

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_sub himalayan west bengal _ sikkim.csv")
df
```

Out[2]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	
		0	437	SUB HIMALAYAN WEST BENGAL & SIKKIM	1901	26.5	14.8	14.1	29.2	195.5	488.4	524.8	501.1	242.7	55.5	17.1
		1	438	SUB HIMALAYAN WEST BENGAL & SIKKIM	1902	1.2	0.7	87.1	126.1	271.3	539.2	671.0	603.8	799.9	74.4	5.6
		2	439	SUB HIMALAYAN WEST BENGAL & SIKKIM	1903	5.5	8.7	19.6	18.6	163.6	541.2	431.5	708.8	365.2	141.3	0.1
		3	440	SUB HIMALAYAN WEST BENGAL & SIKKIM	1904	3.4	29.2	0.9	124.3	333.6	274.2	500.4	468.5	260.6	164.8	8.9
		4	441	SUB HIMALAYAN WEST BENGAL & SIKKIM	1905	12.0	31.2	51.9	104.4	290.6	524.8	523.1	1036.6	321.1	87.9	2.1
	
		110	547	SUB HIMALAYAN WEST BENGAL & SIKKIM	2011	8.5	19.9	71.2	135.0	247.8	419.8	612.3	470.3	356.3	46.7	26.1
		111	548	SUB HIMALAYAN WEST	2012	15.3	13.9	45.5	159.8	202.4	604.2	684.5	332.7	434.7	119.4	12.1

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
			BENGAL & SIKKIM												
			SUB HIMALAYAN												
112	549		WEST BENGAL & SIKKIM	2013	3.0	23.6	32.1	114.7	296.5	404.9	588.4	416.3	308.0	199.8	16.1
113	550		SUB HIMALAYAN	2014	0.2	26.6	37.7	47.9	308.6	543.2	384.6	563.3	371.5	31.2	5.1
114	551		SUB HIMALAYAN	2015	15.7	15.0	64.8	149.0	304.6	508.2	393.3	626.6	354.9	53.6	23.1

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
			SUB HIMALAYAN												
0	437		WEST BENGAL & SIKKIM	1901	26.5	14.8	14.1	29.2	195.5	488.4	524.8	501.1	242.7	55.5	17.1
1	438		SUB HIMALAYAN	1902	1.2	0.7	87.1	126.1	271.3	539.2	671.0	603.8	799.9	74.4	5.6
2	439		SUB HIMALAYAN	1903	5.5	8.7	19.6	18.6	163.6	541.2	431.5	708.8	365.2	141.3	0.1
3	440		SUB HIMALAYAN	1904	3.4	29.2	0.9	124.3	333.6	274.2	500.4	468.5	260.6	164.8	8.1

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
			SUB HIMALAYAN												
4	441		WEST BENGAL & SIKKIM	1905	12.0	31.2	51.9	104.4	290.6	524.8	523.1	1036.6	321.1	87.9	2.1
	
			SUB HIMALAYAN												
110	547		WEST BENGAL & SIKKIM	2011	8.5	19.9	71.2	135.0	247.8	419.8	612.3	470.3	356.3	46.7	26.1
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			SUB HIMALAYAN												
113	550		WEST BENGAL & SIKKIM	2014	0.2	26.6	37.7	47.9	308.6	543.2	384.6	563.3	371.5	31.2	5.1
			SUB HIMALAYAN												
114	551		WEST BENGAL & SIKKIM	2015	15.7	15.0	64.8	149.0	304.6	508.2	393.3	626.6	354.9	53.6	23.1

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
			SUB HIMALAYAN												
0	437		WEST BENGAL & SIKKIM	1901	26.5	14.8	14.1	29.2	195.5	488.4	524.8	501.1	242.7	55.5	17.1

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	438	SUB HIMALAYAN WEST BENGAL & SIKKIM	1902	1.2	0.7	87.1	126.1	271.3	539.2	671.0	603.8	799.9	74.4	5.6
2	439	SUB HIMALAYAN WEST BENGAL & SIKKIM	1903	5.5	8.7	19.6	18.6	163.6	541.2	431.5	708.8	365.2	141.3	0.3
3	440	SUB HIMALAYAN WEST BENGAL & SIKKIM	1904	3.4	29.2	0.9	124.3	333.6	274.2	500.4	468.5	260.6	164.8	8.9
4	441	SUB HIMALAYAN WEST BENGAL & SIKKIM	1905	12.0	31.2	51.9	104.4	290.6	524.8	523.1	1036.6	321.1	87.9	2.1
...
110	547	SUB HIMALAYAN WEST BENGAL & SIKKIM	2011	8.5	19.9	71.2	135.0	247.8	419.8	612.3	470.3	356.3	46.7	26.1
111	548	SUB HIMALAYAN WEST BENGAL & SIKKIM	2012	15.3	13.9	45.5	159.8	202.4	604.2	684.5	332.7	434.7	119.4	12.1
112	549	SUB HIMALAYAN WEST BENGAL & SIKKIM	2013	3.0	23.6	32.1	114.7	296.5	404.9	588.4	416.3	308.0	199.8	16.1
113	550	SUB HIMALAYAN WEST BENGAL & SIKKIM	2014	0.2	26.6	37.7	47.9	308.6	543.2	384.6	563.3	371.5	31.2	5.1
114	551	SUB HIMALAYAN WEST BENGAL & SIKKIM	2015	15.7	15.0	64.8	149.0	304.6	508.2	393.3	626.6	354.9	53.6	23.8

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	494.000000	1958.000000	14.083478	22.974783	43.135652	110.681739	269.143478	537.881739
std	33.341666	33.341666	17.066089	19.583787	30.851319	55.688697	69.790921	134.120594
min	437.000000	1901.000000	0.000000	0.100000	0.000000	4.800000	142.000000	261.700000
25%	465.500000	1929.500000	2.250000	8.650000	15.100000	71.300000	217.100000	447.400000
50%	494.000000	1958.000000	9.400000	19.600000	42.600000	110.900000	269.400000	527.800000
75%	522.500000	1986.500000	19.550000	33.400000	63.650000	144.850000	311.100000	611.200000
max	551.000000	2015.000000	103.000000	109.900000	132.100000	281.800000	503.100000	896.000000

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()
```

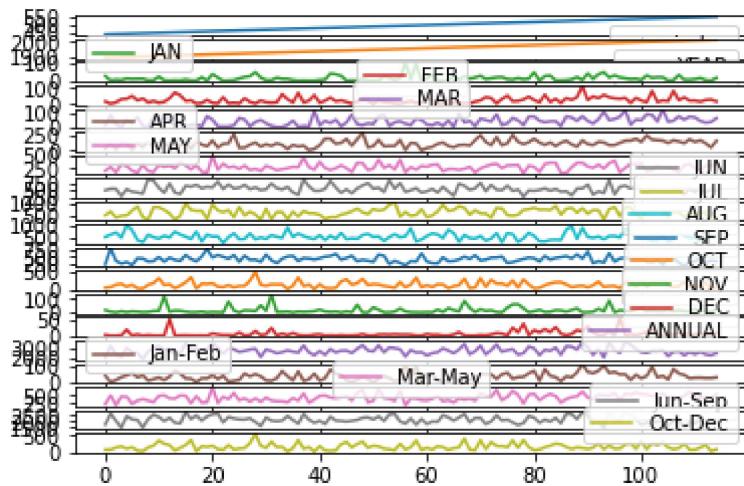
```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 115 entries, 0 to 114
Data columns (total 20 columns):
 #   Column      Non-Null Count  Dtype  
 ---  --          --          --      
 0   index       115 non-null    int64  
 1   SUBDIVISION 115 non-null    object  
 2   YEAR        115 non-null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

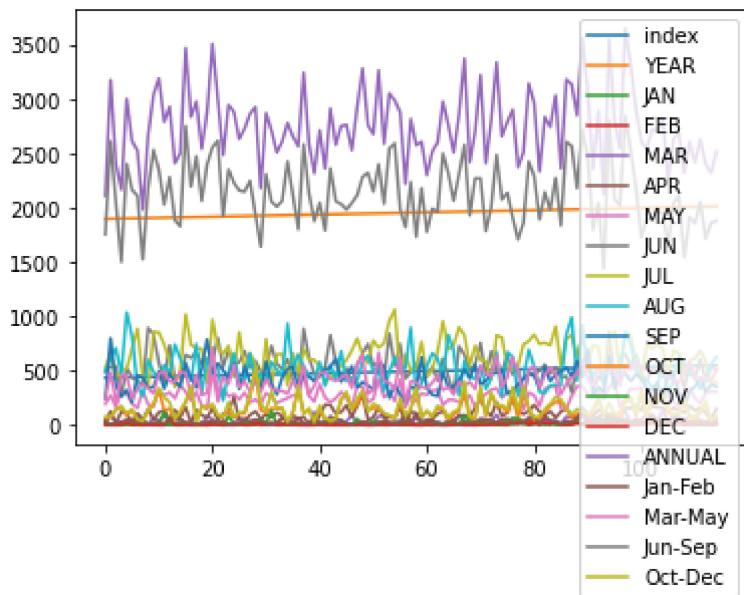
```
Out[11]: array([<AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
   <AxesSubplot:>,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



