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("rainfall_himachal pradesh.csv")
df
```

Out[2]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
0	1587	HIMACHAL PRADESH	1901	137.8	174.5	75.0	19.2	89.6	32.7	280.5	459.7	53.0	3.9	0.0
1	1588	HIMACHAL PRADESH	1902	6.5	27.0	104.4	76.2	61.3	78.8	258.6	199.3	113.4	23.6	2.5
2	1589	HIMACHAL PRADESH	1903	76.5	21.4	213.7	25.4	54.7	32.2	157.7	256.5	107.9	5.8	0.2
3	1590	HIMACHAL PRADESH	1904	79.3	22.4	131.7	48.0	90.3	33.1	241.1	184.3	56.4	51.6	17.3
4	1591	HIMACHAL PRADESH	1905	81.3	76.8	160.2	39.3	50.4	43.6	191.1	132.8	119.1	0.3	0.9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
110	1697	HIMACHAL PRADESH	2011	43.9	97.4	49.7	62.4	45.1	118.3	177.7	380.2	120.3	6.0	0.3
111	1698	HIMACHAL PRADESH	2012	92.3	51.3	28.4	55.9	9.4	31.1	241.5	280.6	133.1	3.1	3.2
112	1699	HIMACHAL PRADESH	2013	79.9	182.6	76.6	28.9	32.6	233.6	208.8	240.0	65.8	21.8	16.6
113	1700	HIMACHAL PRADESH	2014	69.6	124.9	125.2	60.6	68.9	51.7	203.6	146.7	84.6	19.3	4.5
114	1701	HIMACHAL PRADESH	2015	67.2	156.6	192.5	84.9	45.0	85.8	249.9	195.9	75.5	17.7	14.5

115 rows × 20 columns

head

In [3]:
```
df.head(5)
df
```

Out[3]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
0	1587	HIMACHAL PRADESH	1901	137.8	174.5	75.0	19.2	89.6	32.7	280.5	459.7	53.0	3.9	0.0
1	1588	HIMACHAL PRADESH	1902	6.5	27.0	104.4	76.2	61.3	78.8	258.6	199.3	113.4	23.6	2.5
2	1589	HIMACHAL PRADESH	1903	76.5	21.4	213.7	25.4	54.7	32.2	157.7	256.5	107.9	5.8	0.2
3	1590	HIMACHAL PRADESH	1904	79.3	22.4	131.7	48.0	90.3	33.1	241.1	184.3	56.4	51.6	17.3
4	1591	HIMACHAL PRADESH	1905	81.3	76.8	160.2	39.3	50.4	43.6	191.1	132.8	119.1	0.3	0.9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
110	1697	HIMACHAL PRADESH	2011	43.9	97.4	49.7	62.4	45.1	118.3	177.7	380.2	120.3	6.0	0.3
111	1698	HIMACHAL PRADESH	2012	92.3	51.3	28.4	55.9	9.4	31.1	241.5	280.6	133.1	3.1	3.2
112	1699	HIMACHAL PRADESH	2013	79.9	182.6	76.6	28.9	32.6	233.6	208.8	240.0	65.8	21.8	16.6
113	1700	HIMACHAL PRADESH	2014	69.6	124.9	125.2	60.6	68.9	51.7	203.6	146.7	84.6	19.3	4.5
114	1701	HIMACHAL PRADESH	2015	67.2	156.6	192.5	84.9	45.0	85.8	249.9	195.9	75.5	17.7	14.5

115 rows × 20 columns

tail

In [4]:
```
df.tail(5)
df
```

Out[4]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
0	1587	HIMACHAL PRADESH	1901	137.8	174.5	75.0	19.2	89.6	32.7	280.5	459.7	53.0	3.9	0.0
1	1588	HIMACHAL PRADESH	1902	6.5	27.0	104.4	76.2	61.3	78.8	258.6	199.3	113.4	23.6	2.5
