

# Importing Libraries

In [1]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

# Importing Datasets

In [2]:

```
df=pd.read_csv("vidarbha.csv")
df
```

Out[2]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
0	2852	VIDARBHA	1901	36.8	39.9	30.9	26.1	7.3	129.7	295.3	368.8	123.4	35.2	(
1	2853	VIDARBHA	1902	1.6	0.1	0.0	6.5	4.1	38.0	270.7	204.7	150.9	29.6	16
2	2854	VIDARBHA	1903	5.2	4.0	0.1	2.5	37.8	121.2	475.5	325.5	154.8	100.8	2
3	2855	VIDARBHA	1904	4.3	2.4	12.9	0.2	14.8	148.9	158.3	151.8	196.9	61.7	(
4	2856	VIDARBHA	1905	7.3	12.7	12.4	16.2	14.0	81.0	254.5	216.3	321.3	6.0	(
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
110	2962	VIDARBHA	2011	0.0	1.2	0.1	7.7	0.6	137.9	247.1	302.8	191.0	4.7	(
111	2963	VIDARBHA	2012	3.1	0.1	0.0	0.6	0.2	125.5	370.5	316.2	249.4	34.9	7
112	2964	VIDARBHA	2013	6.6	13.0	3.8	2.8	0.5	366.7	535.5	326.1	131.7	133.5	(
113	2965	VIDARBHA	2014	1.2	18.3	49.6	2.6	4.0	63.3	337.6	191.7	224.9	17.3	(
114	2966	VIDARBHA	2015	26.3	4.7	66.3	28.1	12.8	254.6	137.2	288.9	167.5	7.0	(

115 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
0	2852	VIDARBHA	1901	36.8	39.9	30.9	26.1	7.3	129.7	295.3	368.8	123.4	35.2	(
1	2853	VIDARBHA	1902	1.6	0.1	0.0	6.5	4.1	38.0	270.7	204.7	150.9	29.6	16
2	2854	VIDARBHA	1903	5.2	4.0	0.1	2.5	37.8	121.2	475.5	325.5	154.8	100.8	2
3	2855	VIDARBHA	1904	4.3	2.4	12.9	0.2	14.8	148.9	158.3	151.8	196.9	61.7	(
4	2856	VIDARBHA	1905	7.3	12.7	12.4	16.2	14.0	81.0	254.5	216.3	321.3	6.0	(

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	Jan-Feb	Mar-May	Jun-Sep	Oct-Dec
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
110	2962	VIDARBHA	2011	0.0	1.2	0.1	7.7	0.6	137.9	247.1	302.8	191.0	4.7	...	...	...	...	...	...	...
111	2963	VIDARBHA	2012	3.1	0.1	0.0	0.6	0.2	125.5	370.5	316.2	249.4	34.9	...	...	...	...	...	...	...
112	2964	VIDARBHA	2013	6.6	13.0	3.8	2.8	0.5	366.7	535.5	326.1	131.7	133.5	...	...	...	...	...	...	...
113	2965	VIDARBHA	2014	1.2	18.3	49.6	2.6	4.0	63.3	337.6	191.7	224.9	17.3	...	...	...	...	...	...	...
114	2966	VIDARBHA	2015	26.3	4.7	66.3	28.1	12.8	254.6	137.2	288.9	167.5	7.0	...	...	...	...	...	...	...

