

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

```
In [2]: df=pd.read_csv("E:/Datasets/rainfall in india 1901-2015.csv")
df
```

Out[2]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
0	0		ANDAMAN & NICOBAR ISLANDS	1901	49.2	87.1	29.2	2.3	528.8	517.5	365.1	481.1	332.6
1	1		ANDAMAN & NICOBAR ISLANDS	1902	0.0	159.8	12.2	0.0	446.1	537.1	228.9	753.7	666.2
2	2		ANDAMAN & NICOBAR ISLANDS	1903	12.7	144.0	0.0	1.0	235.1	479.9	728.4	326.7	339.0
3	3		ANDAMAN & NICOBAR ISLANDS	1904	9.4	14.7	0.0	202.4	304.5	495.1	502.0	160.1	820.4
4	4		ANDAMAN & NICOBAR ISLANDS	1905	1.3	0.0	3.3	26.9	279.5	628.7	368.7	330.5	297.0
...
4111	4111	LAKSHADWEEP	LAKSHADWEEP	2011	5.1	2.8	3.1	85.9	107.2	153.6	350.2	254.0	255.2
4112	4112	LAKSHADWEEP	LAKSHADWEEP	2012	19.2	0.1	1.6	76.8	21.2	327.0	231.5	381.2	179.8
4113	4113	LAKSHADWEEP	LAKSHADWEEP	2013	26.2	34.4	37.5	5.3	88.3	426.2	296.4	154.4	180.0
4114	4114	LAKSHADWEEP	LAKSHADWEEP	2014	53.2	16.1	4.4	14.9	57.4	244.1	116.1	466.1	132.2
4115	4115	LAKSHADWEEP	LAKSHADWEEP	2015	2.2	0.5	3.7	87.1	133.1	296.6	257.5	146.4	160.4

4116 rows × 20 columns



```
In [11]: df.columns
```

```
Out[11]: 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 [12]: df.isnull().sum()
```

```
Out[12]: index      0
SUBDIVISION  0
YEAR        0
JAN         4
FEB         3
MAR         6
APR         4
MAY         3
JUN         5
JUL         7
AUG         4
SEP         6
OCT         7
NOV        11
DEC        10
ANNUAL     26
Jan-Feb    6
Mar-May    9
Jun-Sep   10
Oct-Dec   13
dtype: int64
```

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

```
Out[3]: index      0
SUBDIVISION  0
YEAR        0
JAN         0
FEB         0
MAR         0
APR         0
MAY         0
JUN         0
JUL         0
AUG         0
SEP         0
OCT         0
NOV         0
DEC         0
ANNUAL     0
Jan-Feb    0
Mar-May    0
Jun-Sep   0
Oct-Dec   0
dtype: int64
```

In [14]: `x=df["SUBDIVISION"]`

`x`

Out[14]:

0	ANDAMAN & NICOBAR ISLANDS
1	ANDAMAN & NICOBAR ISLANDS
2	ANDAMAN & NICOBAR ISLANDS
3	ANDAMAN & NICOBAR ISLANDS
4	ANDAMAN & NICOBAR ISLANDS
	...
4111	LAKSHADWEEP
4112	LAKSHADWEEP
4113	LAKSHADWEEP
4114	LAKSHADWEEP
4115	LAKSHADWEEP

Name: SUBDIVISION, Length: 4090, dtype: object

In [15]: `x.value_counts()`

Out[15]:

SUBDIVISION	
WEST RAJASTHAN	115
SOUTH INTERIOR KARNATAKA	115
TAMIL NADU	115
RAYALSEEMA	115
TELANGANA	115
COASTAL ANDHRA PRADESH	115
CHHATTISGARH	115
VIDARBHA	115
MATATHWADA	115
MADHYA MAHARASHTRA	115
KONKAN & GOA	115
SAURASHTRA & KUTCH	115
GUJARAT REGION	115
EAST MADHYA PRADESH	115
KERALA	115
EAST RAJASTHAN	115
NORTH INTERIOR KARNATAKA	115
HIMACHAL PRADESH	115
PUNJAB	115
HARYANA DELHI & CHANDIGARH	115
UTTARAKHAND	115
WEST UTTAR PRADESH	115
EAST UTTAR PRADESH	115
BIHAR	115
JHARKHAND	115
ORISSA	115
GANGETIC WEST BENGAL	115
SUB HIMALAYAN WEST BENGAL & SIKKIM	115
NAGA MANI MIZO TRIPURA	115
ASSAM & MEGHALAYA	115
JAMMU & KASHMIR	114
COASTAL KARNATAKA	114
WEST MADHYA PRADESH	114
ANDAMAN & NICOBAR ISLANDS	104
LAKSHADWEEP	103
ARUNACHAL PRADESH	91

Name: count, dtype: int64

WEST MADHYA PRADESH

```
In [16]: x=df[df["SUBDIVISION"]=="WEST MADHYA PRADESH"]
x
```

Out[16]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
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
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
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
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
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
...
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
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
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
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
2161	2161	WEST MADHYA PRADESH	2015	40.2	6.4	53.5	13.3	2.0	154.1	428.2	276.6	55.6	11.0

114 rows × 20 columns



In [17]:

```
x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)
```

Out[17]:

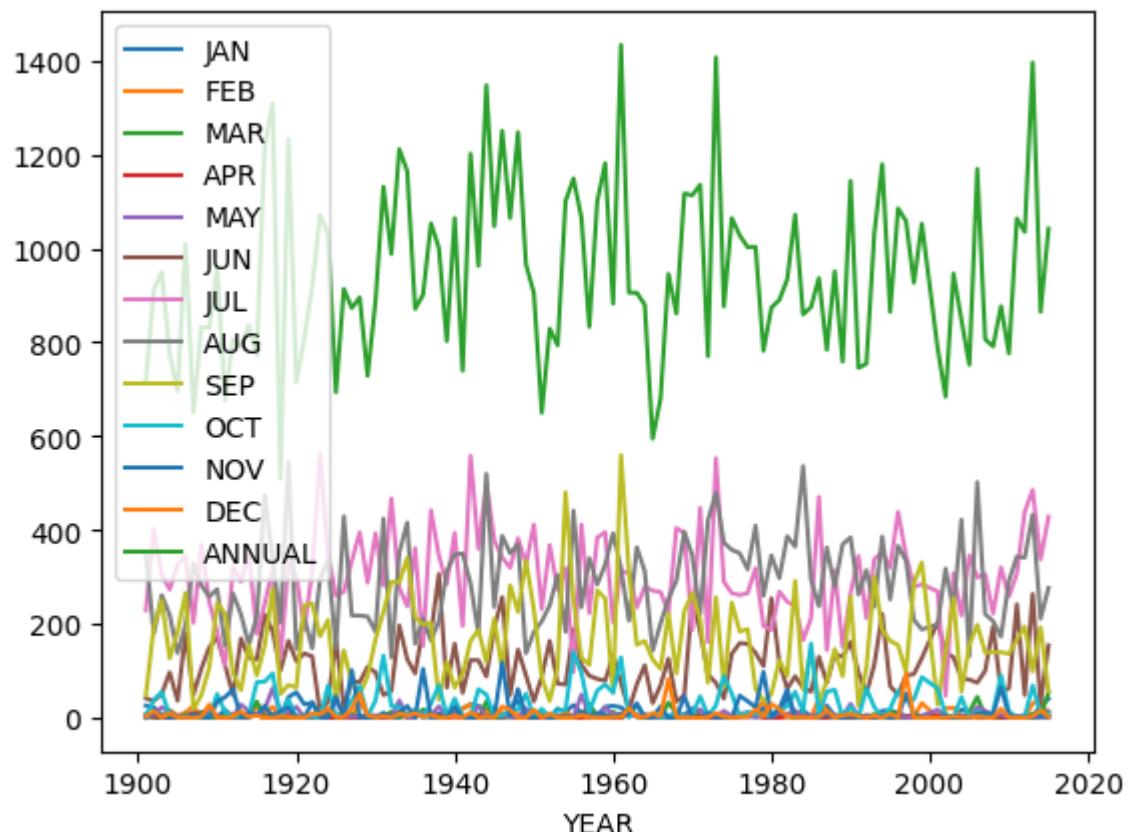
	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2047	1901	25.8	5.8	5.8	2.8	2.1	41.2	228.9	349.9	47.9	5.6	0.0	2.4	718.1
2048	1902	22.1	8.4	0.0	2.0	5.9	35.9	401.9	179.4	194.1	37.9	10.0	14.2	911.1
2049	1903	5.3	0.0	0.0	0.0	22.3	50.6	304.9	261.1	250.2	55.1	0.0	0.0	949.0
2050	1904	3.2	15.5	14.8	0.0	12.0	96.6	273.0	218.6	125.9	3.3	1.8	9.6	774.4
2051	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	696.1
...
2157	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	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	1035.1
2159	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	1396.0
2160	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
2161	2015	40.2	6.4	53.5	13.3	2.0	154.1	428.2	276.6	55.6	11.0	0.3	1.0	1042.1

114 rows × 14 columns

In [18]:

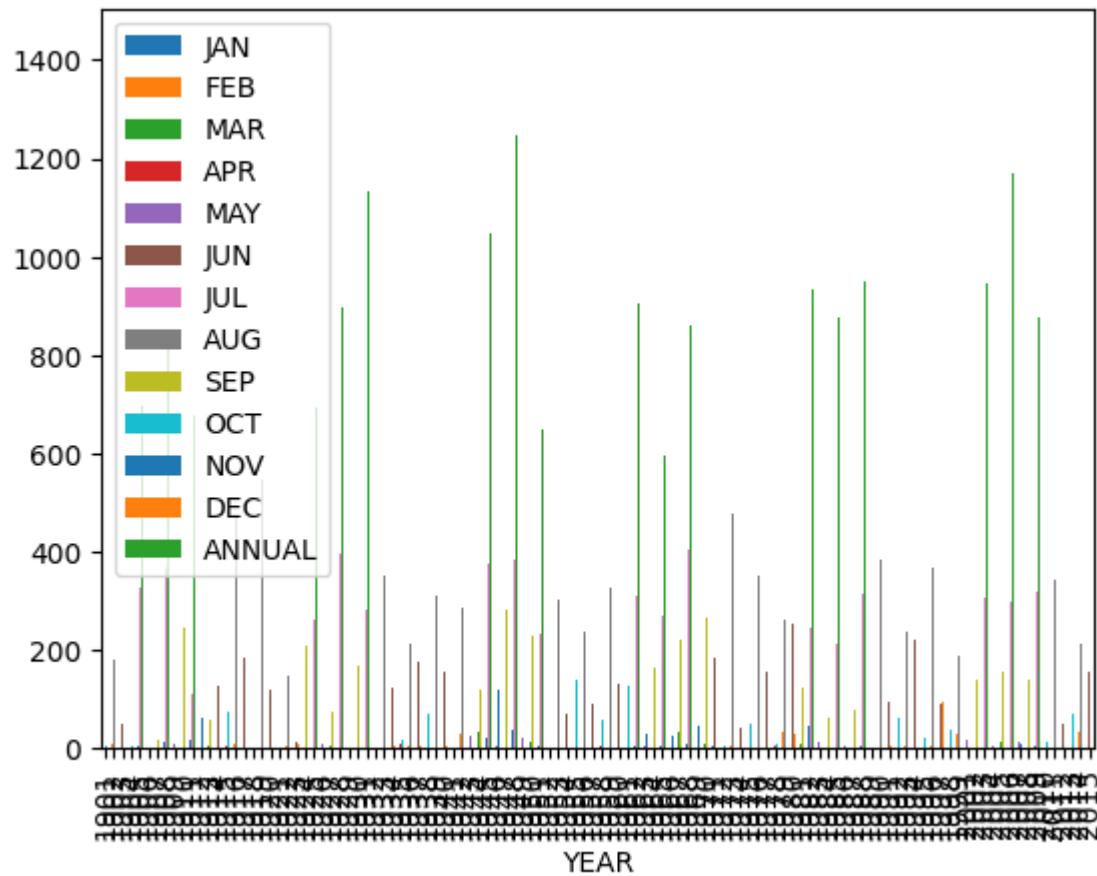
```
x.plot(x='YEAR')
```

Out[18]:



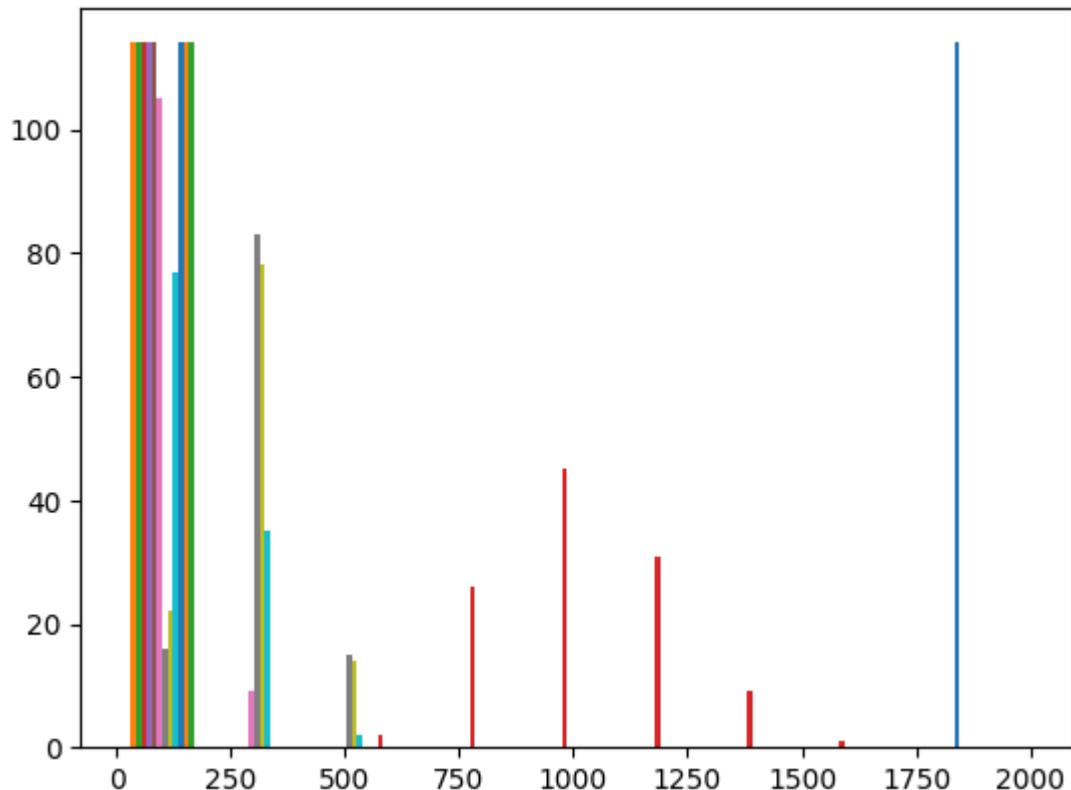
```
In [19]: x.plot.bar(x="YEAR")
```

```
Out[19]: <Axes: xlabel='YEAR'>
```



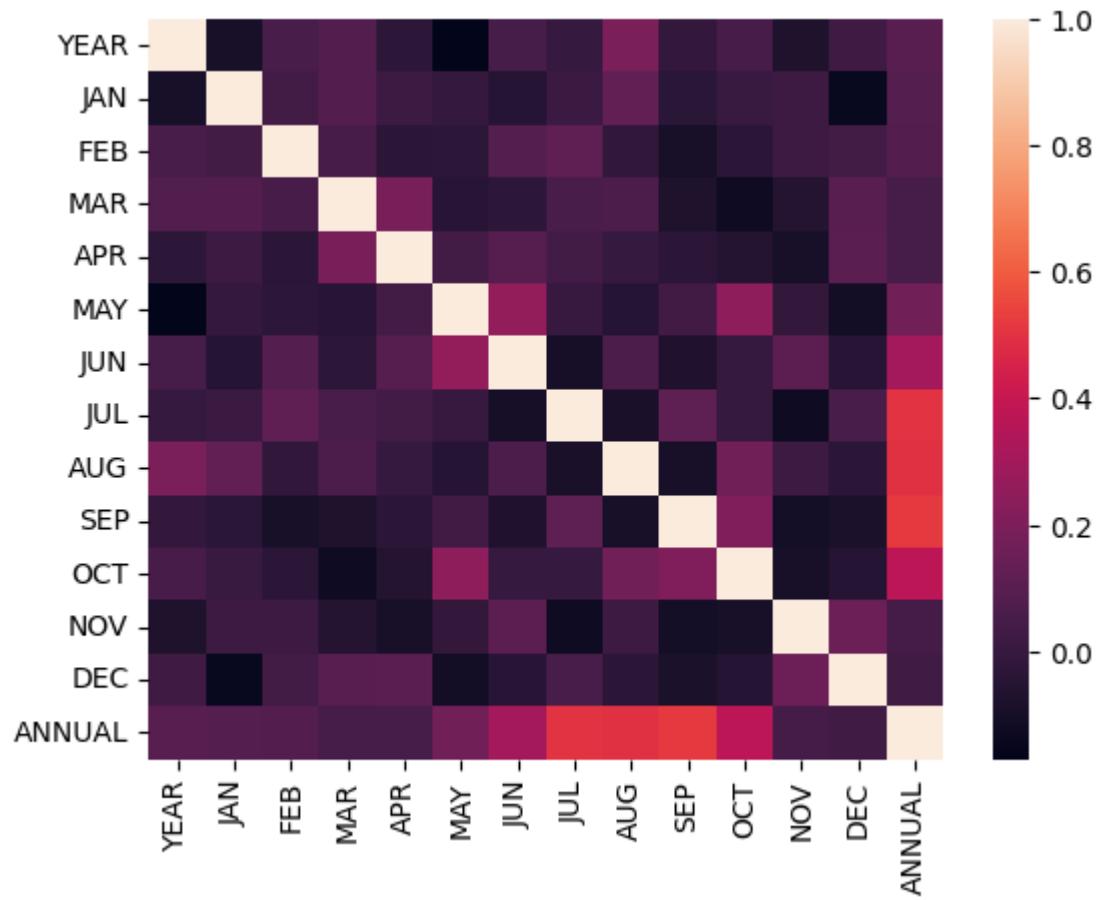
```
In [20]: plt.hist(x)
```

```
Out[20]: (array([[ 0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0., 114.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [105.,  9.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 16.,  83.,  15.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 22.,  78.,  14.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 77.,  35.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 0.,  0.,  2.,  26.,  45.,  31.,  9.,  1.,  0.,  0.]]),
array([ 0. , 201.5, 403. , 604.5, 806. , 1007.5, 1209. , 1410.5,
       1612. , 1813.5, 2015. ]),
<a list of 14 BarContainer objects>)
```



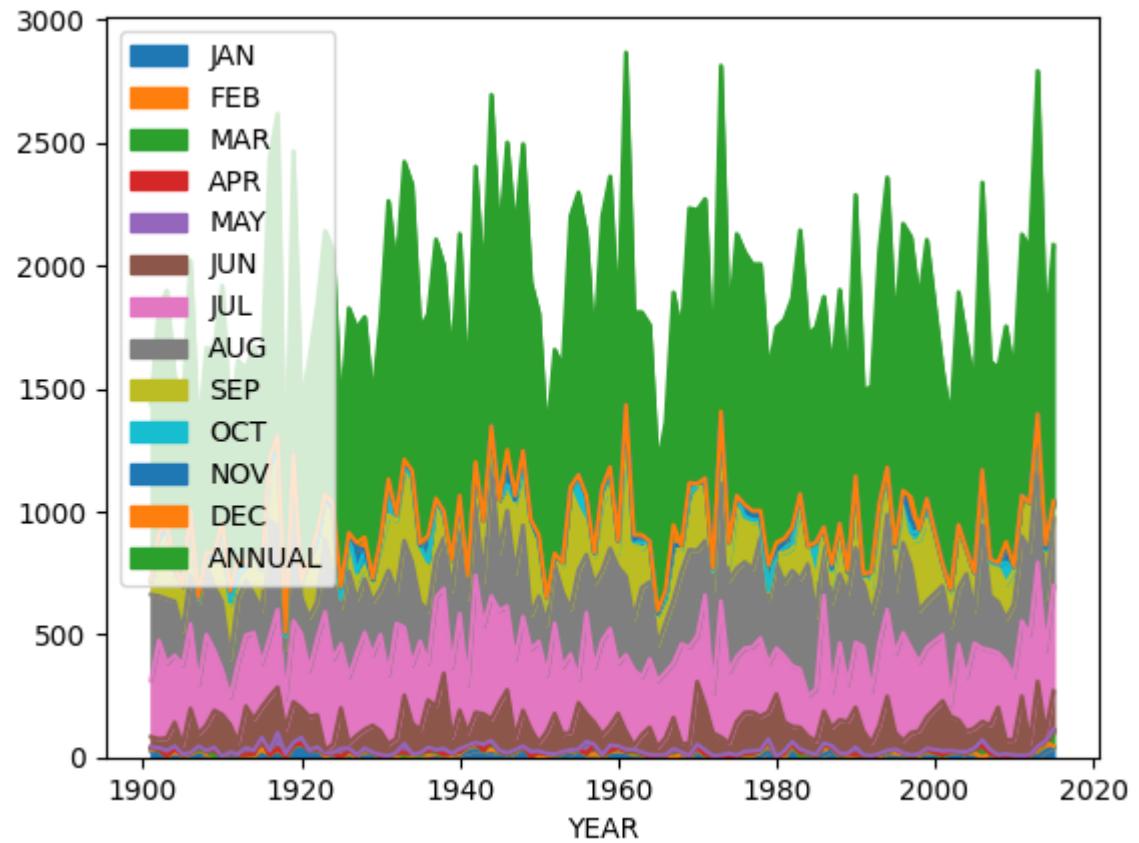
In [21]: `sns.heatmap(x.corr())`

Out[21]: <Axes: >



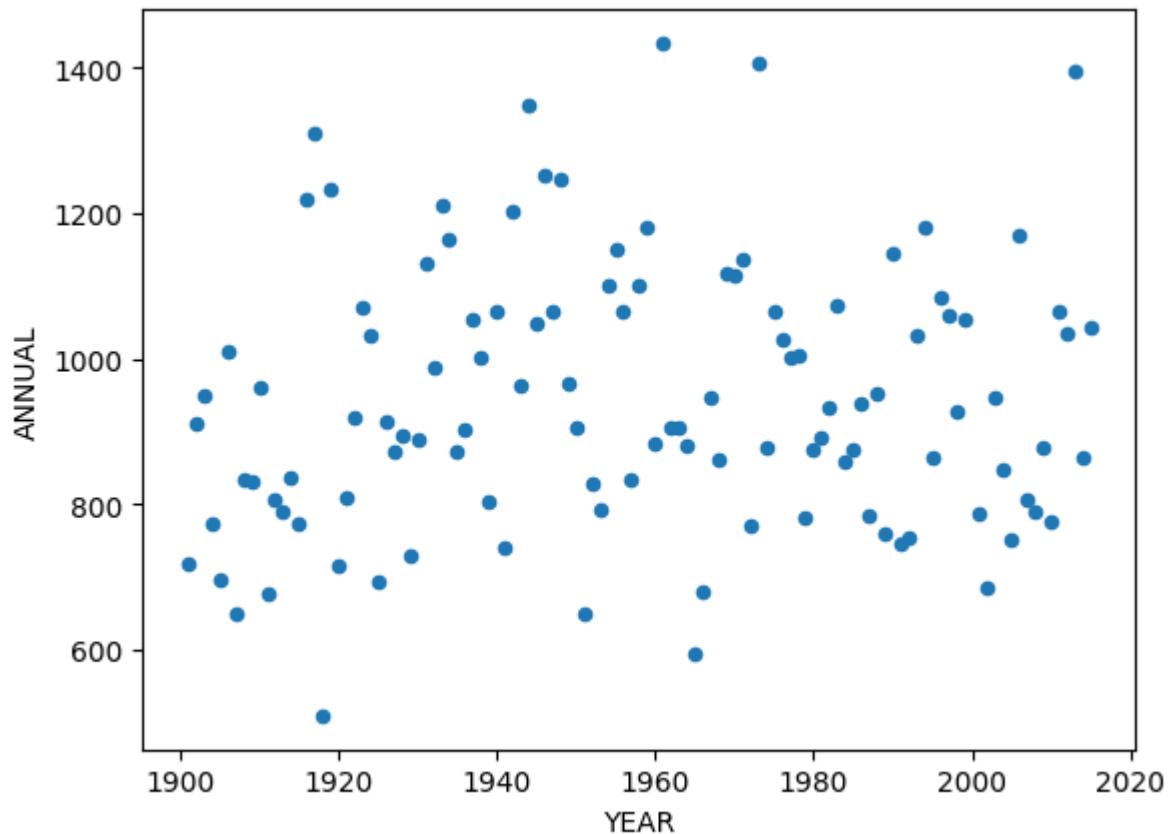
```
In [22]: x.plot.area(x="YEAR")
```

```
Out[22]: <Axes: xlabel='YEAR'>
```



```
In [23]: x.plot.scatter("YEAR", "ANNUAL")
```

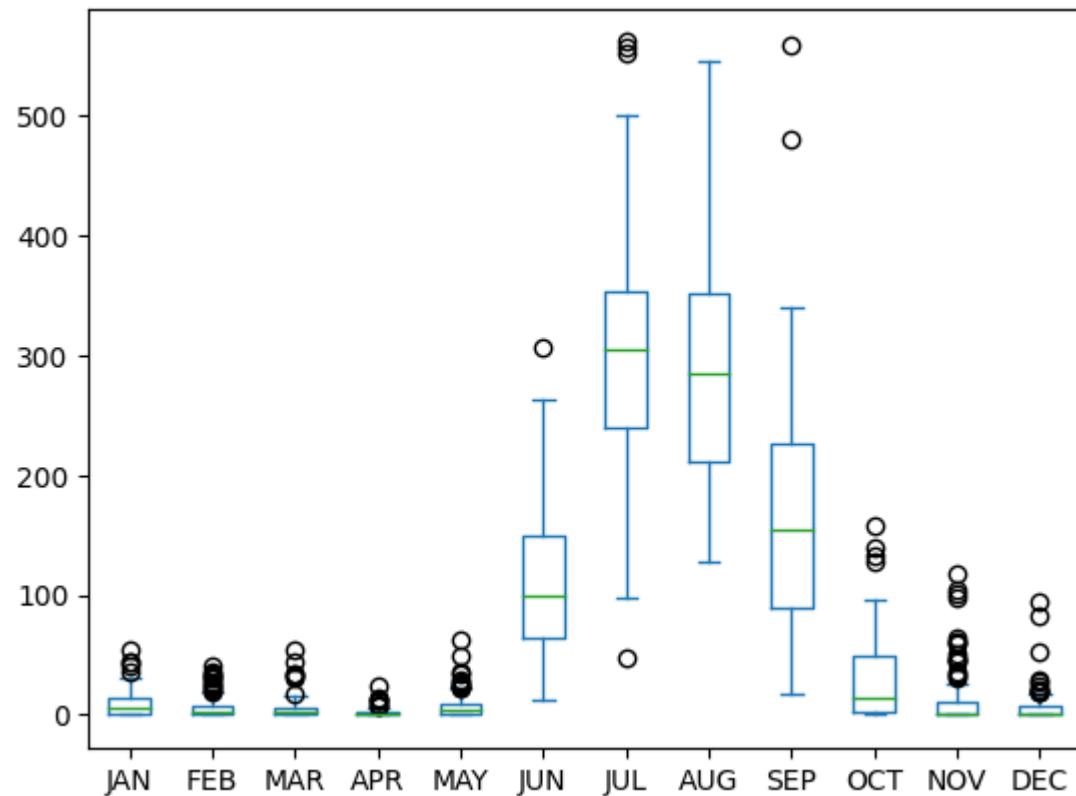
```
Out[23]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



```
In [24]: y=x.drop(["YEAR", "ANNUAL"],axis=1)
```

```
In [25]: y.plot.box()
```

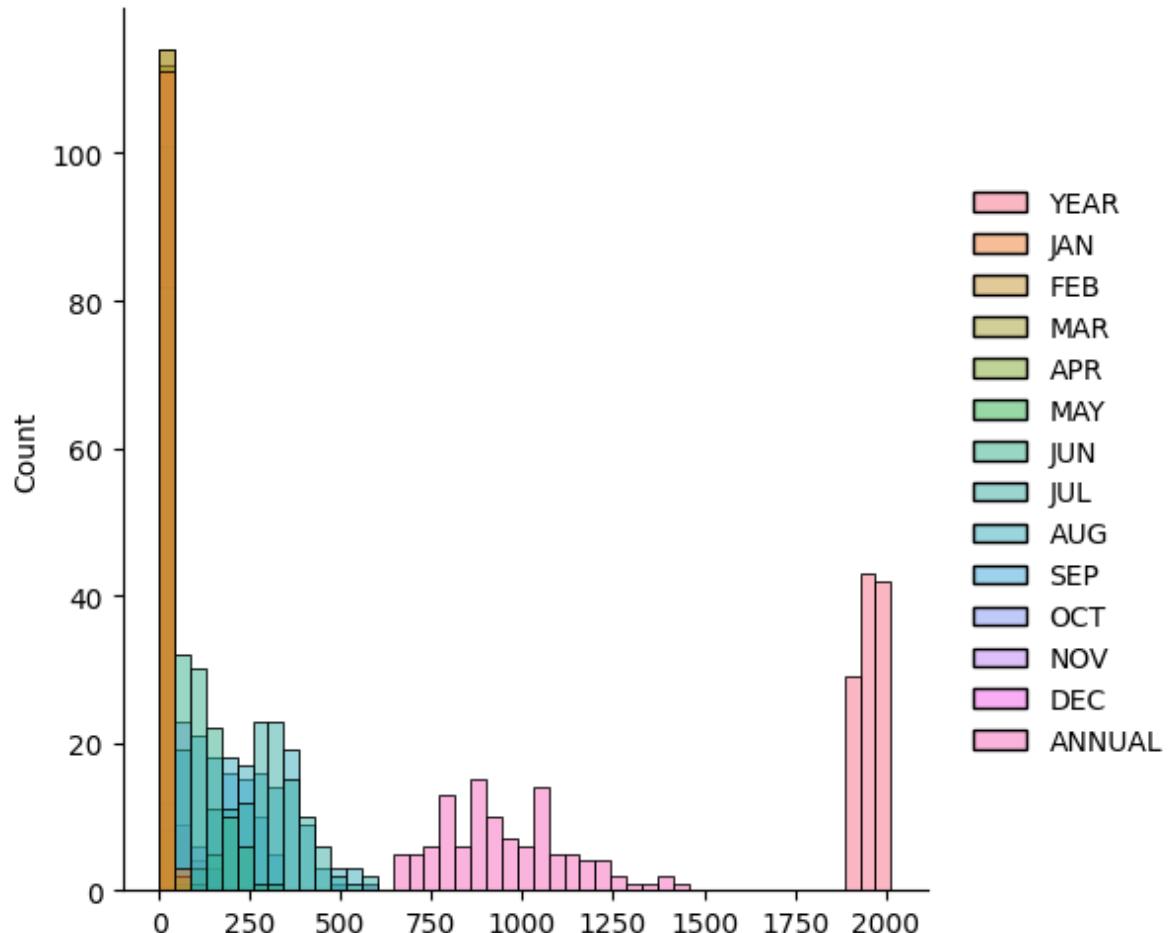
```
Out[25]: <Axes: >
```



In [26]: `sns.displot(x)`

C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
self._figure.tight_layout(*args, **kwargs)

Out[26]: <seaborn.axisgrid.FacetGrid at 0x26de17ced90>



TAMIL NADU

In [27]:

```
x=df[df[ "SUBDIVISION" ]=="TAMIL NADU"]
```

x

Out[27]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
3427	3427	TAMIL NADU	1901	24.5	39.1	21.7	36.0	74.0	41.8	49.3	67.9	191.1	122.3
3428	3428	TAMIL NADU	1902	67.2	9.8	25.1	21.9	84.7	39.3	55.1	113.8	98.6	282.2
3429	3429	TAMIL NADU	1903	19.3	7.8	1.7	18.2	128.5	58.5	72.6	115.0	210.4	128.1
3430	3430	TAMIL NADU	1904	35.2	0.1	0.7	19.5	121.9	34.9	89.0	40.4	85.7	163.2
3431	3431	TAMIL NADU	1905	6.5	7.5	17.2	64.8	83.7	49.8	39.0	101.8	73.5	250.4
...
3537	3537	TAMIL NADU	2011	4.3	11.2	8.0	91.5	33.4	56.0	45.5	128.9	76.0	200.4
3538	3538	TAMIL NADU	2012	3.0	0.1	2.5	35.5	41.9	30.1	46.5	98.0	84.9	235.2
3539	3539	TAMIL NADU	2013	3.9	30.9	30.0	20.3	42.0	54.6	42.7	110.7	113.5	127.9
3540	3540	TAMIL NADU	2014	7.4	6.1	8.1	8.3	139.1	47.8	50.6	117.7	98.9	252.2
3541	3541	TAMIL NADU	2015	8.3	2.3	21.7	108.8	112.4	62.4	43.5	81.6	98.4	132.6

115 rows × 20 columns

In [28]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

Out[28]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNU.
3427	1901	24.5	39.1	21.7	36.0	74.0	41.8	49.3	67.9	191.1	122.3	212.3	80.4	960
3428	1902	67.2	9.8	25.1	21.9	84.7	39.3	55.1	113.8	98.6	282.2	174.9	165.8	1138
3429	1903	19.3	7.8	1.7	18.2	128.5	58.5	72.6	115.0	210.4	128.1	200.5	203.2	1160
3430	1904	35.2	0.1	0.7	19.5	121.9	34.9	89.0	40.4	85.7	163.2	23.6	49.1	660
3431	1905	6.5	7.5	17.2	64.8	83.7	49.8	39.0	101.8	73.5	250.4	123.7	3.2	820
...
3537	2011	4.3	11.2	8.0	91.5	33.4	56.0	45.5	128.9	76.0	200.4	230.5	41.0	920
3538	2012	3.0	0.1	2.5	35.5	41.9	30.1	46.5	98.0	84.9	235.2	44.5	14.0	630
3539	2013	3.9	30.9	30.0	20.3	42.0	54.6	42.7	110.7	113.5	127.9	112.3	53.2	740
3540	2014	7.4	6.1	8.1	8.3	139.1	47.8	50.6	117.7	98.9	252.2	110.8	66.0	910
3541	2015	8.3	2.3	21.7	108.8	112.4	62.4	43.5	81.6	98.4	132.6	379.8	152.8	1200

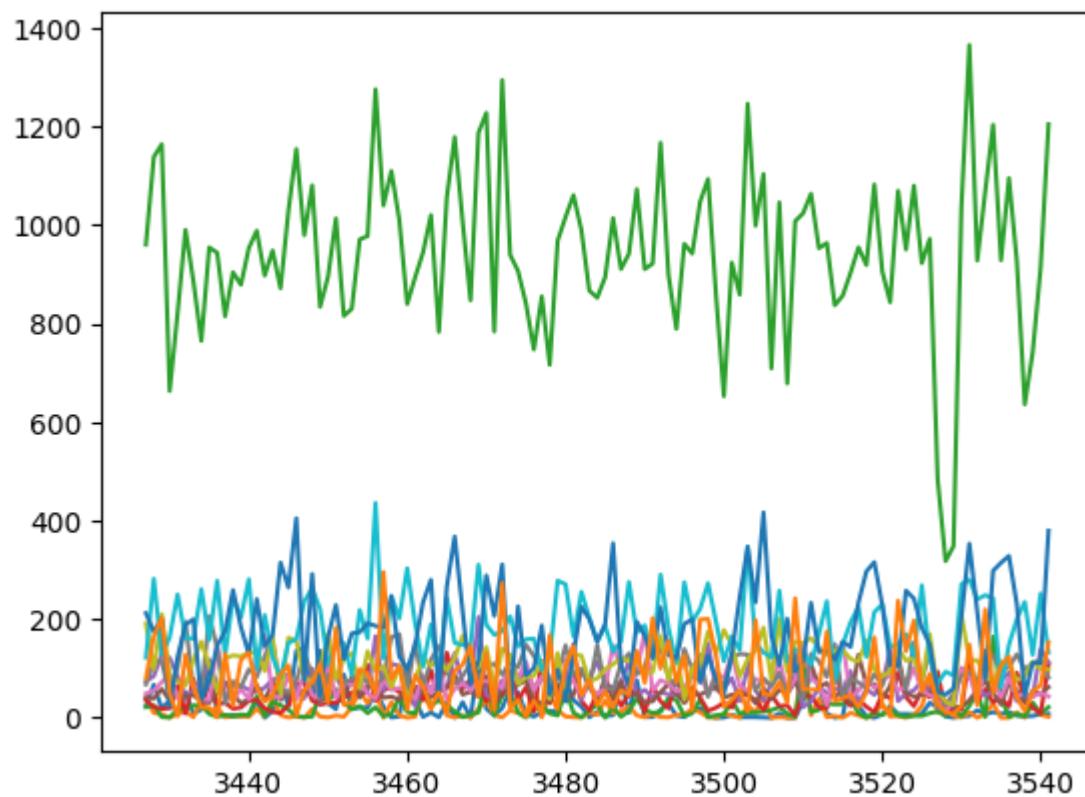
115 rows × 14 columns

In [29]:

```
y=x.drop("YEAR",axis=1)
```

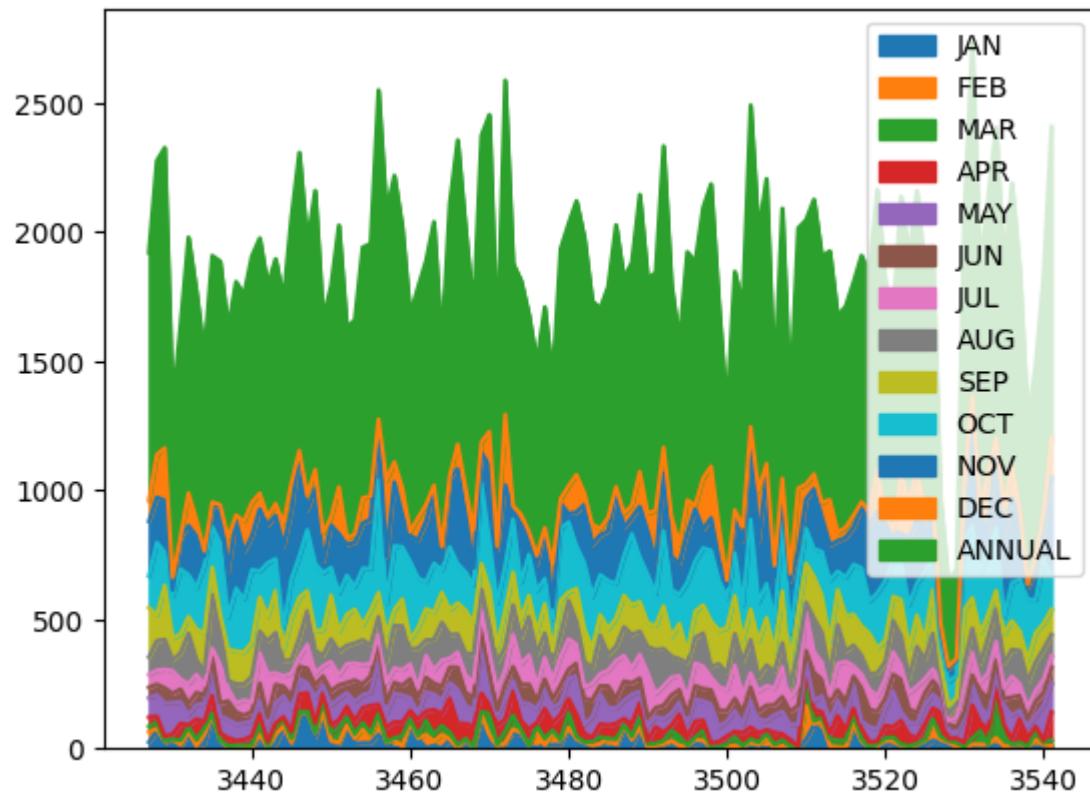
```
In [30]: plt.plot(y)
```

```
Out[30]: [
```



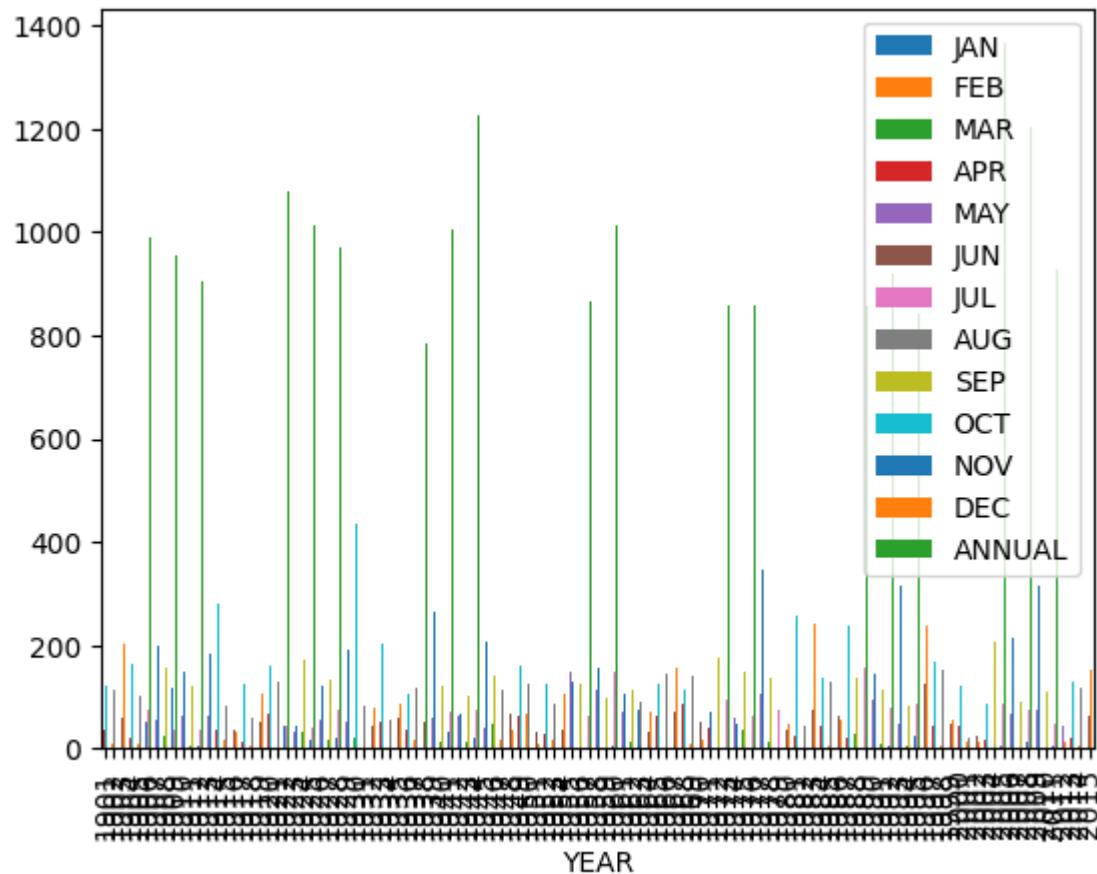
In [31]: `y.plot.area()`

Out[31]: <Axes: >



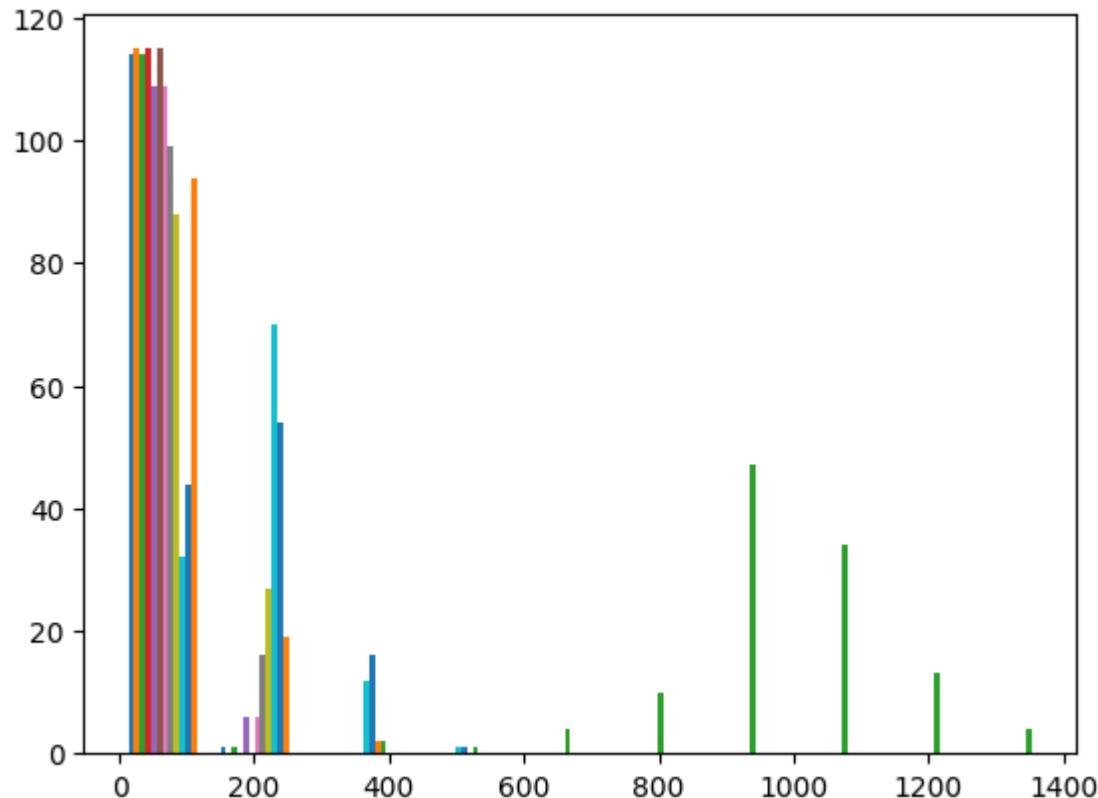
```
In [32]: x.plot.bar(x="YEAR")
```

```
Out[32]: <Axes: xlabel='YEAR'>
```



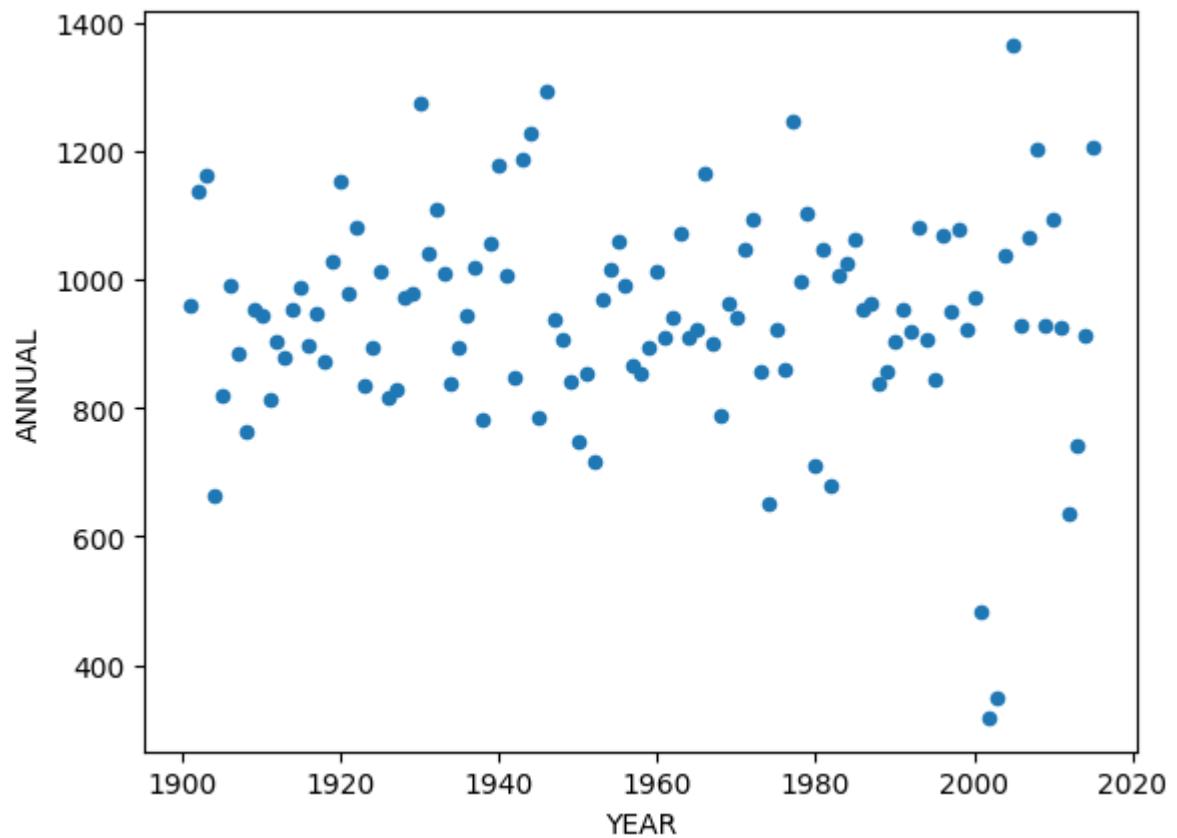
```
In [33]: plt.hist(y)
```

```
Out[33]: (array([[114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
       [109., 6., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
       [109., 6., 0., 0., 0., 0., 0., 0., 0., 0.],
       [ 99., 16., 0., 0., 0., 0., 0., 0., 0., 0.],
       [ 88., 27., 0., 0., 0., 0., 0., 0., 0., 0.],
       [ 32., 70., 12., 1., 0., 0., 0., 0., 0., 0.],
       [ 44., 54., 16., 1., 0., 0., 0., 0., 0., 0.],
       [ 94., 19., 2., 0., 0., 0., 0., 0., 0., 0.],
       [ 0., 0., 2., 1., 4., 10., 47., 34., 13., 4.]]),
array([ 0. , 136.53, 273.06, 409.59, 546.12, 682.65, 819.18,
       955.71, 1092.24, 1228.77, 1365.3 ]),
<a list of 13 BarContainer objects>)
```



```
In [34]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[34]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



EAST RAJASTHAN

In [35]:

```
x=df[df[ "SUBDIVISION" ]=="EAST RAJASTHAN"]
x
```

Out[35]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1932	1932	EAST RAJASTHAN	1901	21.6	8.9	2.9	0.7	5.0	15.0	164.8	175.6	7.5	9.8
1933	1933	EAST RAJASTHAN	1902	4.1	0.7	0.0	1.8	9.9	34.6	247.6	116.7	145.6	14.4
1934	1934	EAST RAJASTHAN	1903	1.9	0.7	1.3	0.1	12.9	15.6	238.2	229.1	168.5	17.8
1935	1935	EAST RAJASTHAN	1904	4.3	5.5	21.7	0.2	27.5	49.9	289.7	223.5	50.2	1.5
1936	1936	EAST RAJASTHAN	1905	4.1	8.8	3.2	1.6	2.0	14.4	130.5	30.9	83.8	0.0
...
2042	2042	EAST RAJASTHAN	2011	0.0	11.2	0.2	0.5	5.1	140.9	193.6	284.1	166.4	0.0
2043	2043	EAST RAJASTHAN	2012	1.9	0.0	0.0	3.6	9.5	11.2	170.5	365.0	131.3	0.5
2044	2044	EAST RAJASTHAN	2013	1.4	21.7	0.4	3.2	1.0	90.6	319.0	278.5	88.0	30.6
2045	2045	EAST RAJASTHAN	2014	28.4	10.0	6.4	7.3	8.4	23.5	197.1	261.0	136.9	3.2
2046	2046	EAST RAJASTHAN	2015	12.1	0.1	55.9	15.9	3.5	96.4	297.6	142.8	20.1	5.0

115 rows × 20 columns



In [36]:

```
x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)
```

Out[36]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1932	1901	21.6	8.9	2.9	0.7	5.0	15.0	164.8	175.6	7.5	9.8	0.0	0.8	412.9
1933	1902	4.1	0.7	0.0	1.8	9.9	34.6	247.6	116.7	145.6	14.4	0.0	2.8	578.1
1934	1903	1.9	0.7	1.3	0.1	12.9	15.6	238.2	229.1	168.5	17.8	0.0	0.0	686.1
1935	1904	4.3	5.5	21.7	0.2	27.5	49.9	289.7	223.5	50.2	1.5	5.8	14.7	694.1
1936	1905	4.1	8.8	3.2	1.6	2.0	14.4	130.5	30.9	83.8	0.0	0.0	0.6	279.1
...
2042	2011	0.0	11.2	0.2	0.5	5.1	140.9	193.6	284.1	166.4	0.0	0.0	0.0	802.1
2043	2012	1.9	0.0	0.0	3.6	9.5	11.2	170.5	365.0	131.3	0.5	0.0	0.1	693.0
2044	2013	1.4	21.7	0.4	3.2	1.0	90.6	319.0	278.5	88.0	30.6	1.3	0.3	836.1
2045	2014	28.4	10.0	6.4	7.3	8.4	23.5	197.1	261.0	136.9	3.2	0.0	1.1	683.1
2046	2015	12.1	0.1	55.9	15.9	3.5	96.4	297.6	142.8	20.1	5.0	0.5	0.8	650.1

115 rows × 14 columns

In [37]:

```
y=x.drop(["YEAR","ANNUAL"],axis=1)
```

y

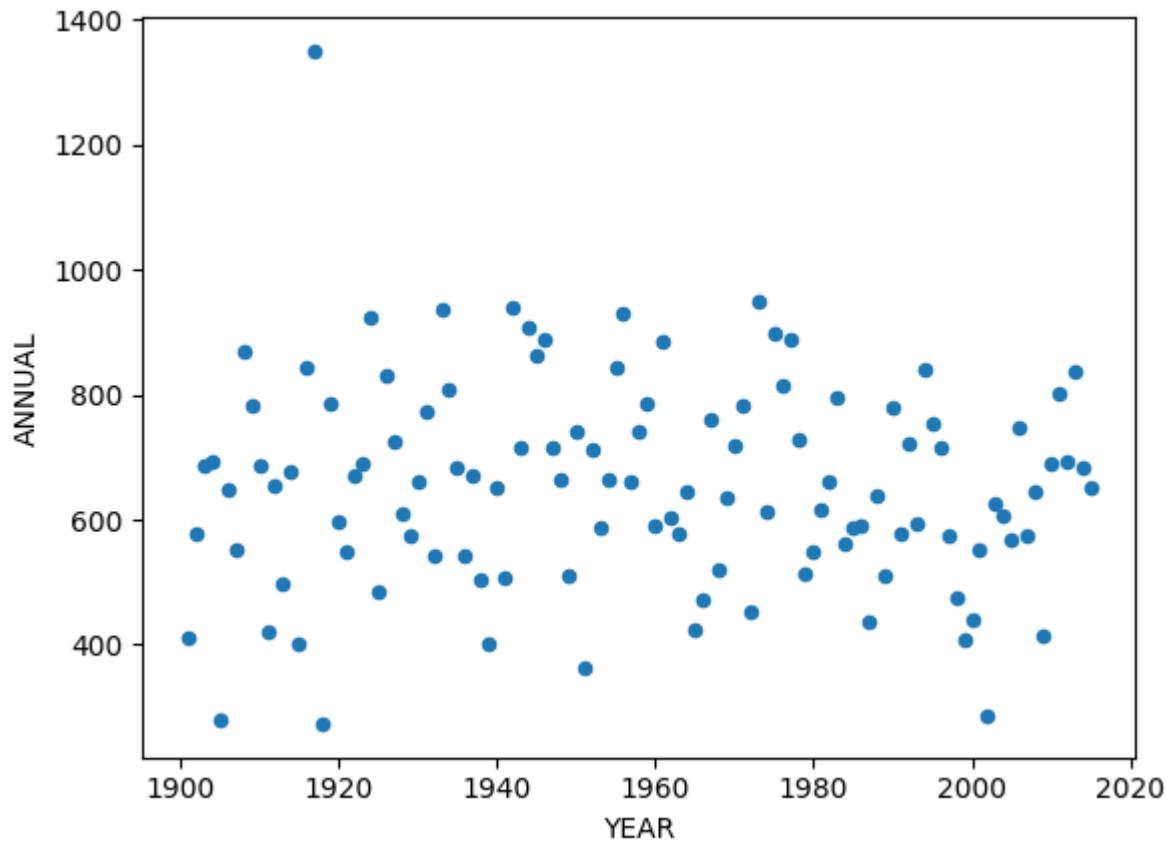
Out[37]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1932	21.6	8.9	2.9	0.7	5.0	15.0	164.8	175.6	7.5	9.8	0.0	0.8
1933	4.1	0.7	0.0	1.8	9.9	34.6	247.6	116.7	145.6	14.4	0.0	2.8
1934	1.9	0.7	1.3	0.1	12.9	15.6	238.2	229.1	168.5	17.8	0.0	0.0
1935	4.3	5.5	21.7	0.2	27.5	49.9	289.7	223.5	50.2	1.5	5.8	14.7
1936	4.1	8.8	3.2	1.6	2.0	14.4	130.5	30.9	83.8	0.0	0.0	0.6
...
2042	0.0	11.2	0.2	0.5	5.1	140.9	193.6	284.1	166.4	0.0	0.0	0.0
2043	1.9	0.0	0.0	3.6	9.5	11.2	170.5	365.0	131.3	0.5	0.0	0.1
2044	1.4	21.7	0.4	3.2	1.0	90.6	319.0	278.5	88.0	30.6	1.3	0.3
2045	28.4	10.0	6.4	7.3	8.4	23.5	197.1	261.0	136.9	3.2	0.0	1.1
2046	12.1	0.1	55.9	15.9	3.5	96.4	297.6	142.8	20.1	5.0	0.5	0.8

115 rows × 12 columns

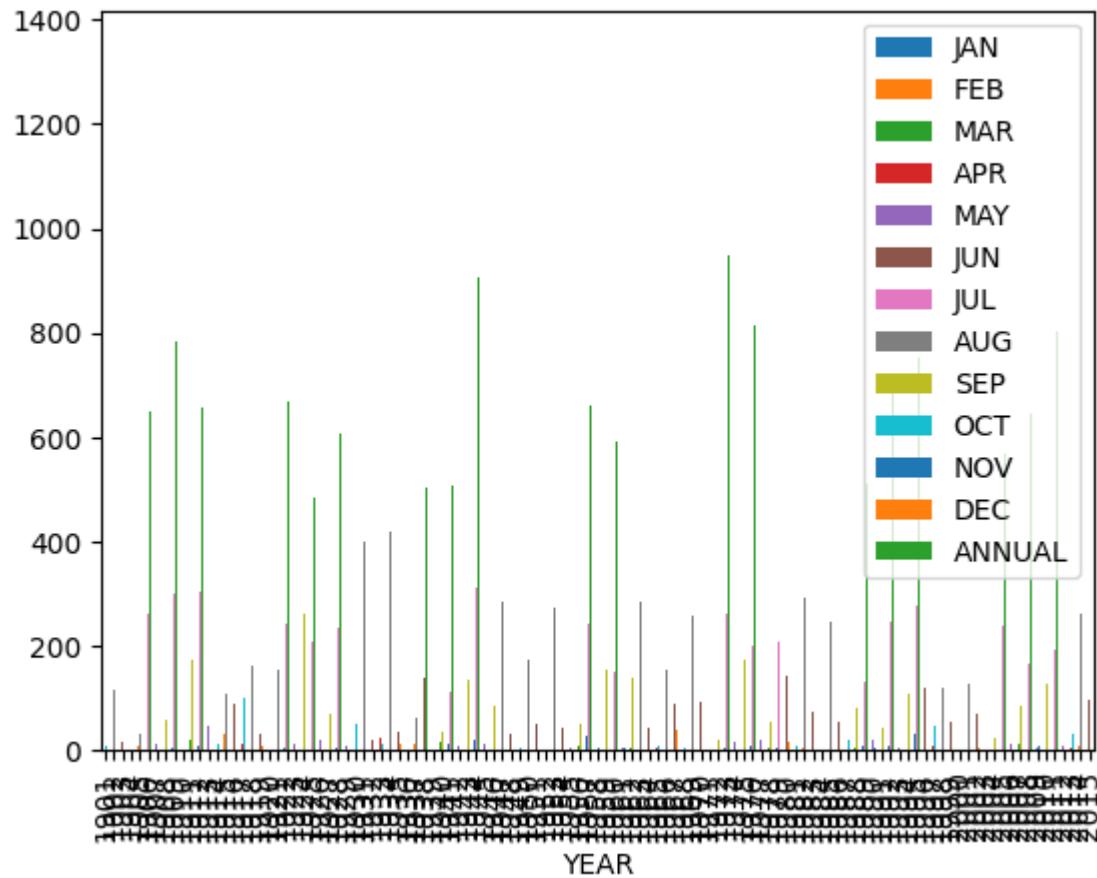
```
In [38]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[38]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



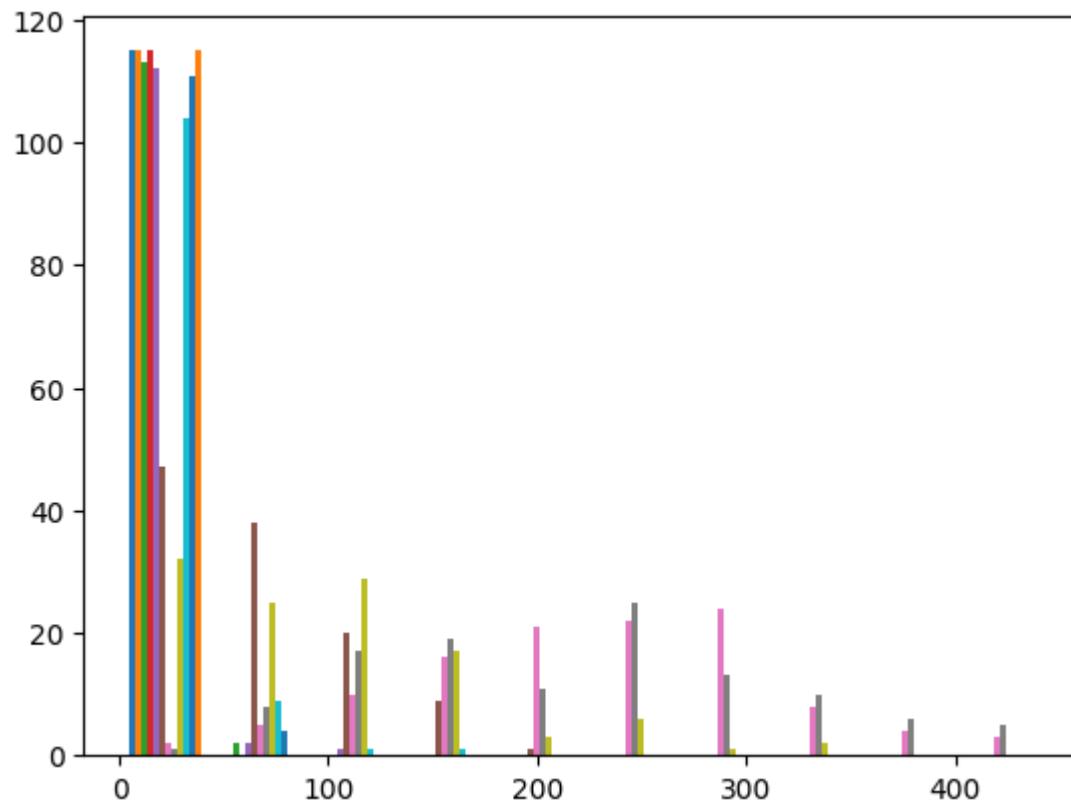
```
In [39]: x.plot.bar(x="YEAR")
```

```
Out[39]: <Axes: xlabel='YEAR'>
```



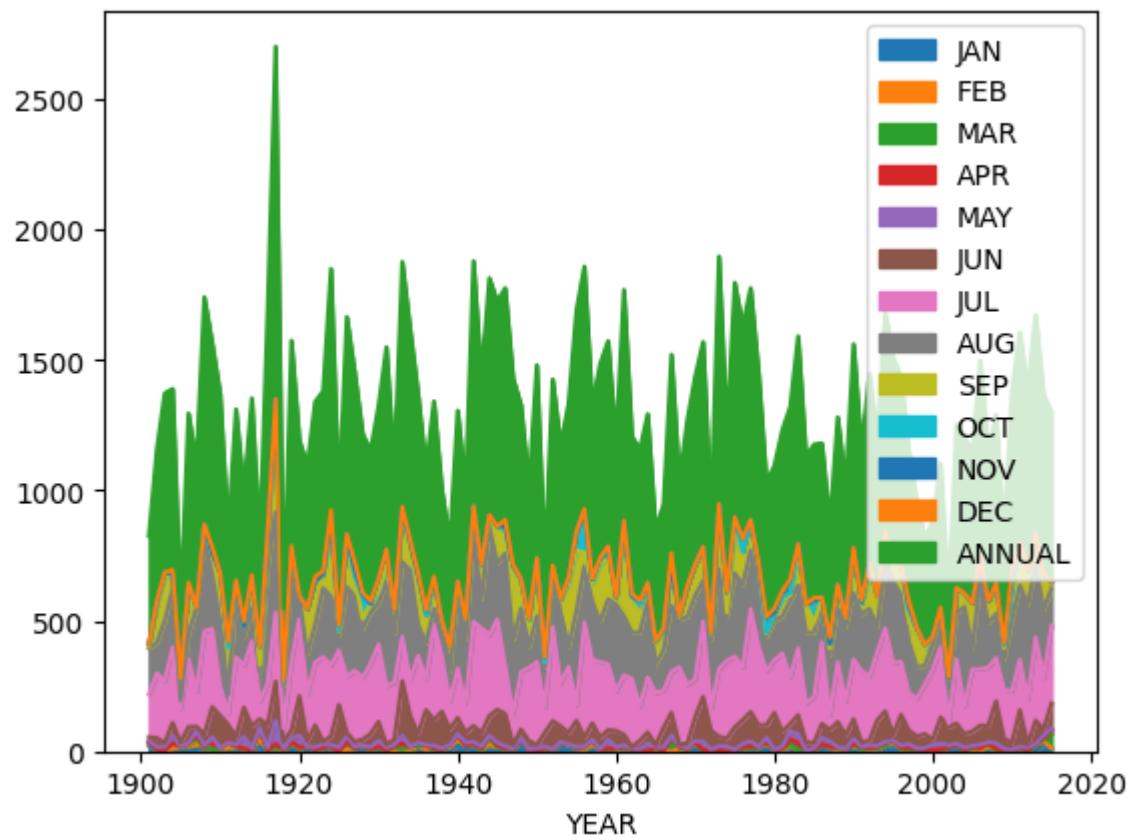
```
In [40]: plt.hist(y)
```

```
Out[40]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [112.,  2.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 47.,  38.,  20.,  9.,  1.,  0.,  0.,  0.,  0.,  0.],
       [  2.,   5.,  10.,  16.,  21.,  22.,  24.,  8.,  4.,  3.],
       [  1.,   8.,  17.,  19.,  11.,  25.,  13.,  10.,  6.,  5.],
       [ 32.,  25.,  29.,  17.,  3.,  6.,  1.,  2.,  0.,  0.],
       [104.,   9.,   1.,   1.,   0.,   0.,   0.,   0.,   0.,   0.],
       [111.,   4.,   0.,   0.,   0.,   0.,   0.,   0.,   0.,   0.],
       [115.,   0.,   0.,   0.,   0.,   0.,   0.,   0.,   0.,   0.]]),
array([ 0. ,  44.06,  88.12, 132.18, 176.24, 220.3 , 264.36, 308.42,
       352.48, 396.54, 440.6 ]),
<a list of 12 BarContainer objects>)
```



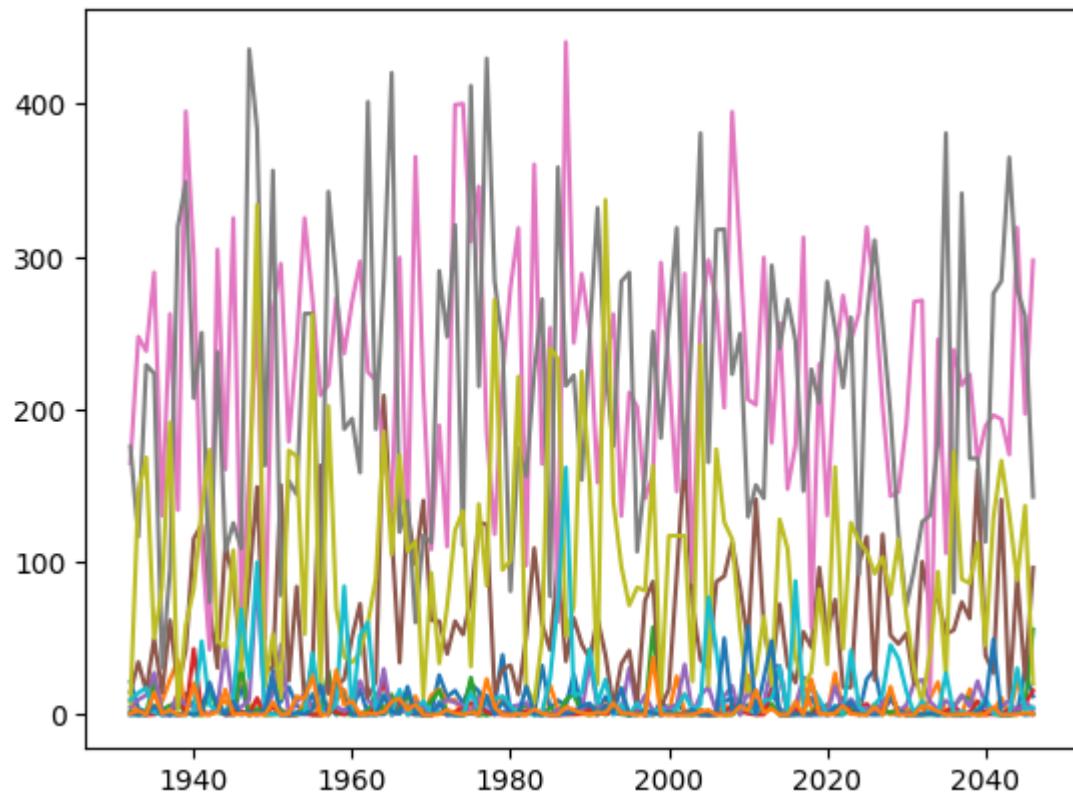
```
In [41]: x.plot.area(x="YEAR")
```

```
Out[41]: <Axes: xlabel='YEAR'>
```



```
In [42]: plt.plot(y)
```

```
Out[42]: [
```



COASTAL KARNATAKA

In [43]:

```
x=df[df[ "SUBDIVISION" ]=="COASTAL KARNATAKA"]  
x
```

Out[43]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
3542	3542	COASTAL KARNATAKA	1901	1.8	0.6	10.7	52.4	81.6	960.9	991.2	606.4	108.0
3543	3543	COASTAL KARNATAKA	1902	3.2	0.3	4.9	10.2	54.6	698.4	1401.6	454.2	708.4
3544	3544	COASTAL KARNATAKA	1903	0.7	0.0	0.0	4.1	202.8	536.5	1405.5	593.8	304.4
3545	3545	COASTAL KARNATAKA	1904	2.4	0.0	4.8	23.7	93.2	1108.2	1070.0	465.6	245.3
3546	3546	COASTAL KARNATAKA	1905	0.0	0.2	0.0	6.4	83.1	767.3	777.3	586.9	172.9
...
3651	3651	COASTAL KARNATAKA	2010	14.4	0.4	3.5	62.2	80.2	682.7	1200.2	637.5	468.4
3652	3652	COASTAL KARNATAKA	2011	4.8	3.8	8.7	66.1	49.3	1018.4	1080.5	861.3	545.2
3654	3654	COASTAL KARNATAKA	2013	2.4	19.6	19.0	28.5	100.4	1153.0	1515.3	680.2	379.1
3655	3655	COASTAL KARNATAKA	2014	0.0	0.3	1.9	40.5	181.9	507.0	1155.4	1121.0	379.3
3656	3656	COASTAL KARNATAKA	2015	1.4	1.0	32.3	72.2	150.3	735.3	930.9	575.2	260.3

114 rows × 20 columns



In [44]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[44]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	A
3542	1901	1.8	0.6	10.7	52.4	81.6	960.9	991.2	606.4	108.0	120.5	104.9	17.8	
3543	1902	3.2	0.3	4.9	10.2	54.6	698.4	1401.6	454.2	708.4	180.4	50.8	132.2	
3544	1903	0.7	0.0	0.0	4.1	202.8	536.5	1405.5	593.8	304.4	185.0	79.3	5.3	
3545	1904	2.4	0.0	4.8	23.7	93.2	1108.2	1070.0	465.6	245.3	127.2	0.7	0.0	
3546	1905	0.0	0.2	0.0	6.4	83.1	767.3	777.3	586.9	172.9	222.2	36.1	0.0	
...	
3651	2010	14.4	0.4	3.5	62.2	80.2	682.7	1200.2	637.5	468.4	294.7	231.5	11.0	
3652	2011	4.8	3.8	8.7	66.1	49.3	1018.4	1080.5	861.3	545.2	178.8	81.5	10.2	
3654	2013	2.4	19.6	19.0	28.5	100.4	1153.0	1515.3	680.2	379.1	265.1	56.9	10.0	
3655	2014	0.0	0.3	1.9	40.5	181.9	507.0	1155.4	1121.0	379.3	226.4	40.0	30.8	
3656	2015	1.4	1.0	32.3	72.2	150.3	735.3	930.9	575.2	260.3	208.5	124.2	14.3	

114 rows × 14 columns

In [45]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

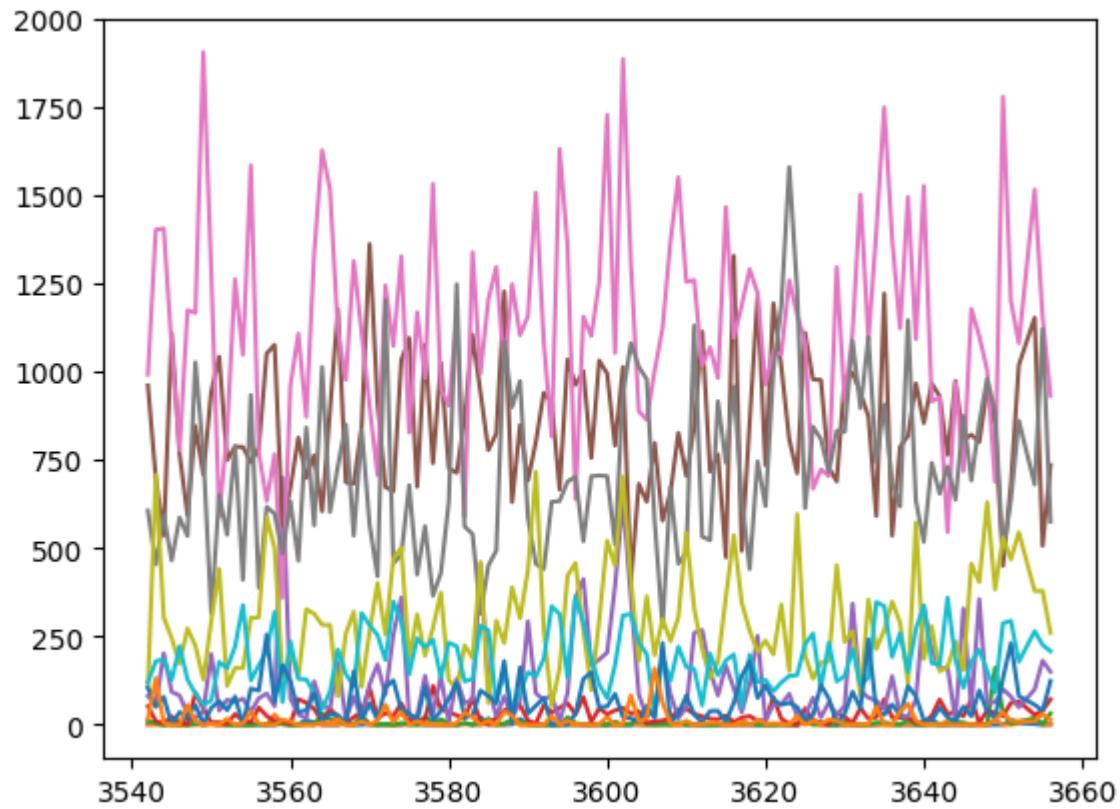
Out[45]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
3542	1.8	0.6	10.7	52.4	81.6	960.9	991.2	606.4	108.0	120.5	104.9	17.8	
3543	3.2	0.3	4.9	10.2	54.6	698.4	1401.6	454.2	708.4	180.4	50.8	132.2	
3544	0.7	0.0	0.0	4.1	202.8	536.5	1405.5	593.8	304.4	185.0	79.3	5.3	
3545	2.4	0.0	4.8	23.7	93.2	1108.2	1070.0	465.6	245.3	127.2	0.7	0.0	
3546	0.0	0.2	0.0	6.4	83.1	767.3	777.3	586.9	172.9	222.2	36.1	0.0	
...	
3651	14.4	0.4	3.5	62.2	80.2	682.7	1200.2	637.5	468.4	294.7	231.5	11.0	
3652	4.8	3.8	8.7	66.1	49.3	1018.4	1080.5	861.3	545.2	178.8	81.5	10.2	
3654	2.4	19.6	19.0	28.5	100.4	1153.0	1515.3	680.2	379.1	265.1	56.9	10.0	
3655	0.0	0.3	1.9	40.5	181.9	507.0	1155.4	1121.0	379.3	226.4	40.0	30.8	
3656	1.4	1.0	32.3	72.2	150.3	735.3	930.9	575.2	260.3	208.5	124.2	14.3	

114 rows × 12 columns

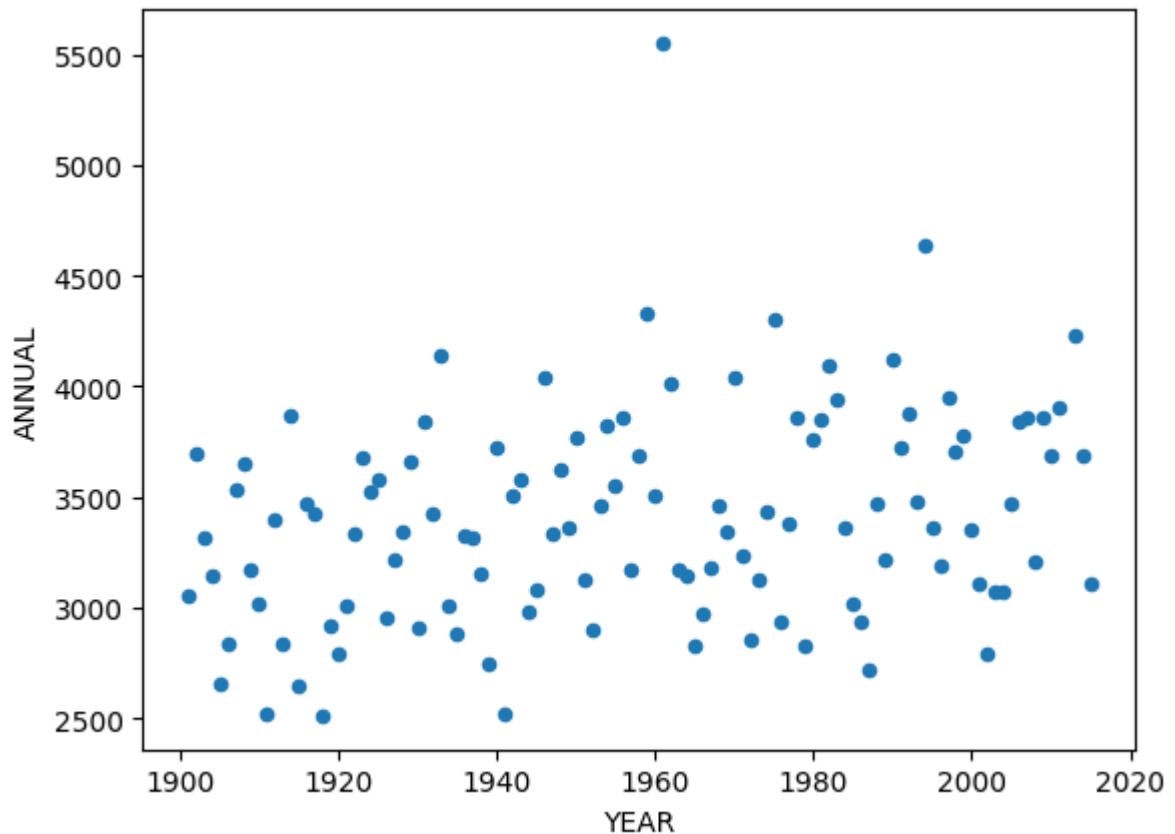
```
In [46]: plt.plot(y)
```

```
Out[46]: [
```



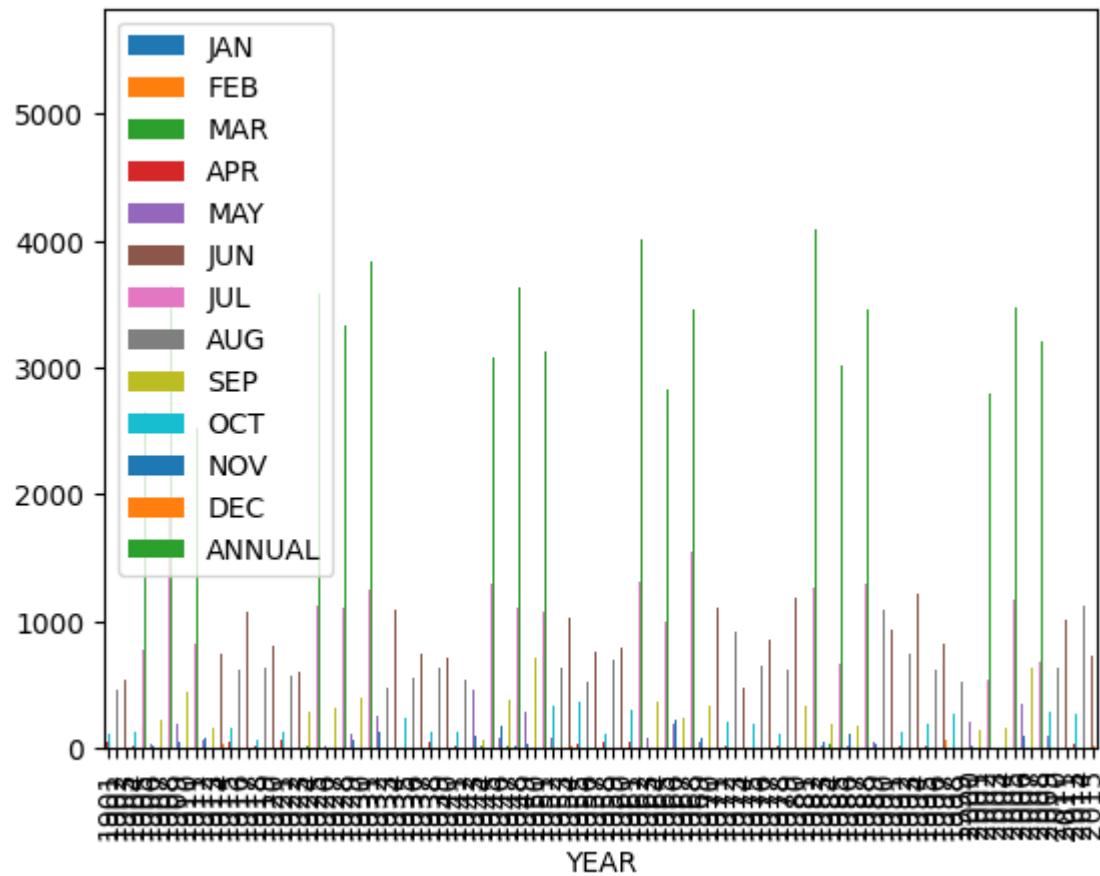
```
In [47]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[47]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



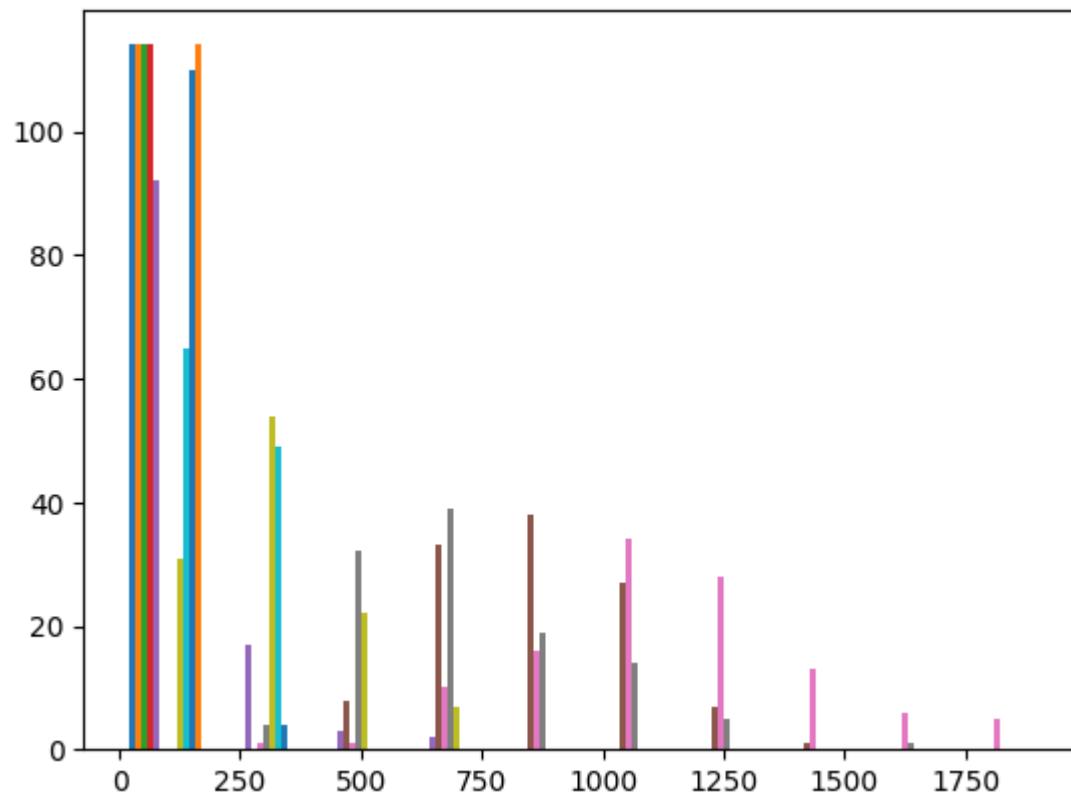
```
In [48]: x.plot.bar(x="YEAR")
```

```
Out[48]: <Axes: xlabel='YEAR'>
```