Line chart

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

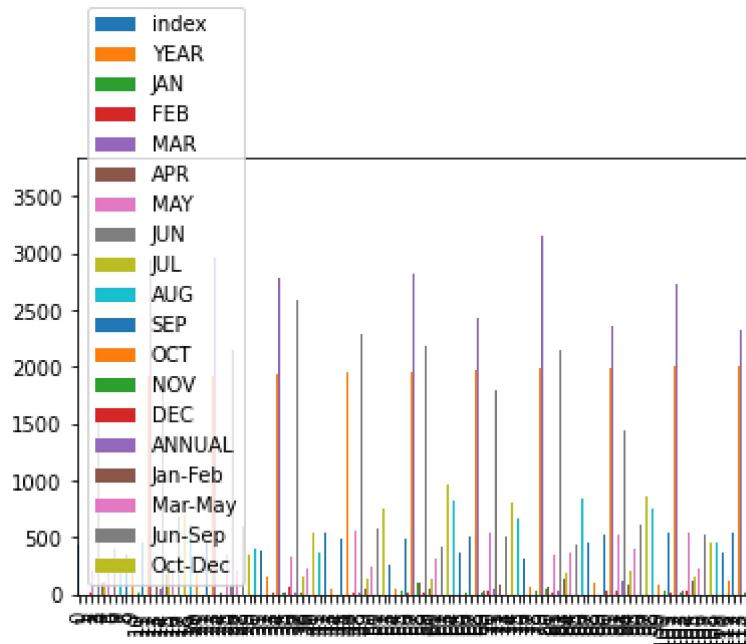
```
Out[12]: <AxesSubplot:>
```



Bar chart

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

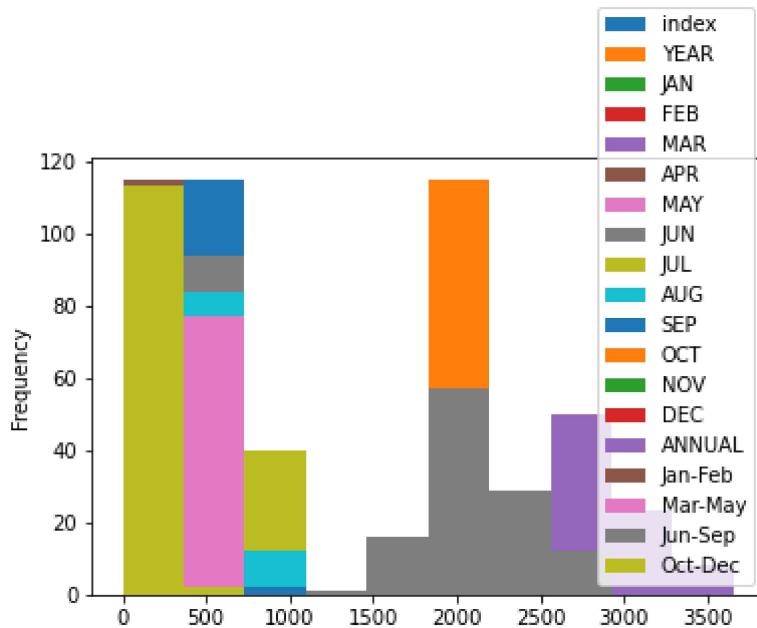
```
Out[13]: <AxesSubplot:>
```



Histogram

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

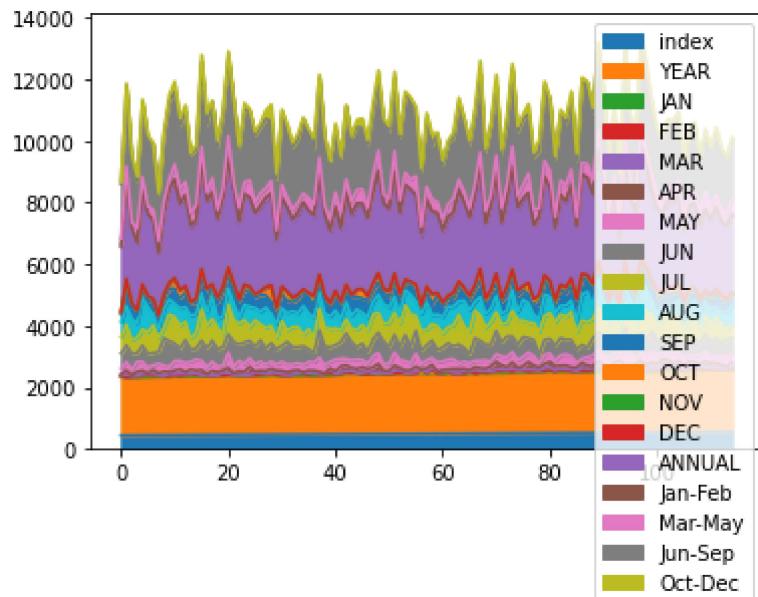
```
Out[14]: <AxesSubplot:ylabel='Frequency'>
```



Area chart

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

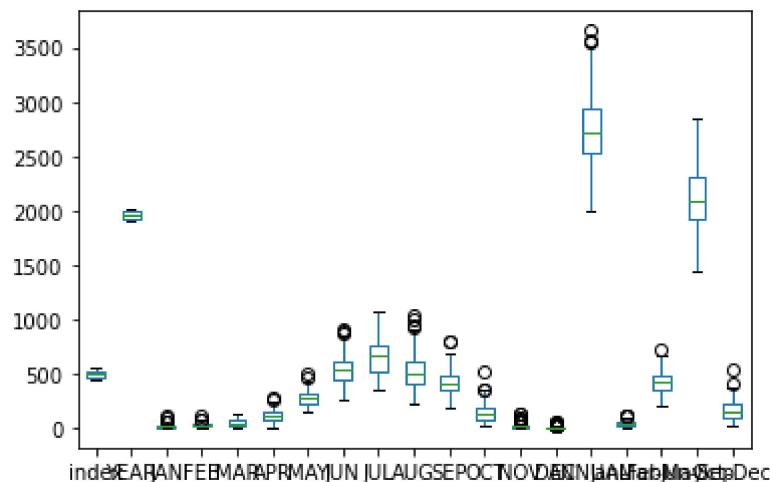
```
Out[15]: <AxesSubplot:>
```



Box chart

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

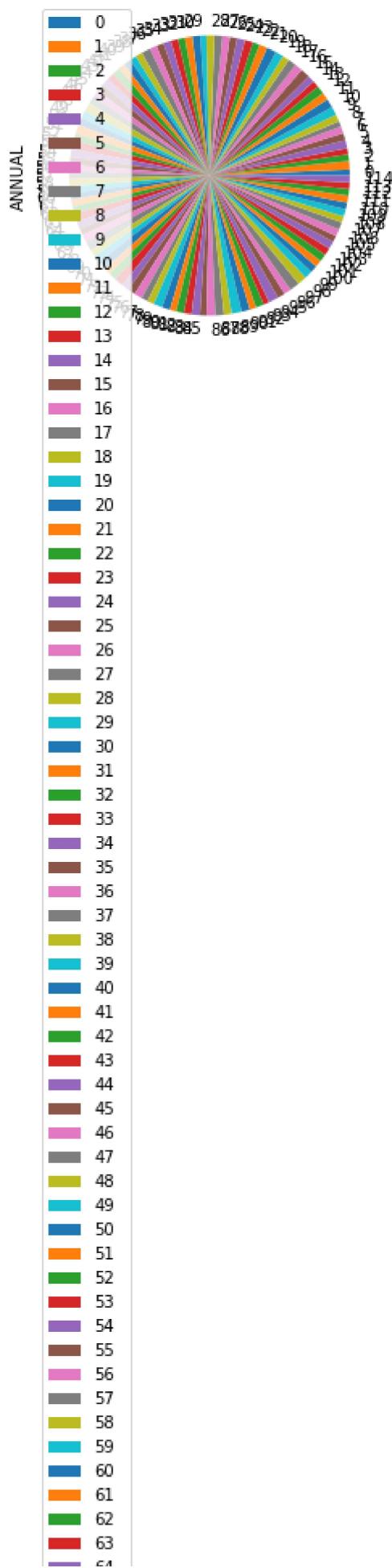
```
Out[16]: <AxesSubplot:>
```

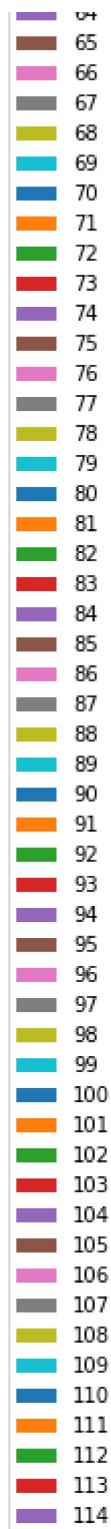


Pie chart

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

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

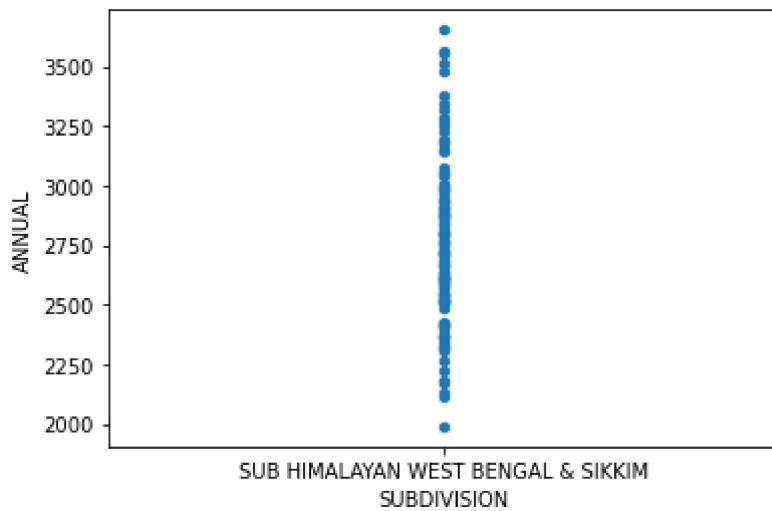




Scatter chart

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]:

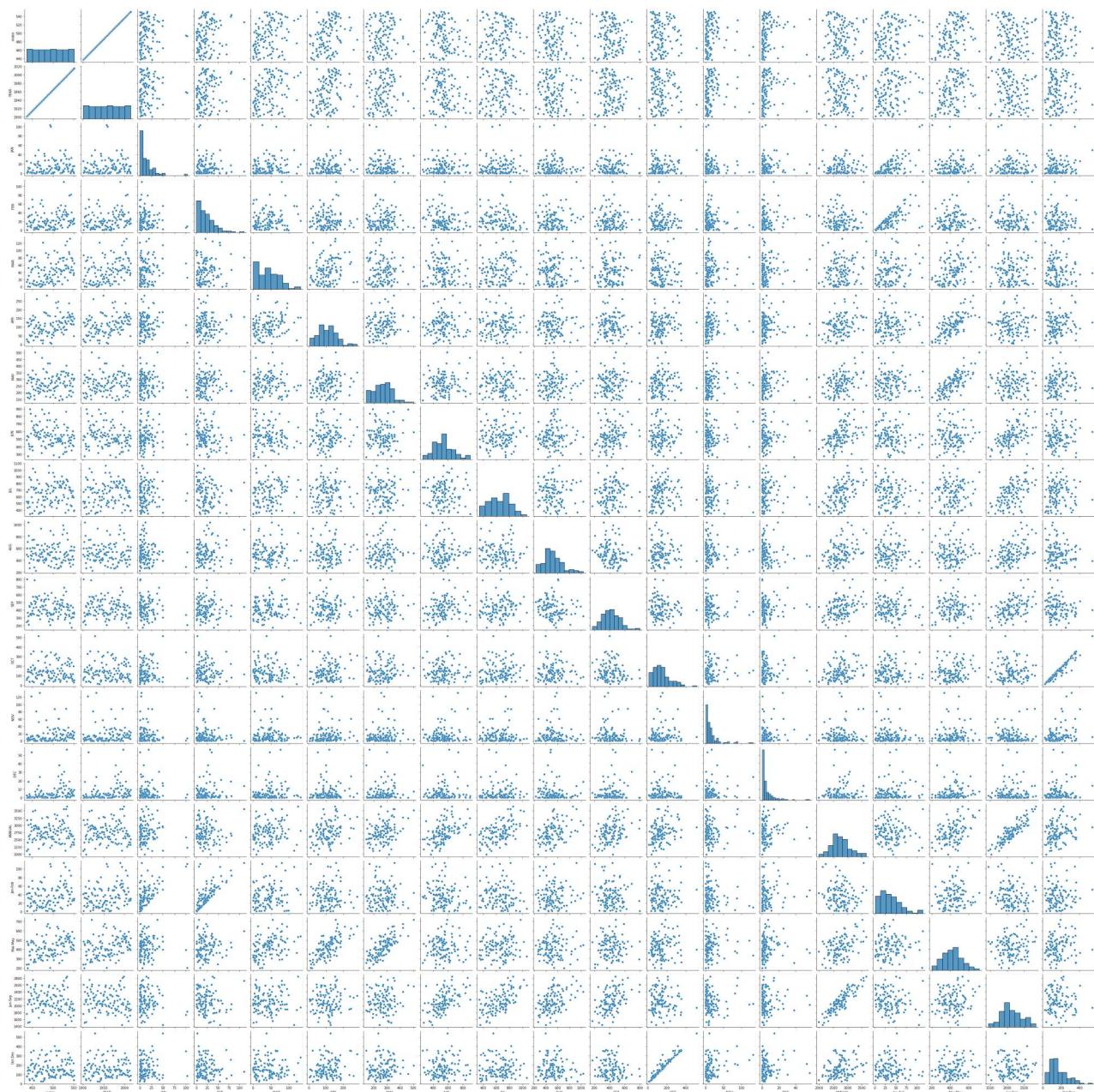
	index	YEAR	JAN	FEB	MAR	APR	MAY	JUN
count	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000	115.000000
mean	494.000000	1958.000000	14.083478	22.974783	43.135652	110.681739	269.143478	537.881739
std	33.341666	33.341666	17.066089	19.583787	30.851319	55.688697	69.790921	134.120594
min	437.000000	1901.000000	0.000000	0.100000	0.000000	4.800000	142.000000	261.700000
25%	465.500000	1929.500000	2.250000	8.650000	15.100000	71.300000	217.100000	447.400000