2	1589	HIMACHAL PRADESH	1903	76.5	21.4	213.7	25.4	54.7	32.2	157.7	256.5	107.9	5.8	0.2

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
3	1590	HIMACHAL PRADESH	1904	79.3	22.4	131.7	48.0	90.3	33.1	241.1	184.3	56.4	51.6	17.3
4	1591	HIMACHAL PRADESH	1905	81.3	76.8	160.2	39.3	50.4	43.6	191.1	132.8	119.1	0.3	0.9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
110	1697	HIMACHAL PRADESH	2011	43.9	97.4	49.7	62.4	45.1	118.3	177.7	380.2	120.3	6.0	0.3
111	1698	HIMACHAL PRADESH	2012	92.3	51.3	28.4	55.9	9.4	31.1	241.5	280.6	133.1	3.1	3.2
112	1699	HIMACHAL PRADESH	2013	79.9	182.6	76.6	28.9	32.6	233.6	208.8	240.0	65.8	21.8	16.6
113	1700	HIMACHAL PRADESH	2014	69.6	124.9	125.2	60.6	68.9	51.7	203.6	146.7	84.6	19.3	4.5
114	1701	HIMACHAL PRADESH	2015	67.2	156.6	192.5	84.9	45.0	85.8	249.9	195.9	75.5	17.7	14.5

115 rows × 20 columns

Data Cleaning and Data Preprocessing

describe()

In [5]:
```
df.describe()
```

Out[5]:

	index	YEAR	JAN	FEB	MAR	APR	MAY	JUN
count	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000
mean	1644.000000	1958.000000	84.189565	90.894783	101.146087	62.428696	58.156522	91.220870
std	33.341666	33.341666	51.919380	52.257987	66.508952	35.885632	33.972489	49.014057
min	1587.000000	1901.000000	0.300000	0.700000	5.900000	4.500000	8.800000	23.700000
25%	1615.500000	1929.500000	45.100000	50.350000	54.350000	35.350000	34.650000	53.550000
50%	1644.000000	1958.000000	78.000000	82.800000	83.600000	55.900000	54.300000	84.000000
75%	1672.500000	1986.500000	113.950000	124.800000	137.100000	84.750000	78.600000	111.550000
max	1701.000000	2015.000000	246.300000	271.800000	382.000000	181.700000	214.200000	252.700000

shape

In [6]:
```
np.shape(df)
```

Out[6]:
```
(115, 20)
```

size

In [7]:
```
np.size(df)
```

Out[7]:
```
2300
```

dropna

In [8]:
```
df=df.dropna()
```

columns

In [9]:
```
df.columns
```

Out[9]:
```
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')
```

info()

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

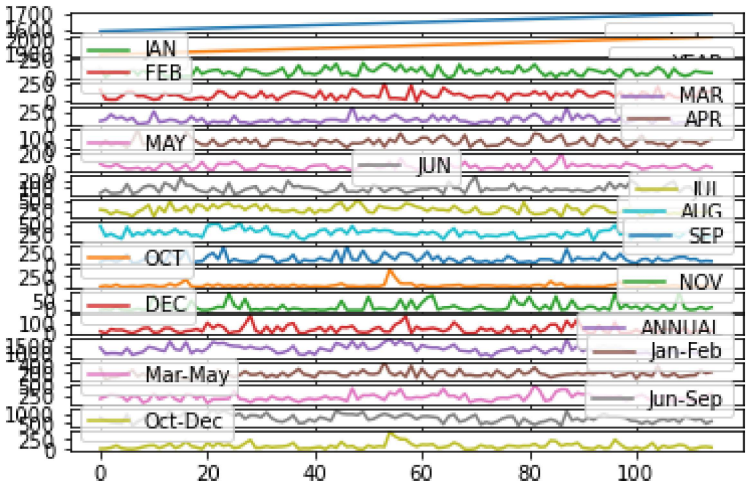
```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 115 entries, 0 to 114
Data columns (total 20 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   index        115 non-null    int64  
 1   SUBDIVISION  115 non-null    object 
 2   YEAR         115 non-null    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 [11]:
```
df.plot.line(subplots=True)
```

