In [22]:
```
import numpy as np
import pandas as pd

df = pd.DataFrame({'A':[21,np.nan,22,4,np.nan],
                   'B': [31,32,33,34,35],
                   'C': [np.nan,np.nan,np.nan,np.nan,np.nan],
                   'D': [46,47,np.nan,48,49]})
df



# 1. How many NaN values are in the entire Dataframe?

def total_nan_values(df):
    missing_values = df.isnull().sum()
    total_missing = missing_values.sum()
    return total_missing

print('Total NaN values:', total_nan_values(df))


# 2. Clear NaN values using Forward Fill
df.ffill()

# 3. Clear NaN values using Backward Fill
df.bfill()

# 4. Clear NaN values using 0
df.fillna(0)
```

```
Total NaN values: 8
```

Out[22]:

	A	B	C	D
0	21.0	31	0.0	46.0
1	0.0	32	0.0	47.0
2	22.0	33	0.0	0.0
3	4.0	34	0.0	48.0
4	0.0	35	0.0	49.0

In [8]:
```
df = pd.DataFrame({'A':[21,np.nan,22,4,np.nan],
                   'B': [31,32,33,34,35],
                   'C': [np.nan,np.nan,np.nan,np.nan,np.nan],
                   'D': [46,47,np.nan,48,49]})
df
```

Out[8]:

	A	B	C	D
0	21.0	31	NaN	46.0
1	NaN	32	NaN	47.0
2	22.0	33	NaN	NaN
3	4.0	34	NaN	48.0
4	NaN	35	NaN	49.0

In [18]:
```
# how many NaN values are in the entire Dataframe?

def total_nan_values(df):
    missing_values = df.isnull().sum()
    total_missing = missing_values.sum()
    return total_missing

print('Total NaN values:', total_nan_values(df))
```

```
Total NaN values: 8
```

In [19]:
```
# Clear NaN values using Forward Fill

df.ffill()

# Clear NaN values using Backward Fill

df.bfill()


# Clear NaN values using 0

df.fillna(0)
```

Out[19]:

	A	B	C	D
0	21.0	31	NaN	46.0
1	21.0	32	NaN	47.0
2	22.0	33	NaN	47.0
3	4.0	34	NaN	48.0
4	4.0	35	NaN	49.0

In [20]:
```
# Clear NaN values using Backward Fill

df.bfill()
```

Out[20]:

	A	B	C	D
0	21.0	31	NaN	46.0
1	22.0	32	NaN	47.0
2	22.0	33	NaN	48.0
3	4.0	34	NaN	48.0
4	NaN	35	NaN	49.0

In [21]:
```
# Clear NaN values using 0

df.fillna(0)
```

Out[21]:

	A	B	C	D
0	21.0	31	0.0	46.0
1	0.0	32	0.0	47.0
2	22.0	33	0.0	0.0
3	4.0	34	0.0	48.0
4	0.0	35	0.0	49.0

In [ ]:
```

```