# 20104016

# DEENA

# 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_naga mani mizo tripura.csv")
df
```

Out[2]:

| | index | SUBDIVISION | YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 322 | NAGA MANI MIZO TRIPURA | 1901 | 11.7 | 18.1 | 29.4 | 206.2 | 124.0 | 443.3 | 331.4 | 466.0 | 304.1 | 166 |
| **1** | 323 | NAGA MANI MIZO TRIPURA | 1902 | 4.8 | 0.5 | 36.3 | 297.8 | 215.5 | 480.1 | 392.4 | 312.8 | 318.7 | 102 |
| **2** | 324 | NAGA MANI MIZO TRIPURA | 1903 | 6.5 | 40.5 | 139.8 | 45.5 | 159.9 | 458.6 | 300.2 | 470.6 | 366.1 | 166 |
| **3** | 325 | NAGA MANI MIZO TRIPURA | 1904 | 2.3 | 46.9 | 47.5 | 290.3 | 230.5 | 455.3 | 423.5 | 423.6 | 375.8 | 128 |
| **4** | 326 | NAGA MANI MIZO TRIPURA | 1905 | 9.1 | 35.3 | 306.5 | 161.7 | 193.6 | 339.7 | 450.1 | 429.9 | 320.1 | 246 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| **110** | 432 | NAGA MANI MIZO TRIPURA | 2011 | 12.6 | 3.6 | 51.4 | 81.1 | 334.9 | 374.2 | 313.3 | 367.6 | 258.3 | 92 |
| **111** | 433 | NAGA MANI MIZO TRIPURA | 2012 | 24.5 | 10.2 | 20.3 | 243.5 | 163.5 | 396.2 | 280.1 | 342.7 | 248.7 | 160 |
| **112** | 434 | NAGA MANI MIZO TRIPURA | 2013 | 0.2 | 5.7 | 19.7 | 60.3 | 348.9 | 206.6 | 255.9 | 291.3 | 241.4 | 125 |
| **113** | 435 | NAGA MANI MIZO TRIPURA | 2014 | 1.2 | 21.0 | 25.4 | 49.6 | 192.5 | 268.3 | 295.7 | 372.3 | 300.9 | 69 |
| **114** | 436 | NAGA MANI MIZO TRIPURA | 2015 | 14.4 | 14.2 | 21.6 | 253.5 | 198.3 | 283.9 | 413.6 | 334.2 | 255.9 | 118 |

115 rows × 20 columns

# Data Cleaning and Data Preprocessing

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

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')
```

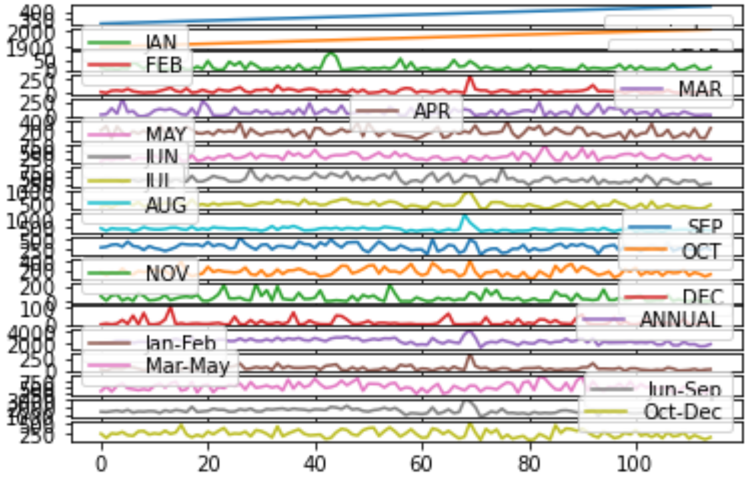
```
In [5]: df.info()
```

```
<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)
```

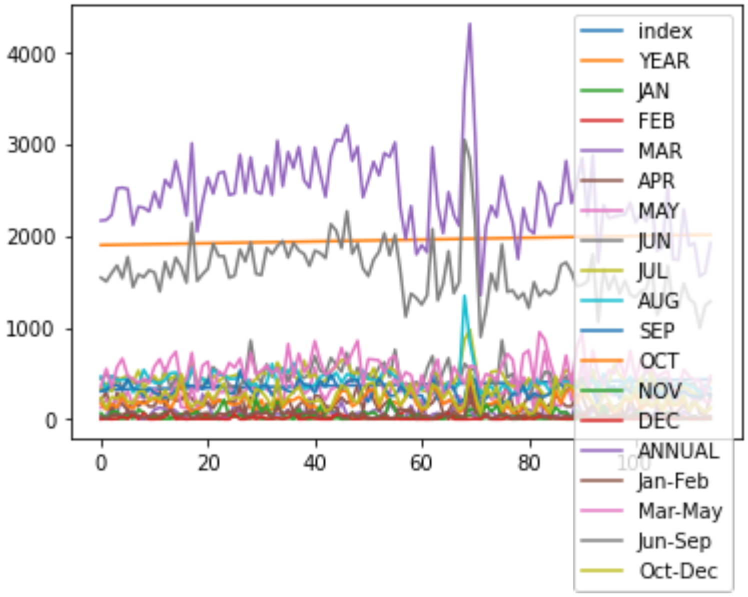
Out[6]:
```
array([<AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
       <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>, <AxesSubplot:>,
    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



# Line chart

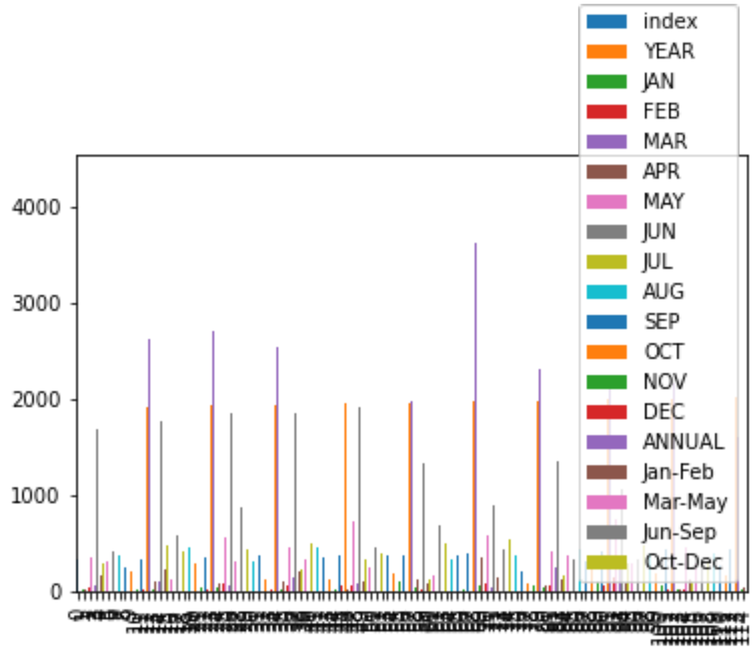
In [7]:
```
df.plot.line()
```

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



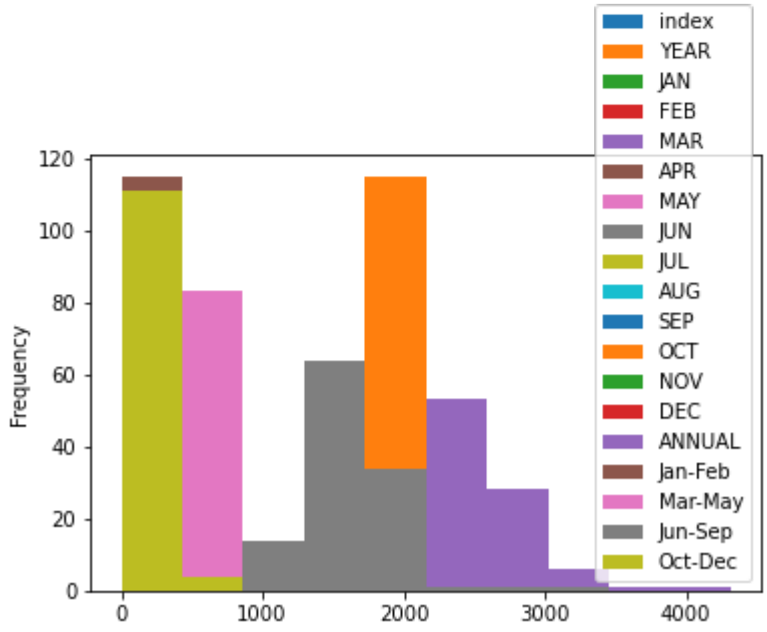
# Bar chart

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

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



# Histogram

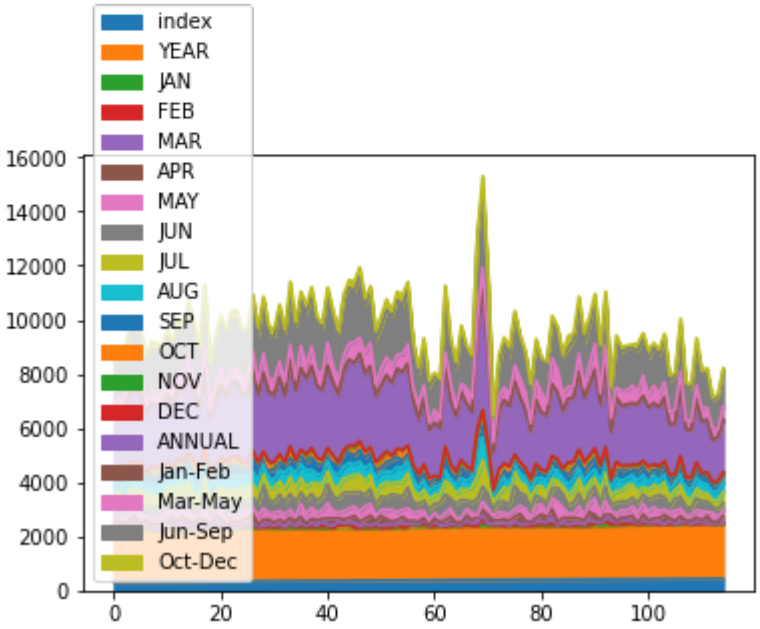
```
In [9]: df.plot.hist()

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



# Area chart

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

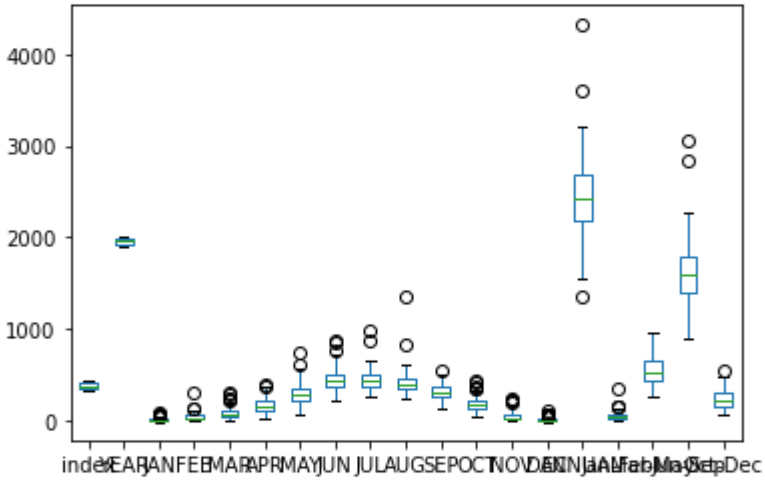
Out[10]:
```
<AxesSubplot:>
```



# Box chart

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

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



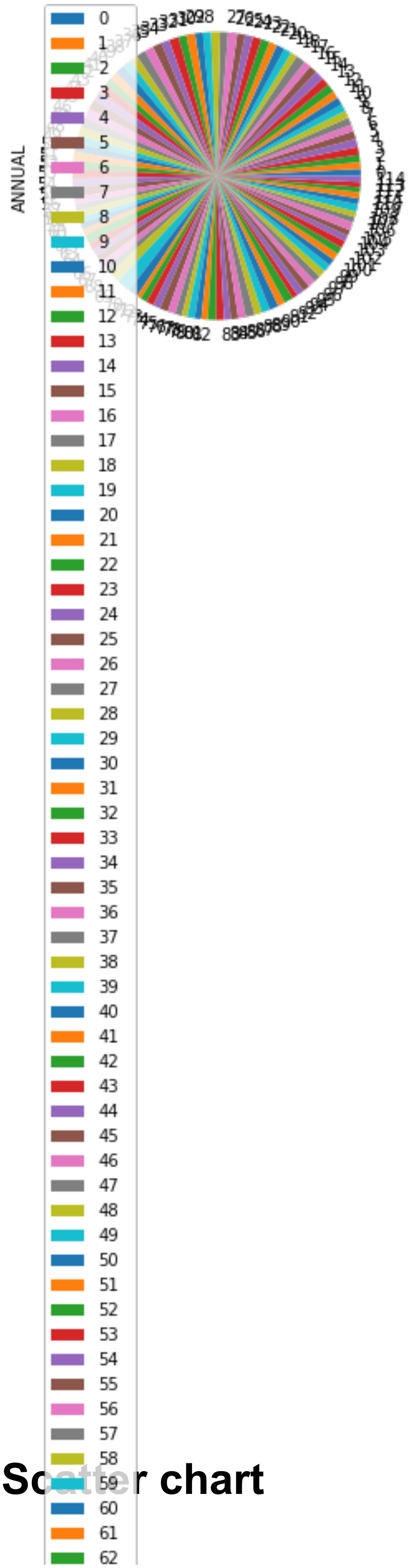
# Pie chart

In [12]:

```
df.plot.pie(y='ANNUAL')
```

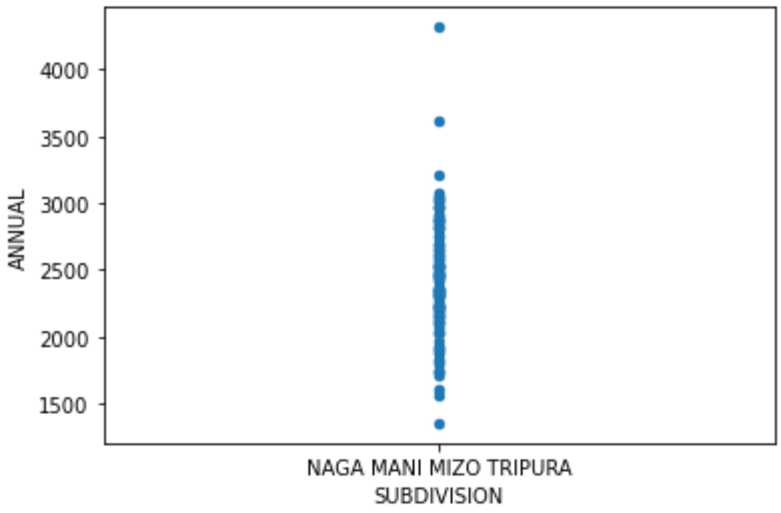
Out[12]:

```
<AxesSubplot:ylabel='ANNUAL'>
```



## Scatter chart

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

Out[13]: <AxesSubplot:xlabel='SUBDIVISION', ylabel='ANNUAL'>
```



```
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
```

In [15]:

```
df.describe()
```

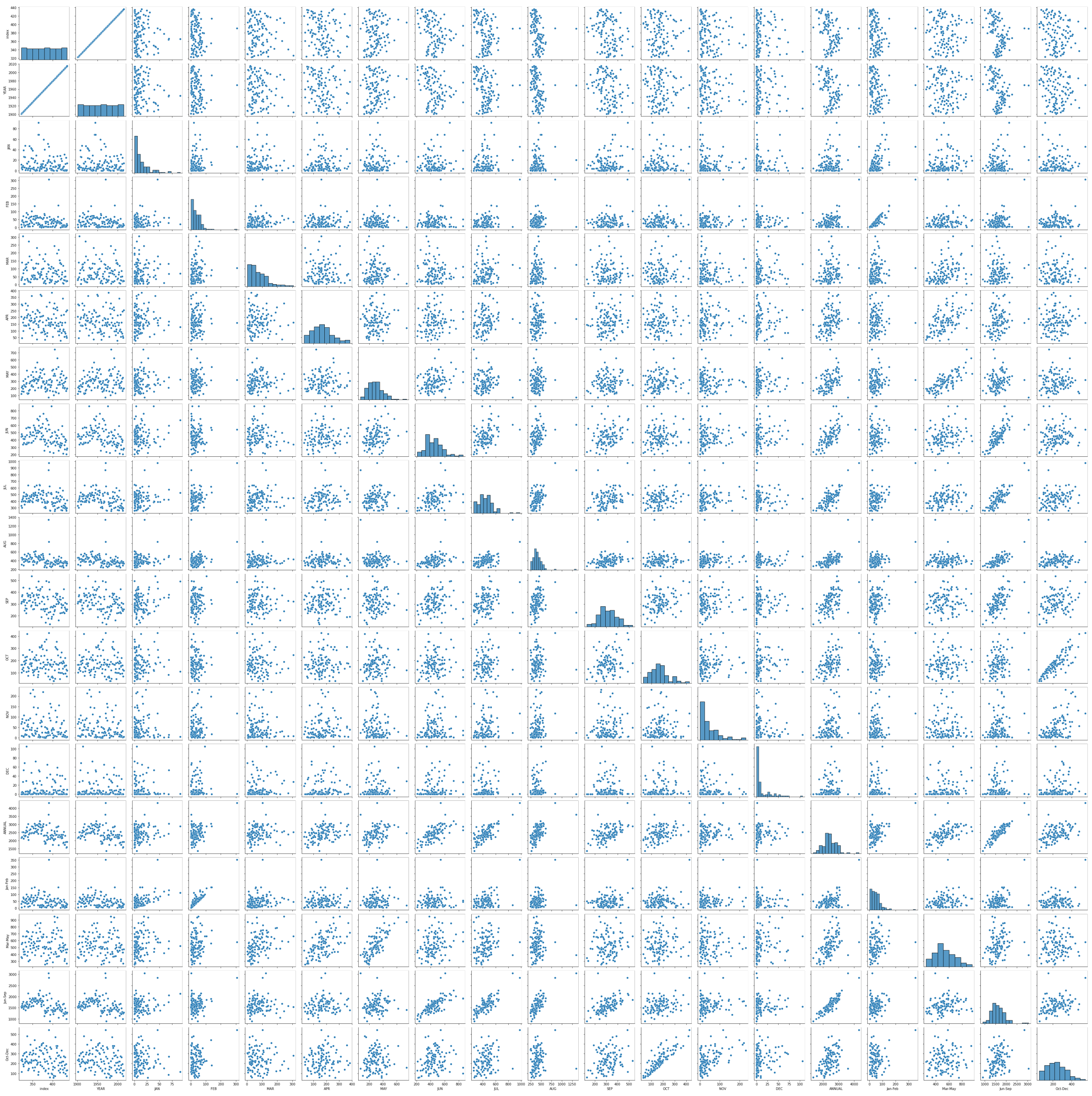
Out[15]:

| | index | YEAR | JAN | FEB | MAR | APR | MAY | |
|---|---|---|---|---|---|---|---|---|
| **count** | 115.000000 | 115.000000 | 115.000000 | 115.000000 | 115.000000 | 115.000000 | 115.000000 | 115 |
| **mean** | 379.000000 | 1958.000000 | 14.025217 | 36.652174 | 77.199130 | 170.733043 | 290.839130 | 445 |
| **std** | 33.341666 | 33.341666 | 16.627750 | 37.776876 | 60.656689 | 78.559032 | 112.675514 | 123 |
| **min** | 322.000000 | 1901.000000 | 0.000000 | 0.000000 | 3.100000 | 26.300000 | 73.500000 | 206 |
| **25%** | 350.500000 | 1929.500000 | 3.150000 | 11.700000 | 31.750000 | 113.750000 | 210.650000 | 361 |
| **50%** | 379.000000 | 1958.000000 | 7.900000 | 30.000000 | 62.700000 | 161.700000 | 278.500000 | 442 |
| **75%** | 407.500000 | 1986.500000 | 18.450000 | 53.300000 | 105.050000 | 213.900000 | 352.300000 | 511 |
| **max** | 436.000000 | 2015.000000 | 91.400000 | 306.300000 | 306.500000 | 383.800000 | 743.000000 | 861 |

# EDA AND VISUALIZATION

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

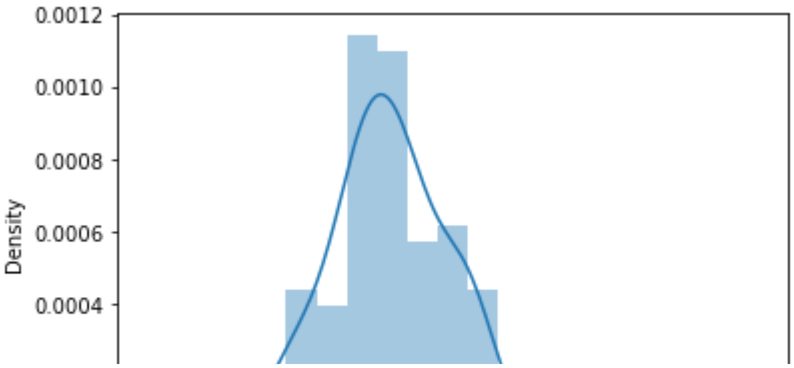
Out[16]:
```
<seaborn.axisgrid.PairGrid at 0x16290f89c40>
```



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

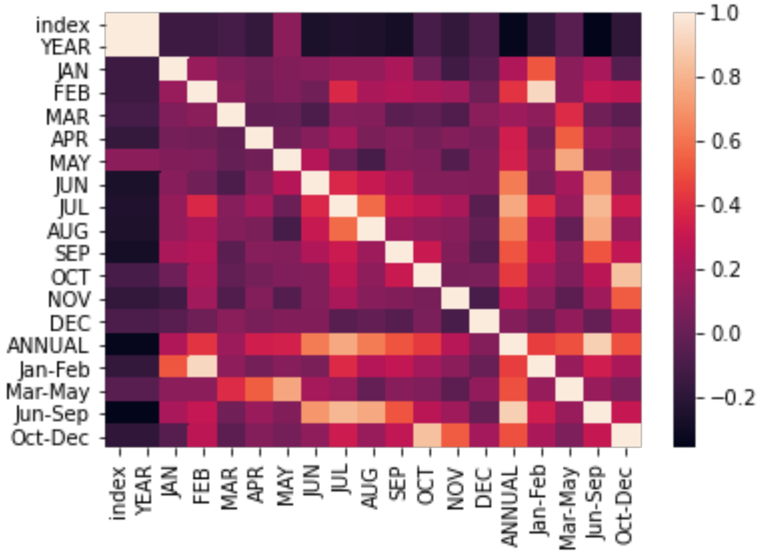
```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: Fut
ureWarning: `distplot` is a deprecated function and will be removed in a futu
re version. Please adapt your code to use either `displot` (a figure-level fu
nction with similar flexibility) or `histplot` (an axes-level function for hi
stograms).
  warnings.warn(msg, FutureWarning)
```

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



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

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


index
YEAR
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
ANNUAL
Jan-Feb
Mar-May
Jun-Sep
Oct-Dec