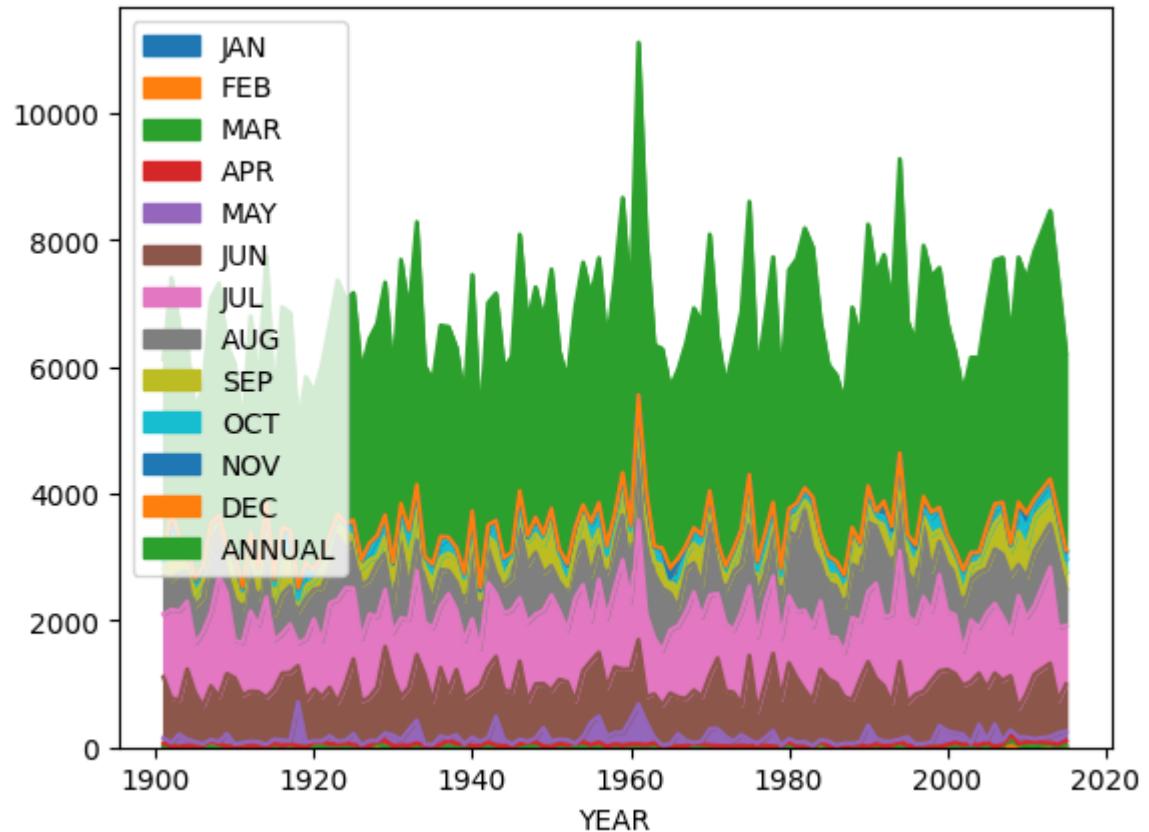
```
In [49]: plt.hist(y)
```

```
Out[49]: (array([[114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 92.,  17.,  3.,  2.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 0.,  0.,  8.,  33.,  38.,  27.,  7.,  1.,  0.,  0.],
       [ 0.,  1.,  1.,  10.,  16.,  34.,  28.,  13.,  6.,  5.],
       [ 0.,  4.,  32.,  39.,  19.,  14.,  5.,  0.,  1.,  0.],
       [ 31.,  54.,  22.,  7.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 65.,  49.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [110.,  4.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. , 190.49, 380.98, 571.47, 761.96, 952.45, 1142.94,
       1333.43, 1523.92, 1714.41, 1904.9 ]),
<a list of 12 BarContainer objects>)
```



```
In [50]: x.plot.area(x="YEAR")
```

```
Out[50]: <Axes: xlabel='YEAR'>
```



RAYALSEEMA

In [46]:

```
x=df[df[ "SUBDIVISION" ]=="RAYALSEEMA"]
x
```

Out[46]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
3312	3312	RAYALSEEMA	1901	7.0	50.2	0.0	12.1	38.9	53.0	73.4	60.3	109.0	81.6
3313	3313	RAYALSEEMA	1902	10.0	0.2	1.7	11.0	36.8	73.6	41.3	148.3	181.7	188.5
3314	3314	RAYALSEEMA	1903	30.0	0.1	0.0	3.6	80.5	67.5	127.5	140.6	219.7	95.3
3315	3315	RAYALSEEMA	1904	14.8	0.0	1.7	7.1	58.8	39.8	75.1	19.4	84.7	111.5
3316	3316	RAYALSEEMA	1905	6.5	6.8	17.0	18.3	44.2	66.1	50.9	219.3	36.5	180.2
...
3422	3422	RAYALSEEMA	2011	0.8	12.1	0.0	34.6	33.0	44.5	128.9	163.6	71.2	107.5
3423	3423	RAYALSEEMA	2012	2.7	0.0	2.5	32.7	38.8	47.0	139.7	120.0	69.5	113.7
3424	3424	RAYALSEEMA	2013	1.3	30.6	11.5	26.8	38.9	73.8	95.7	110.3	163.2	169.3
3425	3425	RAYALSEEMA	2014	0.2	0.7	12.5	5.1	46.7	66.3	68.7	115.1	81.4	104.6
3426	3426	RAYALSEEMA	2015	1.9	0.0	13.4	73.4	39.7	73.0	43.1	123.6	136.3	106.7

115 rows × 20 columns



In [47]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec" ],axis=1)
x
```

Out[47]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
3312	1901	7.0	50.2	0.0	12.1	38.9	53.0	73.4	60.3	109.0	81.6	137.2	91.3	714.
3313	1902	10.0	0.2	1.7	11.0	36.8	73.6	41.3	148.3	181.7	188.5	88.9	36.4	818.
3314	1903	30.0	0.1	0.0	3.6	80.5	67.5	127.5	140.6	219.7	95.3	289.4	84.0	1138.
3315	1904	14.8	0.0	1.7	7.1	58.8	39.8	75.1	19.4	84.7	111.5	4.4	16.1	433.
3316	1905	6.5	6.8	17.0	18.3	44.2	66.1	50.9	219.3	36.5	180.2	55.4	2.0	703.
...
3422	2011	0.8	12.1	0.0	34.6	33.0	44.5	128.9	163.6	71.2	107.5	106.9	35.1	738.
3423	2012	2.7	0.0	2.5	32.7	38.8	47.0	139.7	120.0	69.5	113.7	86.6	61.9	715.
3424	2013	1.3	30.6	11.5	26.8	38.9	73.8	95.7	110.3	163.2	169.3	38.6	2.6	762.
3425	2014	0.2	0.7	12.5	5.1	46.7	66.3	68.7	115.1	81.4	104.6	37.8	12.8	551.
3426	2015	1.9	0.0	13.4	73.4	39.7	73.0	43.1	123.6	136.3	106.7	383.8	52.2	1047.

115 rows × 14 columns



In [48]: `y=x.drop(["YEAR", "ANNUAL"],axis=1)`
`y`

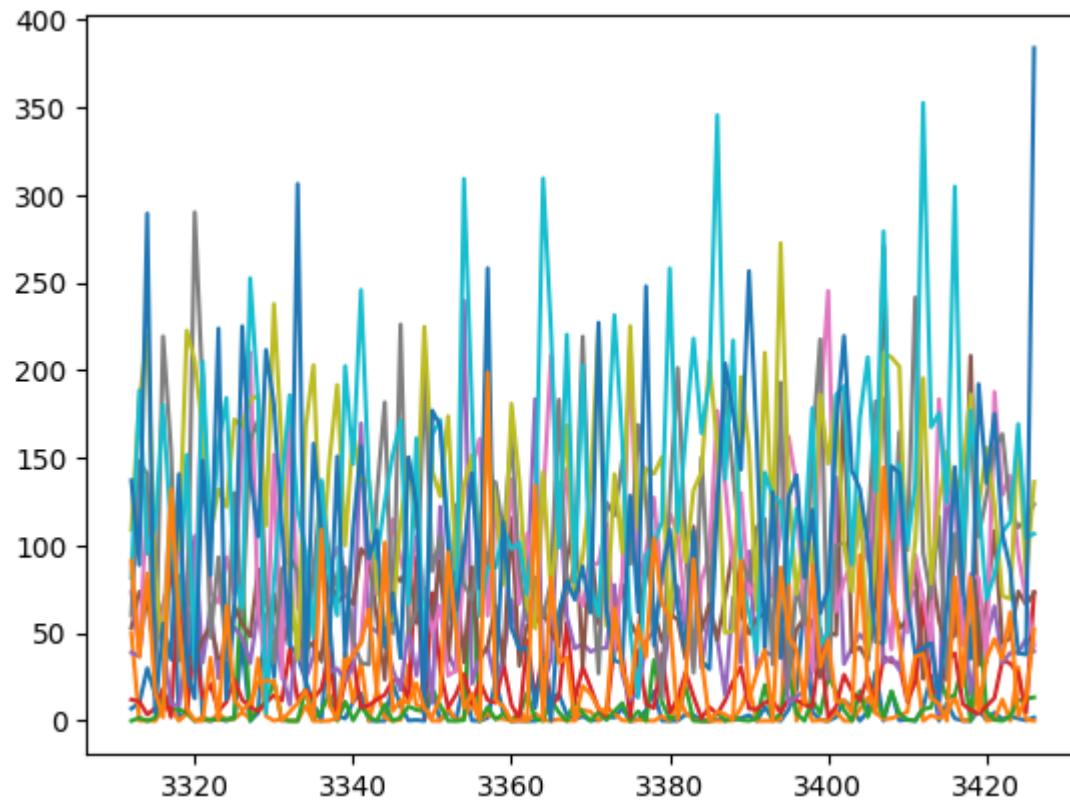
Out[48]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3312	7.0	50.2	0.0	12.1	38.9	53.0	73.4	60.3	109.0	81.6	137.2	91.3
3313	10.0	0.2	1.7	11.0	36.8	73.6	41.3	148.3	181.7	188.5	88.9	36.4
3314	30.0	0.1	0.0	3.6	80.5	67.5	127.5	140.6	219.7	95.3	289.4	84.0
3315	14.8	0.0	1.7	7.1	58.8	39.8	75.1	19.4	84.7	111.5	4.4	16.1
3316	6.5	6.8	17.0	18.3	44.2	66.1	50.9	219.3	36.5	180.2	55.4	2.0
...
3422	0.8	12.1	0.0	34.6	33.0	44.5	128.9	163.6	71.2	107.5	106.9	35.1
3423	2.7	0.0	2.5	32.7	38.8	47.0	139.7	120.0	69.5	113.7	86.6	61.9
3424	1.3	30.6	11.5	26.8	38.9	73.8	95.7	110.3	163.2	169.3	38.6	2.6
3425	0.2	0.7	12.5	5.1	46.7	66.3	68.7	115.1	81.4	104.6	37.8	12.8
3426	1.9	0.0	13.4	73.4	39.7	73.0	43.1	123.6	136.3	106.7	383.8	52.2

115 rows × 12 columns

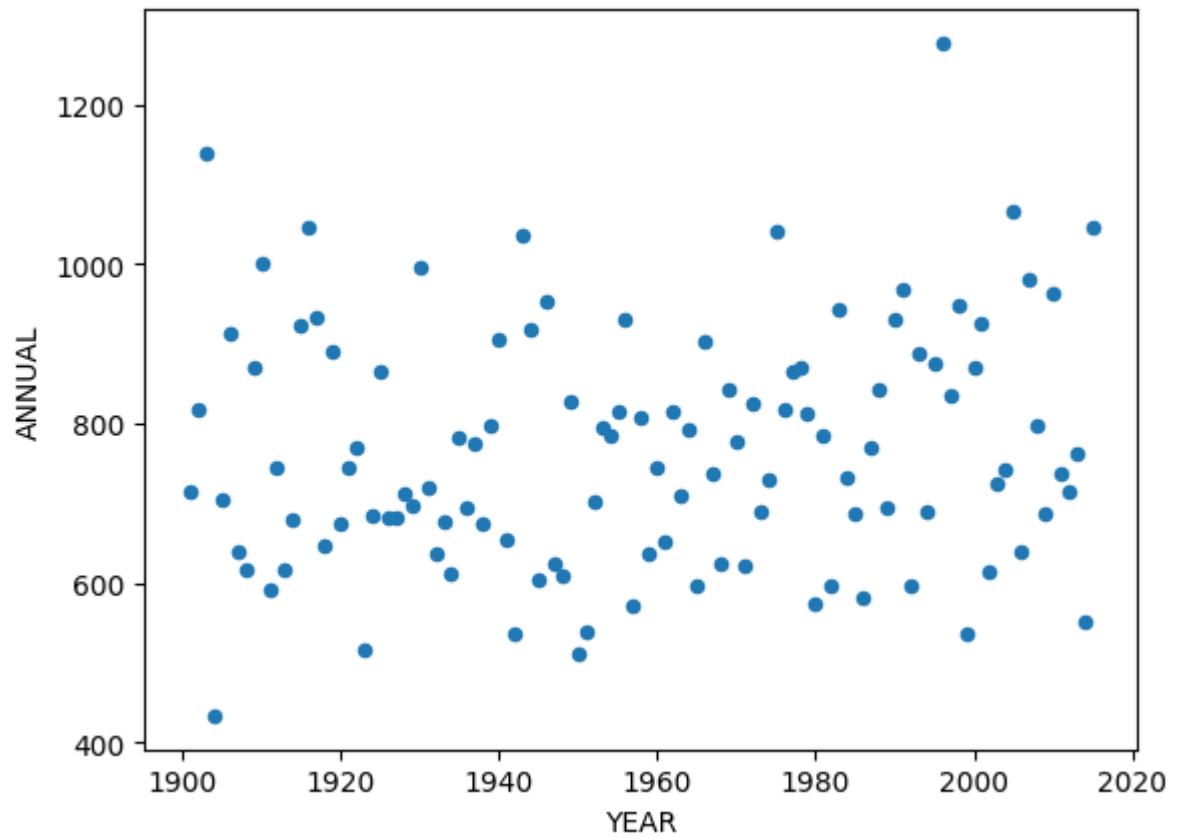
```
In [49]: plt.plot(y)
```

```
Out[49]: [
```



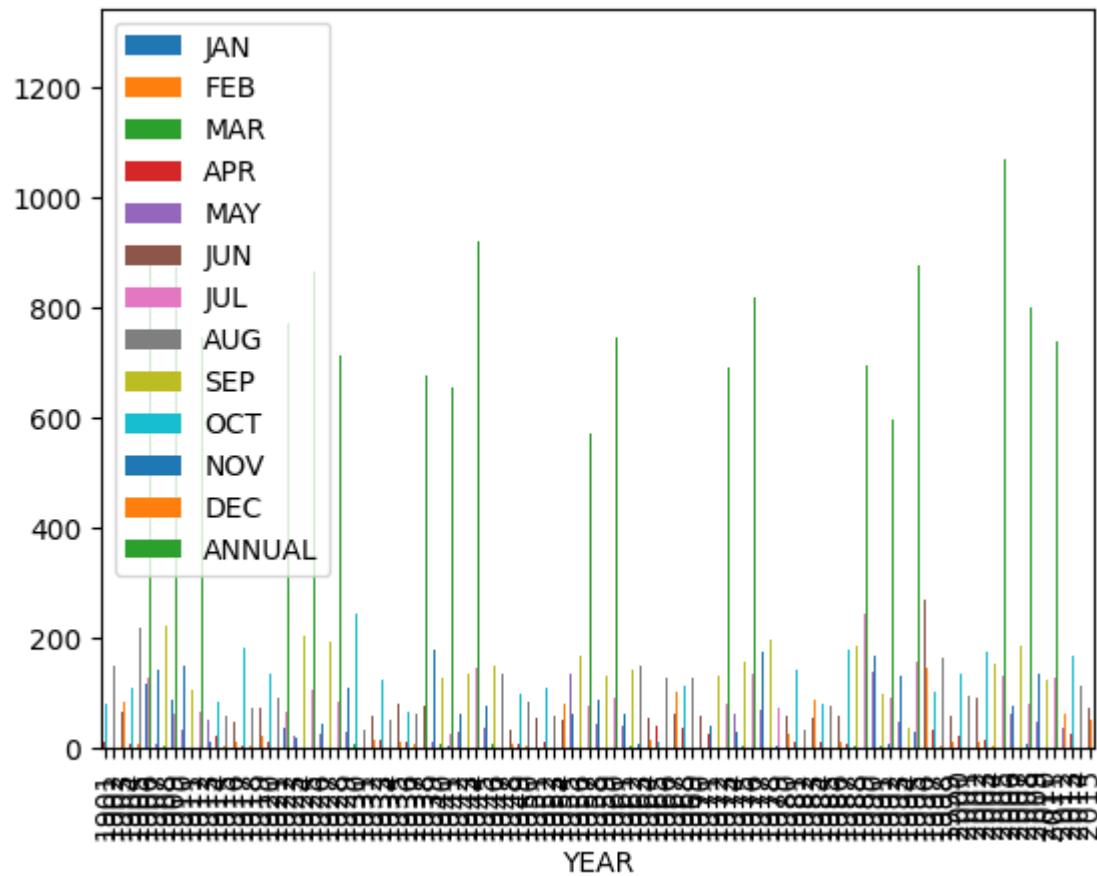
```
In [50]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[50]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



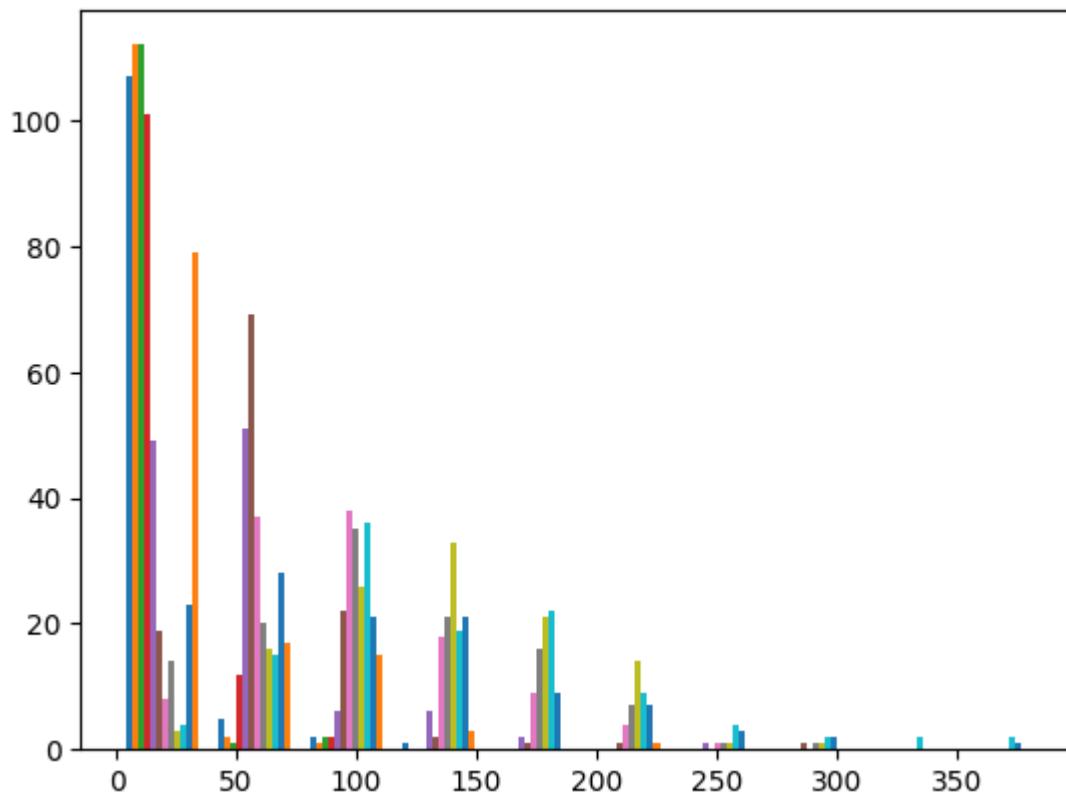
```
In [51]: x.plot.bar(x="YEAR")
```

```
Out[51]: <Axes: xlabel='YEAR'>
```



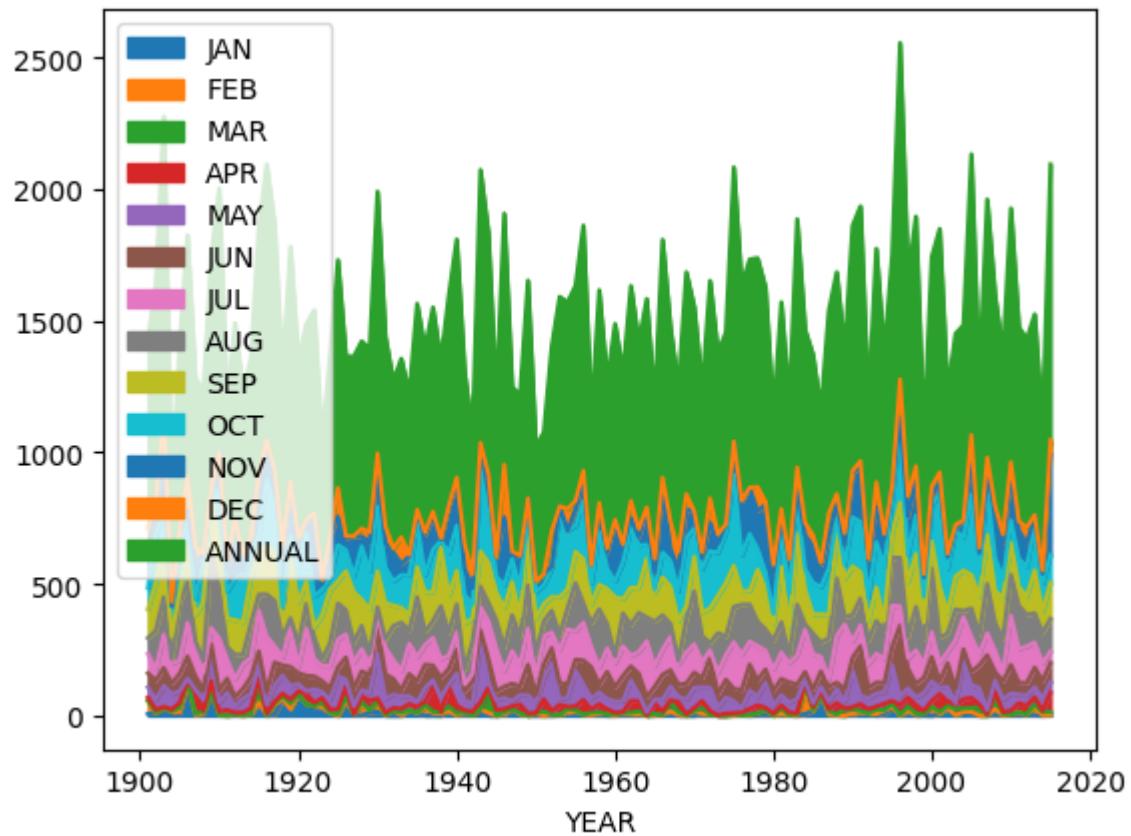
```
In [52]: plt.hist(y)
```

```
Out[52]: (array([[107., 5., 2., 1., 0., 0., 0., 0., 0., 0.],
       [112., 2., 1., 0., 0., 0., 0., 0., 0., 0.],
       [112., 1., 2., 0., 0., 0., 0., 0., 0., 0.],
       [101., 12., 2., 0., 0., 0., 0., 0., 0., 0.],
       [ 49., 51., 6., 6., 2., 0., 1., 0., 0., 0.],
       [ 19., 69., 22., 2., 1., 1., 0., 1., 0., 0.],
       [ 8., 37., 38., 18., 9., 4., 1., 0., 0., 0.],
       [ 14., 20., 35., 21., 16., 7., 1., 1., 0., 0.],
       [ 3., 16., 26., 33., 21., 14., 1., 1., 0., 0.],
       [ 4., 15., 36., 19., 22., 9., 4., 2., 2., 2.],
       [ 23., 28., 21., 21., 9., 7., 3., 2., 0., 1.],
       [ 79., 17., 15., 3., 0., 1., 0., 0., 0., 0.]]),
array([ 0. , 38.38, 76.76, 115.14, 153.52, 191.9 , 230.28, 268.66,
       307.04, 345.42, 383.8 ]),
<a list of 12 BarContainer objects>)
```



```
In [53]: x.plot.area(x="YEAR")
```

```
Out[53]: <Axes: xlabel='YEAR'>
```



TELANGANA

In [59]:

```
x=df[df[ "SUBDIVISION" ]=="TELANGANA"]
```

Out[59]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
3197	3197	TELANGANA	1901	6.9	41.8	7.8	45.2	22.0	123.6	237.8	177.2	77.7	75.5
3198	3198	TELANGANA	1902	0.0	0.0	0.2	10.7	7.3	52.4	146.3	142.8	190.5	41.7
3199	3199	TELANGANA	1903	12.9	4.6	0.0	9.9	40.7	99.2	505.2	246.7	191.9	155.8
3200	3200	TELANGANA	1904	0.0	0.0	10.8	0.8	14.7	104.2	139.5	50.0	162.3	44.4
3201	3201	TELANGANA	1905	0.0	4.3	12.8	27.6	32.2	129.5	82.4	237.3	179.1	19.0
...
3307	3307	TELANGANA	2011	0.0	11.9	2.6	25.6	9.3	83.9	268.2	225.9	107.6	13.9
3308	3308	TELANGANA	2012	6.7	0.0	0.2	14.0	8.4	124.4	300.3	229.9	202.4	83.0
3309	3309	TELANGANA	2013	2.4	29.0	0.2	24.4	8.5	213.4	453.8	230.6	161.4	205.9
3310	3310	TELANGANA	2014	0.2	2.9	58.3	10.3	73.3	62.3	146.0	205.2	146.8	29.0
3311	3311	TELANGANA	2015	17.5	0.0	43.0	65.7	23.3	266.9	104.4	160.5	158.3	15.0

115 rows × 20 columns

In [60]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

Out[60]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUA
3197	1901	6.9	41.8	7.8	45.2	22.0	123.6	237.8	177.2	77.7	75.5	12.2	0.0	827
3198	1902	0.0	0.0	0.2	10.7	7.3	52.4	146.3	142.8	190.5	41.7	31.2	7.3	630
3199	1903	12.9	4.6	0.0	9.9	40.7	99.2	505.2	246.7	191.9	155.8	15.5	1.1	1283
3200	1904	0.0	0.0	10.8	0.8	14.7	104.2	139.5	50.0	162.3	44.4	0.0	0.0	526
3201	1905	0.0	4.3	12.8	27.6	32.2	129.5	82.4	237.3	179.1	19.6	0.0	0.0	724
...
3307	2011	0.0	11.9	2.6	25.6	9.3	83.9	268.2	225.9	107.6	13.9	4.2	0.0	753
3308	2012	6.7	0.0	0.2	14.0	8.4	124.4	300.3	229.9	202.4	83.6	38.7	0.0	1008
3309	2013	2.4	29.0	0.2	24.4	8.5	213.4	453.8	230.6	161.4	205.9	16.4	2.7	1348
3310	2014	0.2	2.9	58.3	10.3	73.3	62.3	146.0	205.2	146.8	29.6	10.8	0.7	746
3311	2015	17.5	0.0	43.0	65.7	23.3	266.9	104.4	160.5	158.3	15.6	0.3	1.7	857

115 rows × 14 columns

```
In [61]: y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

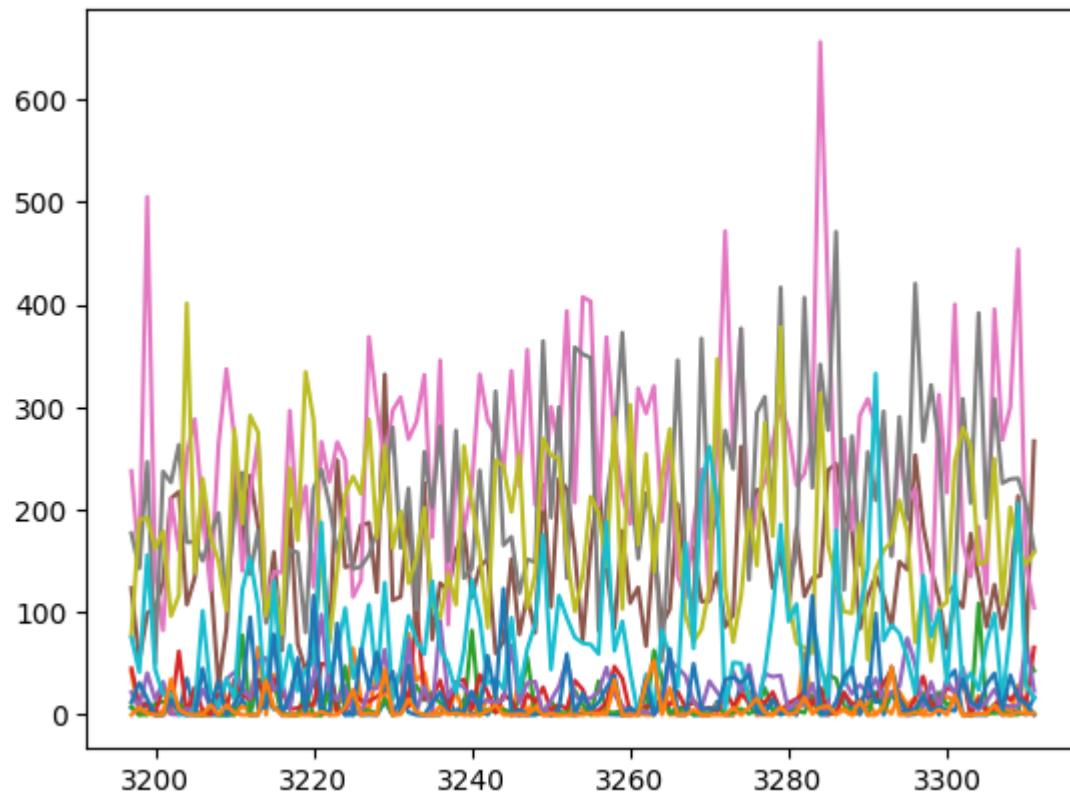
```
Out[61]:
```

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3197	6.9	41.8	7.8	45.2	22.0	123.6	237.8	177.2	77.7	75.5	12.2	0.0
3198	0.0	0.0	0.2	10.7	7.3	52.4	146.3	142.8	190.5	41.7	31.2	7.3
3199	12.9	4.6	0.0	9.9	40.7	99.2	505.2	246.7	191.9	155.8	15.5	1.1
3200	0.0	0.0	10.8	0.8	14.7	104.2	139.5	50.0	162.3	44.4	0.0	0.0
3201	0.0	4.3	12.8	27.6	32.2	129.5	82.4	237.3	179.1	19.6	0.0	0.0
...
3307	0.0	11.9	2.6	25.6	9.3	83.9	268.2	225.9	107.6	13.9	4.2	0.0
3308	6.7	0.0	0.2	14.0	8.4	124.4	300.3	229.9	202.4	83.6	38.7	0.0
3309	2.4	29.0	0.2	24.4	8.5	213.4	453.8	230.6	161.4	205.9	16.4	2.7
3310	0.2	2.9	58.3	10.3	73.3	62.3	146.0	205.2	146.8	29.6	10.8	0.7
3311	17.5	0.0	43.0	65.7	23.3	266.9	104.4	160.5	158.3	15.6	0.3	1.7

115 rows × 12 columns

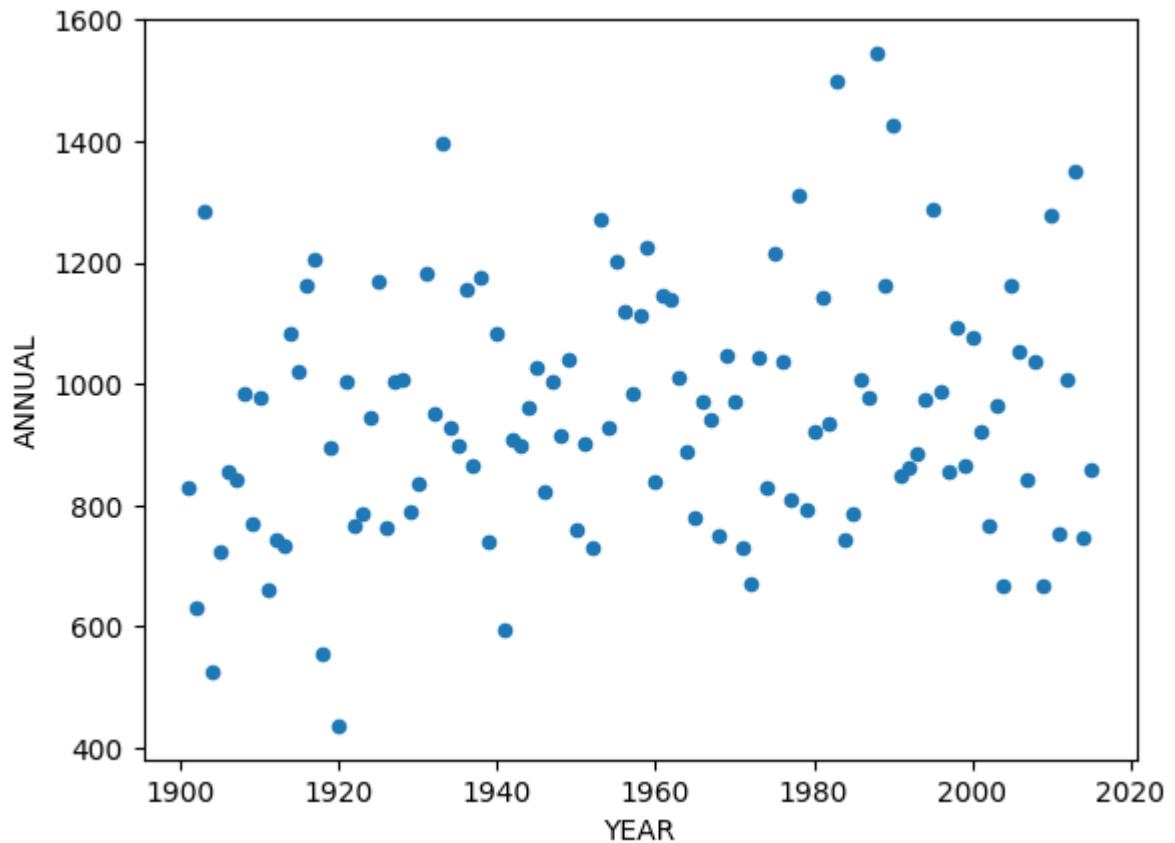
```
In [62]: plt.plot(y)
```

```
Out[62]: [
```



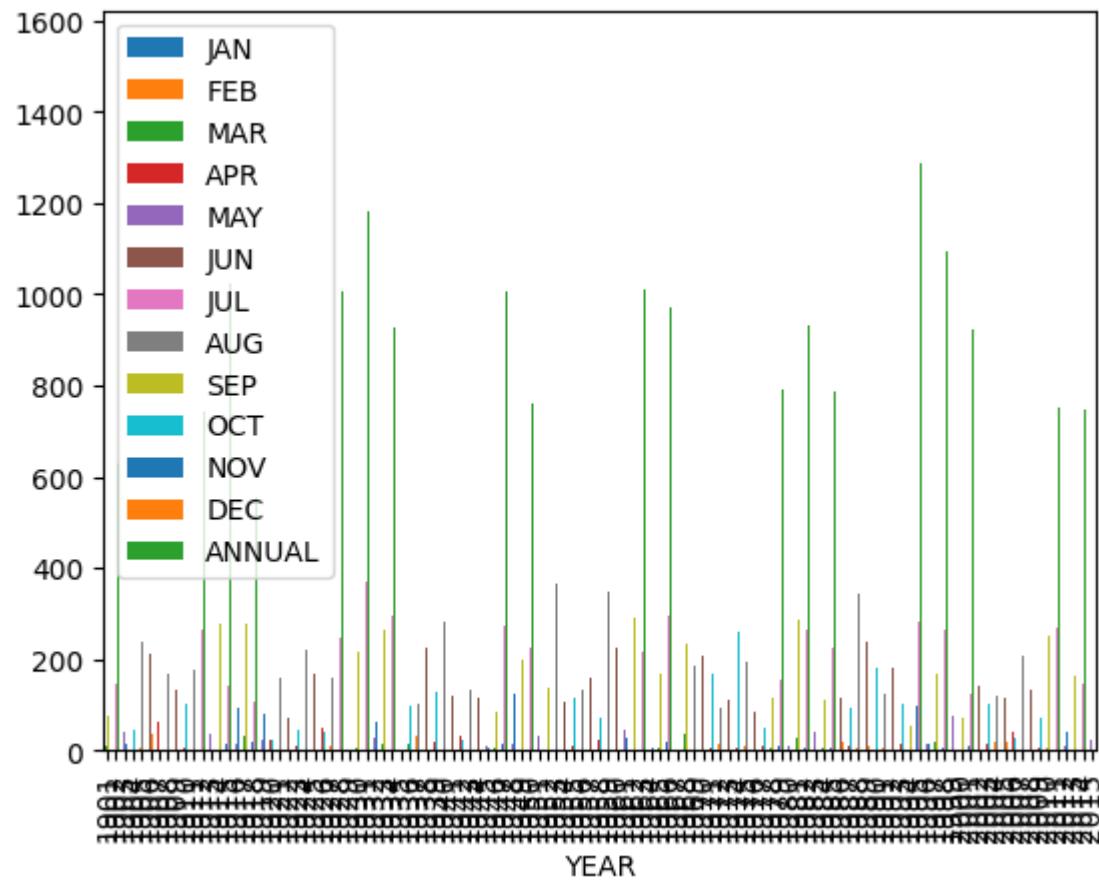
```
In [63]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[63]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



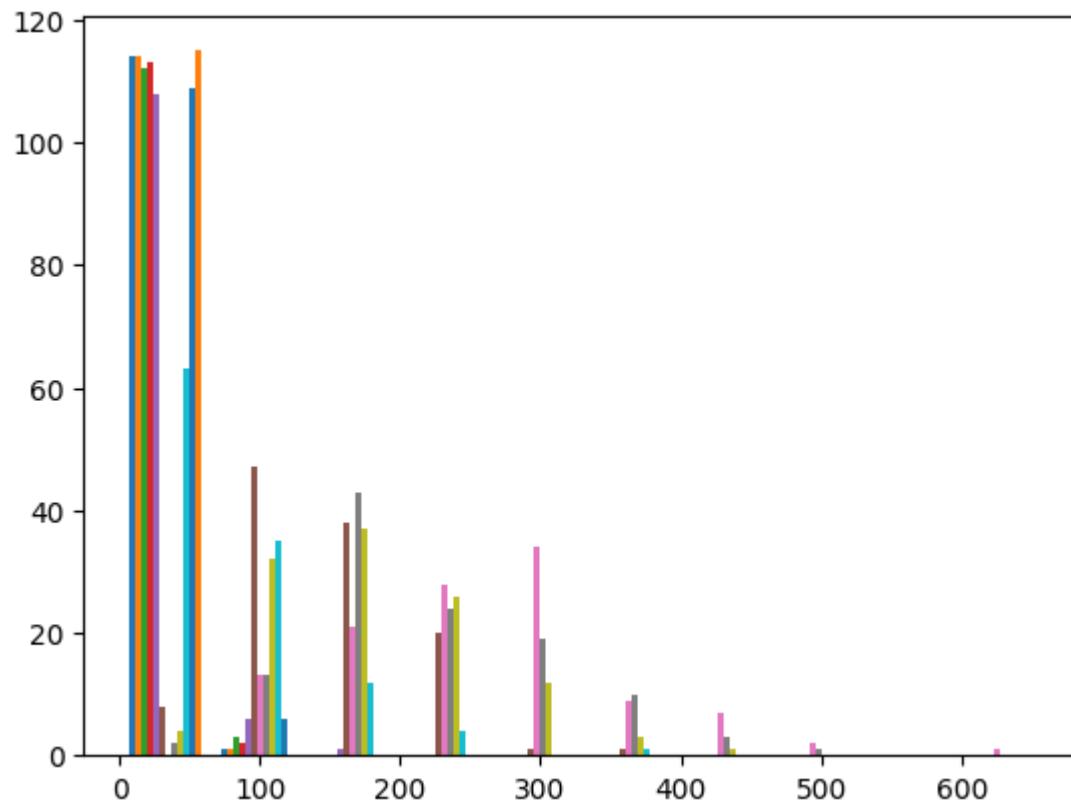
```
In [64]: x.plot.bar(x="YEAR")
```

```
Out[64]: <Axes: xlabel='YEAR'>
```



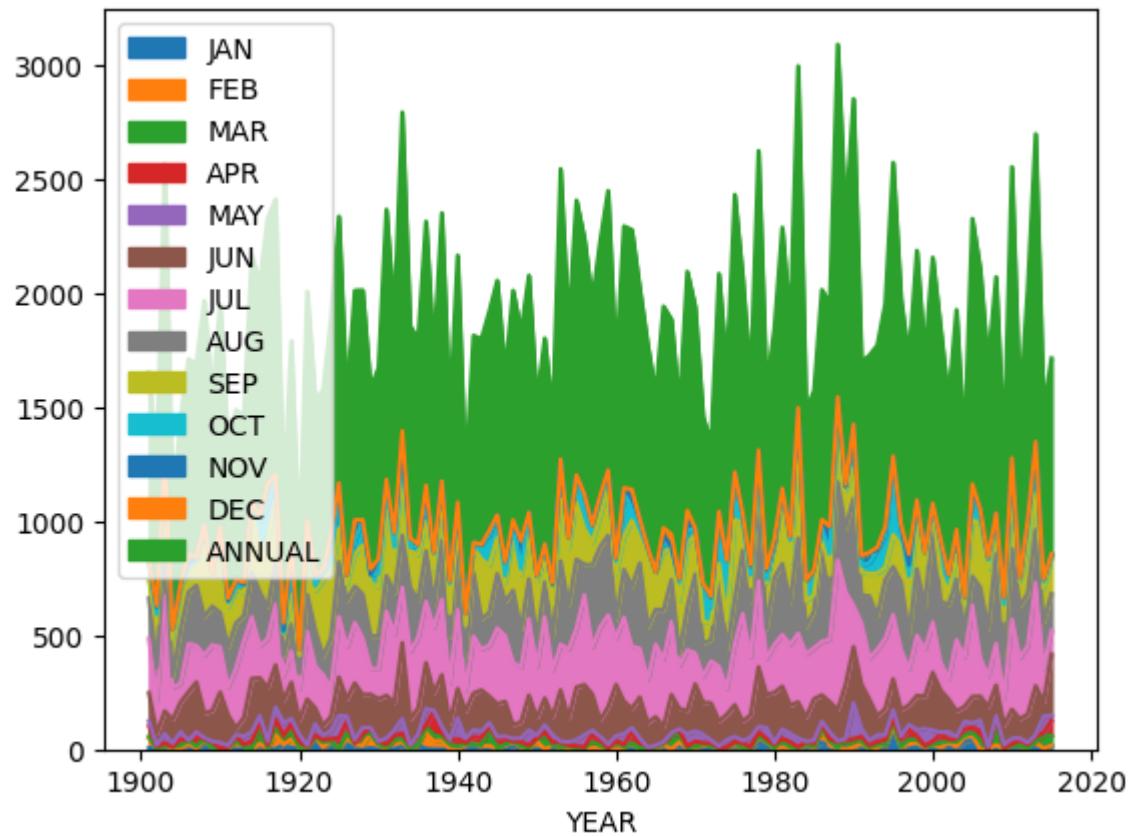
```
In [65]: plt.hist(y)
```

```
Out[65]: (array([[114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [112., 3., 0., 0., 0., 0., 0., 0., 0., 0.],
       [113., 2., 0., 0., 0., 0., 0., 0., 0., 0.],
       [108., 6., 1., 0., 0., 0., 0., 0., 0., 0.],
       [ 8., 47., 38., 20., 1., 1., 0., 0., 0., 0.],
       [ 0., 13., 21., 28., 34., 9., 7., 2., 0., 1.],
       [ 2., 13., 43., 24., 19., 10., 3., 1., 0., 0.],
       [ 4., 32., 37., 26., 12., 3., 1., 0., 0., 0.],
       [ 63., 35., 12., 4., 0., 1., 0., 0., 0., 0.],
       [109., 6., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.]]),
array([ 0. , 65.62, 131.24, 196.86, 262.48, 328.1 , 393.72, 459.34,
      524.96, 590.58, 656.2 ]),
<a list of 12 BarContainer objects>)
```



```
In [66]: x.plot.area(x="YEAR")
```

```
Out[66]: <Axes: xlabel='YEAR'>
```



COASTAL ANDHRA PRADESH

In [67]:

```
x=df[df[ "SUBDIVISION" ]=="COASTAL ANDHRA PRADESH"]
```

```
x
```

Out[67]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
3082	3082		COASTAL ANDHRA PRADESH	1901	18.8	80.9	7.2	28.7	68.7	77.7	113.0	133.7	125.3	173
3083	3083		COASTAL ANDHRA PRADESH	1902	2.0	0.0	2.8	23.9	37.6	72.6	144.5	236.1	204.5	262
3084	3084		COASTAL ANDHRA PRADESH	1903	0.8	13.3	0.2	6.2	73.4	154.0	248.6	258.0	216.5	159
3085	3085		COASTAL ANDHRA PRADESH	1904	1.3	0.0	5.4	3.0	136.3	107.8	120.2	117.7	116.8	240
3086	3086		COASTAL ANDHRA PRADESH	1905	1.1	16.7	68.0	37.0	68.8	84.4	64.6	210.8	170.2	66
...
3192	3192		COASTAL ANDHRA PRADESH	2011	0.0	17.9	0.9	62.3	67.9	86.8	196.0	215.8	129.7	74
3193	3193		COASTAL ANDHRA PRADESH	2012	37.6	0.0	2.7	24.0	39.3	95.4	221.9	221.2	246.5	140
3194	3194		COASTAL ANDHRA PRADESH	2013	2.0	29.6	0.2	48.0	28.2	127.5	162.4	123.1	132.0	411
3195	3195		COASTAL ANDHRA PRADESH	2014	0.4	1.2	9.1	6.0	112.9	45.7	151.8	177.8	144.5	195
3196	3196		COASTAL ANDHRA PRADESH	2015	2.0	0.6	5.5	32.3	34.1	283.8	116.0	192.0	201.8	59

115 rows × 20 columns



In [68]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[68]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNU
3082	1901	18.8	80.9	7.2	28.7	68.7	77.7	113.0	133.7	125.3	173.4	164.8	1.5	99
3083	1902	2.0	0.0	2.8	23.9	37.6	72.6	144.5	236.1	204.5	262.0	50.4	27.1	106
3084	1903	0.8	13.3	0.2	6.2	73.4	154.0	248.6	258.0	216.5	159.1	173.9	12.1	131
3085	1904	1.3	0.0	5.4	3.0	136.3	107.8	120.2	117.7	116.8	240.9	0.0	10.7	86
3086	1905	1.1	16.7	68.0	37.0	68.8	84.4	64.6	210.8	170.2	66.0	7.4	0.0	79
...
3192	2011	0.0	17.9	0.9	62.3	67.9	86.8	196.0	215.8	129.7	74.6	4.9	5.0	86
3193	2012	37.6	0.0	2.7	24.0	39.3	95.4	221.9	221.2	246.5	140.0	289.7	0.0	131
3194	2013	2.0	29.6	0.2	48.0	28.2	127.5	162.4	123.1	132.0	411.5	53.1	2.8	112
3195	2014	0.4	1.2	9.1	6.0	112.9	45.7	151.8	177.8	144.5	195.6	23.7	6.4	87
3196	2015	2.0	0.6	5.5	32.3	34.1	283.8	116.0	192.0	201.8	59.7	81.2	2.0	101

115 rows × 14 columns

In [69]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

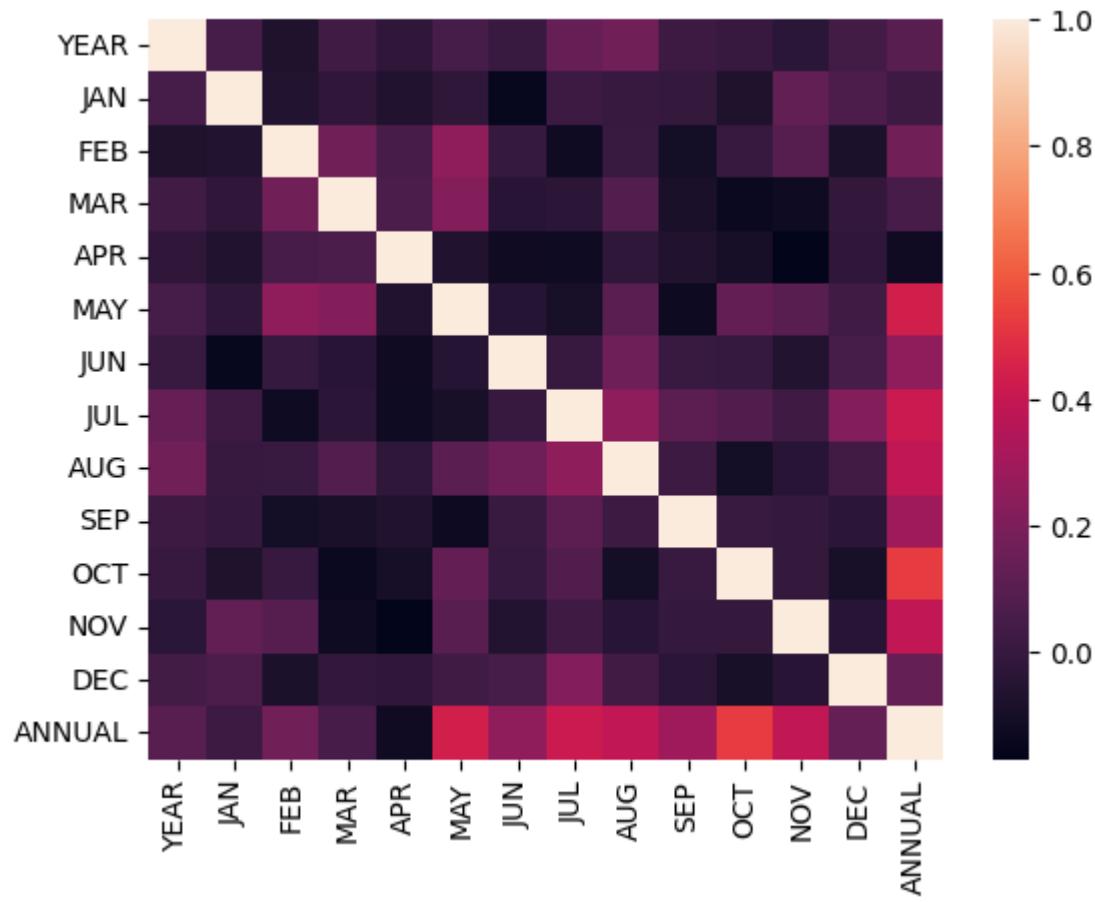
Out[69]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3082	18.8	80.9	7.2	28.7	68.7	77.7	113.0	133.7	125.3	173.4	164.8	1.5
3083	2.0	0.0	2.8	23.9	37.6	72.6	144.5	236.1	204.5	262.0	50.4	27.1
3084	0.8	13.3	0.2	6.2	73.4	154.0	248.6	258.0	216.5	159.1	173.9	12.1
3085	1.3	0.0	5.4	3.0	136.3	107.8	120.2	117.7	116.8	240.9	0.0	10.7
3086	1.1	16.7	68.0	37.0	68.8	84.4	64.6	210.8	170.2	66.0	7.4	0.0
...
3192	0.0	17.9	0.9	62.3	67.9	86.8	196.0	215.8	129.7	74.6	4.9	5.0
3193	37.6	0.0	2.7	24.0	39.3	95.4	221.9	221.2	246.5	140.0	289.7	0.0
3194	2.0	29.6	0.2	48.0	28.2	127.5	162.4	123.1	132.0	411.5	53.1	2.8
3195	0.4	1.2	9.1	6.0	112.9	45.7	151.8	177.8	144.5	195.6	23.7	6.4
3196	2.0	0.6	5.5	32.3	34.1	283.8	116.0	192.0	201.8	59.7	81.2	2.0

115 rows × 12 columns

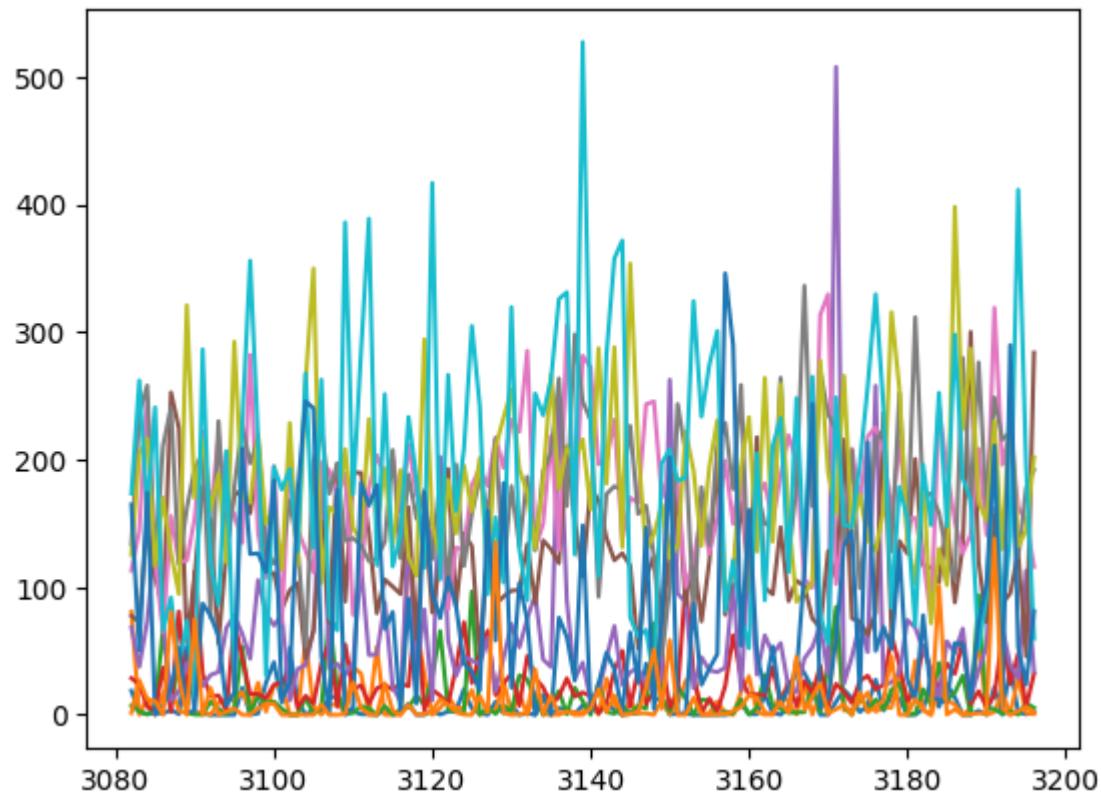
```
In [70]: sns.heatmap(x.corr())
```

```
Out[70]: <Axes: >
```



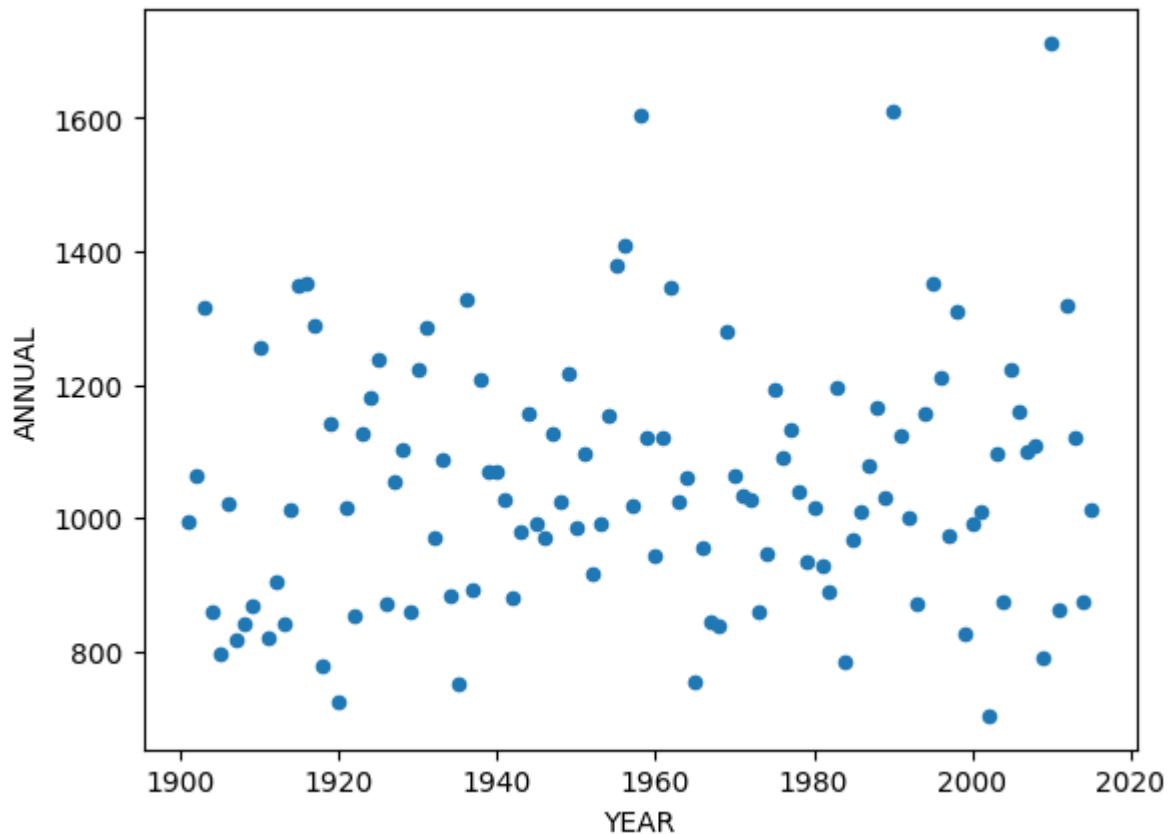
```
In [71]: plt.plot(y)
```

```
Out[71]: [
```



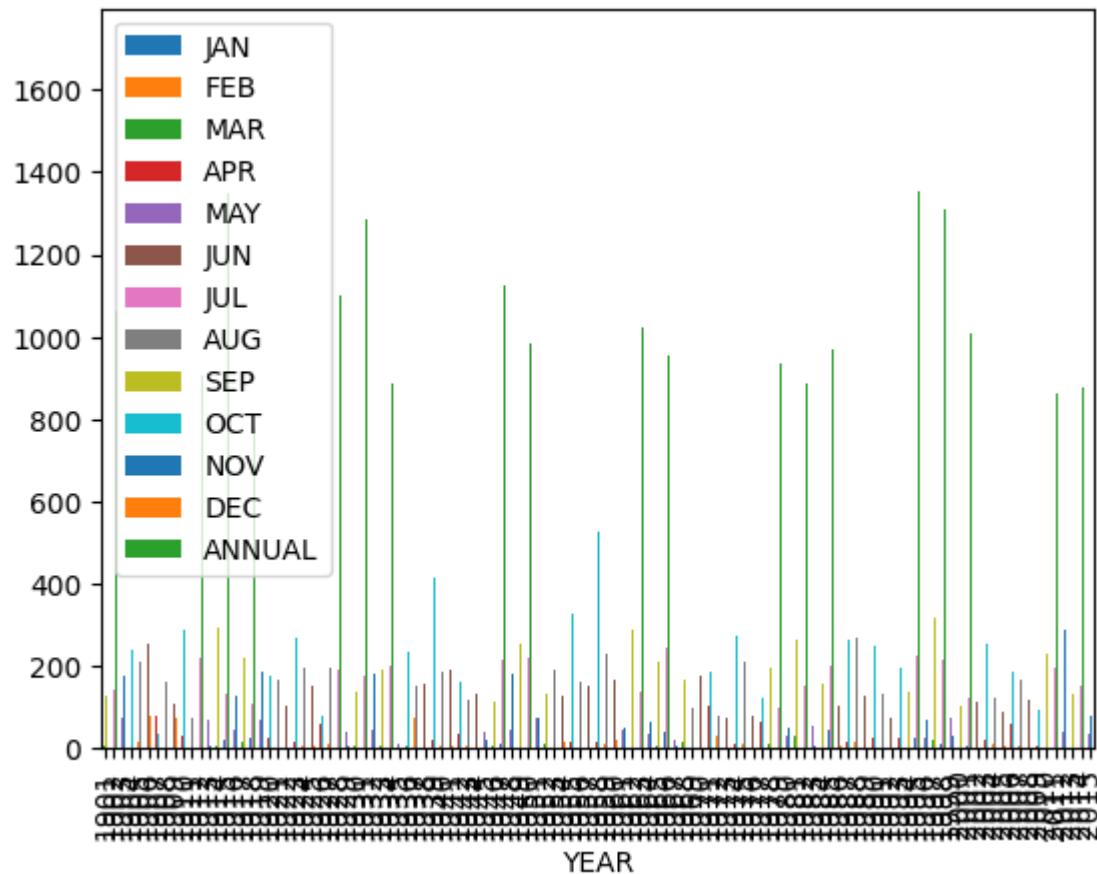
```
In [72]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[72]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



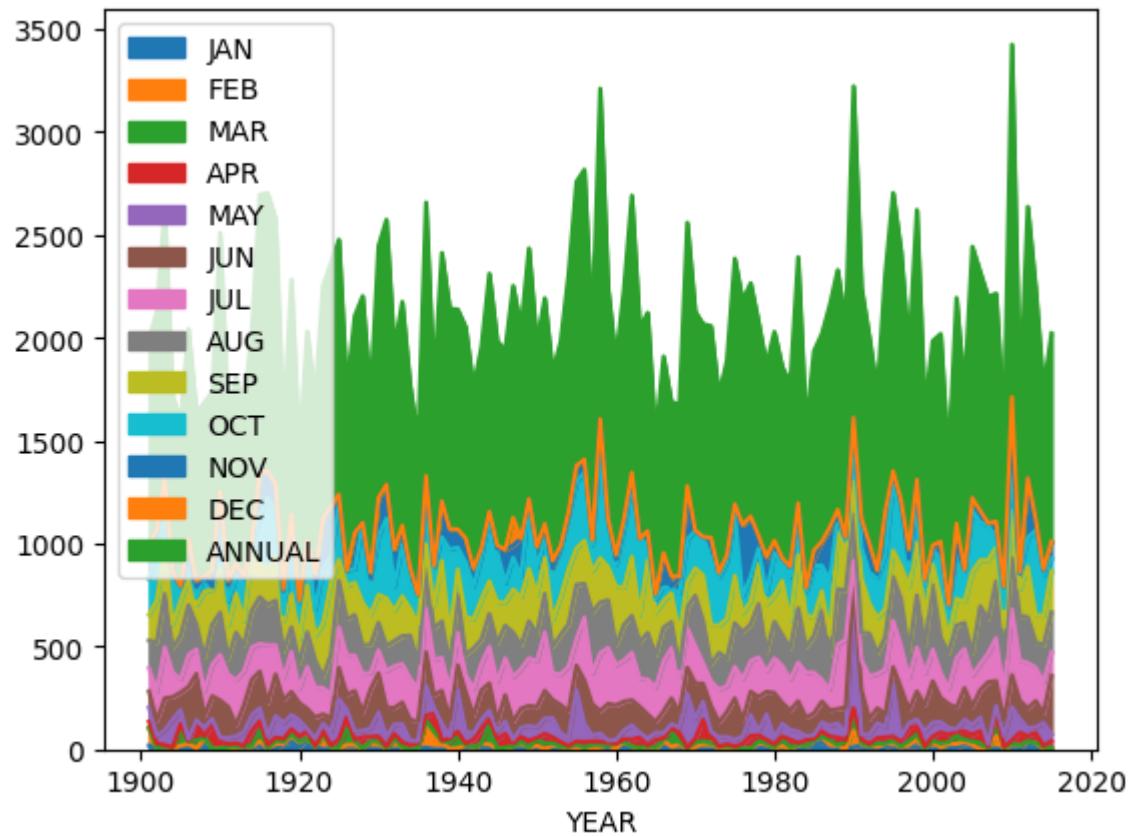
```
In [73]: x.plot.bar(x="YEAR")
```

```
Out[73]: <Axes: xlabel='YEAR'>
```



```
In [74]: x.plot.area(x="YEAR")
```

```
Out[74]: <Axes: xlabel='YEAR'>
```



CHHATTISGARH

In [75]:

```
x=df[df[ "SUBDIVISION" ]=="CHHATTISGARH"]
x
```

Out[75]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
2967	2967	CHHATTISGARH	1901	48.9	116.5	27.8	5.5	18.4	101.6	381.0	476.7	182.8
2968	2968	CHHATTISGARH	1902	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1
2969	2969	CHHATTISGARH	1903	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0
2970	2970	CHHATTISGARH	1904	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8
2971	2971	CHHATTISGARH	1905	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8
...
3077	3077	CHHATTISGARH	2011	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2
3078	3078	CHHATTISGARH	2012	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3
3079	3079	CHHATTISGARH	2013	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9
3080	3080	CHHATTISGARH	2014	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7
3081	3081	CHHATTISGARH	2015	15.8	1.2	21.2	37.0	13.0	257.6	248.6	286.6	216.9

115 rows × 20 columns



In [76]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

Out[76]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNU.
2967	1901	48.9	116.5	27.8	5.5	18.4	101.6	381.0	476.7	182.8	27.3	0.4	0.0	1381
2968	1902	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1	4.7	8.1	3.7	923
2969	1903	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0	168.0	0.1	0.0	1331
2970	1904	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8	129.3	1.0	0.0	1491
2971	1905	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8	8.9	0.0	0.0	1251
...
3077	2011	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2	15.5	0.0	2.8	1302
3078	2012	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3	19.8	20.4	5.0	1371
3079	2013	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9	180.9	0.3	0.0	1420
3080	2014	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7	77.9	2.6	1.1	1278
3081	2015	15.8	1.2	21.2	37.0	13.0	257.6	248.6	286.6	216.9	17.7	0.6	1.5	1111

115 rows × 14 columns



In [77]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

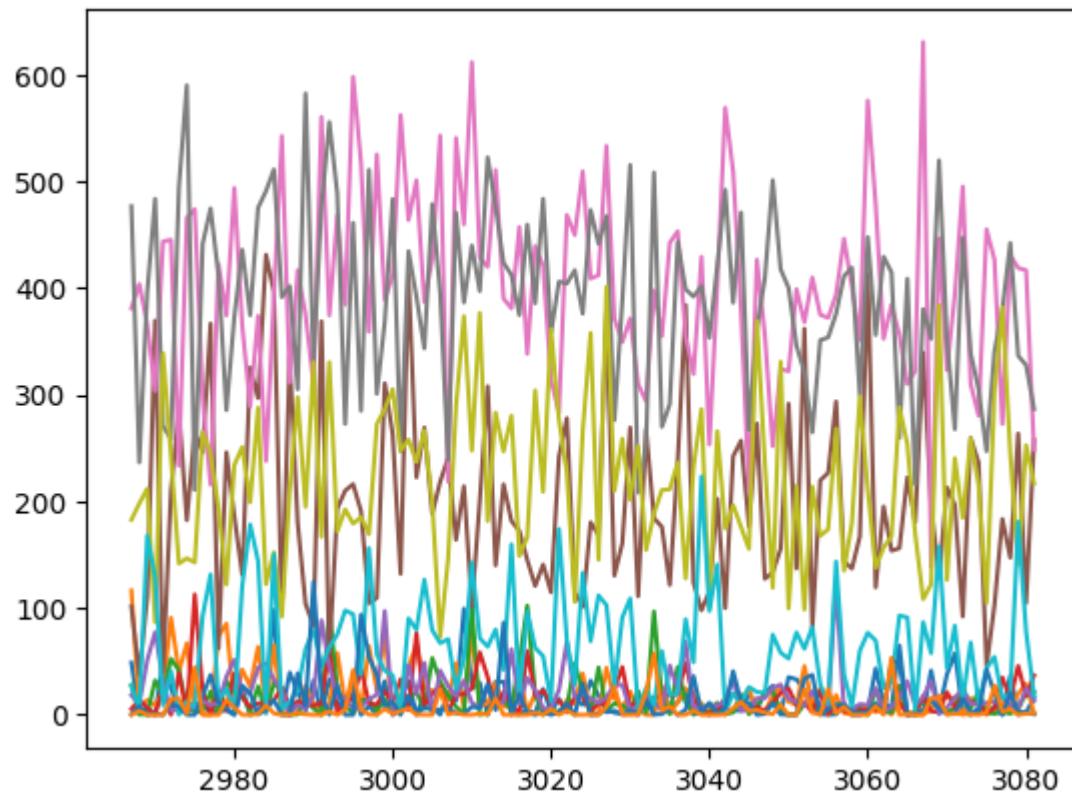
Out[77]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2967	48.9	116.5	27.8	5.5	18.4	101.6	381.0	476.7	182.8	27.3	0.4	0.0
2968	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1	4.7	8.1	3.7
2969	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0	168.0	0.1	0.0
2970	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8	129.3	1.0	0.0
2971	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8	8.9	0.0	0.0
...
3077	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2	15.5	0.0	2.8
3078	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3	19.8	20.4	5.0
3079	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9	180.9	0.3	0.0
3080	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7	77.9	2.6	1.1
3081	15.8	1.2	21.2	37.0	13.0	257.6	248.6	286.6	216.9	17.7	0.6	1.5

115 rows × 12 columns

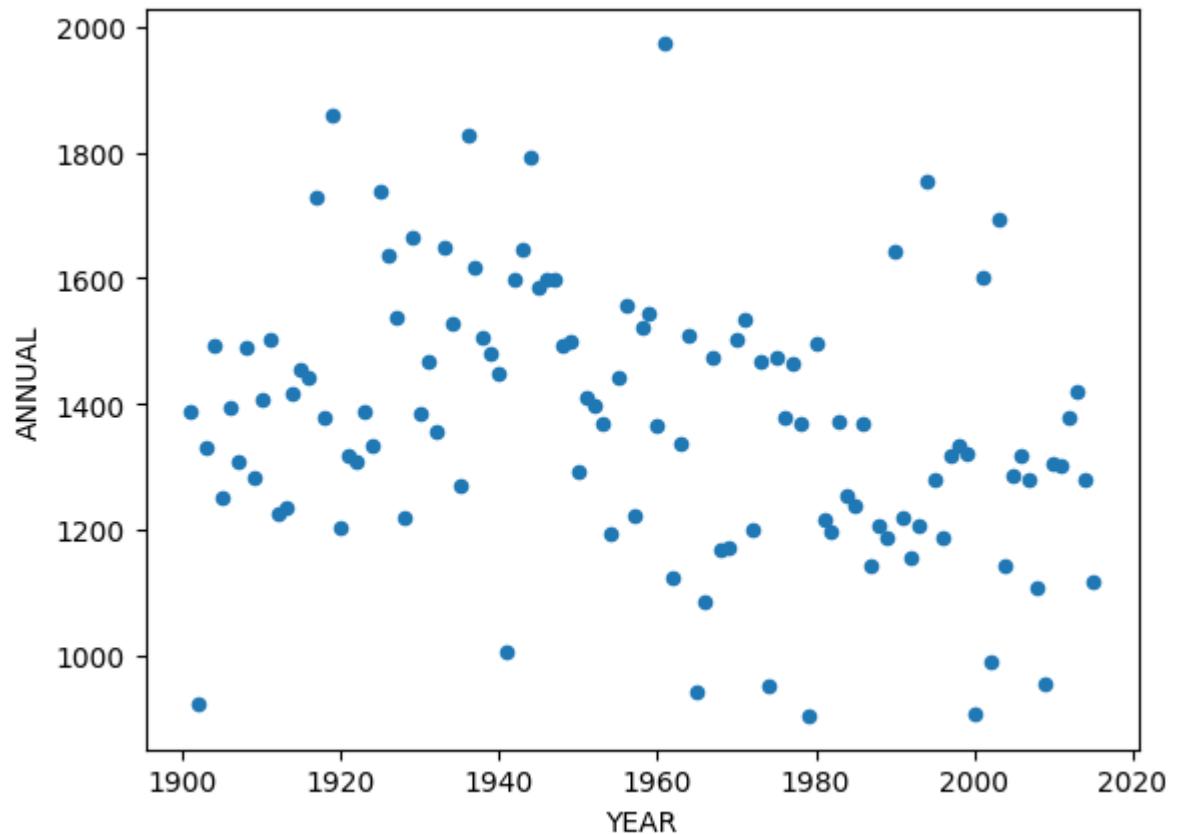
```
In [78]: plt.plot(y)
```

```
Out[78]: [
```



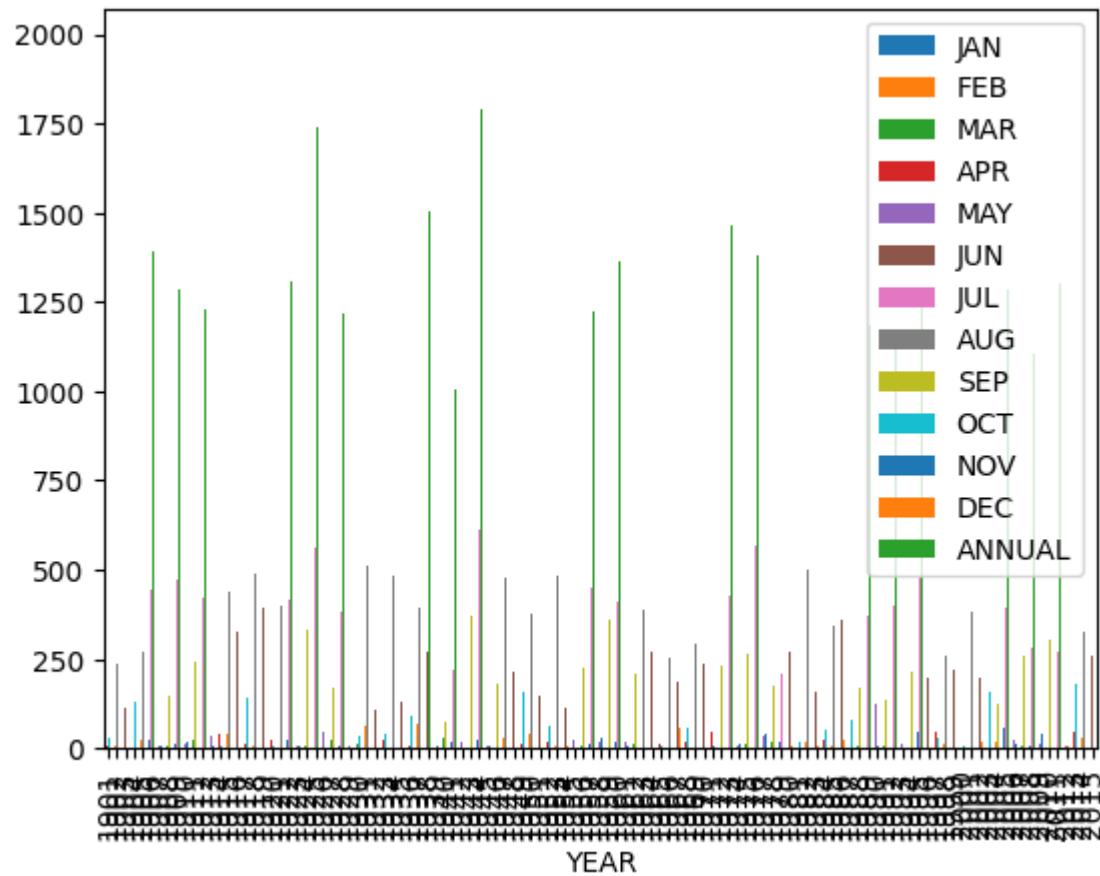
```
In [79]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[79]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



```
In [80]: x.plot.bar(x="YEAR")
```

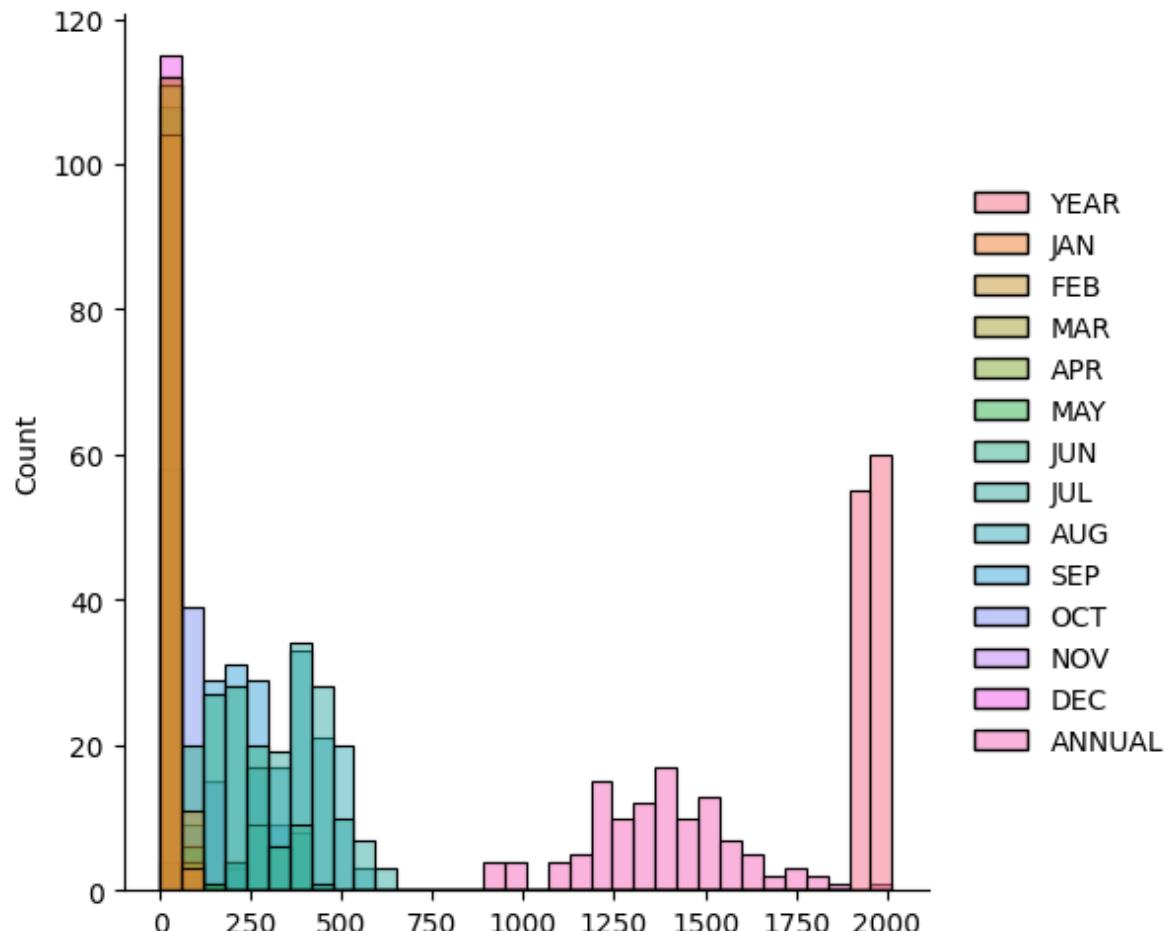
```
Out[80]: <Axes: xlabel='YEAR'>
```



```
In [81]: sns.displot(x)
```

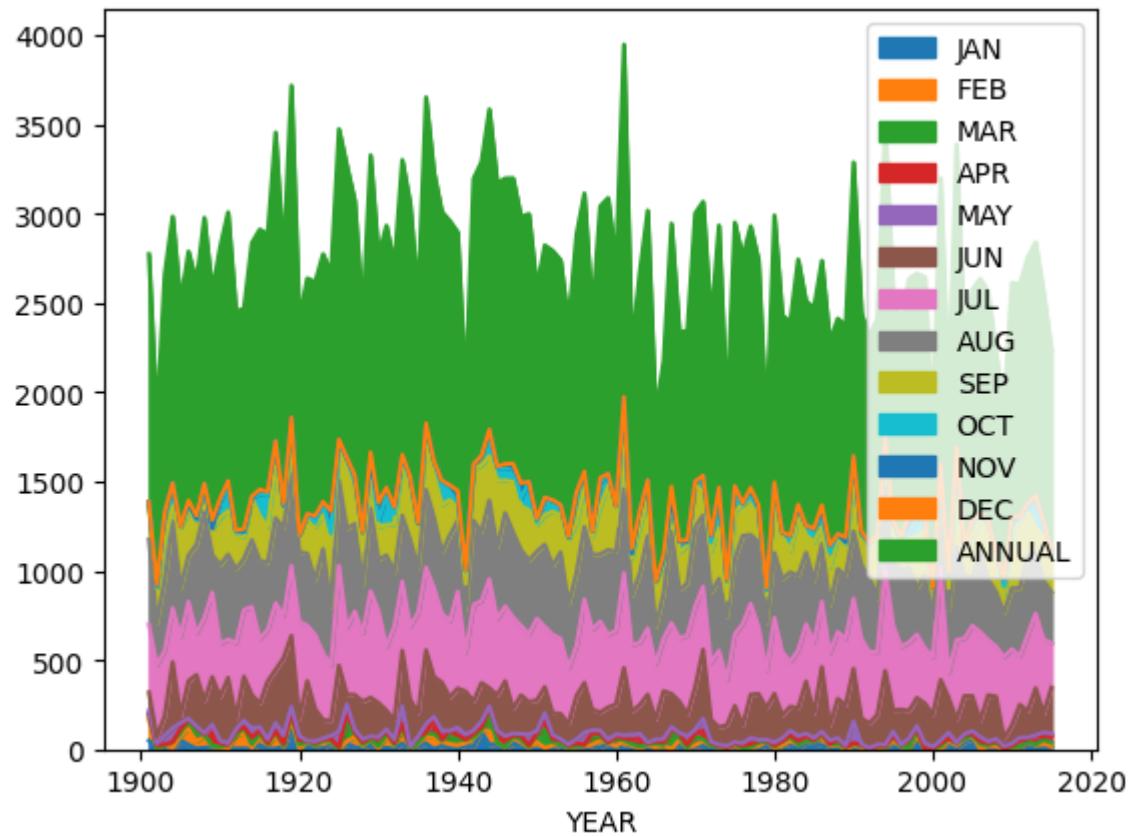
```
C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages
\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

```
Out[81]: <seaborn.axisgrid.FacetGrid at 0x26ded4d6550>
```



```
In [82]: x.plot.area(x="YEAR")
```

```
Out[82]: <Axes: xlabel='YEAR'>
```



VIDARBHA

```
In [83]: x=df[df[ "SUBDIVISION" ]=="VIDARBHA"]
x
```

Out[83]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
2852	2852	VIDARBHA	1901	36.8	39.9	30.9	26.1	7.3	129.7	295.3	368.8	123.4	35.2
2853	2853	VIDARBHA	1902	1.6	0.1	0.0	6.5	4.1	38.0	270.7	204.7	150.9	29.6
2854	2854	VIDARBHA	1903	5.2	4.0	0.1	2.5	37.8	121.2	475.5	325.5	154.8	100.8
2855	2855	VIDARBHA	1904	4.3	2.4	12.9	0.2	14.8	148.9	158.3	151.8	196.9	61.1
2856	2856	VIDARBHA	1905	7.3	12.7	12.4	16.2	14.0	81.0	254.5	216.3	321.3	6.0
...
2962	2962	VIDARBHA	2011	0.0	1.2	0.1	7.7	0.6	137.9	247.1	302.8	191.0	4.7
2963	2963	VIDARBHA	2012	3.1	0.1	0.0	0.6	0.2	125.5	370.5	316.2	249.4	34.9
2964	2964	VIDARBHA	2013	6.6	13.0	3.8	2.8	0.5	366.7	535.5	326.1	131.7	133.6
2965	2965	VIDARBHA	2014	1.2	18.3	49.6	2.6	4.0	63.3	337.6	191.7	224.9	17.3
2966	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 [84]: x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

Out[84]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2852	1901	36.8	39.9	30.9	26.1	7.3	129.7	295.3	368.8	123.4	35.2	0.0	0.0	1093
2853	1902	1.6	0.1	0.0	6.5	4.1	38.0	270.7	204.7	150.9	29.6	16.1	26.7	748
2854	1903	5.2	4.0	0.1	2.5	37.8	121.2	475.5	325.5	154.8	100.8	2.0	0.0	1229
2855	1904	4.3	2.4	12.9	0.2	14.8	148.9	158.3	151.8	196.9	61.7	0.0	0.9	753
2856	1905	7.3	12.7	12.4	16.2	14.0	81.0	254.5	216.3	321.3	6.0	0.2	0.0	941
...
2962	2011	0.0	1.2	0.1	7.7	0.6	137.9	247.1	302.8	191.0	4.7	0.0	0.0	893
2963	2012	3.1	0.1	0.0	0.6	0.2	125.5	370.5	316.2	249.4	34.9	7.3	0.0	1107
2964	2013	6.6	13.0	3.8	2.8	0.5	366.7	535.5	326.1	131.7	133.5	0.0	0.0	1520
2965	2014	1.2	18.3	49.6	2.6	4.0	63.3	337.6	191.7	224.9	17.3	6.2	2.3	919
2966	2015	26.3	4.7	66.3	28.1	12.8	254.6	137.2	288.9	167.5	7.0	0.0	0.2	993

115 rows × 14 columns



```
In [85]: y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

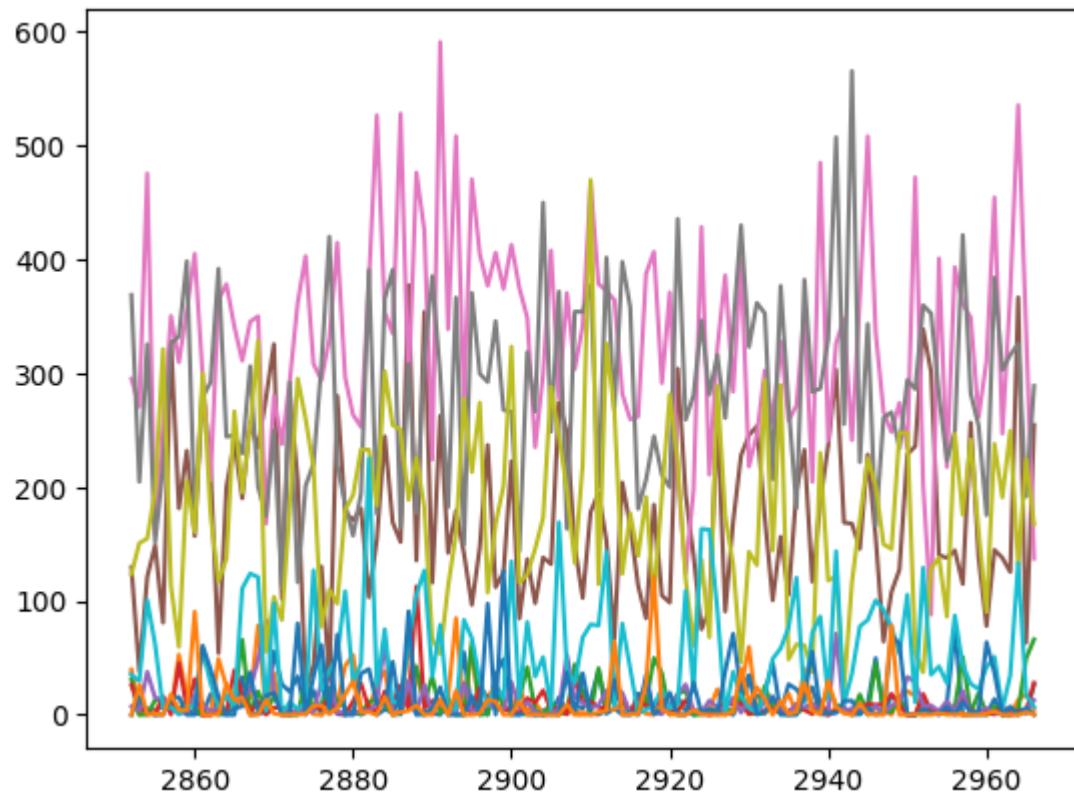
Out[85]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2852	36.8	39.9	30.9	26.1	7.3	129.7	295.3	368.8	123.4	35.2	0.0	0.0
2853	1.6	0.1	0.0	6.5	4.1	38.0	270.7	204.7	150.9	29.6	16.1	26.7
2854	5.2	4.0	0.1	2.5	37.8	121.2	475.5	325.5	154.8	100.8	2.0	0.0
2855	4.3	2.4	12.9	0.2	14.8	148.9	158.3	151.8	196.9	61.7	0.0	0.9
2856	7.3	12.7	12.4	16.2	14.0	81.0	254.5	216.3	321.3	6.0	0.2	0.0
...
2962	0.0	1.2	0.1	7.7	0.6	137.9	247.1	302.8	191.0	4.7	0.0	0.0
2963	3.1	0.1	0.0	0.6	0.2	125.5	370.5	316.2	249.4	34.9	7.3	0.0
2964	6.6	13.0	3.8	2.8	0.5	366.7	535.5	326.1	131.7	133.5	0.0	0.0
2965	1.2	18.3	49.6	2.6	4.0	63.3	337.6	191.7	224.9	17.3	6.2	2.3
2966	26.3	4.7	66.3	28.1	12.8	254.6	137.2	288.9	167.5	7.0	0.0	0.2