	index	YEAR	JAN	FEB	MAR	APR	MAY	JUN
50%	494.000000	1958.000000	9.400000	19.600000	42.600000	110.900000	269.400000	527.800000
75%	522.500000	1986.500000	19.550000	33.400000	63.650000	144.850000	311.100000	611.200000
max	551.000000	2015.000000	103.000000	109.900000	132.100000	281.800000	503.100000	896.000000

EDA AND VISUALIZATION

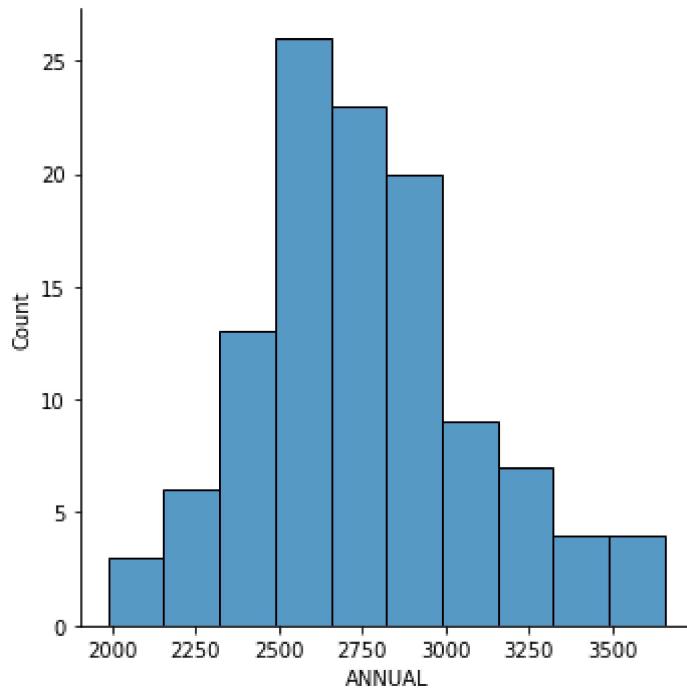
In [21]: `sns.pairplot(df)`

Out[21]: <seaborn.axisgrid.PairGrid at 0x1cc9dec2970>



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

Out[22]: <seaborn.axisgrid.FacetGrid at 0x1ccca7439f40>

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

Out[23]: <AxesSubplot:>

