WEEK- 7: Applications-Practice:Iris dataset from scikit learn perform data exploration,preprocessing and splitting

Session No.3

Data Cleaning With Python Pandas

In [7]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import os
```

[8]:

```
print(os.listdir())
```

```
['.anaconda', '.bash_history', '.conda', '.condarc', '.continuum', '.gitconf
ig', '.idea', '.ipynb_checkpoints', '.ipython', '.jupyter', '.lesshst', '.ma
tplotlib', '.packettracer', '.viminfo', '.VirtualBox', '.vscode', '1st inter
nal.ipynb', '87.py', 'aiml', 'AIML files', 'AIML_CIE1-2.b.ipynb', 'anaconda
3', 'anakonda', 'AppData', 'Application Data', 'area.py', 'Assignment Week 4
& 5.ipynb', 'Atlassian', 'BFS.py', 'BOSTON_KERAS.ipynb', 'Cal.csv', 'calc.p
y', 'Cars Pro.ipynb', 'Cars Program.ipynb', 'CIE 2.b Ans.ipynb', 'CIE 2.ipyn
b', 'CIE 3 Question Paper.ipynb', 'CIE-2.b.ipynb', 'CIE-3.ipynb', 'Cisco Pac
ket Tracer 8.1.1', 'Company_web', 'Confusion matrix and Accuracy.ipynb', 'Co
ntacts', 'Cookies', 'Cross validation 1.ipynb', 'Data Integration 4Week.ipyn
b', 'DataVisualization MATPLOTLIB.ipynb', 'DC with PP.ipynb', 'Decision Tre
e.ipynb', 'DFS.py', 'Documents', 'Downloads', 'Dtree BreastCancer.ipynb', 'E
mp1.py', 'Emp11.py', 'Emp2.py', 'Emp3.py', 'Emp4.py', 'Emp5.py', 'Emp6.py',
'Emp7.py', 'Emp8.py', 'Emp9.py', 'ex.py', 'exp.py', 'exp1.py', 'exp2.py', 'e
xp3.py', 'Factorial.py', 'Favorites', 'Fibonacci.py', 'first python.py', 'fi
rst.py', 'Geometry.py', 'Grouping pandas .ipynb', 'Hash.py', 'hello.py.ipyn
b', 'hello.txt', 'import libraries.py', 'IntelGraphicsProfiles', 'K-means Cl
ustering.ipynb', 'LinearRegression.ipynb', 'LinearRegression1.ipynb', 'Linke
dList.py', 'LinkedList1.py', 'Links', 'Local Settings', 'Logistic Regressio
n.ipynb', 'main.py', 'MediaGet2', 'ML Library.ipynb', 'Movie_data.ipynb', 'M
TCars.csv File.ipynb', 'Multiple Linear Regression.ipynb', 'Music', 'My Docu
ments', 'NetHood', 'New Microsoft Excel Worksheet.xlsx', 'New Microsoft Word
Document.docx', 'NTUSER.DAT', 'ntuser.dat.LOG1', 'ntuser.dat.LOG2', 'NTUSER.
DAT{1c2b59c6-c5f5-11eb-bacb-000d3a96488e}.TM.blf', 'NTUSER.DAT{1c2b59c6-c5f5
-11eb-bacb-000d3a96488e}.TMContainer00000000000000000001.regtrans-ms', 'NTUS
ER.DAT{1c2b59c6-c5f5-11eb-bacb-000d3a96488e}.TMContainer0000000000000000000
2.regtrans-ms', 'ntuser.ini', 'Numpy DataFrame.ipynb', 'Numpy Moduls.ipynb',
'OneDrive', 'Pandas DataFrame.ipynb', 'pictures1.py', 'Polynomial Regressio
n.ipynb', 'Precision, Recall, F1 Score.ipynb', 'PrintHood', 'PriorityQueue.p
y', 'PycharmProjects', 'python.py', 'python1.py', 'python2.py', 'python3.p
y', 'python4.py', 'python5.py', 'python6.py', 'python7.py', 'python8. py.tx
t', 'python9.py', 'Queue.py', 'Random Forest.ipynb', 'Recent', 'Reg no.43.ip
ynb', 'Regression Matrics.ipynb', 'Saved Games', 'seaborn-data', 'Searches',
'SendTo', 'sh.py.ipynb', 'Shru', 'shru.DB', 'shru.main.py', 'shru.num.py',
'shru.py', 'shru.set.py', 'shru.tuple.py', 'shru1.py', 'shrushti.py', 'Simpl
e Linear Regression .ipynb', 'skill test.py', 'sonu.DB', 'sonu.py', 'stack.p
y', 'stack_main.py', 'Start Menu', 'stu.py', 'Support Vector Machine.ipynb',
'Templates', 'testrepo', 'Time Series.ipynb', 'ubuntu-2022-07-10-14-26-58.lo
g', 'Univariate Pro.ipynb', 'Untitled Folder', 'Untitled.ipynb', 'Untitled1
0.ipynb', 'Untitled11.ipynb', 'Untitled12.ipynb', 'Untitled13.ipynb', 'Untit
led14.ipynb', 'Untitled15.ipynb', 'Untitled16.ipynb', 'Untitled17.ipynb', 'U
ntitled18.ipynb', 'Untitled19.ipynb', 'Untitled2.ipynb', 'Untitled20.ipynb',
'Untitled21.ipynb', 'Untitled22.ipynb', 'Untitled23.ipynb', 'Untitled24.ipyn
b', 'Untitled25.ipynb', 'Untitled26.ipynb', 'Untitled27.ipynb', 'Untitled28.
ipynb', 'Untitled29.ipynb', 'Untitled3.ipynb', 'Untitled30.ipynb', 'Untitled
31.ipynb', 'Untitled32.ipynb', 'Untitled33.ipynb', 'Untitled4.ipynb', 'Untit
led5.ipynb', 'Untitled6.ipynb', 'Untitled7.ipynb', 'Untitled8.ipynb', 'Untit
```

