Import Libraies

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

In [2]:
```
df=pd.read_csv(r"C:\Users\user\Downloads\FP2_RainFall\rainfall in india 1901-2015.csv")[2047:216
df
```

Out[2]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2047	2047	WEST MADHYA PRADESH	1901	25.8	5.8	5.8	2.8	2.1	41.2	228.9	349.9	47.9	5.6	0.0	2.4	718.2
2048	2048	WEST MADHYA PRADESH	1902	22.1	8.4	0.0	2.0	5.9	35.9	401.9	179.4	194.1	37.9	10.0	14.2	911.7
2049	2049	WEST MADHYA PRADESH	1903	5.3	0.0	0.0	0.0	22.3	50.6	304.9	261.1	250.2	55.1	0.0	0.0	949.6
2050	2050	WEST MADHYA PRADESH	1904	3.2	15.5	14.8	0.0	12.0	96.6	273.0	218.6	125.9	3.3	1.8	9.6	774.4
2051	2051	WEST MADHYA PRADESH	1905	3.5	4.4	1.1	0.8	3.0	36.1	326.3	137.6	183.5	0.3	0.0	0.0	696.5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2156	2156	WEST MADHYA PRADESH	2010	2.2	5.4	0.8	0.1	0.4	62.2	258.5	291.5	136.1	13.6	4.6	0.8	776.3
2157	2157	WEST MADHYA PRADESH	2011	0.0	1.7	0.1	1.8	3.6	241.5	306.7	343.3	165.0	0.2	0.0	0.0	1063.9
2158	2158	WEST MADHYA PRADESH	2012	6.2	0.0	0.0	0.9	3.1	48.2	439.2	341.2	194.3	2.1	0.0	0.0	1035.2
2159	2159	WEST MADHYA PRADESH	2013	1.7	31.1	8.5	2.8	0.4	263.7	485.1	432.6	98.9	68.7	0.3	2.4	1396.3
2160	2160	WEST MADHYA PRADESH	2014	25.6	34.4	4.6	1.4	1.4	30.6	337.4	211.0	192.6	7.0	3.0	15.8	864.9

114 rows × 20 columns

Data Cleaning and Preprocessing

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

Out[3]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2047	2047	WEST MADHYA PRADESH	1901	25.8	5.8	5.8	2.8	2.1	41.2	228.9	349.9	47.9	5.6	0.0	2.4	718.2
2048	2048	WEST MADHYA PRADESH	1902	22.1	8.4	0.0	2.0	5.9	35.9	401.9	179.4	194.1	37.9	10.0	14.2	911.7
2049	2049	WEST MADHYA PRADESH	1903	5.3	0.0	0.0	0.0	22.3	50.6	304.9	261.1	250.2	55.1	0.0	0.0	949.6
2050	2050	WEST MADHYA PRADESH	1904	3.2	15.5	14.8	0.0	12.0	96.6	273.0	218.6	125.9	3.3	1.8	9.6	774.4
2051	2051	WEST MADHYA PRADESH	1905	3.5	4.4	1.1	0.8	3.0	36.1	326.3	137.6	183.5	0.3	0.0	0.0	696.5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2156	2156	WEST MADHYA PRADESH	2010	2.2	5.4	0.8	0.1	0.4	62.2	258.5	291.5	136.1	13.6	4.6	0.8	776.3
2157	2157	WEST MADHYA PRADESH	2011	0.0	1.7	0.1	1.8	3.6	241.5	306.7	343.3	165.0	0.2	0.0	0.0	1063.9
2158	2158	WEST MADHYA PRADESH	2012	6.2	0.0	0.0	0.9	3.1	48.2	439.2	341.2	194.3	2.1	0.0	0.0	1035.2
2159	2159	WEST MADHYA PRADESH	2013	1.7	31.1	8.5	2.8	0.4	263.7	485.1	432.6	98.9	68.7	0.3	2.4	1396.3
2160	2160	WEST MADHYA PRADESH	2014	25.6	34.4	4.6	1.4	1.4	30.6	337.4	211.0	192.6	7.0	3.0	15.8	864.9

113 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')
```

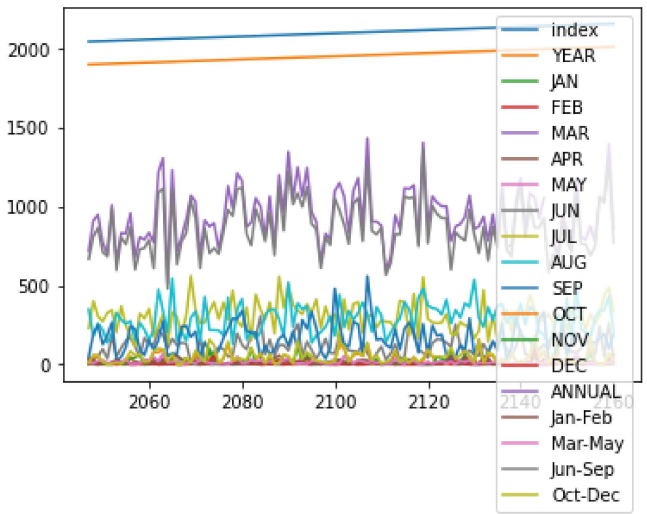
In [5]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 114 entries, 2047 to 2160
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          113 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       113 non-null    float64
 16  Jan-Feb      113 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: 17.9+ KB
```

Line chart

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

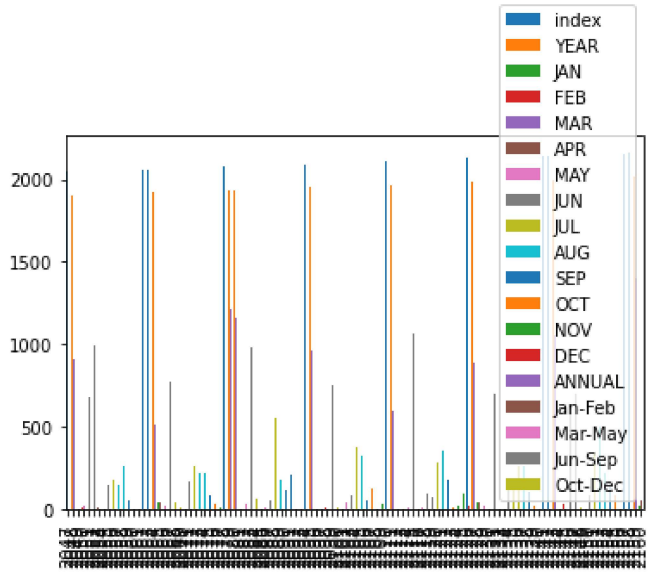
Out[6]: <AxesSubplot:>



Bar chart

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

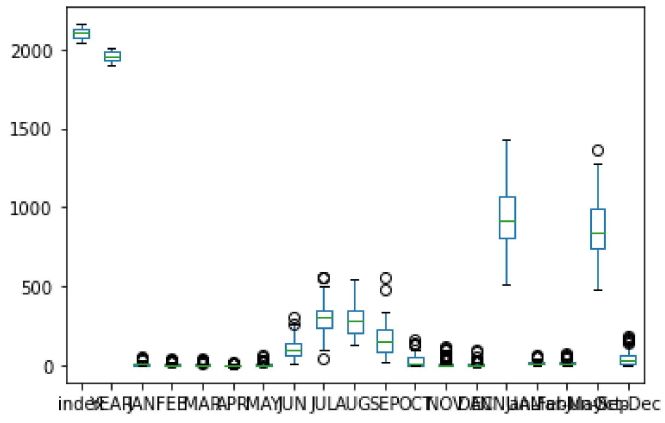
Out[7]: <AxesSubplot:>



Box chart

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

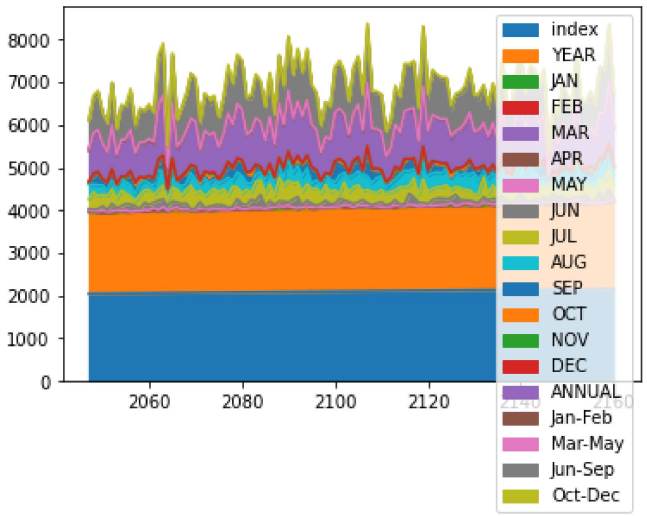
Out[8]: <AxesSubplot:>



Area chart

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

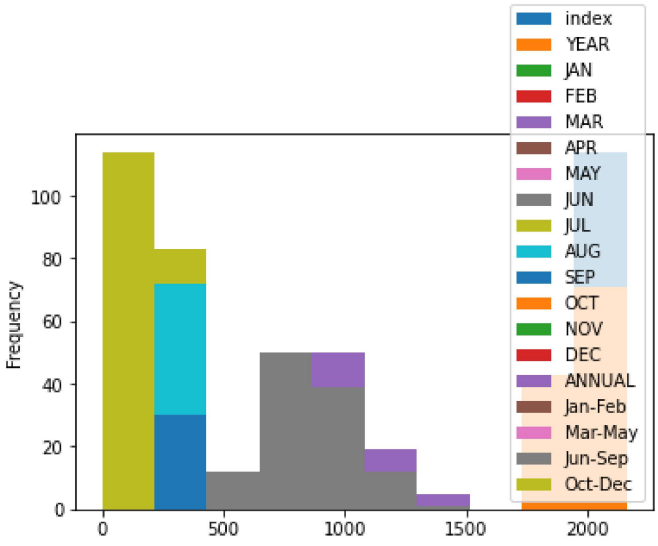
Out[9]: <AxesSubplot:>



Histogram

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

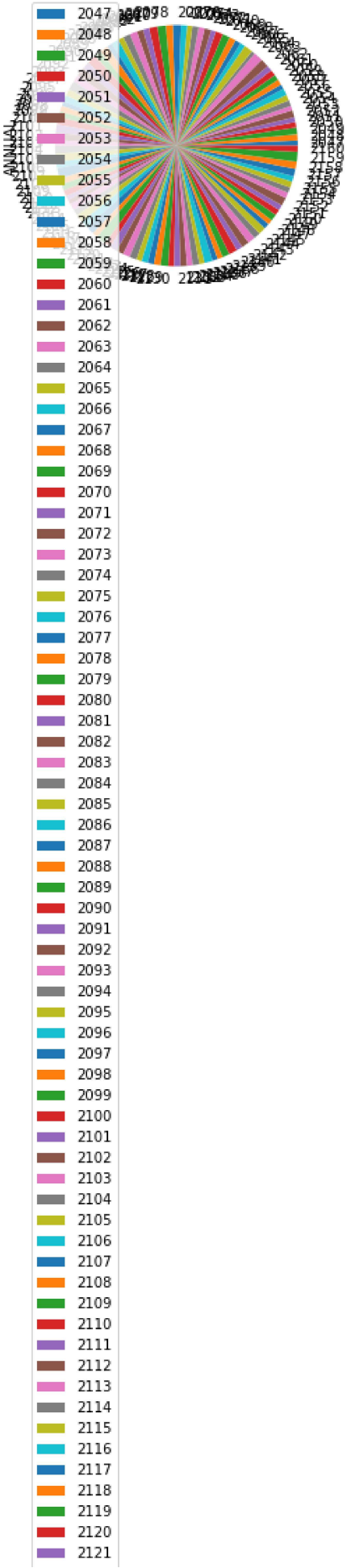
Out[10]: <AxesSubplot:ylabel='Frequency'>



pie chart

In [11]:
```
df.plot.pie(y="ANNUAL")
```

Out[11]:
```
<AxesSubplot:ylabel='ANNUAL'>
```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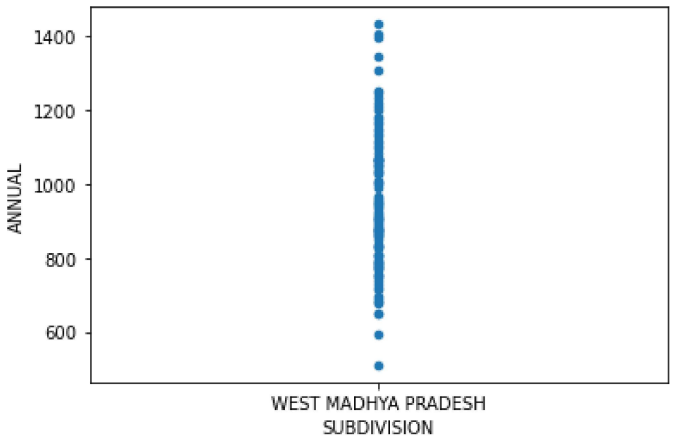
Scatter chart

In [12]:
```
df.plot.scatter(y='ANNUAL',x='SUBDIVISION')
```

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



In [13]:
```
df.describe()
```

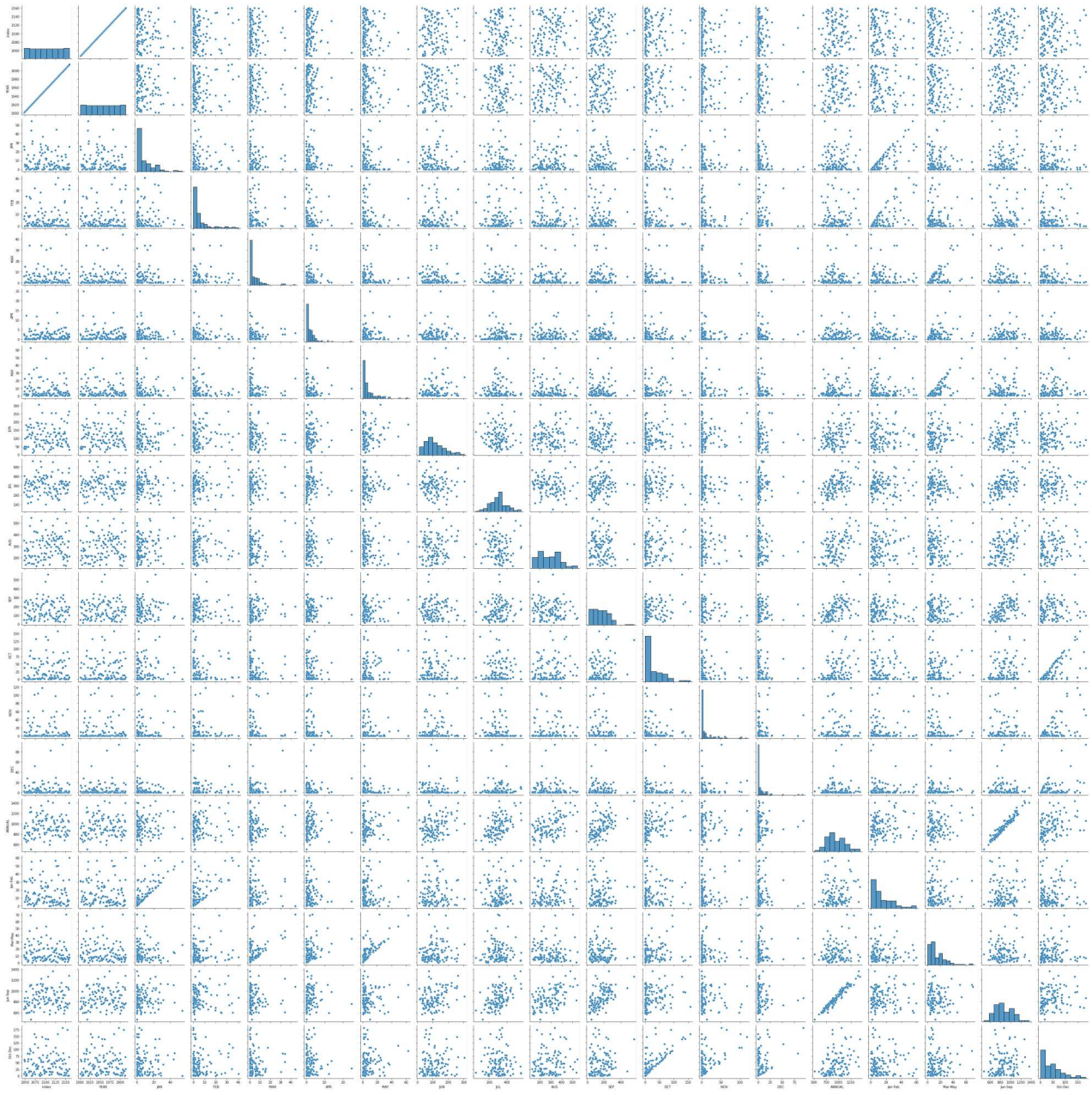
Out[13]:

	index	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	
count	114.000000	114.000000	114.000000	113.000000	114.000000	114.000000	114.000000	114.000000	114.000000	1
mean	2103.500000	1957.500000	8.970175	6.307080	4.749123	2.279825	7.707018	111.410526	301.884211	2
std	33.052988	33.052988	10.922745	9.033813	7.739317	3.342808	10.433919	60.957935	95.917190	
min	2047.000000	1901.000000	0.000000	0.000000	0.000000	0.000000	0.000000	12.100000	46.900000	1
25%	2075.250000	1929.250000	0.900000	0.500000	0.200000	0.200000	1.325000	64.875000	239.275000	2
50%	2103.500000	1957.500000	4.800000	2.700000	1.850000	1.350000	3.550000	98.250000	305.250000	2
75%	2131.750000	1985.750000	14.450000	8.400000	6.100000	3.000000	10.100000	143.475000	351.075000	3
max	2160.000000	2014.000000	54.100000	40.500000	44.300000	24.800000	62.700000	306.300000	561.600000	5

EDA AND VISUALIZATION

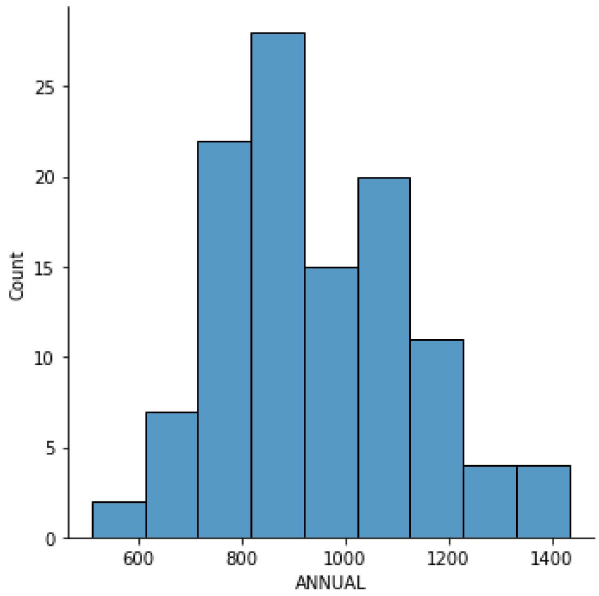
In [14]:
```
sns.pairplot(df)
```

Out[14]:
```
<seaborn.axisgrid.PairGrid at 0x238df8b7fa0>
```



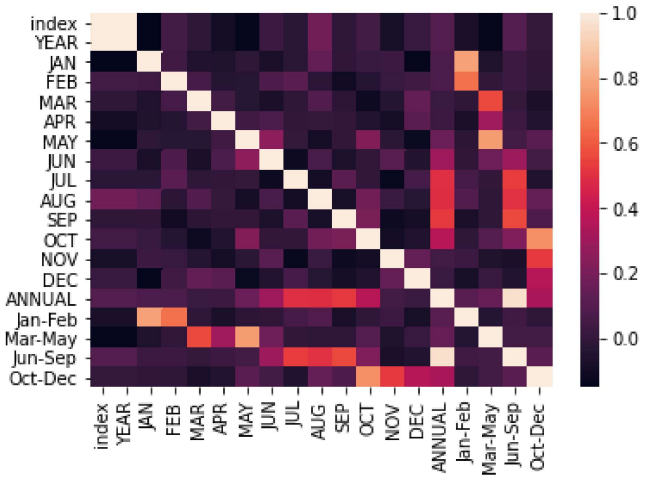
In [15]:
```
sns.displot(df['ANNUAL'])
```

Out[15]: <seaborn.axisgrid.FacetGrid at 0x238ebd6d280>



In [16]:
```
sns.heatmap(df.corr())
```

Out[16]: <AxesSubplot:>



In [ ]:
```

```