115 rows × 12 columns

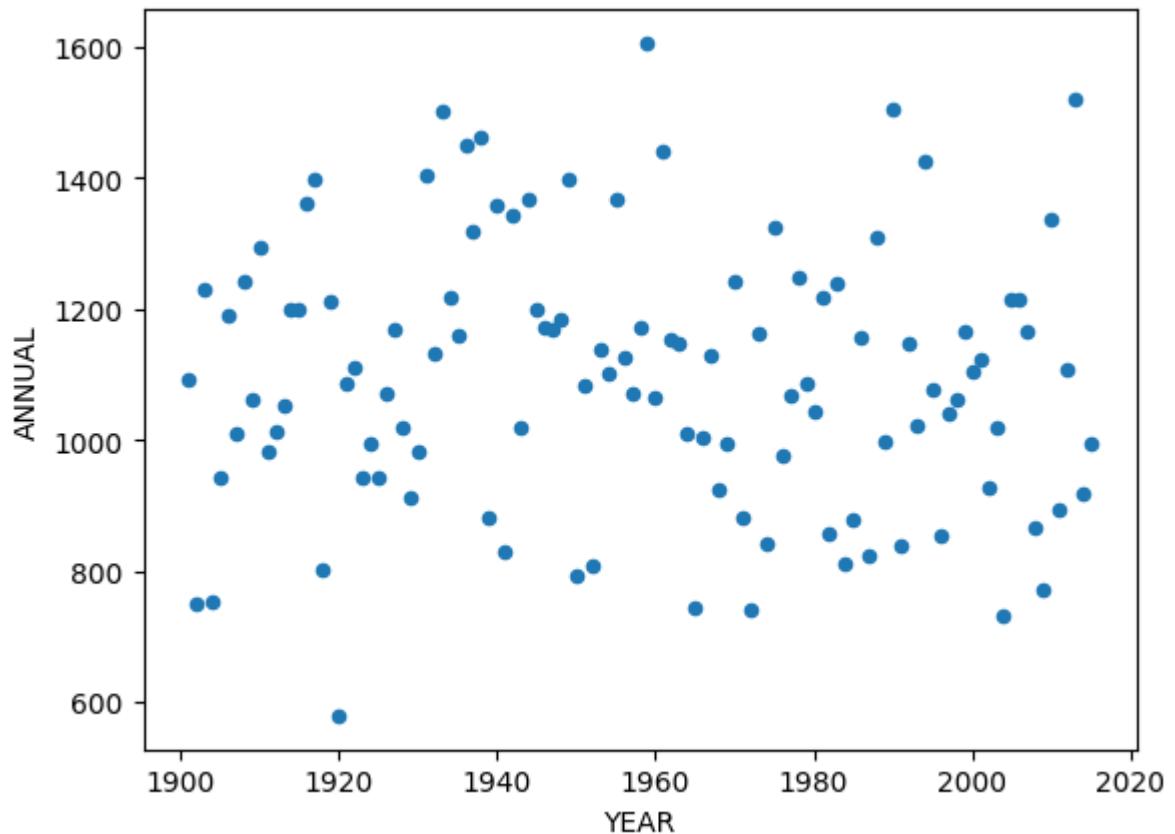
```
In [86]: plt.plot(y)
```

```
Out[86]: [
```



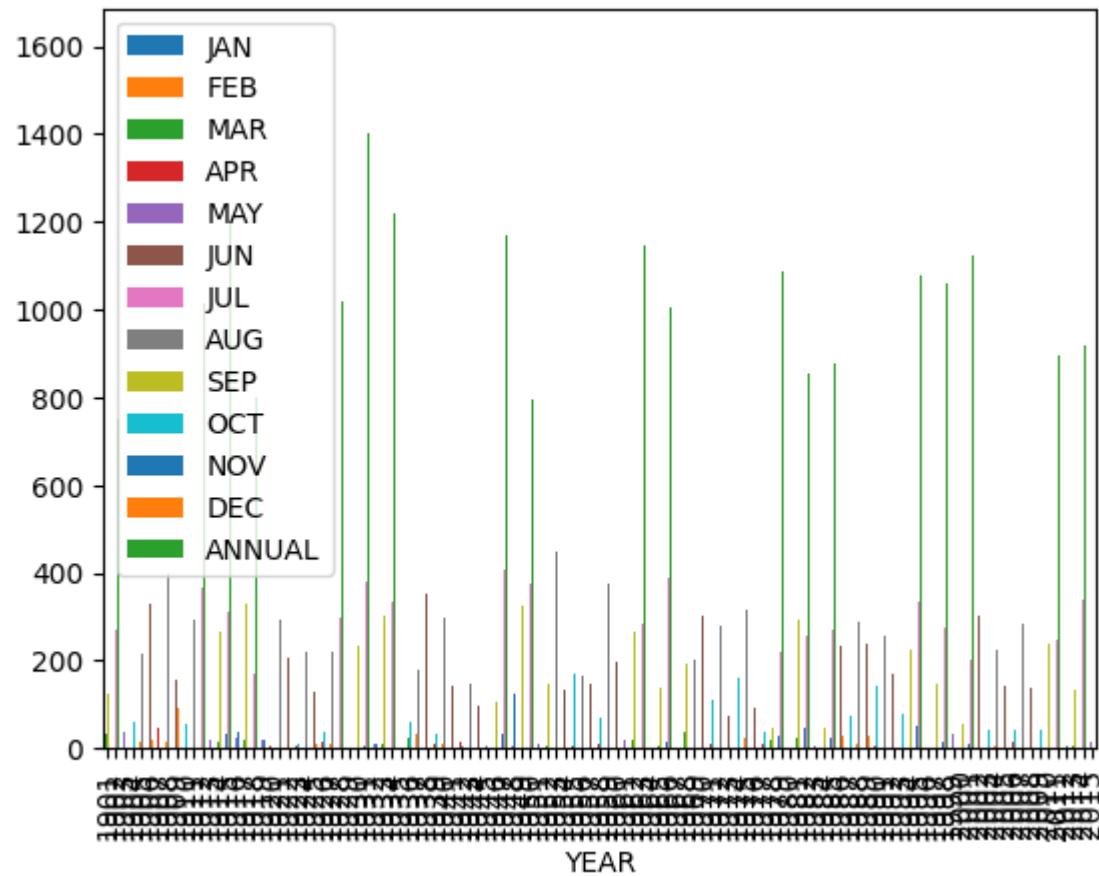
```
In [87]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[87]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



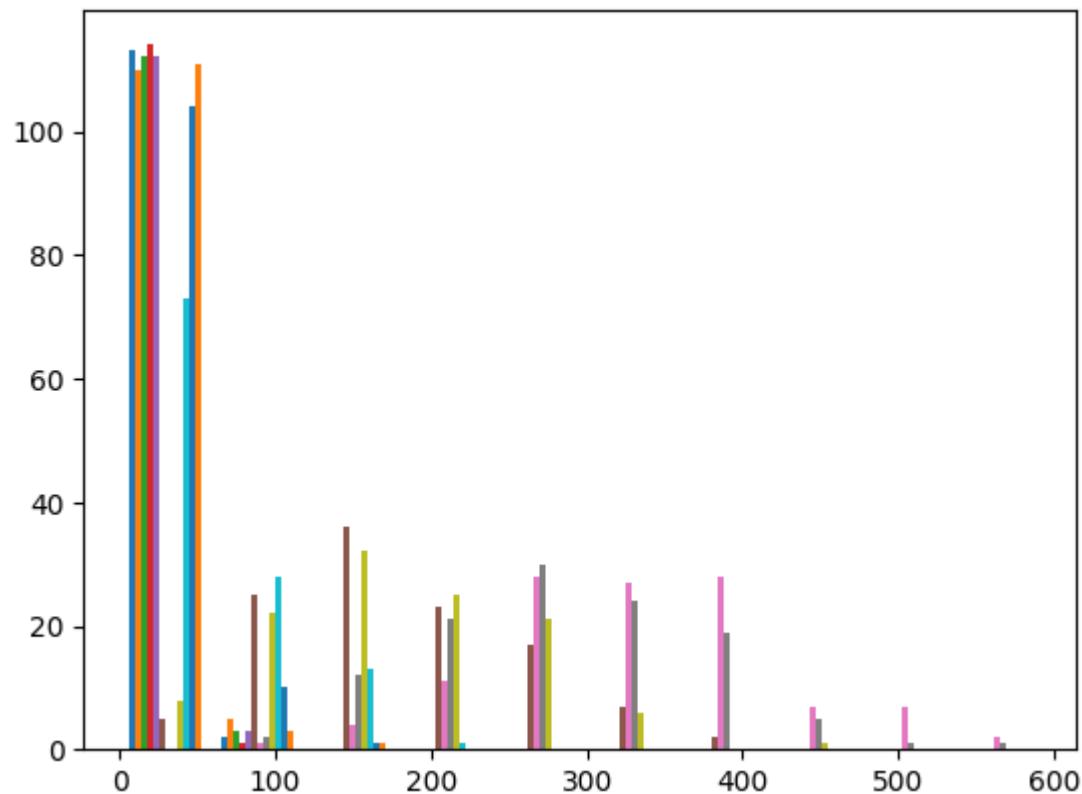
```
In [88]: x.plot.bar(x="YEAR")
```

```
Out[88]: <Axes: xlabel='YEAR'>
```



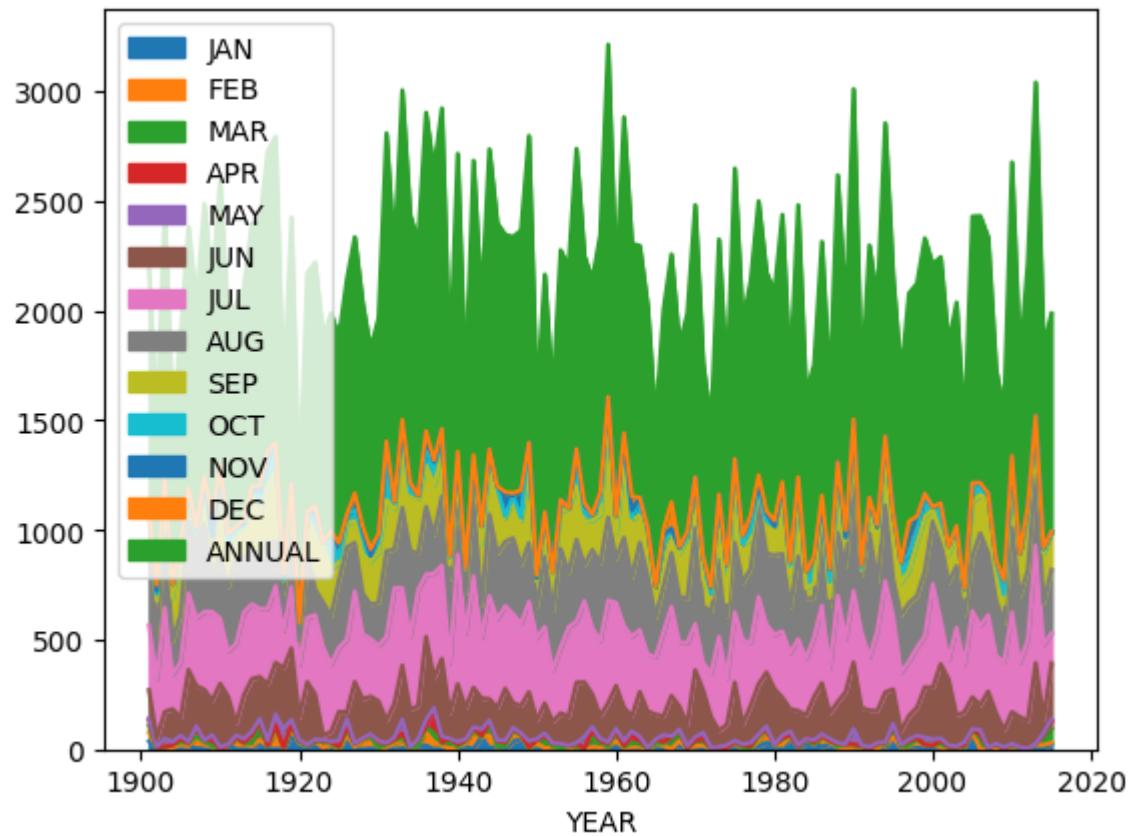
```
In [89]: plt.hist(y)
```

```
Out[89]: (array([[113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [110.,  5.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [112.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [112.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 5.,  25.,  36.,  23.,  17.,  7.,  2.,  0.,  0.,  0.],
       [ 0.,  1.,  4.,  11.,  28.,  27.,  28.,  7.,  7.,  2.],
       [ 0.,  2.,  12.,  21.,  30.,  24.,  19.,  5.,  1.,  1.],
       [ 8.,  22.,  32.,  25.,  21.,  6.,  0.,  1.,  0.,  0.],
       [ 73.,  28.,  13.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [104.,  10.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,  3.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  59.1, 118.2, 177.3, 236.4, 295.5, 354.6, 413.7, 472.8,
      531.9, 591. ]),
<a list of 12 BarContainer objects>)
```



```
In [90]: x.plot.area(x="YEAR")
```

```
Out[90]: <Axes: xlabel='YEAR'>
```



MATATHWADA

In [91]:

```
x=df[df[ "SUBDIVISION" ]=="MATATHWADA"]
x
```

Out[91]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
2737	2737	MATATHWADA	1901	15.8	3.3	32.1	48.5	26.5	193.1	184.1	249.8	74.0	81
2738	2738	MATATHWADA	1902	1.3	0.0	0.4	7.2	0.8	52.4	120.9	85.2	273.3	61
2739	2739	MATATHWADA	1903	2.6	0.8	0.0	1.7	58.3	104.4	264.2	281.9	173.3	139
2740	2740	MATATHWADA	1904	0.0	0.9	12.1	0.3	7.2	79.2	118.4	57.3	339.0	76
2741	2741	MATATHWADA	1905	1.3	2.0	0.0	6.6	4.8	84.6	94.8	137.6	157.8	15
...
2847	2847	MATATHWADA	2011	0.0	3.8	0.7	3.5	3.1	79.2	230.1	228.5	90.0	24
2848	2848	MATATHWADA	2012	0.0	0.0	0.0	0.6	2.3	72.2	161.1	101.4	120.0	68
2849	2849	MATATHWADA	2013	1.5	9.4	2.6	7.9	6.4	160.9	293.4	136.9	154.1	94
2850	2850	MATATHWADA	2014	1.4	13.4	79.0	11.9	7.0	30.4	105.0	178.9	84.5	14
2851	2851	MATATHWADA	2015	10.1	1.6	32.0	39.6	12.3	118.3	27.4	112.2	154.3	19

115 rows × 20 columns



In [92]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

Out[92]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2737	1901	15.8	3.3	32.1	48.5	26.5	193.1	184.1	249.8	74.0	81.6	0.0	0.0	908
2738	1902	1.3	0.0	0.4	7.2	0.8	52.4	120.9	85.2	273.3	61.3	84.4	56.9	744
2739	1903	2.6	0.8	0.0	1.7	58.3	104.4	264.2	281.9	173.3	139.9	0.3	5.3	1032
2740	1904	0.0	0.9	12.1	0.3	7.2	79.2	118.4	57.3	339.0	76.2	0.0	0.0	690
2741	1905	1.3	2.0	0.0	6.6	4.8	84.6	94.8	137.6	157.8	15.4	0.9	0.0	505
...
2847	2011	0.0	3.8	0.7	3.5	3.1	79.2	230.1	228.5	90.0	24.8	0.0	0.0	663
2848	2012	0.0	0.0	0.0	0.6	2.3	72.2	161.1	101.4	120.0	68.8	0.3	0.0	526
2849	2013	1.5	9.4	2.6	7.9	6.4	160.9	293.4	136.9	154.1	94.3	7.4	13.1	888
2850	2014	1.4	13.4	79.0	11.9	7.0	30.4	105.0	178.9	84.5	14.2	19.9	3.3	548
2851	2015	10.1	1.6	32.0	39.6	12.3	118.3	27.4	112.2	154.3	19.5	4.8	0.0	532

115 rows × 14 columns



In [93]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

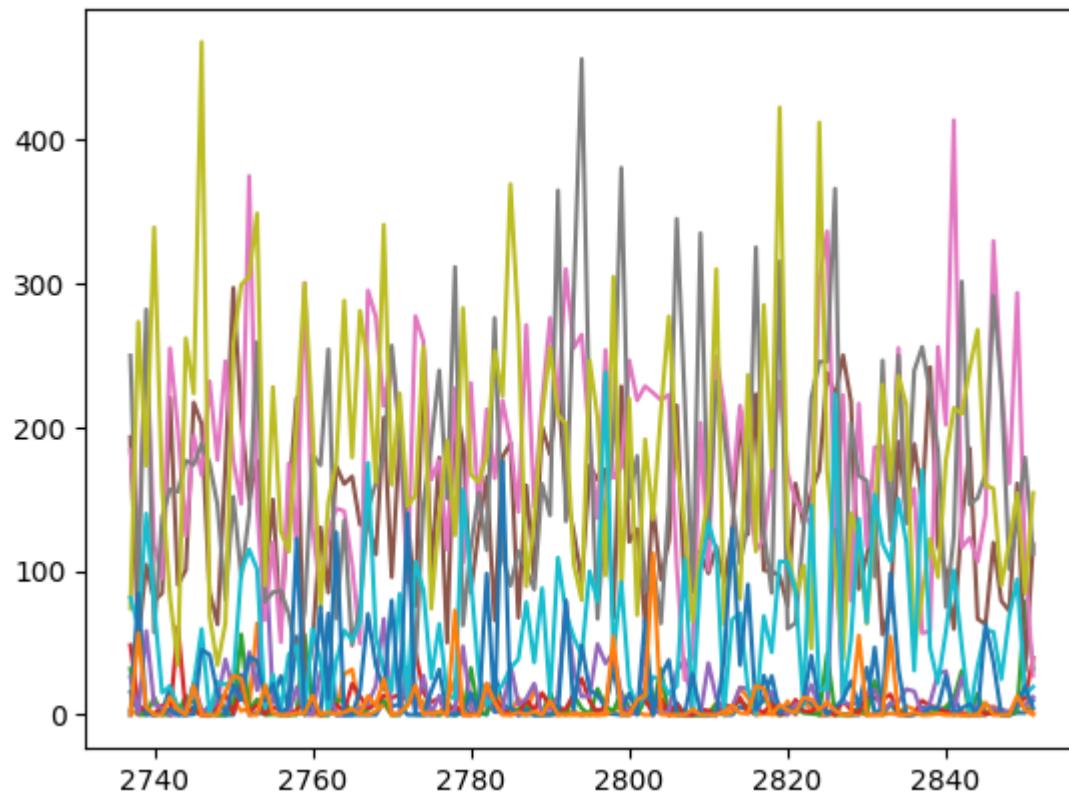
Out[93]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2737	15.8	3.3	32.1	48.5	26.5	193.1	184.1	249.8	74.0	81.6	0.0	0.0
2738	1.3	0.0	0.4	7.2	0.8	52.4	120.9	85.2	273.3	61.3	84.4	56.9
2739	2.6	0.8	0.0	1.7	58.3	104.4	264.2	281.9	173.3	139.9	0.3	5.3
2740	0.0	0.9	12.1	0.3	7.2	79.2	118.4	57.3	339.0	76.2	0.0	0.0
2741	1.3	2.0	0.0	6.6	4.8	84.6	94.8	137.6	157.8	15.4	0.9	0.0
...
2847	0.0	3.8	0.7	3.5	3.1	79.2	230.1	228.5	90.0	24.8	0.0	0.0
2848	0.0	0.0	0.0	0.6	2.3	72.2	161.1	101.4	120.0	68.8	0.3	0.0
2849	1.5	9.4	2.6	7.9	6.4	160.9	293.4	136.9	154.1	94.3	7.4	13.1
2850	1.4	13.4	79.0	11.9	7.0	30.4	105.0	178.9	84.5	14.2	19.9	3.3
2851	10.1	1.6	32.0	39.6	12.3	118.3	27.4	112.2	154.3	19.5	4.8	0.0

115 rows × 12 columns

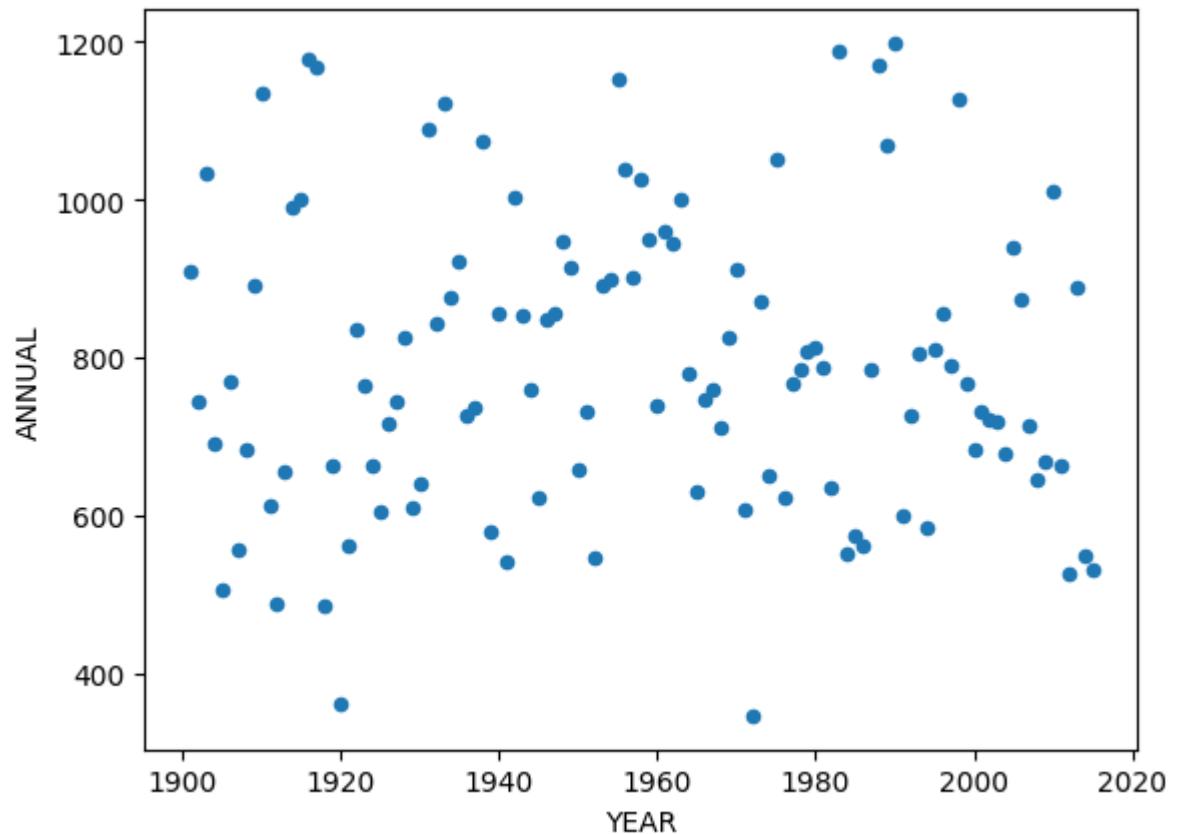
```
In [94]: plt.plot(y)
```

```
Out[94]: [
```



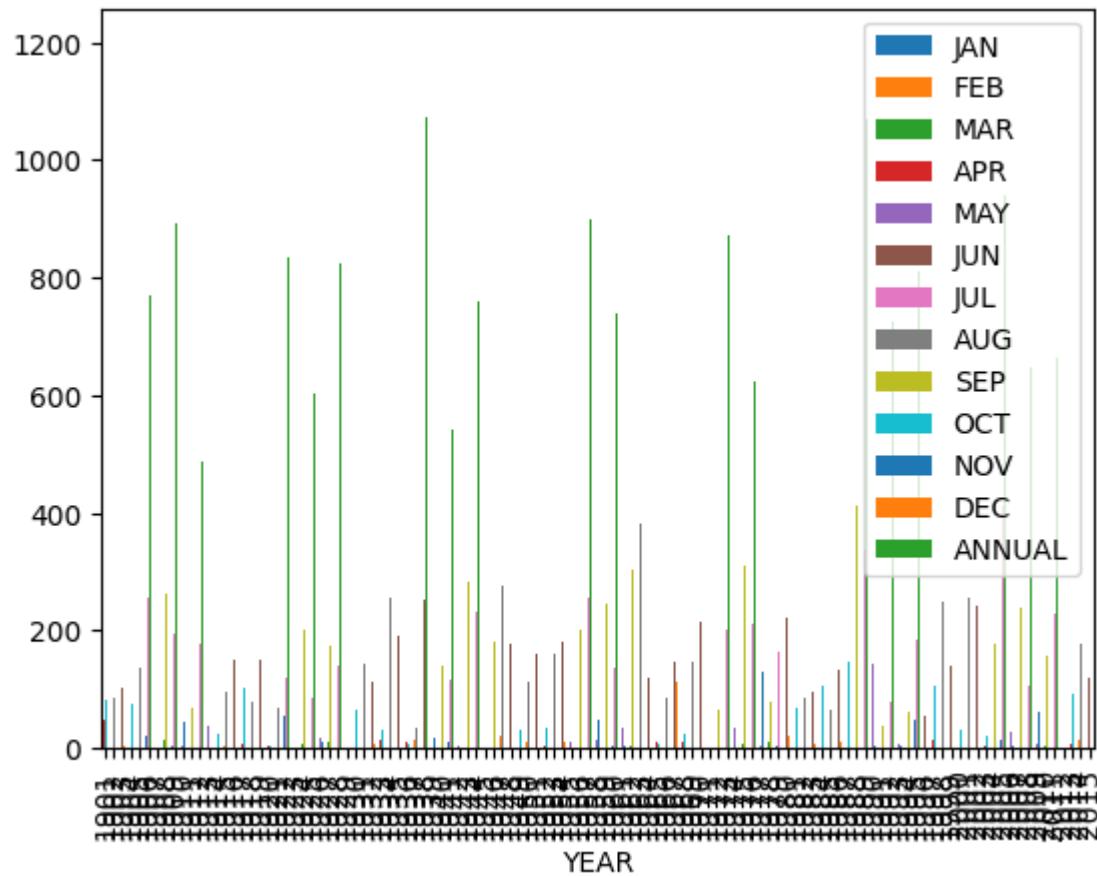
```
In [95]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[95]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



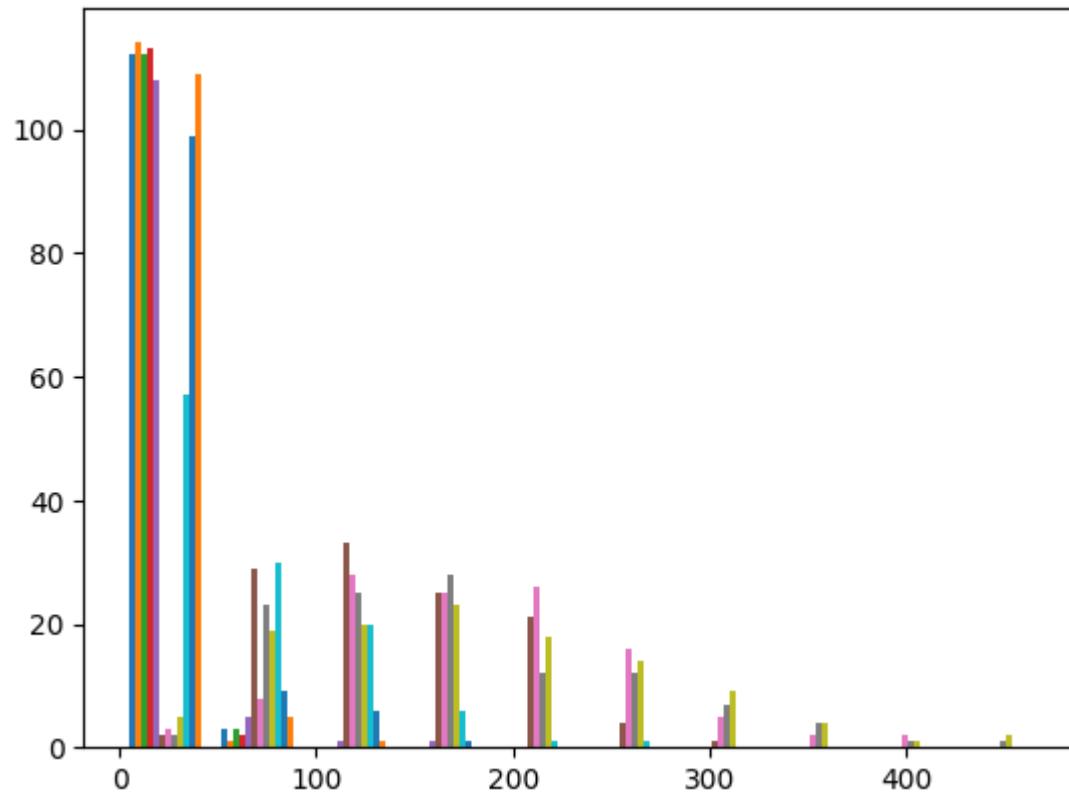
```
In [96]: x.plot.bar(x="YEAR")
```

```
Out[96]: <Axes: xlabel='YEAR'>
```



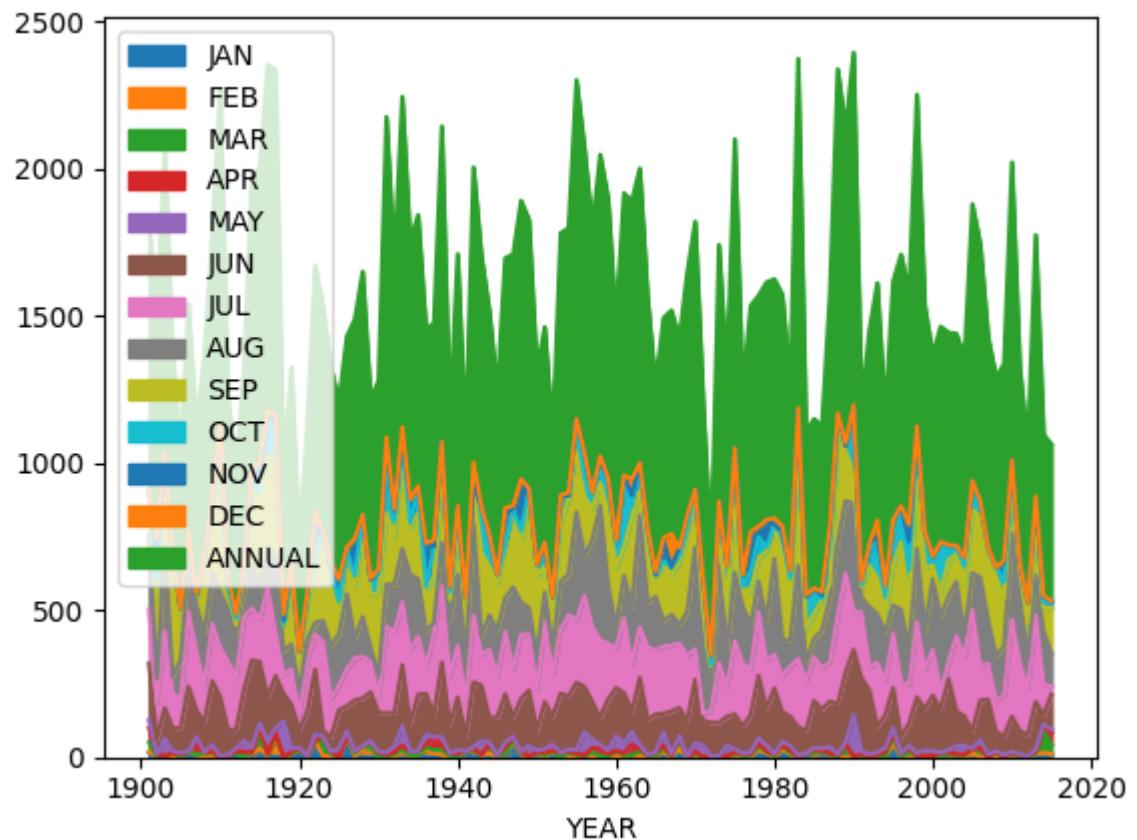
```
In [97]: plt.hist(y)
```

```
Out[97]: (array([[112.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [112.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [108.,  5.,  1.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 2.,  29.,  33.,  25.,  21.,  4.,  1.,  0.,  0.,  0.],
       [ 3.,  8.,  28.,  25.,  26.,  16.,  5.,  2.,  2.,  0.],
       [ 2.,  23.,  25.,  28.,  12.,  12.,  7.,  4.,  1.,  1.],
       [ 5.,  19.,  20.,  23.,  18.,  14.,  9.,  4.,  1.,  2.],
       [ 57.,  30.,  20.,  6.,  1.,  1.,  0.,  0.,  0.,  0.],
       [ 99.,  9.,  6.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [109.,  5.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  46.79,  93.58, 140.37, 187.16, 233.95, 280.74, 327.53,
       374.32, 421.11, 467.9 ]),
<a list of 12 BarContainer objects>)
```



```
In [98]: x.plot.area(x="YEAR")
```

```
Out[98]: <Axes: xlabel='YEAR'>
```



MADHYA MAHARASHTRA

In [99]:

```
x=df[df[ "SUBDIVISION" ]=="MADHYA MAHARASHTRA"]
x
```

Out[99]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2622	2622	MADHYA MAHARASHTRA	1901	18.8	0.6	7.7	36.6	30.4	107.7	215.9	194.1	83.7	68.1	10.1	1.1
2623	2623	MADHYA MAHARASHTRA	1902	7.8	0.0	0.1	5.0	9.8	102.6	210.9	114.5	169.5	60.6	1.1	1.1
2624	2624	MADHYA MAHARASHTRA	1903	7.6	0.0	0.0	3.2	77.2	86.3	281.8	155.5	142.3	74.4	1.1	1.1
2625	2625	MADHYA MAHARASHTRA	1904	0.4	4.7	1.7	3.0	18.7	114.6	126.5	59.5	183.0	91.1	1.1	1.1
2626	2626	MADHYA MAHARASHTRA	1905	0.0	1.2	0.0	2.3	23.6	65.0	252.8	79.0	52.6	52.6	5.2	1.1
...
2732	2732	MADHYA MAHARASHTRA	2011	0.0	0.3	0.3	5.0	2.9	133.3	261.4	238.1	148.4	62.1	1.1	1.1
2733	2733	MADHYA MAHARASHTRA	2012	0.0	0.0	0.0	3.0	1.4	67.9	203.0	187.8	129.5	95.1	1.1	1.1
2734	2734	MADHYA MAHARASHTRA	2013	0.1	5.3	0.8	5.7	6.0	212.4	311.8	147.0	210.3	51.1	1.1	1.1
2735	2735	MADHYA MAHARASHTRA	2014	3.1	6.2	24.4	7.5	29.8	44.0	277.9	240.3	120.4	38.1	1.1	1.1
2736	2736	MADHYA MAHARASHTRA	2015	1.4	0.8	41.2	9.6	24.4	177.0	111.7	67.2	146.6	48.1	1.1	1.1

115 rows × 20 columns



In [100]:

```
x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)
```

Out[100]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2622	1901	18.8	0.6	7.7	36.6	30.4	107.7	215.9	194.1	83.7	68.7	4.4	0.5	769.0
2623	1902	7.8	0.0	0.1	5.0	9.8	102.6	210.9	114.5	169.5	60.4	40.5	62.9	784.0
2624	1903	7.6	0.0	0.0	3.2	77.2	86.3	281.8	155.5	142.3	74.2	7.6	2.2	837.9
2625	1904	0.4	4.7	1.7	3.0	18.7	114.6	126.5	59.5	183.0	91.1	0.0	0.4	603.9
2626	1905	0.0	1.2	0.0	2.3	23.6	65.0	252.8	79.0	52.6	52.9	8.3	0.0	537.8
...
2732	2011	0.0	0.3	0.3	5.0	2.9	133.3	261.4	238.1	148.4	62.8	0.0	0.0	852.0
2733	2012	0.0	0.0	0.0	3.0	1.4	67.9	203.0	187.8	129.5	95.2	2.2	0.0	689.8
2734	2013	0.1	5.3	0.8	5.7	6.0	212.4	311.8	147.0	210.3	57.8	4.0	1.3	962.4
2735	2014	3.1	6.2	24.4	7.5	29.8	44.0	277.9	240.3	120.4	38.5	32.8	13.1	838.0
2736	2015	1.4	0.8	41.2	9.6	24.4	177.0	111.7	67.2	146.6	48.3	16.2	0.1	644.9

115 rows × 14 columns



In [101]:

```
y=x.drop(["YEAR","ANNUAL"],axis=1)
```

y

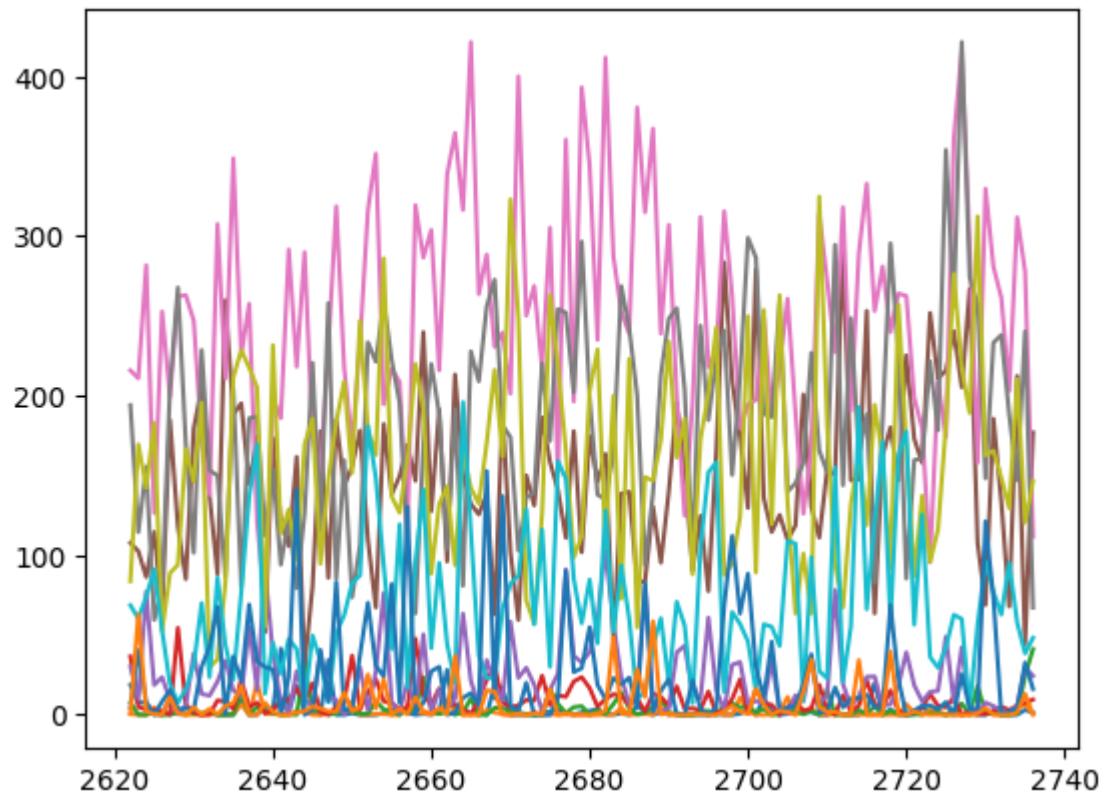
Out[101]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2622	18.8	0.6	7.7	36.6	30.4	107.7	215.9	194.1	83.7	68.7	4.4	0.5
2623	7.8	0.0	0.1	5.0	9.8	102.6	210.9	114.5	169.5	60.4	40.5	62.9
2624	7.6	0.0	0.0	3.2	77.2	86.3	281.8	155.5	142.3	74.2	7.6	2.2
2625	0.4	4.7	1.7	3.0	18.7	114.6	126.5	59.5	183.0	91.1	0.0	0.4
2626	0.0	1.2	0.0	2.3	23.6	65.0	252.8	79.0	52.6	52.9	8.3	0.0
...
2732	0.0	0.3	0.3	5.0	2.9	133.3	261.4	238.1	148.4	62.8	0.0	0.0
2733	0.0	0.0	0.0	3.0	1.4	67.9	203.0	187.8	129.5	95.2	2.2	0.0
2734	0.1	5.3	0.8	5.7	6.0	212.4	311.8	147.0	210.3	57.8	4.0	1.3
2735	3.1	6.2	24.4	7.5	29.8	44.0	277.9	240.3	120.4	38.5	32.8	13.1
2736	1.4	0.8	41.2	9.6	24.4	177.0	111.7	67.2	146.6	48.3	16.2	0.1

115 rows × 12 columns

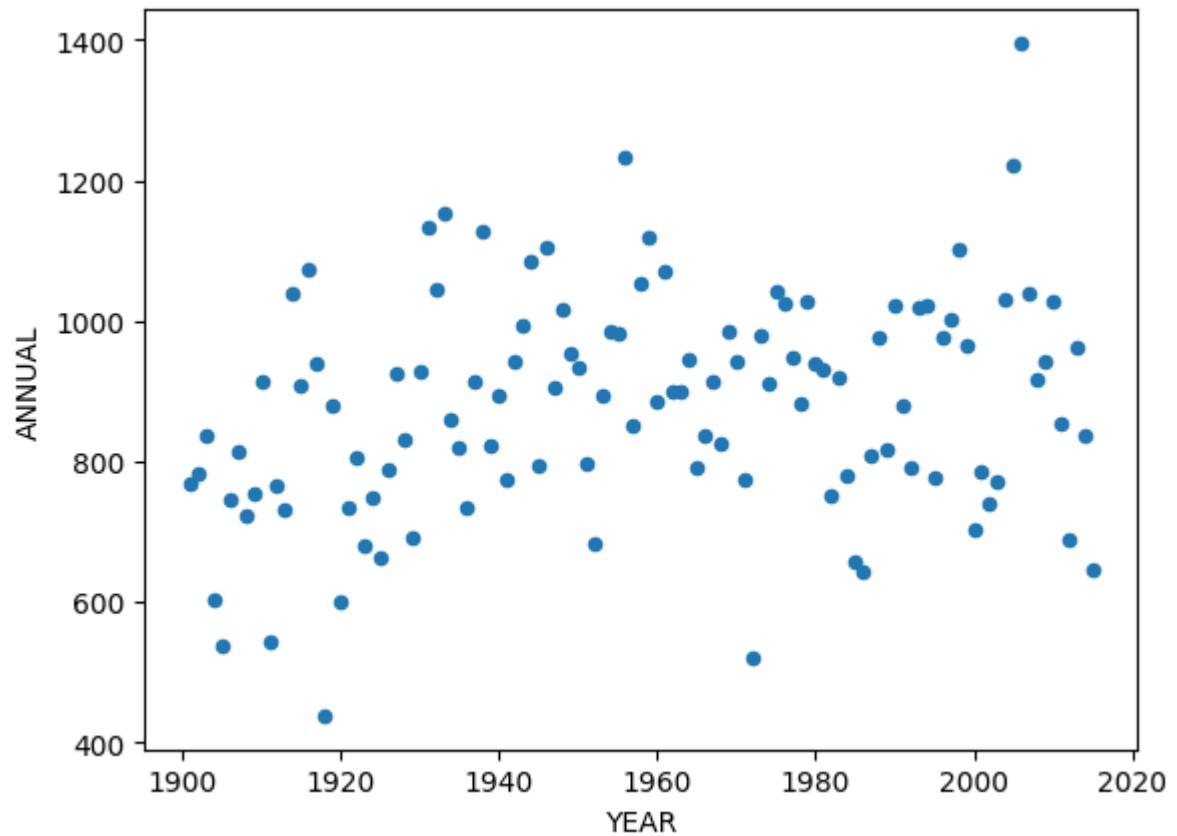
```
In [102]: plt.plot(y)
```

```
Out[102]: [
```



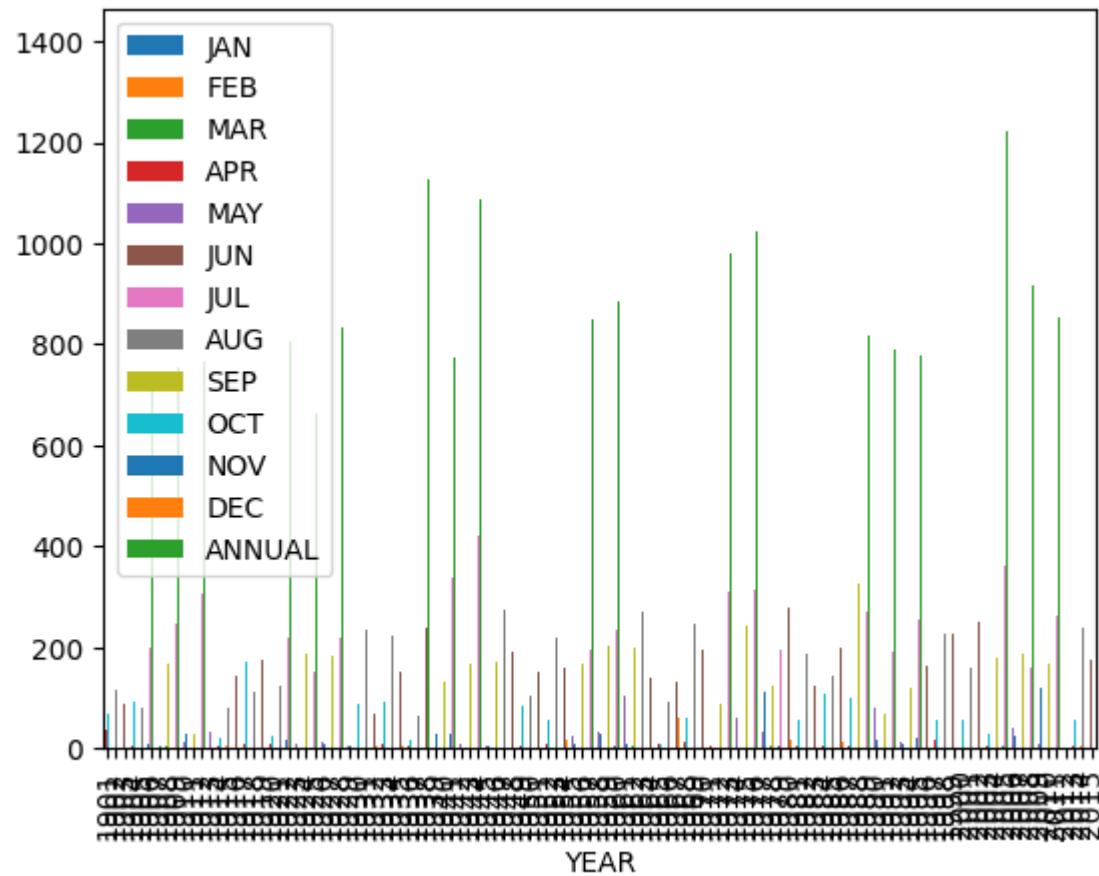
```
In [103]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[103]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



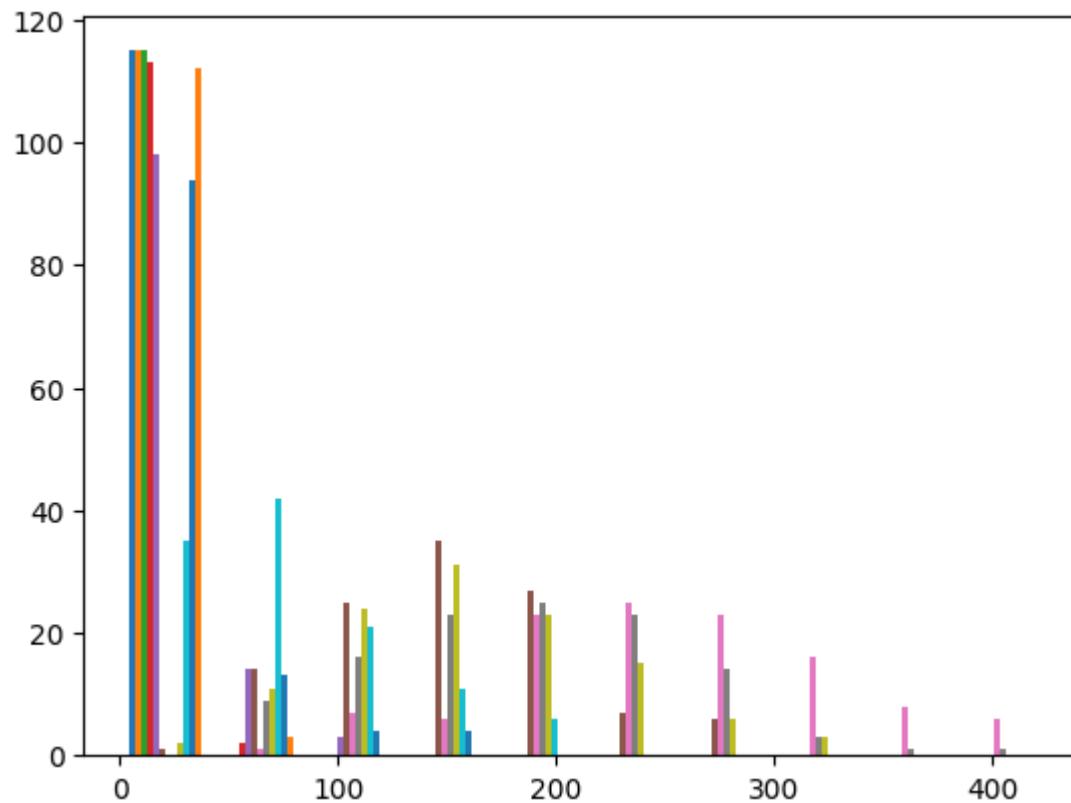
```
In [104]: x.plot.bar(x="YEAR")
```

```
Out[104]: <Axes: xlabel='YEAR'>
```



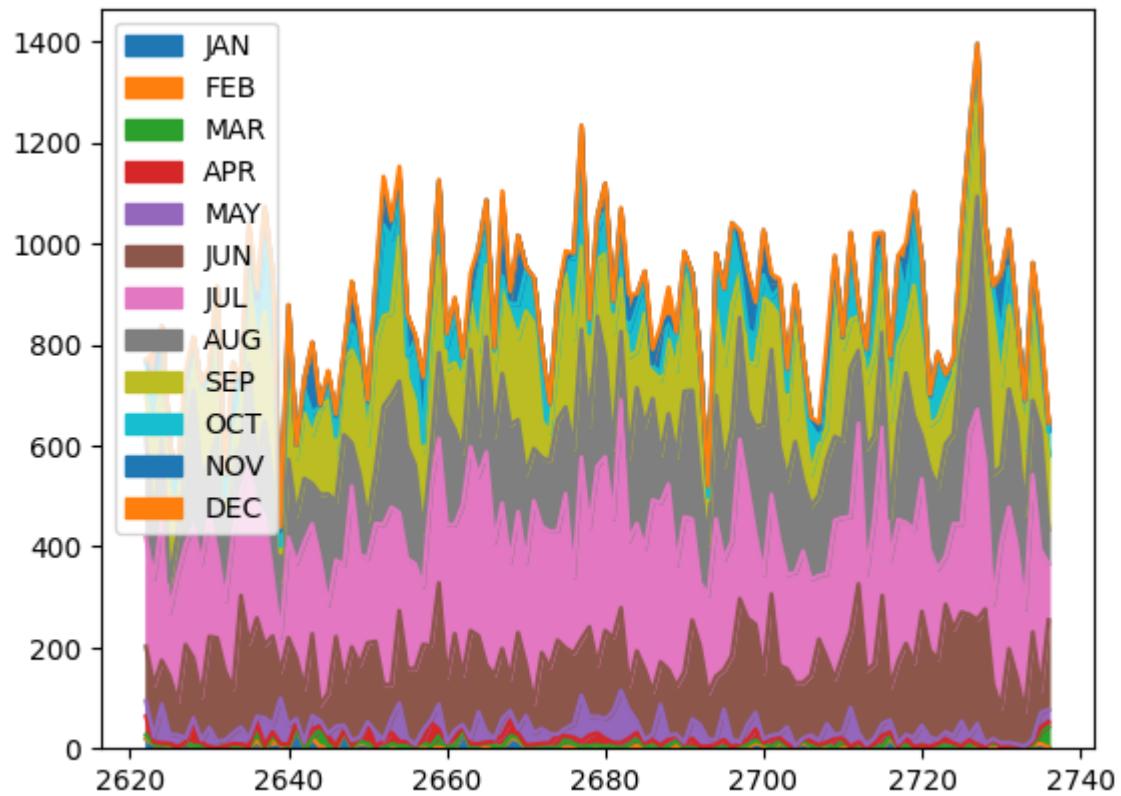
```
In [105]: plt.hist(y)
```

```
Out[105]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 98., 14.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [  1., 14., 25., 35., 27.,  7.,  6.,  0.,  0.,  0.],
       [  0.,  1.,  7.,  6., 23., 25., 23., 16.,  8.,  6.],
       [  0.,  9., 16., 23., 25., 23., 14.,  3.,  1.,  1.],
       [  2., 11., 24., 31., 23., 15.,  6.,  3.,  0.,  0.],
       [ 35., 42., 21., 11.,  6.,  0.,  0.,  0.,  0.,  0.],
       [ 94., 13.,  4.,  4.,  0.,  0.,  0.,  0.,  0.,  0.],
       [112.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  42.17,  84.34, 126.51, 168.68, 210.85, 253.02, 295.19,
       337.36, 379.53, 421.7 ]),
<a list of 12 BarContainer objects>)
```



```
In [106]: y.plot.area()
```

```
Out[106]: <Axes: >
```



KONKAN & GOA

In [107]:

```
x=df[df[ "SUBDIVISION" ]=="KONKAN & GOA"]
```

```
x
```

Out[107]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2507	2507		KONKAN & GOA	1901	5.6	0.1	0.4	35.7	19.9	746.1	1075.5	748.0	117.4			
2508	2508		KONKAN & GOA	1902	0.3	0.0	0.0	0.4	7.6	428.2	943.6	515.1	613.8			
2509	2509		KONKAN & GOA	1903	0.0	0.0	0.1	0.0	201.1	470.5	1298.6	673.9	285.1	1		
2510	2510		KONKAN & GOA	1904	0.0	0.1	6.6	6.3	4.6	975.8	771.7	321.3	217.0			
2511	2511		KONKAN & GOA	1905	0.1	0.1	0.0	0.4	8.6	293.7	770.6	305.5	208.3			
...
2617	2617		KONKAN & GOA	2011	0.0	0.0	0.0	3.4	1.1	857.0	1384.1	987.9	468.3	1		
2618	2618		KONKAN & GOA	2012	0.0	0.0	0.0	0.6	1.1	633.0	928.5	762.5	515.3	1		
2619	2619		KONKAN & GOA	2013	1.8	5.4	0.1	0.1	18.5	1028.3	1478.5	497.6	340.7	1		
2620	2620		KONKAN & GOA	2014	1.3	5.3	1.8	0.7	21.3	238.2	1293.2	658.0	419.5			
2621	2621		KONKAN & GOA	2015	2.7	0.0	36.8	3.6	11.3	764.0	526.5	377.3	240.9			

115 rows × 20 columns



In [108]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[108]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
2507	1901	5.6	0.1	0.4	35.7	19.9	746.1	1075.5	748.0	117.4	38.6	5.4	0.1	27
2508	1902	0.3	0.0	0.0	0.4	7.6	428.2	943.6	515.1	613.8	74.3	42.7	48.0	26
2509	1903	0.0	0.0	0.1	0.0	201.1	470.5	1298.6	673.9	285.1	140.8	12.4	1.7	30
2510	1904	0.0	0.1	6.6	6.3	4.6	975.8	771.7	321.3	217.0	90.3	0.0	0.0	25
2511	1905	0.1	0.1	0.0	0.4	8.6	293.7	770.6	305.5	208.3	83.5	12.1	0.0	16
...
2617	2011	0.0	0.0	0.0	3.4	1.1	857.0	1384.1	987.9	468.3	120.3	3.1	0.0	38
2618	2012	0.0	0.0	0.0	0.6	1.1	633.0	928.5	762.5	515.3	175.1	2.3	0.0	30
2619	2013	1.8	5.4	0.1	0.1	18.5	1028.3	1478.5	497.6	340.7	149.3	2.1	1.5	35
2620	2014	1.3	5.3	1.8	0.7	21.3	238.2	1293.2	658.0	419.5	98.7	8.0	11.7	27
2621	2015	2.7	0.0	36.8	3.6	11.3	764.0	526.5	377.3	240.9	91.4	27.3	0.0	20

115 rows × 14 columns



In [109]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

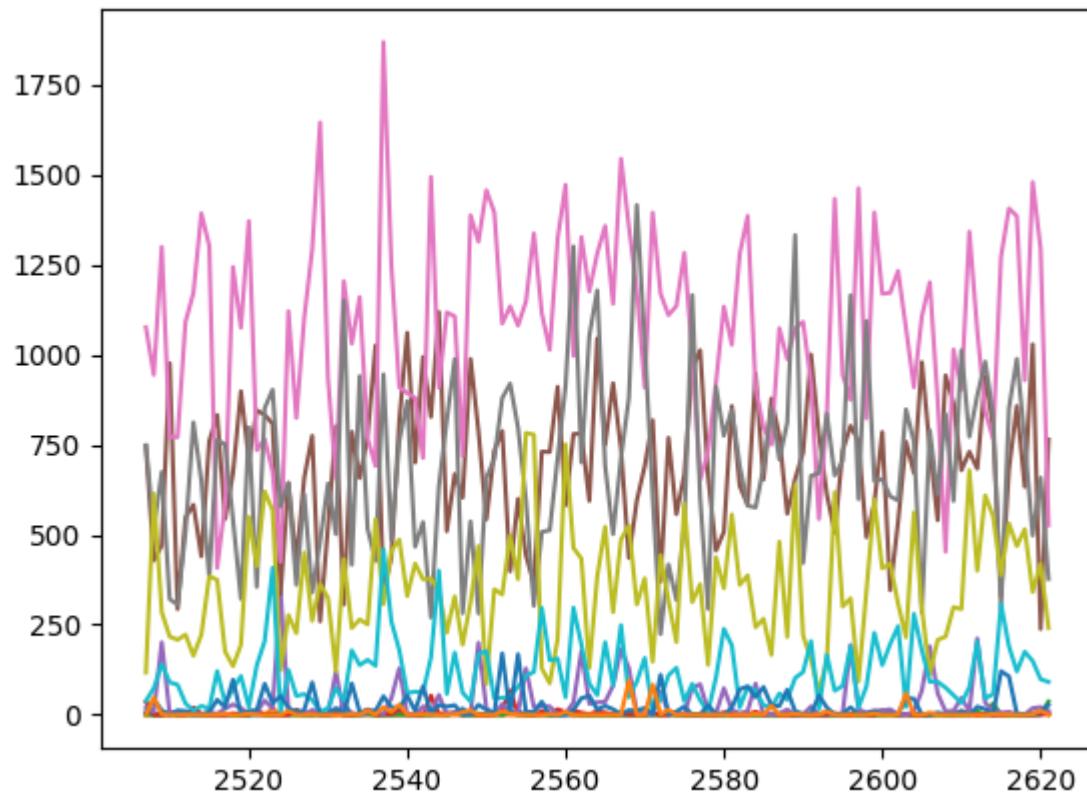
Out[109]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2507	5.6	0.1	0.4	35.7	19.9	746.1	1075.5	748.0	117.4	38.6	5.4	0.1
2508	0.3	0.0	0.0	0.4	7.6	428.2	943.6	515.1	613.8	74.3	42.7	48.0
2509	0.0	0.0	0.1	0.0	201.1	470.5	1298.6	673.9	285.1	140.8	12.4	1.7
2510	0.0	0.1	6.6	6.3	4.6	975.8	771.7	321.3	217.0	90.3	0.0	0.0
2511	0.1	0.1	0.0	0.4	8.6	293.7	770.6	305.5	208.3	83.5	12.1	0.0
...
2617	0.0	0.0	0.0	3.4	1.1	857.0	1384.1	987.9	468.3	120.3	3.1	0.0
2618	0.0	0.0	0.0	0.6	1.1	633.0	928.5	762.5	515.3	175.1	2.3	0.0
2619	1.8	5.4	0.1	0.1	18.5	1028.3	1478.5	497.6	340.7	149.3	2.1	1.5
2620	1.3	5.3	1.8	0.7	21.3	238.2	1293.2	658.0	419.5	98.7	8.0	11.7
2621	2.7	0.0	36.8	3.6	11.3	764.0	526.5	377.3	240.9	91.4	27.3	0.0

115 rows × 12 columns

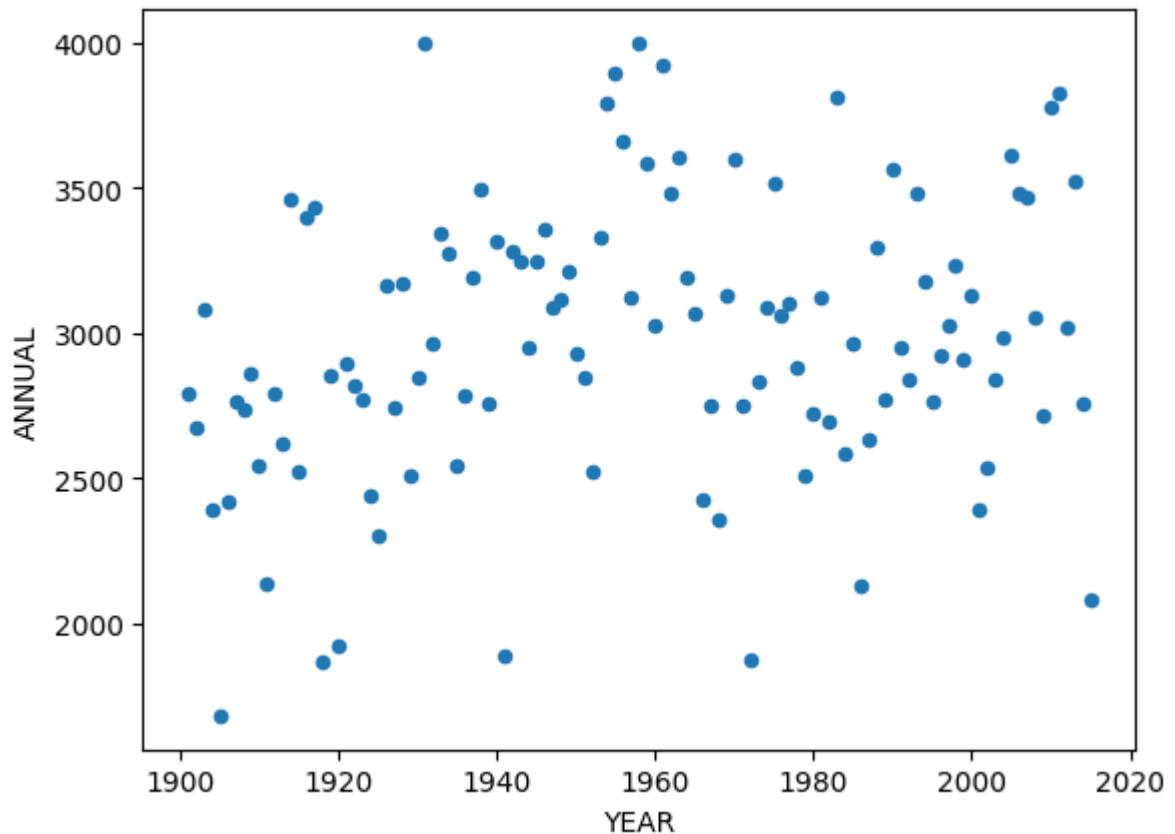
```
In [110]: plt.plot(y)
```

```
Out[110]: [
```



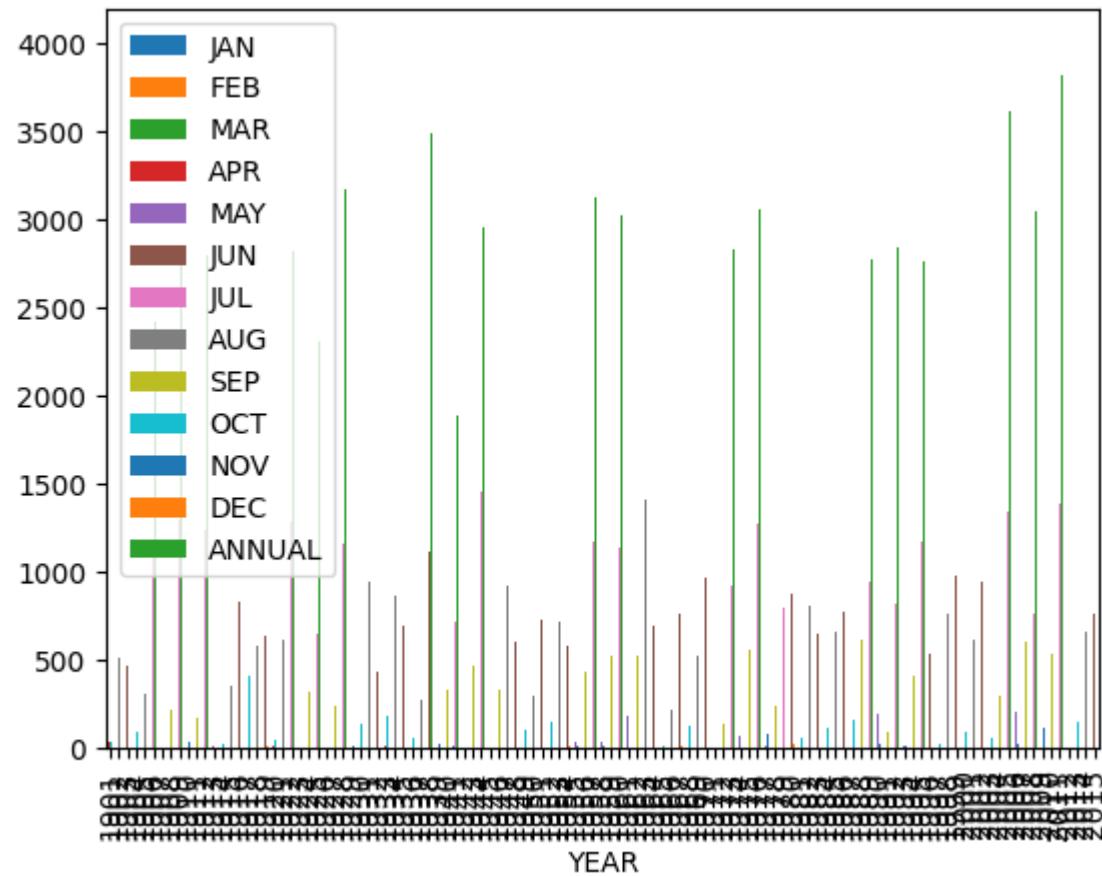
```
In [111]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[111]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



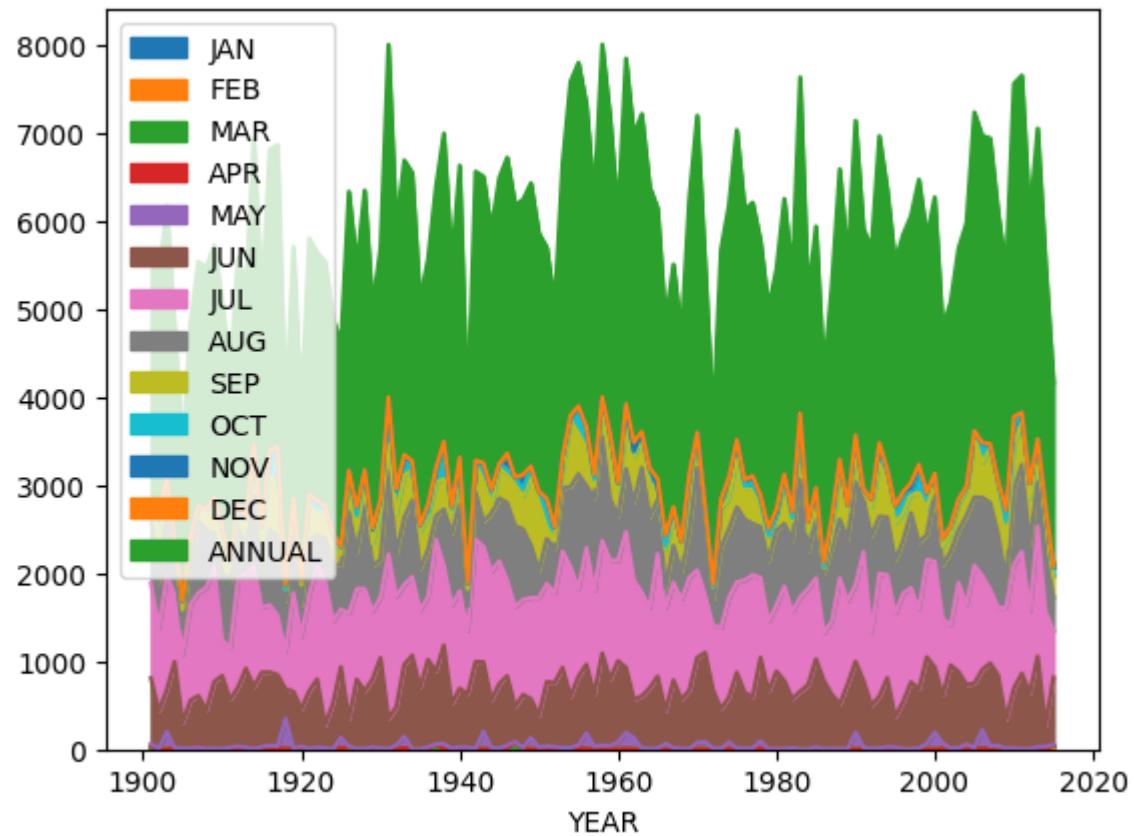
```
In [112]: x.plot.bar(x="YEAR")
```

```
Out[112]: <Axes: xlabel='YEAR'>
```



```
In [113]: x.plot.area(x="YEAR")
```

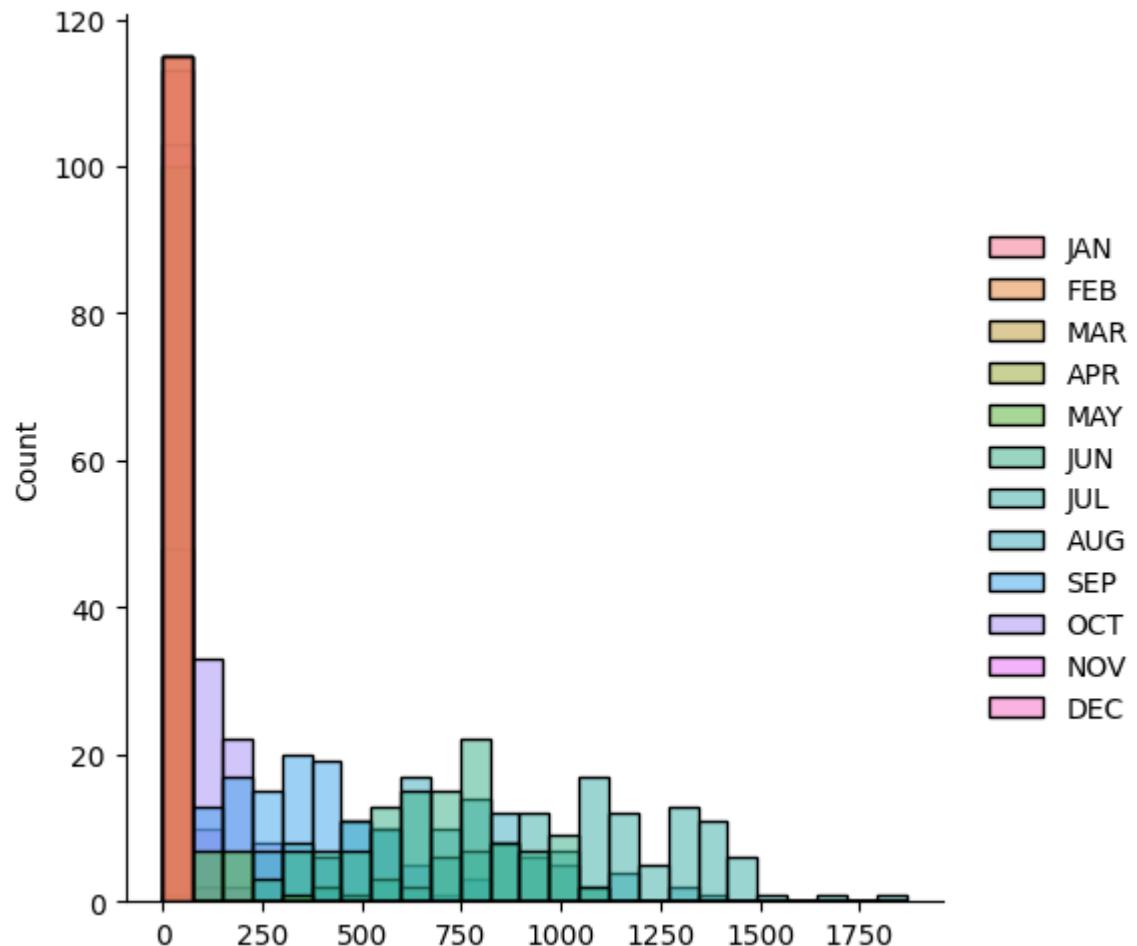
```
Out[113]: <Axes: xlabel='YEAR'>
```



```
In [114]: sns.displot(y)
```

```
C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages
\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

```
Out[114]: <seaborn.axisgrid.FacetGrid at 0x26df2c2ed50>
```



SAURASHTRA & KUTCH

In [115]:

```
x=df[df[ "SUBDIVISION" ]=="SAURASHTRA & KUTCH"]
x
```

Out[115]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
2392	2392	SAURASHTRA & KUTCH	1901	1.9	0.0	0.1	0.2	3.2	9.1	87.8	62.5	12.0	3.8
2393	2393	SAURASHTRA & KUTCH	1902	0.1	0.0	0.0	0.5	1.1	14.4	92.9	160.0	123.9	1.5
2394	2394	SAURASHTRA & KUTCH	1903	0.5	0.0	1.7	0.0	3.1	10.5	337.9	96.1	61.9	11.1
2395	2395	SAURASHTRA & KUTCH	1904	1.4	5.8	17.5	0.0	0.0	9.5	111.2	9.4	28.9	0.3
2396	2396	SAURASHTRA & KUTCH	1905	1.5	1.0	0.6	0.4	0.0	6.4	254.5	12.3	12.8	0.4
...
2502	2502	SAURASHTRA & KUTCH	2011	0.0	1.4	0.0	0.0	0.0	26.0	212.7	290.9	210.1	1.2
2503	2503	SAURASHTRA & KUTCH	2012	0.0	0.0	0.0	0.2	0.1	22.4	34.7	34.5	228.5	2.4
2504	2504	SAURASHTRA & KUTCH	2013	1.7	0.2	0.1	8.5	0.1	127.7	171.2	83.3	260.2	28.6
2505	2505	SAURASHTRA & KUTCH	2014	0.3	0.0	0.1	0.5	2.1	17.3	137.7	118.8	99.2	5.1
2506	2506	SAURASHTRA & KUTCH	2015	0.9	0.0	4.4	2.1	0.8	112.6	226.7	10.6	79.9	3.3

115 rows × 20 columns



In [116]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[116]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2392	1901	1.9	0.0	0.1	0.2	3.2	9.1	87.8	62.5	12.0	3.8	0.0	0.7	181.1
2393	1902	0.1	0.0	0.0	0.5	1.1	14.4	92.9	160.0	123.9	1.5	0.1	6.5	401.1
2394	1903	0.5	0.0	1.7	0.0	3.1	10.5	337.9	96.1	61.9	11.1	0.0	0.0	522.8
2395	1904	1.4	5.8	17.5	0.0	0.0	9.5	111.2	9.4	28.9	0.3	1.7	0.0	185.6
2396	1905	1.5	1.0	0.6	0.4	0.0	6.4	254.5	12.3	12.8	0.4	0.0	0.0	290.0
...
2502	2011	0.0	1.4	0.0	0.0	0.0	26.0	212.7	290.9	210.1	1.2	0.1	0.0	742.1
2503	2012	0.0	0.0	0.0	0.2	0.1	22.4	34.7	34.5	228.5	2.4	0.0	1.0	323.8
2504	2013	1.7	0.2	0.1	8.5	0.1	127.7	171.2	83.3	260.2	28.6	0.0	0.0	681.8
2505	2014	0.3	0.0	0.1	0.5	2.1	17.3	137.7	118.8	99.2	5.2	2.7	0.0	383.9
2506	2015	0.9	0.0	4.4	2.1	0.8	112.6	226.7	10.6	79.9	3.3	0.3	0.0	441.1

115 rows × 14 columns



In [117]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

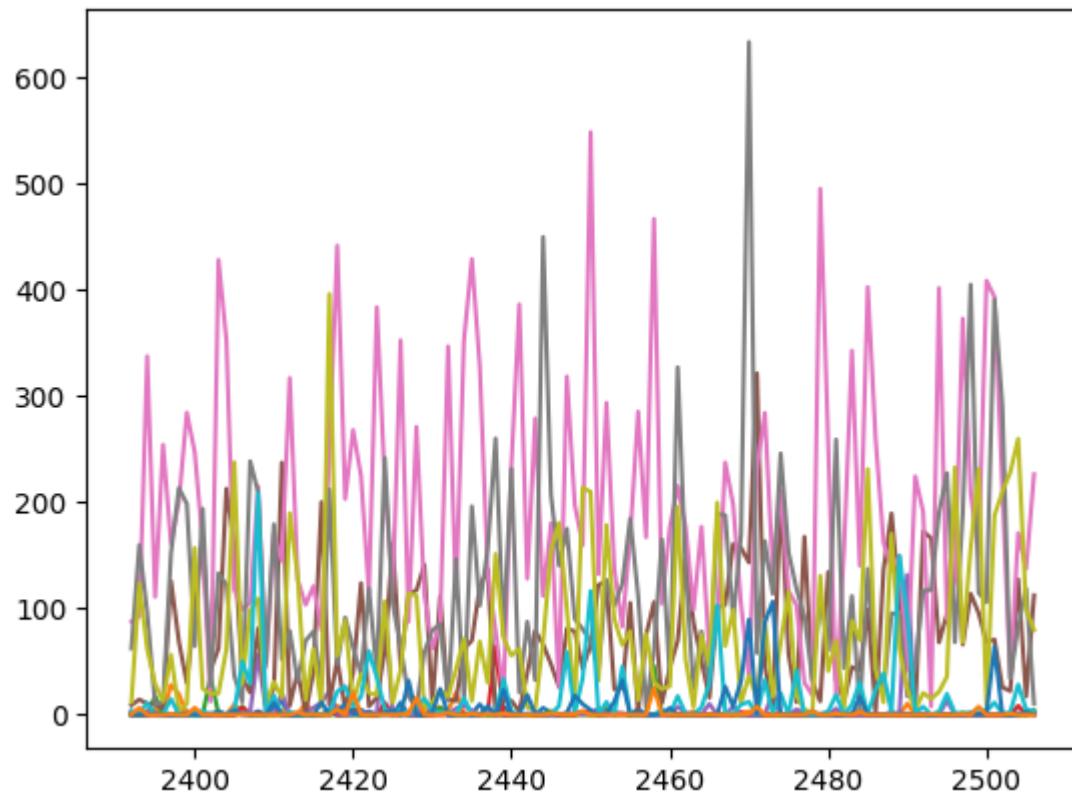
Out[117]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2392	1.9	0.0	0.1	0.2	3.2	9.1	87.8	62.5	12.0	3.8	0.0	0.7
2393	0.1	0.0	0.0	0.5	1.1	14.4	92.9	160.0	123.9	1.5	0.1	6.5
2394	0.5	0.0	1.7	0.0	3.1	10.5	337.9	96.1	61.9	11.1	0.0	0.0
2395	1.4	5.8	17.5	0.0	0.0	9.5	111.2	9.4	28.9	0.3	1.7	0.0
2396	1.5	1.0	0.6	0.4	0.0	6.4	254.5	12.3	12.8	0.4	0.0	0.0
...
2502	0.0	1.4	0.0	0.0	0.0	26.0	212.7	290.9	210.1	1.2	0.1	0.0
2503	0.0	0.0	0.0	0.2	0.1	22.4	34.7	34.5	228.5	2.4	0.0	1.0
2504	1.7	0.2	0.1	8.5	0.1	127.7	171.2	83.3	260.2	28.6	0.0	0.0
2505	0.3	0.0	0.1	0.5	2.1	17.3	137.7	118.8	99.2	5.2	2.7	0.0
2506	0.9	0.0	4.4	2.1	0.8	112.6	226.7	10.6	79.9	3.3	0.3	0.0

115 rows × 12 columns

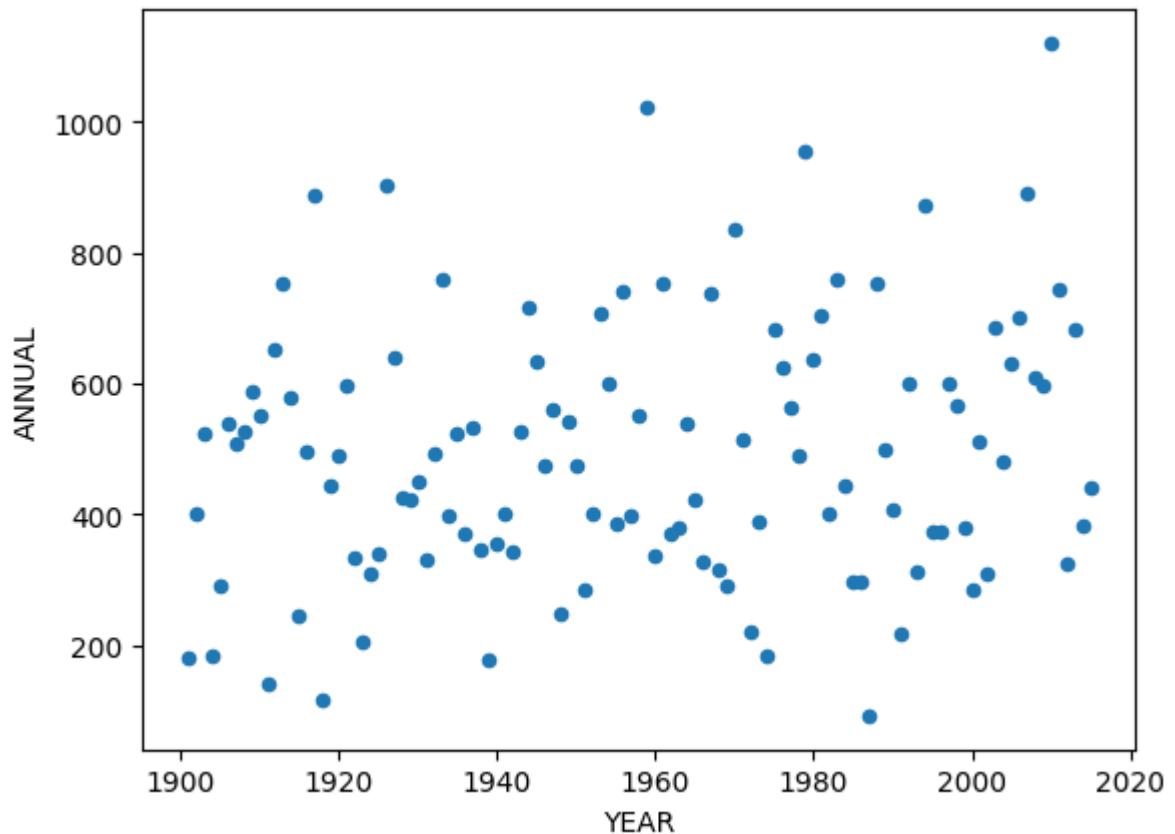
```
In [118]: plt.plot(y)
```

```
Out[118]: [
```



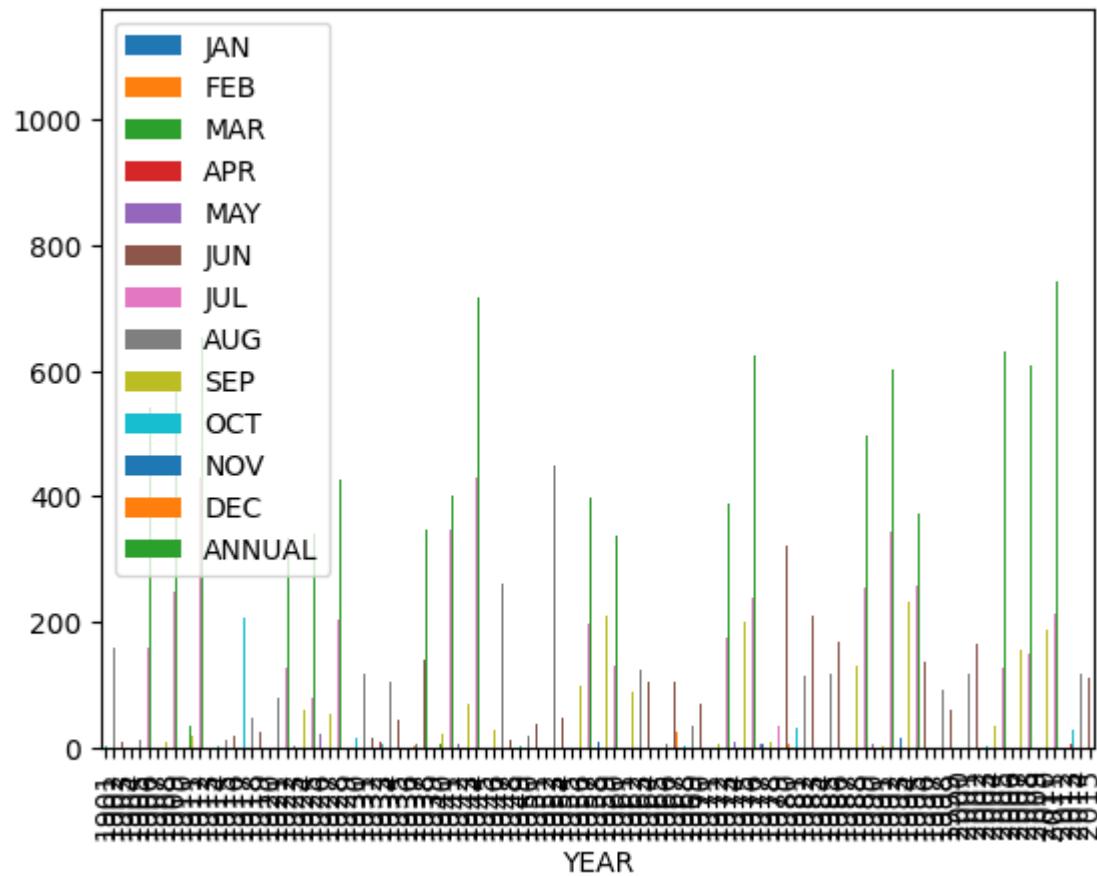
```
In [119]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[119]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