```
df = pd.read_csv("C:\\Users\\maths\\aiml\\flights.csv")
```

In

```
led9.ipynb', 'usermodule.py', 'Videos', 'VirtualBox VM', 'VirtualBox VMs',
'VirtualBox VMs1', 'volume.py', 'Week-6.ipynb', '__init_.py']
```

In [9]:
 [10]:

```
df
```

Out[10]:

	Unnamed: 0	year	month	passenger
0	0	1949.0	January	112.0
1	1	NaN	February	118.0
2	2	1949.0	March	NaN
3	3	1949.0	April	129.0
4	4	1949.0	May	121.0
5	5	1949.0	June	113.0
6	6	1949.0	July	124.0
7	7	1949.0	August	126.0
8	8	1949.0	Septmber	132.0
9	9	1949.0	Octomber	116.0
10	10	NaN	November	114.0
11	11	1949.0	December	117.0

In [11]:

```
df.isnull().sum()
```

Out[11]:

```
Unnamed: 0    0 year
2 month         0
passenger     1
dtype: int64
```

Handling the program

Step 1: Detecting NA N/A and na Values

In [14]:

```
missing_value=["N/a","na",np.nan]
df=pd.read_csv("C:\\Users\\maths\\aiml\\flights.csv",na_values=missing_val
ue)
```

[15]:

```
df.isnull().sum()
```

Out[15]:

```
Unnamed: 0    0
year          2
month         0
passenger     1
dtype: int64 In
```

[16]:

```
df.isnull().any()
```

Out[16]:

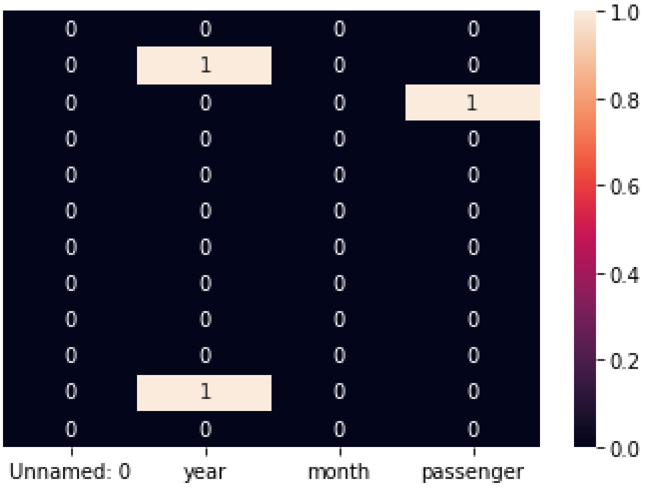
```
Unnamed: 0    False
year           True
month         False
passenger      True
dtype: bool In
```

[19]:

```
sns.heatmap(df.isnull(), yticklabels=False, annot=True)
```

Out[19]:

```
<AxesSubplot:>
```



Step 2: Lets learn how to to Remove this Values

In [25]:

```
df1 = pd.DataFrame(data={
    "year":[1,np.nan,3,2,3],
    "month":[22,np.nan,2,np.nan,22]
})
```

In

month

[26]:

```
df1
```

Out[26]:

	year	
0	1.0	22.0
1	NaN	NaN
2	3.0	2.0
3	2.0	NaN
4	3.0	22.0

In [28]:

```
df1.dropna()
```

Out[28]:

	year	month
0	1.0	22.0
2	3.0	2.0
4	3.0	22.0

In [29]:

```
df1.dropna(how='all')
```

Out[29]: **year**

month

0	1.0	22.0
2	3.0	2.0
3	2.0	NaN
4	3.0	22.0

[30]:

```
df1
```

Out[30]:

In

```
```

	year	month
0	1.0	22.0
1	NaN	NaN
2	3.0	2.0
3	2.0	NaN
4	3.0	22.0

In [31]:

```python
df1.fillna(0)
```

Out[31]:

	year	month
0	1.0	22.0
1	0.0	0.0
2	3.0	2.0
3	2.0	0.0
4	3.0	22.0

In [32]:

```python
# Forward fill
df1.fillna(method='ffill')
```

Out[32]:

	year	month
0	1.0	22.0
1	1.0	22.0
2	3.0	2.0
3	2.0	2.0
4	3.0	22.0

[33]:

```python
df1
```

Out[33]:

In

```

```

	year	month
0	1.0	22.0
1	NaN	NaN
2	3.0	2.0
3	2.0	NaN
4	3.0	22.0

In [34]:

```python
# Backward fill
df1.fillna(method='bfill')
```

Out[34]:

	year	month
0	1.0	22.0
1	3.0	2.0
2	3.0	2.0
3	2.0	22.0
4	3.0	22.0

In [35]:

```python
df1.interpolate()
```

Out[35]:

	year	month
0	1.0	22.0
1	2.0	12.0
2	3.0	2.0
3	2.0	12.0
4	3.0	22.0

In [36]:

```python
df_drop = df.dropna()
```

[37]:

```
df_drop
```

Out[37]:

	Unnamed: 0	year	month	passenger
0	0	1949.0	January	112.0
3	3	1949.0	April	129.0
4	4	1949.0	May	121.0
5	5	1949.0	June	113.0
6	6	1949.0	July	124.0
7	7	1949.0	August	126.0
8	8	1949.0	Septmber	132.0
9	9	1949.0	Octomber	116.0
11	11	1949.0	December	117.0

In [38]:

```
df
```

Out[38]:

	Unnamed: 0	year	month	passenger
0	0	1949.0	January	112.0
1	1	NaN	February	118.0
2	2	1949.0	March	NaN
3	3	1949.0	April	129.0
4	4	1949.0	May	121.0
5	5	1949.0	June	113.0
6	6	1949.0	July	124.0
7	7	1949.0	August	126.0
8	8	1949.0	Septmber	132.0
9	9	1949.0	Octomber	116.0
10	10	NaN	November	114.0
11	11	1949.0	December	117.0

In [39]:

```
df.fillna({
    'year':232323
})
```

Out[39]:

	Unnamed: 0	year	month	passenger
0	0	1949.0	January	112.0
1	1	232323.0	February	118.0
2	2	1949.0	March	NaN
3	3	1949.0	April	129.0
4	4	1949.0	May	121.0
5	5	1949.0	June	113.0
6	6	1949.0	July	124.0
7	7	1949.0	August	126.0
8	8	1949.0	Septmber	132.0
9	9	1949.0	Octomber	116.0
10	10	232323.0	November	114.0
11	11	1949.0	December	117.0

In [ ]:

Training and Testing Data

:

```
impor  panda  a  |
(  |  read_csv "C:\\Users\\maths\\aiml\\carPrice.csv"
(  hea
```

Out[74]:

	Mileage	Age(yrs)	Sell Price($)
0	69000	6	18000
1	35000	3	34000
2	57000	5	26100
3	225000	2	40000
4	46000	4	31500

:

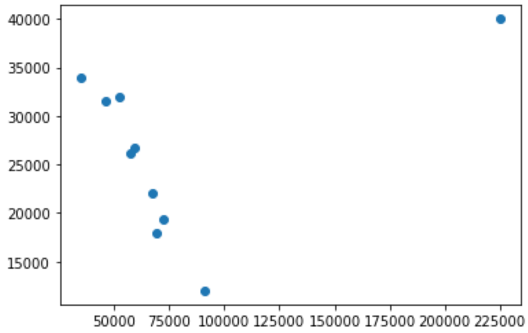
```
impor  matplotlib pyplo  a  p
 matplotlib inlin
```

:

```
p   scatter (  'Mileage'  (  'Sell Price($)'
```

Out[76]:

```
matplotlib.collections.PathCollection at  0x2297842d130>
```



:

```
  (   'Mileage' 'Age(yrs)'
  (  'Sell Price($)'
```

:

```

```

Out[78]:

	Mileage	Age(yrs)
0	69000	6
1	35000	3
2	57000	5
3	225000	2
4	46000	4
5	59000	5

In

```
6   52000      5

7   72000      6

8   91000      8

9   67000      6
```

In [79]:

```

```

Out[79]:

```
0    18000
1    34000
2    26100
3    40000
4    31500
5    26750
6    32000
7    19300
8    12000
9    22000
Name: Sell Price($), dtype: int64 In
```

[80]:

```
      fro  sklearn model_selection  impor  train_test_split
      x_train x_tes  y_train y_tes    train_test_split      test_size  0
```

:

```
      prin  "X:  l

      prin  "X_train:" l   x_train

      prin  "X_test:" l   x_tes
```

```
  X:
  X_train: 8
X_test: 2 In
```

[82]:

```
      x_train
```

Out[82]: **Mileage**

Age(yrs)

```
  8  91000       8
  2  57000       5
  5  59000       5
  0  69000       6
  9  67000       6
  3 225000       2
  7  72000       6
  6  52000       5
```

In [83]:

```
      x_tes
```

Out[83]: **Mileage**

Age(yrs)

```
  4  46000       4
  1  35000       3
```

In [84]:

```
y_train
```

Out[84]:

```
8    12000
2    26100
5    26750
0    18000
9    22000
3    40000
7    19300
6    32000
Name: Sell Price($), dtype: int64 In
[85]:
```

```
y_tes
```

Out[85]:

```
4    31500
1    34000
   Name: Sell Price($), dtype: int64 In
```