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

In [2]:
```
dict1={'Name':['Ram','Sita
','Laxman',np.nan],
'Age':[30,31,np.nan,33],
'City':[np.nan,'Hyd','Pune
','Chennai']}
pd.DataFrame(dict1)
```

Out[2]:

	Name	Age	City
0	Ram	30.0	NaN
1	Sita	31.0	Hyd
2	Laxman	NaN	Pune
3	NaN	33.0	Chennai

In [3]:
```
dict1={'Name':['Ram','Sit
a','Laxman',None],
'Age':[30,31,None,33],
'City':[None,'Hyd','Pune'
,'Chennai']}
pd.DataFrame(dict1)
```

Out[3]:

	Name	Age	City
0	Ram	30.0	None
1	Sita	31.0	Hyd
2	Laxman	NaN	Pune
3	None	33.0	Chennai

In [4]:
```
dict1={'Name':['Ram','Sita
','Laxman',"Null"],
'Age':[30,31,"Null",33],
'City':["Null",'Hyd','Pune
','Chennai']}
pd.DataFrame(dict1)
```

Out[4]:

	Name	Age	City
0	Ram	30	Null
1	Sita	31	Hyd
2	Laxman	Null	Pune
3	Null	33	Chennai

In [5]:
```
# Recommended
dict1={'Name':['Ram','Sita
','Laxman',np.nan],
'Age':[30,31,np.nan,33],
'City':[np.nan,'Hyd','Pune
','Chennai']}

df=pd.DataFrame(dict1)
df
```

Out[5]:

	Name	Age	City
0	Ram	30.0	NaN
1	Sita	31.0	Hyd
2	Laxman	NaN	Pune
3	NaN	33.0	Chennai

********h**** – 1**

:

Fill with a random number to all Null values

In [6]:
```
df.isnull
()
```

Out[6]:

	Name	Age	City
0	False	False	True
1	False	False	False
2	False	True	False
3	True	False	False

In [11]:
```
df.isnull().sum()
.count()
```

Out[11]: 3

In [10]:
```
df.isna()
```

Out[10]:

	Name	Age	City
0	False	False	True
1	False	False	False
2	False	True	False
3	True	False	False

****

In [15]:
```
df.fillna(40,inpl
ace=True)
```

In [16]:
```
df
```

Out[16]:

	Name	Age	City
0	Ram	30.0	40
1	Sita	31.0	Hyd
2	Laxman	40.0	Pune
3	40	33.0	Chennai

In [17]:
```
df.dtypes
```

Out[17]:
```
Name object
Age float64
City object
dtype: object
```

******h**** - 2

Fill the random value by using column wise

In [18]:
```
###################### Read the data again ##########################
dict1={'Name':['Ram','Sita','Laxman',np.nan],
       'Age':[30,31,np.nan,33],
       'City':[np.nan,'Hyd','Pune','Chennai']}

df=pd.DataFrame(dict1)
df
```

Out[18]:

	Name	Age	City
0	Ram	30.0	NaN
1	Sita	31.0	Hyd
2	Laxman	NaN	Pune
3	NaN	33.0	Chennai

In [20]:
```
df['Name'].fillna("Raheem",inplace=True)
df['Age'].fillna(32,inplace=True)
df['City'].fillna("Blr",inplace=True)
df
```

Out[20]:

	Name	Age	City
0	Ram	30.0	Blr
1	Sita	31.0	Hyd
2	Laxman	32.0	Pune
3	Raheem	33.0	Chennai

******h**** - 3

- pad
- bfill
- backfill
- ffill

In [21]:
```
################### Read the data
```

```
again ################
dict1={'Name':['Ram','Sita','Lax
man',np.nan],
'Age':[30,31,np.nan,33],
```

```
'City':[np.nan,'Hyd','Pune','Che
nnai']}

df=pd.DataFrame(dict1)
df
```

Out[21]:

	Name	Age	City
0	Ram	30.0	NaN
1	Sita	31.0	Hyd
2	Laxman	NaN	Pune
3	NaN	33.0	Chennai


```
print(df)
```

In [24]:

```
print("========origina
l===========")
```

```
print("======pad======
=====")
```

```
print(df.fillna(method
='pad'))

print("======ffill====
=======")
print(df.fillna(method
='ffill'))

print("======bfill====
=======")
print(df.fillna(method
='bfill'))

print("======backfill=
==========")
print(df.fillna(method
='backfill'))

========original======
=====  Name Age City
0 Ram 30.0 NaN
1 Sita 31.0 Hyd
2 Laxman NaN Pune
3 NaN 33.0 Chennai
======pad==========
 Name Age City
0 Ram 30.0 NaN
1 Sita 31.0 Hyd
2 Laxman 31.0 Pune
3 Laxman 33.0 Chennai
======ffill==========
 Name Age City
0 Ram 30.0 NaN
1 Sita 31.0 Hyd
2 Laxman 31.0 Pune
3 Laxman 33.0 Chennai
======bfill==========
 Name Age City
0 Ram 30.0 Hyd
1 Sita 31.0 Hyd
2 Laxman 33.0 Pune
3 NaN 33.0 Chennai
======backfill========
===
 Name Age City
0 Ram 30.0 Hyd
1 Sita 31.0 Hyd
2 Laxman 33.0 Pune
3 NaN 33.0 Chennai
```


In [25]:

```
print(df.fillna(method='pad',axis=
1))

========original==========
 Name Age City
0 Ram 30.0 NaN
1 Sita 31.0 Hyd
2 Laxman NaN Pune
3 NaN 33.0 Chennai
======pad==========
 Name Age City
0 Ram 30.0 NaN
1 Sita 31.0 Hyd
2 Laxman 31.0 Pune
3 Laxman 33.0 Chennai
======pad==========
 Name Age City
0 Ram 30.0 30.0
1 Sita 31.0 Hyd
2 Laxman Laxman Pune
3 NaN 33.0 Chennai

# KNN imputer
```

********h**** – 4**

:

Mean
Median
Mode

In [ ]: In [31]:

```
print("========original==========
")
print(df)

print("======pad==========")
print(df.fillna(method='pad'))

print("======pad==========")
```

```
################## Read the data
agian####################
dict1={'Name':['Ram','Sita','Laxma
n',np.nan],
'Age':[30,31,np.nan,33],

'City':[np.nan,'Hyd','Pune','Chenn
ai']}

df=pd.DataFrame(dict1)
df
```

Out[31]:

	Name	Age	City
0	Ram	30.0	NaN
1	Sita	31.0	Hyd
2	Laxman	NaN	Pune
3	NaN	33.0	Chennai

```
In [32]:                ].mean()
                        df['Age'].fillna(
mean_age=df['Age'] mean_age)
```

```
Out[32]: 0 30.000000
         1 31.000000
         2 31.333333
         3 33.000000
         Name: Age, dtype: float64
```

```
In [33]:                ].median()
                        df['Age'].fillna(me
median_age=df['Age' dian_age)
```

```
Out[33]: 0 30.0
         1 31.0
         2 31.0
         3 33.0
         Name: Age, dtype: float64
```

Mode is used for categorical data

Mean and median is used for numerical data

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```