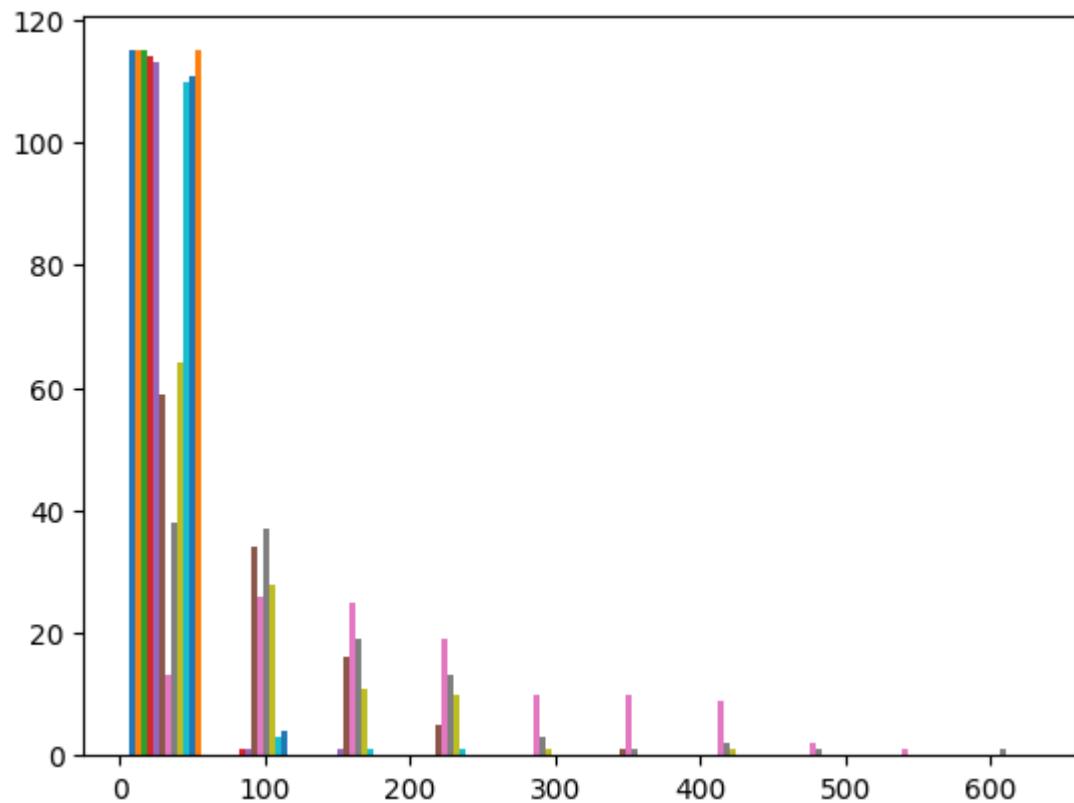
```
In [120]: x.plot.bar(x="YEAR")
```

```
Out[120]: <Axes: xlabel='YEAR'>
```



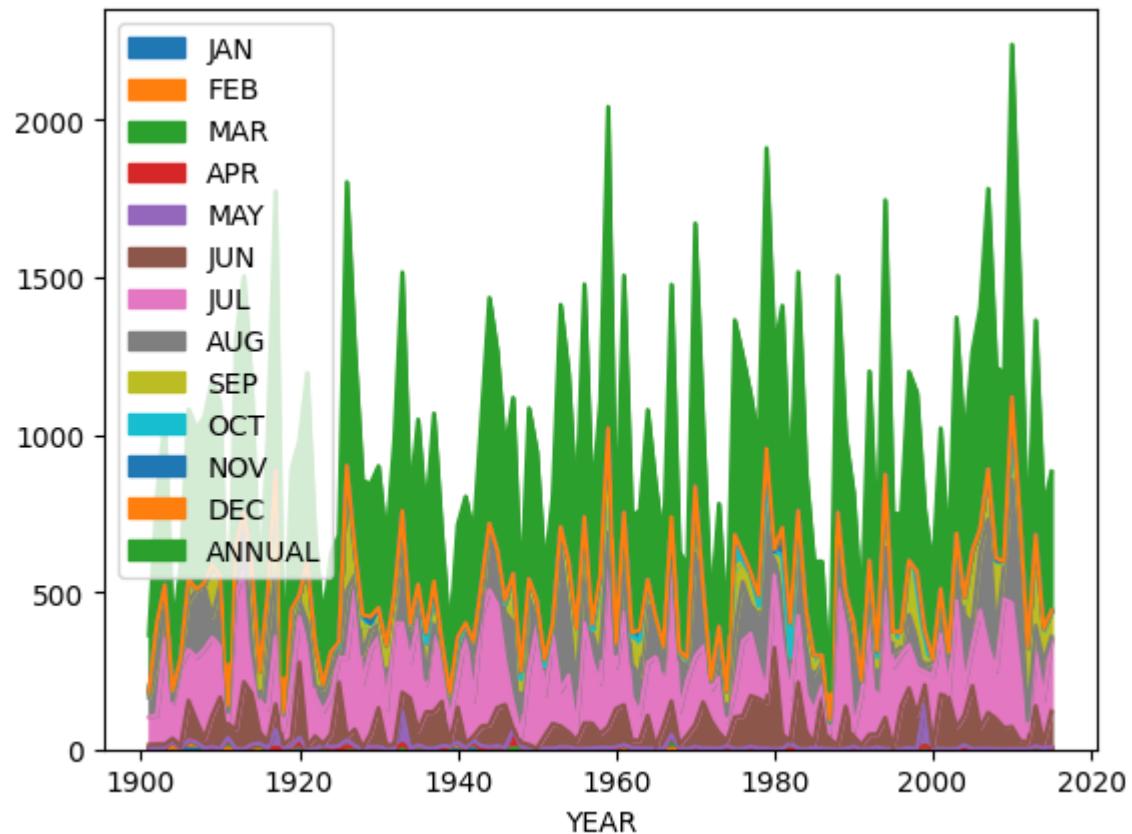
```
In [121]: plt.hist(y)
```

```
Out[121]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  1.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 59.,  34.,  16.,  5.,  0.,  1.,  0.,  0.,  0.,  0.],
       [ 13.,  26.,  25.,  19.,  10.,  10.,  9.,  2.,  1.,  0.],
       [ 38.,  37.,  19.,  13.,  3.,  1.,  2.,  1.,  0.,  1.],
       [ 64.,  28.,  11.,  10.,  1.,  0.,  1.,  0.,  0.,  0.],
       [110.,  3.,  1.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,  4.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  63.4, 126.8, 190.2, 253.6, 317. , 380.4, 443.8, 507.2,
      570.6, 634. ]),
<a list of 12 BarContainer objects>)
```



```
In [122]: x.plot.area(x="YEAR")
```

```
Out[122]: <Axes: xlabel='YEAR'>
```



GUJARAT REGION

In [123]:

```
x=df[df[ "SUBDIVISION" ]=="GUJARAT REGION"]  
x
```

Out[123]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
2277	2277	GUJARAT REGION	1901	4.2	0.0	0.6	1.6	7.0	60.3	240.2	205.4	18.1	16.6
2278	2278	GUJARAT REGION	1902	3.9	0.0	0.0	0.6	1.0	32.8	229.8	299.0	281.2	2.3
2279	2279	GUJARAT REGION	1903	0.3	0.1	1.4	0.0	12.3	30.1	452.9	202.0	183.2	5.4
2280	2280	GUJARAT REGION	1904	0.8	10.6	16.8	0.2	3.9	48.3	194.8	71.8	138.0	6.1
2281	2281	GUJARAT REGION	1905	0.1	0.7	1.1	0.3	0.0	20.1	668.3	37.9	81.3	1.4
...
2387	2387	GUJARAT REGION	2011	0.0	0.2	0.0	0.0	0.0	16.3	259.2	451.7	162.5	0.4
2388	2388	GUJARAT REGION	2012	0.1	0.0	0.0	0.0	0.0	34.4	178.2	230.3	263.8	7.1
2389	2389	GUJARAT REGION	2013	0.0	0.9	0.1	4.6	0.0	155.7	405.4	211.1	287.3	53.2
2390	2390	GUJARAT REGION	2014	5.7	0.1	0.2	1.0	1.3	11.6	307.5	138.6	235.1	3.3
2391	2391	GUJARAT REGION	2015	1.8	0.0	6.1	5.5	0.9	120.7	354.7	37.4	93.4	2.2

115 rows × 20 columns



In [124]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[124]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2277	1901	4.2	0.0	0.6	1.6	7.0	60.3	240.2	205.4	18.1	16.6	0.0	0.3	554.1
2278	1902	3.9	0.0	0.0	0.6	1.0	32.8	229.8	299.0	281.2	2.3	1.5	11.9	863.9
2279	1903	0.3	0.1	1.4	0.0	12.3	30.1	452.9	202.0	183.2	5.4	0.0	0.0	887.0
2280	1904	0.8	10.6	16.8	0.2	3.9	48.3	194.8	71.8	138.0	6.1	0.1	1.2	492.6
2281	1905	0.1	0.7	1.1	0.3	0.0	20.1	668.3	37.9	81.3	1.4	0.2	0.1	811.1
...
2387	2011	0.0	0.2	0.0	0.0	0.0	16.3	259.2	451.7	162.5	0.4	0.0	0.0	890.1
2388	2012	0.1	0.0	0.0	0.0	0.0	34.4	178.2	230.3	263.8	7.1	0.0	0.0	714.0
2389	2013	0.0	0.9	0.1	4.6	0.0	155.7	405.4	211.1	287.3	53.2	0.1	0.0	1118.0
2390	2014	5.7	0.1	0.2	1.0	1.3	11.6	307.5	138.6	235.1	3.3	1.3	0.0	705.1
2391	2015	1.8	0.0	6.1	5.5	0.9	120.7	354.7	37.4	93.4	2.2	0.3	0.0	622.9

115 rows × 14 columns



In [125]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

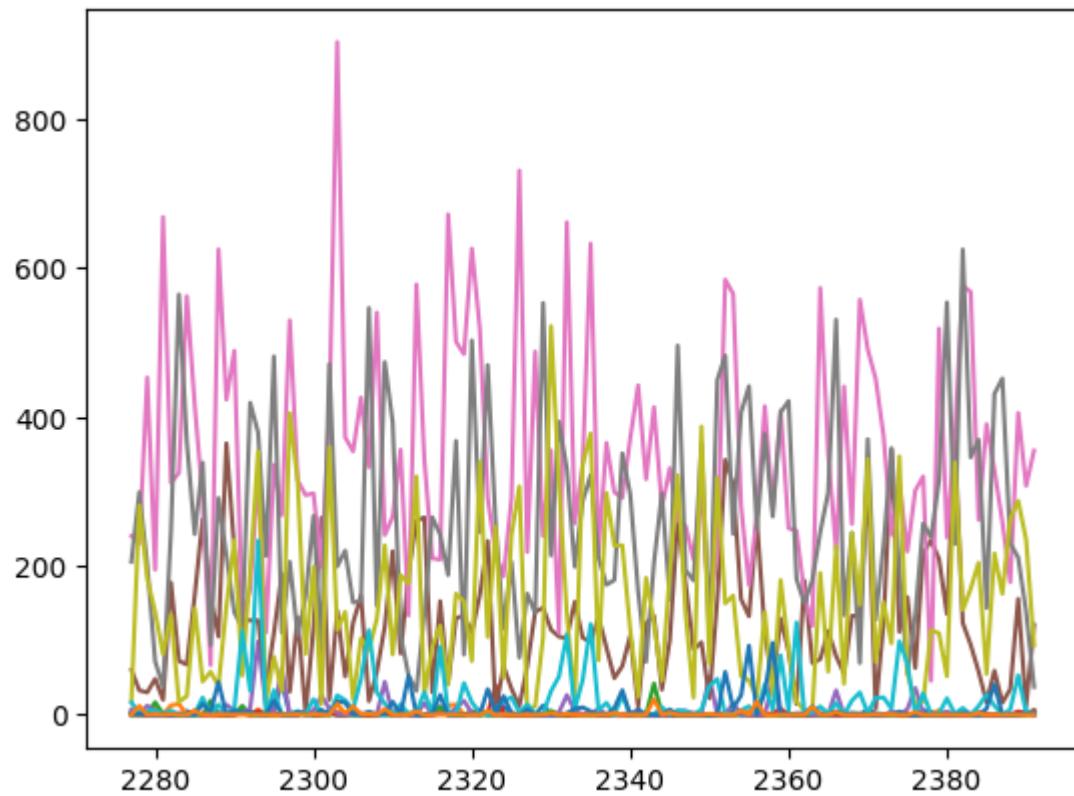
Out[125]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2277	4.2	0.0	0.6	1.6	7.0	60.3	240.2	205.4	18.1	16.6	0.0	0.3
2278	3.9	0.0	0.0	0.6	1.0	32.8	229.8	299.0	281.2	2.3	1.5	11.9
2279	0.3	0.1	1.4	0.0	12.3	30.1	452.9	202.0	183.2	5.4	0.0	0.0
2280	0.8	10.6	16.8	0.2	3.9	48.3	194.8	71.8	138.0	6.1	0.1	1.2
2281	0.1	0.7	1.1	0.3	0.0	20.1	668.3	37.9	81.3	1.4	0.2	0.1
...
2387	0.0	0.2	0.0	0.0	0.0	16.3	259.2	451.7	162.5	0.4	0.0	0.0
2388	0.1	0.0	0.0	0.0	0.0	34.4	178.2	230.3	263.8	7.1	0.0	0.0
2389	0.0	0.9	0.1	4.6	0.0	155.7	405.4	211.1	287.3	53.2	0.1	0.0
2390	5.7	0.1	0.2	1.0	1.3	11.6	307.5	138.6	235.1	3.3	1.3	0.0
2391	1.8	0.0	6.1	5.5	0.9	120.7	354.7	37.4	93.4	2.2	0.3	0.0

115 rows × 12 columns

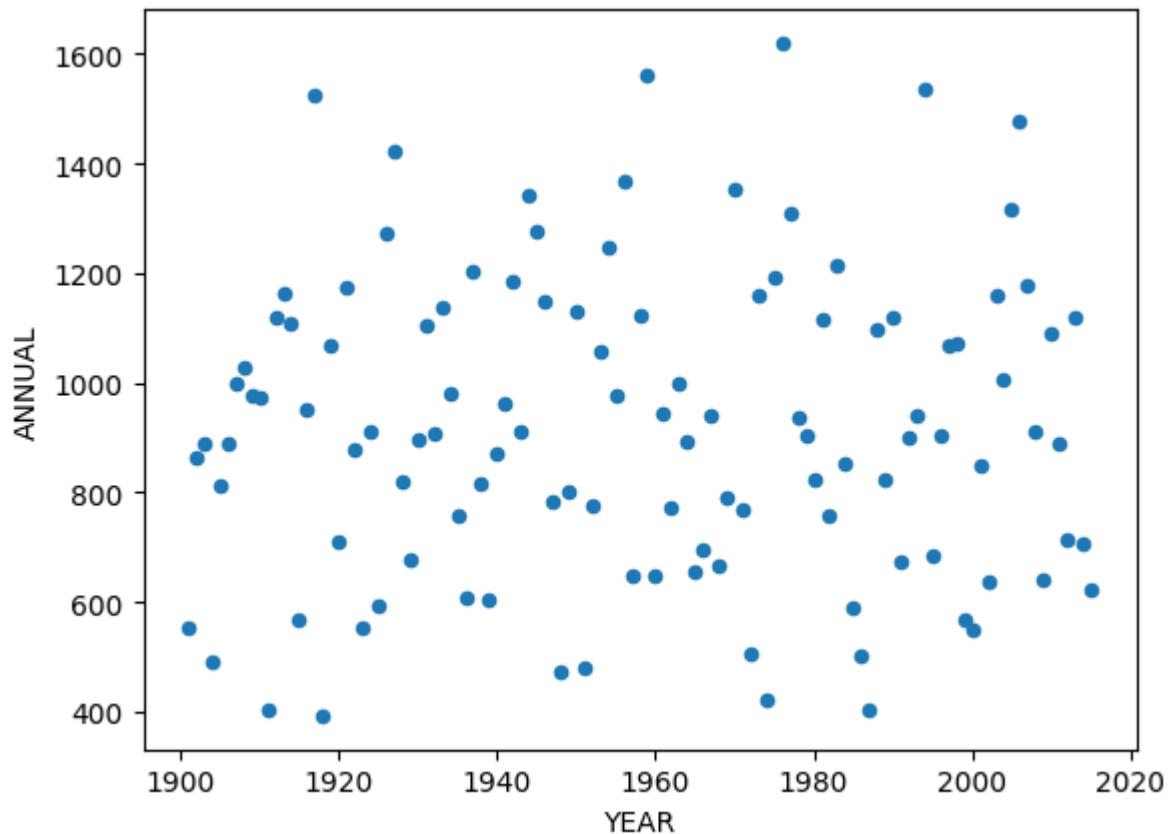
In [126]: `plt.plot(y)`

Out[126]: [`<matplotlib.lines.Line2D at 0x26df93f2dd0>`,
`<matplotlib.lines.Line2D at 0x26df91a5490>`,
`<matplotlib.lines.Line2D at 0x26df91a5850>`,
`<matplotlib.lines.Line2D at 0x26df91a5c50>`,
`<matplotlib.lines.Line2D at 0x26df91a5f50>`,
`<matplotlib.lines.Line2D at 0x26df91a6310>`,
`<matplotlib.lines.Line2D at 0x26df91a6910>`,
`<matplotlib.lines.Line2D at 0x26df91a6d50>`,
`<matplotlib.lines.Line2D at 0x26df91a6050>`,
`<matplotlib.lines.Line2D at 0x26df91a6490>`,
`<matplotlib.lines.Line2D at 0x26df91a7710>`,
`<matplotlib.lines.Line2D at 0x26df91a7ad0>`]



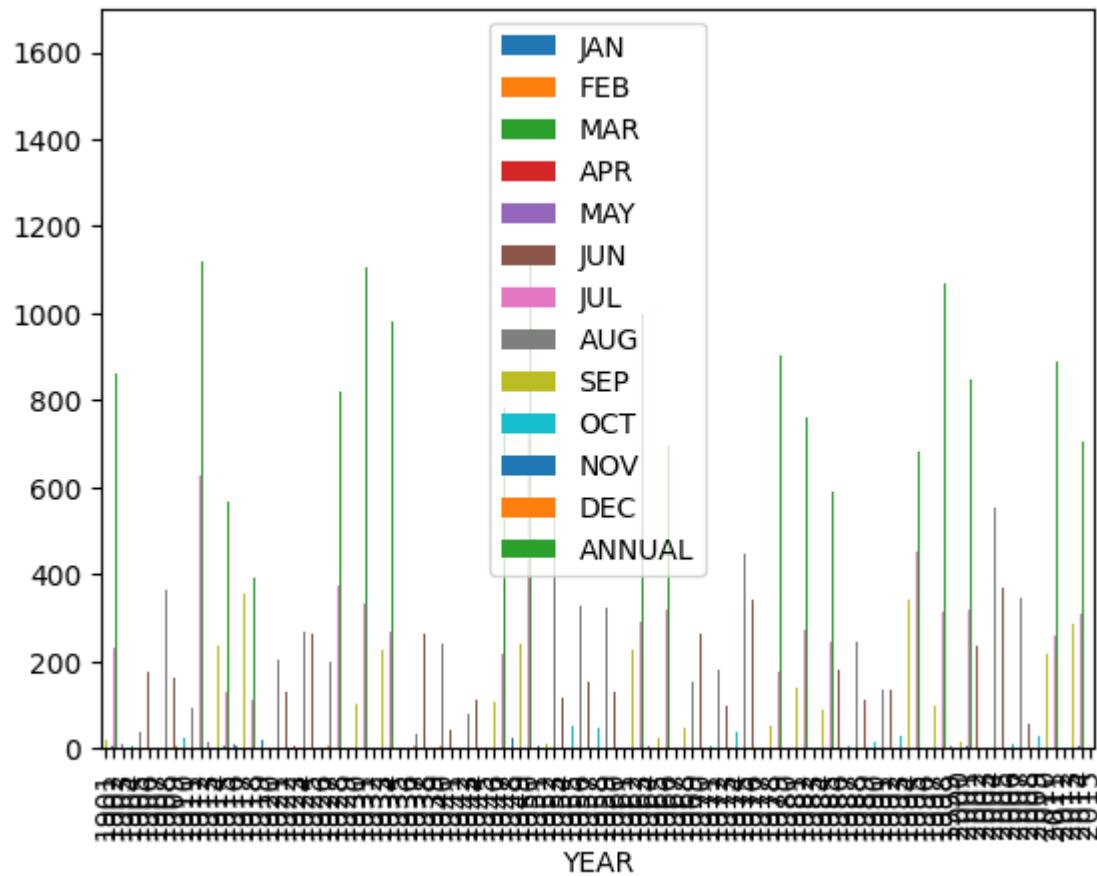
```
In [127]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[127]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



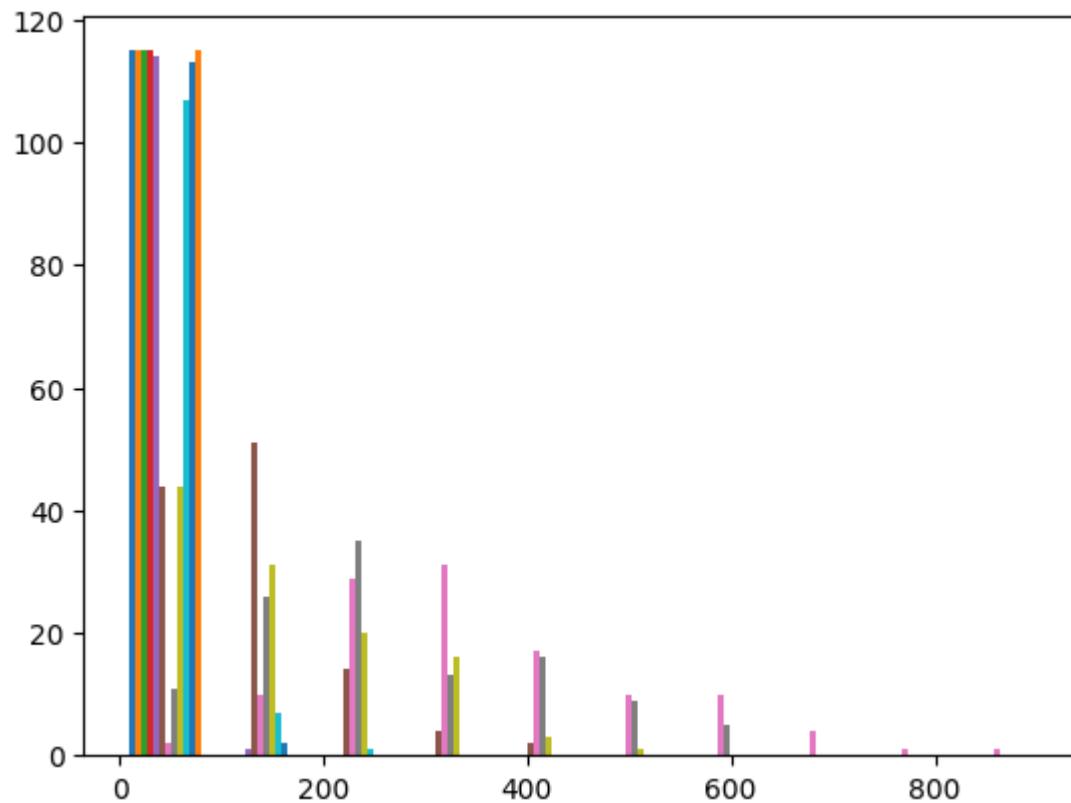
```
In [128]: x.plot.bar(x="YEAR")
```

```
Out[128]: <Axes: xlabel='YEAR'>
```



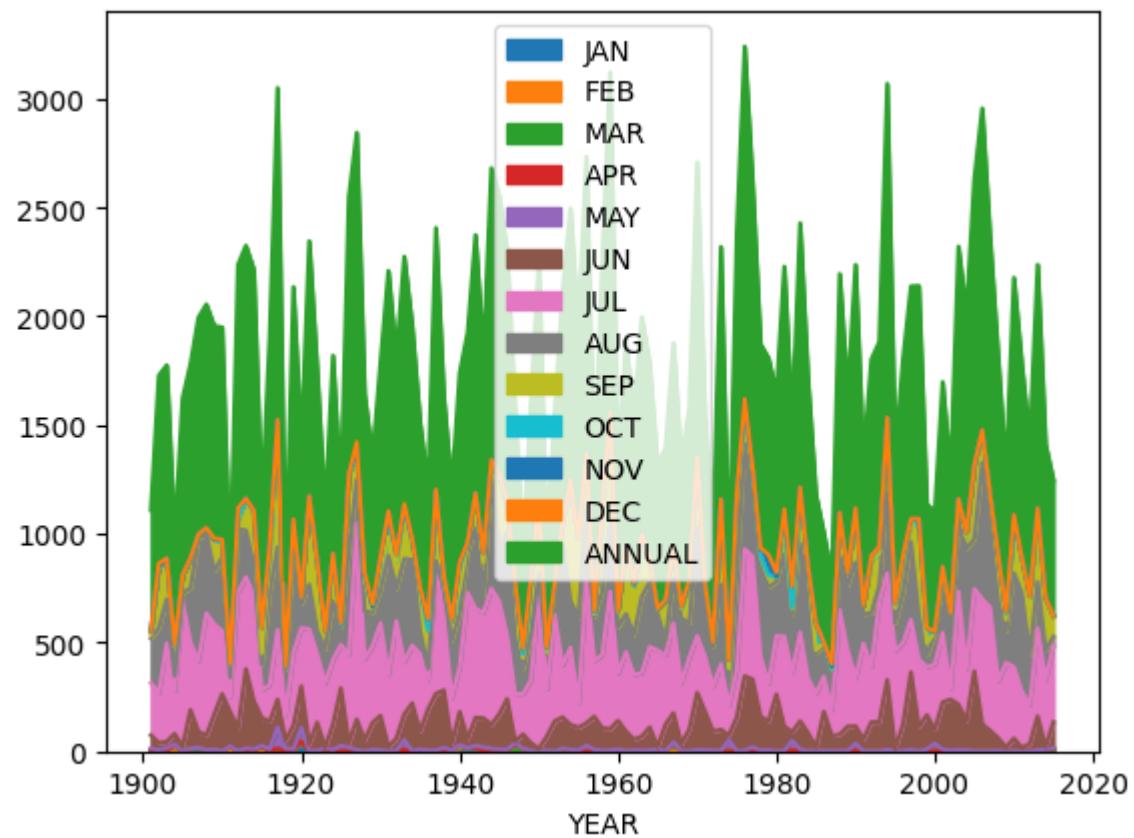
```
In [129]: plt.hist(y)
```

```
Out[129]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 44.,  51.,  14.,  4.,  2.,  0.,  0.,  0.,  0.,  0.],
       [ 2.,  10.,  29.,  31.,  17.,  10.,  10.,  4.,  1.,  1.],
       [ 11.,  26.,  35.,  13.,  16.,  9.,  5.,  0.,  0.,  0.],
       [ 44.,  31.,  20.,  16.,  3.,  1.,  0.,  0.,  0.,  0.],
       [107.,  7.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  90.33, 180.66, 270.99, 361.32, 451.65, 541.98, 632.31,
       722.64, 812.97, 903.3 ]),
<a list of 12 BarContainer objects>)
```



```
In [130]: x.plot.area(x="YEAR")
```

```
Out[130]: <Axes: xlabel='YEAR'>
```



EAST MADHYA PRADESH

In [131]:

```
x=df[df[ "SUBDIVISION" ]=="EAST MADHYA PRADESH"]
x
```

Out[131]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
2162	2162	EAST MADHYA PRADESH	1901	48.5	38.1	15.7	10.7	6.2	61.0	367.5	589.2	189.9	5.1
2163	2163	EAST MADHYA PRADESH	1902	14.9	8.9	0.0	3.6	2.7	28.0	411.9	227.0	236.6	17.0
2164	2164	EAST MADHYA PRADESH	1903	5.6	2.9	0.3	0.9	37.5	67.5	261.4	366.7	257.4	177.9
2165	2165	EAST MADHYA PRADESH	1904	2.0	15.3	48.2	0.0	8.6	109.9	443.2	316.6	135.6	44.8
2166	2166	EAST MADHYA PRADESH	1905	15.9	8.0	14.3	12.3	10.2	34.4	292.4	243.3	250.9	2.9
...
2272	2272	EAST MADHYA PRADESH	2011	0.6	1.9	0.3	7.1	4.7	332.5	323.6	326.9	276.5	1.1
2273	2273	EAST MADHYA PRADESH	2012	39.4	0.7	0.6	1.1	1.2	67.8	398.9	351.7	172.6	12.1
2274	2274	EAST MADHYA PRADESH	2013	2.0	43.4	14.1	9.5	0.3	311.9	456.2	480.8	78.0	124.1
2275	2275	EAST MADHYA PRADESH	2014	32.1	49.7	17.8	5.1	2.5	91.8	283.4	231.8	139.6	56.4
2276	2276	EAST MADHYA PRADESH	2015	37.3	11.0	73.4	25.8	6.3	139.2	262.2	272.1	71.6	38.1

115 rows × 20 columns



In [132]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[132]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2162	1901	48.5	38.1	15.7	10.7	6.2	61.0	367.5	589.2	189.9	5.9	0.0	0.0	1332
2163	1902	14.9	8.9	0.0	3.6	2.7	28.0	411.9	227.0	236.6	17.0	27.6	6.1	984
2164	1903	5.6	2.9	0.3	0.9	37.5	67.5	261.4	366.7	257.4	177.9	0.0	0.0	1178
2165	1904	2.0	15.3	48.2	0.0	8.6	109.9	443.2	316.6	135.6	44.8	3.2	16.9	1144
2166	1905	15.9	8.0	14.3	12.3	10.2	34.4	292.4	243.3	250.9	2.9	0.0	1.6	886
...
2272	2011	0.6	1.9	0.3	7.1	4.7	332.5	323.6	326.9	276.5	1.1	0.0	0.0	1275
2273	2012	39.4	0.7	0.6	1.1	1.2	67.8	398.9	351.7	172.6	12.7	3.8	2.7	1053
2274	2013	2.0	43.4	14.1	9.5	0.3	311.9	456.2	480.8	78.0	124.2	0.5	1.0	1521
2275	2014	32.1	49.7	17.8	5.1	2.5	91.8	283.4	231.8	139.6	56.4	1.9	12.9	924
2276	2015	37.3	11.0	73.4	25.8	6.3	139.2	262.2	272.1	71.6	38.2	1.2	0.9	939

115 rows × 14 columns



In [133]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

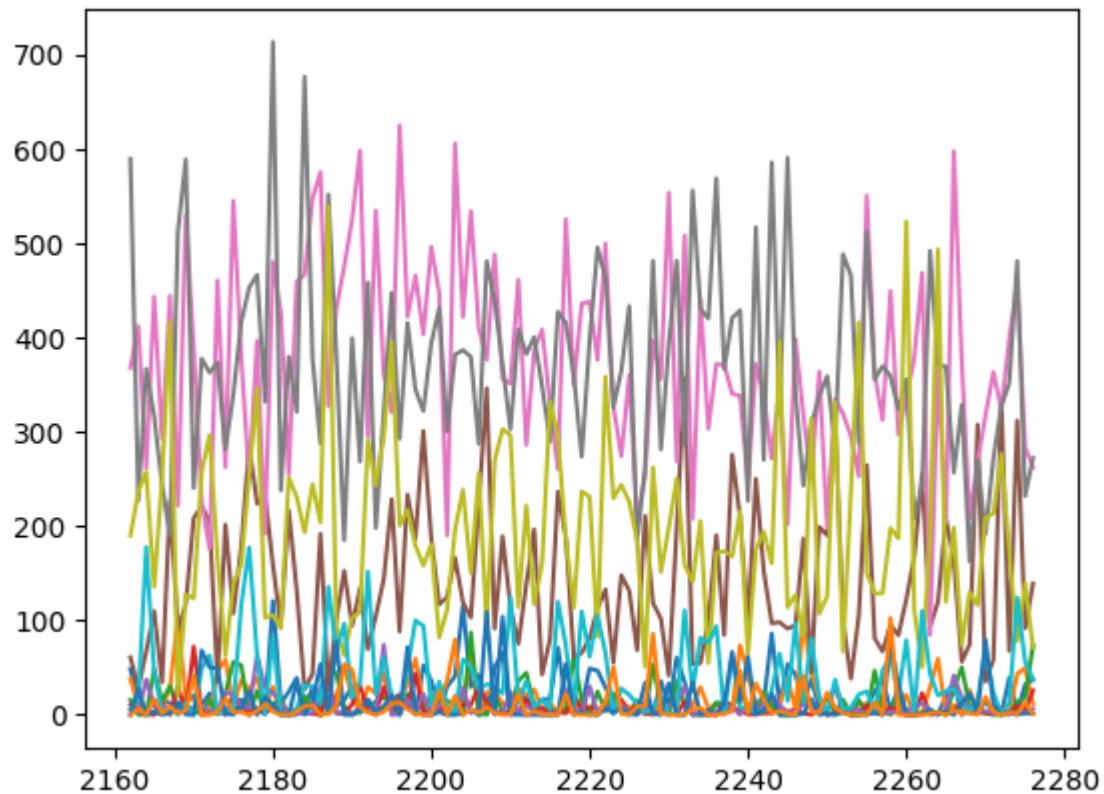
Out[133]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
2162	48.5	38.1	15.7	10.7	6.2	61.0	367.5	589.2	189.9	5.9	0.0	0.0	
2163	14.9	8.9	0.0	3.6	2.7	28.0	411.9	227.0	236.6	17.0	27.6	6.1	
2164	5.6	2.9	0.3	0.9	37.5	67.5	261.4	366.7	257.4	177.9	0.0	0.0	
2165	2.0	15.3	48.2	0.0	8.6	109.9	443.2	316.6	135.6	44.8	3.2	16.9	
2166	15.9	8.0	14.3	12.3	10.2	34.4	292.4	243.3	250.9	2.9	0.0	1.6	
...
2272	0.6	1.9	0.3	7.1	4.7	332.5	323.6	326.9	276.5	1.1	0.0	0.0	
2273	39.4	0.7	0.6	1.1	1.2	67.8	398.9	351.7	172.6	12.7	3.8	2.7	
2274	2.0	43.4	14.1	9.5	0.3	311.9	456.2	480.8	78.0	124.2	0.5	1.0	
2275	32.1	49.7	17.8	5.1	2.5	91.8	283.4	231.8	139.6	56.4	1.9	12.9	
2276	37.3	11.0	73.4	25.8	6.3	139.2	262.2	272.1	71.6	38.2	1.2	0.9	

115 rows × 12 columns

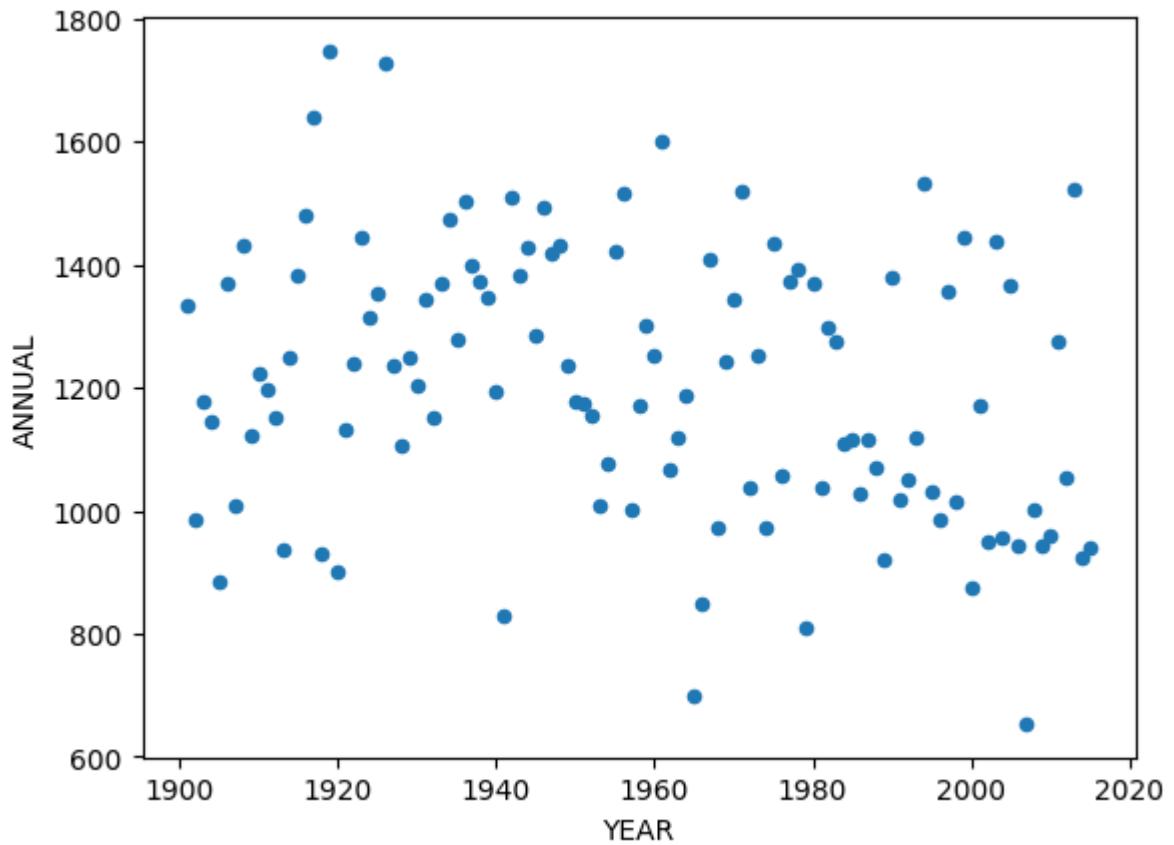
```
In [134]: plt.plot(y)
```

```
Out[134]: [
```



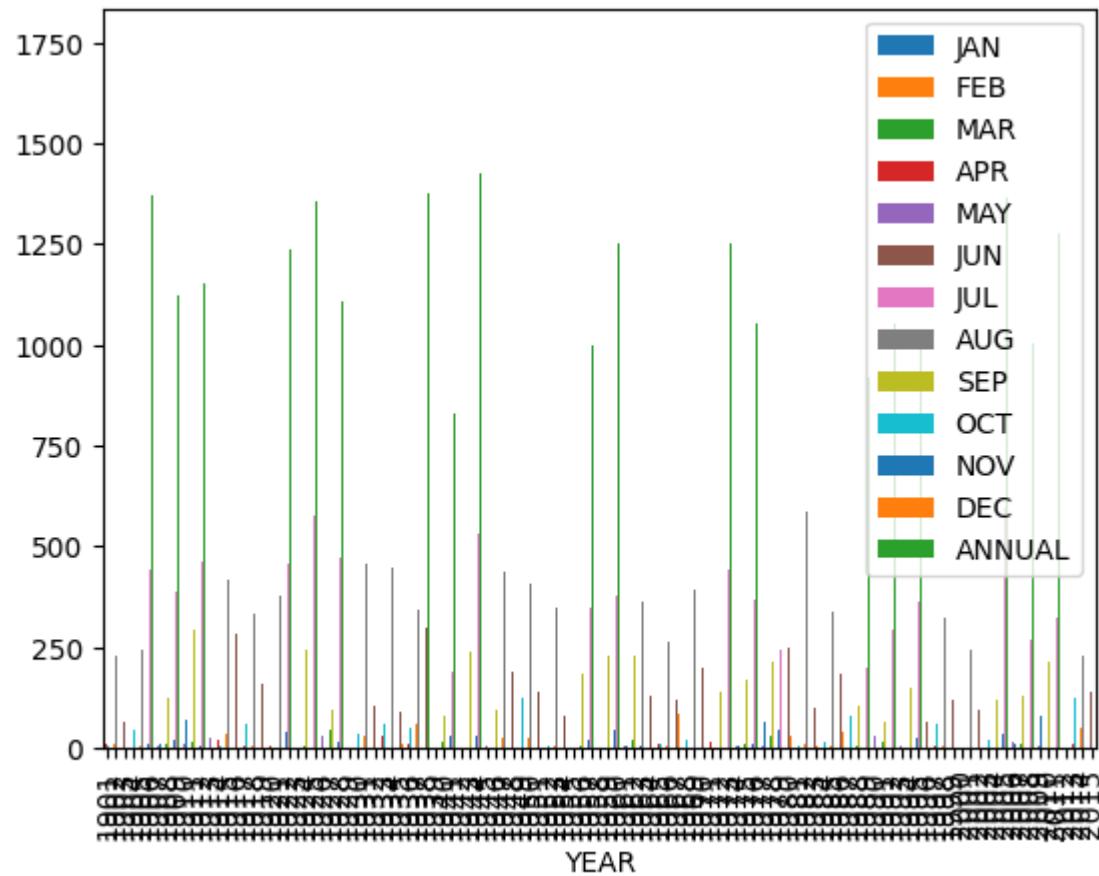
```
In [135]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[135]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



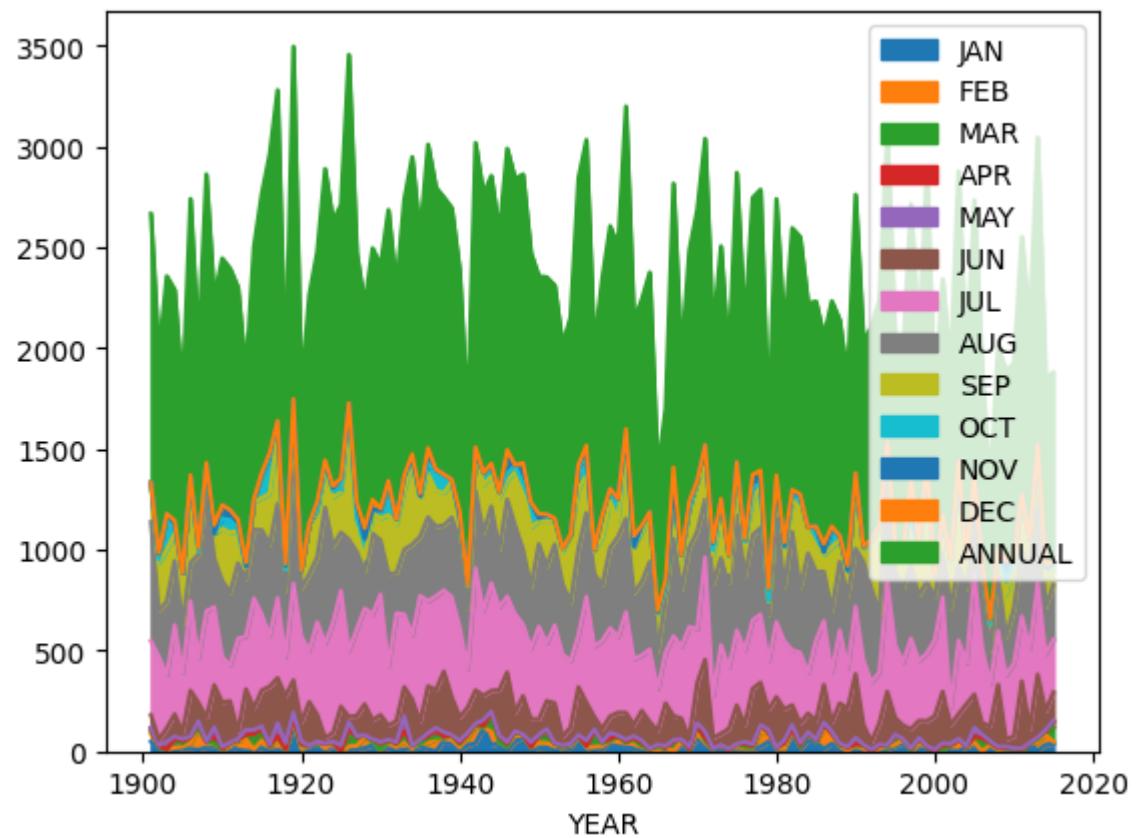
```
In [136]: x.plot.bar(x="YEAR")
```

```
Out[136]: <Axes: xlabel='YEAR'>
```



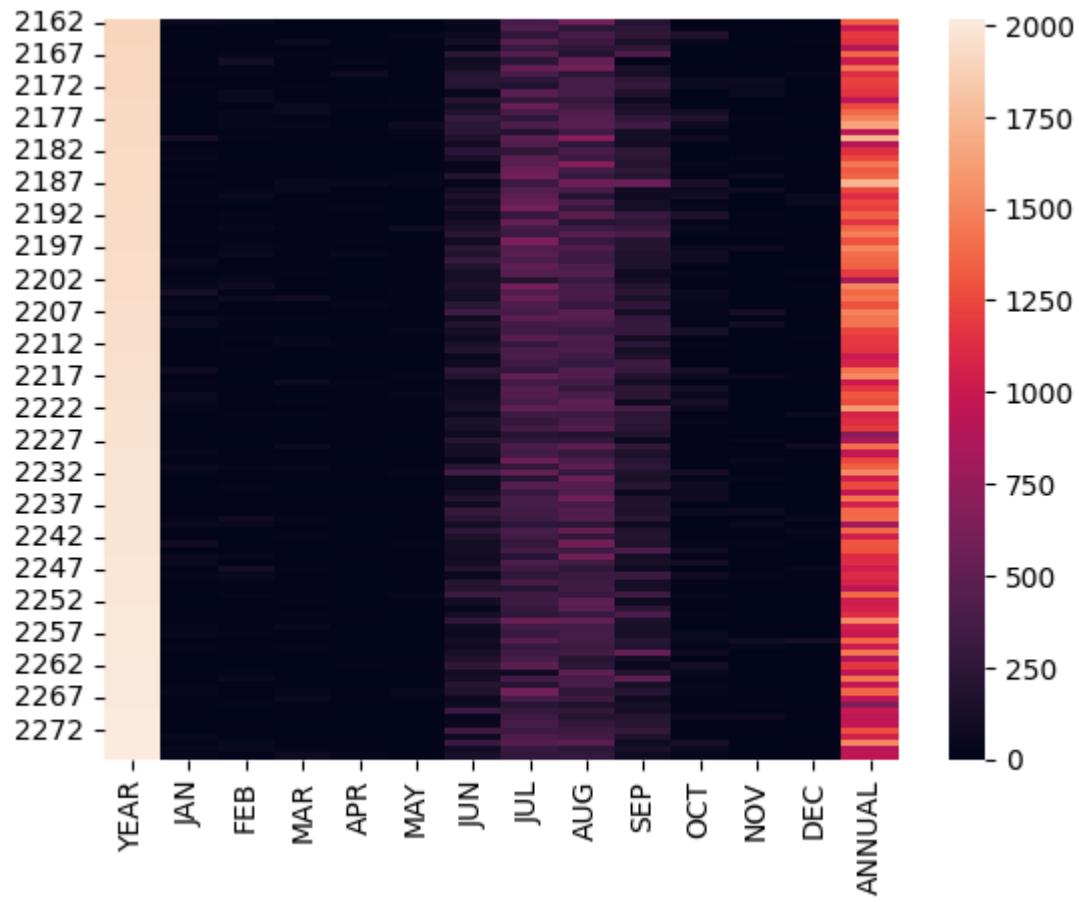
```
In [137]: x.plot.area(x="YEAR")
```

```
Out[137]: <Axes: xlabel='YEAR'>
```



In [138]: `sns.heatmap(x)`

Out[138]: <Axes: >



KERALA

In [139]:

```
x=df[df[ "SUBDIVISION" ]=="KERALA"]
```

```
x
```

Out[139]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3887	3887	KERALA	1901	28.7	44.7	51.6	160.0	174.7	824.6	743.0	357.5	197.7	266.9	350.8	48.4
3888	3888	KERALA	1902	6.7	2.6	57.3	83.9	134.5	390.9	1205.0	315.8	491.6	358.4	158.3	121.5
3889	3889	KERALA	1903	3.2	18.6	3.1	83.6	249.7	558.6	1022.5	420.2	341.8	354.1	157.0	59.0
3890	3890	KERALA	1904	23.7	3.0	32.2	71.5	235.7	1098.2	725.5	351.8	222.7	328.1	33.9	3.3
3891	3891	KERALA	1905	1.2	22.3	9.4	105.9	263.3	850.2	520.5	293.6	217.2	383.5	74.4	0.2
...
3997	3997	KERALA	2011	20.5	45.7	24.1	165.2	124.2	788.5	536.8	492.7	391.2	227.2	169.7	49.5
3998	3998	KERALA	2012	7.4	11.0	21.0	171.1	95.3	430.3	362.6	501.6	241.1	187.5	112.9	9.4
3999	3999	KERALA	2013	3.9	40.1	49.9	49.3	119.3	1042.7	830.2	369.7	318.6	259.9	154.9	17.0
4000	4000	KERALA	2014	4.6	10.3	17.9	95.7	251.0	454.4	677.8	733.9	298.8	355.5	99.5	47.2
4001	4001	KERALA	2015	3.1	5.8	50.1	214.1	201.8	563.6	406.0	252.2	292.9	308.1	223.6	79.4

115 rows × 20 columns



In [140]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

```
x
```

Out[140]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	A
3887	1901	28.7	44.7	51.6	160.0	174.7	824.6	743.0	357.5	197.7	266.9	350.8	48.4	
3888	1902	6.7	2.6	57.3	83.9	134.5	390.9	1205.0	315.8	491.6	358.4	158.3	121.5	
3889	1903	3.2	18.6	3.1	83.6	249.7	558.6	1022.5	420.2	341.8	354.1	157.0	59.0	
3890	1904	23.7	3.0	32.2	71.5	235.7	1098.2	725.5	351.8	222.7	328.1	33.9	3.3	
3891	1905	1.2	22.3	9.4	105.9	263.3	850.2	520.5	293.6	217.2	383.5	74.4	0.2	
...
3997	2011	20.5	45.7	24.1	165.2	124.2	788.5	536.8	492.7	391.2	227.2	169.7	49.5	
3998	2012	7.4	11.0	21.0	171.1	95.3	430.3	362.6	501.6	241.1	187.5	112.9	9.4	
3999	2013	3.9	40.1	49.9	49.3	119.3	1042.7	830.2	369.7	318.6	259.9	154.9	17.0	
4000	2014	4.6	10.3	17.9	95.7	251.0	454.4	677.8	733.9	298.8	355.5	99.5	47.2	
4001	2015	3.1	5.8	50.1	214.1	201.8	563.6	406.0	252.2	292.9	308.1	223.6	79.4	

115 rows × 14 columns



In [141]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

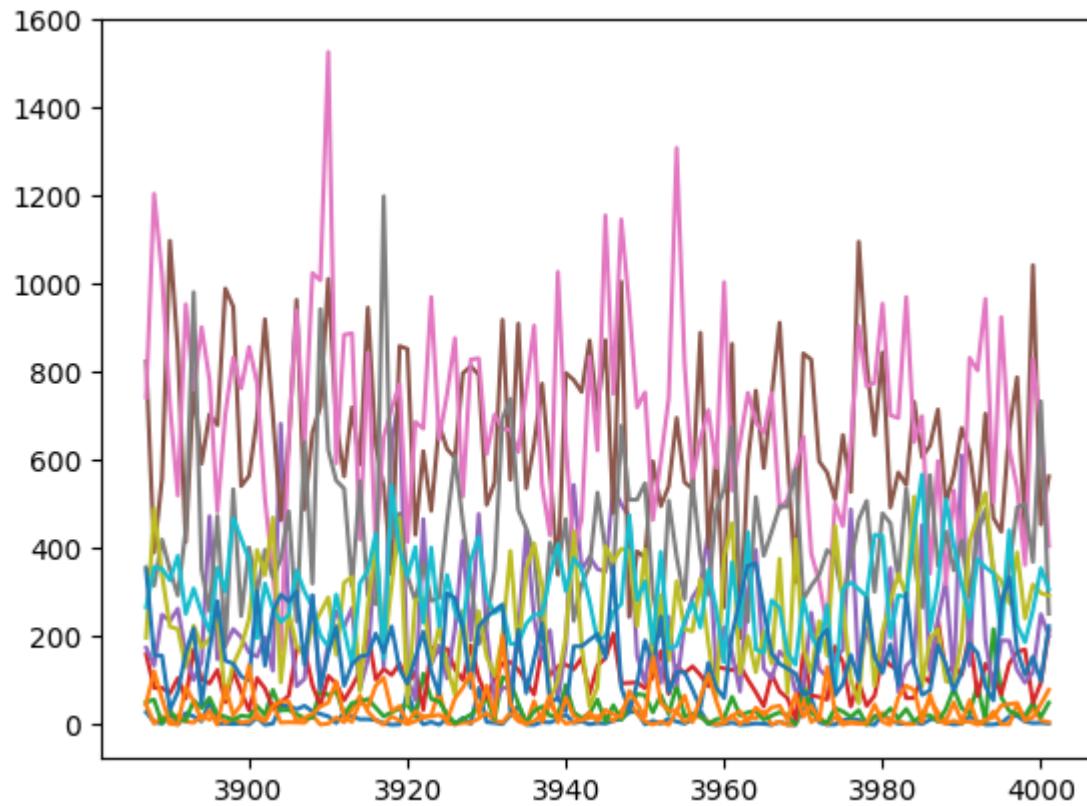
Out[141]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3887	28.7	44.7	51.6	160.0	174.7	824.6	743.0	357.5	197.7	266.9	350.8	48.4
3888	6.7	2.6	57.3	83.9	134.5	390.9	1205.0	315.8	491.6	358.4	158.3	121.5
3889	3.2	18.6	3.1	83.6	249.7	558.6	1022.5	420.2	341.8	354.1	157.0	59.0
3890	23.7	3.0	32.2	71.5	235.7	1098.2	725.5	351.8	222.7	328.1	33.9	3.3
3891	1.2	22.3	9.4	105.9	263.3	850.2	520.5	293.6	217.2	383.5	74.4	0.2
...
3997	20.5	45.7	24.1	165.2	124.2	788.5	536.8	492.7	391.2	227.2	169.7	49.5
3998	7.4	11.0	21.0	171.1	95.3	430.3	362.6	501.6	241.1	187.5	112.9	9.4
3999	3.9	40.1	49.9	49.3	119.3	1042.7	830.2	369.7	318.6	259.9	154.9	17.0
4000	4.6	10.3	17.9	95.7	251.0	454.4	677.8	733.9	298.8	355.5	99.5	47.2
4001	3.1	5.8	50.1	214.1	201.8	563.6	406.0	252.2	292.9	308.1	223.6	79.4

115 rows × 12 columns

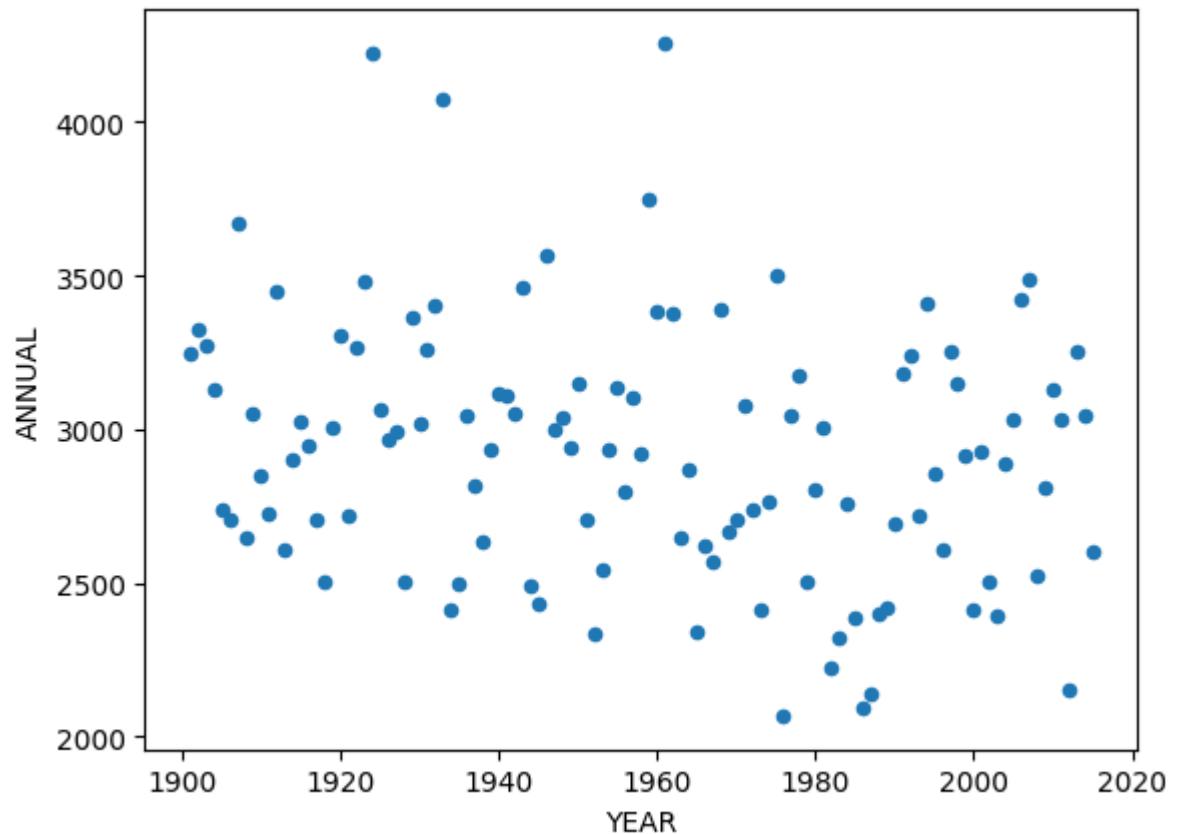
```
In [142]: plt.plot(y)
```

```
Out[142]: [
```



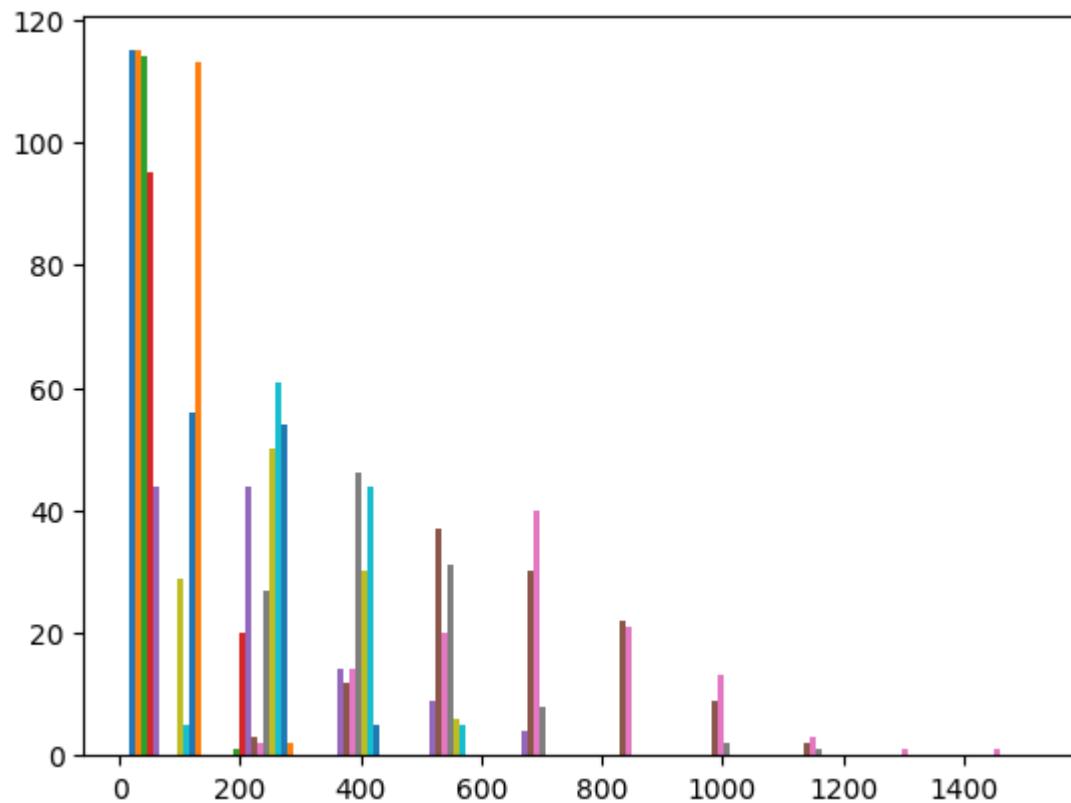
```
In [143]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[143]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



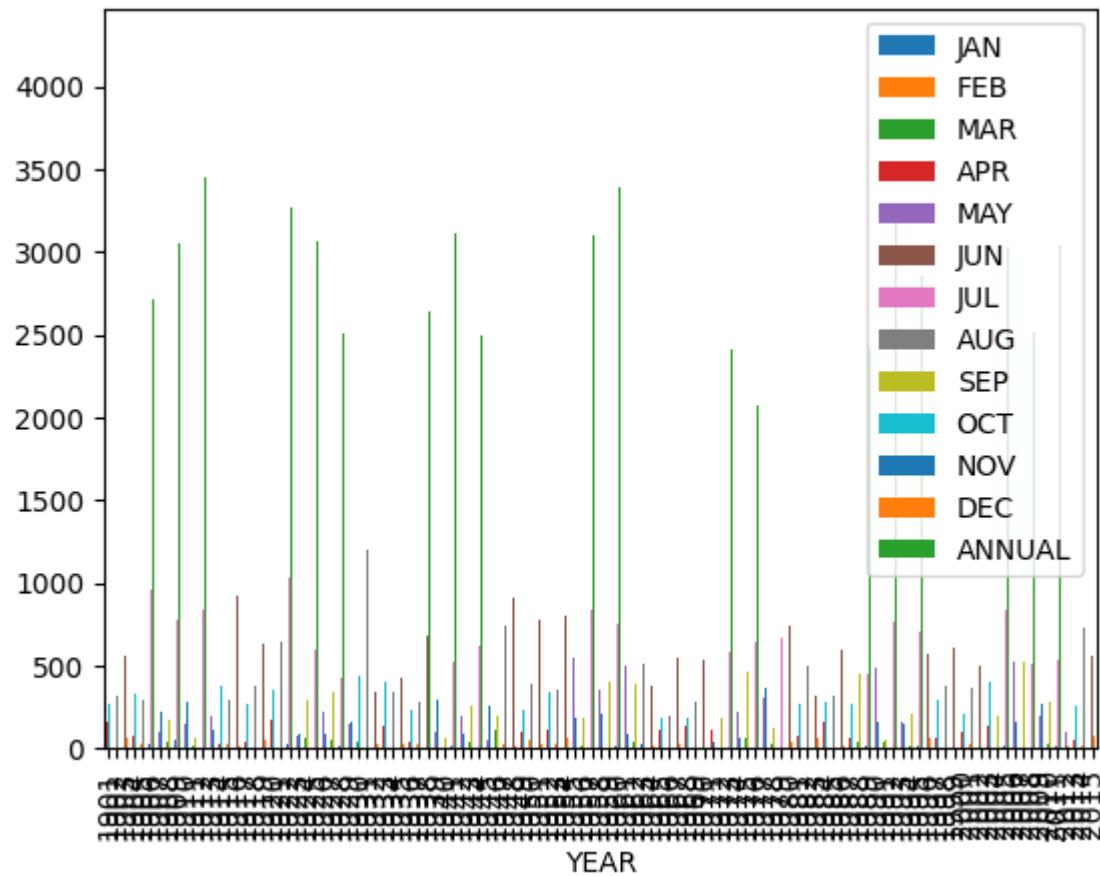
```
In [144]: plt.hist(y)
```

```
Out[144]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 95.,  20.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 44.,  44.,  14.,  9.,  4.,  0.,  0.,  0.,  0.,  0.],
       [  0.,  3.,  12.,  37.,  30.,  22.,  9.,  2.,  0.,  0.],
       [  0.,  2.,  14.,  20.,  40.,  21.,  13.,  3.,  1.,  1.],
       [  0.,  27.,  46.,  31.,  8.,  0.,  2.,  1.,  0.,  0.],
       [ 29.,  50.,  30.,  6.,  0.,  0.,  0.,  0.,  0.,  0.],
       [  5.,  61.,  44.,  5.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 56.,  54.,  5.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([  0. ,  152.65,  305.3 ,  457.95,  610.6 ,  763.25,  915.9 ,
       1068.55, 1221.2 , 1373.85, 1526.5 ]),
<a list of 12 BarContainer objects>)
```



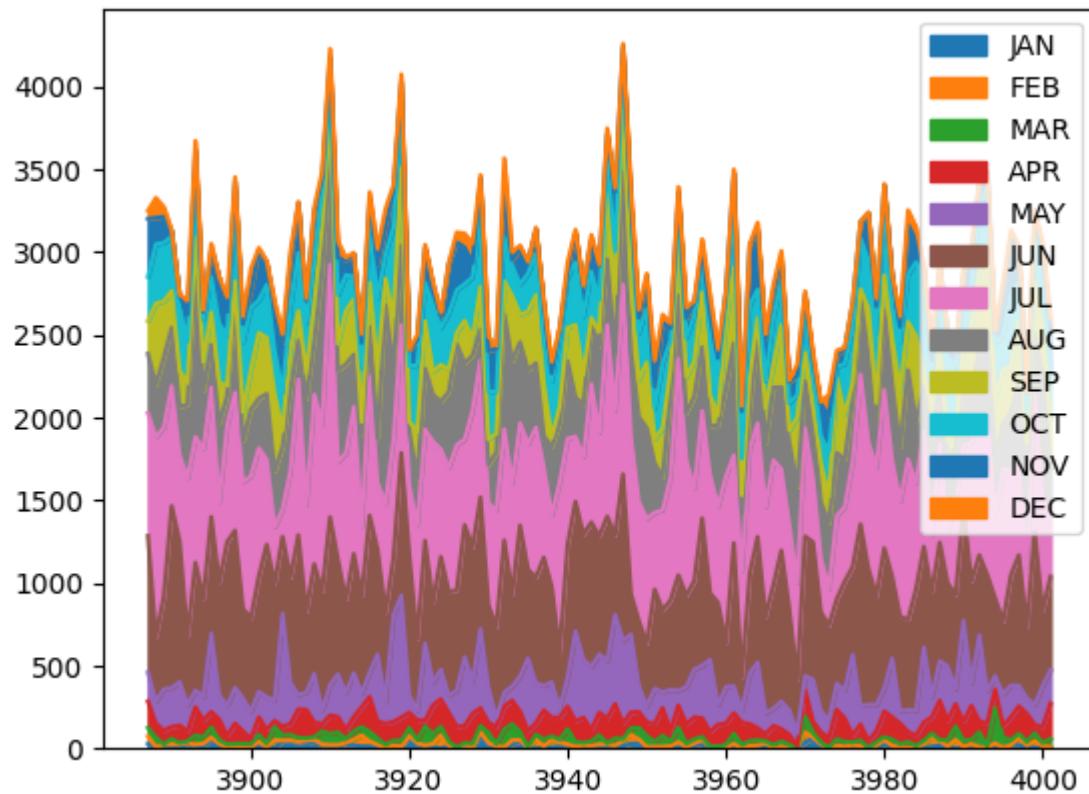
```
In [145]: x.plot.bar(x="YEAR")
```

```
Out[145]: <Axes: xlabel='YEAR'>
```



In [146]: `y.plot.area()`

Out[146]: <Axes: >



WEST RAJASTHAN

In [147]:

```
x=df[df[ "SUBDIVISION" ]=="WEST RAJASTHAN"]
```

```
x
```

Out[147]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1817	1817		WEST RAJASTHAN	1901	6.7	0.0	1.1	0.0	6.1	3.0	79.0	59.2	1.0	2.1
1818	1818		WEST RAJASTHAN	1902	0.0	0.0	0.0	0.5	4.0	49.1	27.0	71.3	41.8	1.8
1819	1819		WEST RAJASTHAN	1903	1.7	1.3	5.5	0.0	4.2	2.7	154.8	87.1	49.3	0.1
1820	1820		WEST RAJASTHAN	1904	3.8	2.9	16.3	0.7	11.4	14.6	39.8	45.6	21.4	1.4
1821	1821		WEST RAJASTHAN	1905	6.3	4.8	0.7	1.3	0.3	4.9	30.1	0.6	64.5	0.0
...
1927	1927		WEST RAJASTHAN	2011	0.0	11.8	1.5	1.5	7.8	24.4	88.5	166.8	116.3	0.1
1928	1928		WEST RAJASTHAN	2012	0.5	0.0	0.0	9.5	10.4	5.3	40.4	166.7	92.0	1.9
1929	1929		WEST RAJASTHAN	2013	8.6	21.8	4.2	3.1	1.7	37.6	104.5	138.2	58.7	10.1
1930	1930		WEST RAJASTHAN	2014	0.8	2.2	4.7	8.4	23.0	13.8	94.3	69.6	84.9	0.5
1931	1931		WEST RAJASTHAN	2015	1.4	0.9	30.3	25.2	15.5	53.2	234.6	60.5	35.7	1.1

115 rows × 20 columns

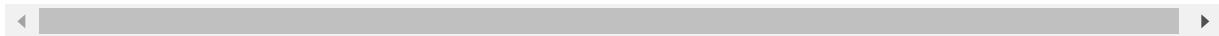


In [148]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[148]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1817	1901	6.7	0.0	1.1	0.0	6.1	3.0	79.0	59.2	1.0	2.1	0.0	0.6	158.9
1818	1902	0.0	0.0	0.0	0.5	4.0	49.1	27.0	71.3	41.8	1.8	0.0	0.0	195.6
1819	1903	1.7	1.3	5.5	0.0	4.2	2.7	154.8	87.1	49.3	0.1	0.0	0.5	307.0
1820	1904	3.8	2.9	16.3	0.7	11.4	14.6	39.8	45.6	21.4	1.4	2.9	7.1	167.9
1821	1905	6.3	4.8	0.7	1.3	0.3	4.9	30.1	0.6	64.5	0.0	0.0	0.9	114.4
...
1927	2011	0.0	11.8	1.5	1.5	7.8	24.4	88.5	166.8	116.3	0.1	0.0	0.0	418.7
1928	2012	0.5	0.0	0.0	9.5	10.4	5.3	40.4	166.7	92.0	1.9	0.0	0.6	327.3
1929	2013	8.6	21.8	4.2	3.1	1.7	37.6	104.5	138.2	58.7	10.1	1.0	0.0	389.4
1930	2014	0.8	2.2	4.7	8.4	23.0	13.8	94.3	69.6	84.9	0.5	0.2	0.0	302.4
1931	2015	1.4	0.9	30.3	25.2	15.5	53.2	234.6	60.5	35.7	1.1	0.1	0.0	458.4

115 rows × 14 columns



In [149]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

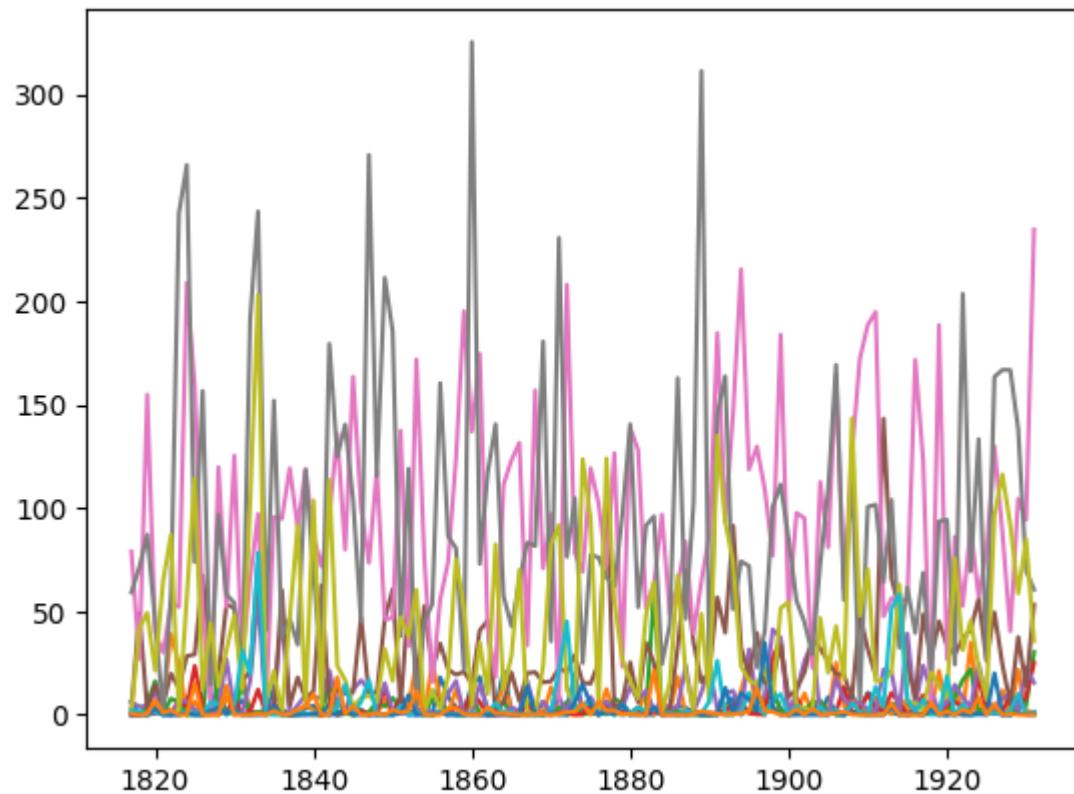
Out[149]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1817	6.7	0.0	1.1	0.0	6.1	3.0	79.0	59.2	1.0	2.1	0.0	0.6
1818	0.0	0.0	0.0	0.5	4.0	49.1	27.0	71.3	41.8	1.8	0.0	0.0
1819	1.7	1.3	5.5	0.0	4.2	2.7	154.8	87.1	49.3	0.1	0.0	0.5
1820	3.8	2.9	16.3	0.7	11.4	14.6	39.8	45.6	21.4	1.4	2.9	7.1
1821	6.3	4.8	0.7	1.3	0.3	4.9	30.1	0.6	64.5	0.0	0.0	0.9
...
1927	0.0	11.8	1.5	1.5	7.8	24.4	88.5	166.8	116.3	0.1	0.0	0.0
1928	0.5	0.0	0.0	9.5	10.4	5.3	40.4	166.7	92.0	1.9	0.0	0.6
1929	8.6	21.8	4.2	3.1	1.7	37.6	104.5	138.2	58.7	10.1	1.0	0.0
1930	0.8	2.2	4.7	8.4	23.0	13.8	94.3	69.6	84.9	0.5	0.2	0.0
1931	1.4	0.9	30.3	25.2	15.5	53.2	234.6	60.5	35.7	1.1	0.1	0.0

115 rows × 12 columns

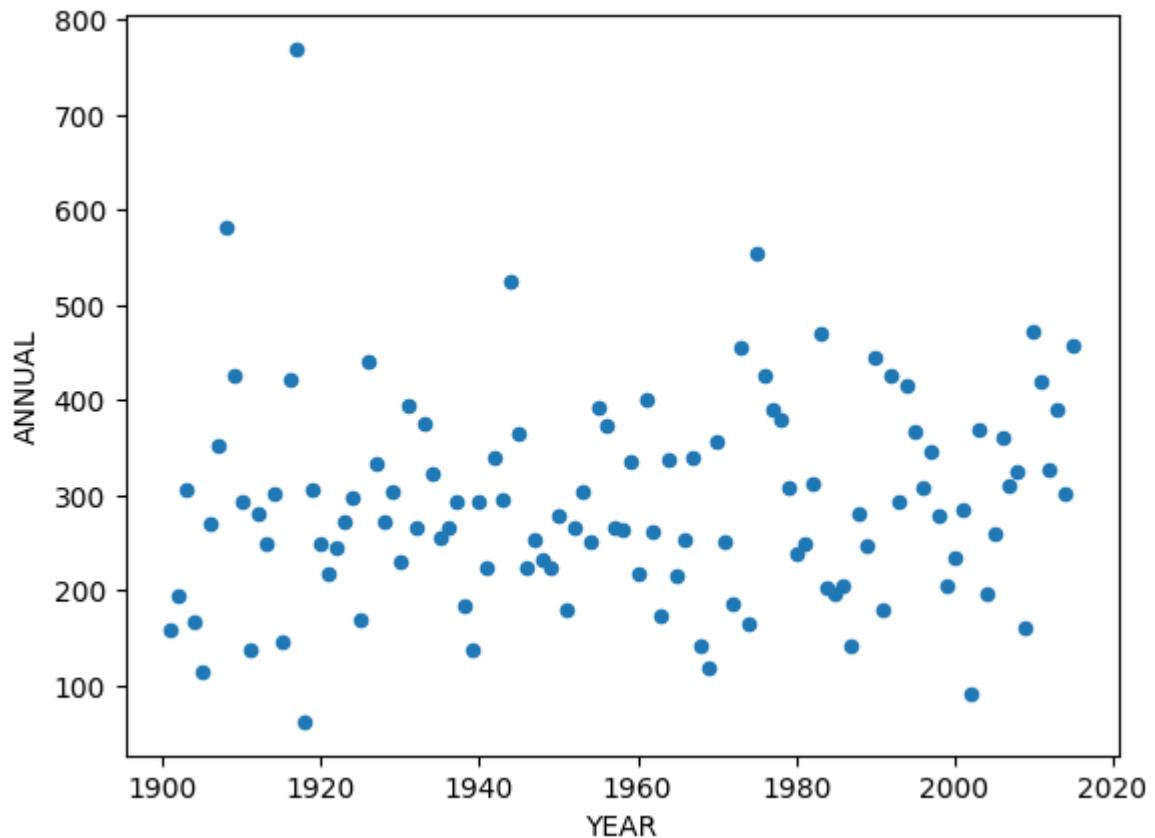
```
In [150]: plt.plot(y)
```

```
Out[150]: [
```



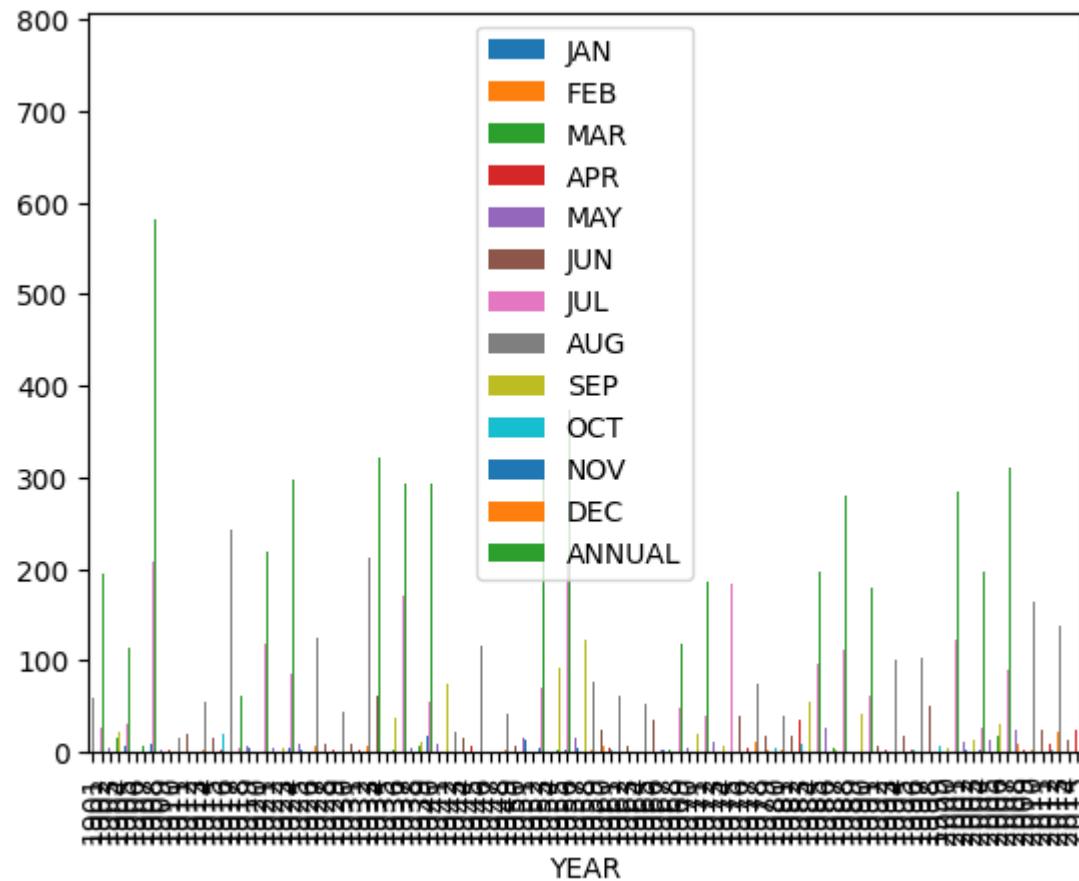
```
In [151]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[151]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



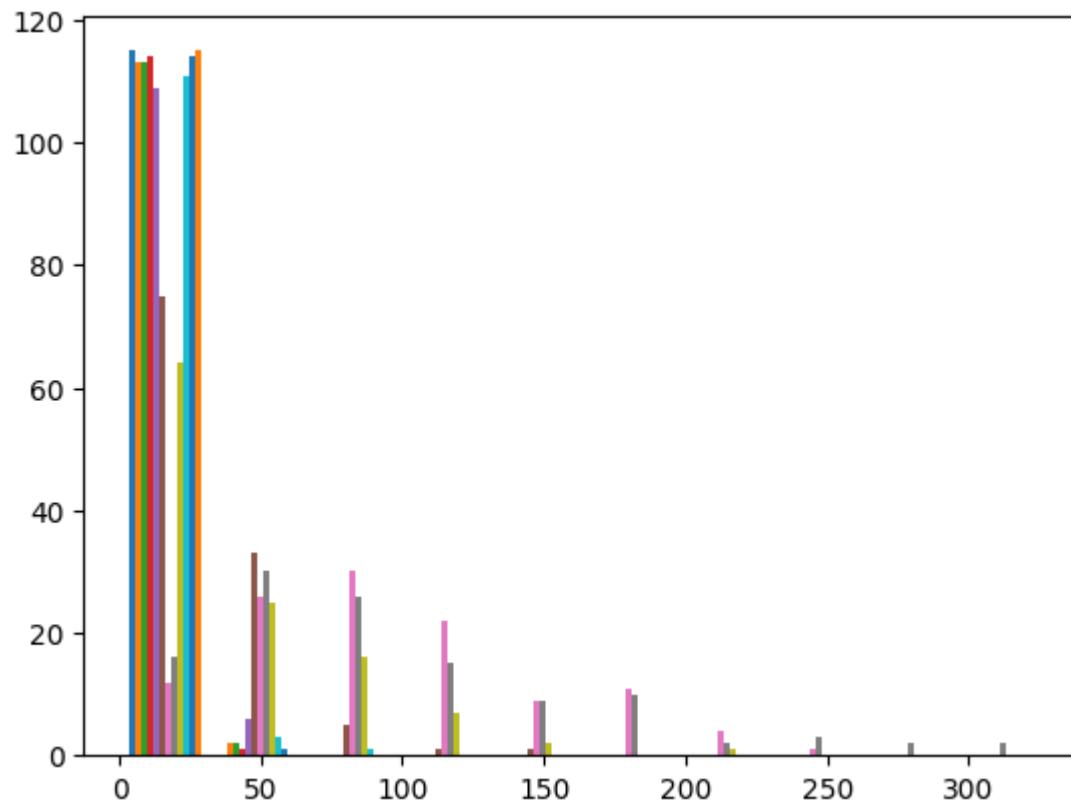
```
In [152]: x.plot.bar(x="YEAR")
```

```
Out[152]: <Axes: xlabel='YEAR'>
```



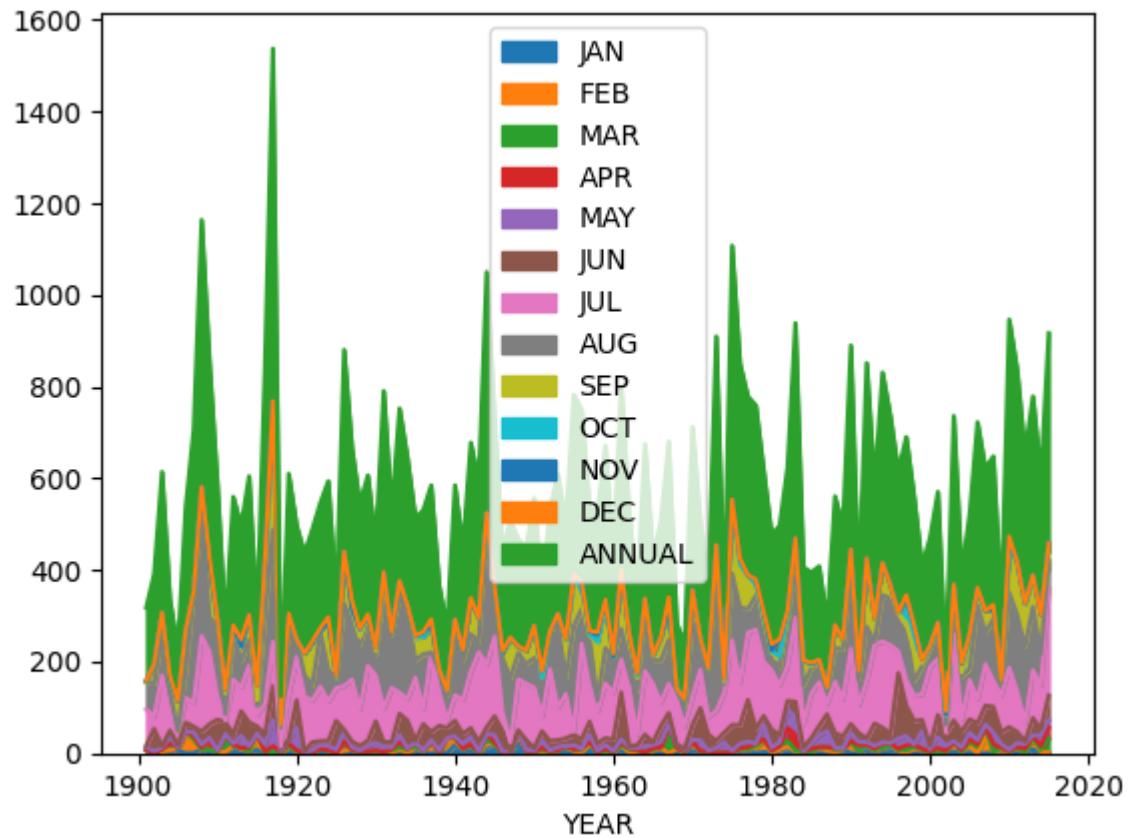
```
In [153]: plt.hist(y)
```

```
Out[153]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [109.,  6.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 75.,  33.,  5.,  1.,  1.,  0.,  0.,  0.,  0.,  0.],
       [ 12.,  26.,  30.,  22.,  9.,  11.,  4.,  1.,  0.,  0.],
       [ 16.,  30.,  26.,  15.,  9.,  10.,  2.,  3.,  2.,  2.],
       [ 64.,  25.,  16.,  7.,  2.,  0.,  1.,  0.,  0.,  0.],
       [111.,  3.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  32.53,  65.06,  97.59, 130.12, 162.65, 195.18, 227.71,
       260.24, 292.77, 325.3 ]),
<a list of 12 BarContainer objects>)
```



```
In [154]: x.plot.area(x="YEAR")
```

