

# Importing Libraries

```
In [1]: import numpy as np  
import pandas as pd  
import matplotlib.pyplot as plt  
import seaborn as sns
```

# Importing Datasets

```
In [2]: df=pd.read_csv(r'C:\Users\user\Downloads\Rainfall\CHHATTISGARH.csv')  
df
```

Out[2]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	2968	CHHATTISGARH	1902	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1	4	11	1
1	2969	CHHATTISGARH	1903	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0	168.1	11	1
2	2970	CHHATTISGARH	1904	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8	129.1	11	1
3	2971	CHHATTISGARH	1905	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8	11	1	1
4	2972	CHHATTISGARH	1906	25.0	91.0	52.5	0.0	4.1	210.1	445.2	258.3	242.3	4	11	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
109	3077	CHHATTISGARH	2011	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2	11	1	1
110	3078	CHHATTISGARH	2012	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3	11	1	1
111	3079	CHHATTISGARH	2013	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9	180.1	11	1
112	3080	CHHATTISGARH	2014	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7	77.1	11	1
113	3081	CHHATTISGARH	2015	15.8	1.2	21.2	37.0	13.0	257.6	248.6	286.6	216.9	11	1	1

114 rows × 20 columns



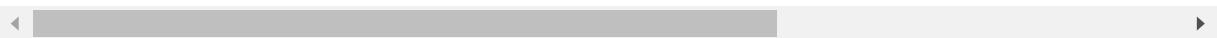
# Data Cleaning and Data Preprocessing

In [3]: df=df.dropna()  
df

Out[3]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct-Dec
0	2968	CHHATTISGARH	1902	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1	148.5	110.7	365.9	396.0	212.0	168.5	129.5	100.5
1	2969	CHHATTISGARH	1903	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0	168.5	110.7	365.9	396.0	212.0	168.5	129.5	100.5
2	2970	CHHATTISGARH	1904	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8	129.5	110.7	365.9	396.0	212.0	168.5	129.5	100.5
3	2971	CHHATTISGARH	1905	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8	100.5	110.7	365.9	396.0	212.0	168.5	129.5	100.5
4	2972	CHHATTISGARH	1906	25.0	91.0	52.5	0.0	4.1	210.1	445.2	258.3	242.3	4.1	110.7	365.9	396.0	212.0	168.5	129.5	100.5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
109	3077	CHHATTISGARH	2011	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2	110.7	365.9	396.0	212.0	168.5	129.5	100.5	
110	3078	CHHATTISGARH	2012	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3	110.7	365.9	396.0	212.0	168.5	129.5	100.5	
111	3079	CHHATTISGARH	2013	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9	180.0	110.7	365.9	396.0	212.0	168.5	129.5	100.5
112	3080	CHHATTISGARH	2014	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7	7.0	110.7	365.9	396.0	212.0	168.5	129.5	100.5
113	3081	CHHATTISGARH	2015	15.8	1.2	21.2	37.0	13.0	257.6	248.6	286.6	216.9	110.7	365.9	396.0	212.0	168.5	129.5	100.5	

114 rows × 20 columns



In [4]: df.columns

Out[4]: Index(['index', 'SUBDIVISION', 'YEAR', 'JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN', 'JUL', 'AUG', 'SEP', 'OCT', 'NOV', 'DEC', 'ANNUAL', 'Jan-Feb', 'Mar-May', 'Jun-Sep', 'Oct-Dec'],  
dtype='object')

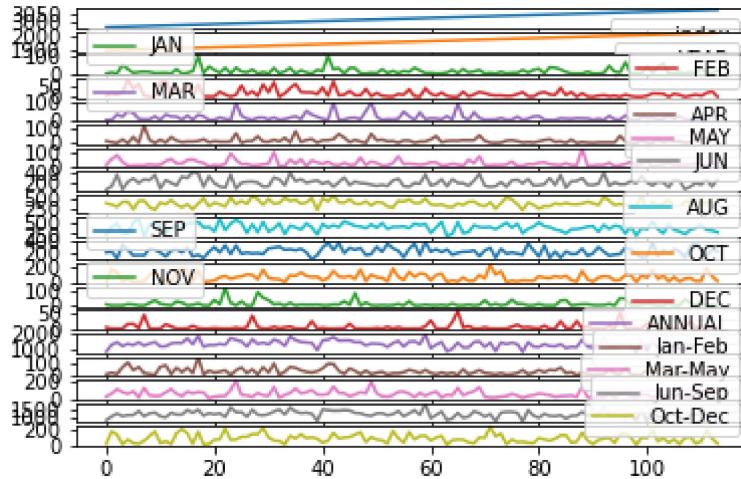
In [5]: df.info()

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 114 entries, 0 to 113
Data columns (total 20 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   index       114 non-null    int64  
 1   SUBDIVISION 114 non-null    object  
 2   YEAR        114 non-null    int64  
 3   JAN         114 non-null    float64 
 4   FEB         114 non-null    float64 
 5   MAR         114 non-null    float64 
 6   APR         114 non-null    float64 
 7   MAY         114 non-null    float64 
 8   JUN         114 non-null    float64 
 9   JUL         114 non-null    float64 
 10  AUG         114 non-null    float64 
 11  SEP         114 non-null    float64 
 12  OCT         114 non-null    float64 
 13  NOV         114 non-null    float64 
 14  DEC         114 non-null    float64 
 15  ANNUAL      114 non-null    float64 
 16  Jan-Feb     114 non-null    float64 
 17  Mar-May     114 non-null    float64 
 18  Jun-Sep     114 non-null    float64 
 19  Oct-Dec     114 non-null    float64 
dtypes: float64(17), int64(2), object(1)
memory usage: 18.7+ KB
```

## Line Chart

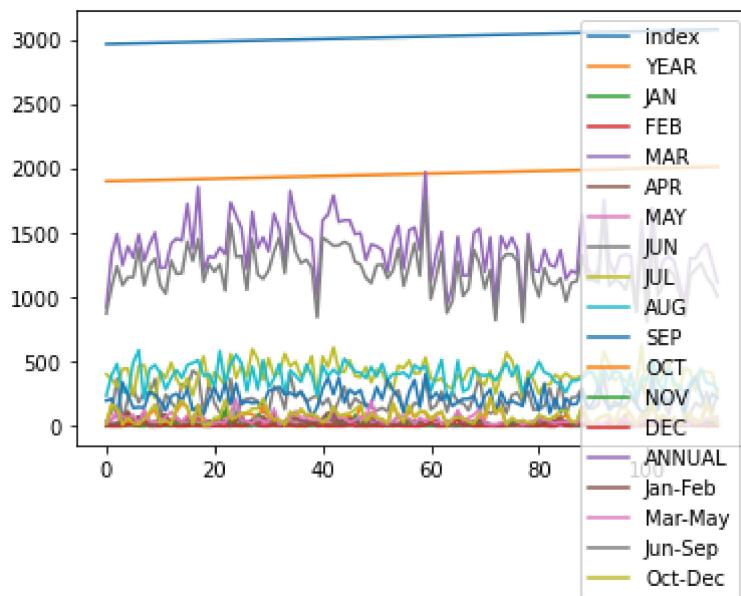
```
In [6]: df.plot.line(subplots=True)
```

```
Out[6]: array([<AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>], dtype=object)
```



```
In [7]: df.plot.line()
```

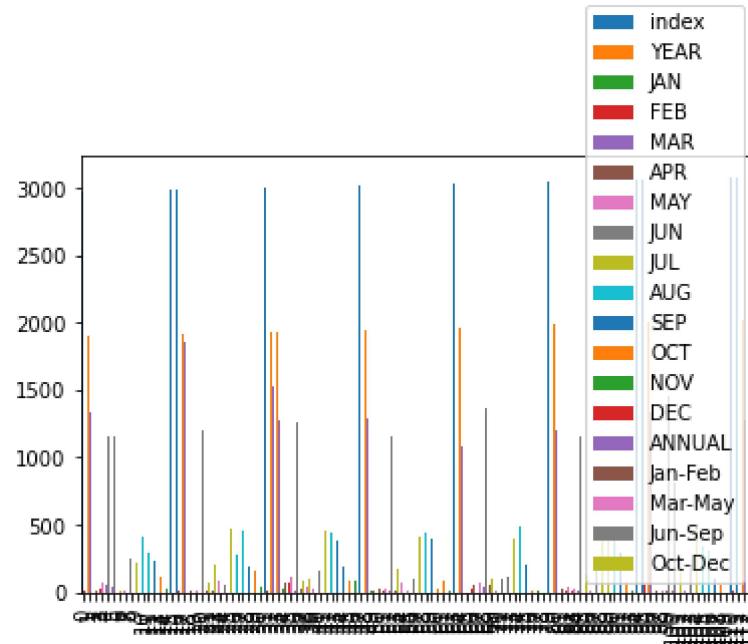
```
Out[7]: <AxesSubplot:>
```



## Bar Chart

In [8]: `df.plot.bar()`

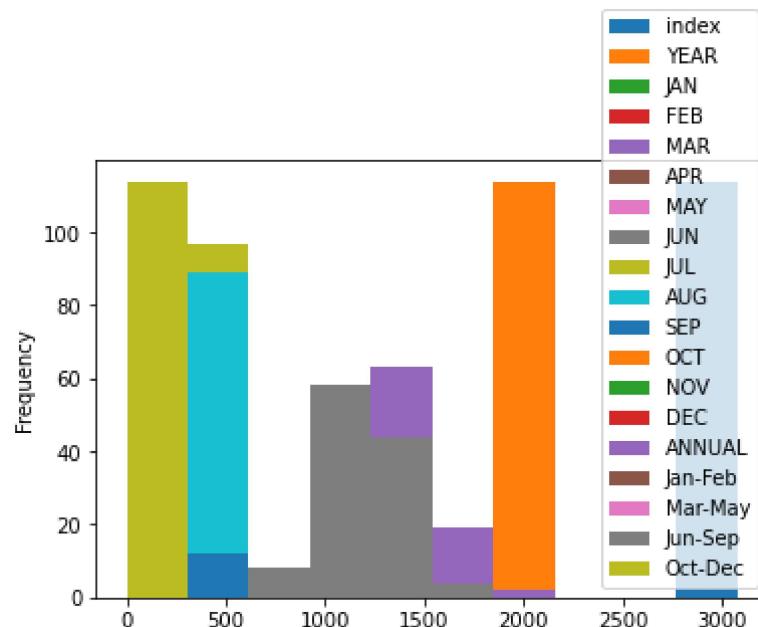
Out[8]: <AxesSubplot:>



## Histogram

In [9]: `df.plot.hist()`

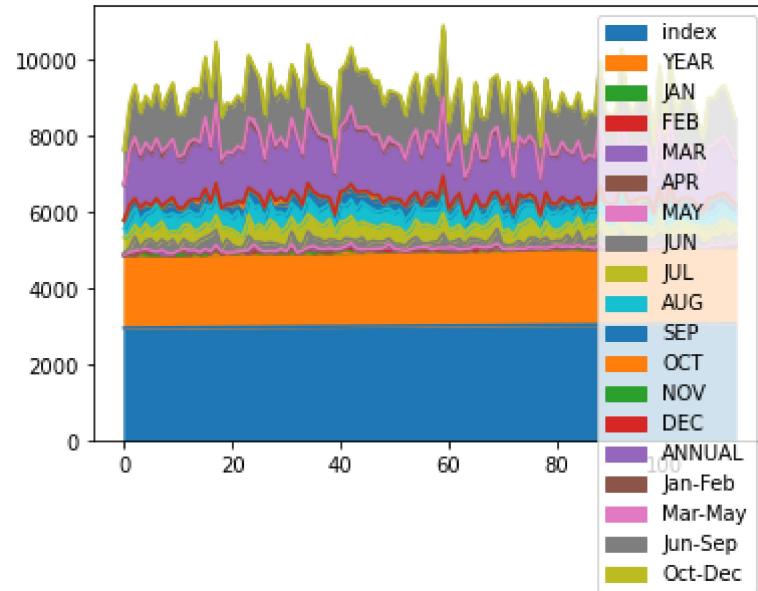
Out[9]: <AxesSubplot:ylabel='Frequency'>



## Area Chart

```
In [10]: df.plot.area()
```

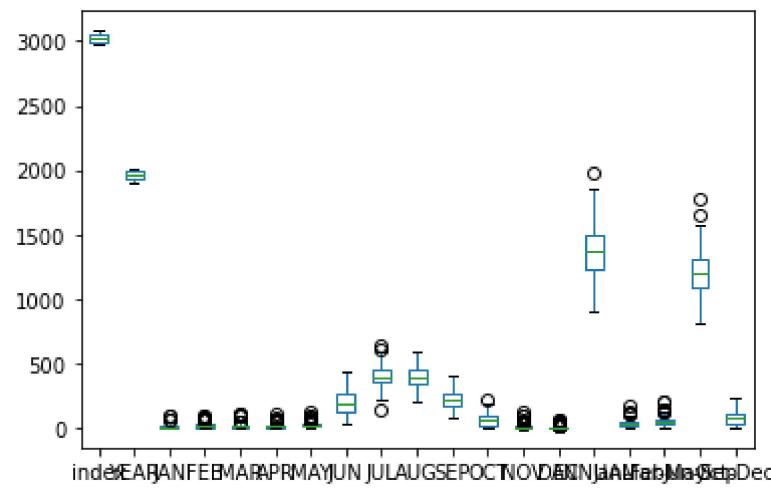
```
Out[10]: <AxesSubplot:>
```



## Box Chart

```
In [11]: df.plot.box()
```

```
Out[11]: <AxesSubplot:>
```

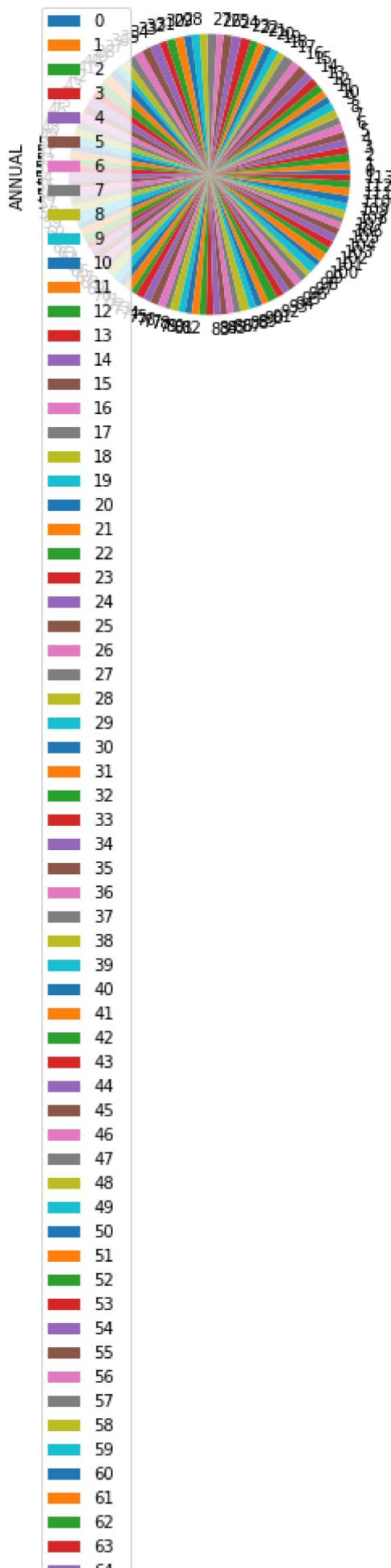


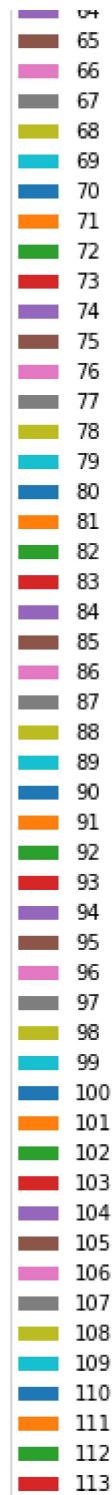
## Pie Chart

In [12]: `df.plot.pie(y='ANNUAL')`

Out[12]: <AxesSubplot:ylabel='ANNUAL'>



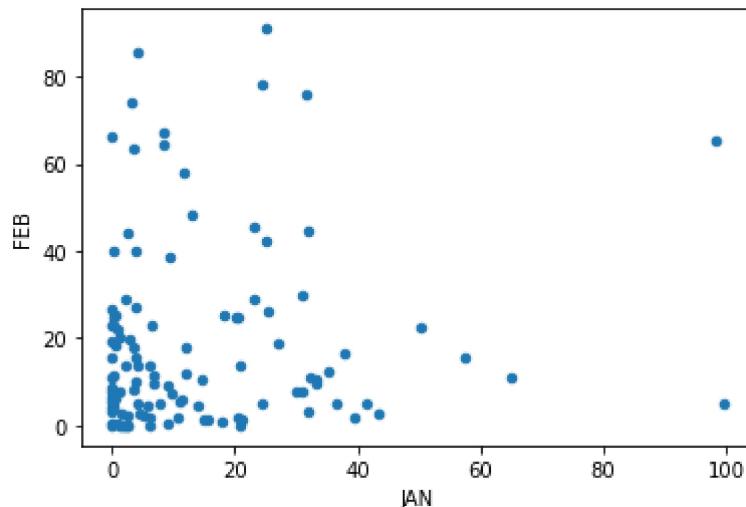




## Scatter Plot

```
In [13]: df.plot.scatter(x='JAN',y='FEB')
```

```
Out[13]: <AxesSubplot:xlabel='JAN', ylabel='FEB'>
```



```
In [14]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 114 entries, 0 to 113
Data columns (total 20 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   index       114 non-null    int64  
 1   SUBDIVISION 114 non-null    object  
 2   YEAR        114 non-null    int64  
 3   JAN         114 non-null    float64 
 4   FEB         114 non-null    float64 
 5   MAR         114 non-null    float64 
 6   APR         114 non-null    float64 
 7   MAY         114 non-null    float64 
 8   JUN         114 non-null    float64 
 9   JUL         114 non-null    float64 
 10  AUG         114 non-null    float64 
 11  SEP         114 non-null    float64 
 12  OCT         114 non-null    float64 
 13  NOV         114 non-null    float64 
 14  DEC         114 non-null    float64 
 15  ANNUAL      114 non-null    float64 
 16  Jan-Feb     114 non-null    float64 
 17  Mar-May     114 non-null    float64 
 18  Jun-Sep     114 non-null    float64 
 19  Oct-Dec     114 non-null    float64 
dtypes: float64(17), int64(2), object(1)
memory usage: 18.7+ KB
```

In [15]: df.describe()

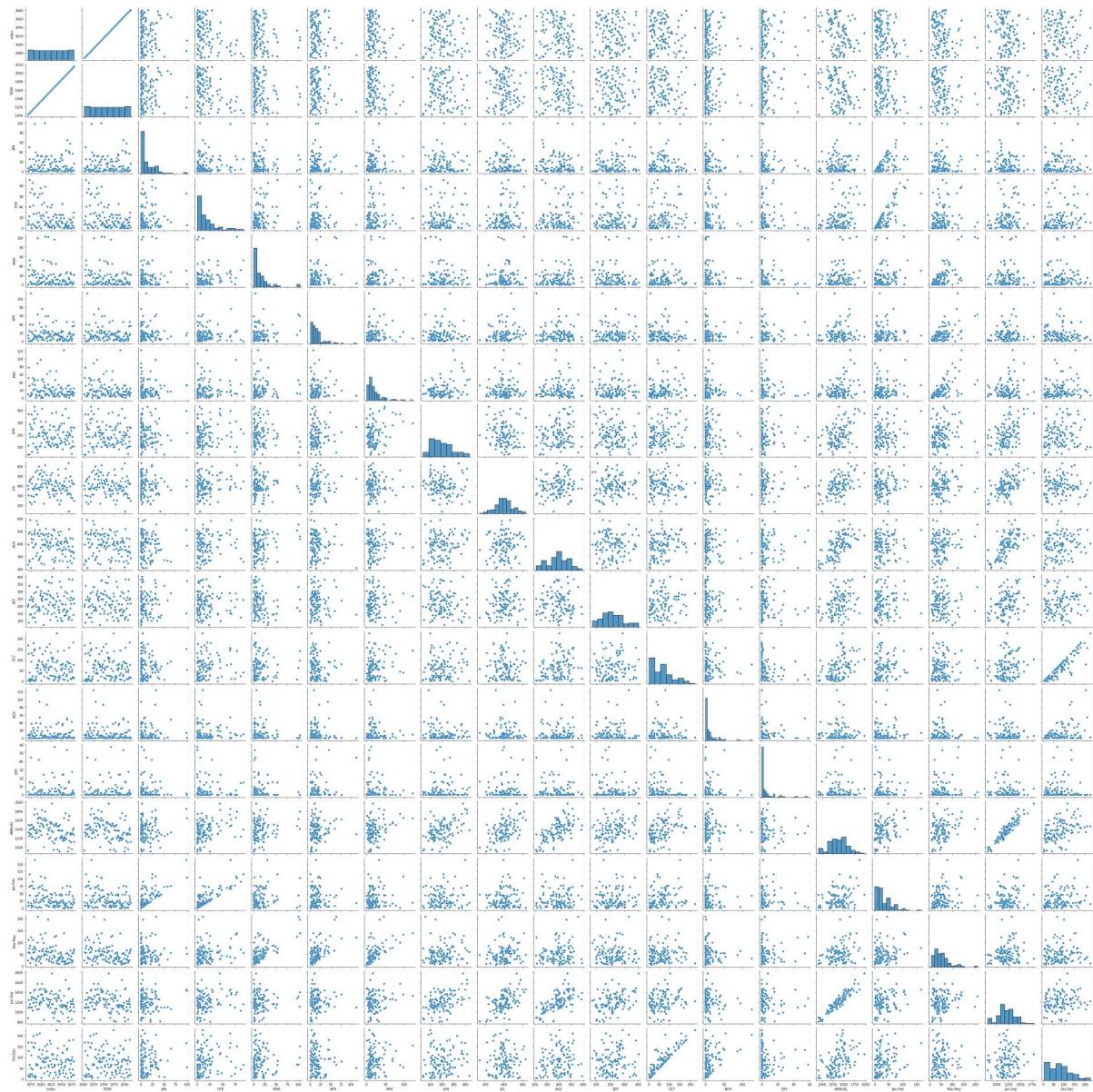
Out[15]:

	index	YEAR	JAN	FEB	MAR	APR	MAY	
<b>count</b>	114.000000	114.000000	114.000000	114.000000	114.000000	114.000000	114.000000	11
<b>mean</b>	3024.500000	1958.500000	13.902632	18.406140	15.157018	16.871930	21.071930	19
<b>std</b>	33.052988	33.052988	18.102249	21.237062	20.711285	17.167677	20.719921	9
<b>min</b>	2968.000000	1902.000000	0.000000	0.000000	0.000000	0.000000	0.000000	3
<b>25%</b>	2996.250000	1930.250000	1.325000	4.025000	2.200000	5.375000	8.700000	12
<b>50%</b>	3024.500000	1958.500000	6.400000	10.850000	7.900000	12.300000	15.500000	18
<b>75%</b>	3052.750000	1986.750000	21.050000	24.775000	21.150000	21.000000	25.225000	25
<b>max</b>	3081.000000	2015.000000	99.500000	91.000000	102.900000	112.800000	122.300000	43

## EDA And Visualization

```
In [16]: sns.pairplot(df)
```

```
Out[16]: <seaborn.axisgrid.PairGrid at 0x1f638ac7b80>
```

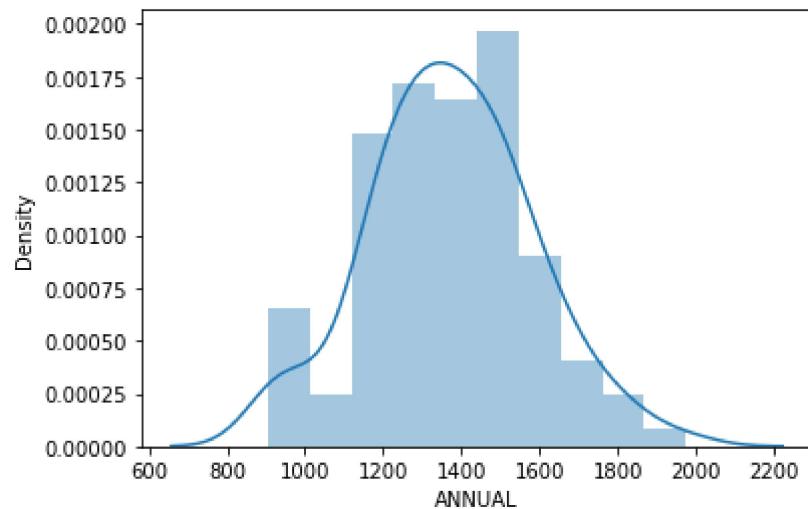


```
In [17]: sns.distplot(df[ 'ANNUAL' ])
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

```
warnings.warn(msg, FutureWarning)
```

```
Out[17]: <AxesSubplot:xlabel='ANNUAL', ylabel='Density'>
```



```
In [18]: sns.heatmap(df.corr())
```

```
Out[18]: <AxesSubplot:>
```