115 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: 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
16  Jan-Feb               115 non-null   float64
17  Mar-May               115 non-null   float64
18  Jun-Sep               115 non-null   float64
19  Oct-Dec               115 non-null   float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.9+ KB
```

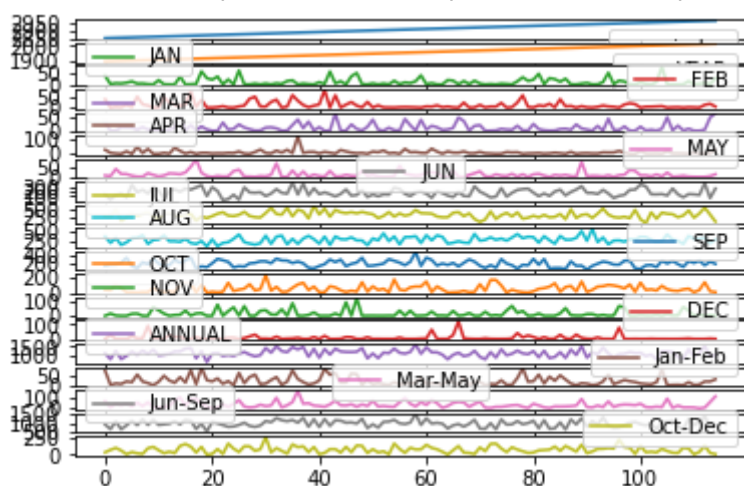
## Line chart

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:~>, <AxesSubplot:~>, <AxesSubplot:~>, <AxesSubplot:~>, <AxesSubplot:~>])

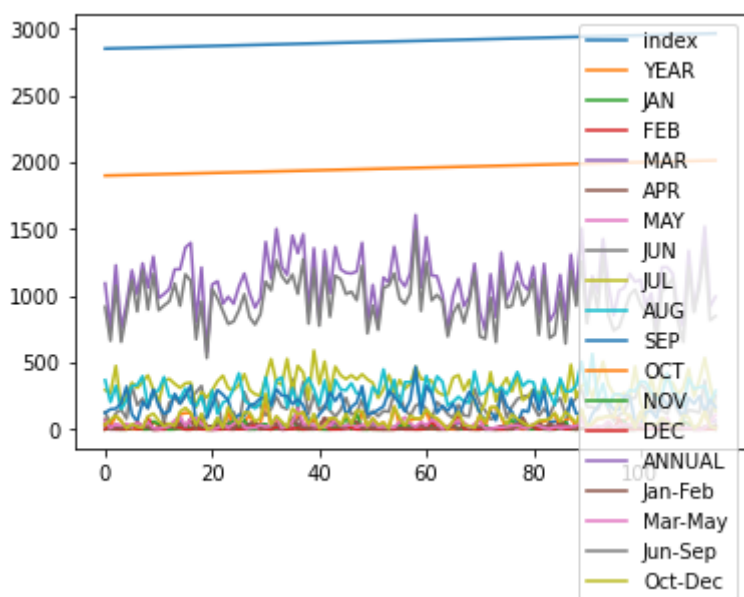
```
<AxesSubplot:~>, <AxesSubplot:~>, <AxesSubplot:~>, <AxesSubplot:~>,
<AxesSubplot:~>, <AxesSubplot:~>, <AxesSubplot:~>], dtype=object)