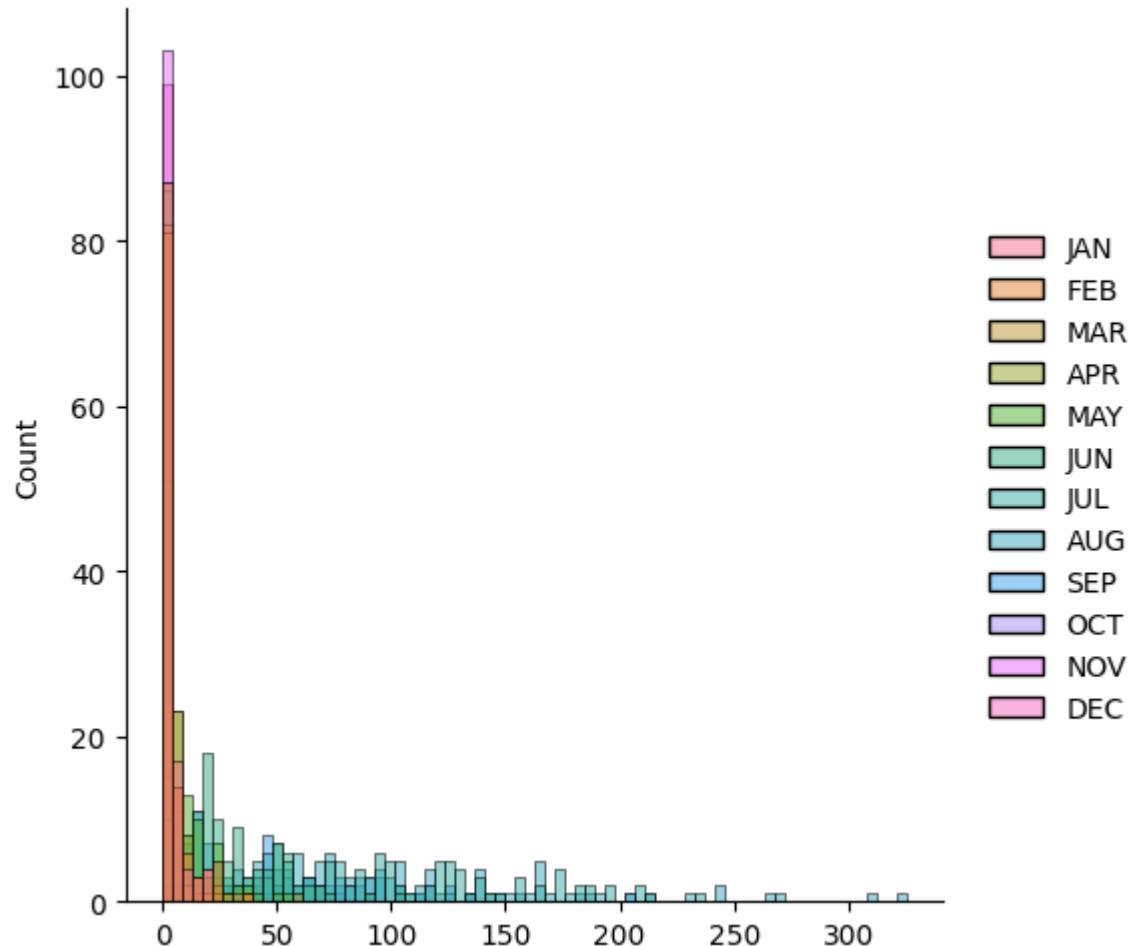
```
Out[154]: <Axes: xlabel='YEAR'>
```



```
In [155]: sns.displot(y)
```

```
C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages
\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

```
Out[155]: <seaborn.axisgrid.FacetGrid at 0x26dfe72a590>
```



SOUTH INTERIOR KARNATAKA

In [156]:

```
x=df[df[ "SUBDIVISION" ]=="SOUTH INTERIOR KARNATAKA"]
x
```

Out[156]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
		3772	3772	SOUTH INTERIOR KARNATAKA	1901	4.9	31.8	3.0	32.7	109.6	106.0	210.0	109.2	140.8
		3773	3773	SOUTH INTERIOR KARNATAKA	1902	1.9	0.5	6.7	42.6	97.7	91.7	210.0	82.1	138.4
		3774	3774	SOUTH INTERIOR KARNATAKA	1903	0.3	0.0	1.1	11.6	125.1	129.7	284.4	155.7	197.1
		3775	3775	SOUTH INTERIOR KARNATAKA	1904	1.0	0.5	5.2	43.5	144.7	167.9	197.1	73.2	89.6
		3776	3776	SOUTH INTERIOR KARNATAKA	1905	1.7	7.9	14.2	23.6	118.6	95.9	148.4	140.6	43.1
	
		3882	3882	SOUTH INTERIOR KARNATAKA	2011	2.1	12.4	12.4	80.2	83.5	177.1	202.4	199.5	111.2
		3883	3883	SOUTH INTERIOR KARNATAKA	2012	4.6	5.5	8.1	99.0	45.6	81.8	144.7	236.5	100.6
		3884	3884	SOUTH INTERIOR KARNATAKA	2013	0.5	10.1	11.7	34.6	95.6	176.2	307.4	151.7	191.8
		3885	3885	SOUTH INTERIOR KARNATAKA	2014	0.4	2.4	17.7	46.7	130.5	106.8	271.6	254.6	161.6
		3886	3886	SOUTH INTERIOR KARNATAKA	2015	1.7	0.2	24.4	80.5	125.3	218.7	112.0	136.6	164.5

115 rows × 20 columns



In [157]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[157]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNU
3772	1901	4.9	31.8	3.0	32.7	109.6	106.0	210.0	109.2	140.8	170.1	72.5	12.3	100
3773	1902	1.9	0.5	6.7	42.6	97.7	91.7	210.0	82.1	138.4	219.1	44.6	84.9	102
3774	1903	0.3	0.0	1.1	11.6	125.1	129.7	284.4	155.7	197.1	154.2	186.6	24.1	126
3775	1904	1.0	0.5	5.2	43.5	144.7	167.9	197.1	73.2	89.6	120.4	2.5	0.3	84
3776	1905	1.7	7.9	14.2	23.6	118.6	95.9	148.4	140.6	43.1	142.8	22.4	0.3	75
...
3882	2011	2.1	12.4	12.4	80.2	83.5	177.1	202.4	199.5	111.2	144.8	56.7	5.0	108
3883	2012	4.6	5.5	8.1	99.0	45.6	81.8	144.7	236.5	100.6	62.8	82.6	6.2	87
3884	2013	0.5	10.1	11.7	34.6	95.6	176.2	307.4	151.7	191.8	103.7	24.9	2.4	111
3885	2014	0.4	2.4	17.7	46.7	130.5	106.8	271.6	254.6	161.6	152.9	20.2	18.7	118
3886	2015	1.7	0.2	24.4	80.5	125.3	218.7	112.0	136.6	164.5	106.1	138.1	4.4	111

115 rows × 14 columns

In [158]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

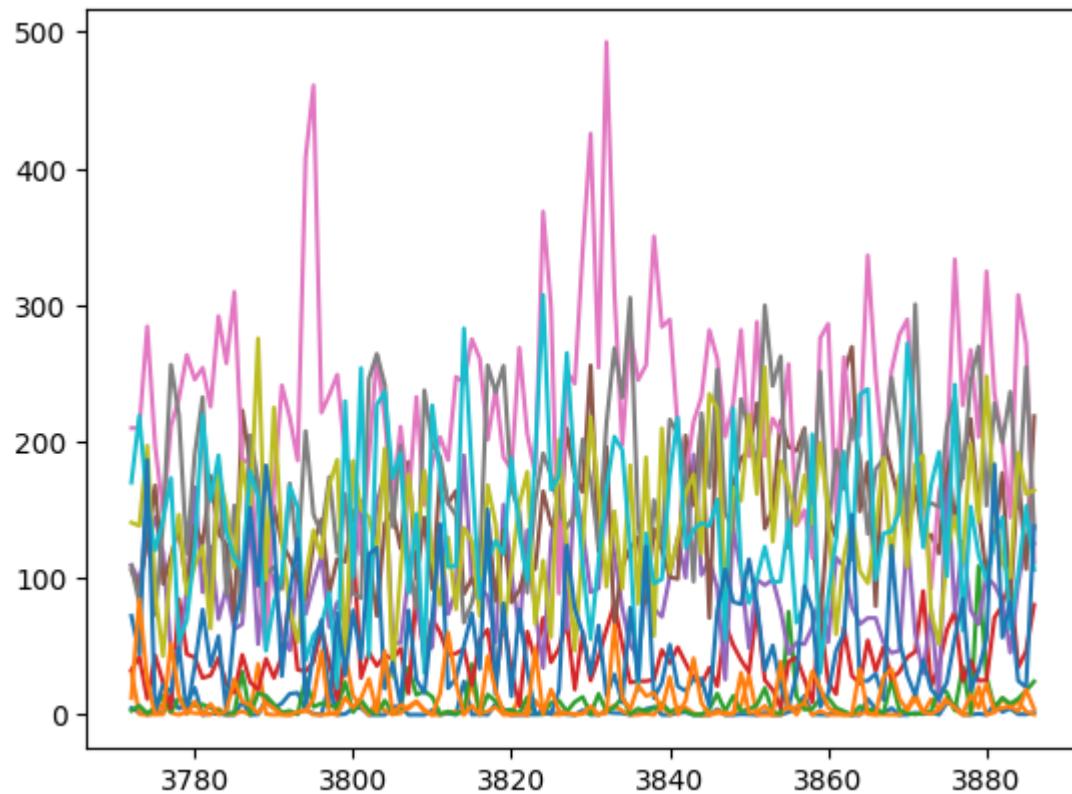
Out[158]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3772	4.9	31.8	3.0	32.7	109.6	106.0	210.0	109.2	140.8	170.1	72.5	12.3
3773	1.9	0.5	6.7	42.6	97.7	91.7	210.0	82.1	138.4	219.1	44.6	84.9
3774	0.3	0.0	1.1	11.6	125.1	129.7	284.4	155.7	197.1	154.2	186.6	24.1
3775	1.0	0.5	5.2	43.5	144.7	167.9	197.1	73.2	89.6	120.4	2.5	0.3
3776	1.7	7.9	14.2	23.6	118.6	95.9	148.4	140.6	43.1	142.8	22.4	0.3
...
3882	2.1	12.4	12.4	80.2	83.5	177.1	202.4	199.5	111.2	144.8	56.7	5.0
3883	4.6	5.5	8.1	99.0	45.6	81.8	144.7	236.5	100.6	62.8	82.6	6.2
3884	0.5	10.1	11.7	34.6	95.6	176.2	307.4	151.7	191.8	103.7	24.9	2.4
3885	0.4	2.4	17.7	46.7	130.5	106.8	271.6	254.6	161.6	152.9	20.2	18.7
3886	1.7	0.2	24.4	80.5	125.3	218.7	112.0	136.6	164.5	106.1	138.1	4.4

115 rows × 12 columns

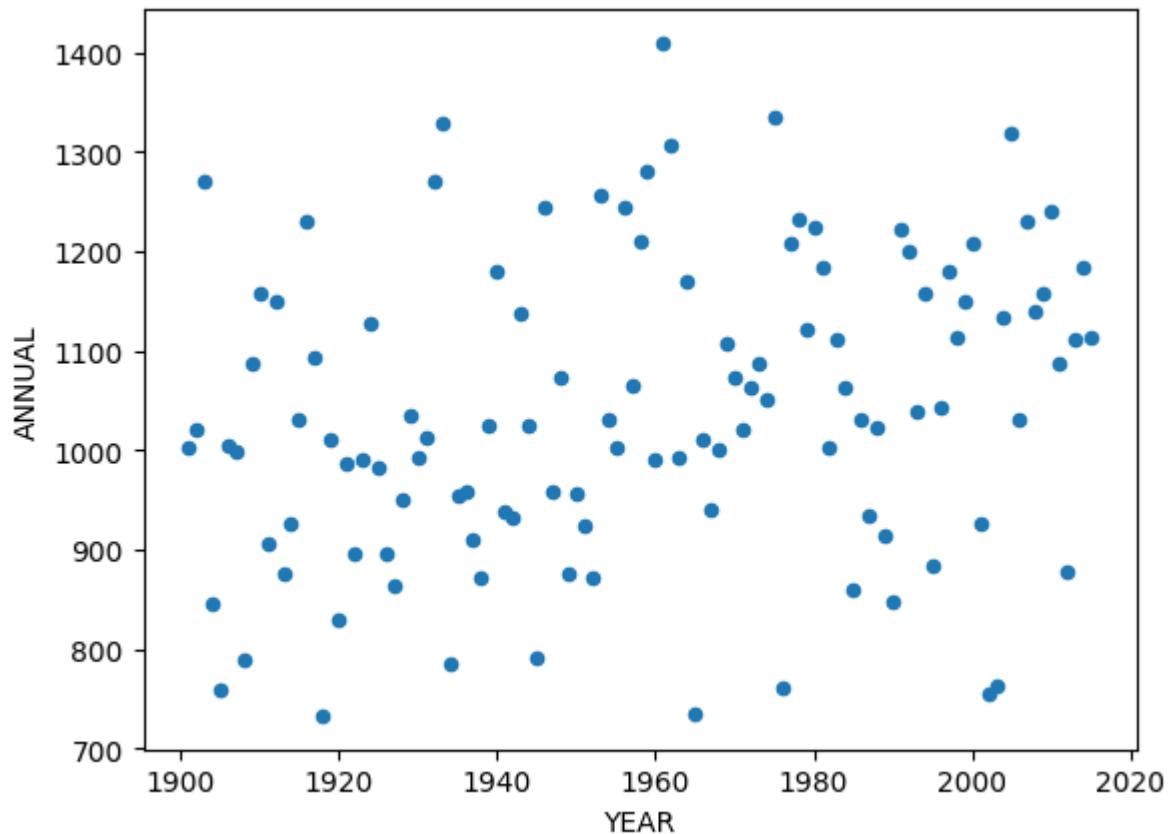
```
In [159]: plt.plot(y)
```

```
Out[159]: [
```



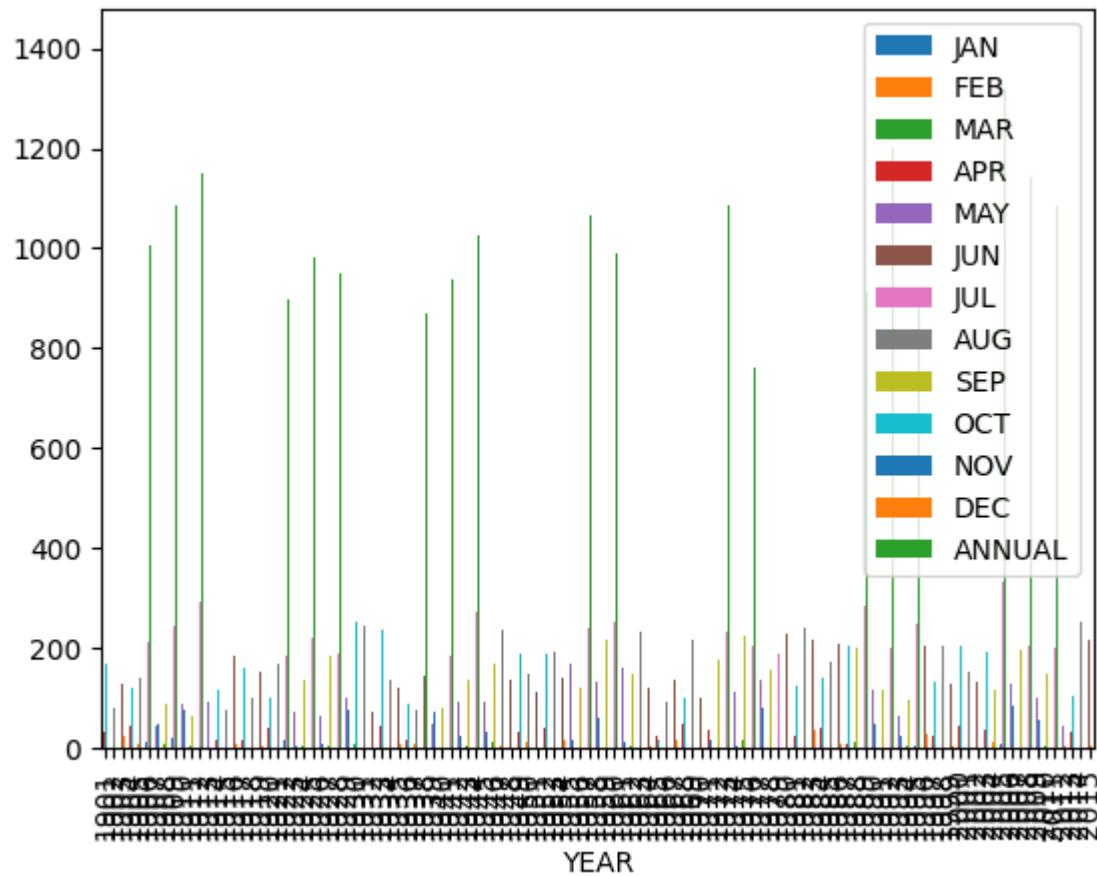
```
In [160]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[160]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



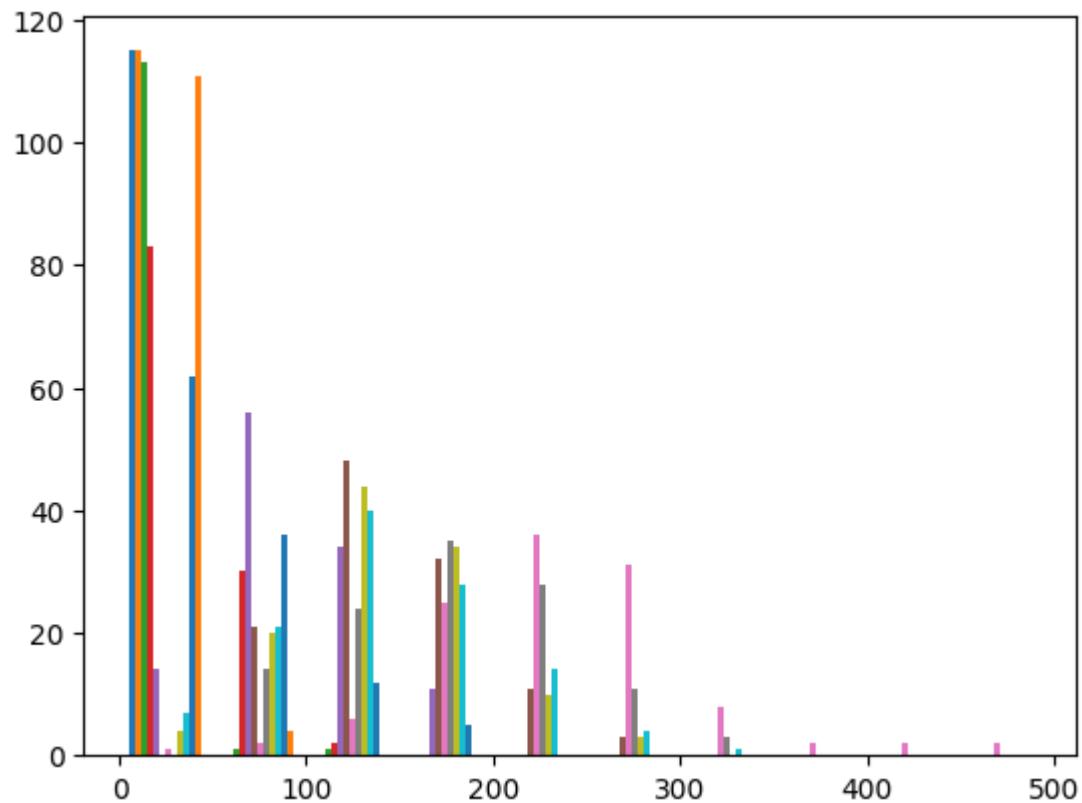
```
In [161]: x.plot.bar(x="YEAR")
```

```
Out[161]: <Axes: xlabel='YEAR'>
```



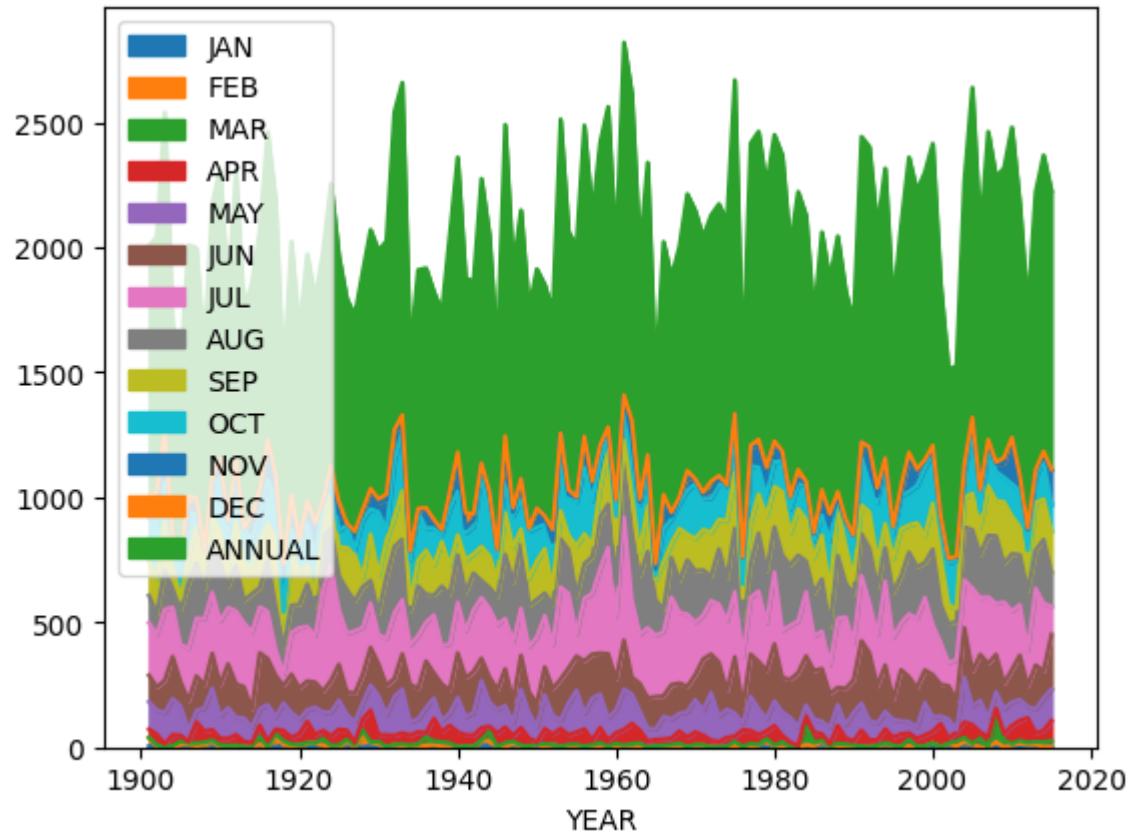
```
In [162]: plt.hist(y)
```

```
Out[162]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  1.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 83.,  30.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 14.,  56.,  34.,  11.,  0.,  0.,  0.,  0.,  0.,  0.],
       [  0.,  21.,  48.,  32.,  11.,  3.,  0.,  0.,  0.,  0.],
       [  1.,  2.,  6.,  25.,  36.,  31.,  8.,  2.,  2.,  2.],
       [  0.,  14.,  24.,  35.,  28.,  11.,  3.,  0.,  0.,  0.],
       [  4.,  20.,  44.,  34.,  10.,  3.,  0.,  0.,  0.,  0.],
       [  7.,  21.,  40.,  28.,  14.,  4.,  1.,  0.,  0.,  0.],
       [ 62.,  36.,  12.,  5.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,  4.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  49.27,  98.54, 147.81, 197.08, 246.35, 295.62, 344.89,
       394.16, 443.43, 492.7 ]),
<a list of 12 BarContainer objects>)
```



```
In [163]: x.plot.area(x="YEAR")
```

```
Out[163]: <Axes: xlabel='YEAR'>
```



JAMMU & KASHMIR

```
In [221]: x=df[df[ "SUBDIVISION" ]=="JAMMU & KASHMIR"]  
x
```

Out[221]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1702	1702	JAMMU & KASHMIR	1901	66.4	69.3	69.6	132.2	105.8	53.4	171.7	181.3	101.8	111.1	111.1	111.1
1703	1703	JAMMU & KASHMIR	1902	6.5	9.7	91.3	100.5	70.7	113.3	108.4	136.9	62.2	111.1	111.1	111.1
1704	1704	JAMMU & KASHMIR	1903	96.2	21.5	238.6	58.7	57.3	18.9	332.5	218.6	176.9	111.1	111.1	111.1
1705	1705	JAMMU & KASHMIR	1904	110.6	17.3	145.2	64.5	67.8	25.9	182.3	132.2	62.3	111.1	111.1	111.1
1706	1706	JAMMU & KASHMIR	1905	146.7	76.3	161.4	71.7	65.2	43.3	145.2	111.5	239.7	111.1	111.1	111.1
...
1812	1812	JAMMU & KASHMIR	2011	43.4	211.6	97.8	89.0	32.4	72.5	81.6	131.2	72.0	111.1	111.1	111.1
1813	1813	JAMMU & KASHMIR	2012	150.9	95.8	45.2	86.6	48.9	32.6	118.8	264.9	106.7	111.1	111.1	111.1
1814	1814	JAMMU & KASHMIR	2013	52.2	136.4	41.9	47.4	47.4	80.5	125.1	219.1	41.2	111.1	111.1	111.1
1815	1815	JAMMU & KASHMIR	2014	75.8	64.0	153.1	76.1	52.7	25.3	100.5	134.6	362.8	111.1	111.1	111.1
1816	1816	JAMMU & KASHMIR	2015	27.9	187.2	341.4	173.3	64.6	121.4	233.2	129.2	130.2	111.1	111.1	111.1

114 rows × 20 columns



In [222]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[222]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1702	1901	66.4	69.3	69.6	132.2	105.8	53.4	171.7	181.3	101.8	24.1	0.0	4.4	1
1703	1902	6.5	9.7	91.3	100.5	70.7	113.3	108.4	136.9	62.2	15.1	44.0	1.8	1
1704	1903	96.2	21.5	238.6	58.7	57.3	18.9	332.5	218.6	176.9	10.7	15.0	41.8	1
1705	1904	110.6	17.3	145.2	64.5	67.8	25.9	182.3	132.2	62.3	50.0	24.8	99.2	1
1706	1905	146.7	76.3	161.4	71.7	65.2	43.3	145.2	111.5	239.7	5.8	0.6	90.2	1
...
1812	2011	43.4	211.6	97.8	89.0	32.4	72.5	81.6	131.2	72.0	19.4	12.9	23.8	1
1813	2012	150.9	95.8	45.2	86.6	48.9	32.6	118.8	264.9	106.7	15.7	10.8	57.8	1
1814	2013	52.2	136.4	41.9	47.4	47.4	80.5	125.1	219.1	41.2	34.4	13.4	20.3	1
1815	2014	75.8	64.0	153.1	76.1	52.7	25.3	100.5	134.6	362.8	32.2	14.1	2.3	1
1816	2015	27.9	187.2	341.4	173.3	64.6	121.4	233.2	129.2	130.2	87.1	38.1	39.3	1

114 rows × 14 columns



In [223]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

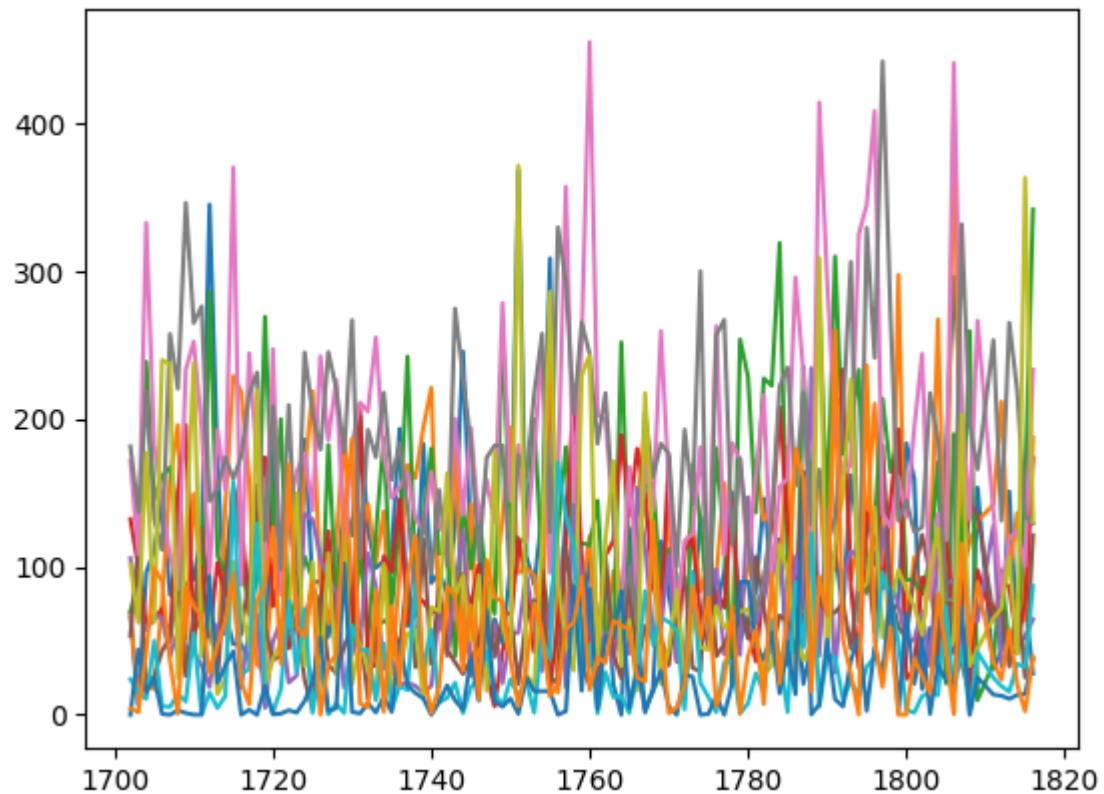
Out[223]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1702	66.4	69.3	69.6	132.2	105.8	53.4	171.7	181.3	101.8	24.1	0.0	4.4
1703	6.5	9.7	91.3	100.5	70.7	113.3	108.4	136.9	62.2	15.1	44.0	1.8
1704	96.2	21.5	238.6	58.7	57.3	18.9	332.5	218.6	176.9	10.7	15.0	41.8
1705	110.6	17.3	145.2	64.5	67.8	25.9	182.3	132.2	62.3	50.0	24.8	99.2
1706	146.7	76.3	161.4	71.7	65.2	43.3	145.2	111.5	239.7	5.8	0.6	90.2
...
1812	43.4	211.6	97.8	89.0	32.4	72.5	81.6	131.2	72.0	19.4	12.9	23.8
1813	150.9	95.8	45.2	86.6	48.9	32.6	118.8	264.9	106.7	15.7	10.8	57.8
1814	52.2	136.4	41.9	47.4	47.4	80.5	125.1	219.1	41.2	34.4	13.4	20.3
1815	75.8	64.0	153.1	76.1	52.7	25.3	100.5	134.6	362.8	32.2	14.1	2.3
1816	27.9	187.2	341.4	173.3	64.6	121.4	233.2	129.2	130.2	87.1	38.1	39.3

114 rows × 12 columns

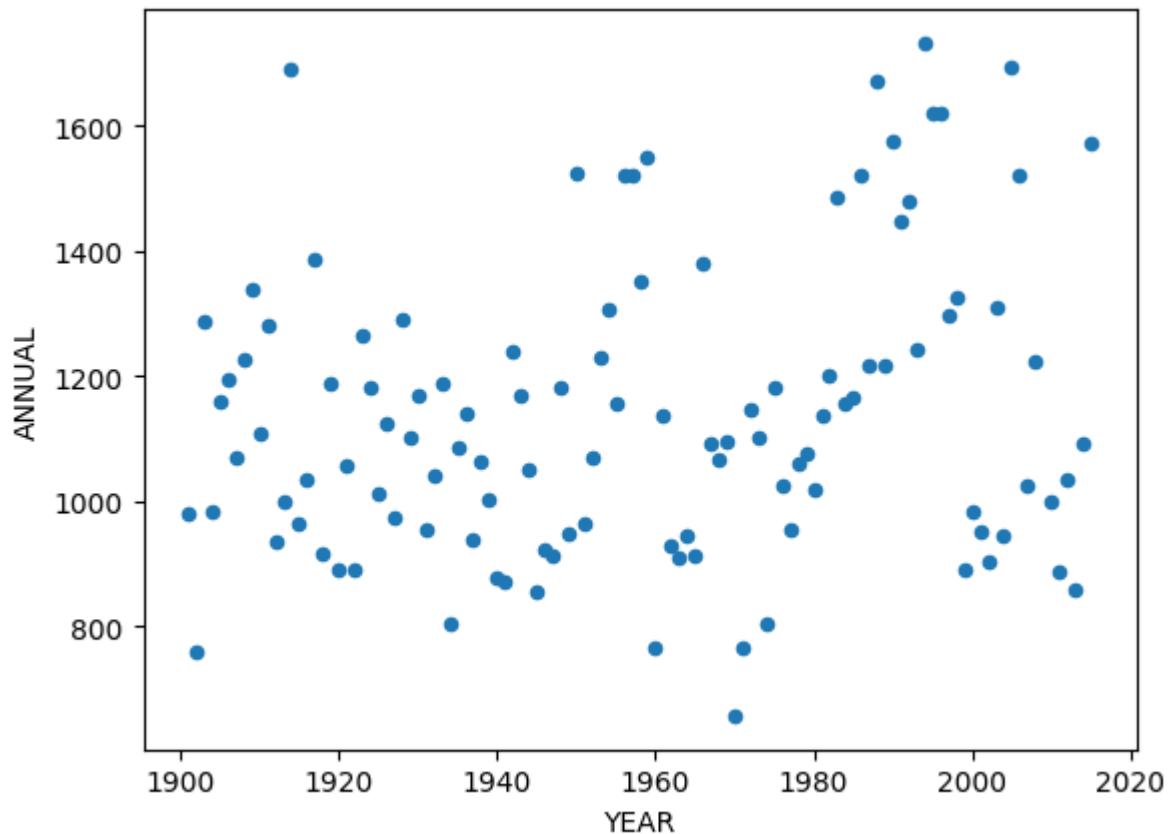
```
In [224]: plt.plot(y)
```

```
Out[224]: [
```



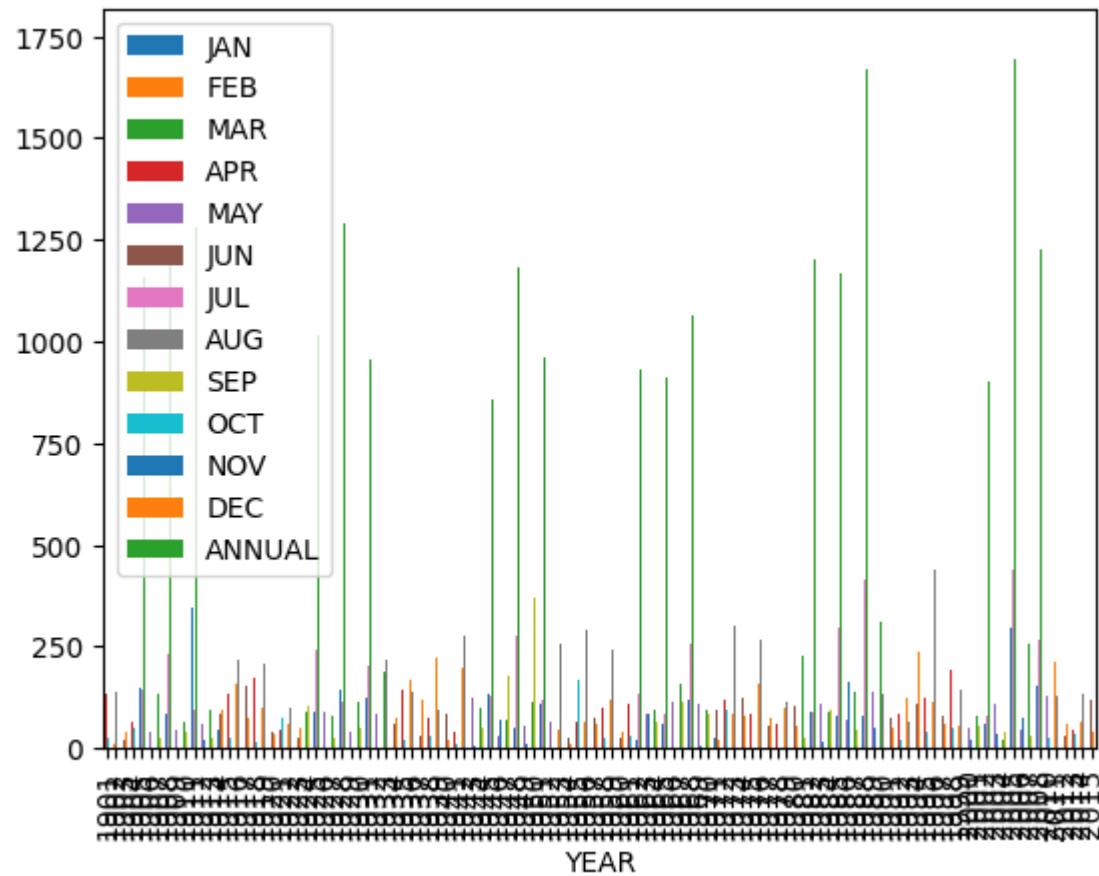
```
In [225]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[225]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



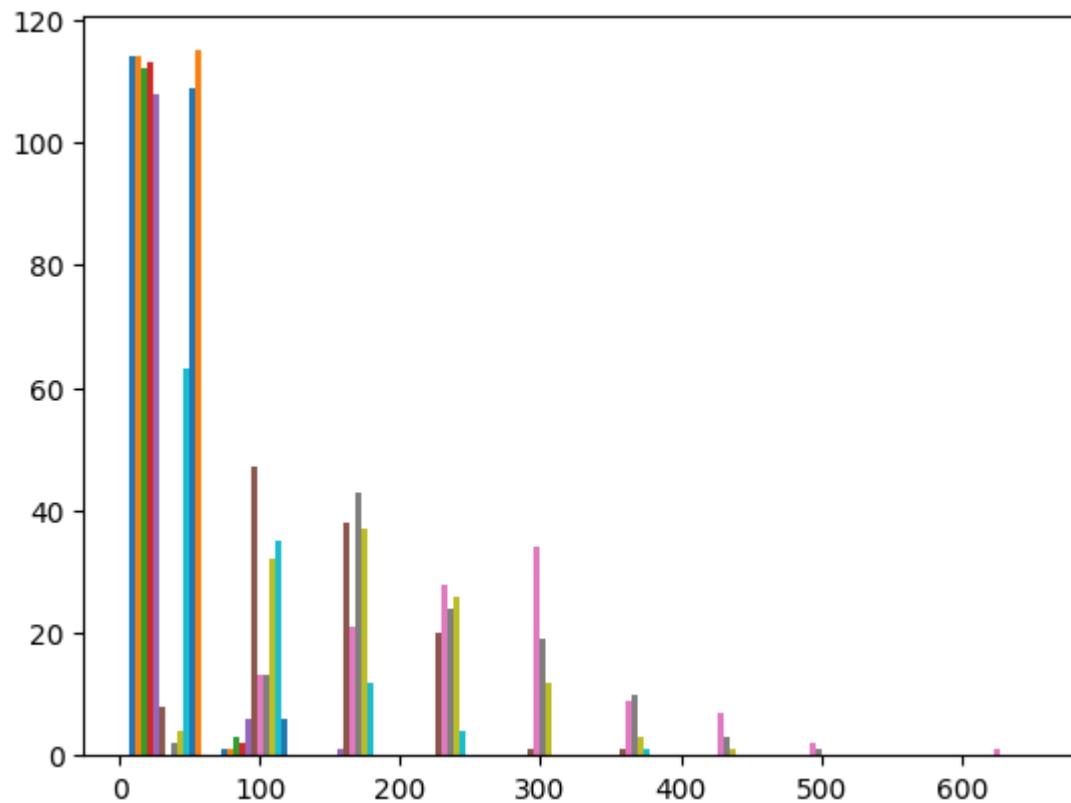
```
In [226]: x.plot.bar(x="YEAR")
```

```
Out[226]: <Axes: xlabel='YEAR'>
```



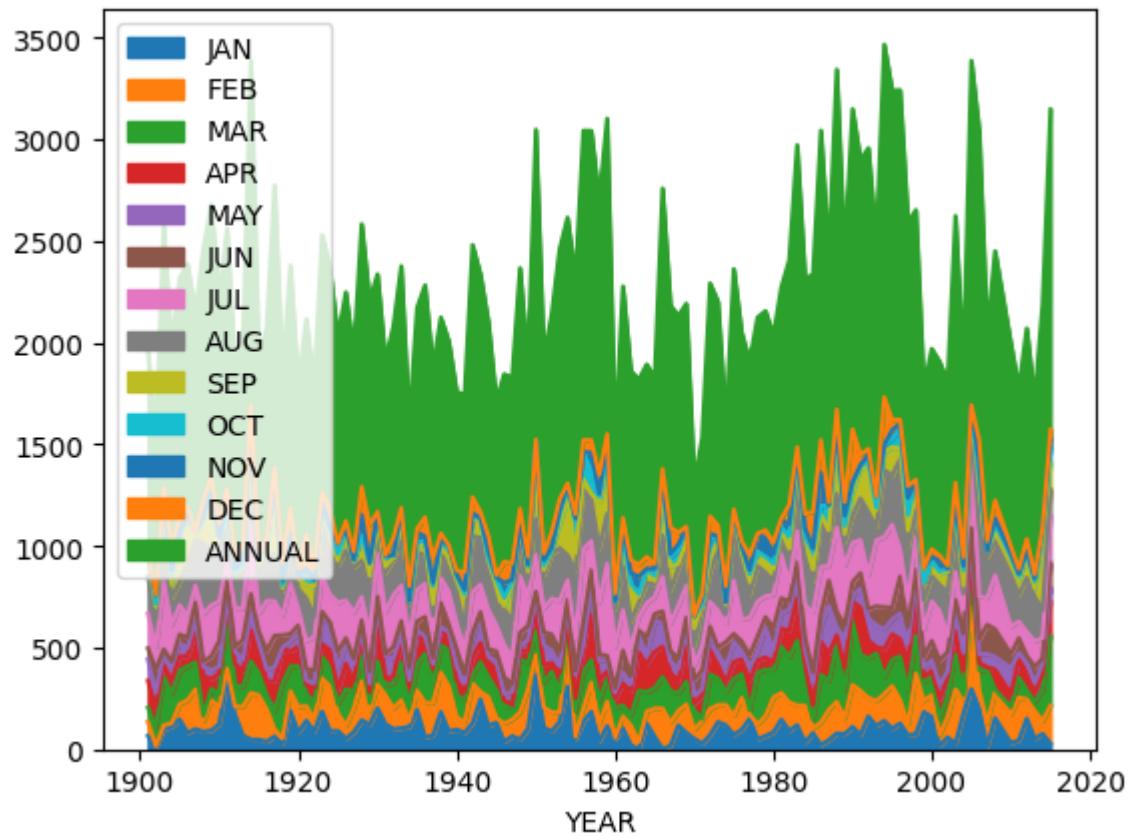
```
In [170]: plt.hist(y)
```

```
Out[170]: (array([[114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [112., 3., 0., 0., 0., 0., 0., 0., 0., 0.],
       [113., 2., 0., 0., 0., 0., 0., 0., 0., 0.],
       [108., 6., 1., 0., 0., 0., 0., 0., 0., 0.],
       [ 8., 47., 38., 20., 1., 1., 0., 0., 0., 0.],
       [ 0., 13., 21., 28., 34., 9., 7., 2., 0., 1.],
       [ 2., 13., 43., 24., 19., 10., 3., 1., 0., 0.],
       [ 4., 32., 37., 26., 12., 3., 1., 0., 0., 0.],
       [ 63., 35., 12., 4., 0., 1., 0., 0., 0., 0.],
       [109., 6., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.]]),
array([ 0. , 65.62, 131.24, 196.86, 262.48, 328.1 , 393.72, 459.34,
      524.96, 590.58, 656.2 ]),
<a list of 12 BarContainer objects>)
```



In [227]: `x.plot.area(x="YEAR")`

Out[227]: <Axes: xlabel='YEAR'>



HIMACHAL PRADESH

In [228]:

```
x=df[df[ "SUBDIVISION" ]=="HIMACHAL PRADESH"]
```

```
x
```

Out[228]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1587	1587	HIMACHAL PRADESH	1901	137.8	174.5	75.0	19.2	89.6	32.7	280.5	459.7	53.0	1	1	1
1588	1588	HIMACHAL PRADESH	1902	6.5	27.0	104.4	76.2	61.3	78.8	258.6	199.3	113.4	2	2	2
1589	1589	HIMACHAL PRADESH	1903	76.5	21.4	213.7	25.4	54.7	32.2	157.7	256.5	107.9	1	1	1
1590	1590	HIMACHAL PRADESH	1904	79.3	22.4	131.7	48.0	90.3	33.1	241.1	184.3	56.4	5	5	5
1591	1591	HIMACHAL PRADESH	1905	81.3	76.8	160.2	39.3	50.4	43.6	191.1	132.8	119.1	1	1	1
...
1697	1697	HIMACHAL PRADESH	2011	43.9	97.4	49.7	62.4	45.1	118.3	177.7	380.2	120.3	1	1	1
1698	1698	HIMACHAL PRADESH	2012	92.3	51.3	28.4	55.9	9.4	31.1	241.5	280.6	133.1	1	1	1
1699	1699	HIMACHAL PRADESH	2013	79.9	182.6	76.6	28.9	32.6	233.6	208.8	240.0	65.8	2	2	2
1700	1700	HIMACHAL PRADESH	2014	69.6	124.9	125.2	60.6	68.9	51.7	203.6	146.7	84.6	19	19	19
1701	1701	HIMACHAL PRADESH	2015	67.2	156.6	192.5	84.9	45.0	85.8	249.9	195.9	75.5	1	1	1

115 rows × 20 columns



In [229]:

```
x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)
```

Out[229]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1587	1901	137.8	174.5	75.0	19.2	89.6	32.7	280.5	459.7	53.0	3.9	0.0	19.1	134
1588	1902	6.5	27.0	104.4	76.2	61.3	78.8	258.6	199.3	113.4	23.6	2.5	0.0	95
1589	1903	76.5	21.4	213.7	25.4	54.7	32.2	157.7	256.5	107.9	5.8	0.2	41.4	99
1590	1904	79.3	22.4	131.7	48.0	90.3	33.1	241.1	184.3	56.4	51.6	17.3	32.0	98
1591	1905	81.3	76.8	160.2	39.3	50.4	43.6	191.1	132.8	119.1	0.3	0.9	34.4	93
...
1697	2011	43.9	97.4	49.7	62.4	45.1	118.3	177.7	380.2	120.3	6.0	0.3	6.9	110
1698	2012	92.3	51.3	28.4	55.9	9.4	31.1	241.5	280.6	133.1	3.1	3.2	21.8	95
1699	2013	79.9	182.6	76.6	28.9	32.6	233.6	208.8	240.0	65.8	21.8	16.6	24.8	121
1700	2014	69.6	124.9	125.2	60.6	68.9	51.7	203.6	146.7	84.6	19.3	4.5	49.3	100
1701	2015	67.2	156.6	192.5	84.9	45.0	85.8	249.9	195.9	75.5	17.7	14.5	25.0	121

115 rows × 14 columns



In [230]:

```
y=x.drop(["YEAR","ANNUAL"],axis=1)
```

y

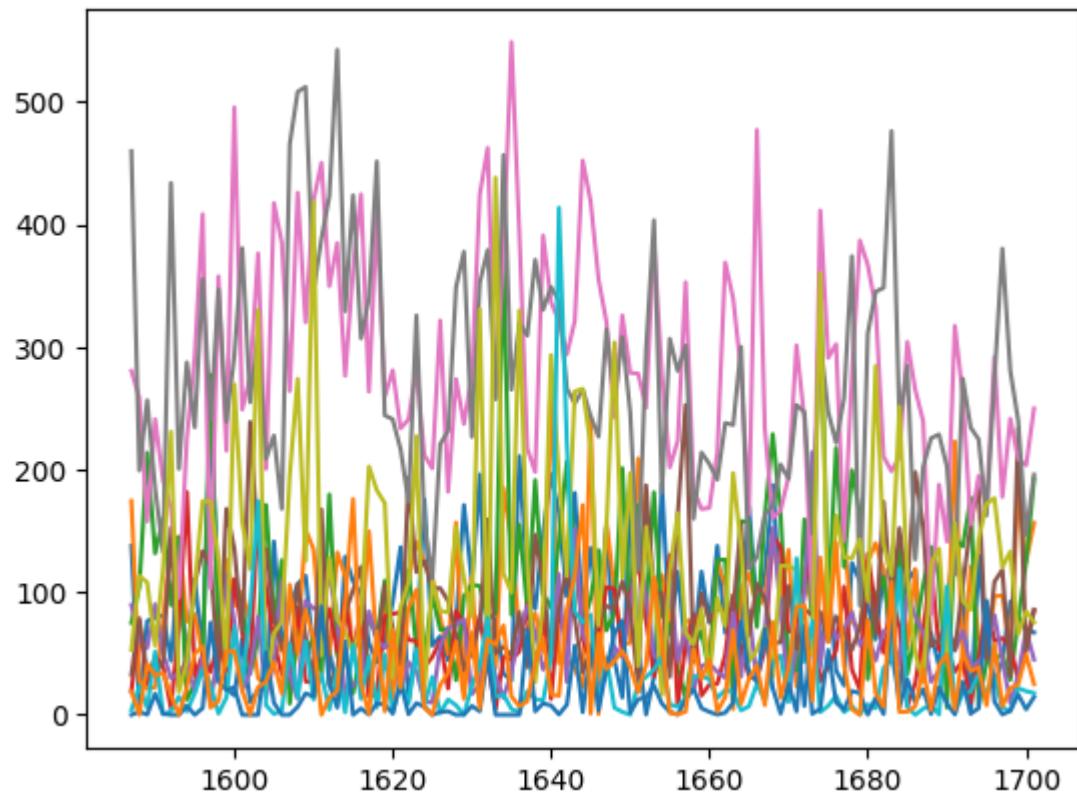
Out[230]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1587	137.8	174.5	75.0	19.2	89.6	32.7	280.5	459.7	53.0	3.9	0.0	19.1
1588	6.5	27.0	104.4	76.2	61.3	78.8	258.6	199.3	113.4	23.6	2.5	0.0
1589	76.5	21.4	213.7	25.4	54.7	32.2	157.7	256.5	107.9	5.8	0.2	41.4
1590	79.3	22.4	131.7	48.0	90.3	33.1	241.1	184.3	56.4	51.6	17.3	32.0
1591	81.3	76.8	160.2	39.3	50.4	43.6	191.1	132.8	119.1	0.3	0.9	34.4
...
1697	43.9	97.4	49.7	62.4	45.1	118.3	177.7	380.2	120.3	6.0	0.3	6.9
1698	92.3	51.3	28.4	55.9	9.4	31.1	241.5	280.6	133.1	3.1	3.2	21.8
1699	79.9	182.6	76.6	28.9	32.6	233.6	208.8	240.0	65.8	21.8	16.6	24.8
1700	69.6	124.9	125.2	60.6	68.9	51.7	203.6	146.7	84.6	19.3	4.5	49.3
1701	67.2	156.6	192.5	84.9	45.0	85.8	249.9	195.9	75.5	17.7	14.5	25.0

115 rows × 12 columns

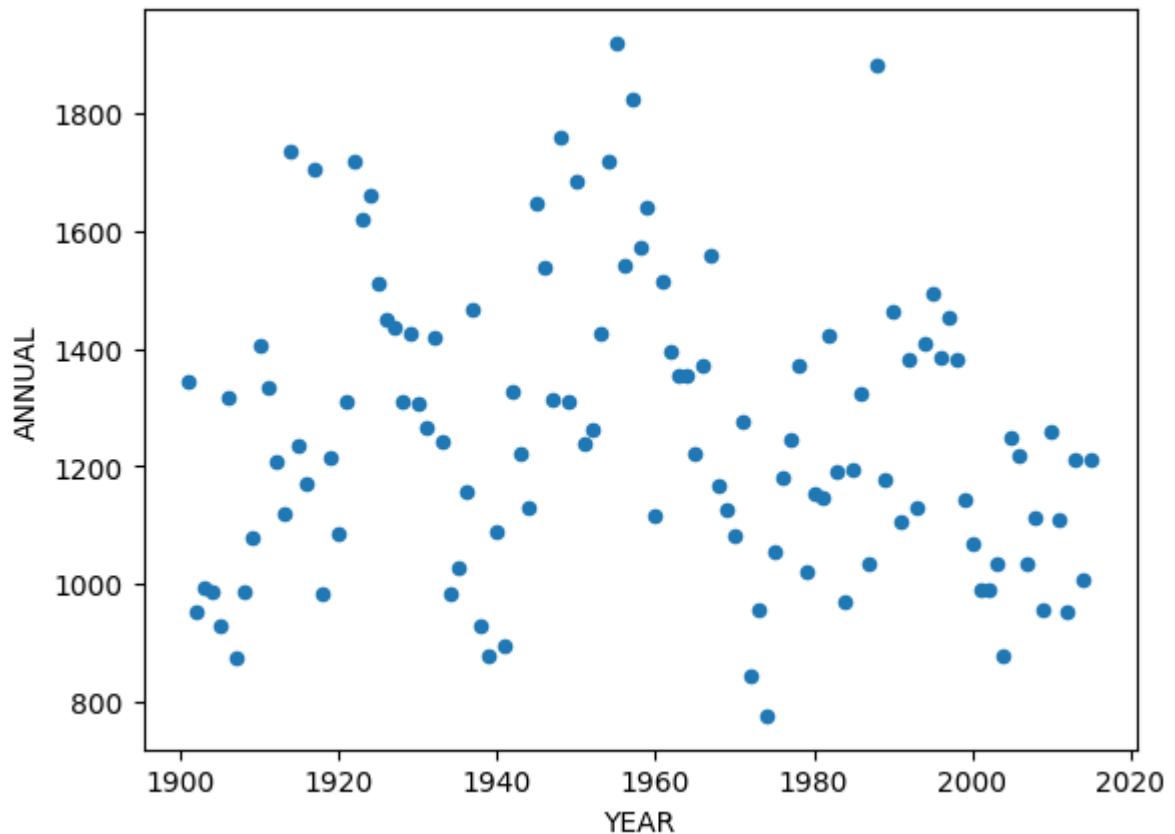
```
In [231]: plt.plot(y)
```

```
Out[231]: [
```



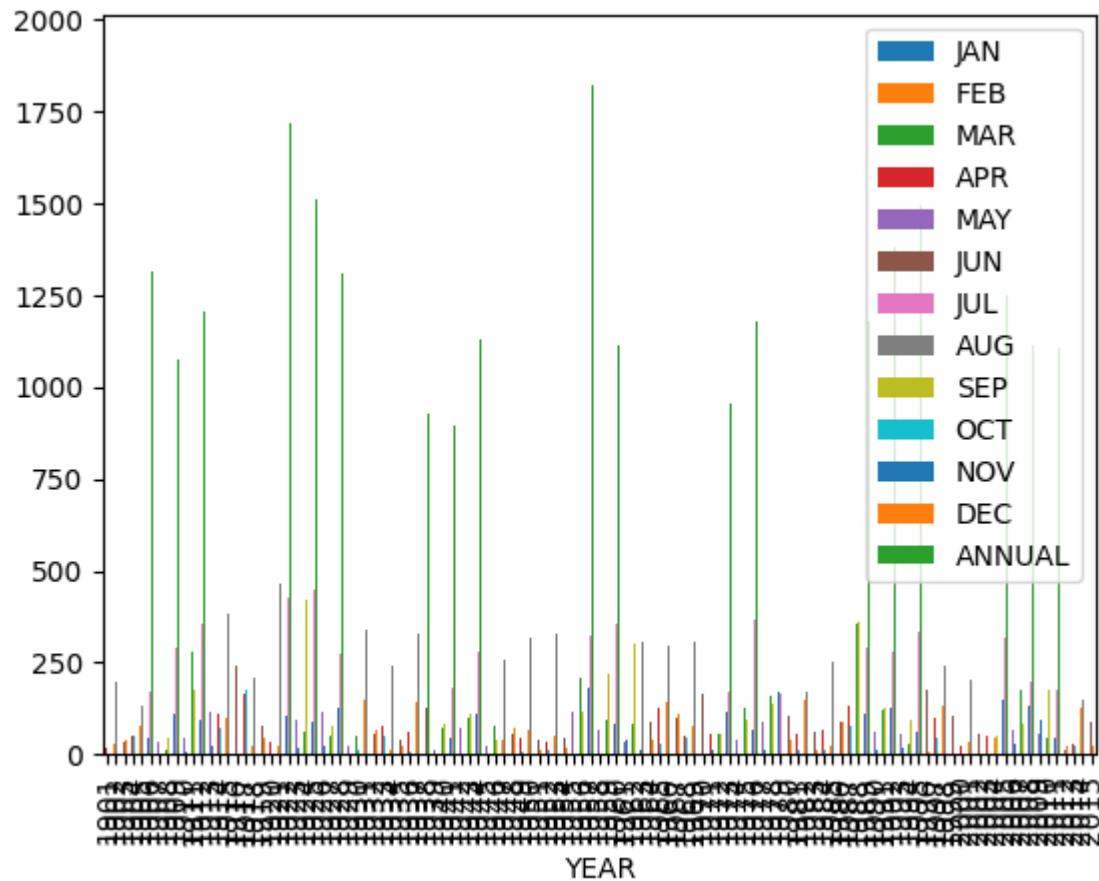
```
In [232]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[232]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



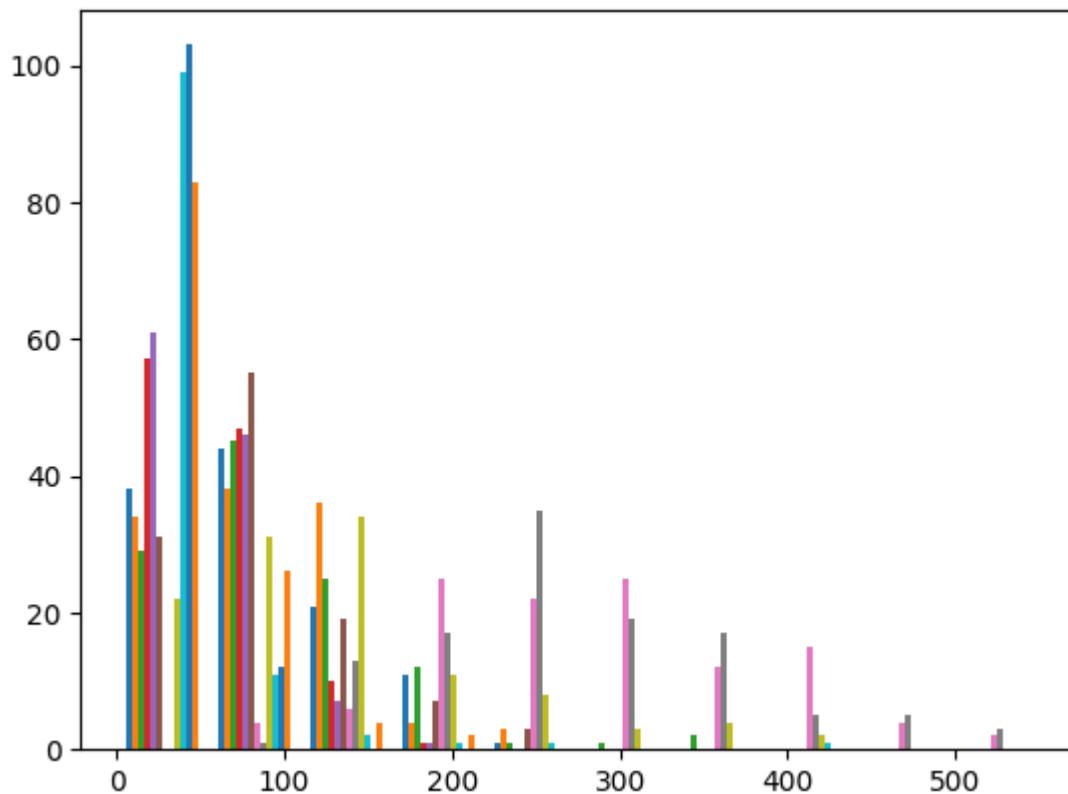
In [233]: `x.plot.bar(x="YEAR")`

Out[233]: <Axes: xlabel='YEAR'>



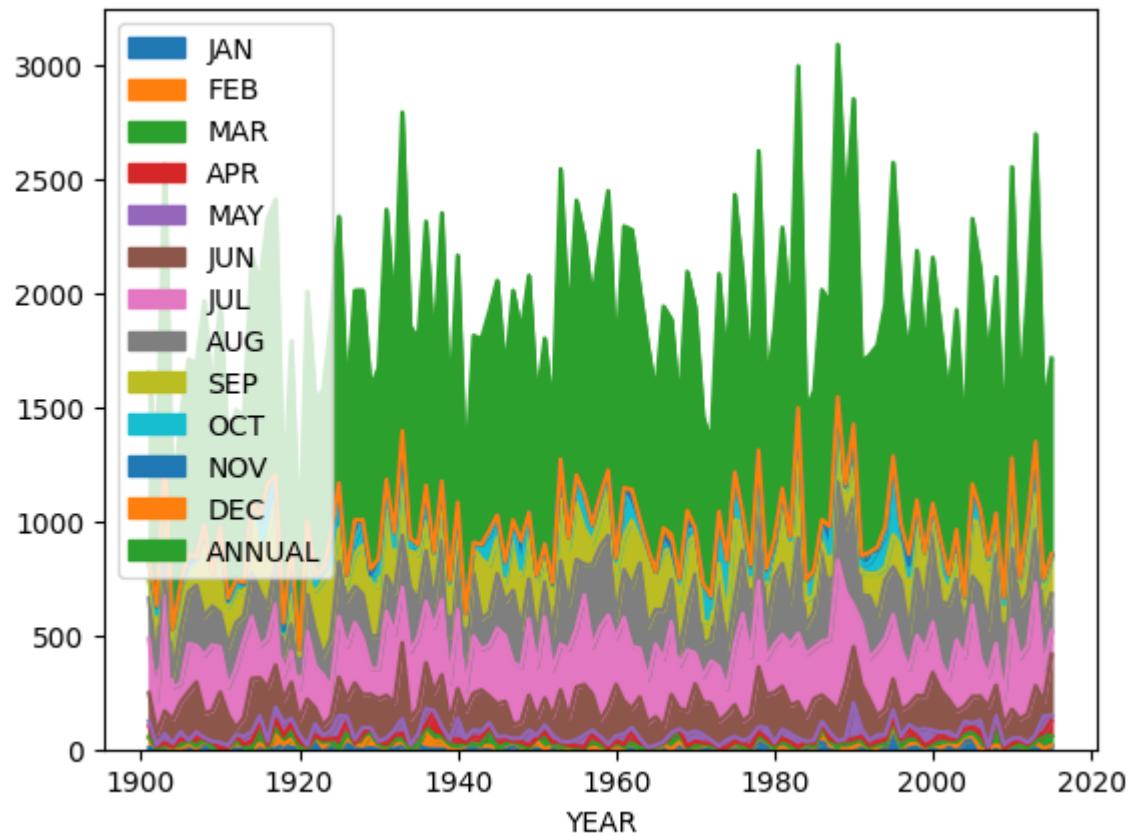
```
In [234]: plt.hist(y)
```

```
Out[234]: (array([[ 38.,  44.,  21.,  11.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 34.,  38.,  36.,  4.,  3.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 29.,  45.,  25.,  12.,  1.,  1.,  2.,  0.,  0.,  0.,  0.],
       [ 57.,  47.,  10.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 61.,  46.,  7.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 31.,  55.,  19.,  7.,  3.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 0.,  4.,  6.,  25.,  22.,  25.,  12.,  15.,  4.,  2.],
       [ 0.,  1.,  13.,  17.,  35.,  19.,  17.,  5.,  5.,  3.],
       [ 22.,  31.,  34.,  11.,  8.,  3.,  4.,  2.,  0.,  0.],
       [ 99.,  11.,  2.,  1.,  1.,  0.,  0.,  1.,  0.,  0.],
       [103.,  12.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 83.,  26.,  4.,  2.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  54.87, 109.74, 164.61, 219.48, 274.35, 329.22, 384.09,
       438.96, 493.83, 548.7 ]),
<a list of 12 BarContainer objects>)
```



```
In [179]: x.plot.area(x="YEAR")
```

```
Out[179]: <Axes: xlabel='YEAR'>
```



NORTH INTERIOR KARNATAKA

In [180]:

```
x=df[df[ "SUBDIVISION" ]=="NORTH INTERIOR KARNATAKA"]
x
```

Out[180]:

		index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
		3657	NORTH INTERIOR KARNATAKA	1901	3.5	18.8	7.1	67.2	65.5	120.5	151.9	115.1	128.8	80.0
		3658	NORTH INTERIOR KARNATAKA	1902	0.0	0.0	0.3	22.5	34.4	111.3	83.2	78.1	146.7	118.0
		3659	NORTH INTERIOR KARNATAKA	1903	3.5	0.0	0.1	6.9	53.4	102.8	209.4	146.4	189.3	166.4
		3660	NORTH INTERIOR KARNATAKA	1904	0.2	0.3	8.5	11.0	46.3	120.6	91.6	48.5	165.1	86.0
		3661	NORTH INTERIOR KARNATAKA	1905	0.0	6.0	2.6	16.0	51.2	99.6	60.1	139.2	42.2	85.0
...
		3767	NORTH INTERIOR KARNATAKA	2011	0.5	7.2	7.2	41.2	46.8	101.3	150.8	152.0	69.0	73.4
		3768	NORTH INTERIOR KARNATAKA	2012	28.5	6.2	0.4	35.4	19.5	60.0	114.5	105.5	79.2	85.1
		3769	NORTH INTERIOR KARNATAKA	2013	1.2	6.1	3.0	25.4	47.4	99.4	160.7	73.9	201.0	101.0
		3770	NORTH INTERIOR KARNATAKA	2014	0.0	6.1	29.2	26.4	93.0	50.4	136.8	205.2	90.2	80.1
		3771	NORTH INTERIOR KARNATAKA	2015	2.4	0.0	27.5	50.8	45.3	89.6	38.5	78.4	150.8	61.1

115 rows × 20 columns



In [181]:

```
x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)
```

Out[181]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
3657	1901	3.5	18.8	7.1	67.2	65.5	120.5	151.9	115.1	128.8	80.0	13.6	0.9	773
3658	1902	0.0	0.0	0.3	22.5	34.4	111.3	83.2	78.1	146.7	118.8	35.7	85.1	716
3659	1903	3.5	0.0	0.1	6.9	53.4	102.8	209.4	146.4	189.3	166.4	34.3	16.0	928
3660	1904	0.2	0.3	8.5	11.0	46.3	120.6	91.6	48.5	165.1	86.5	0.0	0.0	578
3661	1905	0.0	6.0	2.6	16.0	51.2	99.6	60.1	139.2	42.2	85.0	4.4	0.0	506
...
3767	2011	0.5	7.2	7.2	41.2	46.8	101.3	150.8	152.0	69.0	73.4	5.7	0.0	655
3768	2012	28.5	6.2	0.4	35.4	19.5	60.0	114.5	105.5	79.2	85.2	46.5	2.9	583
3769	2013	1.2	6.1	3.0	25.4	47.4	99.4	160.7	73.9	201.0	101.0	4.2	0.1	723
3770	2014	0.0	6.1	29.2	26.4	93.0	50.4	136.8	205.2	90.2	80.3	25.0	14.1	756
3771	2015	2.4	0.0	27.5	50.8	45.3	89.6	38.5	78.4	150.8	61.2	5.7	1.7	551

115 rows × 14 columns



In [182]:

```
y=x.drop(["YEAR","ANNUAL"],axis=1)
```

y

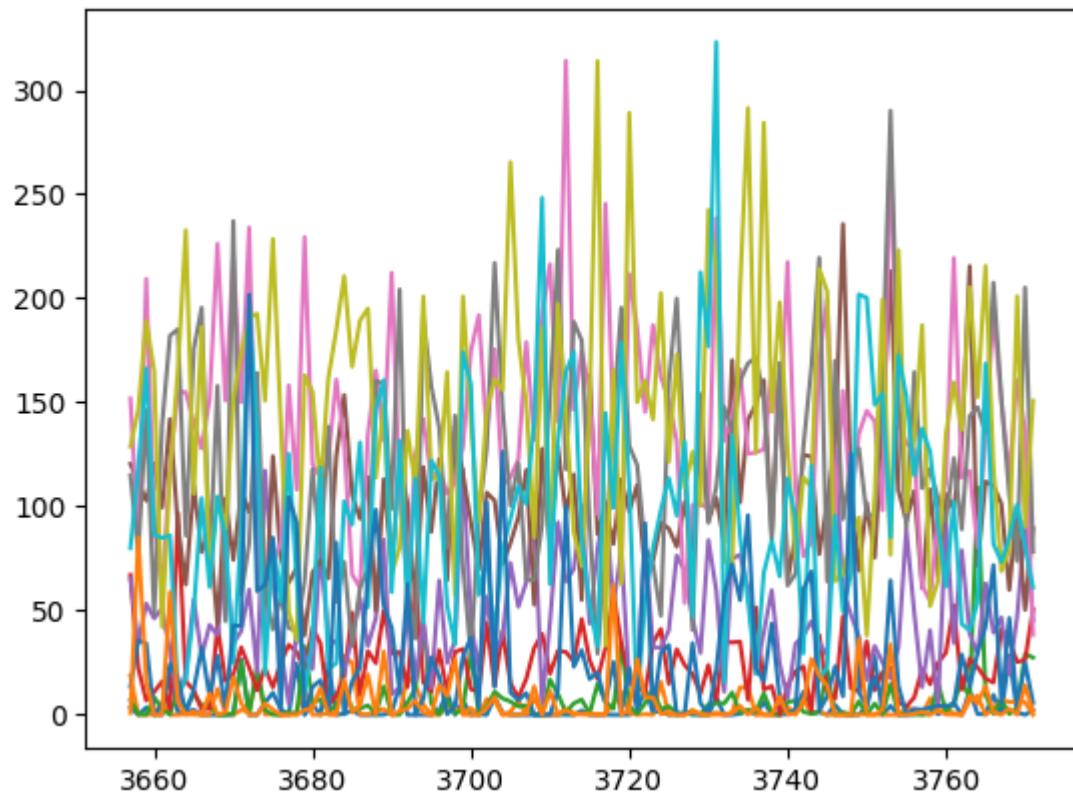
Out[182]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
3657	3.5	18.8	7.1	67.2	65.5	120.5	151.9	115.1	128.8	80.0	13.6	0.9	
3658	0.0	0.0	0.3	22.5	34.4	111.3	83.2	78.1	146.7	118.8	35.7	85.1	
3659	3.5	0.0	0.1	6.9	53.4	102.8	209.4	146.4	189.3	166.4	34.3	16.0	
3660	0.2	0.3	8.5	11.0	46.3	120.6	91.6	48.5	165.1	86.5	0.0	0.0	
3661	0.0	6.0	2.6	16.0	51.2	99.6	60.1	139.2	42.2	85.0	4.4	0.0	
...
3767	0.5	7.2	7.2	41.2	46.8	101.3	150.8	152.0	69.0	73.4	5.7	0.0	
3768	28.5	6.2	0.4	35.4	19.5	60.0	114.5	105.5	79.2	85.2	46.5	2.9	
3769	1.2	6.1	3.0	25.4	47.4	99.4	160.7	73.9	201.0	101.0	4.2	0.1	
3770	0.0	6.1	29.2	26.4	93.0	50.4	136.8	205.2	90.2	80.3	25.0	14.1	
3771	2.4	0.0	27.5	50.8	45.3	89.6	38.5	78.4	150.8	61.2	5.7	1.7	

115 rows × 12 columns

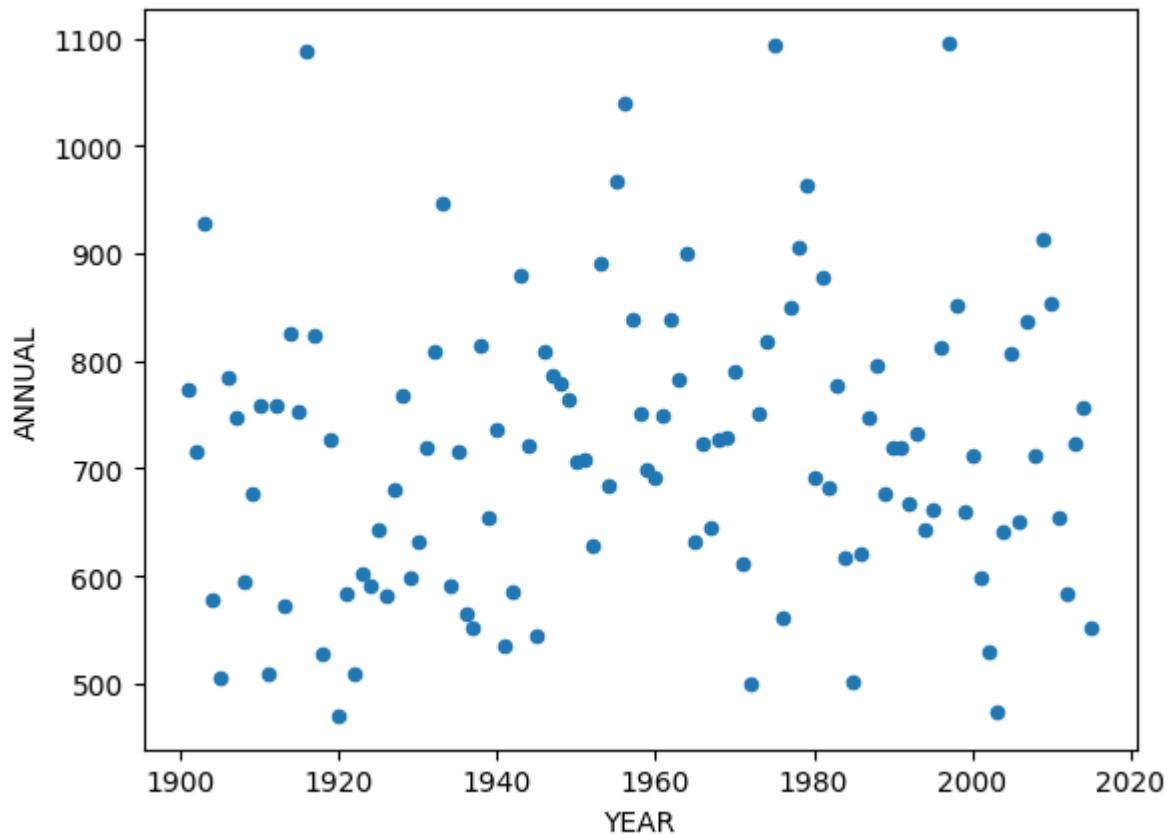
```
In [183]: plt.plot(y)
```

```
Out[183]: [
```



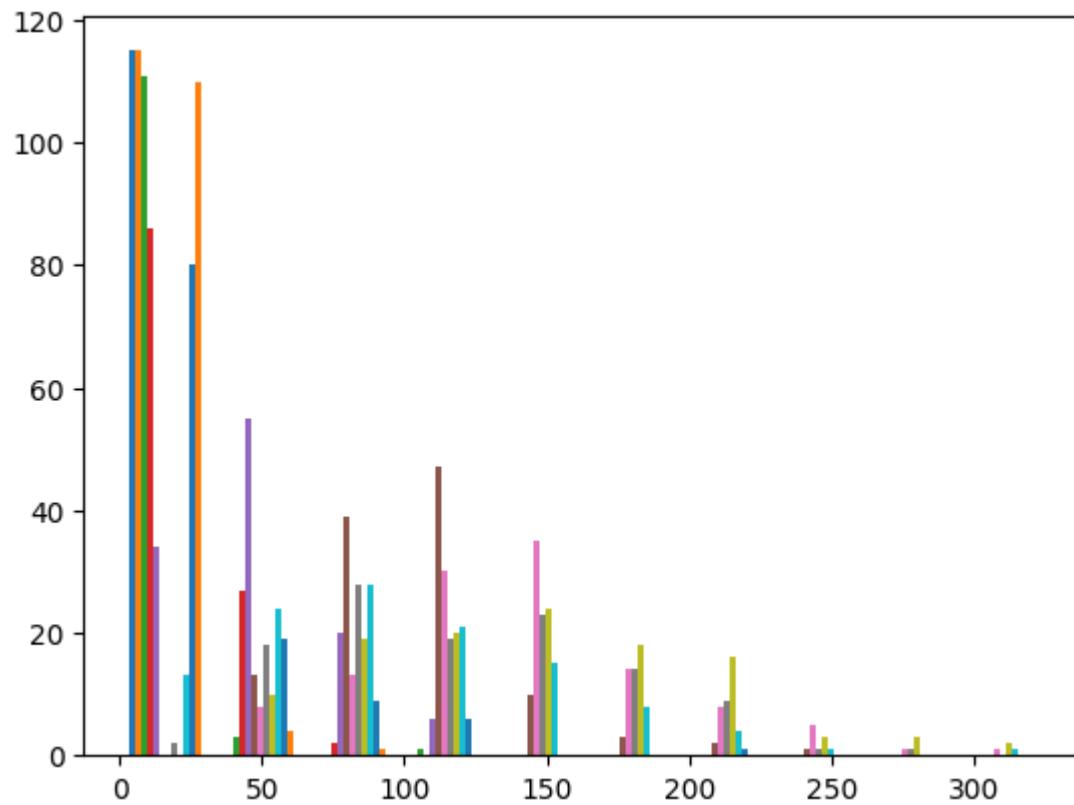
```
In [184]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[184]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



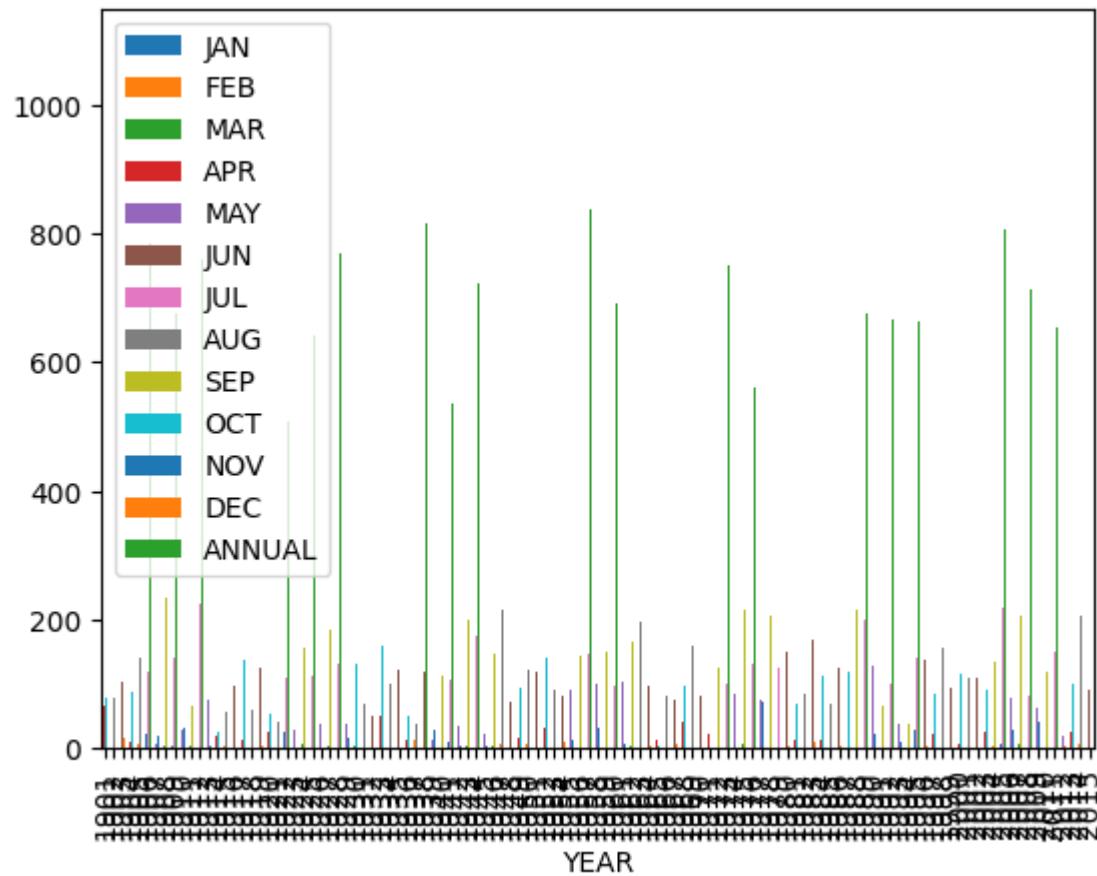
```
In [185]: plt.hist(y)
```

```
Out[185]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,  3.,  0.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 86.,  27.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 34.,  55.,  20.,  6.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 0.,  13.,  39.,  47.,  10.,  3.,  2.,  1.,  0.,  0.],
       [ 0.,  8.,  13.,  30.,  35.,  14.,  8.,  5.,  1.,  1.],
       [ 2.,  18.,  28.,  19.,  23.,  14.,  9.,  1.,  1.,  0.],
       [ 0.,  10.,  19.,  20.,  24.,  18.,  16.,  3.,  3.,  2.],
       [ 13.,  24.,  28.,  21.,  15.,  8.,  4.,  1.,  0.,  1.],
       [ 80.,  19.,  9.,  6.,  0.,  0.,  1.,  0.,  0.,  0.],
       [110.,  4.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  32.31,  64.62,  96.93, 129.24, 161.55, 193.86, 226.17,
       258.48, 290.79, 323.1 ]),
<a list of 12 BarContainer objects>)
```



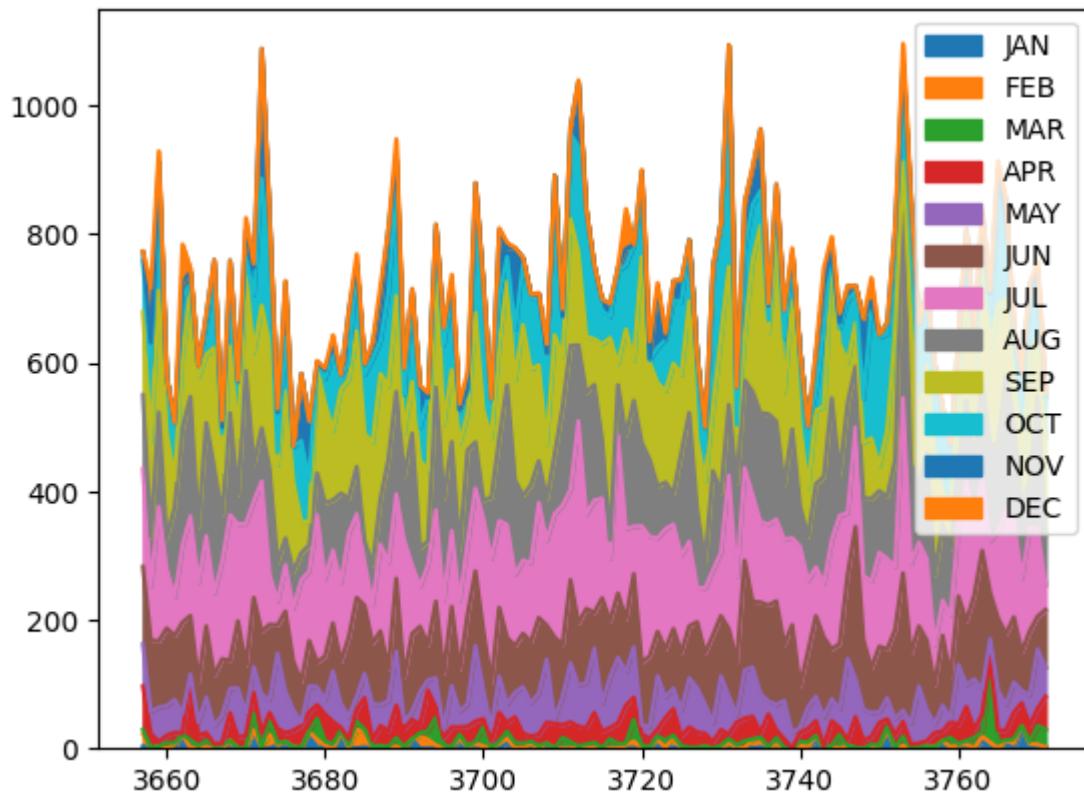
```
In [186]: x.plot.bar(x="YEAR")
```

```
Out[186]: <Axes: xlabel='YEAR'>
```



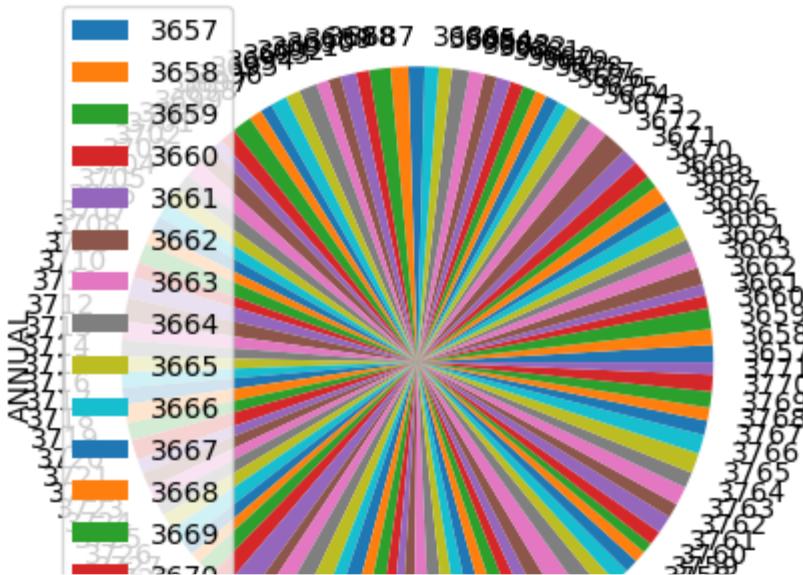
```
In [187]: y.plot.area()
```

```
Out[187]: <Axes: >
```



```
In [193]: x.plot.pie(y="ANNUAL", subplots=True)
```

```
Out[193]: array([<Axes: ylabel='ANNUAL'>], dtype=object)
```



PUNJAB

In [235]:

```
x=df[df[ "SUBDIVISION" ]=="PUNJAB"]
```

```
x
```

Out[235]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1472	1472	PUNJAB	1901	55.7	50.1	25.2	2.1	25.2	10.4	178.2	145.0	24.4	3.7
1473	1473	PUNJAB	1902	0.0	0.8	9.9	10.9	29.6	49.9	125.6	94.9	67.2	9.0
1474	1474	PUNJAB	1903	29.5	0.5	45.0	1.3	9.2	5.2	212.2	119.1	132.5	6.9
1475	1475	PUNJAB	1904	24.2	1.7	87.8	1.2	13.8	22.0	59.9	124.0	73.8	7.4
1476	1476	PUNJAB	1905	53.0	40.3	24.3	0.5	2.2	19.2	122.6	50.3	111.1	1.2
...
1582	1582	PUNJAB	2011	3.5	35.6	8.2	17.8	18.9	162.9	120.9	193.5	140.2	0.0
1583	1583	PUNJAB	2012	62.6	3.2	1.9	31.1	1.6	11.9	120.2	135.1	112.3	2.2
1584	1584	PUNJAB	2013	9.3	50.1	11.6	3.4	3.6	120.3	117.9	217.1	24.4	16.2
1585	1585	PUNJAB	2014	21.8	20.1	30.3	24.5	20.8	20.6	76.3	41.9	105.8	6.0
1586	1586	PUNJAB	2015	17.7	31.3	68.5	29.8	16.7	48.3	130.2	88.6	69.2	9.0

115 rows × 20 columns



In [236]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