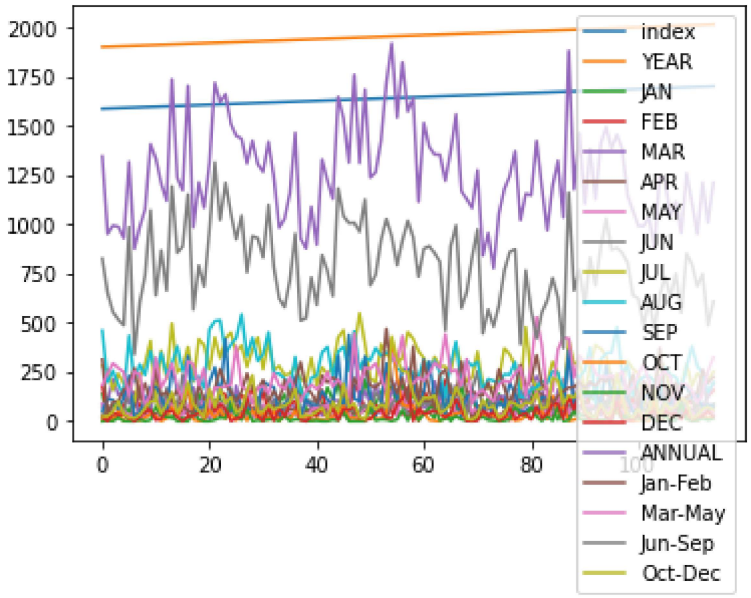
Out[11]:
```
array([<AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>], dtype=object)
```