```



## Line chart

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

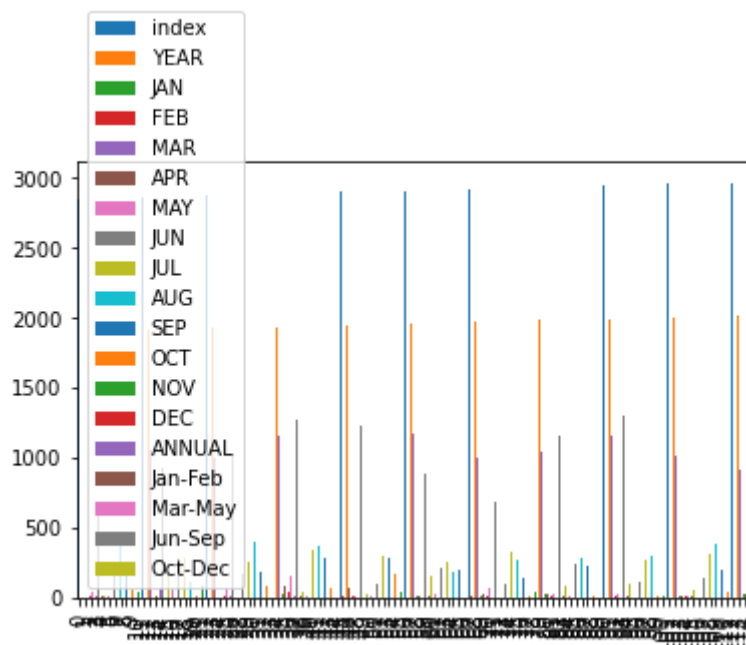
```
Out[7]: <AxesSubplot:~>
```



## Bar chart

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

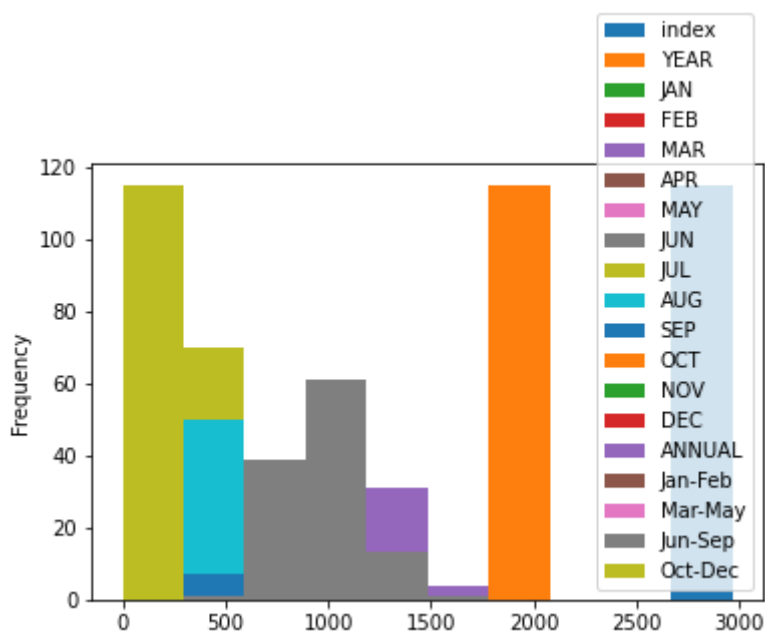
```
Out[8]: <AxesSubplot:~>
```



## Histogram

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

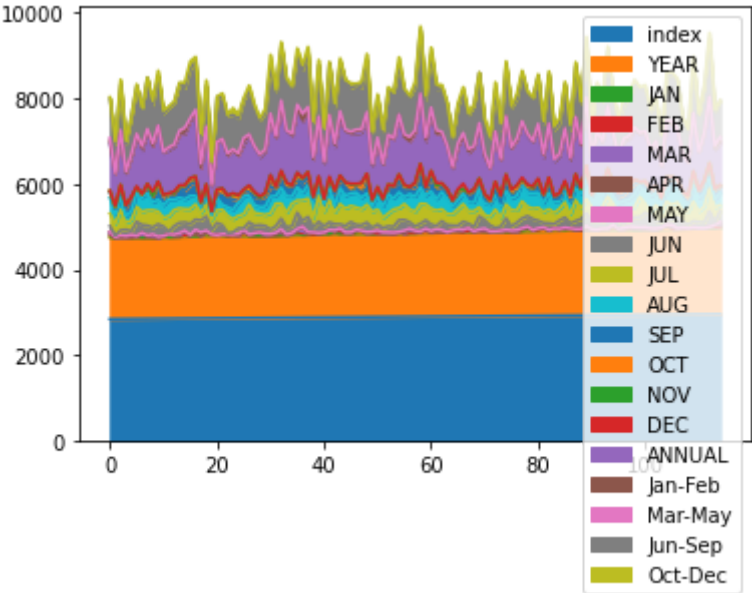
Out[9]: `<AxesSubplot:ylabel='Frequency'>`



## Area chart

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

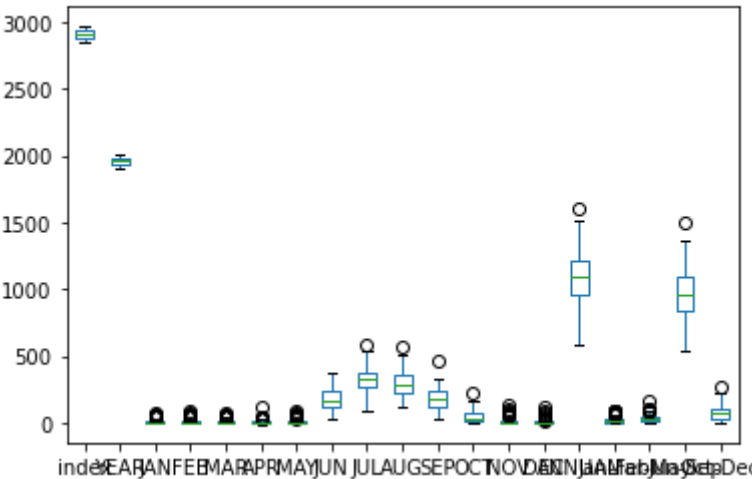
Out[10]: `<AxesSubplot:>`



## Box chart

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

Out[11]: <AxesSubplot:>

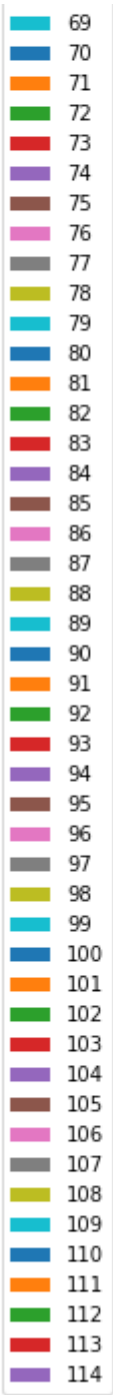


## Pie chart

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

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

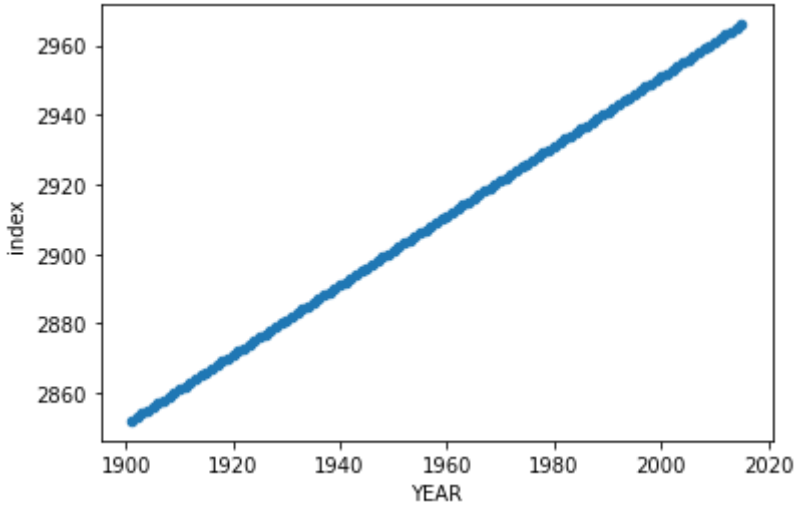




# Scatter chart

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

Out[13]: <AxesSubplot:xlabel='YEAR', ylabel='index'>



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

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 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
16  Jan-Feb         115 non-null    float64
17  Mar-May         115 non-null    float64
18  Jun-Sep         115 non-null    float64
19  Oct-Dec         115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.9+ KB
```

```
In [15]: df.describe()
```

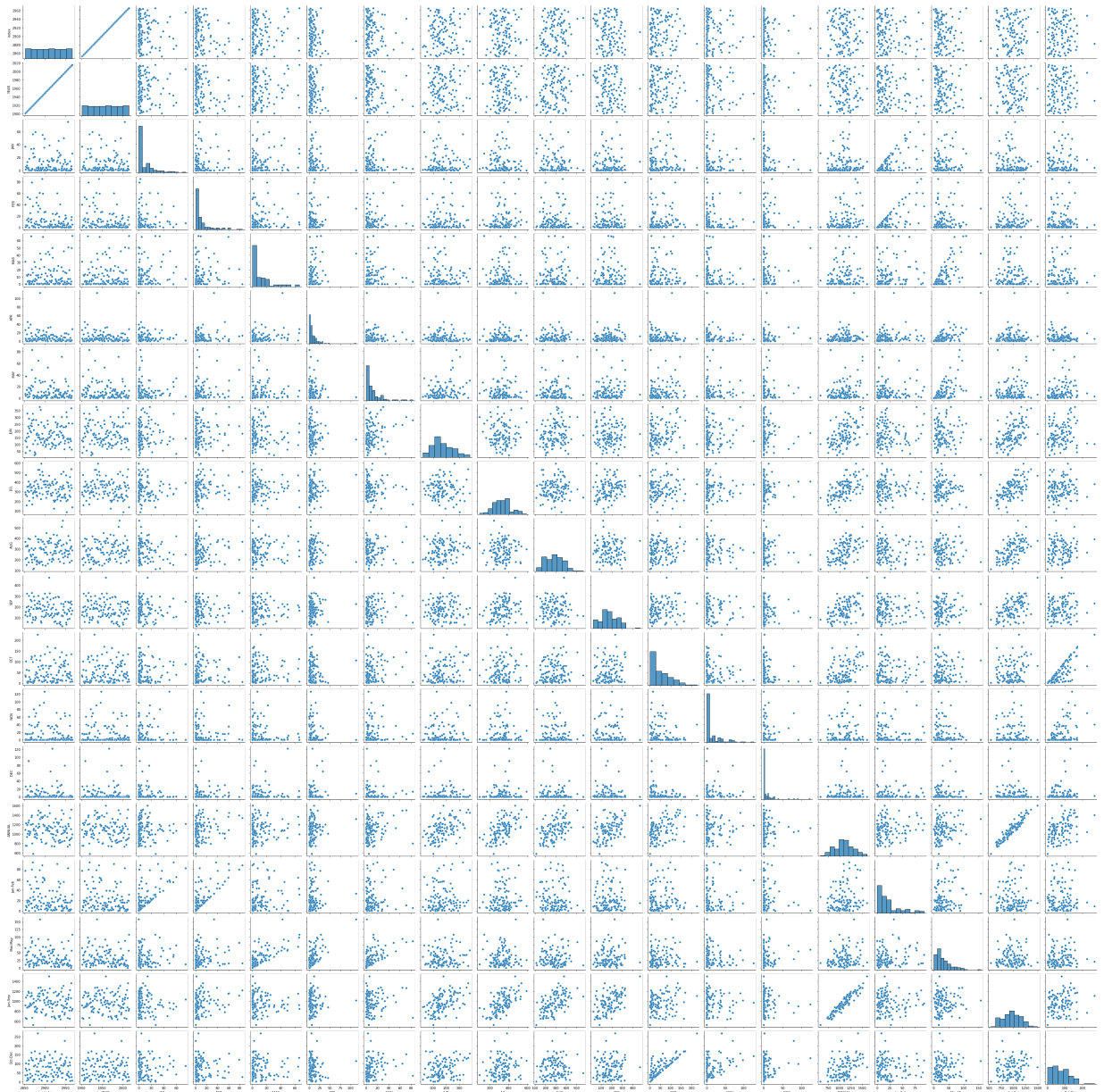
	index	YEAR	JAN	FEB	MAR	APR	MAY	
count	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000
mean	2909.000000	1958.000000	10.563478	11.982609	11.872174	9.435652	11.551304	173.578
std	33.341666	33.341666	15.105752	17.288888	15.540002	13.177554	14.604363	77.517
min	2852.000000	1901.000000	0.000000	0.000000	0.000000	0.000000	0.000000	21.400
25%	2880.500000	1929.500000	0.400000	1.100000	0.950000	2.650000	2.250000	116.550
50%	2909.000000	1958.000000	3.800000	4.800000	4.900000	5.600000	6.200000	156.400
75%	2937.500000	1986.500000	14.950000	14.300000	16.050000	12.000000	14.900000	232.400
max	2966.000000	2015.000000	74.900000	84.900000	66.300000	112.700000	83.100000	377.500



