3       Diesel
4       Diesel
         ...
1431    Petrol
1432    Petrol
1433    Petrol
1434       NaN
1435    Petrol
Name: FuelType, Length: 1436, dtype: object
```

Solution 8

In [8]:
```
df['MetColor'] = df['MetColor'].fillna(df['MetColor'].mode())
print(df['MetColor'])
```

```
0       1.0
1       1.0
2       NaN
3       0.0
4       0.0
       ...
1431    1.0
1432    0.0
1433    0.0
1434    1.0
1435    0.0
Name: MetColor, Length: 1436, dtype: float64
```

Solution : 9

In [9]:
```
df['FuelType'] = df['FuelType'].replace(" Petrol", "0")
df['FuelType']= df['FuelType'].replace("diesel", "1")
```

```
df['FuelType']= df['FuelType'].replace("CNG", "2")
print(df['FuelType'])
```

```
0       Diesel
1       Diesel
2       Diesel
3       Diesel
4       Diesel
         ...
1431    Petrol
1432    Petrol
1433    Petrol
1434       NaN
1435    Petrol
Name: FuelType, Length: 1436, dtype: object
```

********** PART B **********

Solution :1

In [ ]: