mk 04/08/2023

```
In [1]: import numpy as np
   import pandas as pd
   import matplotlib.pyplot as plt
   import seaborn as sns
   from sklearn.linear_model import LogisticRegression
   from sklearn.preprocessing import StandardScaler
   import re
   from sklearn.datasets import load_digits
   from sklearn.model_selection import train_test_split
```

In [2]: a=pd.read_csv(r"C:\Users\user\Downloads\Book5.csv")
 a

Out[2]:

| | index | SUBDIVISION | YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | ОСТ |
|-----|-------|-------------|------|------|------|------|-------|-------|------|------|-------|-------|-------|
| 0 | 3427 | TAMIL NADU | 1901 | 24.5 | 39.1 | 21.7 | 36.0 | 74.0 | 41.8 | 49.3 | 67.9 | 191.1 | 122.3 |
| 1 | 3428 | TAMIL NADU | 1902 | 67.2 | 9.8 | 25.1 | 21.9 | 84.7 | 39.3 | 55.1 | 113.8 | 98.6 | 282.2 |
| 2 | 3429 | TAMIL NADU | 1903 | 19.3 | 7.8 | 1.7 | 18.2 | 128.5 | 58.5 | 72.6 | 115.0 | 210.4 | 128.1 |
| 3 | 3430 | TAMIL NADU | 1904 | 35.2 | 0.1 | 0.7 | 19.5 | 121.9 | 34.9 | 89.0 | 40.4 | 85.7 | 163.2 |
| 4 | 3431 | TAMIL NADU | 1905 | 6.5 | 7.5 | 17.2 | 64.8 | 83.7 | 49.8 | 39.0 | 101.8 | 73.5 | 250.4 |
| | | | | | | | | | | | | | |
| 110 | 3537 | TAMIL NADU | 2011 | 4.3 | 11.2 | 8.0 | 91.5 | 33.4 | 56.0 | 45.5 | 128.9 | 76.0 | 200.4 |
| 111 | 3538 | TAMIL NADU | 2012 | 3.0 | 0.1 | 2.5 | 35.5 | 41.9 | 30.1 | 46.5 | 98.0 | 84.9 | 235.2 |
| 112 | 3539 | TAMIL NADU | 2013 | 3.9 | 30.9 | 30.0 | 20.3 | 42.0 | 54.6 | 42.7 | 110.7 | 113.5 | 127.9 |
| 113 | 3540 | TAMIL NADU | 2014 | 7.4 | 6.1 | 8.1 | 8.3 | 139.1 | 47.8 | 50.6 | 117.7 | 98.9 | 252.2 |
| 114 | 3541 | TAMIL NADU | 2015 | 8.3 | 2.3 | 21.7 | 108.8 | 112.4 | 62.4 | 43.5 | 81.6 | 98.4 | 132.6 |

115 rows × 20 columns

```
In [3]: a.info()
```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):

| # Column Non-Null Count | Dtype | | | | | | | |
|---|---------|--|--|--|--|--|--|--|
| | | | | | | | | |
| 0 index 115 non-null | int64 | | | | | | | |
| 1 SUBDIVISION 115 non-null | object | | | | | | | |
| 2 YEAR 115 non-null | int64 | | | | | | | |
| 3 JAN 115 non-null | float64 | | | | | | | |
| 4 FEB 115 non-null | float64 | | | | | | | |
| 5 MAR 115 non-null | float64 | | | | | | | |
| 6 APR 115 non-null | float64 | | | | | | | |
| 7 MAY 115 non-null | float64 | | | | | | | |
| 8 JUN 115 non-null | float64 | | | | | | | |
| 9 JUL 115 non-null | float64 | | | | | | | |
| 10 AUG 115 non-null | float64 | | | | | | | |
| 11 SEP 115 non-null | float64 | | | | | | | |
| 12 OCT 115 non-null | float64 | | | | | | | |
| 13 NOV 115 non-null | float64 | | | | | | | |
| 14 DEC 115 non-null | float64 | | | | | | | |
| 15 ANNUAL 115 non-null | float64 | | | | | | | |
| <pre>16 Jan-Feb 115 non-null</pre> | float64 | | | | | | | |
| 17 Mar-May 115 non-null | float64 | | | | | | | |
| <pre>18 Jun-Sep 115 non-null</pre> | float64 | | | | | | | |
| <pre>19 Oct-Dec 115 non-null</pre> | float64 | | | | | | | |
| <pre>dtypes: float64(17), int64(2), object(1)</pre> | | | | | | | | |
| memory usage: 18.1+ KB | | | | | | | | |

```
In [4]: b=a.fillna(method='ffill')
b
```

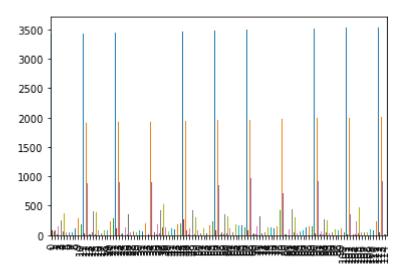
Out[4]:

| index | SUBDIVISION | YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | ОСТ |
|-------|--|---|---|--|---|---|--|--|--|---|---|---|
| 3427 | TAMIL NADU | 1901 | 24.5 | 39.1 | 21.7 | 36.0 | 74.0 | 41.8 | 49.3 | 67.9 | 191.1 | 122.3 |
| 3428 | TAMIL NADU | 1902 | 67.2 | 9.8 | 25.1 | 21.9 | 84.7 | 39.3 | 55.1 | 113.8 | 98.6 | 282.2 |
| 3429 | TAMIL NADU | 1903 | 19.3 | 7.8 | 1.7 | 18.2 | 128.5 | 58.5 | 72.6 | 115.0 | 210.4 | 128.1 |
| 3430 | TAMIL NADU | 1904 | 35.2 | 0.1 | 0.7 | 19.5 | 121.9 | 34.9 | 89.0 | 40.4 | 85.7 | 163.2 |
| 3431 | TAMIL NADU | 1905 | 6.5 | 7.5 | 17.2 | 64.8 | 83.7 | 49.8 | 39.0 | 101.8 | 73.5 | 250.4 |
| | ••• | | | | | | | | | | | |
| 3537 | TAMIL NADU | 2011 | 4.3 | 11.2 | 8.0 | 91.5 | 33.4 | 56.0 | 45.5 | 128.9 | 76.0 | 200.4 |
| 3538 | TAMIL NADU | 2012 | 3.0 | 0.1 | 2.5 | 35.5 | 41.9 | 30.1 | 46.5 | 98.0 | 84.9 | 235.2 |
| 3539 | TAMIL NADU | 2013 | 3.9 | 30.9 | 30.0 | 20.3 | 42.0 | 54.6 | 42.7 | 110.7 | 113.5 | 127.9 |
| 3540 | TAMIL NADU | 2014 | 7.4 | 6.1 | 8.1 | 8.3 | 139.1 | 47.8 | 50.6 | 117.7 | 98.9 | 252.2 |
| 3541 | TAMIL NADU | 2015 | 8.3 | 2.3 | 21.7 | 108.8 | 112.4 | 62.4 | 43.5 | 81.6 | 98.4 | 132.6 |
| | 3427 3428 3429 3430 3431 3537 3538 3539 3540 | 3427 TAMIL NADU 3428 TAMIL NADU 3429 TAMIL NADU 3430 TAMIL NADU 3431 TAMIL NADU 3537 TAMIL NADU 3538 TAMIL NADU 3539 TAMIL NADU 3540 TAMIL NADU | 3427 TAMIL NADU 1901 3428 TAMIL NADU 1902 3429 TAMIL NADU 1903 3430 TAMIL NADU 1904 3431 TAMIL NADU 1905 3537 TAMIL NADU 2011 3538 TAMIL NADU 2012 3539 TAMIL NADU 2013 | 3427 TAMIL NADU 1901 24.5 3428 TAMIL NADU 1902 67.2 3429 TAMIL NADU 1903 19.3 3430 TAMIL NADU 1904 35.2 3431 TAMIL NADU 1905 6.5 3537 TAMIL NADU 2011 4.3 3538 TAMIL NADU 2012 3.0 3539 TAMIL NADU 2013 3.9 3540 TAMIL NADU 2014 7.4 | 3427 TAMIL NADU 1901 24.5 39.1 3428 TAMIL NADU 1902 67.2 9.8 3429 TAMIL NADU 1903 19.3 7.8 3430 TAMIL NADU 1904 35.2 0.1 3431 TAMIL NADU 1905 6.5 7.5 3537 TAMIL NADU 2011 4.3 11.2 3538 TAMIL NADU 2012 3.0 0.1 3539 TAMIL NADU 2013 3.9 30.9 3540 TAMIL NADU 2014 7.4 6.1 | 3427 TAMIL NADU 1901 24.5 39.1 21.7 3428 TAMIL NADU 1902 67.2 9.8 25.1 3429 TAMIL NADU 1903 19.3 7.8 1.7 3430 TAMIL NADU 1904 35.2 0.1 0.7 3431 TAMIL NADU 1905 6.5 7.5 17.2 3537 TAMIL NADU 2011 4.3 11.2 8.0 3538 TAMIL NADU 2012 3.0 0.1 2.5 3539 TAMIL NADU 2013 3.9 30.9 30.0 3540 TAMIL NADU 2014 7.4 6.1 8.1 | 3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 3537 TAMIL NADU 2011 4.3 11.2 8.0 91.5 3538 TAMIL NADU 2012 3.0 0.1 2.5 35.5 3539 TAMIL NADU 2013 3.9 30.9 30.0 20.3 3540 TAMIL NADU 2014 7.4 6.1 8.1 8.3 | 3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 3537 TAMIL NADU 2011 4.3 11.2 8.0 91.5 33.4 3538 TAMIL NADU 2012 3.0 0.1 2.5 35.5 41.9 3539 TAMIL NADU 2013 3.9 30.9 30.0 20.3 42.0 3540 TAMIL NADU 2014 7.4 6.1 8.1 8.3 139.1 | 3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 <th>3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 <!--</th--><th>3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 67.9 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 113.8 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 115.0 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 40.4 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 101.8 <</th><th>3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 67.9 191.1 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 113.8 98.6 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 115.0 210.4 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 40.4 85.7 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 101.8 73.5 </th></th> | 3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 </th <th>3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 67.9 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 113.8 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 115.0 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 40.4 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 101.8 <</th> <th>3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 67.9 191.1 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 113.8 98.6 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 115.0 210.4 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 40.4 85.7 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 101.8 73.5 </th> | 3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 67.9 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 113.8 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 115.0 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 40.4 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 101.8 < | 3427 TAMIL NADU 1901 24.5 39.1 21.7 36.0 74.0 41.8 49.3 67.9 191.1 3428 TAMIL NADU 1902 67.2 9.8 25.1 21.9 84.7 39.3 55.1 113.8 98.6 3429 TAMIL NADU 1903 19.3 7.8 1.7 18.2 128.5 58.5 72.6 115.0 210.4 3430 TAMIL NADU 1904 35.2 0.1 0.7 19.5 121.9 34.9 89.0 40.4 85.7 3431 TAMIL NADU 1905 6.5 7.5 17.2 64.8 83.7 49.8 39.0 101.8 73.5 |

115 rows × 20 columns

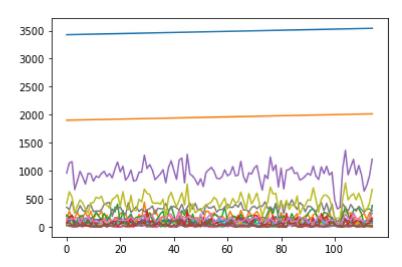
In [5]: b.plot.bar(legend=None)

Out[5]: <AxesSubplot:>



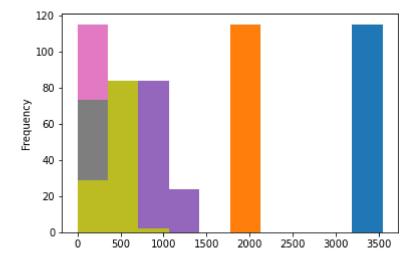
In [6]: b.plot.line(legend=None)

Out[6]: <AxesSubplot:>



```
In [7]: b.plot.hist(legend=None)
```

Out[7]: <AxesSubplot:ylabel='Frequency'>



In [8]: a.plot.pie(y='MAY',figsize=(8,8),labels=None,legend=None)

Out[8]: <AxesSubplot:ylabel='MAY'>



```
In [ ]:
```