Line chart

In [12]:
```
df.plot.line()
```

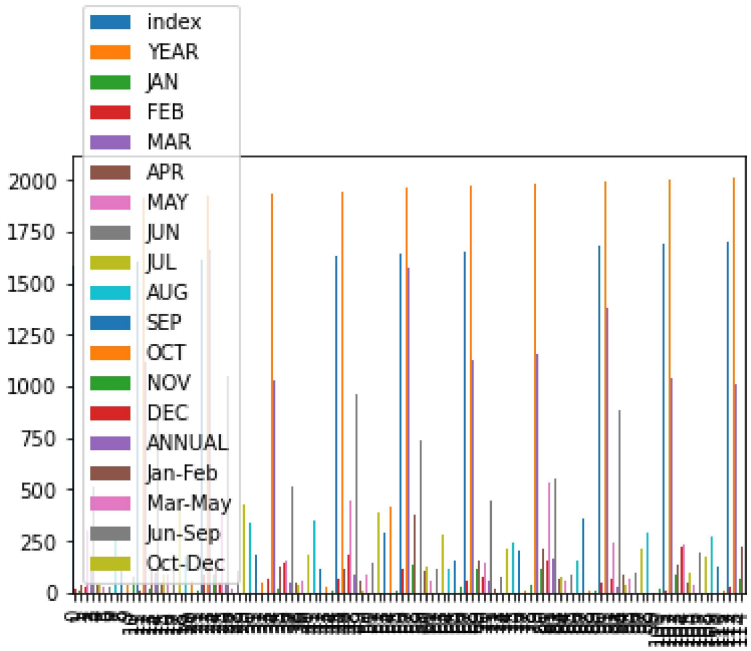
Out[12]:
```
<AxesSubplot:>
```



Bar chart

In [13]:
```
df.plot.bar()
```

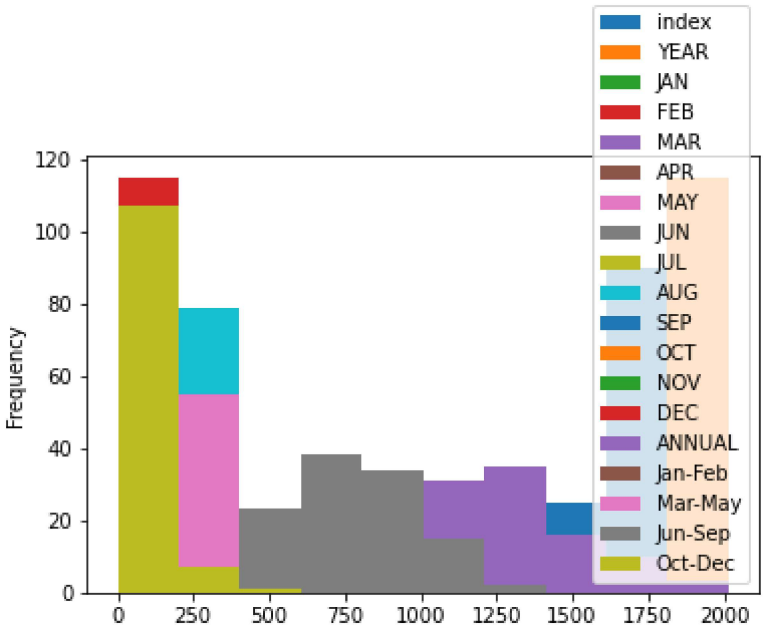
Out[13]: <AxesSubplot:>



Histogram

In [14]:
```
df.plot.hist()
```

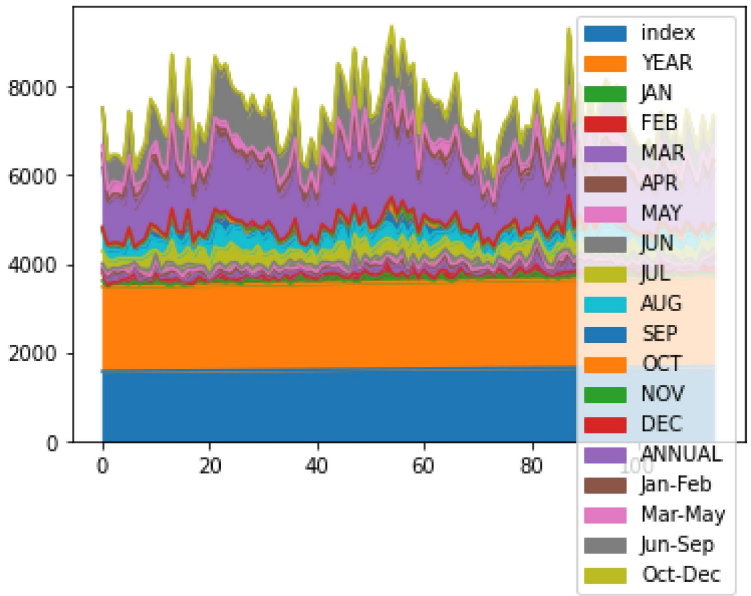
Out[14]: <AxesSubplot:ylabel='Frequency'>



Area chart

In [15]:
```
df.plot.area()
```

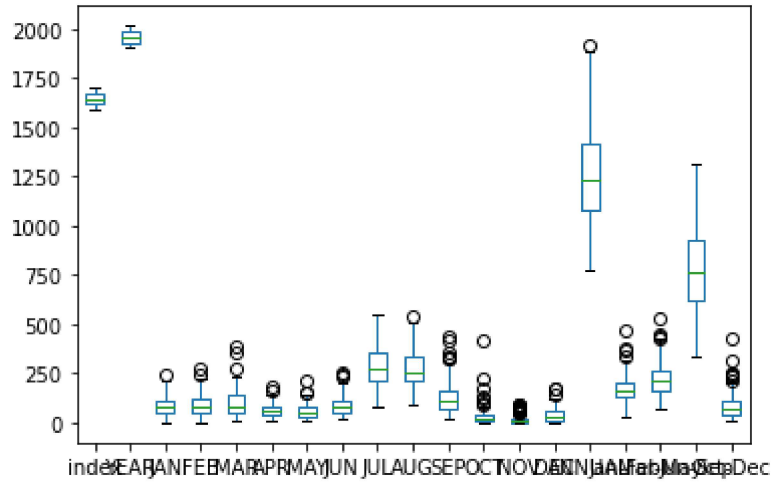
Out[15]: <AxesSubplot:>



Box chart

In [16]:
```
df.plot.box()
```

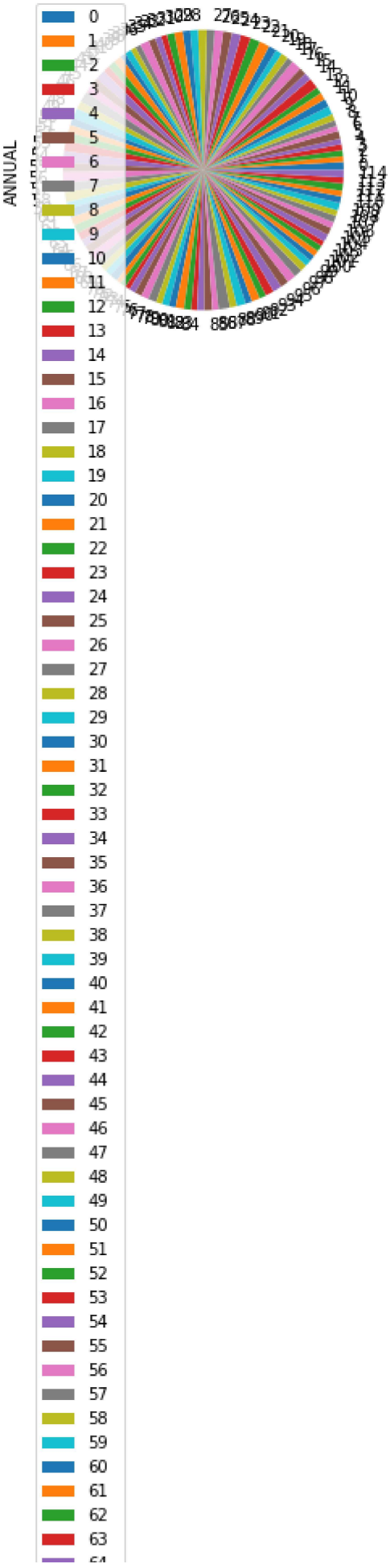
Out[16]: <AxesSubplot:>



Pie chart

In [17]:
```
df.plot.pie(y='ANNUAL')
```

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


ANNUAL
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
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30
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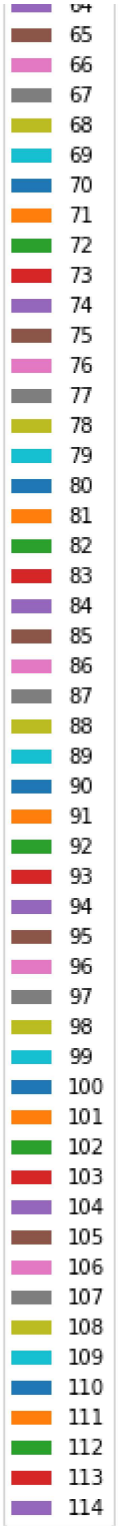
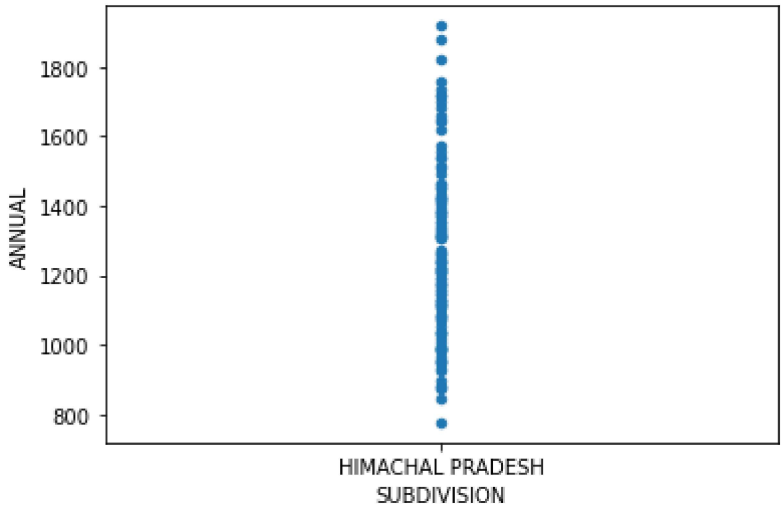
61
62
63