```
x
```

Out[236]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1472	1901	55.7	50.1	25.2	2.1	25.2	10.4	178.2	145.0	24.4	3.7	0.0	3.3	523.1
1473	1902	0.0	0.8	9.9	10.9	29.6	49.9	125.6	94.9	67.2	9.0	0.0	0.1	398.1
1474	1903	29.5	0.5	45.0	1.3	9.2	5.2	212.2	119.1	132.5	6.9	0.0	9.5	571.1
1475	1904	24.2	1.7	87.8	1.2	13.8	22.0	59.9	124.0	73.8	7.4	9.8	25.9	451.1
1476	1905	53.0	40.3	24.3	0.5	2.2	19.2	122.6	50.3	111.1	1.2	0.0	9.4	434.1
...
1582	2011	3.5	35.6	8.2	17.8	18.9	162.9	120.9	193.5	140.2	0.0	1.0	2.6	705.1
1583	2012	62.6	3.2	1.9	31.1	1.6	11.9	120.2	135.1	112.3	2.2	0.4	11.0	493.1
1584	2013	9.3	50.1	11.6	3.4	3.6	120.3	117.9	217.1	24.4	16.2	6.1	6.6	586.1
1585	2014	21.8	20.1	30.3	24.5	20.8	20.6	76.3	41.9	105.8	6.0	0.7	14.1	382.1
1586	2015	17.7	31.3	68.5	29.8	16.7	48.3	130.2	88.6	69.2	9.0	0.8	0.7	510.1

115 rows × 14 columns



In [237]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

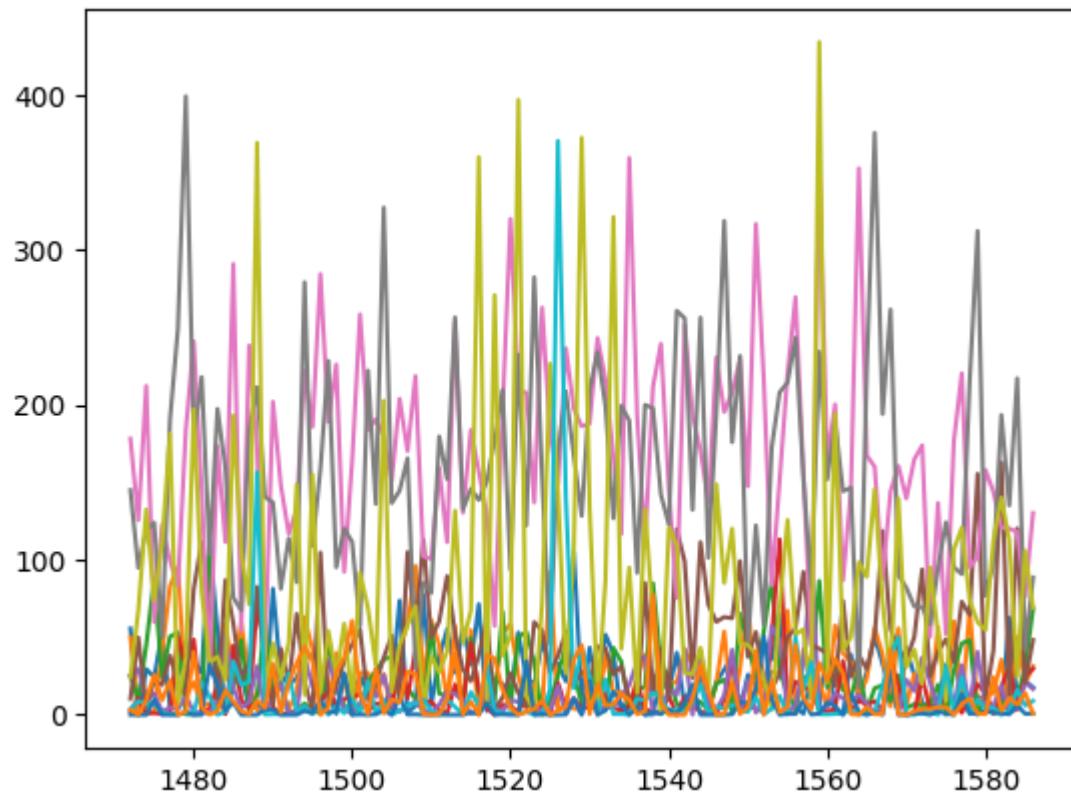
Out[237]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1472	55.7	50.1	25.2	2.1	25.2	10.4	178.2	145.0	24.4	3.7	0.0	3.3
1473	0.0	0.8	9.9	10.9	29.6	49.9	125.6	94.9	67.2	9.0	0.0	0.1
1474	29.5	0.5	45.0	1.3	9.2	5.2	212.2	119.1	132.5	6.9	0.0	9.5
1475	24.2	1.7	87.8	1.2	13.8	22.0	59.9	124.0	73.8	7.4	9.8	25.9
1476	53.0	40.3	24.3	0.5	2.2	19.2	122.6	50.3	111.1	1.2	0.0	9.4
...
1582	3.5	35.6	8.2	17.8	18.9	162.9	120.9	193.5	140.2	0.0	1.0	2.6
1583	62.6	3.2	1.9	31.1	1.6	11.9	120.2	135.1	112.3	2.2	0.4	11.0
1584	9.3	50.1	11.6	3.4	3.6	120.3	117.9	217.1	24.4	16.2	6.1	6.6
1585	21.8	20.1	30.3	24.5	20.8	20.6	76.3	41.9	105.8	6.0	0.7	14.1
1586	17.7	31.3	68.5	29.8	16.7	48.3	130.2	88.6	69.2	9.0	0.8	0.7

115 rows × 12 columns

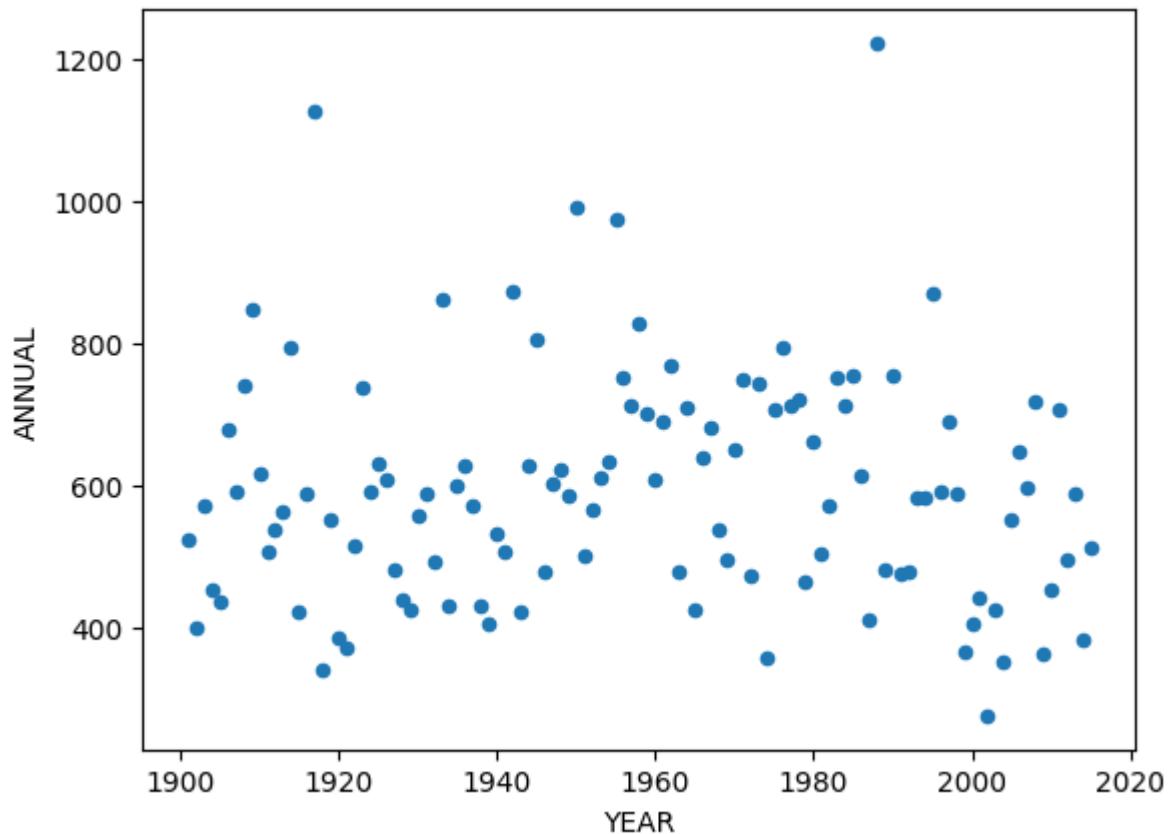
```
In [238]: plt.plot(y)
```

```
Out[238]: [
```



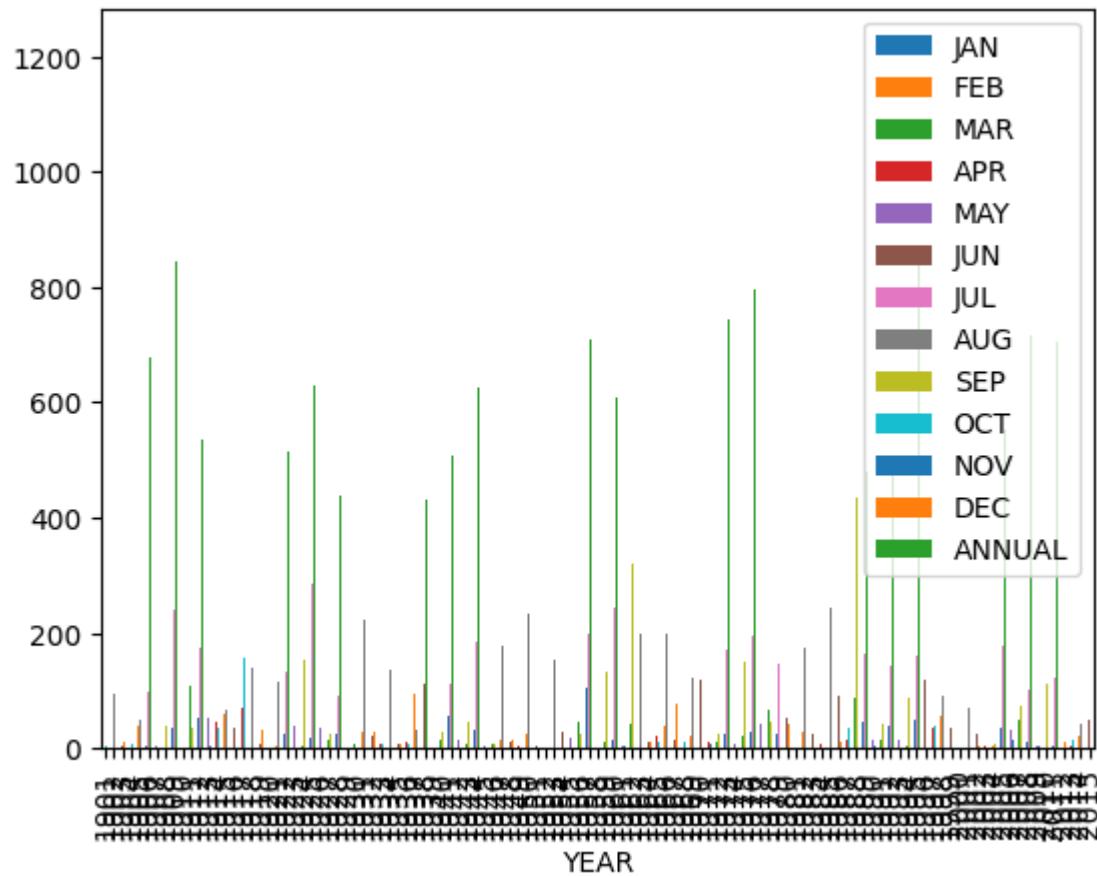
```
In [239]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[239]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



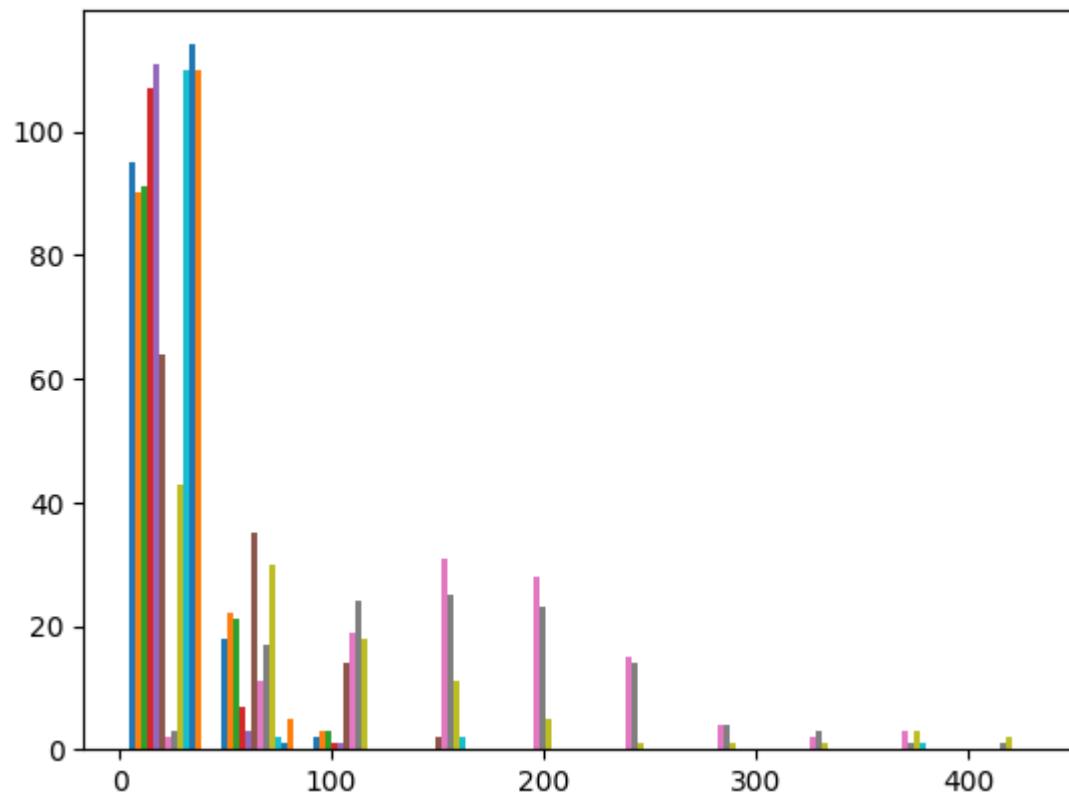
```
In [240]: x.plot.bar(x="YEAR")
```

```
Out[240]: <Axes: xlabel='YEAR'>
```



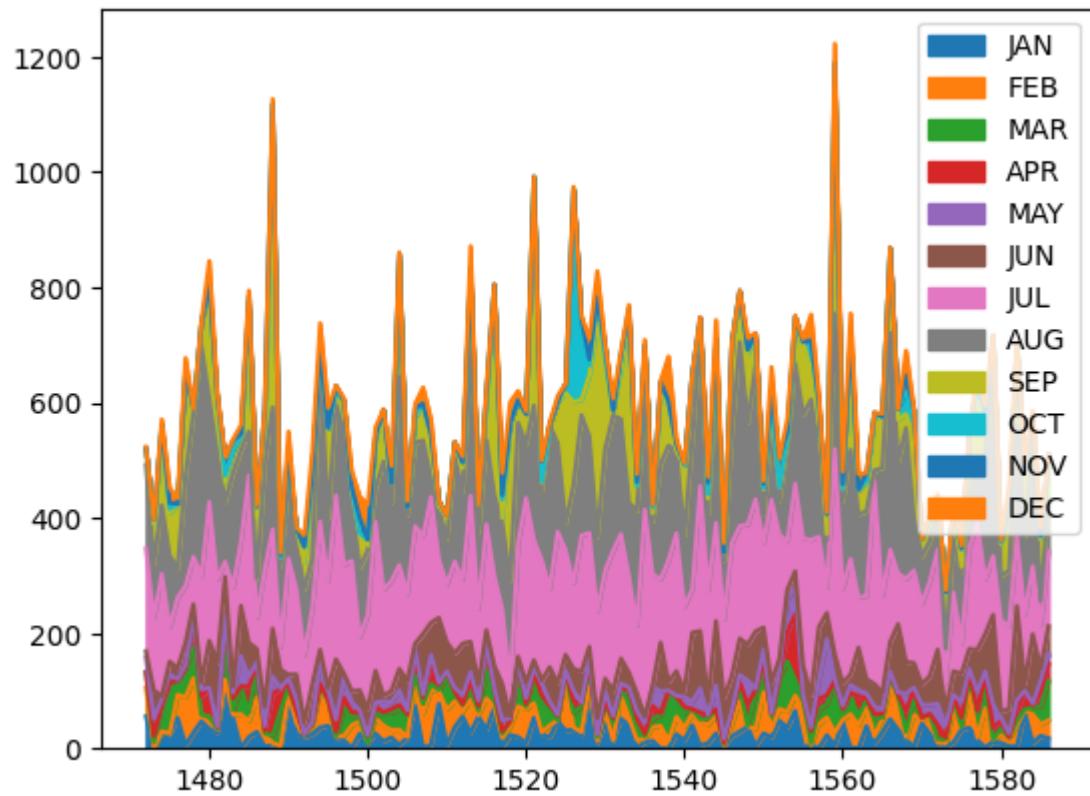
```
In [241]: plt.hist(y)
```

```
Out[241]: (array([[ 95.,  18.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 90.,  22.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 91.,  21.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [107.,   7.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,   3.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 64.,  35.,  14.,  2.,  0.,  0.,  0.,  0.,  0.,  0.],
       [  2.,  11.,  19.,  31.,  28.,  15.,  4.,  2.,  3.,  0.],
       [  3.,  17.,  24.,  25.,  23.,  14.,  4.,  3.,  1.,  1.],
       [ 43.,  30.,  18.,  11.,  5.,  1.,  1.,  1.,  3.,  2.],
       [110.,   2.,  0.,  2.,  0.,  0.,  0.,  0.,  1.,  0.],
       [114.,   1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [110.,   5.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  43.41,  86.82, 130.23, 173.64, 217.05, 260.46, 303.87,
       347.28, 390.69, 434.1 ]),
<a list of 12 BarContainer objects>)
```



In [242]: `y.plot.area()`

Out[242]: <Axes: >



HARYANA DELHI & CHANDIGARH

In [243]:

```
x=df[df[ "SUBDIVISION" ]=="HARYANA DELHI & CHANDIGARH"]
x
```

Out[243]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1357	1357	HARYANA DELHI & CHANDIGARH	1901	35.4	28.9	11.1	0.0	5.1	13.2	126.4	151.5	10.5	2.0
1358	1358	HARYANA DELHI & CHANDIGARH	1902	0.0	0.7	2.9	10.2	15.8	74.6	149.3	97.1	59.8	9.3
1359	1359	HARYANA DELHI & CHANDIGARH	1903	14.7	0.5	2.3	0.5	8.5	8.6	151.6	138.2	97.7	4.0
1360	1360	HARYANA DELHI & CHANDIGARH	1904	7.6	0.7	48.0	0.5	29.3	34.3	109.7	162.9	102.3	1.5
1361	1361	HARYANA DELHI & CHANDIGARH	1905	44.8	20.8	14.0	1.3	7.4	20.1	93.6	23.1	92.6	0.0
...
1467	1467	HARYANA DELHI & CHANDIGARH	2011	0.7	26.7	6.9	8.9	28.7	94.4	85.0	127.3	133.1	0.0
1468	1468	HARYANA DELHI & CHANDIGARH	2012	8.2	0.2	0.1	11.8	3.8	5.3	68.1	196.6	90.7	2.4
1469	1469	HARYANA DELHI & CHANDIGARH	2013	21.1	52.2	5.3	3.3	1.4	62.1	96.5	161.9	42.8	10.9
1470	1470	HARYANA DELHI & CHANDIGARH	2014	13.0	17.3	26.8	7.5	20.3	25.9	72.3	34.8	67.3	10.5
1471	1471	HARYANA DELHI & CHANDIGARH	2015	12.4	6.6	71.8	34.8	8.4	43.7	130.3	89.2	32.1	3.7

115 rows × 20 columns



In [244]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[244]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1357	1901	35.4	28.9	11.1	0.0	5.1	13.2	126.4	151.5	10.5	2.0	0.0	6.1	390.1
1358	1902	0.0	0.7	2.9	10.2	15.8	74.6	149.3	97.1	59.8	9.3	0.0	0.0	419.8
1359	1903	14.7	0.5	2.3	0.5	8.5	8.6	151.6	138.2	97.7	4.0	0.0	2.3	428.9
1360	1904	7.6	0.7	48.0	0.5	29.3	34.3	109.7	162.9	102.3	1.5	10.4	20.3	527.8
1361	1905	44.8	20.8	14.0	1.3	7.4	20.1	93.6	23.1	92.6	0.0	0.0	5.1	322.9
...
1467	2011	0.7	26.7	6.9	8.9	28.7	94.4	85.0	127.3	133.1	0.0	0.0	0.4	512.0
1468	2012	8.2	0.2	0.1	11.8	3.8	5.3	68.1	196.6	90.7	2.4	0.6	3.5	391.4
1469	2013	21.1	52.2	5.3	3.3	1.4	62.1	96.5	161.9	42.8	10.9	1.7	2.1	461.2
1470	2014	13.0	17.3	26.8	7.5	20.3	25.9	72.3	34.8	67.3	10.5	0.2	9.6	305.5
1471	2015	12.4	6.6	71.8	34.8	8.4	43.7	130.3	89.2	32.1	3.7	2.3	0.2	435.3

115 rows × 14 columns



In [245]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

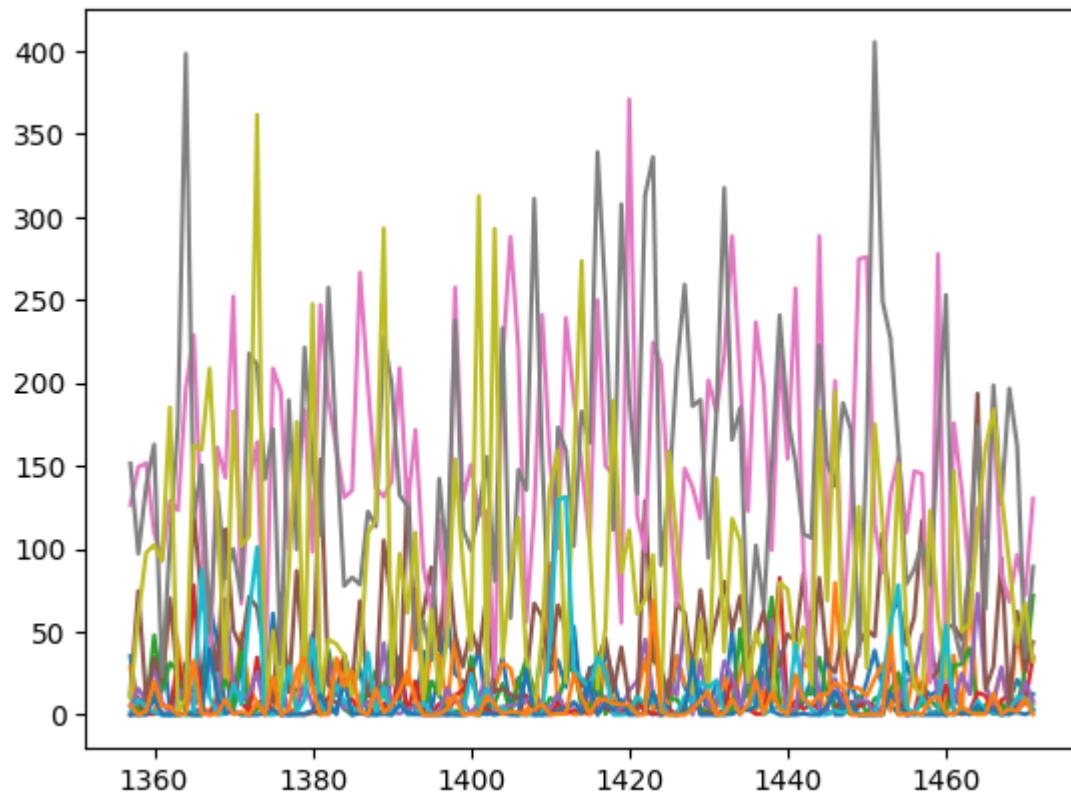
Out[245]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1357	35.4	28.9	11.1	0.0	5.1	13.2	126.4	151.5	10.5	2.0	0.0	6.1
1358	0.0	0.7	2.9	10.2	15.8	74.6	149.3	97.1	59.8	9.3	0.0	0.0
1359	14.7	0.5	2.3	0.5	8.5	8.6	151.6	138.2	97.7	4.0	0.0	2.3
1360	7.6	0.7	48.0	0.5	29.3	34.3	109.7	162.9	102.3	1.5	10.4	20.3
1361	44.8	20.8	14.0	1.3	7.4	20.1	93.6	23.1	92.6	0.0	0.0	5.1
...
1467	0.7	26.7	6.9	8.9	28.7	94.4	85.0	127.3	133.1	0.0	0.0	0.4
1468	8.2	0.2	0.1	11.8	3.8	5.3	68.1	196.6	90.7	2.4	0.6	3.5
1469	21.1	52.2	5.3	3.3	1.4	62.1	96.5	161.9	42.8	10.9	1.7	2.1
1470	13.0	17.3	26.8	7.5	20.3	25.9	72.3	34.8	67.3	10.5	0.2	9.6
1471	12.4	6.6	71.8	34.8	8.4	43.7	130.3	89.2	32.1	3.7	2.3	0.2

115 rows × 12 columns

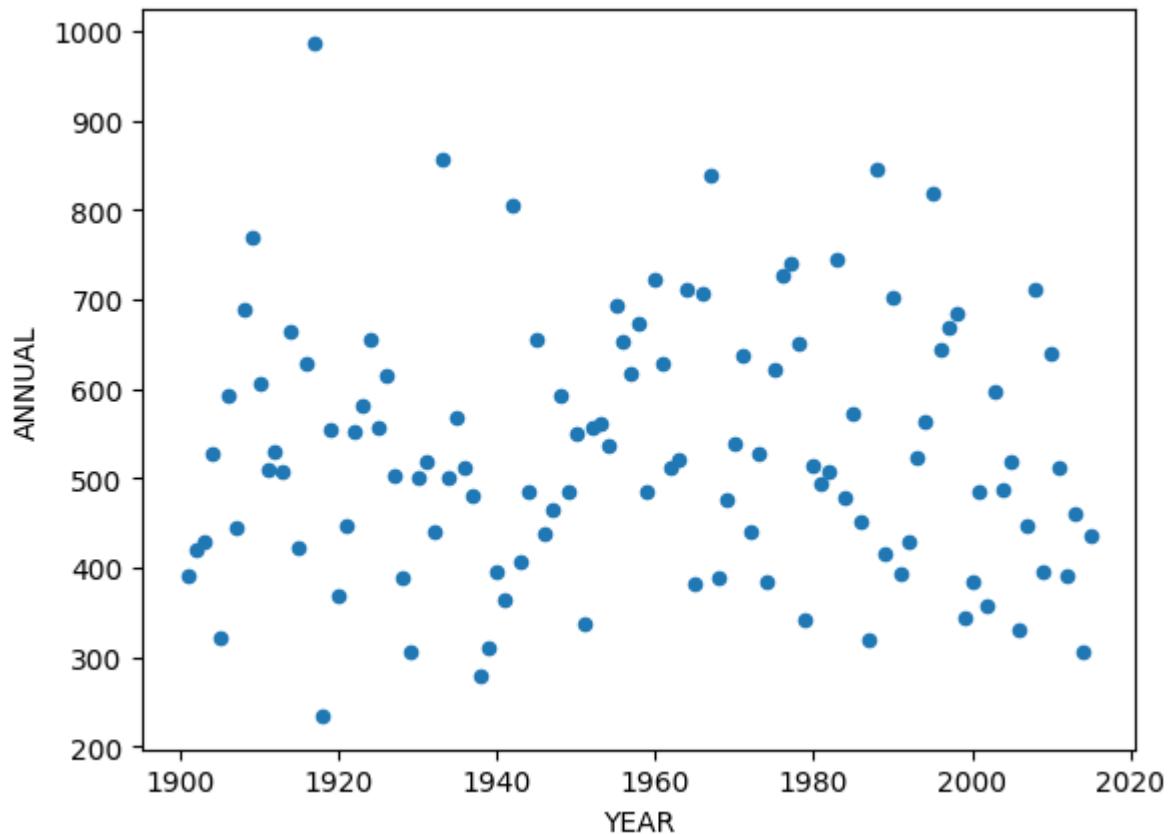
```
In [246]: plt.plot(y)
```

```
Out[246]: [
```



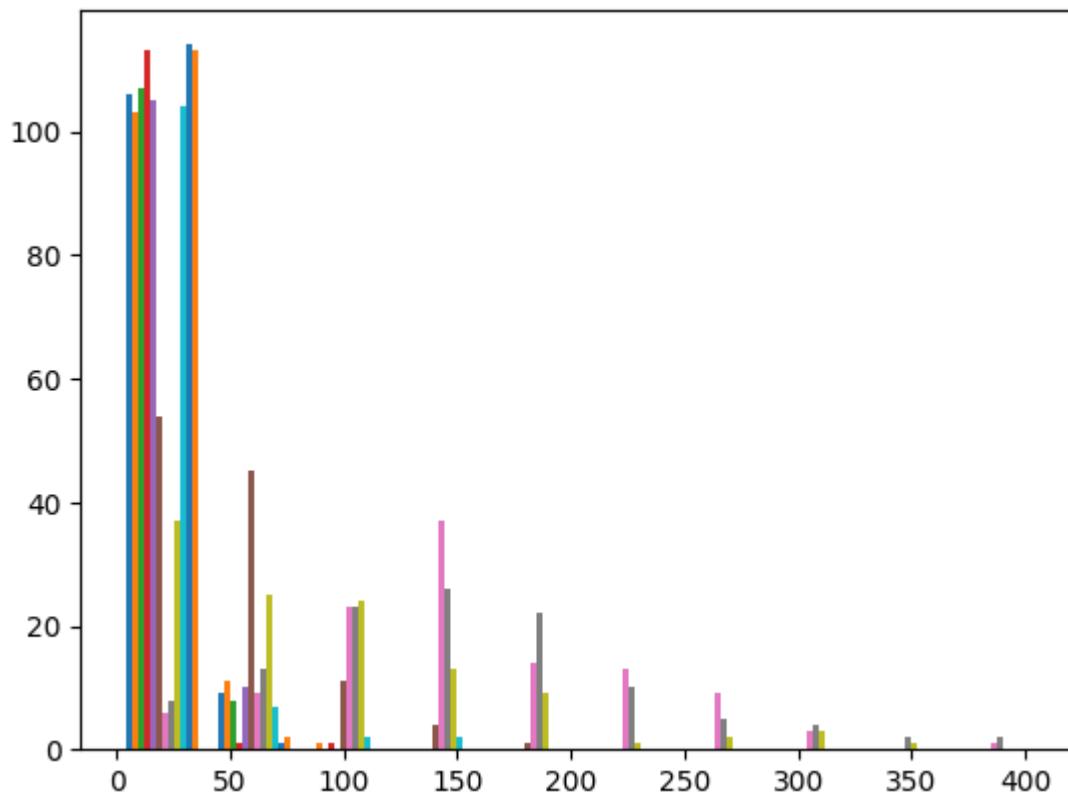
```
In [247]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[247]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



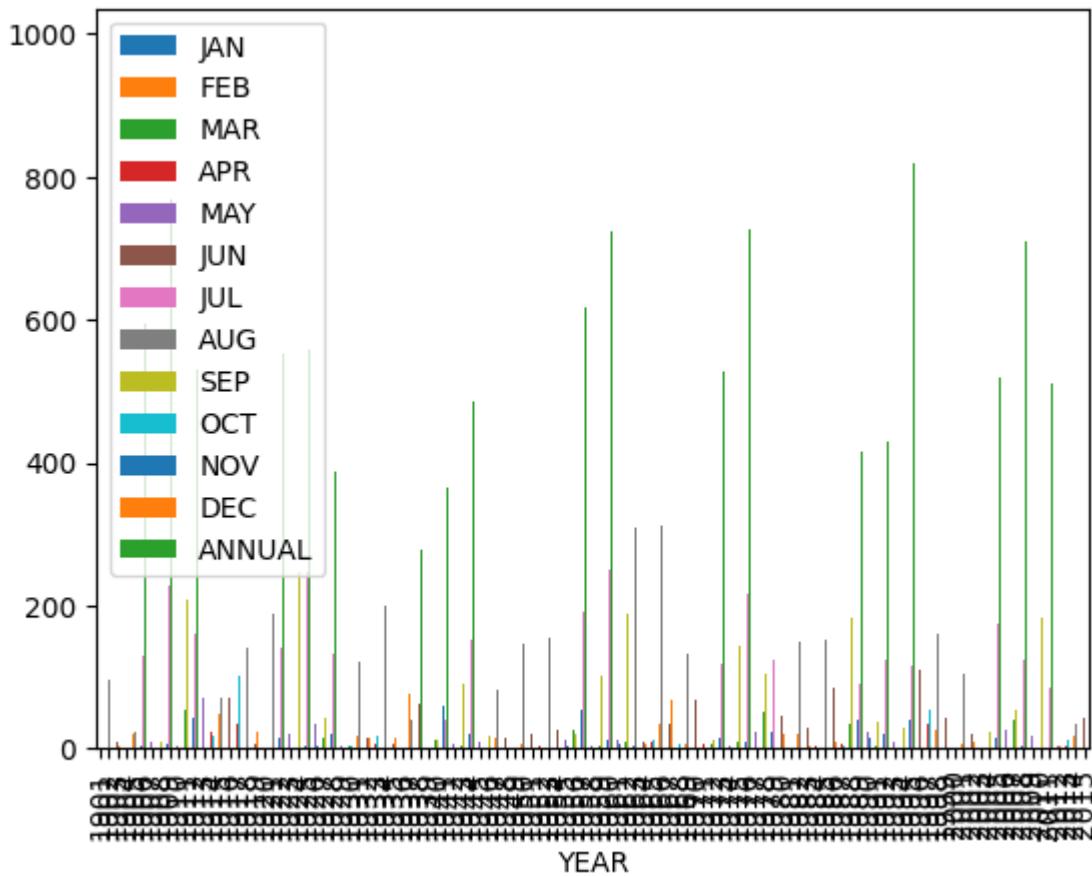
```
In [248]: plt.hist(y)
```

```
Out[248]: (array([[106.,  9.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [103., 11.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [107.,  8.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  1.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [105., 10.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 54., 45., 11.,  4.,  1.,  0.,  0.,  0.,  0.,  0.],
       [ 6.,  9., 23., 37., 14., 13.,  9.,  3.,  0.,  1.],
       [ 8., 13., 23., 26., 22., 10.,  5.,  4.,  2.,  2.],
       [ 37., 25., 24., 13.,  9.,  1.,  2.,  3.,  1.,  0.],
       [104.,  7.,  2.,  2.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
 array([ 0. ,  40.53,  81.06, 121.59, 162.12, 202.65, 243.18, 283.71,
       324.24, 364.77, 405.3 ]),
 <a list of 12 BarContainer objects>)
```



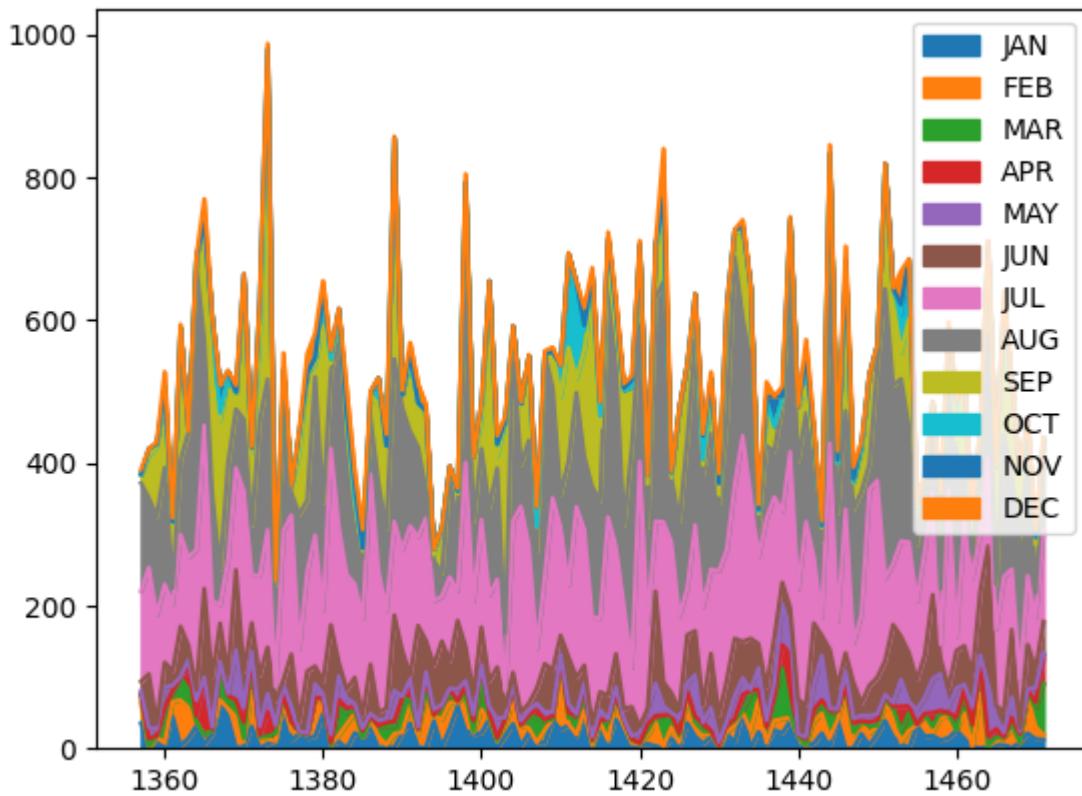
In [249]: `x.plot.bar(x="YEAR")`

Out[249]: <Axes: xlabel='YEAR'>



In [250]: `y.plot.area()`

Out[250]: <Axes: >



UTTARAKHAND

In [251]:

```
x=df[df[ "SUBDIVISION" ]=="UTTARAKHAND"]
```

```
x
```

Out[251]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1242	1242	UTTARAKHAND	1901	134.5	81.4	44.5	5.9	60.8	33.6	381.1	612.3	167.1
1243	1243	UTTARAKHAND	1902	0.0	17.0	52.2	63.7	52.1	113.1	444.1	327.5	220.4
1244	1244	UTTARAKHAND	1903	68.0	7.9	87.6	10.3	37.5	83.0	251.6	442.7	249.3
1245	1245	UTTARAKHAND	1904	40.0	5.2	78.3	13.6	61.1	180.1	449.6	417.2	174.1
1246	1246	UTTARAKHAND	1905	115.4	80.7	99.8	26.1	70.3	111.5	299.9	349.5	129.5
...
1352	1352	UTTARAKHAND	2011	30.9	65.2	18.0	30.9	84.2	223.1	433.3	523.7	148.4
1353	1353	UTTARAKHAND	2012	38.8	11.9	28.1	39.2	9.1	46.0	387.1	419.5	220.6
1354	1354	UTTARAKHAND	2013	73.0	188.3	22.0	24.7	18.2	488.9	413.4	359.4	111.3
1355	1355	UTTARAKHAND	2014	45.9	99.9	68.4	37.6	52.9	62.9	462.7	264.2	107.9
1356	1356	UTTARAKHAND	2015	54.5	62.6	127.3	57.3	38.0	186.6	337.0	305.3	52.6

115 rows × 20 columns



In [252]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

```
x
```

Out[252]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNL
1242	1901	134.5	81.4	44.5	5.9	60.8	33.6	381.1	612.3	167.1	16.3	0.0	24.9	156
1243	1902	0.0	17.0	52.2	63.7	52.1	113.1	444.1	327.5	220.4	31.9	2.1	0.0	132
1244	1903	68.0	7.9	87.6	10.3	37.5	83.0	251.6	442.7	249.3	57.5	0.0	11.3	130
1245	1904	40.0	5.2	78.3	13.6	61.1	180.1	449.6	417.2	174.1	6.3	35.6	31.0	149
1246	1905	115.4	80.7	99.8	26.1	70.3	111.5	299.9	349.5	129.5	0.0	1.0	18.5	130
...
1352	2011	30.9	65.2	18.0	30.9	84.2	223.1	433.3	523.7	148.4	3.4	1.2	2.3	156
1353	2012	38.8	11.9	28.1	39.2	9.1	46.0	387.1	419.5	220.6	4.7	3.4	15.5	122
1354	2013	73.0	188.3	22.0	24.7	18.2	488.9	413.4	359.4	111.3	29.1	3.2	3.8	173
1355	2014	45.9	99.9	68.4	37.6	52.9	62.9	462.7	264.2	107.9	40.8	0.0	44.3	128
1356	2015	54.5	62.6	127.3	57.3	38.0	186.6	337.0	305.3	52.6	16.8	2.4	7.2	124

115 rows × 14 columns



In [253]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

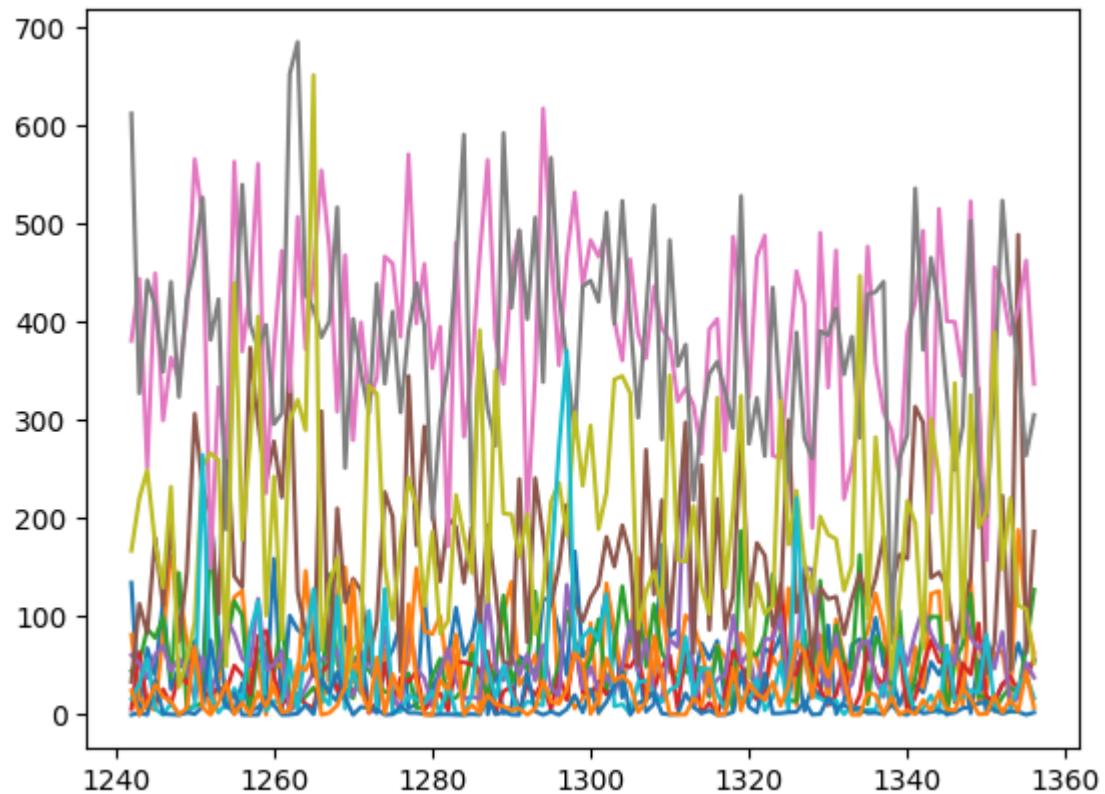
Out[253]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1242	134.5	81.4	44.5	5.9	60.8	33.6	381.1	612.3	167.1	16.3	0.0	24.9
1243	0.0	17.0	52.2	63.7	52.1	113.1	444.1	327.5	220.4	31.9	2.1	0.0
1244	68.0	7.9	87.6	10.3	37.5	83.0	251.6	442.7	249.3	57.5	0.0	11.3
1245	40.0	5.2	78.3	13.6	61.1	180.1	449.6	417.2	174.1	6.3	35.6	31.0
1246	115.4	80.7	99.8	26.1	70.3	111.5	299.9	349.5	129.5	0.0	1.0	18.5
...
1352	30.9	65.2	18.0	30.9	84.2	223.1	433.3	523.7	148.4	3.4	1.2	2.3
1353	38.8	11.9	28.1	39.2	9.1	46.0	387.1	419.5	220.6	4.7	3.4	15.5
1354	73.0	188.3	22.0	24.7	18.2	488.9	413.4	359.4	111.3	29.1	3.2	3.8
1355	45.9	99.9	68.4	37.6	52.9	62.9	462.7	264.2	107.9	40.8	0.0	44.3
1356	54.5	62.6	127.3	57.3	38.0	186.6	337.0	305.3	52.6	16.8	2.4	7.2

115 rows × 12 columns

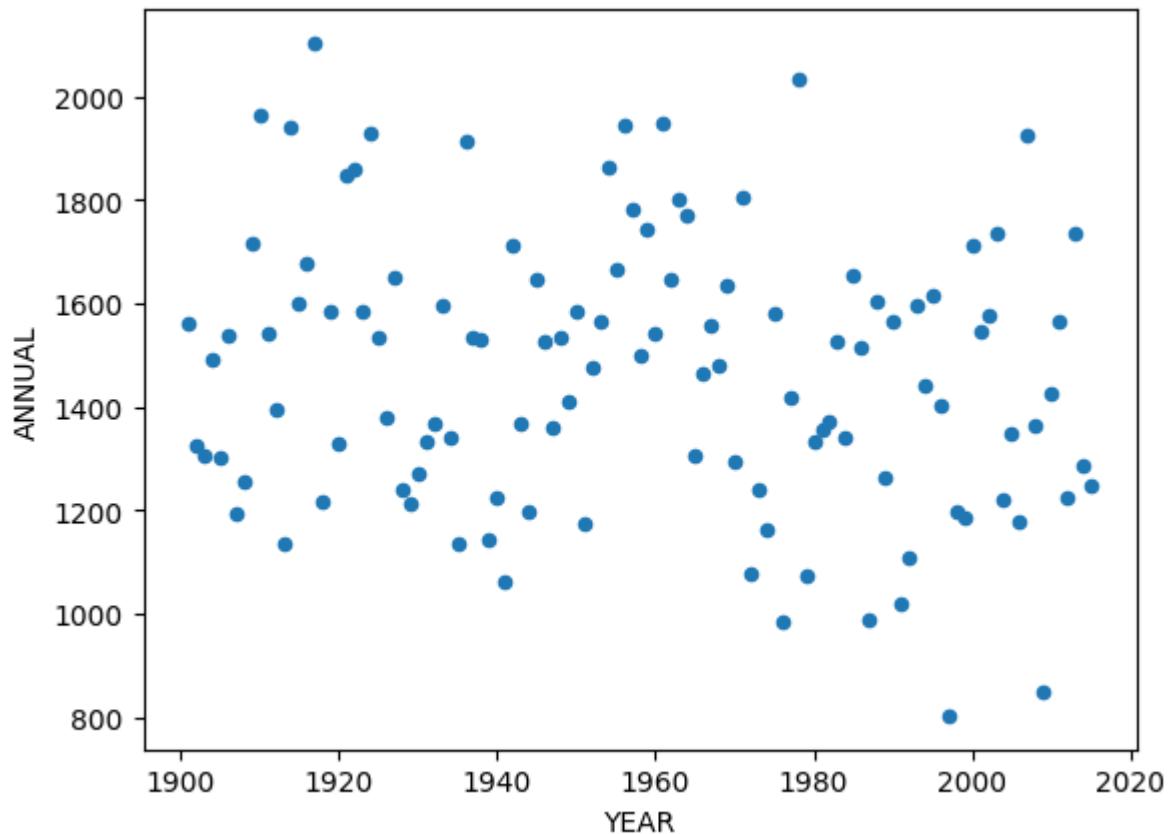
```
In [254]: plt.plot(y)
```

```
Out[254]: [
```



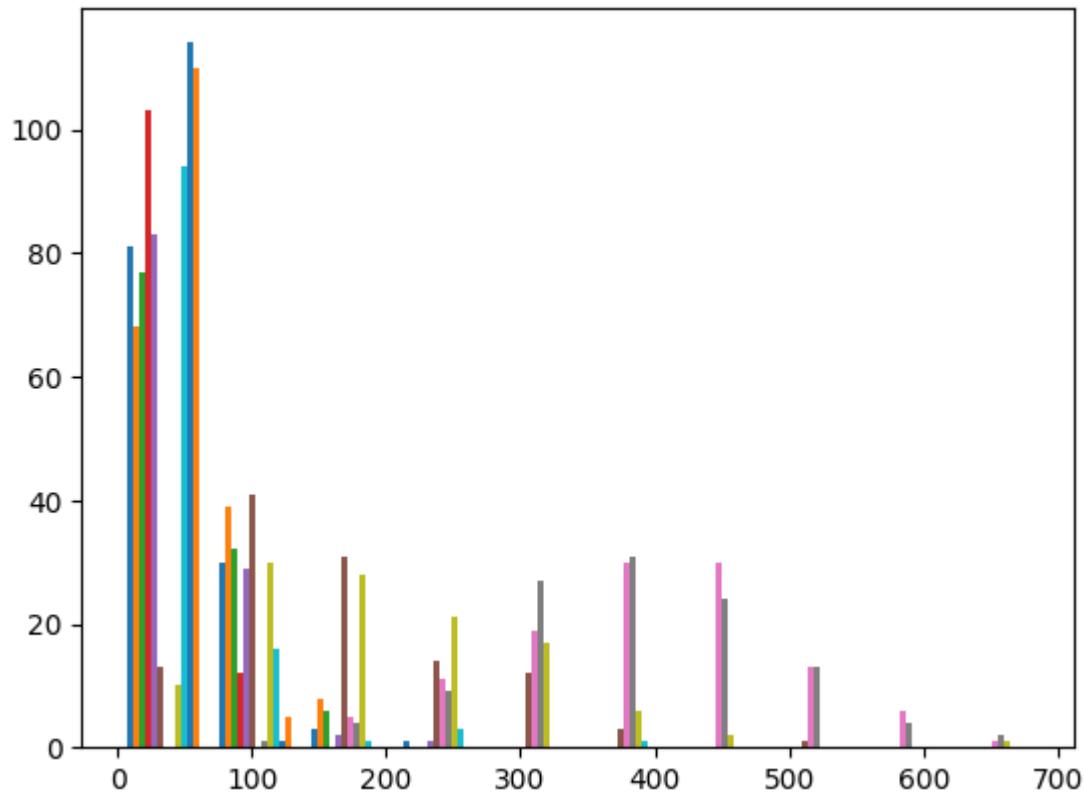
```
In [255]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[255]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



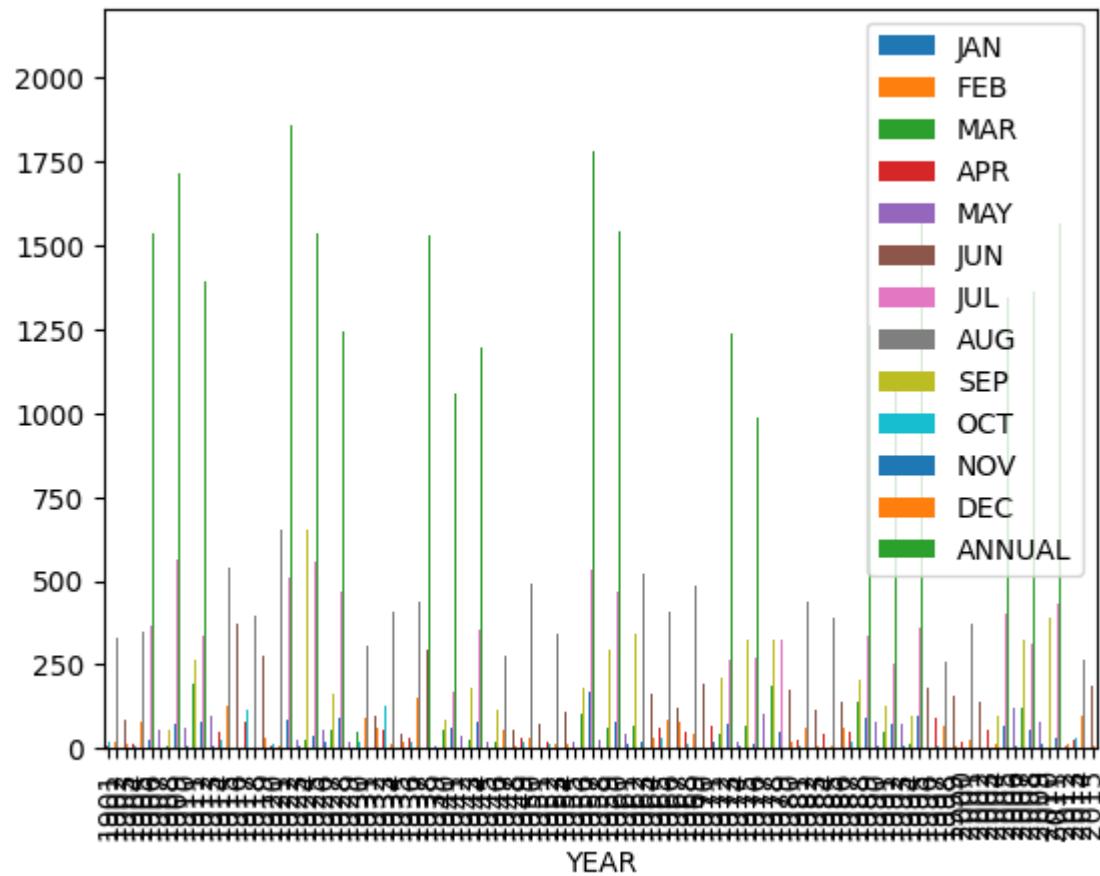
```
In [256]: plt.hist(y)
```

```
Out[256]: (array([[ 81.,  30.,  3.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 68.,  39.,  8.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 77.,  32.,  6.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [103.,  12.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 83.,  29.,  2.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 13.,  41.,  31.,  14.,  12.,  3.,  0.,  1.,  0.,  0.],
       [ 0.,  0.,  5.,  11.,  19.,  30.,  30.,  13.,  6.,  1.],
       [ 0.,  1.,  4.,  9.,  27.,  31.,  24.,  13.,  4.,  2.],
       [ 10.,  30.,  28.,  21.,  17.,  6.,  2.,  0.,  0.,  1.],
       [ 94.,  16.,  1.,  3.,  0.,  1.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [110.,  5.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  68.52, 137.04, 205.56, 274.08, 342.6 , 411.12, 479.64,
      548.16, 616.68, 685.2 ]),
<a list of 12 BarContainer objects>)
```



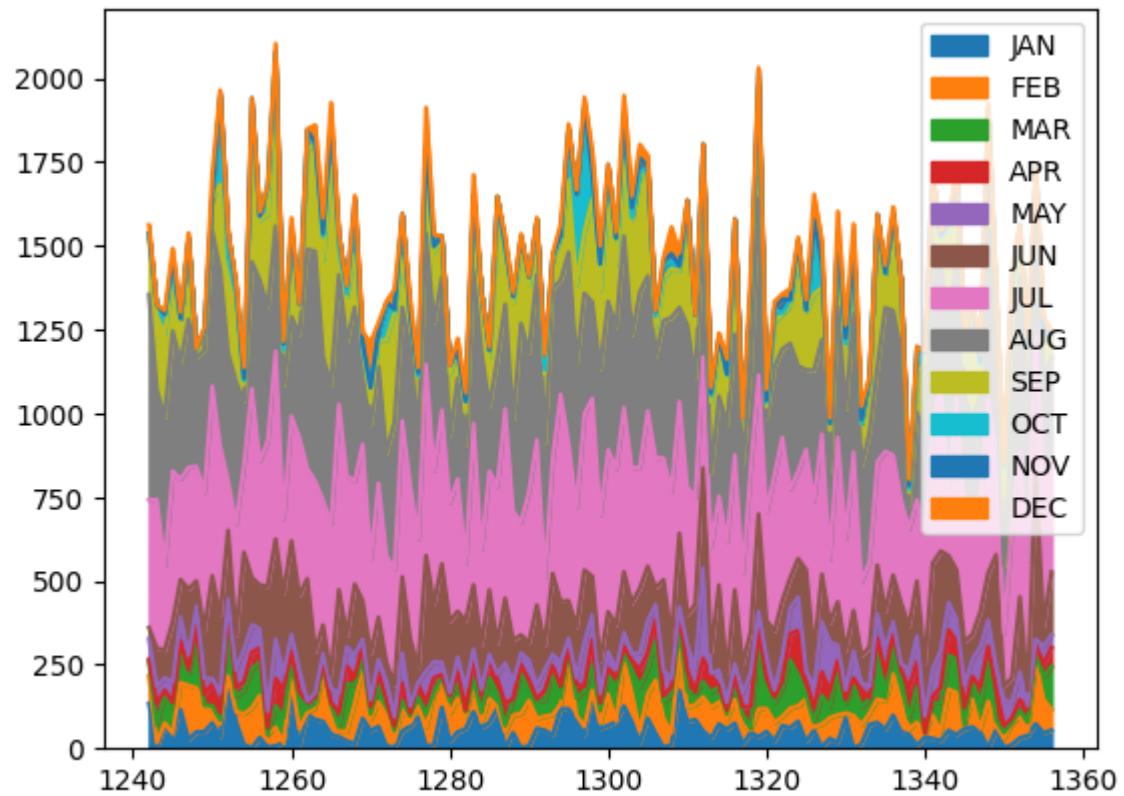
```
In [257]: x.plot.bar(x="YEAR")
```

```
Out[257]: <Axes: xlabel='YEAR'>
```



In [258]: `y.plot.area()`

Out[258]: <Axes: >



WEST UTTAR PRADESH

In [259]:

```
x=df[df[ "SUBDIVISION" ]=="WEST UTTAR PRADESH"]
```

```
x
```

Out[259]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
1127	1127	WEST UTTAR PRADESH	1901	51.4	25.6	9.5	0.7	5.6	23.8	201.9	374.3	67.7	7.0
1128	1128	WEST UTTAR PRADESH	1902	4.6	4.6	0.6	4.8	7.2	54.5	325.9	180.6	143.1	9.0
1129	1129	WEST UTTAR PRADESH	1903	13.4	0.4	1.2	0.0	8.2	32.7	145.4	279.1	150.4	177.1
1130	1130	WEST UTTAR PRADESH	1904	6.3	2.0	29.7	0.4	24.8	68.5	358.8	311.1	97.1	2.1
1131	1131	WEST UTTAR PRADESH	1905	32.3	26.6	14.8	3.6	7.1	18.9	139.8	95.0	92.2	0.1
...
1237	1237	WEST UTTAR PRADESH	2011	2.1	10.4	3.9	2.8	29.6	175.9	215.9	232.3	101.7	0.1
1238	1238	WEST UTTAR PRADESH	2012	14.5	0.1	1.4	4.7	0.3	4.0	145.1	149.1	67.8	0.1
1239	1239	WEST UTTAR PRADESH	2013	20.4	69.5	3.5	1.6	2.1	190.6	233.9	287.1	52.2	61.1
1240	1240	WEST UTTAR PRADESH	2014	48.3	29.4	22.6	5.3	11.0	22.0	151.6	81.0	84.7	14.0
1241	1241	WEST UTTAR PRADESH	2015	31.6	7.2	66.8	21.0	8.1	72.0	194.2	143.5	26.5	6.1

115 rows × 20 columns



In [260]:

```
x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)
```

Out[260]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1127	1901	51.4	25.6	9.5	0.7	5.6	23.8	201.9	374.3	67.7	7.6	0.0	7.9	775
1128	1902	4.6	4.6	0.6	4.8	7.2	54.5	325.9	180.6	143.1	9.6	0.9	0.2	736
1129	1903	13.4	0.4	1.2	0.0	8.2	32.7	145.4	279.1	150.4	177.3	0.0	0.4	808
1130	1904	6.3	2.0	29.7	0.4	24.8	68.5	358.8	311.1	97.1	2.7	15.7	28.2	945
1131	1905	32.3	26.6	14.8	3.6	7.1	18.9	139.8	95.0	92.2	0.2	0.0	2.9	433
...
1237	2011	2.1	10.4	3.9	2.8	29.6	175.9	215.9	232.3	101.7	0.7	0.5	1.5	777
1238	2012	14.5	0.1	1.4	4.7	0.3	4.0	145.1	149.1	67.8	0.5	0.1	2.0	389
1239	2013	20.4	69.5	3.5	1.6	2.1	190.6	233.9	287.1	52.2	61.2	1.7	8.9	932
1240	2014	48.3	29.4	22.6	5.3	11.0	22.0	151.6	81.0	84.7	14.6	0.0	16.3	486
1241	2015	31.6	7.2	66.8	21.0	8.1	72.0	194.2	143.5	26.5	6.9	2.0	3.0	582

115 rows × 14 columns



In [261]:

```
y=x.drop(["YEAR","ANNUAL"],axis=1)
```

y

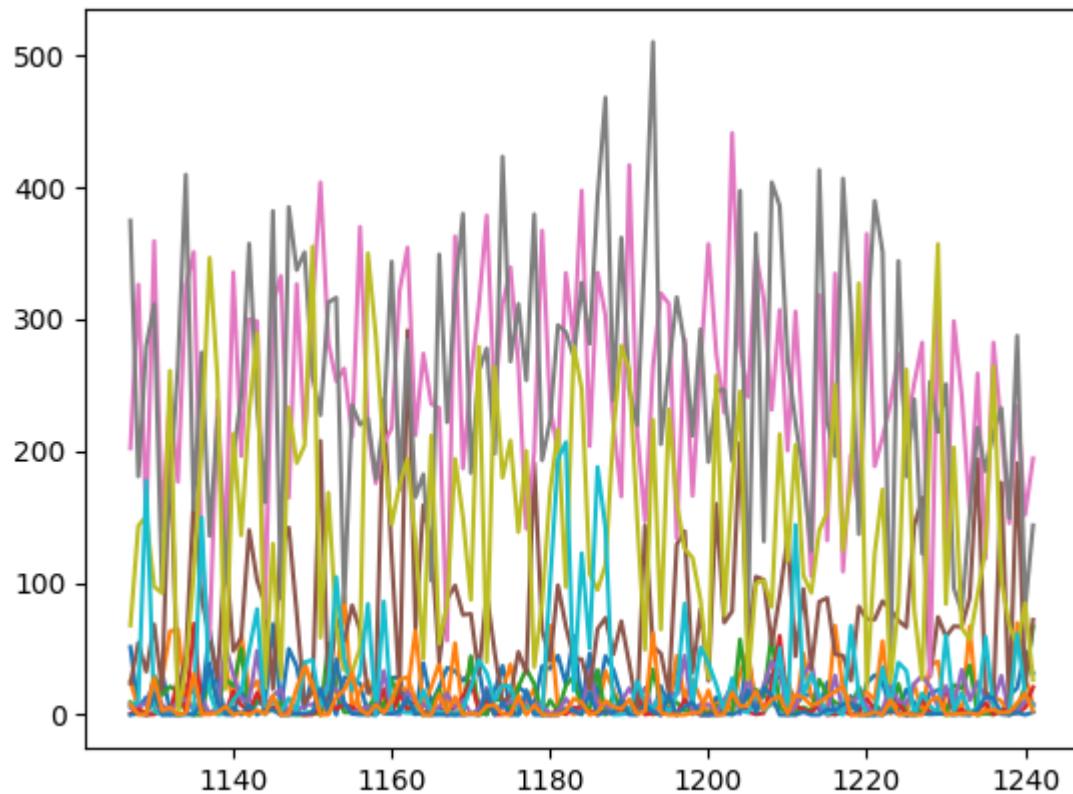
Out[261]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1127	51.4	25.6	9.5	0.7	5.6	23.8	201.9	374.3	67.7	7.6	0.0	7.9
1128	4.6	4.6	0.6	4.8	7.2	54.5	325.9	180.6	143.1	9.6	0.9	0.2
1129	13.4	0.4	1.2	0.0	8.2	32.7	145.4	279.1	150.4	177.3	0.0	0.4
1130	6.3	2.0	29.7	0.4	24.8	68.5	358.8	311.1	97.1	2.7	15.7	28.2
1131	32.3	26.6	14.8	3.6	7.1	18.9	139.8	95.0	92.2	0.2	0.0	2.9
...
1237	2.1	10.4	3.9	2.8	29.6	175.9	215.9	232.3	101.7	0.7	0.5	1.5
1238	14.5	0.1	1.4	4.7	0.3	4.0	145.1	149.1	67.8	0.5	0.1	2.0
1239	20.4	69.5	3.5	1.6	2.1	190.6	233.9	287.1	52.2	61.2	1.7	8.9
1240	48.3	29.4	22.6	5.3	11.0	22.0	151.6	81.0	84.7	14.6	0.0	16.3
1241	31.6	7.2	66.8	21.0	8.1	72.0	194.2	143.5	26.5	6.9	2.0	3.0

115 rows × 12 columns

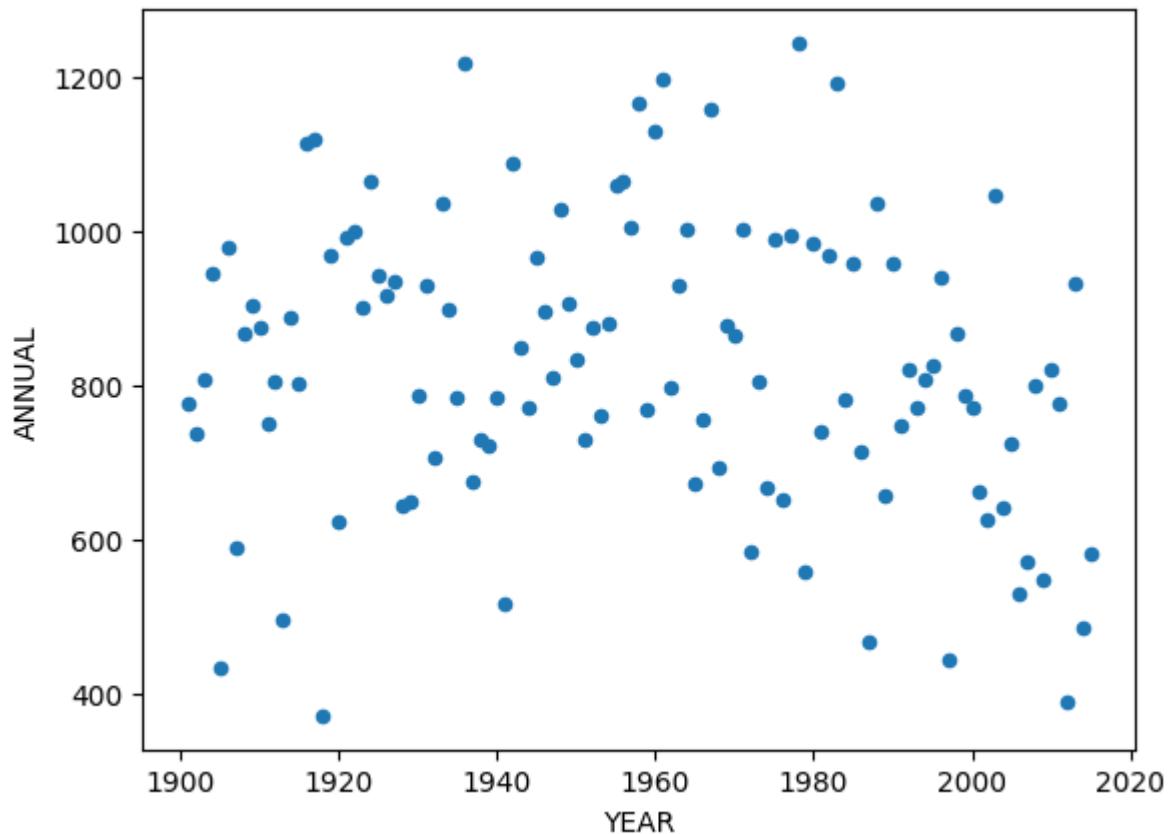
In [262]: `plt.plot(y)`

Out[262]: [`<matplotlib.lines.Line2D at 0x26d9d552dd0>`,
`<matplotlib.lines.Line2D at 0x26d9f775b50>`,
`<matplotlib.lines.Line2D at 0x26d9f776050>`,
`<matplotlib.lines.Line2D at 0x26d9f776390>`,
`<matplotlib.lines.Line2D at 0x26d9f776690>`,
`<matplotlib.lines.Line2D at 0x26d9f776a50>`,
`<matplotlib.lines.Line2D at 0x26d9f776fd0>`,
`<matplotlib.lines.Line2D at 0x26d9f777410>`,
`<matplotlib.lines.Line2D at 0x26d9f776790>`,
`<matplotlib.lines.Line2D at 0x26d9f776bd0>`,
`<matplotlib.lines.Line2D at 0x26d9f777e10>`,
`<matplotlib.lines.Line2D at 0x26d9f780210>`]



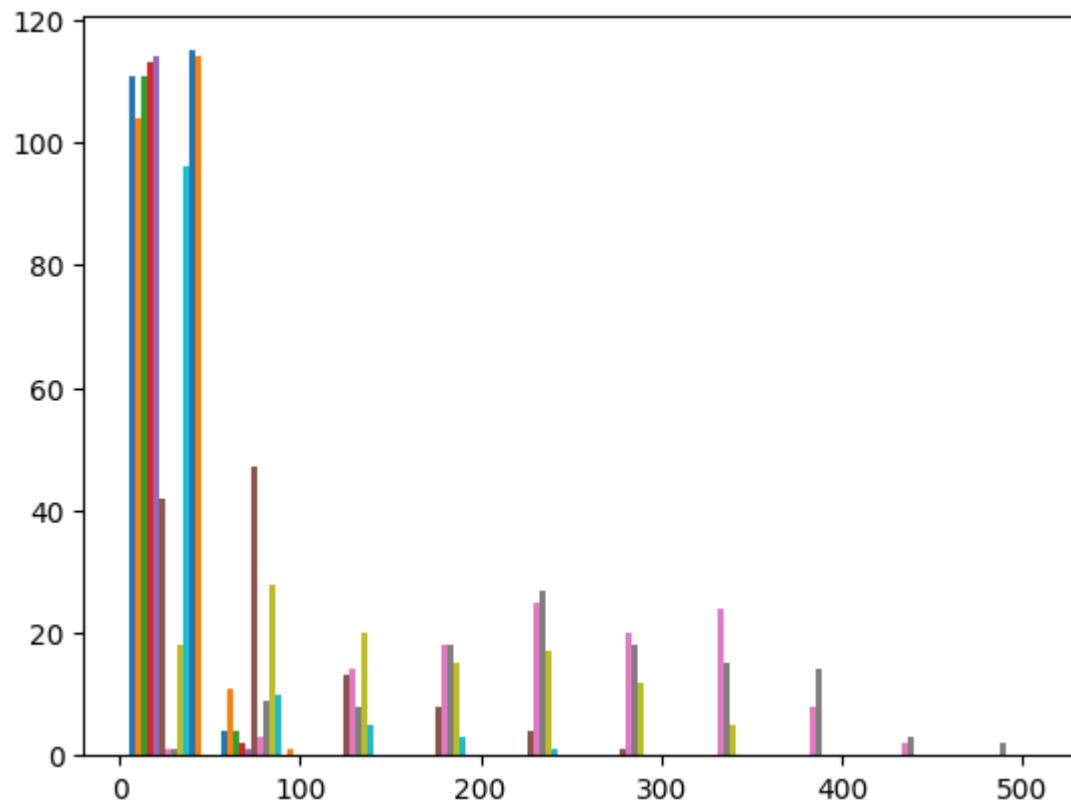
```
In [263]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[263]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



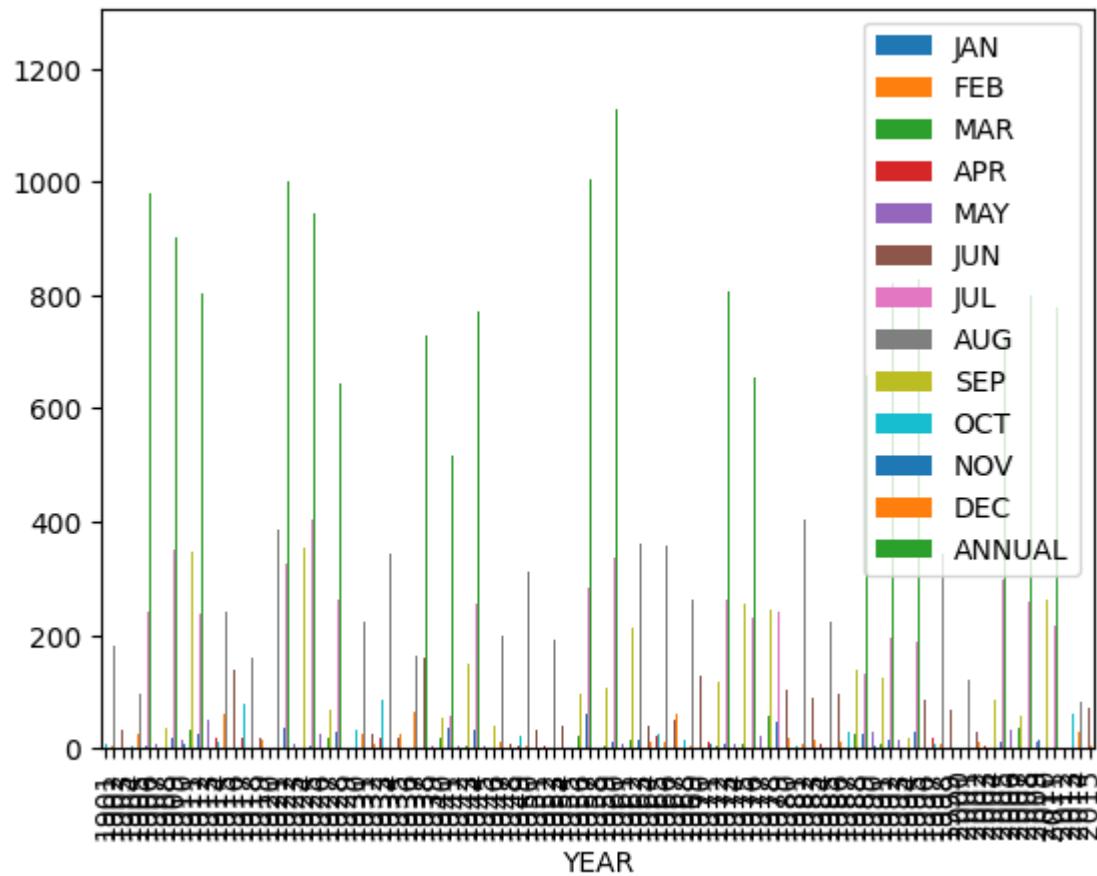
```
In [264]: plt.hist(y)
```

```
Out[264]: (array([[111.,  4.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [104., 11.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,  4.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 42., 47., 13.,  8.,  4.,  1.,  0.,  0.,  0.,  0.],
       [ 1.,  3., 14., 18., 25., 20., 24.,  8.,  2.,  0.],
       [ 1.,  9.,  8., 18., 27., 18., 15., 14.,  3.,  2.],
       [ 18., 28., 20., 15., 17., 12.,  5.,  0.,  0.,  0.],
       [ 96., 10.,  5.,  3.,  1.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
 array([ 0. , 50.96, 101.92, 152.88, 203.84, 254.8 , 305.76, 356.72,
        407.68, 458.64, 509.6 ]),
 <a list of 12 BarContainer objects>)
```



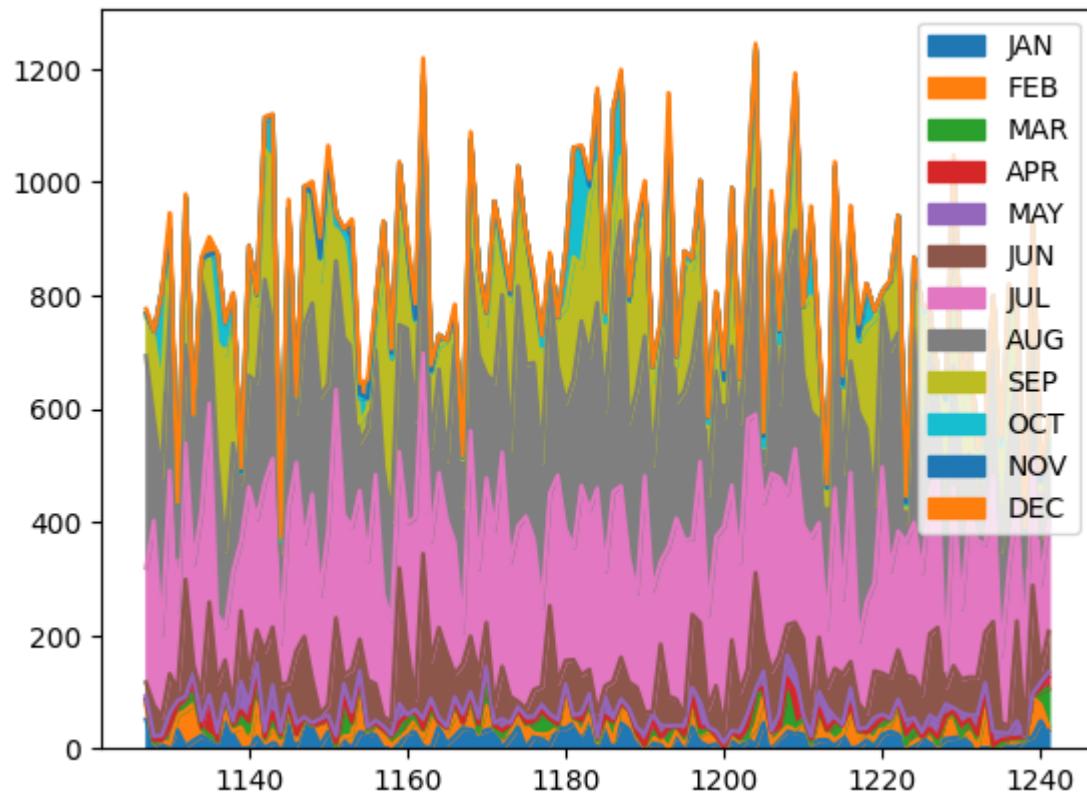
```
In [265]: x.plot.bar(x="YEAR")
```

```
Out[265]: <Axes: xlabel='YEAR'>
```



```
In [266]: y.plot.area()
```

```
Out[266]: <Axes: >
```



EAST UTTAR PRADESH

In [270]:

```
x=df[df[ "SUBDIVISION" ]=="EAST UTTAR PRADESH"]
x
```

Out[270]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
1012	1012	EAST UTTAR PRADESH	1901	62.6	31.3	8.2	1.1	13.6	21.8	226.5	285.6	215.4	4.9
1013	1013	EAST UTTAR PRADESH	1902	6.1	2.3	2.4	2.0	21.4	32.5	411.5	155.4	257.2	13.1
1014	1014	EAST UTTAR PRADESH	1903	8.2	0.4	1.3	0.7	15.3	71.6	115.3	420.2	258.7	324.1
1015	1015	EAST UTTAR PRADESH	1904	7.3	1.5	8.3	0.4	28.7	148.0	359.4	328.8	95.0	50.0
1016	1016	EAST UTTAR PRADESH	1905	16.8	23.6	20.0	5.4	15.4	17.3	302.4	316.2	169.5	3.1
...
1122	1122	EAST UTTAR PRADESH	2011	1.0	2.7	1.6	2.9	32.2	163.8	197.9	232.1	146.4	0.0
1123	1123	EAST UTTAR PRADESH	2012	20.3	1.2	3.4	2.8	0.2	18.5	234.2	156.0	164.4	0.1
1124	1124	EAST UTTAR PRADESH	2013	6.1	59.6	2.7	8.7	1.1	309.7	230.0	246.1	78.2	97.4
1125	1125	EAST UTTAR PRADESH	2014	47.4	25.8	15.4	1.7	10.7	47.8	224.5	138.1	106.7	74.1
1126	1126	EAST UTTAR PRADESH	2015	30.0	4.1	48.2	23.2	8.6	95.3	179.0	175.8	21.9	11.8

115 rows × 20 columns



In [271]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[271]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1012	1901	62.6	31.3	8.2	1.1	13.6	21.8	226.5	285.6	215.4	4.9	0.1	2.1	873
1013	1902	6.1	2.3	2.4	2.0	21.4	32.5	411.5	155.4	257.2	13.2	1.2	0.0	905
1014	1903	8.2	0.4	1.3	0.7	15.3	71.6	115.3	420.2	258.7	324.7	0.0	0.0	1216
1015	1904	7.3	1.5	8.3	0.4	28.7	148.0	359.4	328.8	95.0	50.6	17.0	26.3	1071
1016	1905	16.8	23.6	20.0	5.4	15.4	17.3	302.4	316.2	169.5	3.3	0.0	1.6	891
...
1122	2011	1.0	2.7	1.6	2.9	32.2	163.8	197.9	232.1	146.4	0.6	0.0	0.0	781
1123	2012	20.3	1.2	3.4	2.8	0.2	18.5	234.2	156.0	164.4	0.7	0.3	0.7	602
1124	2013	6.1	59.6	2.7	8.7	1.1	309.7	230.0	246.1	78.2	97.4	0.5	1.1	1041
1125	2014	47.4	25.8	15.4	1.7	10.7	47.8	224.5	138.1	106.7	74.7	0.0	8.4	701
1126	2015	30.0	4.1	48.2	23.2	8.6	95.3	179.0	175.8	21.9	11.8	0.5	4.9	603

115 rows × 14 columns



In [272]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

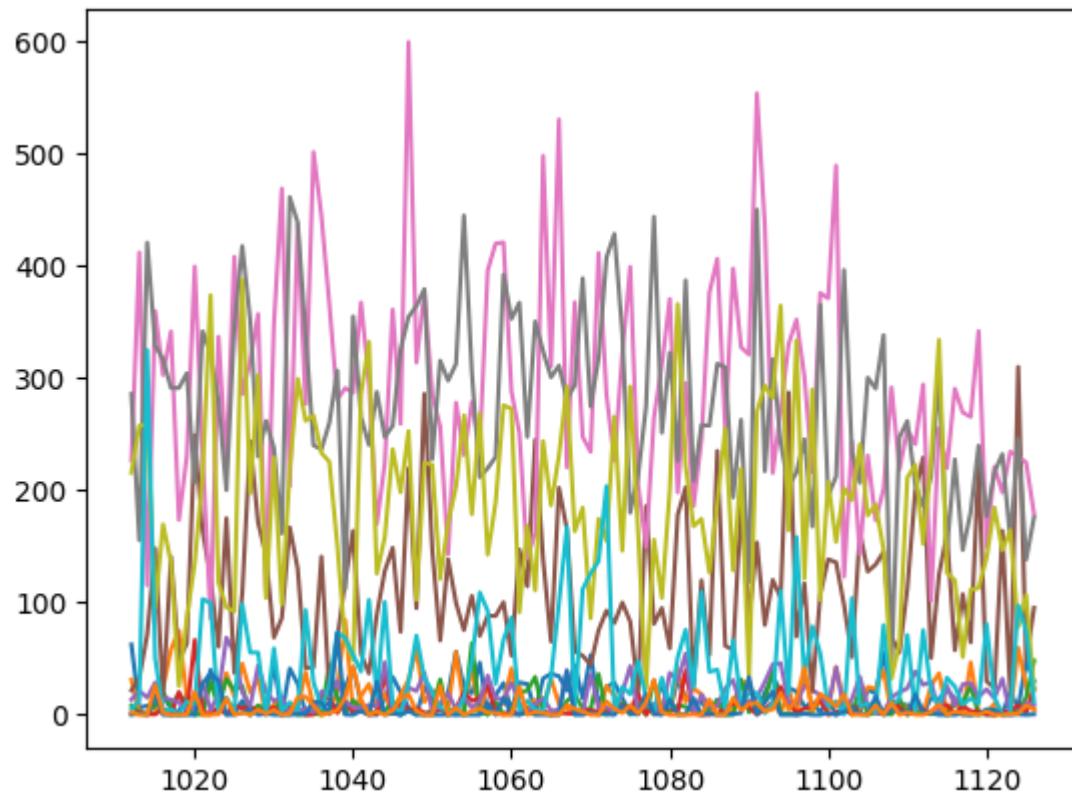
Out[272]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1012	62.6	31.3	8.2	1.1	13.6	21.8	226.5	285.6	215.4	4.9	0.1	2.1
1013	6.1	2.3	2.4	2.0	21.4	32.5	411.5	155.4	257.2	13.2	1.2	0.0
1014	8.2	0.4	1.3	0.7	15.3	71.6	115.3	420.2	258.7	324.7	0.0	0.0
1015	7.3	1.5	8.3	0.4	28.7	148.0	359.4	328.8	95.0	50.6	17.0	26.3
1016	16.8	23.6	20.0	5.4	15.4	17.3	302.4	316.2	169.5	3.3	0.0	1.6
...
1122	1.0	2.7	1.6	2.9	32.2	163.8	197.9	232.1	146.4	0.6	0.0	0.0
1123	20.3	1.2	3.4	2.8	0.2	18.5	234.2	156.0	164.4	0.7	0.3	0.7
1124	6.1	59.6	2.7	8.7	1.1	309.7	230.0	246.1	78.2	97.4	0.5	1.1
1125	47.4	25.8	15.4	1.7	10.7	47.8	224.5	138.1	106.7	74.7	0.0	8.4
1126	30.0	4.1	48.2	23.2	8.6	95.3	179.0	175.8	21.9	11.8	0.5	4.9

115 rows × 12 columns

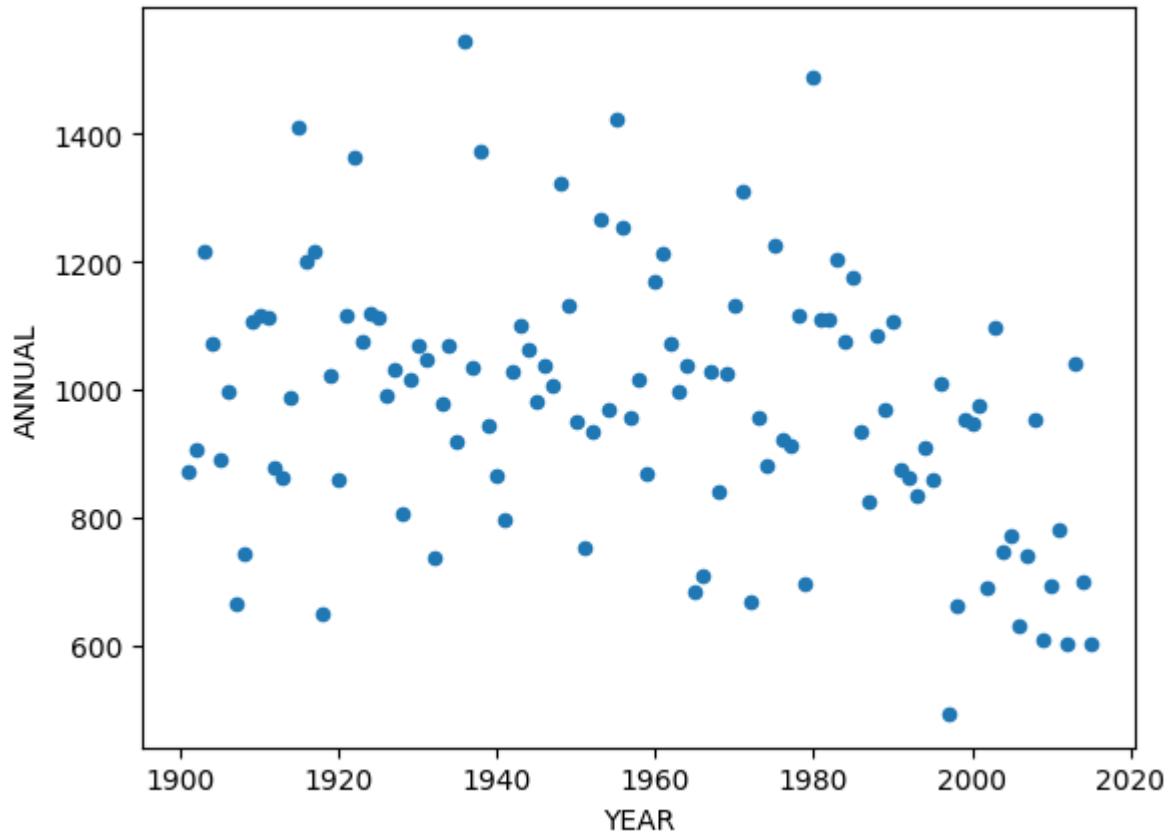
In [273]: `plt.plot(y)`

Out[273]: [`<matplotlib.lines.Line2D at 0x26da15a08d0>`,
`<matplotlib.lines.Line2D at 0x26da14c9250>`,
`<matplotlib.lines.Line2D at 0x26da14e34d0>`,
`<matplotlib.lines.Line2D at 0x26da14b9250>`,
`<matplotlib.lines.Line2D at 0x26da155ab50>`,
`<matplotlib.lines.Line2D at 0x26da155af50>`,
`<matplotlib.lines.Line2D at 0x26da1559d50>`,
`<matplotlib.lines.Line2D at 0x26da14fcfd0>`,
`<matplotlib.lines.Line2D at 0x26da155b390>`,
`<matplotlib.lines.Line2D at 0x26da1559a50>`,
`<matplotlib.lines.Line2D at 0x26da14f2210>`,
`<matplotlib.lines.Line2D at 0x26da14ac6d0>`]



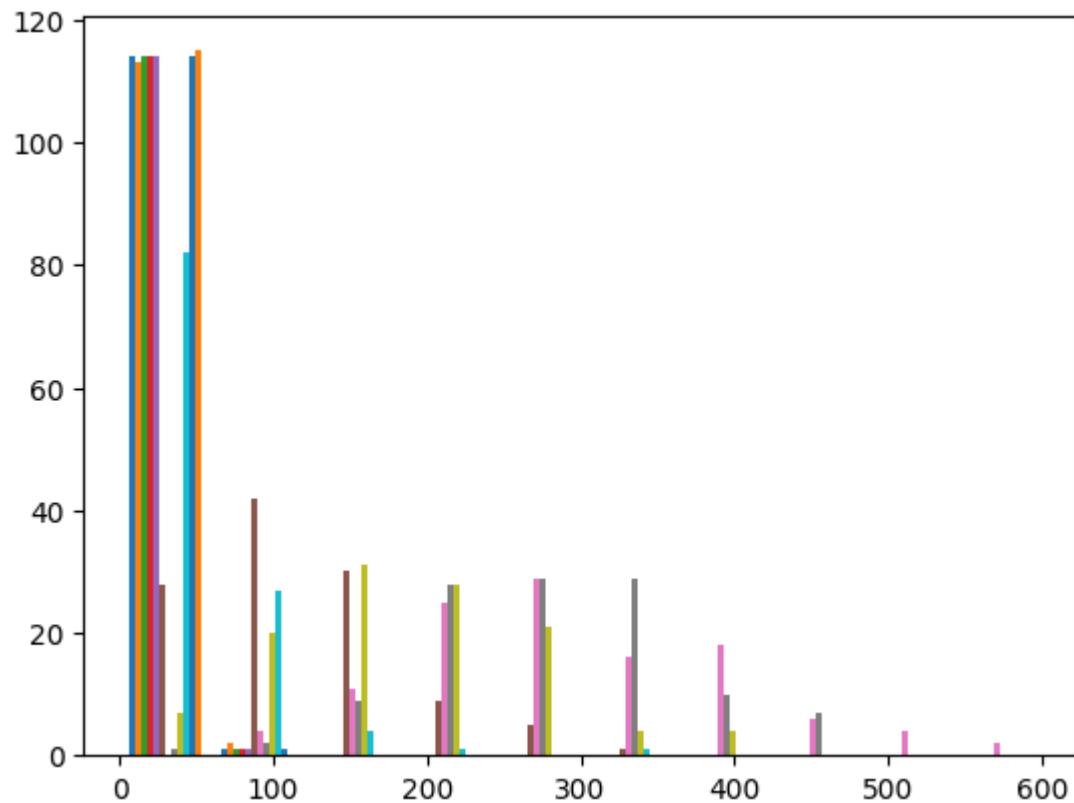
```
In [274]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[274]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