# EDA AND VISUALIZATION

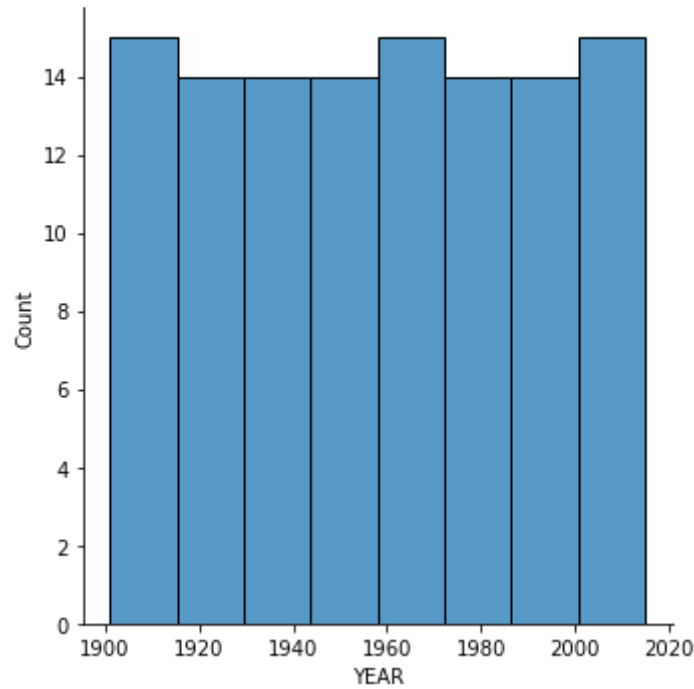
```
In [16]: sns.pairplot(df)
```

```
Out[16]: <seaborn.axisgrid.PairGrid at 0x22463481a60>
```



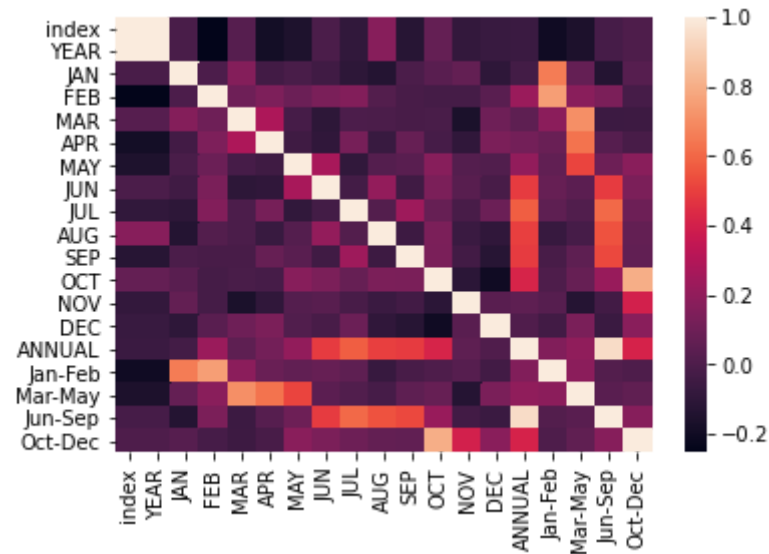
```
In [17]: sns.displot(df['YEAR'])
```

```
Out[17]: <seaborn.axisgrid.FacetGrid at 0x22471283df0>
```



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

Out[18]: <AxesSubplot:>



```
In [ ]:
```