Scatter chart

In [18]:
```
df.plot.scatter(x='SUBDIVISION' ,y='ANNUAL')
```

Out[18]:
```
<AxesSubplot:xlabel='SUBDIVISION', ylabel='ANNUAL'>
```



In [19]:
```
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 [20]:
```
df.describe()
```

Out[20]:

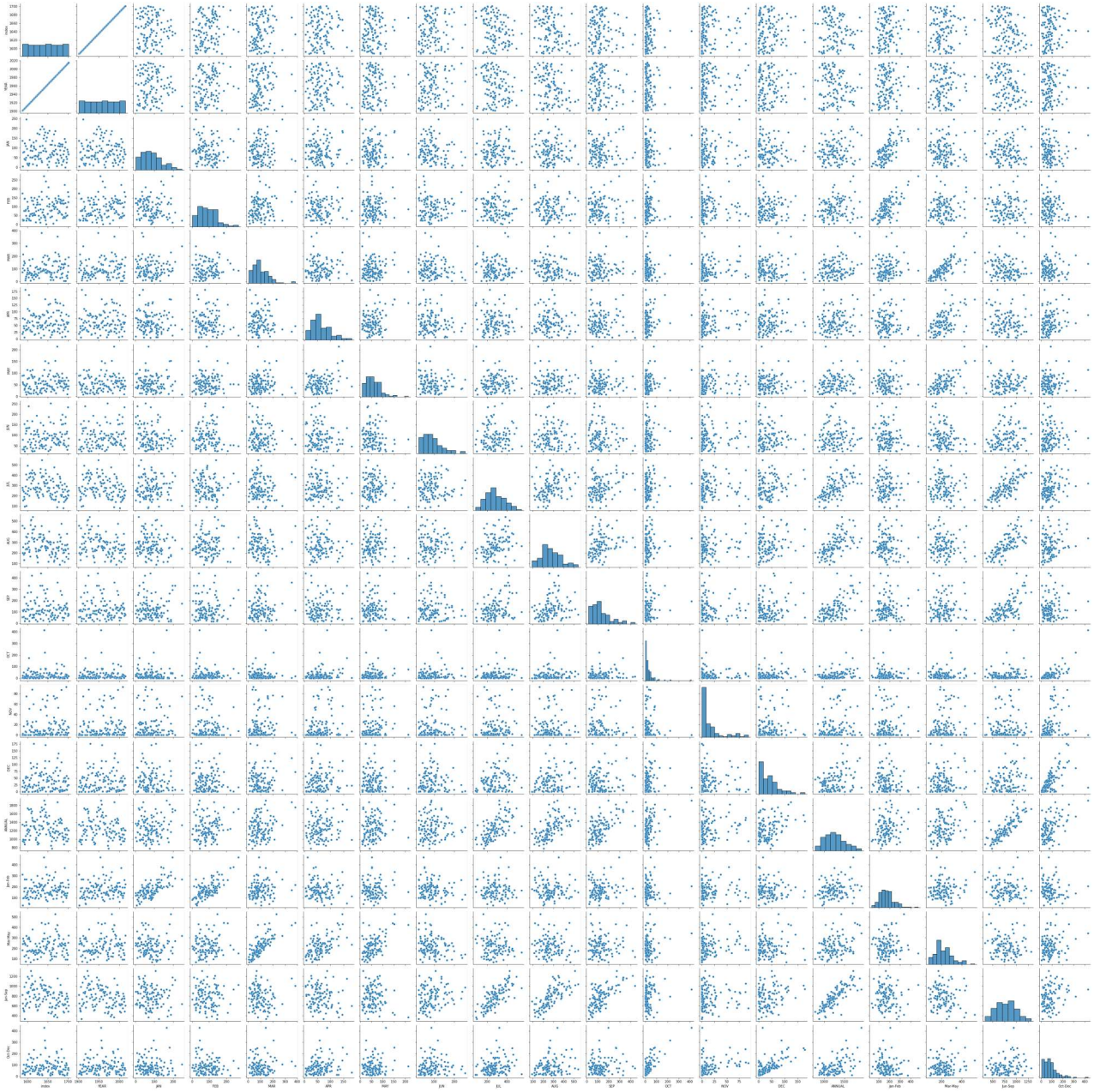
	index	YEAR	JAN	FEB	MAR	APR	MAY	JUN
count	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000
mean	1644.000000	1958.000000	84.189565	90.894783	101.146087	62.428696	58.156522	91.220870
std	33.341666	33.341666	51.919380	52.257987	66.508952	35.885632	33.972489	49.014057
min	1587.000000	1901.000000	0.300000	0.700000	5.900000	4.500000	8.800000	23.700000