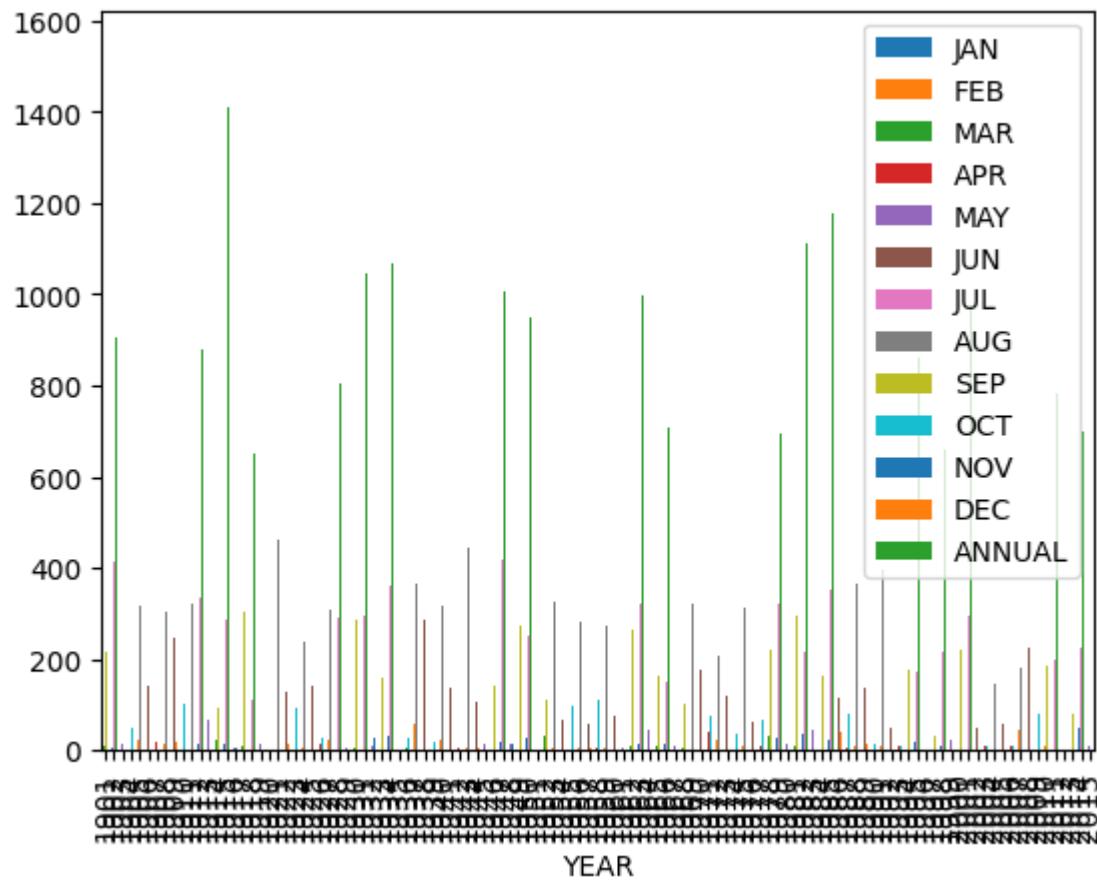
```
In [275]: plt.hist(y)
```

```
Out[275]: (array([[114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [113., 2., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [28., 42., 30., 9., 5., 1., 0., 0., 0., 0.],
       [0., 4., 11., 25., 29., 16., 18., 6., 4., 2.],
       [1., 2., 9., 28., 29., 29., 10., 7., 0., 0.],
       [7., 20., 31., 28., 21., 4., 4., 0., 0., 0.],
       [82., 27., 4., 1., 0., 1., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.]]),
array([ 0. , 59.88, 119.76, 179.64, 239.52, 299.4 , 359.28, 419.16,
479.04, 538.92, 598.8 ]),
<a list of 12 BarContainer objects>)
```



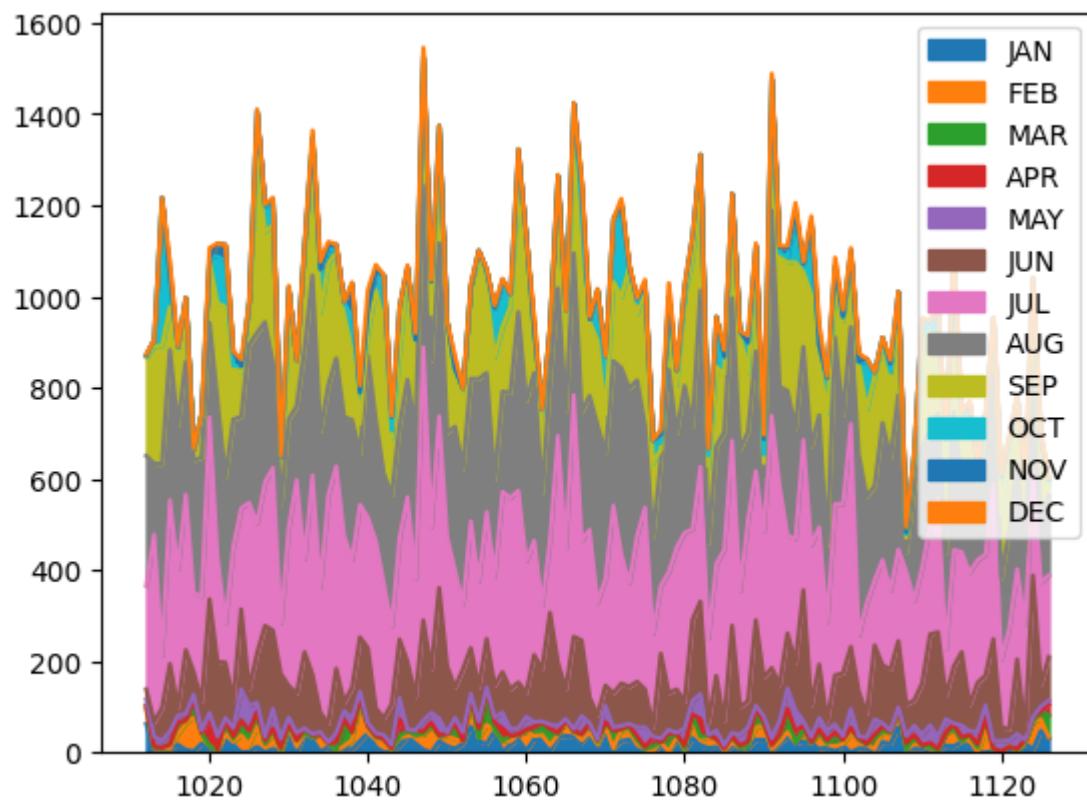
```
In [276]: x.plot.bar(x="YEAR")
```

```
Out[276]: <Axes: xlabel='YEAR'>
```



In [277]: `y.plot.area()`

Out[277]: <Axes: >



BIHAR

In [283]:

```
x=df[df[ "SUBDIVISION" ]=="BIHAR"]
```

```
x
```

Out[283]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
897	897	BIHAR	1901	51.8	19.6	11.9	1.1	65.6	66.3	245.9	319.4	155.1	8
898	898	BIHAR	1902	4.6	0.7	24.3	17.3	66.3	118.2	361.0	225.5	358.7	28
899	899	BIHAR	1903	5.3	4.7	2.0	4.7	28.2	192.9	115.0	342.6	173.9	147
900	900	BIHAR	1904	6.3	1.7	3.5	5.3	118.7	191.6	394.4	351.3	84.4	98
901	901	BIHAR	1905	16.0	30.1	32.6	21.4	77.5	50.5	409.1	495.3	353.9	11
...
1007	1007	BIHAR	2011	4.2	7.7	9.2	23.9	74.5	211.0	241.1	278.7	234.1	10
1008	1008	BIHAR	2012	18.1	2.7	7.3	20.4	18.8	96.2	354.0	240.4	233.8	34
1009	1009	BIHAR	2013	5.1	22.6	0.6	32.3	89.5	183.3	182.0	213.6	143.3	197
1010	1010	BIHAR	2014	17.0	33.5	8.4	0.7	103.9	115.2	265.4	307.6	160.3	47
1011	1011	BIHAR	2015	12.8	1.8	27.2	38.7	39.5	122.1	231.5	287.0	101.7	10

115 rows × 20 columns



In [284]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

```
x
```

Out[284]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
897	1901	51.8	19.6	11.9	1.1	65.6	66.3	245.9	319.4	155.1	8.3	7.3	0.1	952
898	1902	4.6	0.7	24.3	17.3	66.3	118.2	361.0	225.5	358.7	28.5	1.1	0.0	1206
899	1903	5.3	4.7	2.0	4.7	28.2	192.9	115.0	342.6	173.9	147.0	0.1	0.0	1016
900	1904	6.3	1.7	3.5	5.3	118.7	191.6	394.4	351.3	84.4	98.1	10.6	3.8	1269
901	1905	16.0	30.1	32.6	21.4	77.5	50.5	409.1	495.3	353.9	11.6	0.0	0.6	1498
...
1007	2011	4.2	7.7	9.2	23.9	74.5	211.0	241.1	278.7	234.1	10.0	2.0	0.9	1097
1008	2012	18.1	2.7	7.3	20.4	18.8	96.2	354.0	240.4	233.8	34.3	6.4	0.0	1032
1009	2013	5.1	22.6	0.6	32.3	89.5	183.3	182.0	213.6	143.3	197.1	0.4	0.0	1069
1010	2014	17.0	33.5	8.4	0.7	103.9	115.2	265.4	307.6	160.3	47.8	0.0	1.2	1061
1011	2015	12.8	1.8	27.2	38.7	39.5	122.1	231.5	287.0	101.7	10.4	0.0	0.0	872

115 rows × 14 columns



```
In [285]: y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

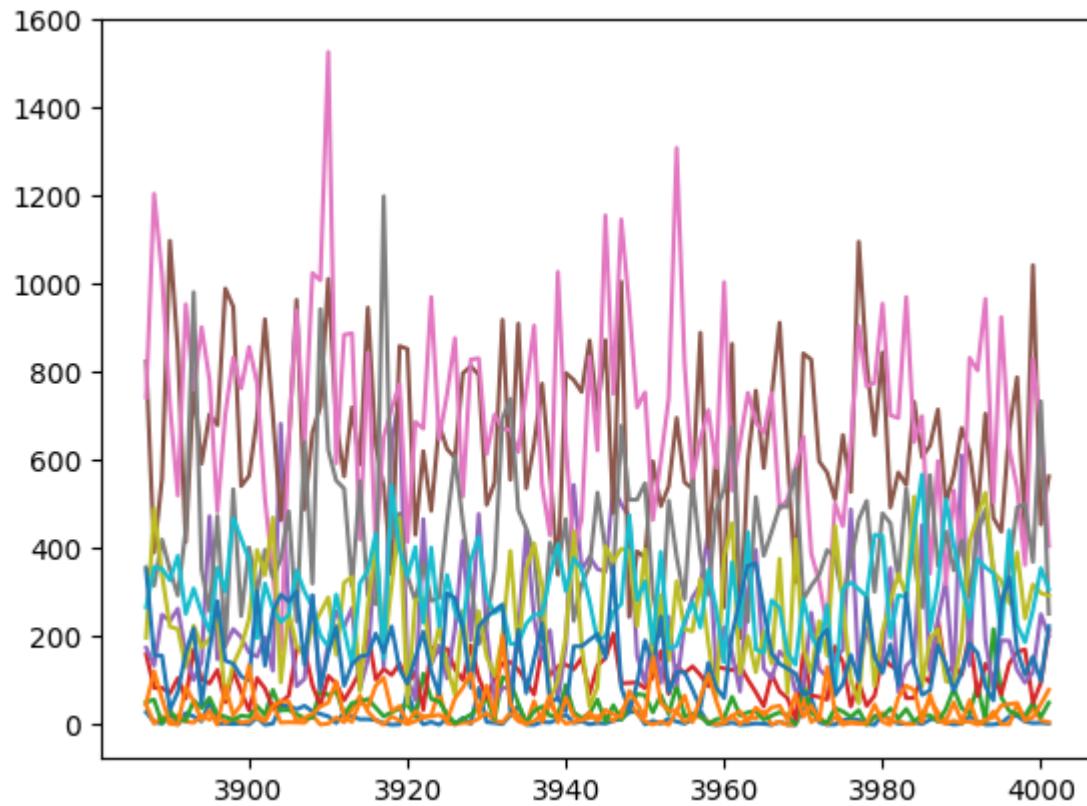
```
Out[285]:
```

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
897	51.8	19.6	11.9	1.1	65.6	66.3	245.9	319.4	155.1	8.3	7.3	0.1
898	4.6	0.7	24.3	17.3	66.3	118.2	361.0	225.5	358.7	28.5	1.1	0.0
899	5.3	4.7	2.0	4.7	28.2	192.9	115.0	342.6	173.9	147.0	0.1	0.0
900	6.3	1.7	3.5	5.3	118.7	191.6	394.4	351.3	84.4	98.1	10.6	3.8
901	16.0	30.1	32.6	21.4	77.5	50.5	409.1	495.3	353.9	11.6	0.0	0.6
...
1007	4.2	7.7	9.2	23.9	74.5	211.0	241.1	278.7	234.1	10.0	2.0	0.9
1008	18.1	2.7	7.3	20.4	18.8	96.2	354.0	240.4	233.8	34.3	6.4	0.0
1009	5.1	22.6	0.6	32.3	89.5	183.3	182.0	213.6	143.3	197.1	0.4	0.0
1010	17.0	33.5	8.4	0.7	103.9	115.2	265.4	307.6	160.3	47.8	0.0	1.2
1011	12.8	1.8	27.2	38.7	39.5	122.1	231.5	287.0	101.7	10.4	0.0	0.0

115 rows × 12 columns

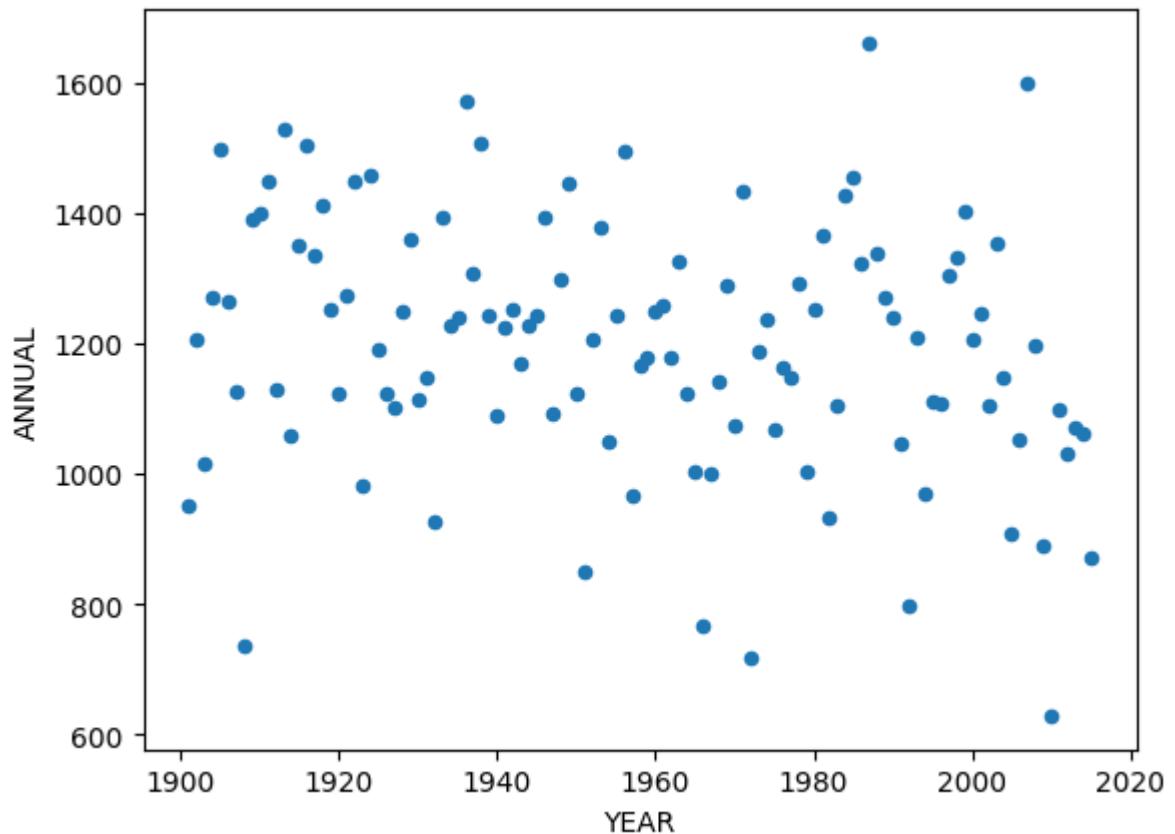
```
In [281]: plt.plot(y)
```

```
Out[281]: [
```



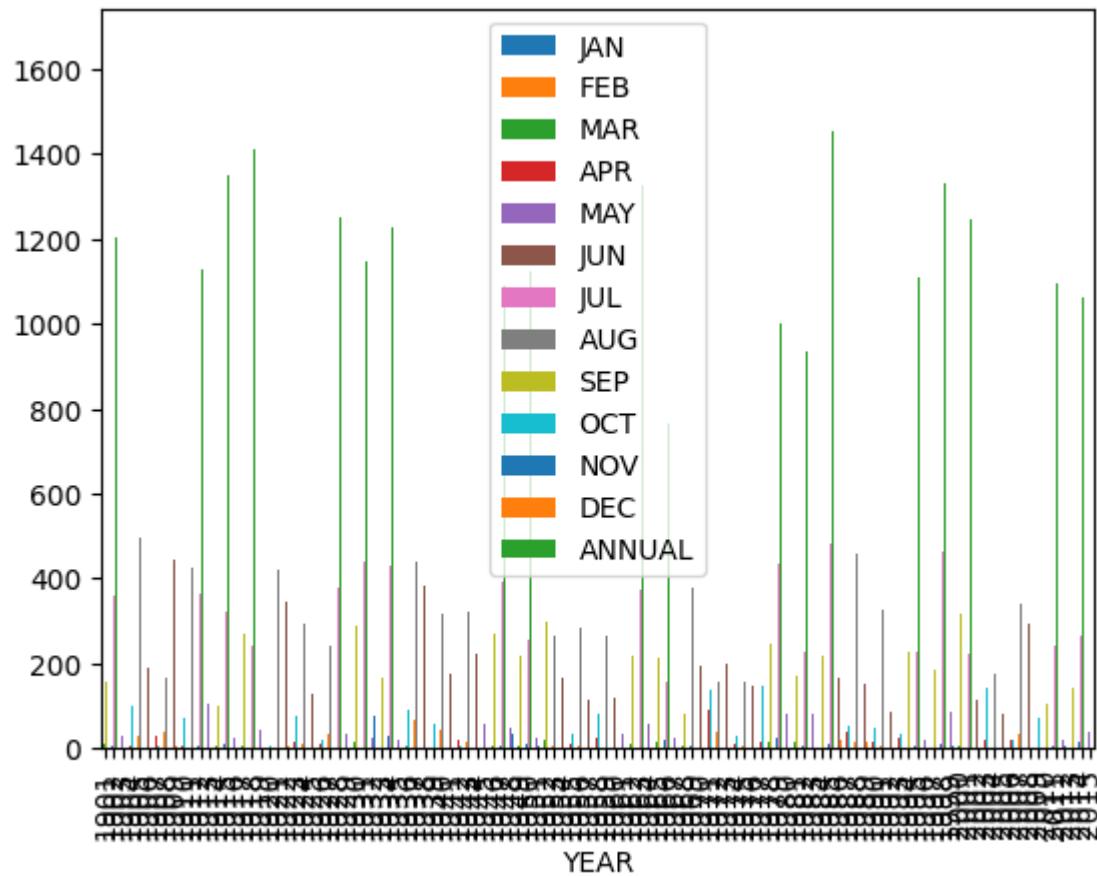
```
In [286]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[286]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



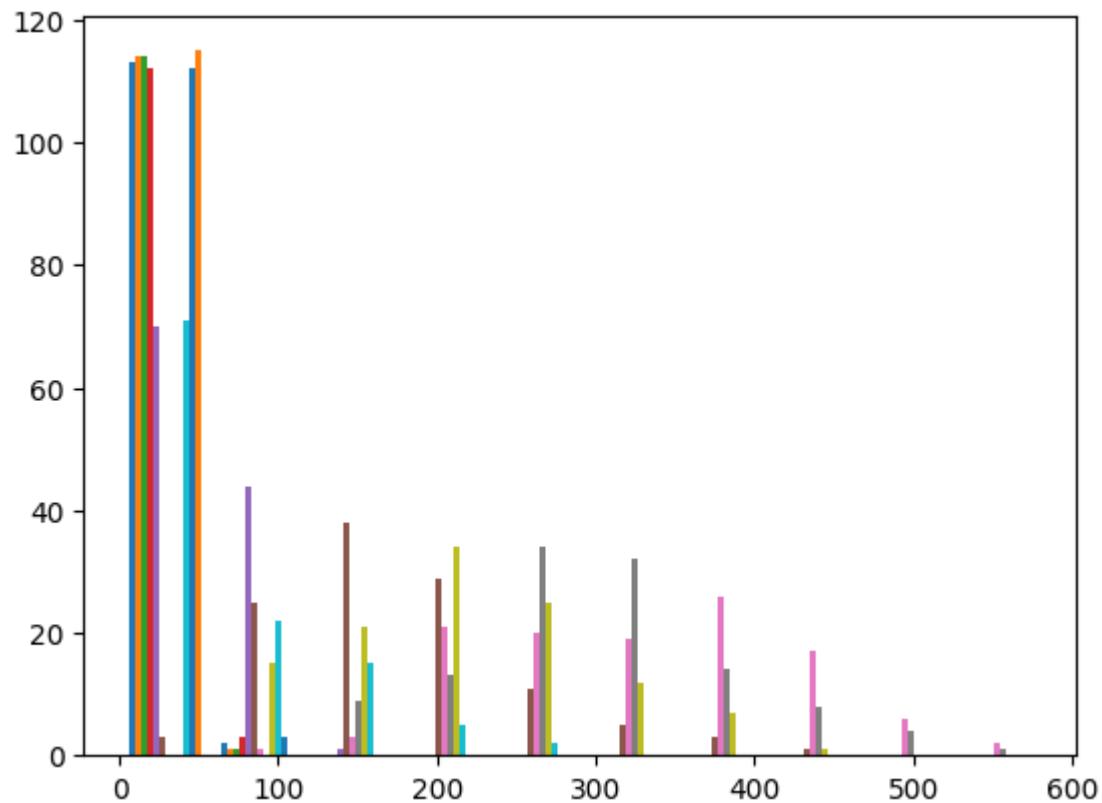
In [287]: `x.plot.bar(x="YEAR")`

Out[287]: <Axes: xlabel='YEAR'>



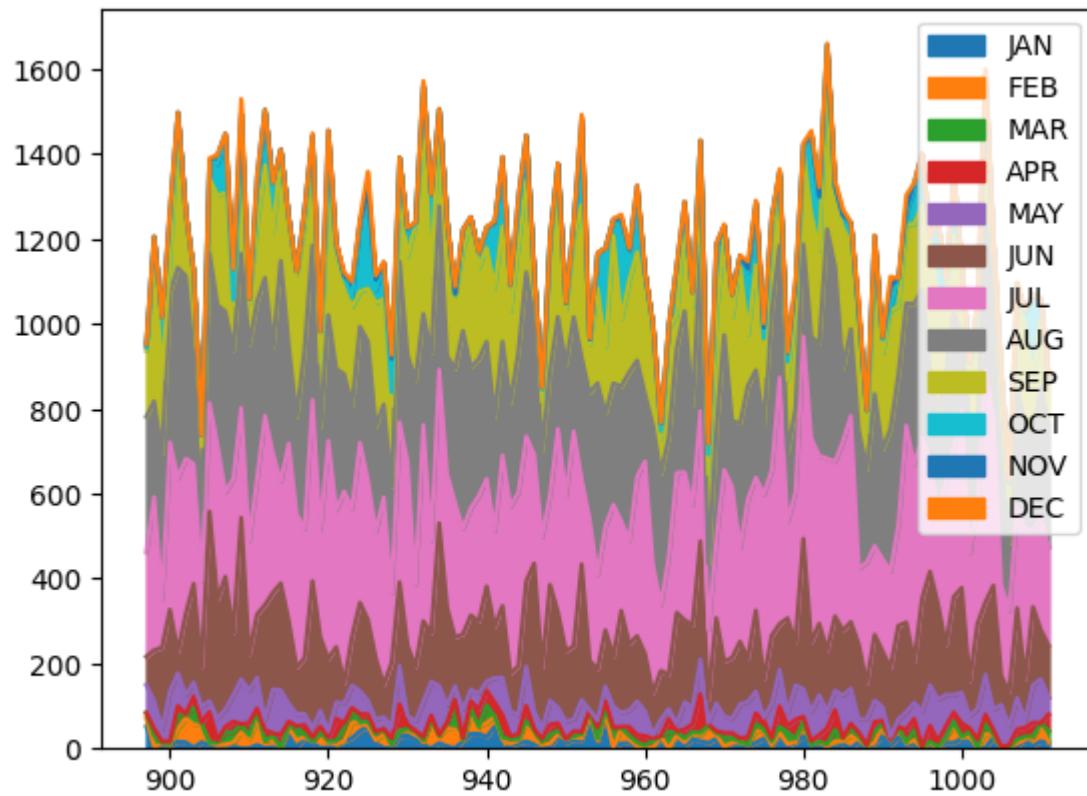
```
In [288]: plt.hist(y)
```

```
Out[288]: (array([[113., 2., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [114., 1., 0., 0., 0., 0., 0., 0., 0., 0.],
       [112., 3., 0., 0., 0., 0., 0., 0., 0., 0.],
       [ 70., 44., 1., 0., 0., 0., 0., 0., 0., 0.],
       [ 3., 25., 38., 29., 11., 5., 3., 1., 0., 0.],
       [ 0., 1., 3., 21., 20., 19., 26., 17., 6., 2.],
       [ 0., 0., 9., 13., 34., 32., 14., 8., 4., 1.],
       [ 0., 15., 21., 34., 25., 12., 7., 1., 0., 0.],
       [ 71., 22., 15., 5., 2., 0., 0., 0., 0., 0.],
       [112., 3., 0., 0., 0., 0., 0., 0., 0., 0.],
       [115., 0., 0., 0., 0., 0., 0., 0., 0., 0.]]),
array([ 0. , 58.01, 116.02, 174.03, 232.04, 290.05, 348.06, 406.07,
       464.08, 522.09, 580.1 ]),
<a list of 12 BarContainer objects>)
```



```
In [289]: y.plot.area()
```

```
Out[289]: <Axes: >
```



JHARKHAND

In [297]:

```
x=df[df[ "SUBDIVISION" ]=="JHARKHAND"]
```

```
x
```

Out[297]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
782	782	JHARKHAND	1901	92.7	66.6	11.1	18.4	33.5	70.9	269.4	415.1	248.0	37.3
783	783	JHARKHAND	1902	4.2	7.7	13.2	28.5	59.8	89.9	456.1	204.9	306.6	17.6
784	784	JHARKHAND	1903	25.1	19.5	10.7	32.8	56.4	142.1	206.1	280.8	190.2	210.1
785	785	JHARKHAND	1904	2.5	17.0	38.1	9.1	116.1	308.9	494.1	336.1	125.6	30.6
786	786	JHARKHAND	1905	38.4	53.3	61.6	32.9	66.2	41.5	420.3	293.7	322.8	21.3
...
892	892	JHARKHAND	2011	3.3	2.5	6.4	25.4	55.0	349.0	181.8	403.2	324.6	23.3
893	893	JHARKHAND	2012	34.6	10.3	1.5	9.6	6.6	121.1	287.2	282.4	217.6	37.8
894	894	JHARKHAND	2013	1.1	17.9	1.6	22.3	85.0	181.5	211.1	278.1	173.8	281.1
895	895	JHARKHAND	2014	9.9	47.5	22.9	1.9	98.2	139.7	321.3	290.9	178.2	44.9
896	896	JHARKHAND	2015	12.2	2.6	21.6	55.5	25.5	183.3	429.7	240.7	85.1	22.7

115 rows × 20 columns



In [298]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

```
x
```

Out[298]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
782	1901	92.7	66.6	11.1	18.4	33.5	70.9	269.4	415.1	248.0	37.3	11.5	0.0	1274.
783	1902	4.2	7.7	13.2	28.5	59.8	89.9	456.1	204.9	306.6	17.6	5.9	3.2	1197.
784	1903	25.1	19.5	10.7	32.8	56.4	142.1	206.1	280.8	190.2	210.1	0.5	0.0	1174.
785	1904	2.5	17.0	38.1	9.1	116.1	308.9	494.1	336.1	125.6	30.6	2.3	0.4	1480.
786	1905	38.4	53.3	61.6	32.9	66.2	41.5	420.3	293.7	322.8	21.3	0.0	2.7	1354.
...	-
892	2011	3.3	2.5	6.4	25.4	55.0	349.0	181.8	403.2	324.6	23.3	0.0	0.1	1374.
893	2012	34.6	10.3	1.5	9.6	6.6	121.1	287.2	282.4	217.6	37.8	48.6	7.6	1065.
894	2013	1.1	17.9	1.6	22.3	85.0	181.5	211.1	278.1	173.8	281.1	0.0	0.0	1253.
895	2014	9.9	47.5	22.9	1.9	98.2	139.7	321.3	290.9	178.2	44.9	0.0	1.2	1156.
896	2015	12.2	2.6	21.6	55.5	25.5	183.3	429.7	240.7	85.1	22.7	0.2	2.7	1081.

115 rows × 14 columns



In [299]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

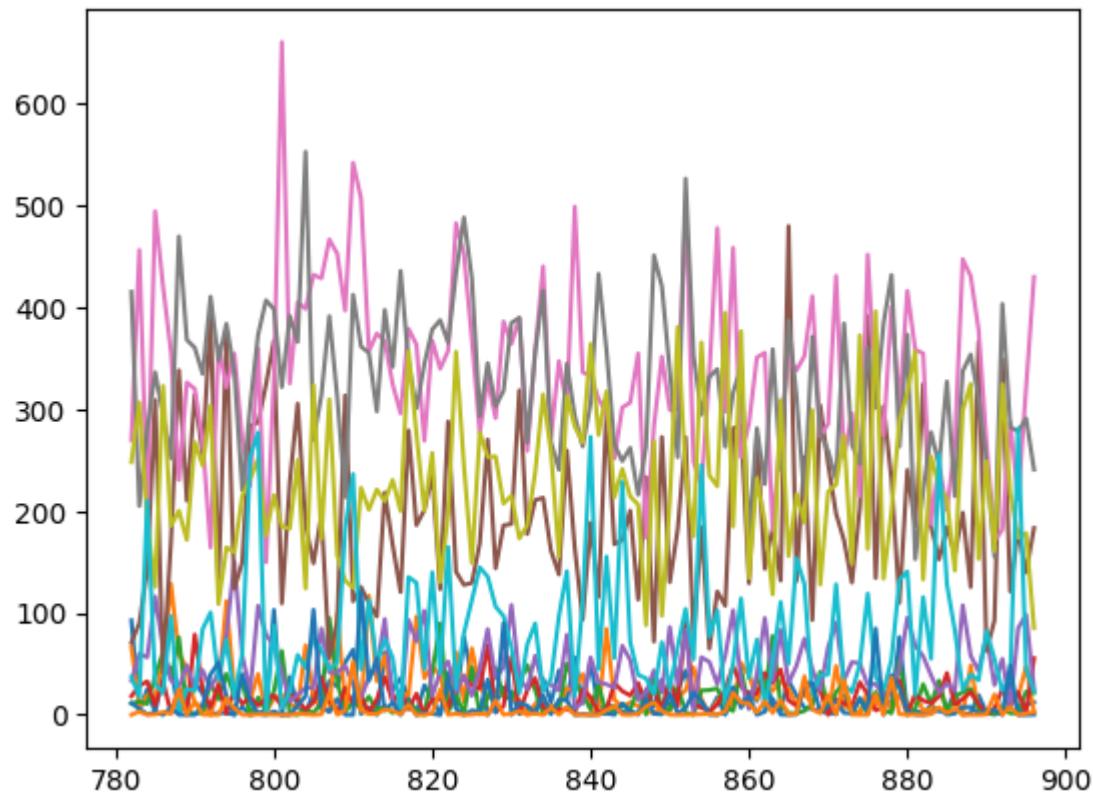
Out[299]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
782	92.7	66.6	11.1	18.4	33.5	70.9	269.4	415.1	248.0	37.3	11.5	0.0
783	4.2	7.7	13.2	28.5	59.8	89.9	456.1	204.9	306.6	17.6	5.9	3.2
784	25.1	19.5	10.7	32.8	56.4	142.1	206.1	280.8	190.2	210.1	0.5	0.0
785	2.5	17.0	38.1	9.1	116.1	308.9	494.1	336.1	125.6	30.6	2.3	0.4
786	38.4	53.3	61.6	32.9	66.2	41.5	420.3	293.7	322.8	21.3	0.0	2.7
...
892	3.3	2.5	6.4	25.4	55.0	349.0	181.8	403.2	324.6	23.3	0.0	0.1
893	34.6	10.3	1.5	9.6	6.6	121.1	287.2	282.4	217.6	37.8	48.6	7.6
894	1.1	17.9	1.6	22.3	85.0	181.5	211.1	278.1	173.8	281.1	0.0	0.0
895	9.9	47.5	22.9	1.9	98.2	139.7	321.3	290.9	178.2	44.9	0.0	1.2
896	12.2	2.6	21.6	55.5	25.5	183.3	429.7	240.7	85.1	22.7	0.2	2.7

115 rows × 12 columns

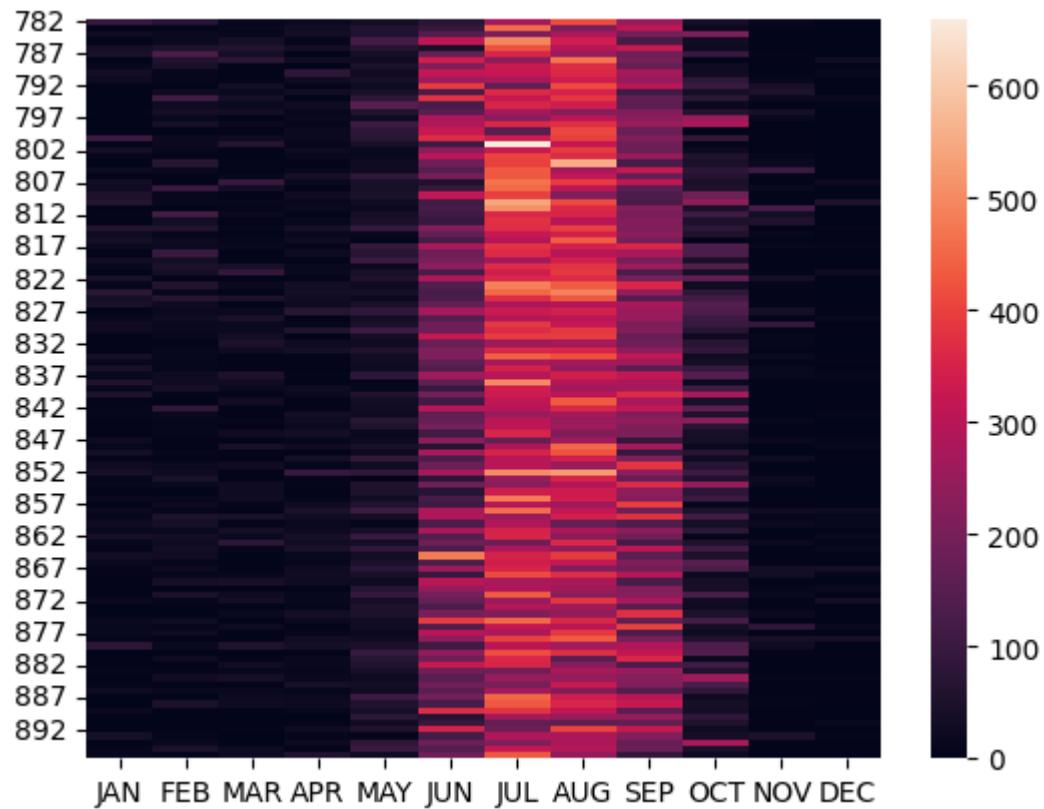
```
In [300]: plt.plot(y)
```

```
Out[300]: [
```



In [301]: `sns.heatmap(y)`

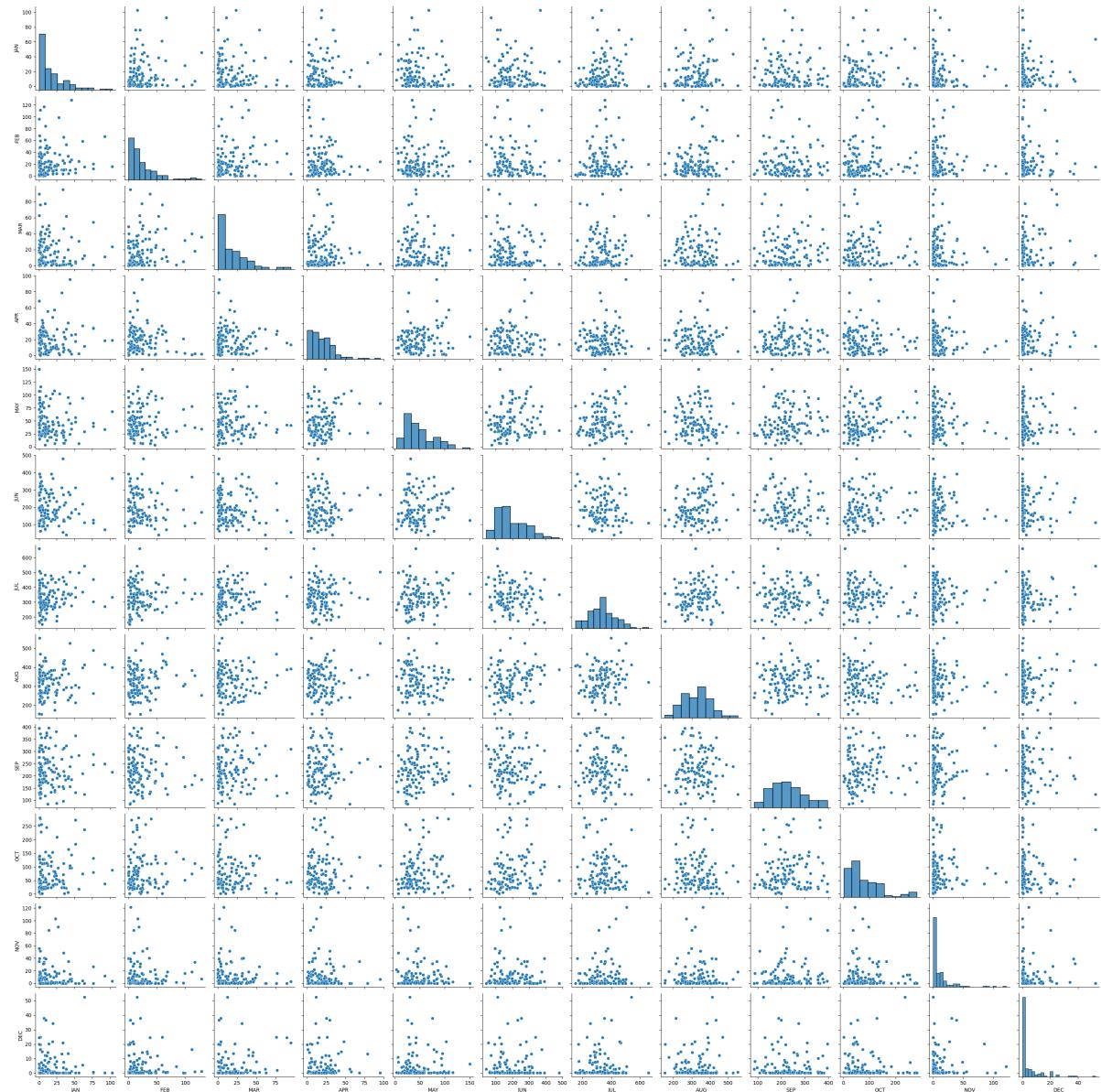
Out[301]: <Axes: >



```
In [302]: sns.pairplot(y)
```

C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
self._figure.tight_layout(*args, **kwargs)

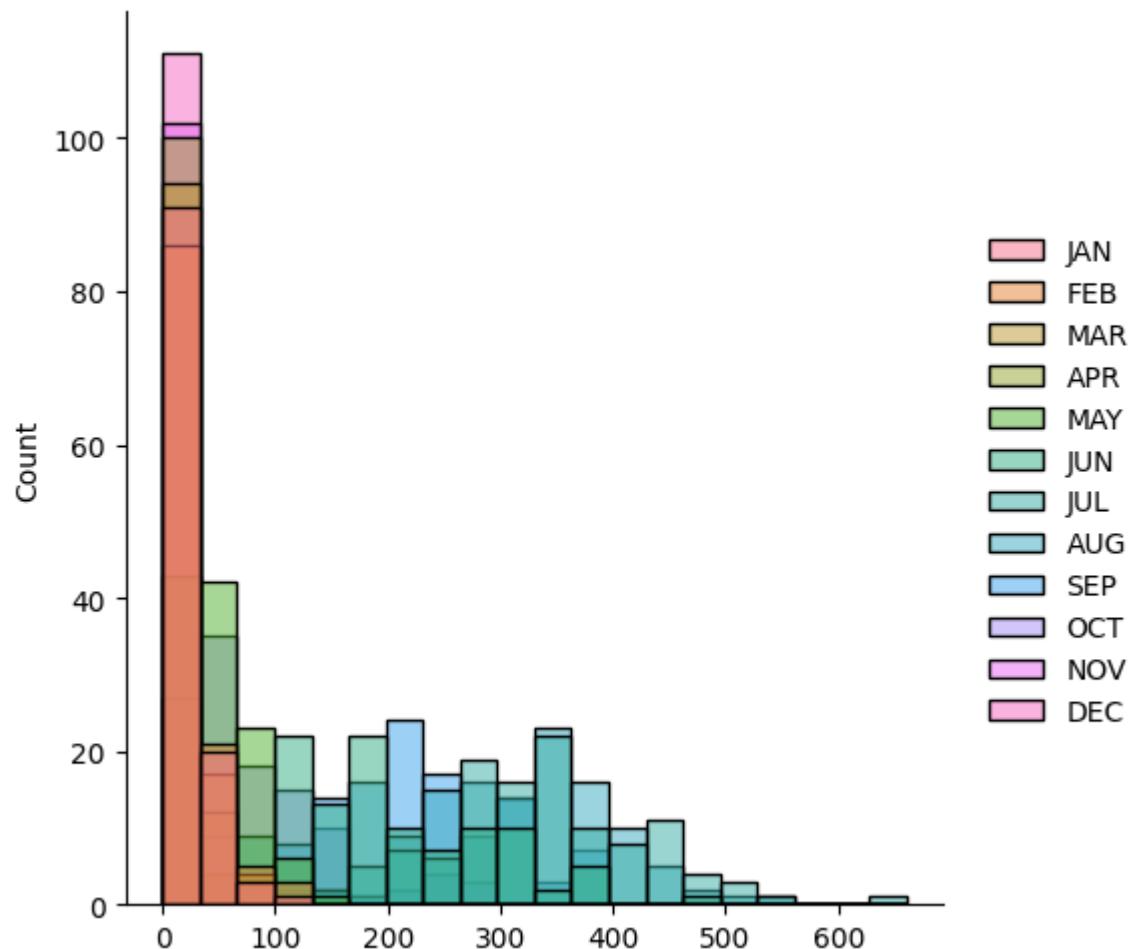
Out[302]: <seaborn.axisgrid.PairGrid at 0x26dade35990>



In [303]: `sns.displot(y)`

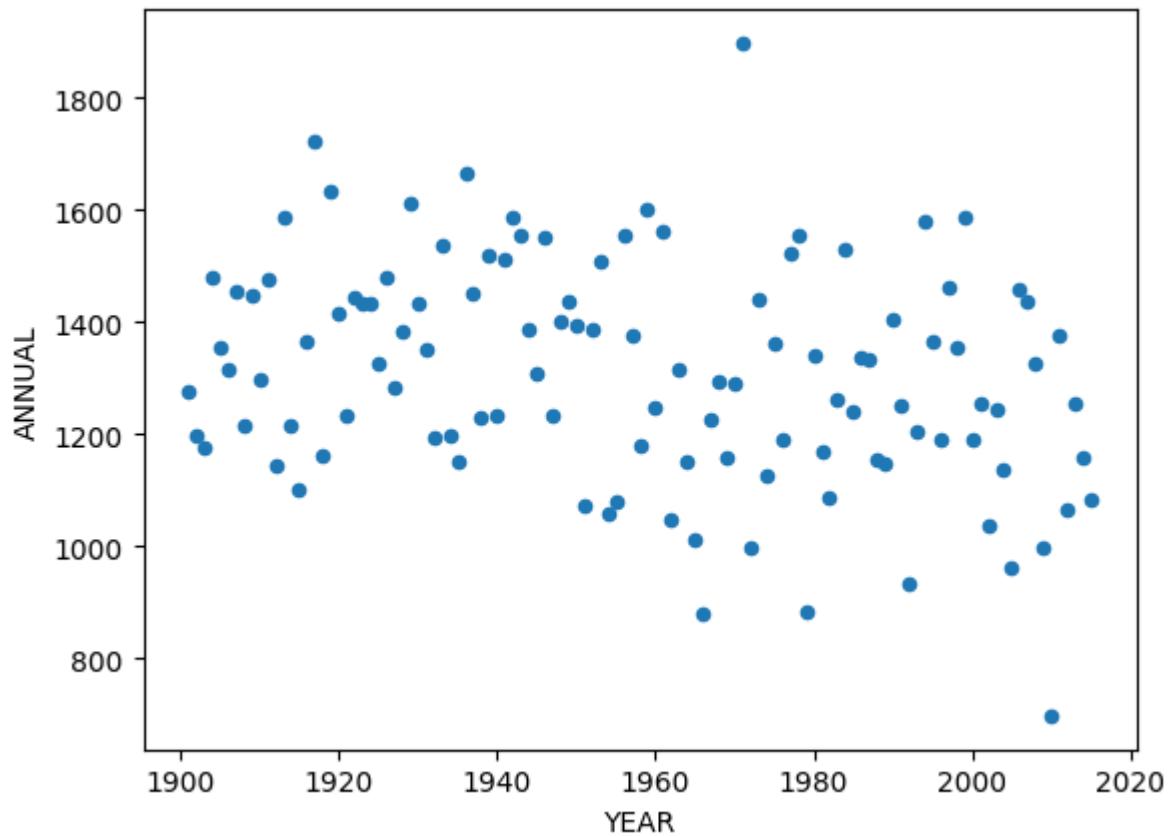
```
C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages
\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

Out[303]: <seaborn.axisgrid.FacetGrid at 0x26db7edd410>



```
In [304]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[304]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



ORISSA

In [305]:

```
x=df[df[ "SUBDIVISION" ]=="ORISSA"]
```

```
x
```

Out[305]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
667	667	ORISSA	1901	39.5	65.1	16.1	51.6	79.0	78.2	288.4	307.7	185.3	76.
668	668	ORISSA	1902	3.4	0.2	14.2	101.1	56.7	108.3	437.4	349.1	202.7	33.
669	669	ORISSA	1903	19.7	18.9	10.5	34.6	73.3	154.3	410.4	295.2	265.6	228.
670	670	ORISSA	1904	0.2	12.2	20.6	10.1	100.2	342.9	336.7	350.4	227.8	111.
671	671	ORISSA	1905	24.3	17.2	66.3	56.9	107.5	92.0	330.1	281.4	344.1	36.
...
777	777	ORISSA	2011	3.7	16.2	4.9	58.2	75.6	210.1	199.6	358.6	398.7	20.
778	778	ORISSA	2012	50.8	3.6	0.9	34.8	21.3	169.6	324.3	417.0	242.4	66.
779	779	ORISSA	2013	3.3	7.8	2.1	53.6	57.7	272.6	380.0	254.9	208.1	391.
780	780	ORISSA	2014	0.0	17.6	25.1	11.7	111.9	92.2	496.2	386.3	281.1	111.
781	781	ORISSA	2015	15.1	3.3	10.5	67.6	32.6	238.6	294.8	264.0	237.0	24.

115 rows × 20 columns



In [306]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

```
x
```

Out[306]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
667	1901	39.5	65.1	16.1	51.6	79.0	78.2	288.4	307.7	185.3	76.6	96.7	0.0	1284
668	1902	3.4	0.2	14.2	101.1	56.7	108.3	437.4	349.1	202.7	33.2	13.0	29.6	1349
669	1903	19.7	18.9	10.5	34.6	73.3	154.3	410.4	295.2	265.6	228.5	46.2	11.0	1568
670	1904	0.2	12.2	20.6	10.1	100.2	342.9	336.7	350.4	227.8	111.8	0.0	1.9	1514
671	1905	24.3	17.2	66.3	56.9	107.5	92.0	330.1	281.4	344.1	36.4	0.7	0.4	1357
...
777	2011	3.7	16.2	4.9	58.2	75.6	210.1	199.6	358.6	398.7	20.2	0.1	0.4	1346
778	2012	50.8	3.6	0.9	34.8	21.3	169.6	324.3	417.0	242.4	66.0	72.1	3.1	1405
779	2013	3.3	7.8	2.1	53.6	57.7	272.6	380.0	254.9	208.1	391.0	1.2	0.0	1632
780	2014	0.0	17.6	25.1	11.7	111.9	92.2	496.2	386.3	281.1	111.8	2.2	0.9	1536
781	2015	15.1	3.3	10.5	67.6	32.6	238.6	294.8	264.0	237.0	24.7	6.2	15.6	1210

115 rows × 14 columns



In [307]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

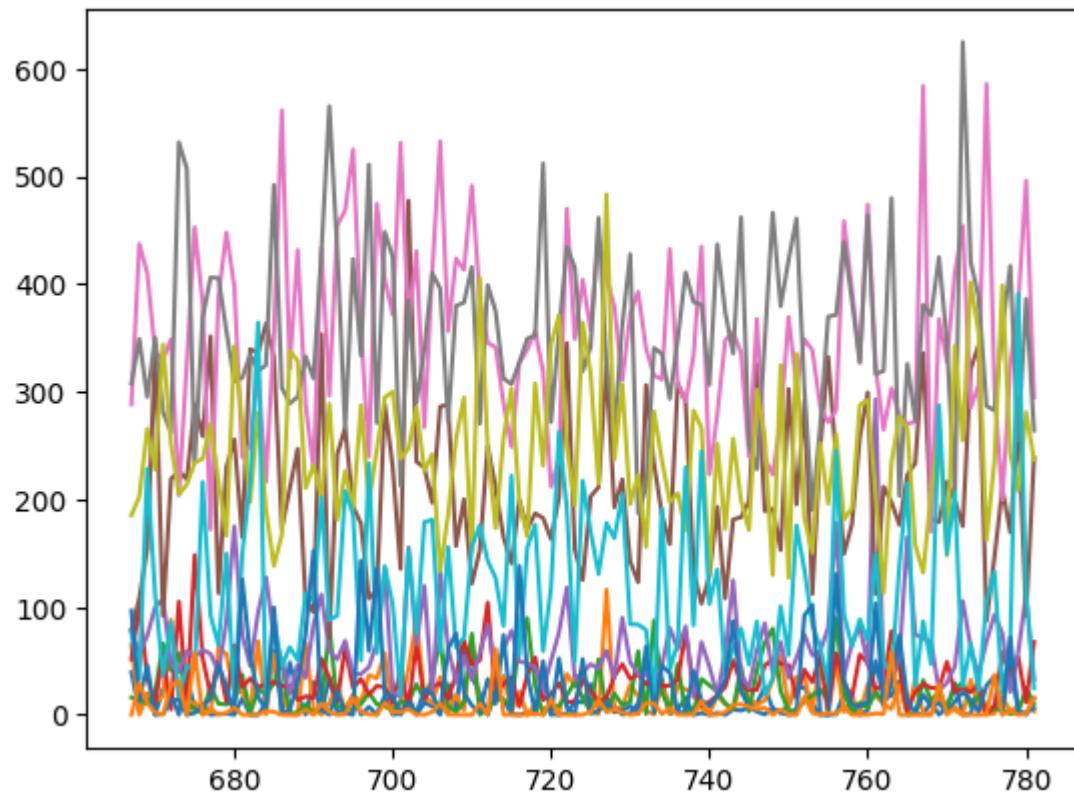
Out[307]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
667	39.5	65.1	16.1	51.6	79.0	78.2	288.4	307.7	185.3	76.6	96.7	0.0
668	3.4	0.2	14.2	101.1	56.7	108.3	437.4	349.1	202.7	33.2	13.0	29.6
669	19.7	18.9	10.5	34.6	73.3	154.3	410.4	295.2	265.6	228.5	46.2	11.0
670	0.2	12.2	20.6	10.1	100.2	342.9	336.7	350.4	227.8	111.8	0.0	1.9
671	24.3	17.2	66.3	56.9	107.5	92.0	330.1	281.4	344.1	36.4	0.7	0.4
...
777	3.7	16.2	4.9	58.2	75.6	210.1	199.6	358.6	398.7	20.2	0.1	0.4
778	50.8	3.6	0.9	34.8	21.3	169.6	324.3	417.0	242.4	66.0	72.1	3.1
779	3.3	7.8	2.1	53.6	57.7	272.6	380.0	254.9	208.1	391.0	1.2	0.0
780	0.0	17.6	25.1	11.7	111.9	92.2	496.2	386.3	281.1	111.8	2.2	0.9
781	15.1	3.3	10.5	67.6	32.6	238.6	294.8	264.0	237.0	24.7	6.2	15.6

115 rows × 12 columns

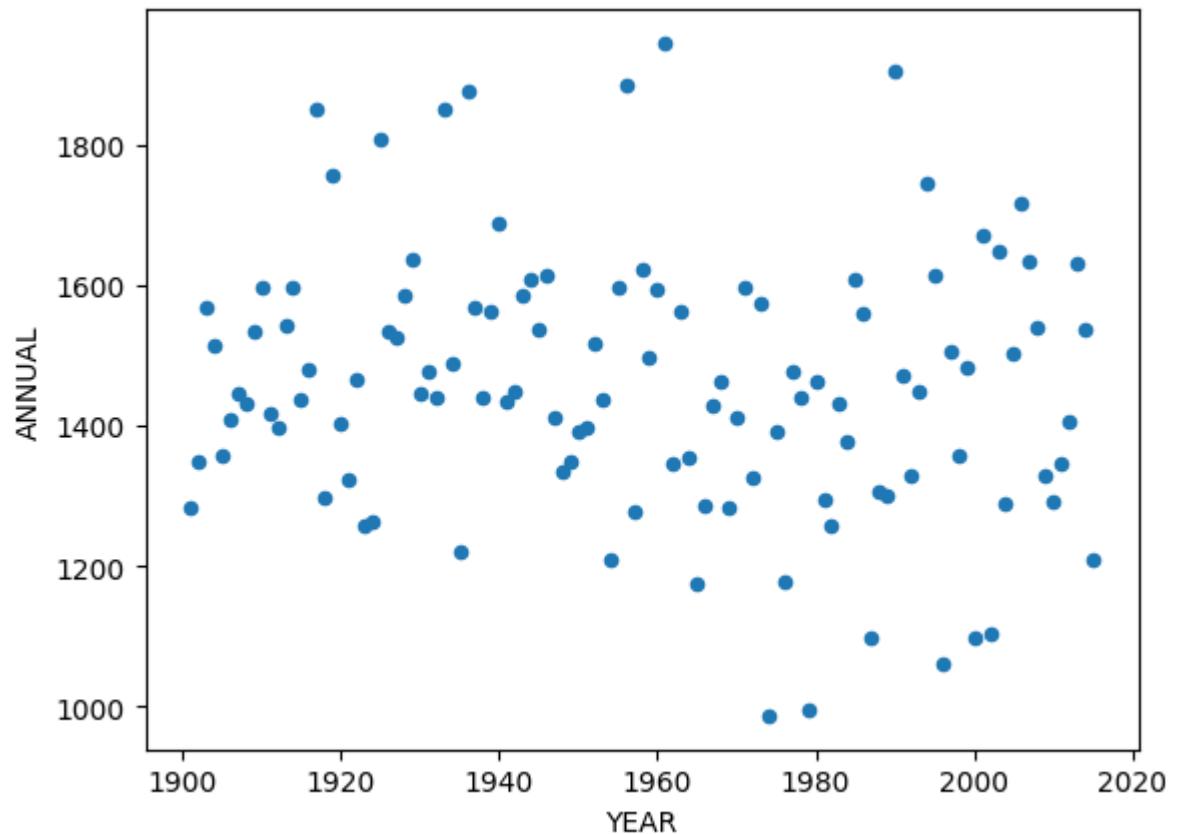
```
In [308]: plt.plot(y)
```

```
Out[308]: [
```



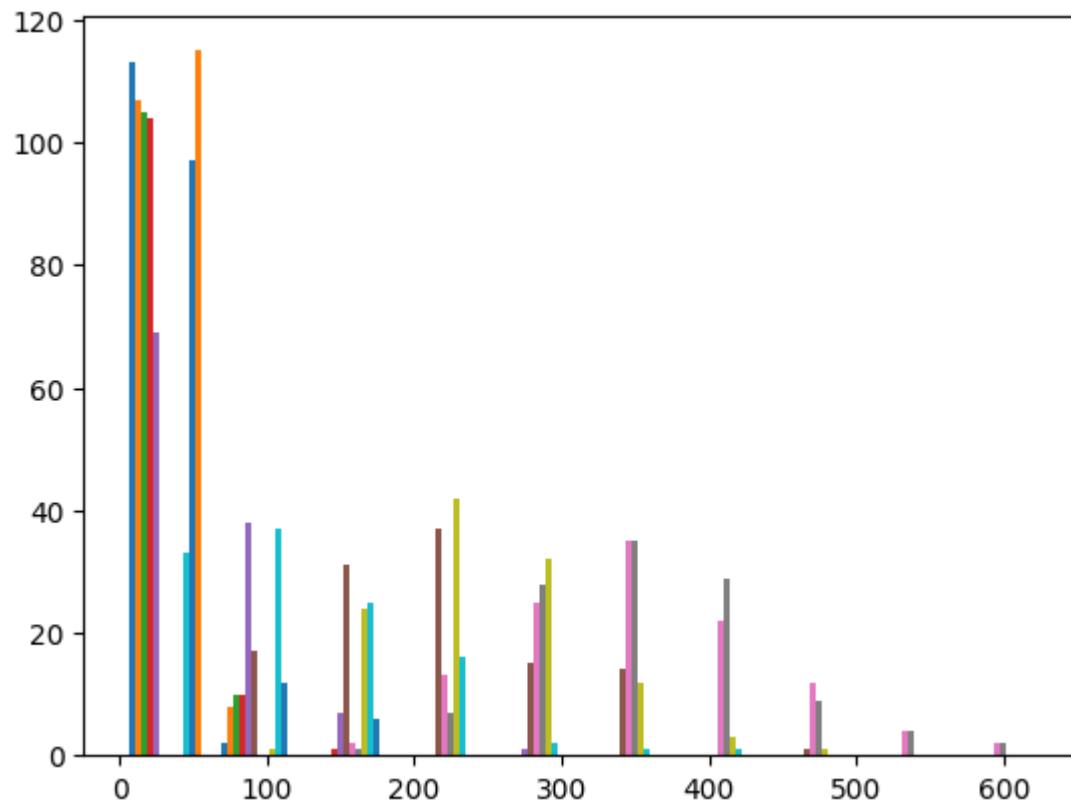
```
In [309]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[309]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



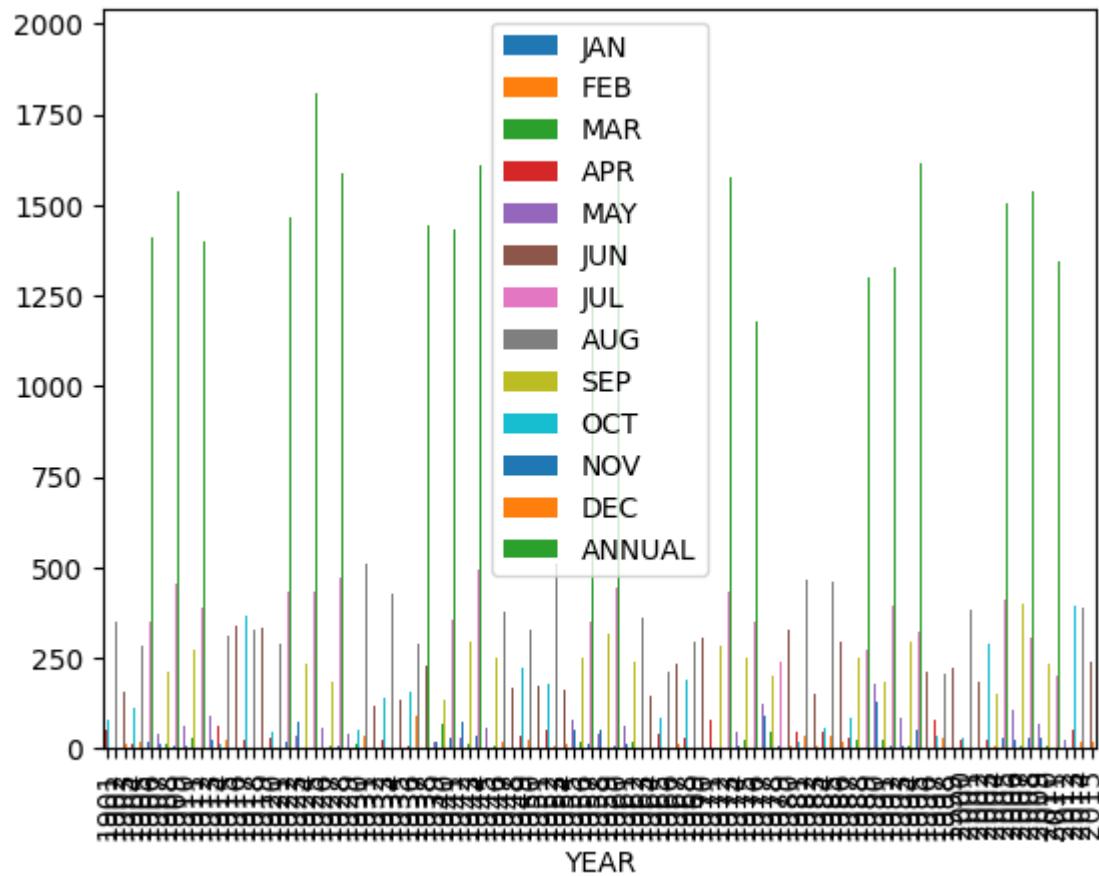
```
In [310]: plt.hist(y)
```

```
Out[310]: (array([[113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [107.,  8.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [105., 10.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [104., 10.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 69., 38.,  7.,  0.,  1.,  0.,  0.,  0.,  0.,  0.],
       [  0., 17., 31., 37., 15., 14.,  0.,  1.,  0.,  0.],
       [  0.,  0.,  2., 13., 25., 35., 22., 12.,  4.,  2.],
       [  0.,  0.,  1.,  7., 28., 35., 29.,  9.,  4.,  2.],
       [  0.,  1., 24., 42., 32., 12.,  3.,  1.,  0.,  0.],
       [ 33., 37., 25., 16.,  2.,  1.,  1.,  0.,  0.,  0.],
       [ 97., 12.,  6.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  62.49, 124.98, 187.47, 249.96, 312.45, 374.94, 437.43,
       499.92, 562.41, 624.9 ]),
<a list of 12 BarContainer objects>)
```



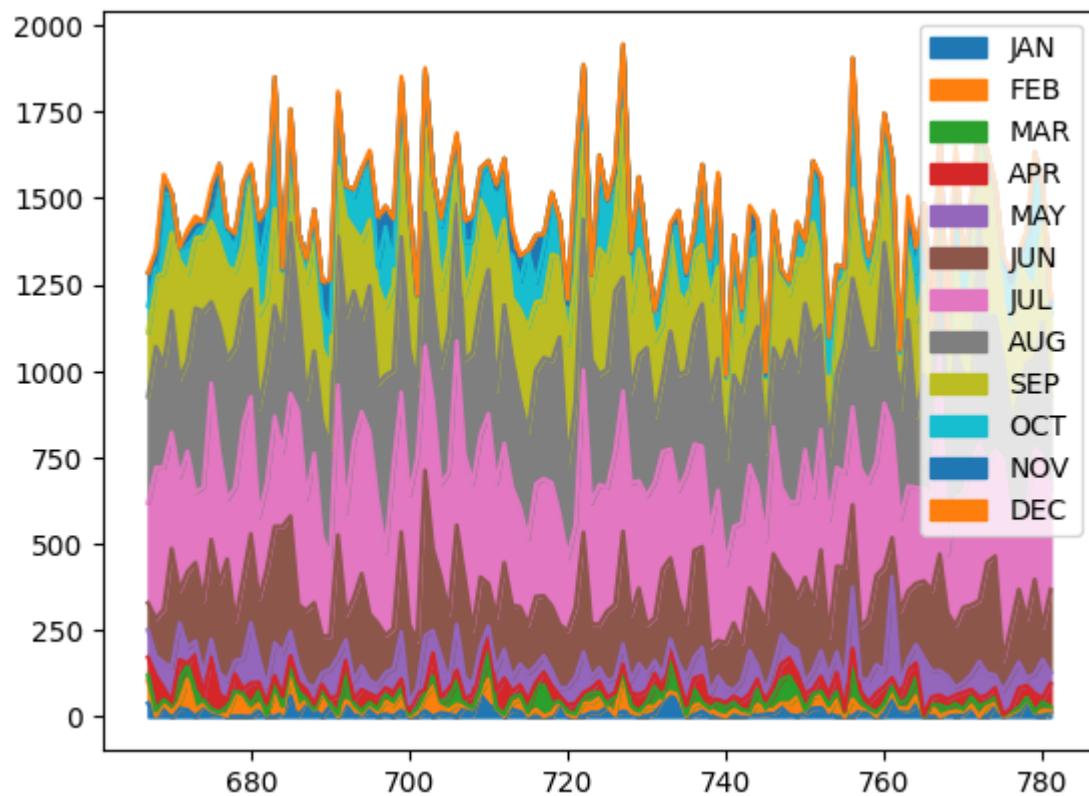
```
In [311]: x.plot.bar(x="YEAR")
```

```
Out[311]: <Axes: xlabel='YEAR'>
```



```
In [312]: y.plot.area()
```

```
Out[312]: <Axes: >
```



GANGETIC WEST BENGAL

In [313]:

```
x=df[df[ "SUBDIVISION" ]=="GANGETIC WEST BENGAL"]
x
```

Out[313]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
552	552	GANGETIC WEST BENGAL	1901	37.1	58.4	3.9	64.1	121.7	198.0	280.8	275.7	313.5	51.
553	553	GANGETIC WEST BENGAL	1902	0.0	1.2	44.2	103.8	161.6	140.9	347.8	264.8	230.5	32.
554	554	GANGETIC WEST BENGAL	1903	17.5	24.6	37.3	30.6	78.5	201.7	179.6	277.6	300.7	198.
555	555	GANGETIC WEST BENGAL	1904	0.1	23.9	35.6	17.5	160.2	286.7	435.3	241.7	142.8	35.
556	556	GANGETIC WEST BENGAL	1905	30.9	49.6	84.7	84.9	156.8	70.9	525.5	263.6	287.6	107.
...
662	662	GANGETIC WEST BENGAL	2011	2.5	2.7	40.5	75.0	132.6	434.5	219.9	443.2	295.9	36.
663	663	GANGETIC WEST BENGAL	2012	40.7	15.3	4.4	57.7	44.2	146.6	315.0	261.4	246.9	64.
664	664	GANGETIC WEST BENGAL	2013	2.5	10.0	4.8	45.6	195.9	233.4	263.2	401.4	254.0	353.
665	665	GANGETIC WEST BENGAL	2014	0.9	42.2	19.9	1.9	124.4	193.6	298.7	292.6	229.5	56.
666	666	GANGETIC WEST BENGAL	2015	12.9	5.5	19.3	88.7	57.6	247.2	633.1	260.6	164.0	32.

115 rows × 20 columns



In [314]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[314]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
552	1901	37.1	58.4	3.9	64.1	121.7	198.0	280.8	275.7	313.5	51.1	83.4	0.0	1487
553	1902	0.0	1.2	44.2	103.8	161.6	140.9	347.8	264.8	230.5	32.5	10.4	9.9	1347
554	1903	17.5	24.6	37.3	30.6	78.5	201.7	179.6	277.6	300.7	198.0	8.2	0.0	1354
555	1904	0.1	23.9	35.6	17.5	160.2	286.7	435.3	241.7	142.8	35.1	4.1	0.1	1383
556	1905	30.9	49.6	84.7	84.9	156.8	70.9	525.5	263.6	287.6	107.3	0.0	5.2	1666
...
662	2011	2.5	2.7	40.5	75.0	132.6	434.5	219.9	443.2	295.9	36.9	1.3	1.4	1686
663	2012	40.7	15.3	4.4	57.7	44.2	146.6	315.0	261.4	246.9	64.2	47.0	24.6	1268
664	2013	2.5	10.0	4.8	45.6	195.9	233.4	263.2	401.4	254.0	353.2	0.0	0.0	1764
665	2014	0.9	42.2	19.9	1.9	124.4	193.6	298.7	292.6	229.5	56.9	0.1	0.6	1261
666	2015	12.9	5.5	19.3	88.7	57.6	247.2	633.1	260.6	164.0	32.7	2.3	6.3	1530

115 rows × 14 columns



In [315]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

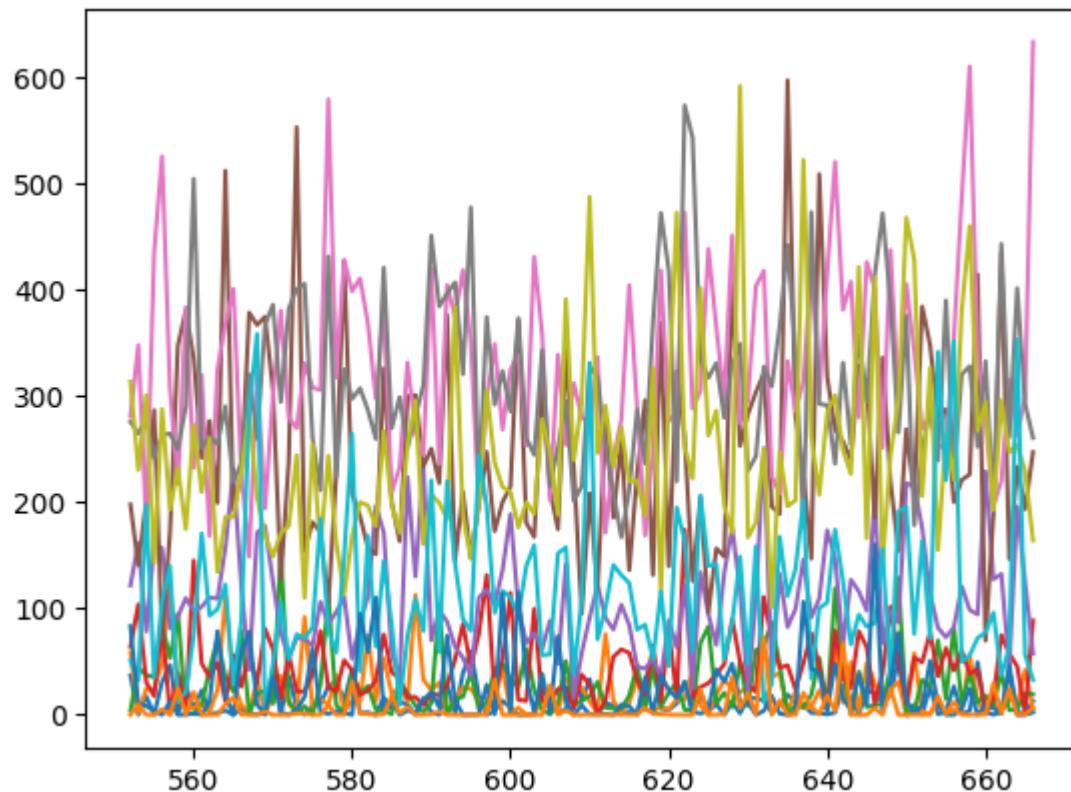
Out[315]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
552	37.1	58.4	3.9	64.1	121.7	198.0	280.8	275.7	313.5	51.1	83.4	0.0	
553	0.0	1.2	44.2	103.8	161.6	140.9	347.8	264.8	230.5	32.5	10.4	9.9	
554	17.5	24.6	37.3	30.6	78.5	201.7	179.6	277.6	300.7	198.0	8.2	0.0	
555	0.1	23.9	35.6	17.5	160.2	286.7	435.3	241.7	142.8	35.1	4.1	0.1	
556	30.9	49.6	84.7	84.9	156.8	70.9	525.5	263.6	287.6	107.3	0.0	5.2	
...
662	2.5	2.7	40.5	75.0	132.6	434.5	219.9	443.2	295.9	36.9	1.3	1.4	
663	40.7	15.3	4.4	57.7	44.2	146.6	315.0	261.4	246.9	64.2	47.0	24.6	
664	2.5	10.0	4.8	45.6	195.9	233.4	263.2	401.4	254.0	353.2	0.0	0.0	
665	0.9	42.2	19.9	1.9	124.4	193.6	298.7	292.6	229.5	56.9	0.1	0.6	
666	12.9	5.5	19.3	88.7	57.6	247.2	633.1	260.6	164.0	32.7	2.3	6.3	

115 rows × 12 columns

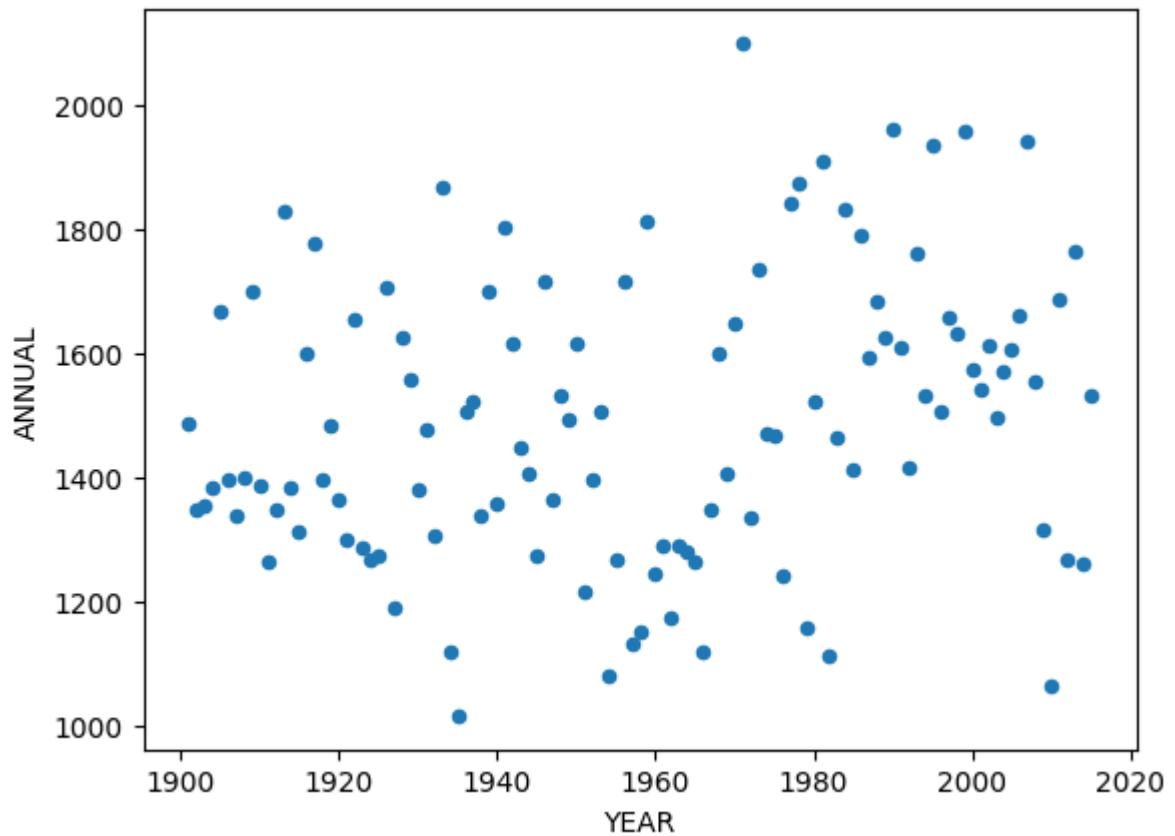
```
In [316]: plt.plot(y)
```

```
Out[316]: [
```



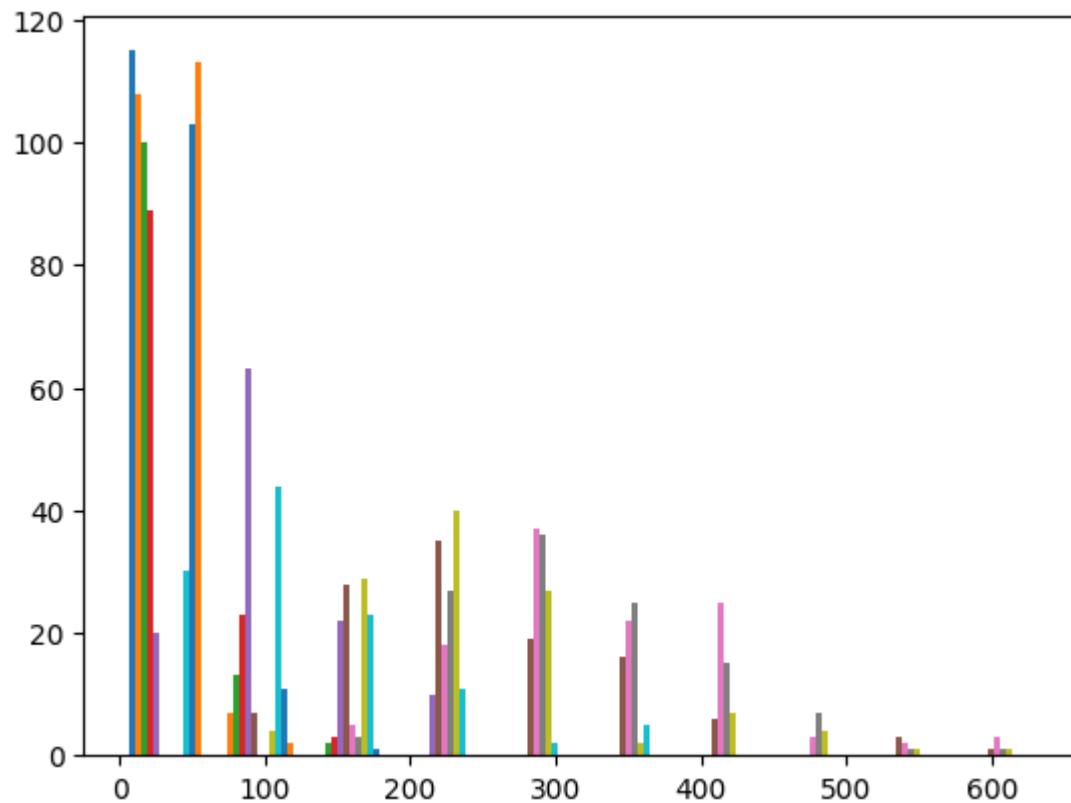
```
In [317]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[317]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



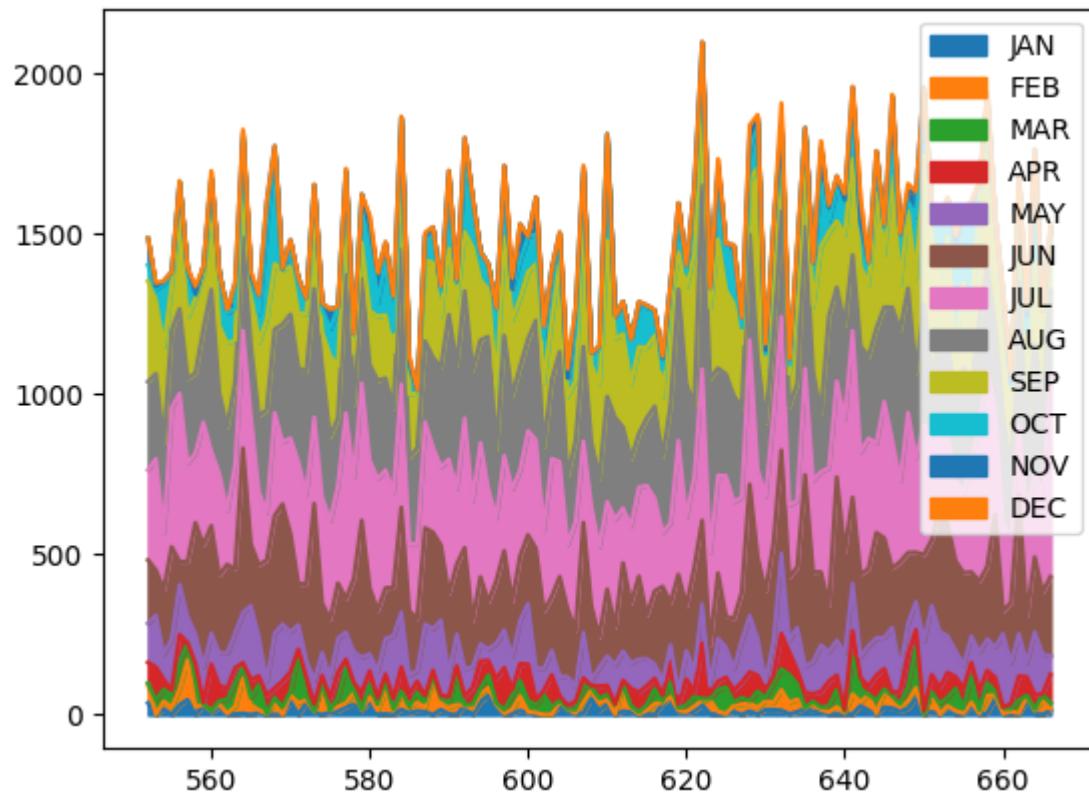
```
In [318]: plt.hist(y)
```

```
Out[318]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [108.,  7.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [100., 13.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 89., 23.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 20., 63., 22., 10.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 0.,  7., 28., 35., 19., 16.,  6.,  0.,  3.,  1.],
       [ 0.,  0.,  5., 18., 37., 22., 25.,  3.,  2.,  3.],
       [ 0.,  0.,  3., 27., 36., 25., 15.,  7.,  1.,  1.],
       [ 0.,  4., 29., 40., 27.,  2.,  7.,  4.,  1.,  1.],
       [ 30., 44., 23., 11.,  2.,  5.,  0.,  0.,  0.,  0.],
       [103., 11.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. , 63.31, 126.62, 189.93, 253.24, 316.55, 379.86, 443.17,
      506.48, 569.79, 633.1 ]),
<a list of 12 BarContainer objects>)
```



```
In [320]: y.plot.area()
```