25%	1615.500000	1929.500000	45.100000	50.350000	54.350000	35.350000	34.650000	53.550000

	index	YEAR	JAN	FEB	MAR	APR	MAY	JUN
50%	1644.000000	1958.000000	78.000000	82.800000	83.600000	55.900000	54.300000	84.000000
75%	1672.500000	1986.500000	113.950000	124.800000	137.100000	84.750000	78.600000	111.550000
max	1701.000000	2015.000000	246.300000	271.800000	382.000000	181.700000	214.200000	252.700000

EDA AND VISUALIZATION

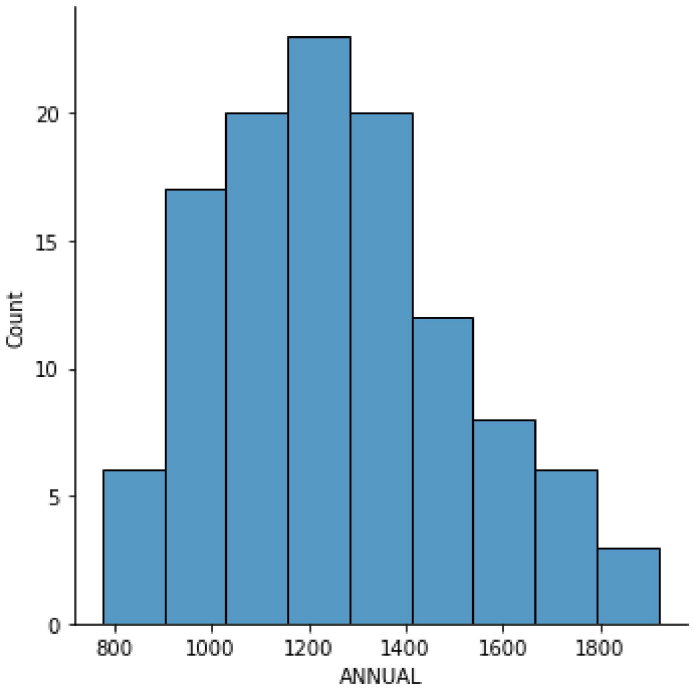
In [21]:
```
sns.pairplot(df)
```

Out[21]: <seaborn.axisgrid.PairGrid at 0x1c4e93164c0>



In [22]:
```
sns.displot(df['ANNUAL'])
```

Out[22]: <seaborn.axisgrid.FacetGrid at 0x1c4f4607370>



In [23]:
```
sns.heatmap(df.corr())
```

Out[23]: <AxesSubplot:>