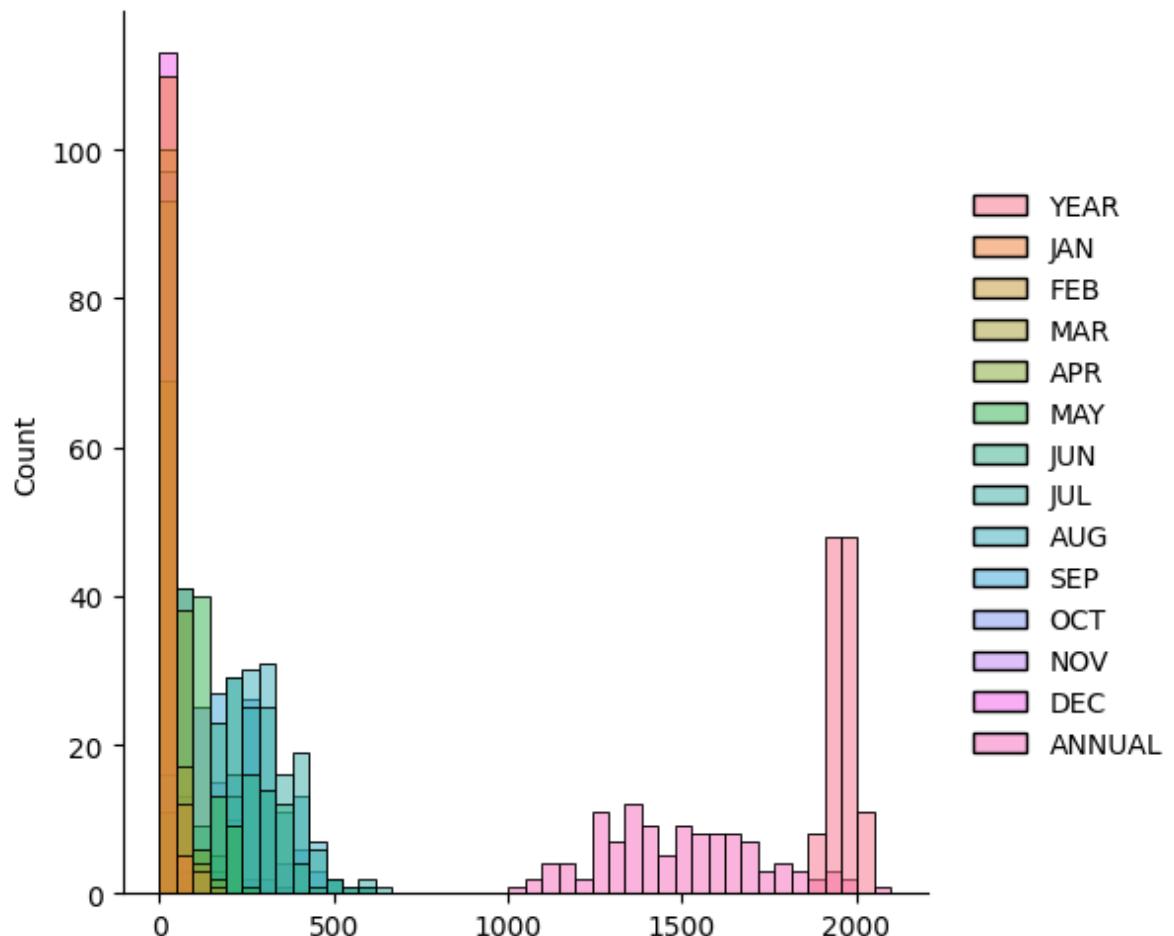
```
Out[320]: <Axes: >
```



In [321]: `sns.displot(x)`

C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
self._figure.tight_layout(*args, **kwargs)

Out[321]: <seaborn.axisgrid.FacetGrid at 0x26dbe806490>



SUB HIMALAYAN WEST BENGAL & SIKKIM

```
In [322]: x=df[df[ "SUBDIVISION" ]=="SUB HIMALAYAN WEST BENGAL & SIKKIM"]  
x
```

Out[322]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
437	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	1.5	0.5
438	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	74.7	1.7	0.7
439	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	14.1	1.1	0.1
440	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	16.4	1.4	0.4
441	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	87.1	8.1	0.1
...
547	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	46.4	4.4	0.4
548	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	119.5	11.5	0.5
549	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	19.9	1.9	0.9
550	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	3.1	0.1	0.1
551	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	55.5	5.5	0.5

115 rows × 20 columns



In [323]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[323]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNU
437	1901	26.5	14.8	14.1	29.2	195.5	488.4	524.8	501.1	242.7	55.5	17.9	2.6	211
438	1902	1.2	0.7	87.1	126.1	271.3	539.2	671.0	603.8	799.9	74.4	5.6	0.0	318
439	1903	5.5	8.7	19.6	18.6	163.6	541.2	431.5	708.8	365.2	141.3	0.3	0.0	240
440	1904	3.4	29.2	0.9	124.3	333.6	274.2	500.4	468.5	260.6	164.8	8.9	1.1	216
441	1905	12.0	31.2	51.9	104.4	290.6	524.8	523.1	1036.6	321.1	87.9	2.7	18.7	300
...
547	2011	8.5	19.9	71.2	135.0	247.8	419.8	612.3	470.3	356.3	46.7	26.7	4.3	241
548	2012	15.3	13.9	45.5	159.8	202.4	604.2	684.5	332.7	434.7	119.4	12.5	7.4	263
549	2013	3.0	23.6	32.1	114.7	296.5	404.9	588.4	416.3	308.0	199.8	16.1	2.7	240
550	2014	0.2	26.6	37.7	47.9	308.6	543.2	384.6	563.3	371.5	31.2	5.3	2.4	232
551	2015	15.7	15.0	64.8	149.0	304.6	508.2	393.3	626.6	354.9	53.6	23.8	9.0	251

115 rows × 14 columns



In [324]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

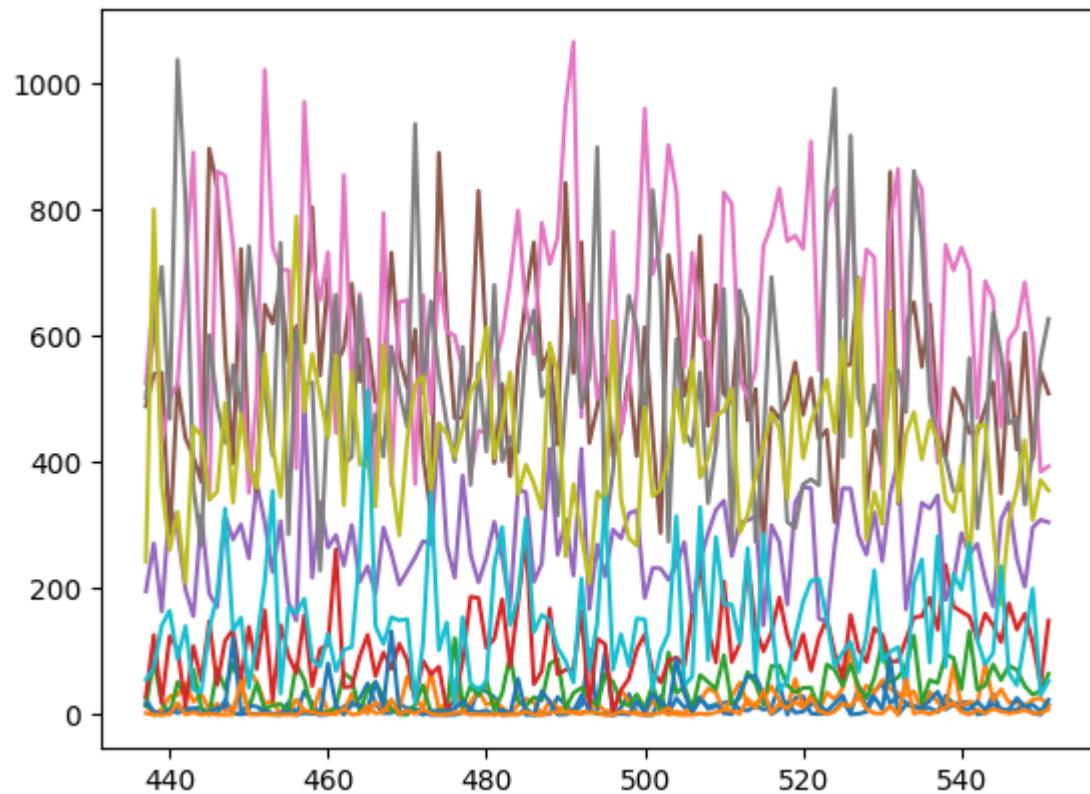
Out[324]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
437	26.5	14.8	14.1	29.2	195.5	488.4	524.8	501.1	242.7	55.5	17.9	2.6	
438	1.2	0.7	87.1	126.1	271.3	539.2	671.0	603.8	799.9	74.4	5.6	0.0	
439	5.5	8.7	19.6	18.6	163.6	541.2	431.5	708.8	365.2	141.3	0.3	0.0	
440	3.4	29.2	0.9	124.3	333.6	274.2	500.4	468.5	260.6	164.8	8.9	1.1	
441	12.0	31.2	51.9	104.4	290.6	524.8	523.1	1036.6	321.1	87.9	2.7	18.7	
...
547	8.5	19.9	71.2	135.0	247.8	419.8	612.3	470.3	356.3	46.7	26.7	4.3	
548	15.3	13.9	45.5	159.8	202.4	604.2	684.5	332.7	434.7	119.4	12.5	7.4	
549	3.0	23.6	32.1	114.7	296.5	404.9	588.4	416.3	308.0	199.8	16.1	2.7	
550	0.2	26.6	37.7	47.9	308.6	543.2	384.6	563.3	371.5	31.2	5.3	2.4	
551	15.7	15.0	64.8	149.0	304.6	508.2	393.3	626.6	354.9	53.6	23.8	9.0	

115 rows × 12 columns

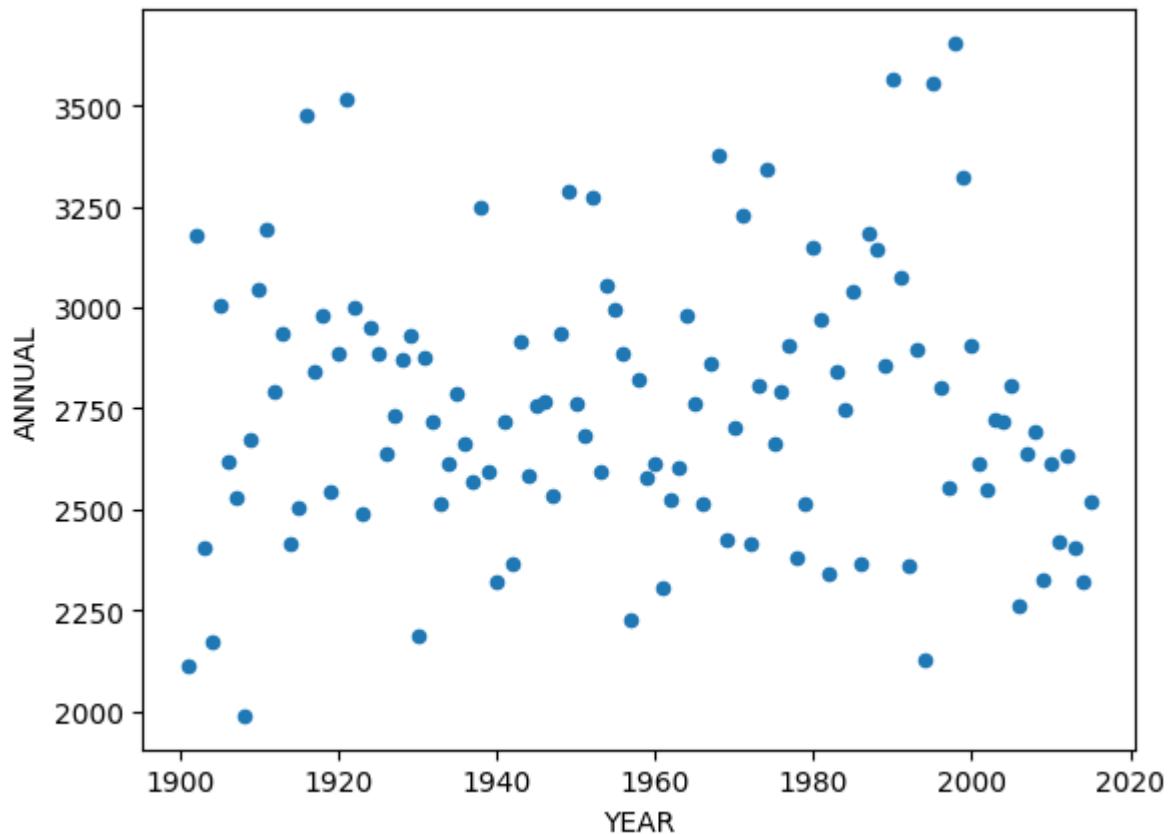
```
In [325]: plt.plot(y)
```

```
Out[325]: [
```



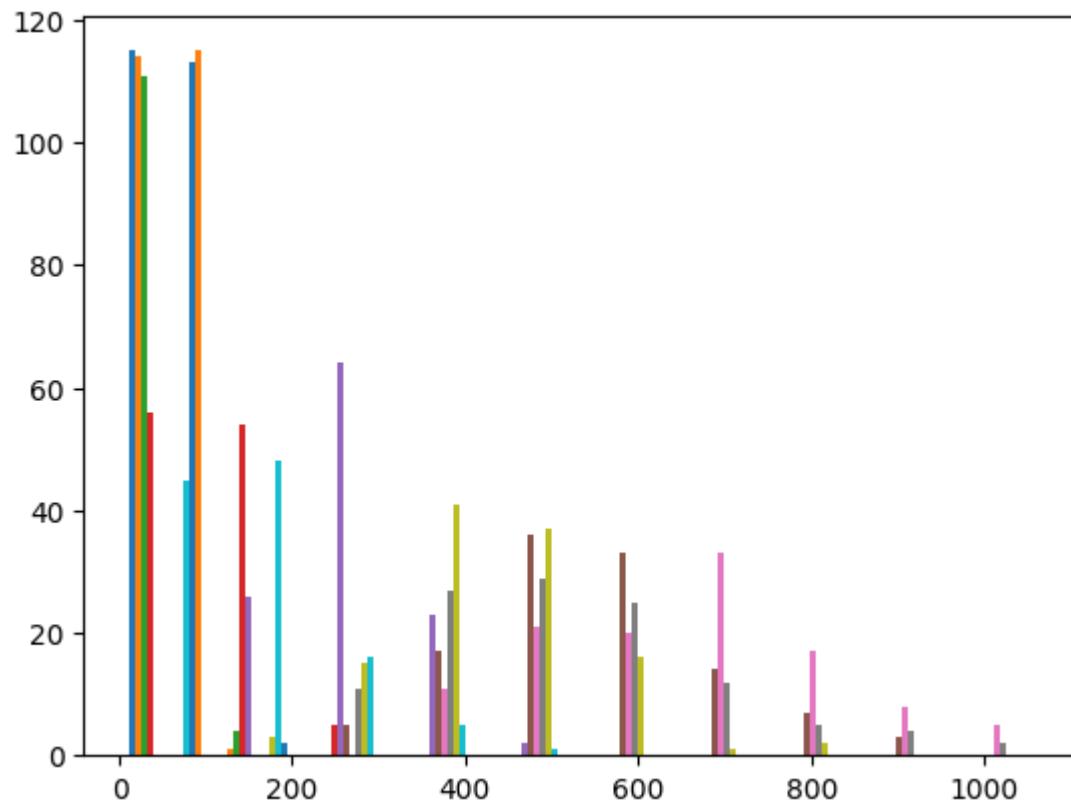
```
In [326]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[326]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



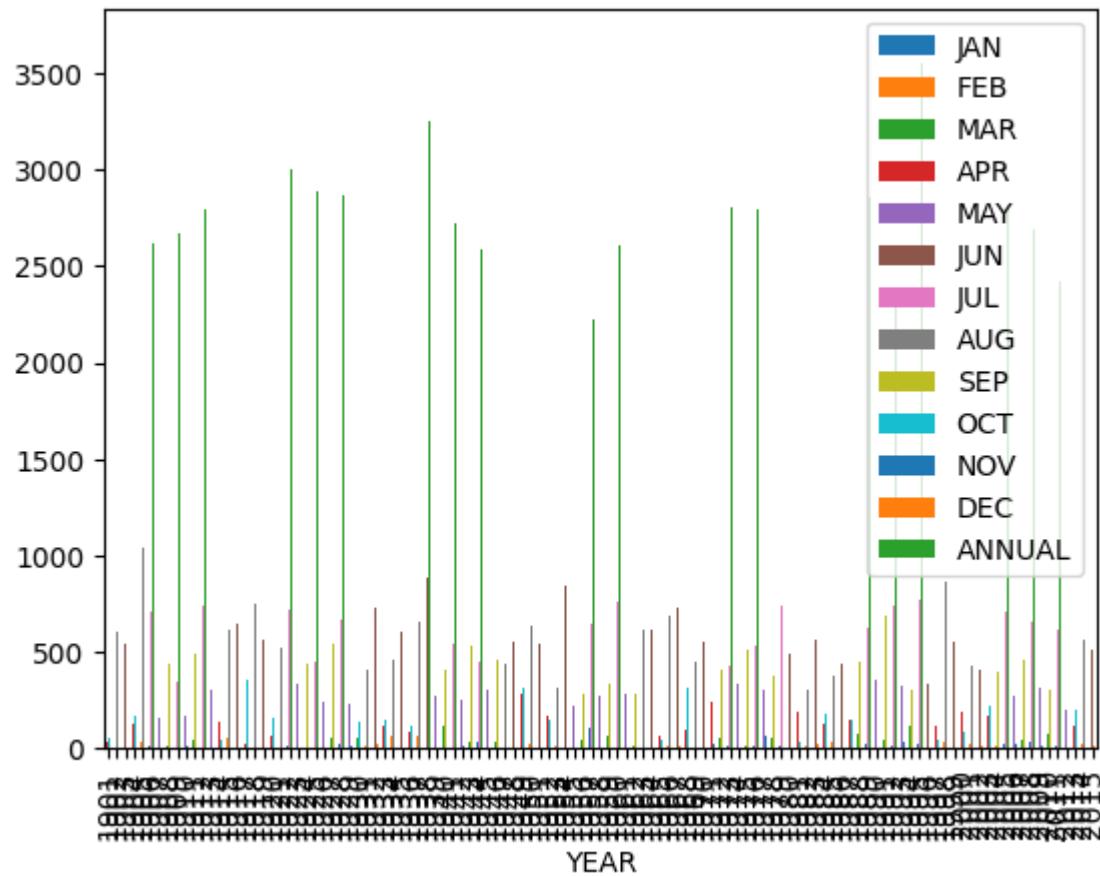
```
In [327]: plt.hist(y)
```

```
Out[327]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [114.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [111.,  4.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 56.,  54.,  5.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [  0.,  26.,  64.,  23.,  2.,  0.,  0.,  0.,  0.,  0.],
       [  0.,  0.,  17.,  36.,  33.,  14.,  7.,  3.,  0.,  0.],
       [  0.,  0.,  0.,  11.,  21.,  20.,  33.,  17.,  8.,  5.],
       [  0.,  0.,  11.,  27.,  29.,  25.,  12.,  5.,  4.,  2.],
       [  0.,  3.,  15.,  41.,  37.,  16.,  1.,  2.,  0.,  0.],
       [ 45.,  48.,  16.,  5.,  1.,  0.,  0.,  0.,  0.,  0.],
       [113.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]),
array([  0. ,  106.46,  212.92,  319.38,  425.84,  532.3 ,  638.76,
       745.22,  851.68,  958.14, 1064.6 ]),
<a list of 12 BarContainer objects>)
```



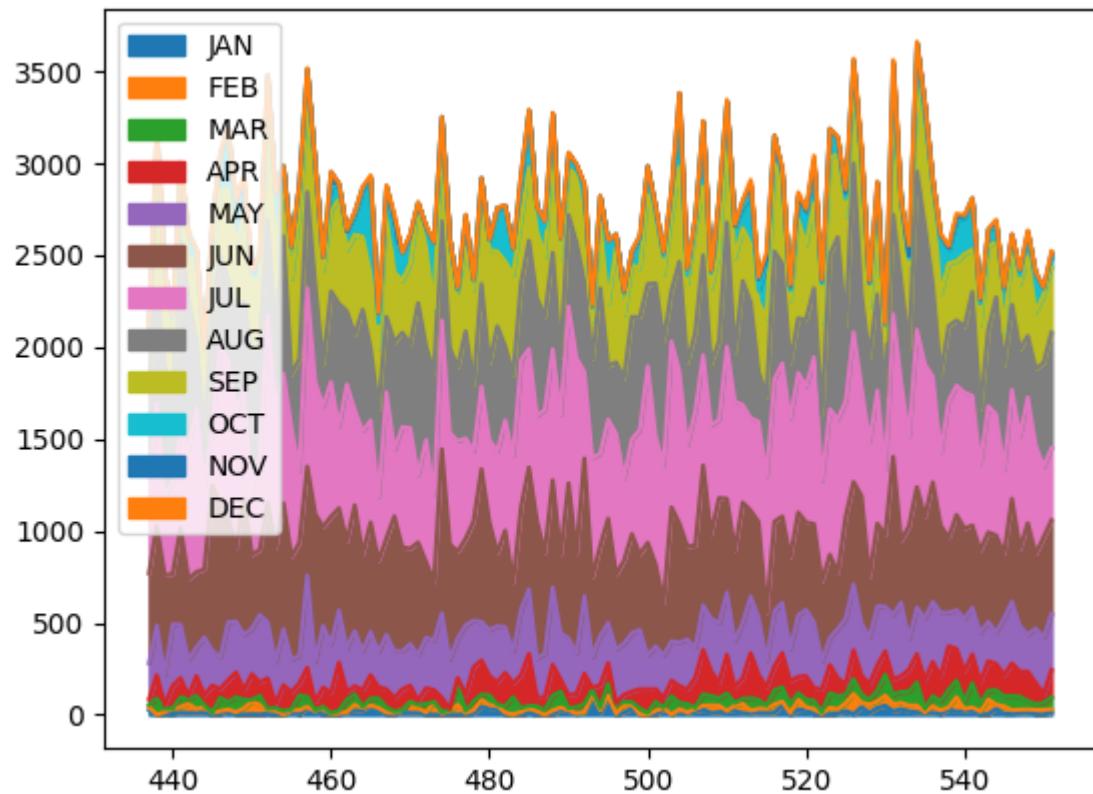
```
In [328]: x.plot.bar(x="YEAR")
```

```
Out[328]: <Axes: xlabel='YEAR'>
```



In [329]: `y.plot.area()`

Out[329]: <Axes: >



NAGA MANI MIZO TRIPURA

```
In [4]: x=df[df[ "SUBDIVISION" ]=="NAGA MANI MIZO TRIPURA"]
x
```

Out[4]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
322	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
323	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
324	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
325	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
326	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
...
432	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
433	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
434	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
435	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
436	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



In [5]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[5]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
322	1901	11.7	18.1	29.4	206.2	124.0	443.3	331.4	466.0	304.1	166.7	67.4	0.0	2168.0
323	1902	4.8	0.5	36.3	297.8	215.5	480.1	392.4	312.8	318.7	102.4	8.9	4.7	2174.0
324	1903	6.5	40.5	139.8	45.5	159.9	458.6	300.2	470.6	366.1	166.4	76.7	0.1	2230.0
325	1904	2.3	46.9	47.5	290.3	230.5	455.3	423.5	423.6	375.8	128.9	90.0	5.0	2519.0
326	1905	9.1	35.3	306.5	161.7	193.6	339.7	450.1	429.9	320.1	246.4	8.0	27.1	2521.0
...
432	2011	12.6	3.6	51.4	81.1	334.9	374.2	313.3	367.6	258.3	92.6	2.4	0.2	1891.0
433	2012	24.5	10.2	20.3	243.5	163.5	396.2	280.1	342.7	248.7	160.9	32.0	0.4	1921.0
434	2013	0.2	5.7	19.7	60.3	348.9	206.6	255.9	291.3	241.4	125.6	0.3	1.2	1551.0
435	2014	1.2	21.0	25.4	49.6	192.5	268.3	295.7	372.3	300.9	69.6	3.3	0.1	1599.0
436	2015	14.4	14.2	21.6	253.5	198.3	283.9	413.6	334.2	255.9	118.7	3.9	10.0	1921.0

115 rows × 14 columns



In [6]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

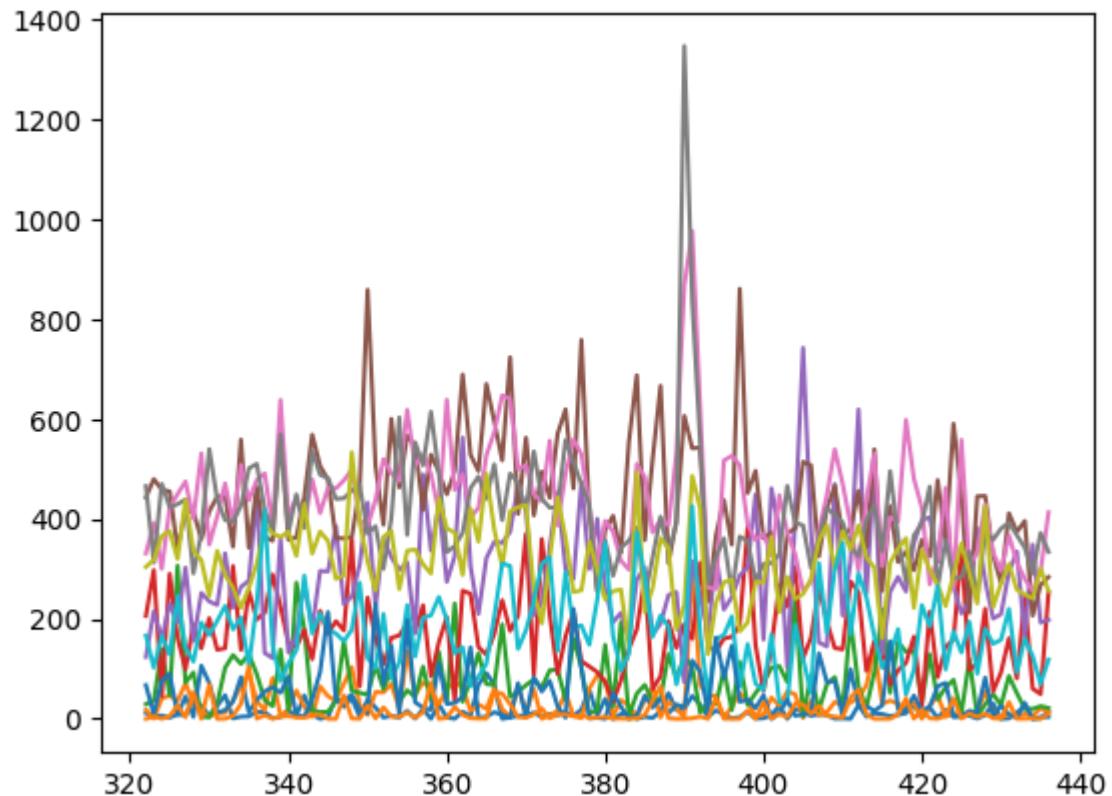
Out[6]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
322	11.7	18.1	29.4	206.2	124.0	443.3	331.4	466.0	304.1	166.7	67.4	0.0
323	4.8	0.5	36.3	297.8	215.5	480.1	392.4	312.8	318.7	102.4	8.9	4.7
324	6.5	40.5	139.8	45.5	159.9	458.6	300.2	470.6	366.1	166.4	76.7	0.1
325	2.3	46.9	47.5	290.3	230.5	455.3	423.5	423.6	375.8	128.9	90.0	5.0
326	9.1	35.3	306.5	161.7	193.6	339.7	450.1	429.9	320.1	246.4	8.0	27.1
...
432	12.6	3.6	51.4	81.1	334.9	374.2	313.3	367.6	258.3	92.6	2.4	0.2
433	24.5	10.2	20.3	243.5	163.5	396.2	280.1	342.7	248.7	160.9	32.0	0.4
434	0.2	5.7	19.7	60.3	348.9	206.6	255.9	291.3	241.4	125.6	0.3	1.2
435	1.2	21.0	25.4	49.6	192.5	268.3	295.7	372.3	300.9	69.6	3.3	0.1
436	14.4	14.2	21.6	253.5	198.3	283.9	413.6	334.2	255.9	118.7	3.9	10.0

115 rows × 12 columns

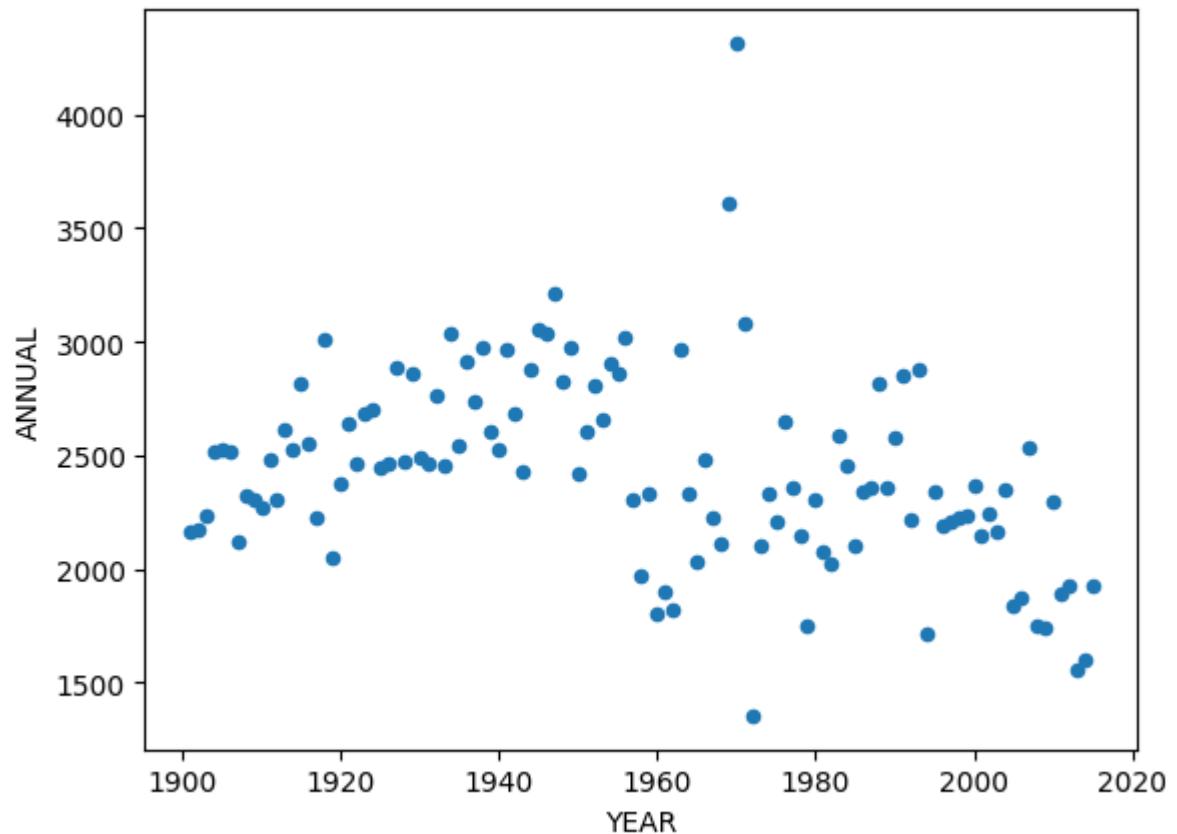
```
In [7]: plt.plot(y)
```

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



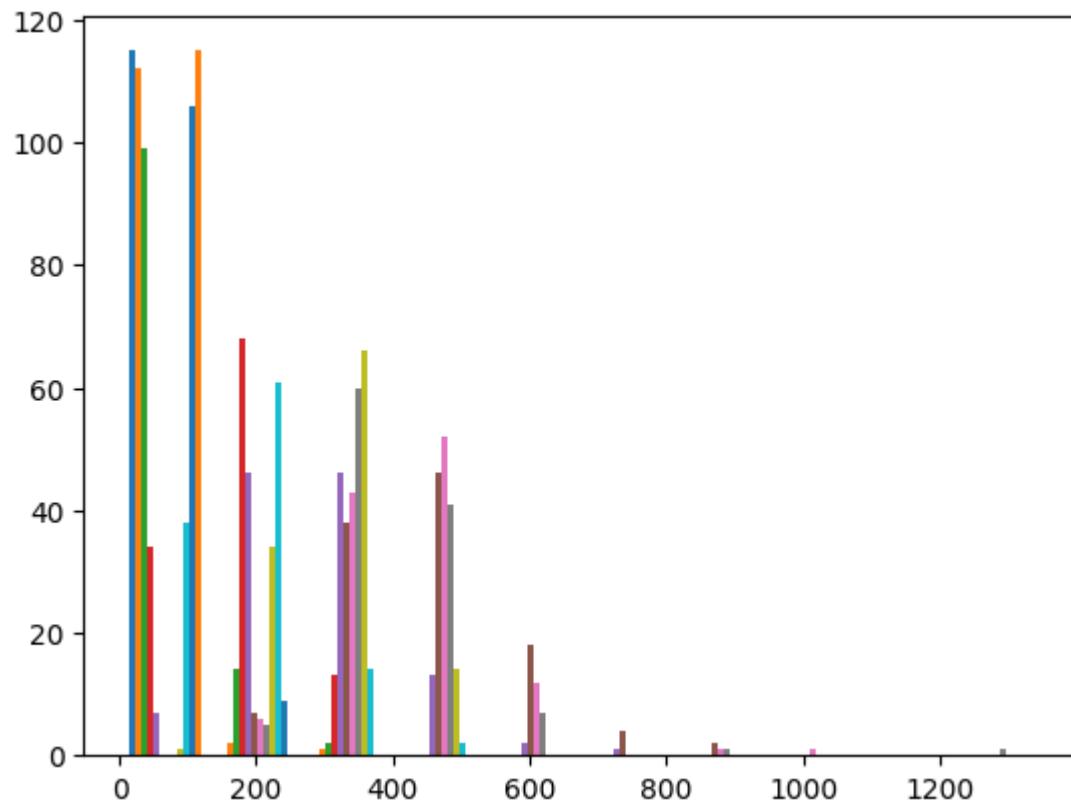
```
In [8]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[8]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



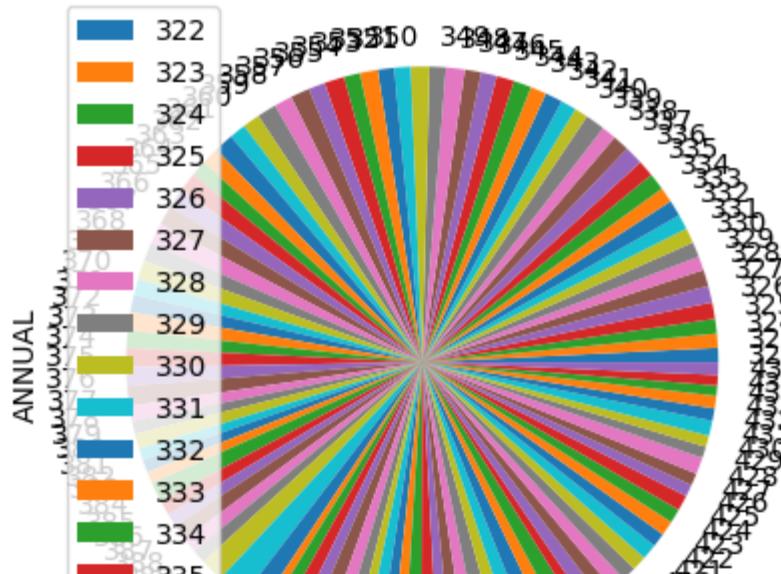
```
In [9]: plt.hist(y)
```

```
Out[9]: (array([[115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
   [112.,  2.,  1.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
   [ 99., 14.,  2.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
   [ 34., 68., 13.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
   [  7., 46., 46., 13.,  2.,  1.,  0.,  0.,  0.,  0.],
   [  0.,  7., 38., 46., 18.,  4.,  2.,  0.,  0.,  0.],
   [  0.,  6., 43., 52., 12.,  0.,  1.,  1.,  0.,  0.],
   [  0.,  5., 60., 41.,  7.,  0.,  1.,  0.,  0.,  1.],
   [ 1., 34., 66., 14.,  0.,  0.,  0.,  0.,  0.,  0.],
   [ 38., 61., 14.,  2.,  0.,  0.,  0.,  0.,  0.,  0.],
   [106.,  9.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
   [115.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.]]) ,
array([  0. , 134.72, 269.44, 404.16, 538.88, 673.6 , 808.32,
   943.04, 1077.76, 1212.48, 1347.2 ]),
<a list of 12 BarContainer objects>)
```



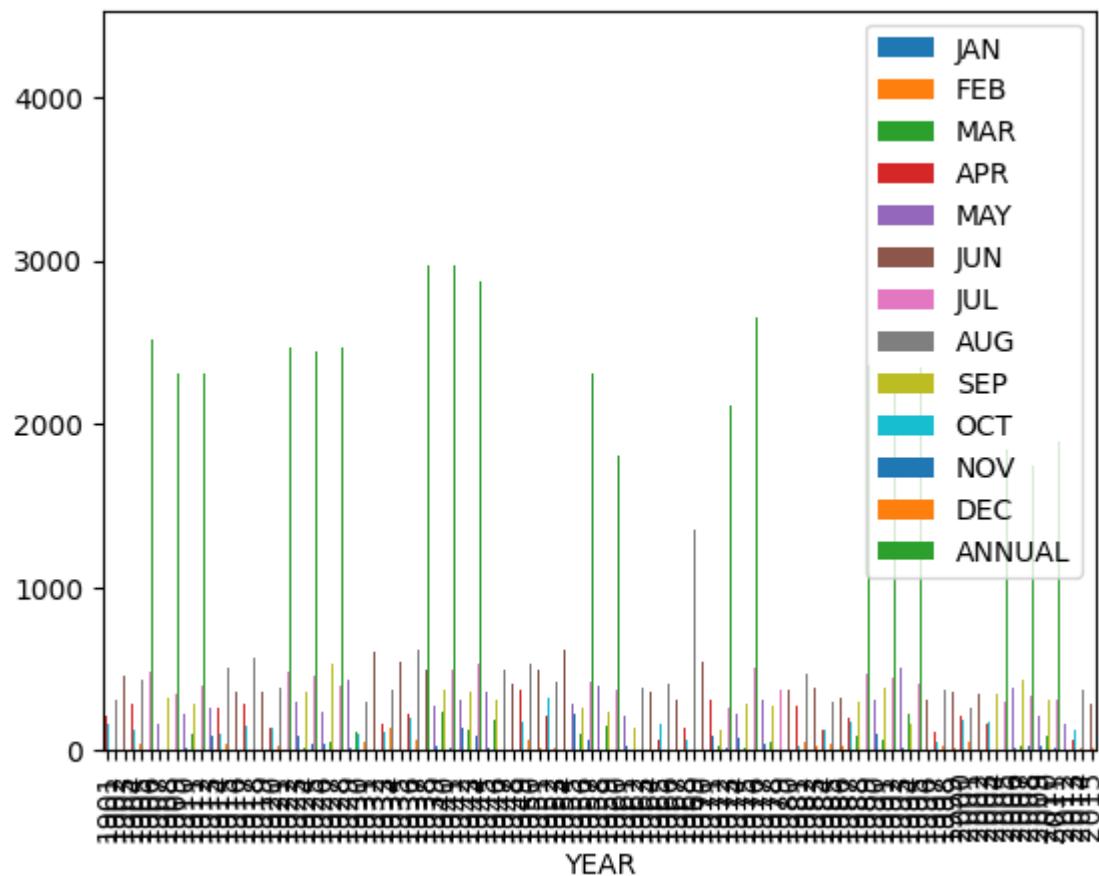
```
In [10]: x.plot.pie(y="ANNUAL", subplots=True)
```

```
Out[10]: array([
```



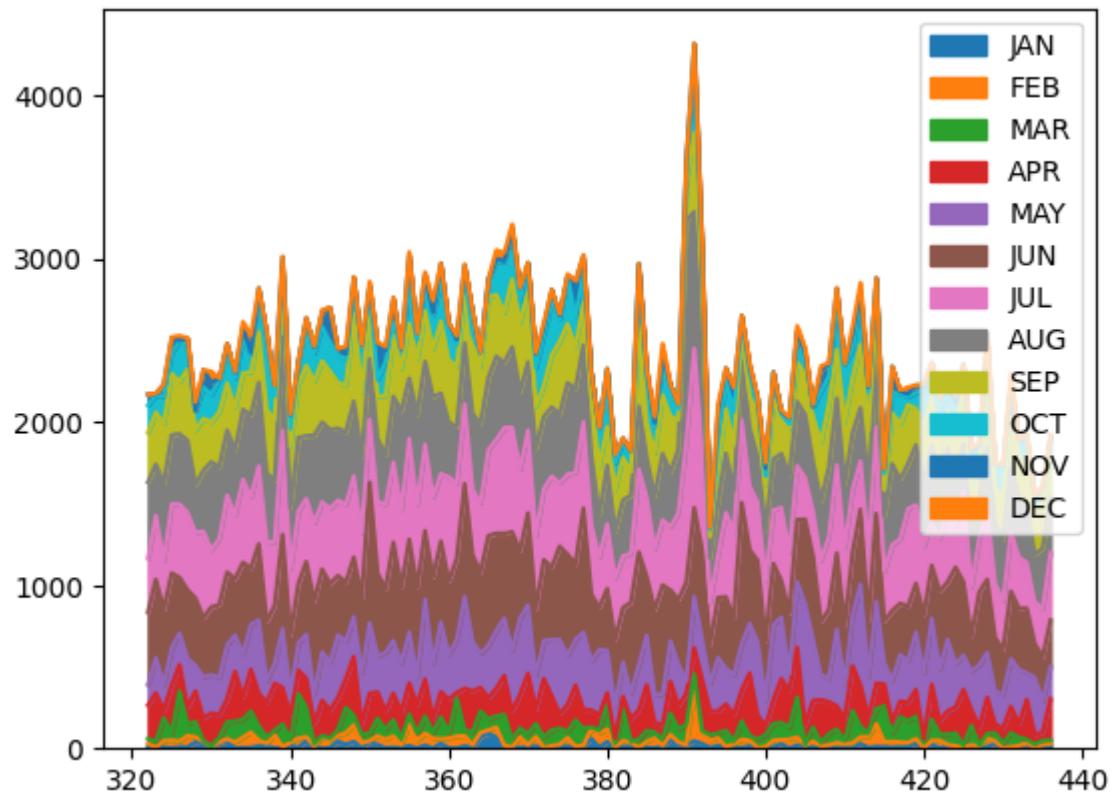
```
In [11]: x.plot.bar(x="YEAR")
```

```
Out[11]: <Axes: xlabel='YEAR'>
```



In [12]: `y.plot.area()`

Out[12]: <Axes: >



ASSAM & MEGHALAYA

In [13]:

```
x=df[df[ "SUBDIVISION" ]=="ASSAM & MEGHALAYA"]
x
```

Out[13]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OC
207	207	ASSAM & MEGHALAYA	1901	27.1	19.5	30.6	223.0	207.0	524.9	430.6	464.1	291.4	163
208	208	ASSAM & MEGHALAYA	1902	9.3	10.2	105.6	350.0	262.1	620.7	510.8	536.0	441.3	97
209	209	ASSAM & MEGHALAYA	1903	19.9	25.4	103.6	140.6	206.6	607.4	362.7	551.9	306.4	159
210	210	ASSAM & MEGHALAYA	1904	11.1	56.1	51.9	457.1	375.2	385.7	477.6	438.8	245.9	115
211	211	ASSAM & MEGHALAYA	1905	19.9	16.9	137.9	213.0	275.5	521.7	439.1	649.1	276.0	200
...
317	317	ASSAM & MEGHALAYA	2011	11.1	11.4	109.0	92.1	238.3	316.0	395.8	302.6	221.6	30
318	318	ASSAM & MEGHALAYA	2012	15.2	6.9	28.8	279.1	185.8	729.7	444.3	289.2	411.6	199
319	319	ASSAM & MEGHALAYA	2013	1.1	9.6	44.0	112.8	346.7	286.2	367.8	289.7	229.3	126
320	320	ASSAM & MEGHALAYA	2014	2.0	28.3	29.3	51.5	351.1	426.4	374.4	484.6	420.2	35
321	321	ASSAM & MEGHALAYA	2015	13.4	15.5	37.5	250.9	332.5	558.5	300.1	590.9	279.9	62

115 rows × 20 columns



In [14]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[14]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNU
207	1901	27.1	19.5	30.6	223.0	207.0	524.9	430.6	464.1	291.4	163.7	115.6	1.2	249
208	1902	9.3	10.2	105.6	350.0	262.1	620.7	510.8	536.0	441.3	97.0	7.8	1.3	295
209	1903	19.9	25.4	103.6	140.6	206.6	607.4	362.7	551.9	306.4	159.5	59.3	1.3	254
210	1904	11.1	56.1	51.9	457.1	375.2	385.7	477.6	438.8	245.9	115.9	46.4	2.5	266
211	1905	19.9	16.9	137.9	213.0	275.5	521.7	439.1	649.1	276.0	200.0	16.8	24.8	279
...
317	2011	11.1	11.4	109.0	92.1	238.3	316.0	395.8	302.6	221.6	30.2	11.9	3.5	174
318	2012	15.2	6.9	28.8	279.1	185.8	729.7	444.3	289.2	411.6	199.4	17.1	2.3	260
319	2013	1.1	9.6	44.0	112.8	346.7	286.2	367.8	289.7	229.3	126.3	1.0	2.0	181
320	2014	2.0	28.3	29.3	51.5	351.1	426.4	374.4	484.6	420.2	35.0	3.0	0.4	220
321	2015	13.4	15.5	37.5	250.9	332.5	558.5	300.1	590.9	279.9	62.6	14.0	15.2	247

115 rows × 14 columns

In [15]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

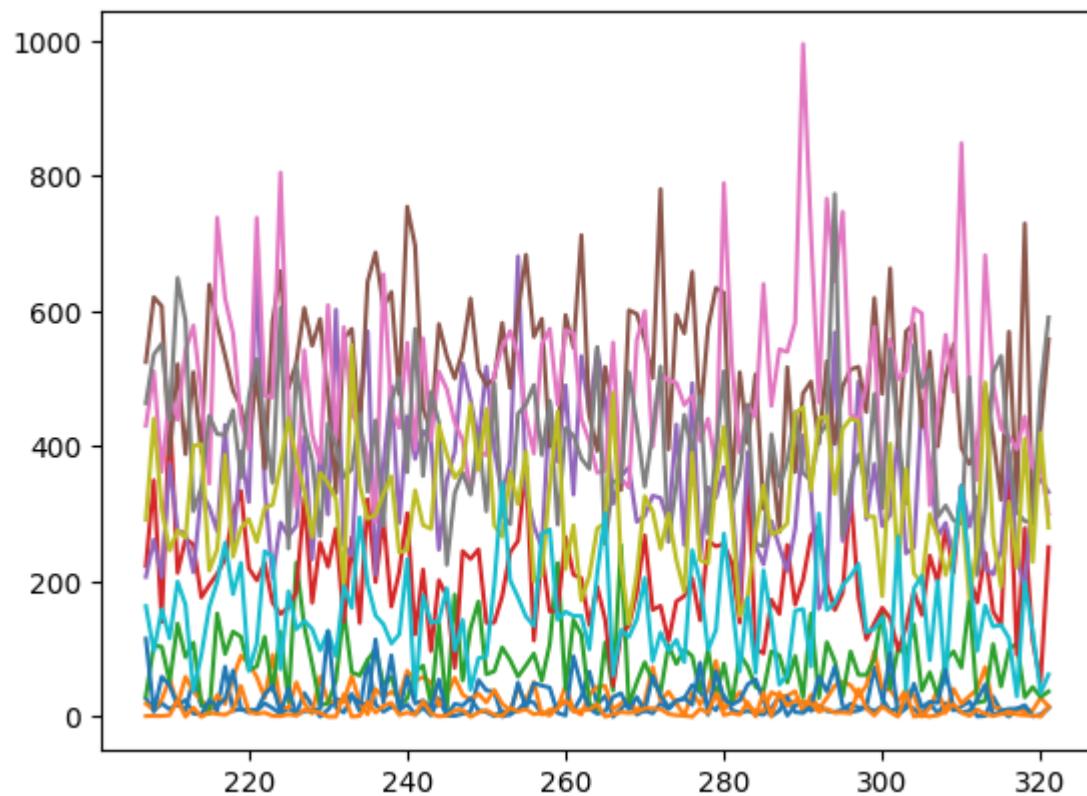
Out[15]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
207	27.1	19.5	30.6	223.0	207.0	524.9	430.6	464.1	291.4	163.7	115.6	1.2	
208	9.3	10.2	105.6	350.0	262.1	620.7	510.8	536.0	441.3	97.0	7.8	1.3	
209	19.9	25.4	103.6	140.6	206.6	607.4	362.7	551.9	306.4	159.5	59.3	1.3	
210	11.1	56.1	51.9	457.1	375.2	385.7	477.6	438.8	245.9	115.9	46.4	2.5	
211	19.9	16.9	137.9	213.0	275.5	521.7	439.1	649.1	276.0	200.0	16.8	24.8	
...
317	11.1	11.4	109.0	92.1	238.3	316.0	395.8	302.6	221.6	30.2	11.9	3.5	
318	15.2	6.9	28.8	279.1	185.8	729.7	444.3	289.2	411.6	199.4	17.1	2.3	
319	1.1	9.6	44.0	112.8	346.7	286.2	367.8	289.7	229.3	126.3	1.0	2.0	
320	2.0	28.3	29.3	51.5	351.1	426.4	374.4	484.6	420.2	35.0	3.0	0.4	
321	13.4	15.5	37.5	250.9	332.5	558.5	300.1	590.9	279.9	62.6	14.0	15.2	

115 rows × 12 columns

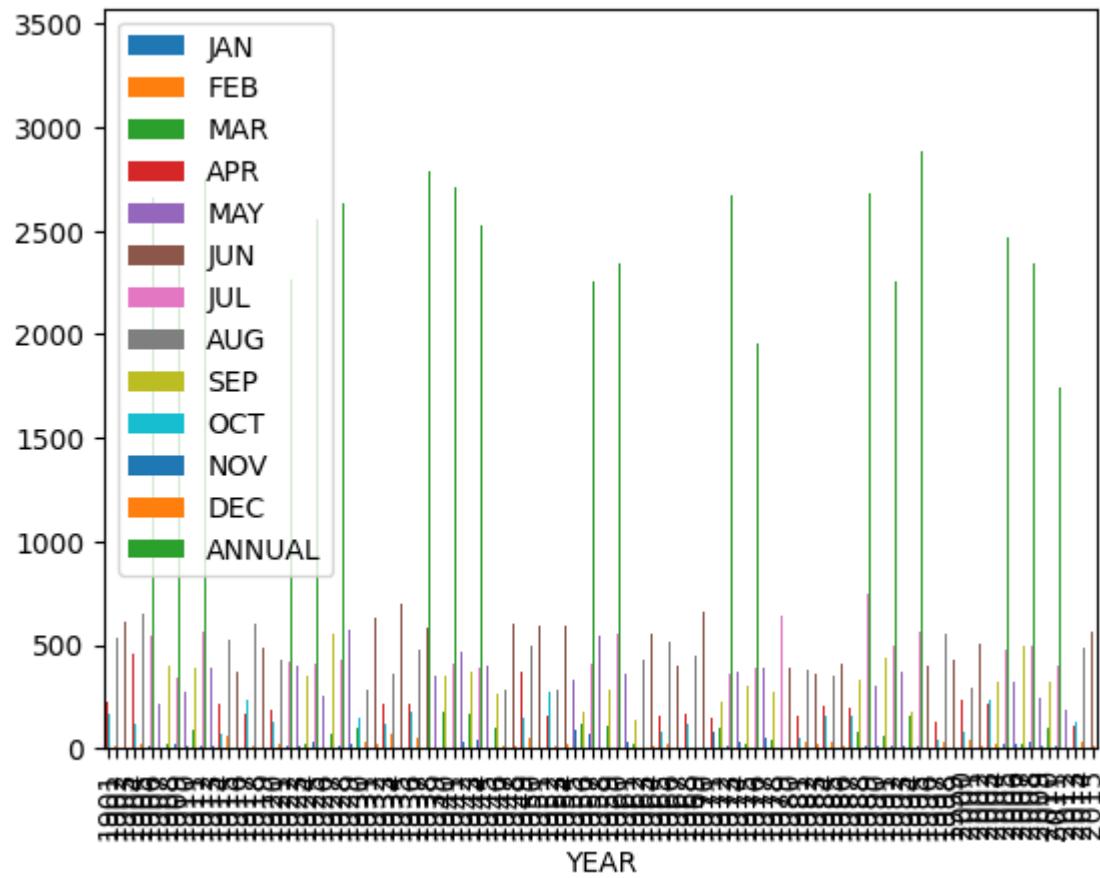
```
In [16]: plt.plot(y)
```

```
Out[16]: [
```



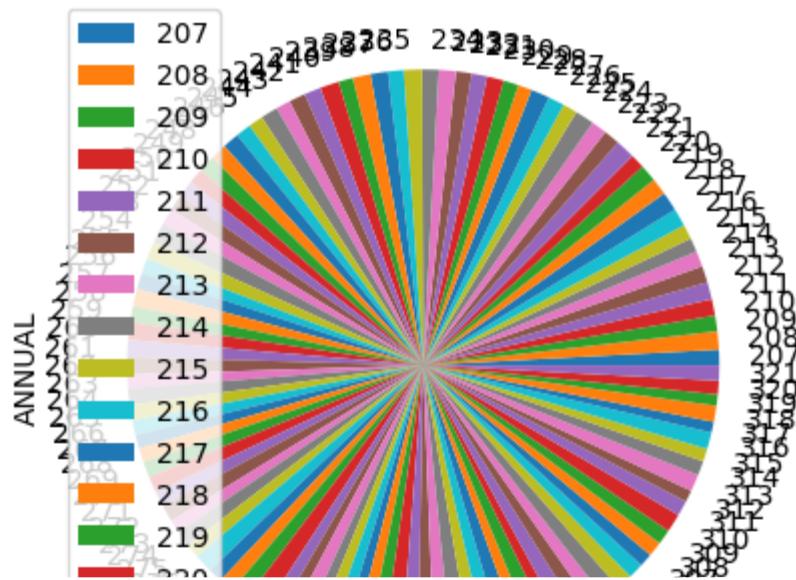
In [17]: `x.plot.bar(x="YEAR")`

Out[17]: <Axes: xlabel='YEAR'>



In [18]: `x.plot.pie(y="ANNUAL", subplots=True)`

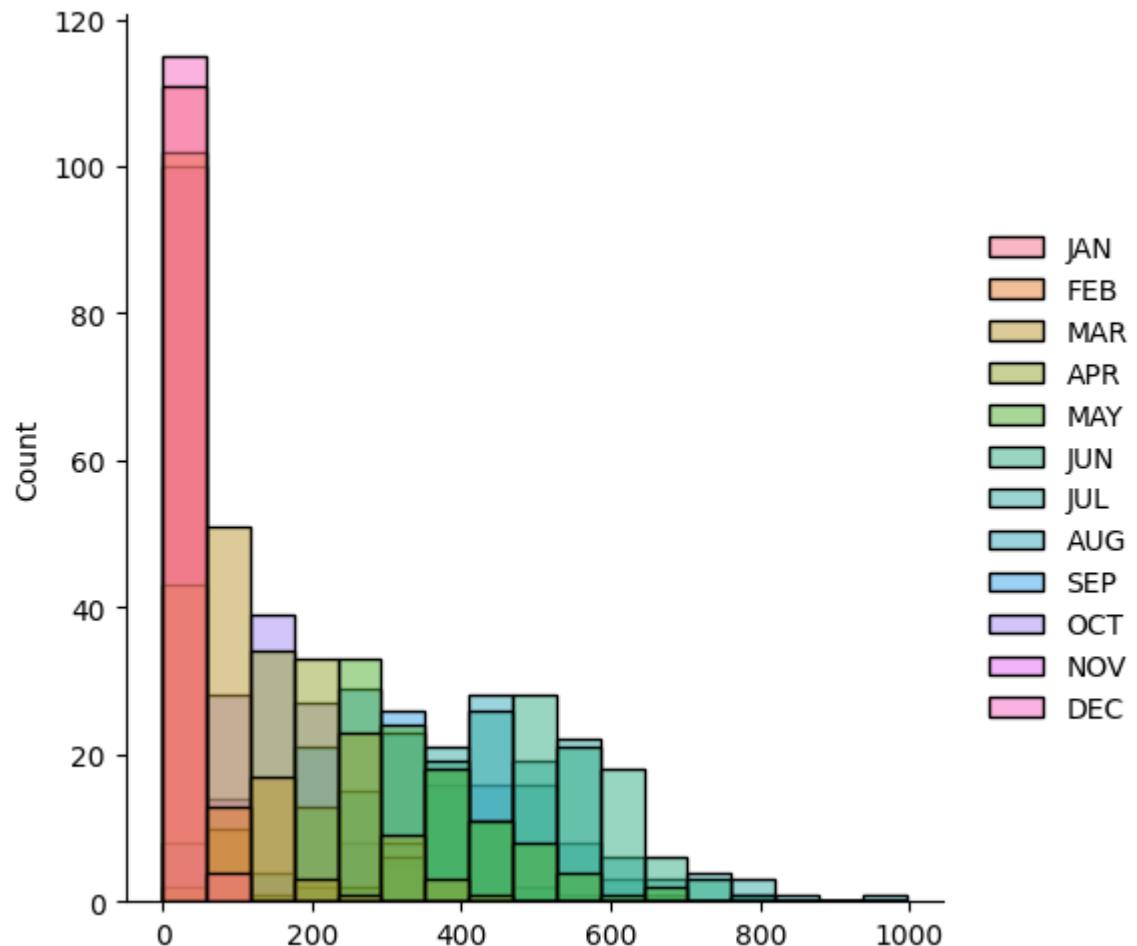
Out[18]: array([<Axes: ylabel='ANNUAL'>], dtype=object)



In [19]: `sns.displot(y)`

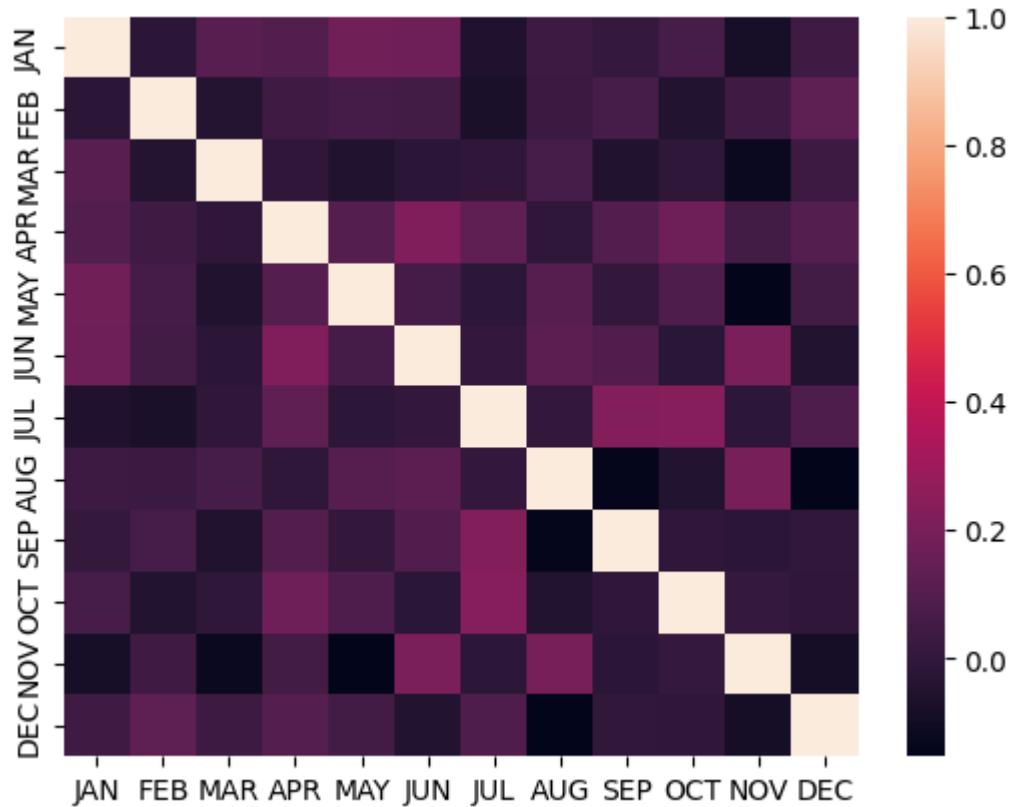
```
C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages
\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

Out[19]: <seaborn.axisgrid.FacetGrid at 0x1a457988410>



In [20]: `sns.heatmap(y.corr())`

Out[20]: <Axes: >



ANDAMAN & NICOBAR ISLANDS

```
In [21]: x=df[df[ "SUBDIVISION" ]=="ANDAMAN & NICOBAR ISLANDS"]
x
```

Out[21]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	ANDAMAN & NICOBAR ISLANDS	1901	49.2	87.1	29.2	2.3	528.8	517.5	365.1	481.1	332.6	311.1	25.0	1.1
1	1	ANDAMAN & NICOBAR ISLANDS	1902	0.0	159.8	12.2	0.0	446.1	537.1	228.9	753.7	666.2	11.1	1.1	1.1
2	2	ANDAMAN & NICOBAR ISLANDS	1903	12.7	144.0	0.0	1.0	235.1	479.9	728.4	326.7	339.0	11.1	1.1	1.1
3	3	ANDAMAN & NICOBAR ISLANDS	1904	9.4	14.7	0.0	202.4	304.5	495.1	502.0	160.1	820.4	21.1	1.1	1.1
4	4	ANDAMAN & NICOBAR ISLANDS	1905	1.3	0.0	3.3	26.9	279.5	628.7	368.7	330.5	297.0	21.1	1.1	1.1
...
105	105	ANDAMAN & NICOBAR ISLANDS	2011	265.9	84.8	272.8	111.4	326.5	383.2	583.2	441.5	757.1	21.1	1.1	1.1
106	106	ANDAMAN & NICOBAR ISLANDS	2012	119.9	45.6	30.9	55.8	533.9	458.2	317.3	369.6	868.9	21.1	1.1	1.1
107	107	ANDAMAN & NICOBAR ISLANDS	2013	67.1	37.6	43.0	46.3	509.3	777.0	564.8	336.7	473.6	41.1	1.1	1.1
108	108	ANDAMAN & NICOBAR ISLANDS	2014	41.9	8.6	0.0	11.1	238.0	416.6	467.6	321.6	412.9	41.1	1.1	1.1
109	109	ANDAMAN & NICOBAR ISLANDS	2015	126.8	7.6	3.1	138.2	331.9	346.4	328.9	480.0	523.3	21.1	1.1	1.1

104 rows × 20 columns



In [22]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[22]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AN
0	1901	49.2	87.1	29.2	2.3	528.8	517.5	365.1	481.1	332.6	388.5	558.2	33.6	104.0
1	1902	0.0	159.8	12.2	0.0	446.1	537.1	228.9	753.7	666.2	197.2	359.0	160.5	104.0
2	1903	12.7	144.0	0.0	1.0	235.1	479.9	728.4	326.7	339.0	181.2	284.4	225.0	104.0
3	1904	9.4	14.7	0.0	202.4	304.5	495.1	502.0	160.1	820.4	222.2	308.7	40.1	104.0
4	1905	1.3	0.0	3.3	26.9	279.5	628.7	368.7	330.5	297.0	260.7	25.4	344.7	104.0
...
105	2011	265.9	84.8	272.8	111.4	326.5	383.2	583.2	441.5	757.1	212.3	150.8	238.5	104.0
106	2012	119.9	45.6	30.9	55.8	533.9	458.2	317.3	369.6	868.9	209.7	300.5	187.3	104.0
107	2013	67.1	37.6	43.0	46.3	509.3	777.0	564.8	336.7	473.6	455.8	354.2	92.3	104.0
108	2014	41.9	8.6	0.0	11.1	238.0	416.6	467.6	321.6	412.9	402.6	201.2	100.4	104.0
109	2015	126.8	7.6	3.1	138.2	331.9	346.4	328.9	480.0	523.3	252.1	236.3	129.9	104.0

104 rows × 14 columns



In [23]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

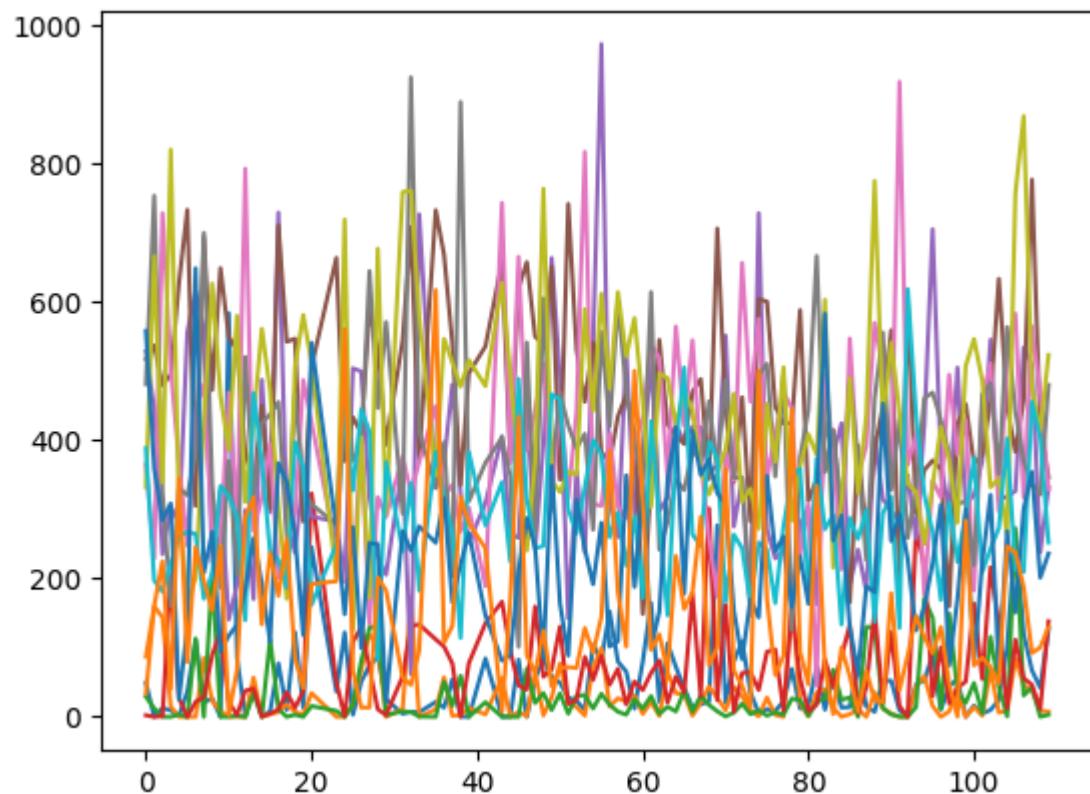
Out[23]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
0	49.2	87.1	29.2	2.3	528.8	517.5	365.1	481.1	332.6	388.5	558.2	33.6	
1	0.0	159.8	12.2	0.0	446.1	537.1	228.9	753.7	666.2	197.2	359.0	160.5	
2	12.7	144.0	0.0	1.0	235.1	479.9	728.4	326.7	339.0	181.2	284.4	225.0	
3	9.4	14.7	0.0	202.4	304.5	495.1	502.0	160.1	820.4	222.2	308.7	40.1	
4	1.3	0.0	3.3	26.9	279.5	628.7	368.7	330.5	297.0	260.7	25.4	344.7	
...
105	265.9	84.8	272.8	111.4	326.5	383.2	583.2	441.5	757.1	212.3	150.8	238.5	
106	119.9	45.6	30.9	55.8	533.9	458.2	317.3	369.6	868.9	209.7	300.5	187.3	
107	67.1	37.6	43.0	46.3	509.3	777.0	564.8	336.7	473.6	455.8	354.2	92.3	
108	41.9	8.6	0.0	11.1	238.0	416.6	467.6	321.6	412.9	402.6	201.2	100.4	
109	126.8	7.6	3.1	138.2	331.9	346.4	328.9	480.0	523.3	252.1	236.3	129.9	

104 rows × 12 columns

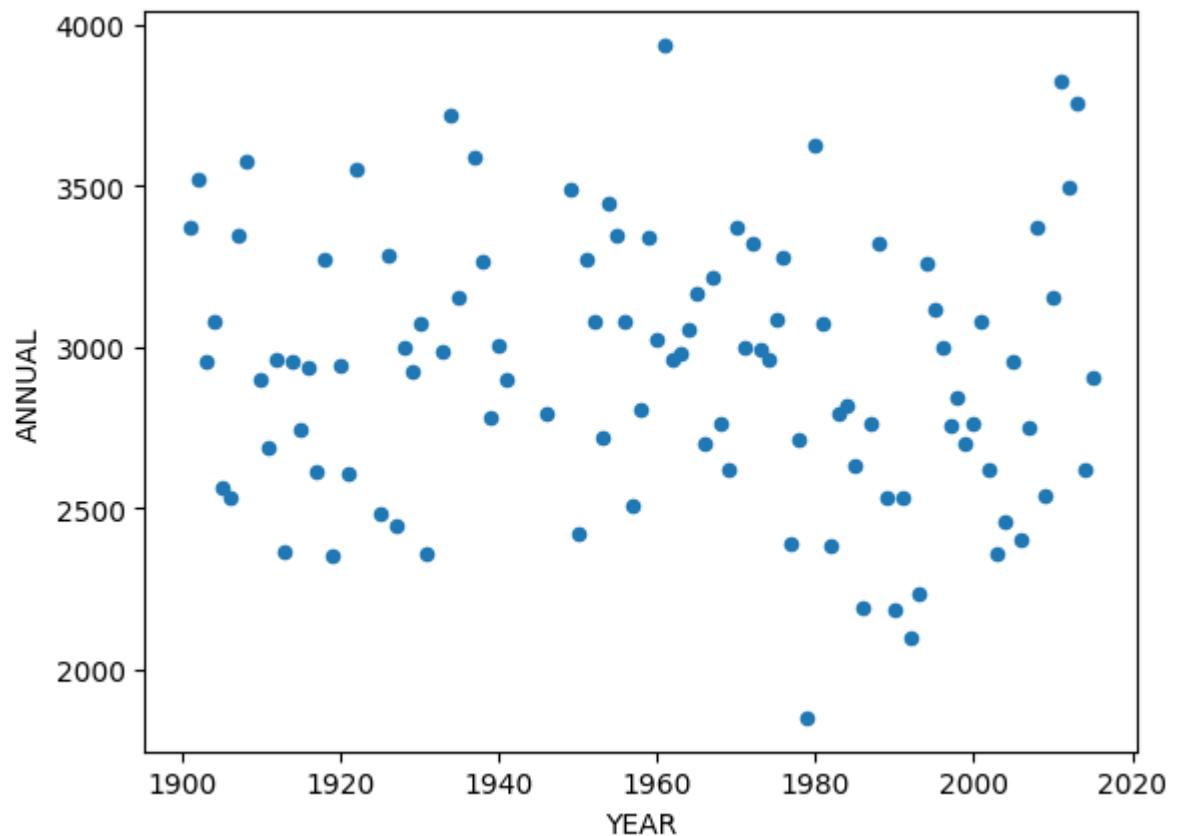
```
In [24]: plt.plot(y)
```

```
Out[24]: [
```



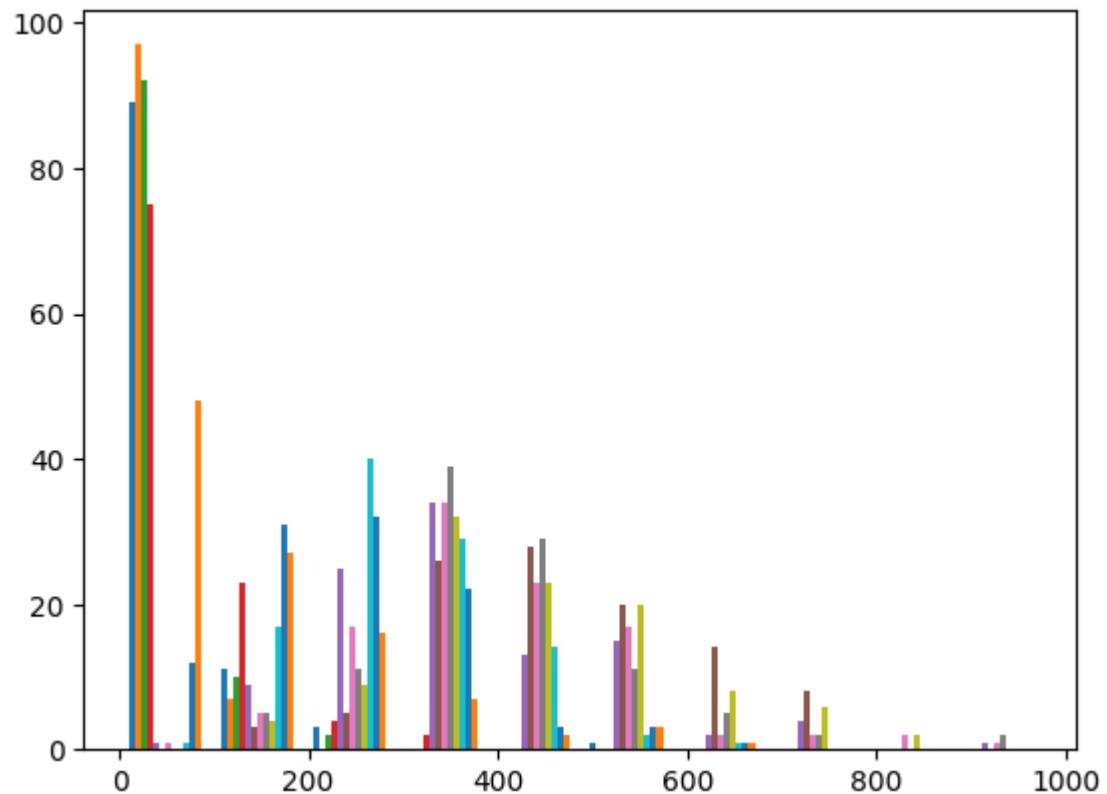
```
In [25]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[25]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



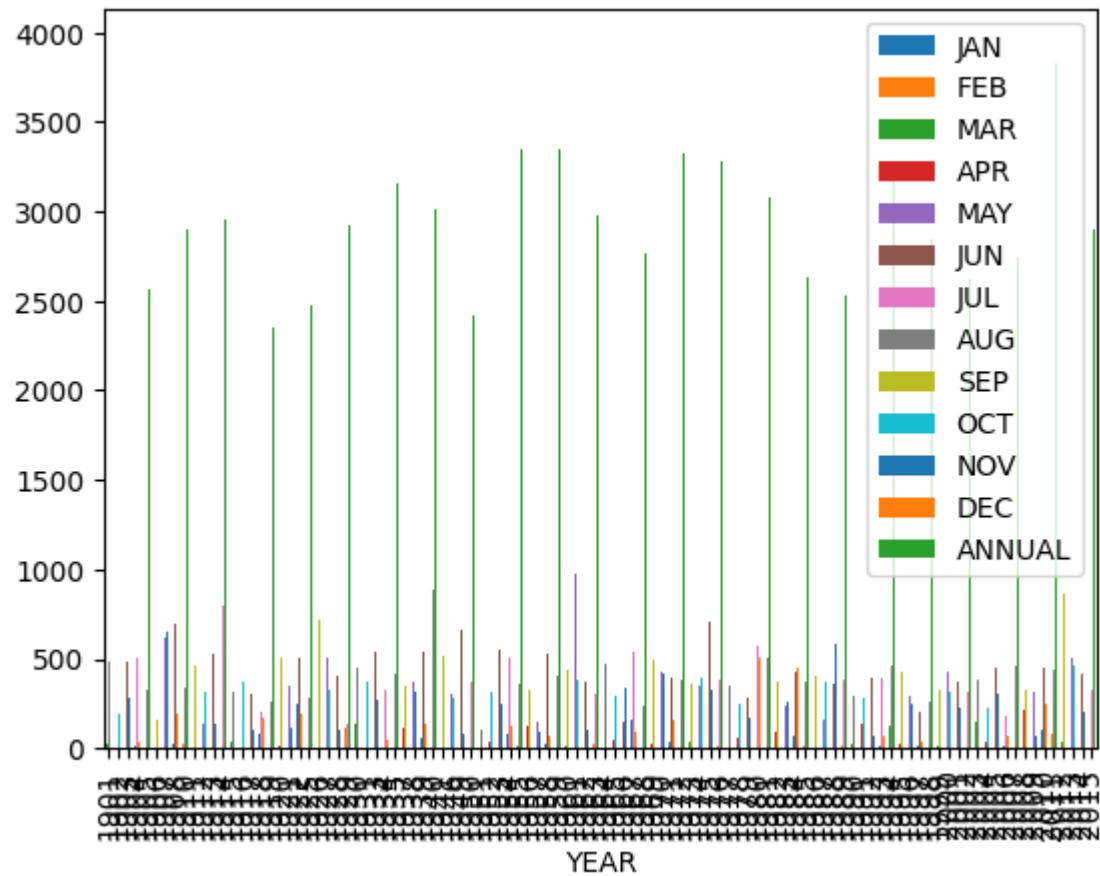
```
In [26]: plt.hist(y)
```

```
Out[26]: (array([[89., 11., 3., 0., 0., 1., 0., 0., 0., 0., 0.],
       [97., 7., 0., 0., 0., 0., 0., 0., 0., 0., 0.],
       [92., 10., 2., 0., 0., 0., 0., 0., 0., 0., 0.],
       [75., 23., 4., 2., 0., 0., 0., 0., 0., 0., 0.],
       [ 1., 9., 25., 34., 13., 15., 2., 4., 0., 1.],
       [ 0., 3., 5., 26., 28., 20., 14., 8., 0., 0.],
       [ 1., 5., 17., 34., 23., 17., 2., 2., 2., 1.],
       [ 0., 5., 11., 39., 29., 11., 5., 2., 0., 2.],
       [ 0., 4., 9., 32., 23., 20., 8., 6., 2., 0.],
       [ 1., 17., 40., 29., 14., 2., 1., 0., 0., 0.],
       [12., 31., 32., 22., 3., 3., 1., 0., 0., 0.],
       [48., 27., 16., 7., 2., 3., 1., 0., 0., 0.]]),
array([ 0. , 97.31, 194.62, 291.93, 389.24, 486.55, 583.86, 681.17,
       778.48, 875.79, 973.1 ]),
<a list of 12 BarContainer objects>)
```



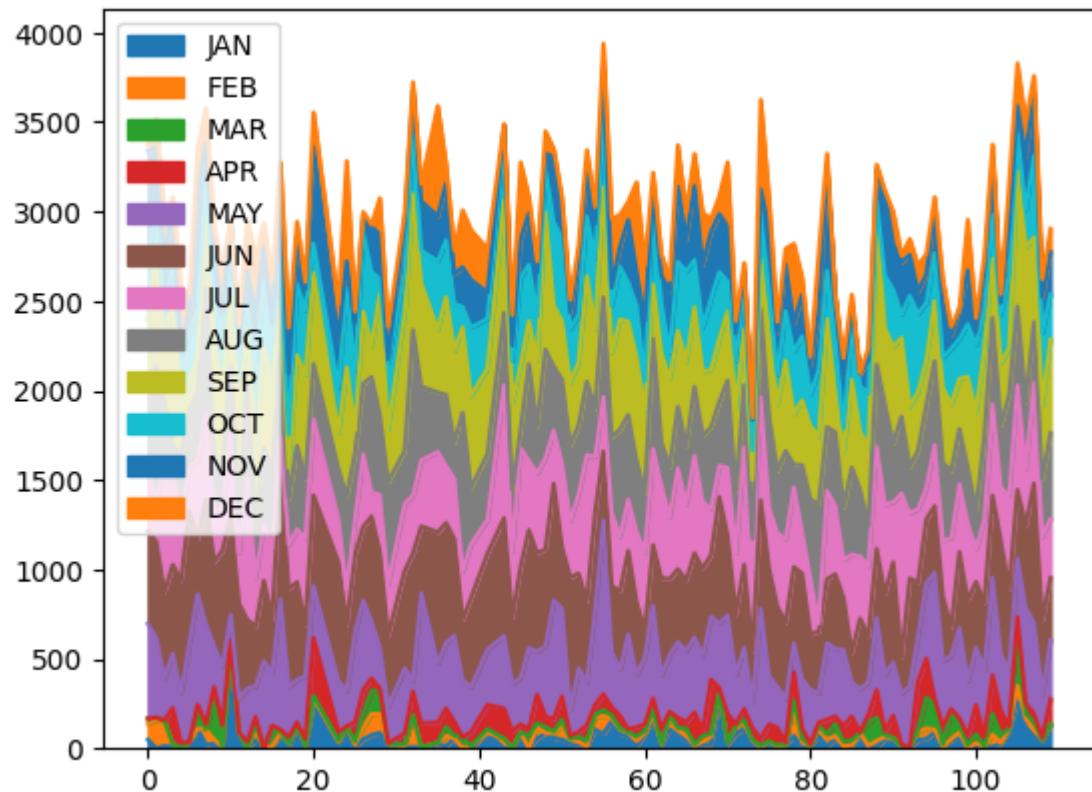
```
In [27]: x.plot.bar(x="YEAR")
```

```
Out[27]: <Axes: xlabel='YEAR'>
```



In [28]: `y.plot.area()`

Out[28]: <Axes: >



LAKSHADWEEP

In [29]:

```
x=df[df[ "SUBDIVISION" ]=="LAKSHADWEEP"]
```

x

Out[29]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
4002	4002	LAKSHADWEEP	1901	22.6	86.4	114.8	263.8	37.3	459.0	0.0	0.0	46.7
4003	4003	LAKSHADWEEP	1902	99.3	9.6	32.6	40.4	179.1	374.2	413.3	170.0	214.3
4005	4005	LAKSHADWEEP	1904	0.0	0.0	13.5	13.2	143.3	261.3	256.0	38.9	219.9
4006	4006	LAKSHADWEEP	1905	62.4	0.0	0.0	0.0	166.7	400.7	68.7	377.5	107.5
4007	4007	LAKSHADWEEP	1906	17.8	0.0	24.4	33.8	213.0	465.0	348.6	260.5	25.9
...
4111	4111	LAKSHADWEEP	2011	5.1	2.8	3.1	85.9	107.2	153.6	350.2	254.0	255.2
4112	4112	LAKSHADWEEP	2012	19.2	0.1	1.6	76.8	21.2	327.0	231.5	381.2	179.8
4113	4113	LAKSHADWEEP	2013	26.2	34.4	37.5	5.3	88.3	426.2	296.4	154.4	180.0
4114	4114	LAKSHADWEEP	2014	53.2	16.1	4.4	14.9	57.4	244.1	116.1	466.1	132.2
4115	4115	LAKSHADWEEP	2015	2.2	0.5	3.7	87.1	133.1	296.6	257.5	146.4	160.4

103 rows × 20 columns



In [30]:

```
x=x.drop([ "SUBDIVISION", "index", "Jan-Feb", "Mar-May", "Jun-Sep", "Oct-Dec"],axis=1)
```

Out[30]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
4002	1901	22.6	86.4	114.8	263.8	37.3	459.0	0.0	0.0	46.7	183.7	229.9	15.0	1.
4003	1902	99.3	9.6	32.6	40.4	179.1	374.2	413.3	170.0	214.3	384.2	192.8	49.0	2
4005	1904	0.0	0.0	13.5	13.2	143.3	261.3	256.0	38.9	219.9	153.6	8.3	68.9	1
4006	1905	62.4	0.0	0.0	0.0	166.7	400.7	68.7	377.5	107.5	232.1	159.3	0.0	1
4007	1906	17.8	0.0	24.4	33.8	213.0	465.0	348.6	260.5	25.9	252.3	106.5	63.8	1
...
4111	2011	5.1	2.8	3.1	85.9	107.2	153.6	350.2	254.0	255.2	117.4	184.3	14.9	1
4112	2012	19.2	0.1	1.6	76.8	21.2	327.0	231.5	381.2	179.8	145.9	12.4	8.8	1
4113	2013	26.2	34.4	37.5	5.3	88.3	426.2	296.4	154.4	180.0	72.8	78.1	26.7	1
4114	2014	53.2	16.1	4.4	14.9	57.4	244.1	116.1	466.1	132.2	169.2	59.0	62.3	1
4115	2015	2.2	0.5	3.7	87.1	133.1	296.6	257.5	146.4	160.4	165.4	231.0	159.0	1

103 rows × 14 columns



In [31]:

```
y=x.drop(["YEAR", "ANNUAL"],axis=1)  
y
```

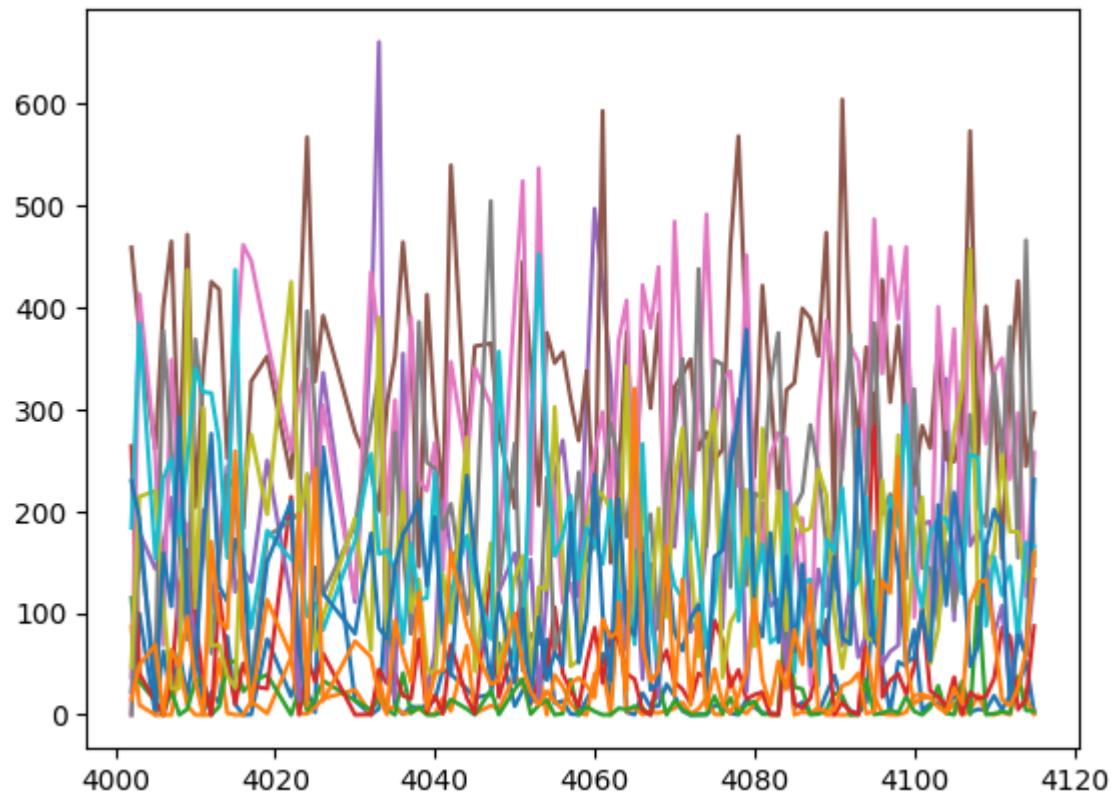
Out[31]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4002	22.6	86.4	114.8	263.8	37.3	459.0	0.0	0.0	46.7	183.7	229.9	15.0
4003	99.3	9.6	32.6	40.4	179.1	374.2	413.3	170.0	214.3	384.2	192.8	49.0
4005	0.0	0.0	13.5	13.2	143.3	261.3	256.0	38.9	219.9	153.6	8.3	68.9
4006	62.4	0.0	0.0	0.0	166.7	400.7	68.7	377.5	107.5	232.1	159.3	0.0
4007	17.8	0.0	24.4	33.8	213.0	465.0	348.6	260.5	25.9	252.3	106.5	63.8
...
4111	5.1	2.8	3.1	85.9	107.2	153.6	350.2	254.0	255.2	117.4	184.3	14.9
4112	19.2	0.1	1.6	76.8	21.2	327.0	231.5	381.2	179.8	145.9	12.4	8.8
4113	26.2	34.4	37.5	5.3	88.3	426.2	296.4	154.4	180.0	72.8	78.1	26.7
4114	53.2	16.1	4.4	14.9	57.4	244.1	116.1	466.1	132.2	169.2	59.0	62.3
4115	2.2	0.5	3.7	87.1	133.1	296.6	257.5	146.4	160.4	165.4	231.0	159.0

103 rows × 12 columns

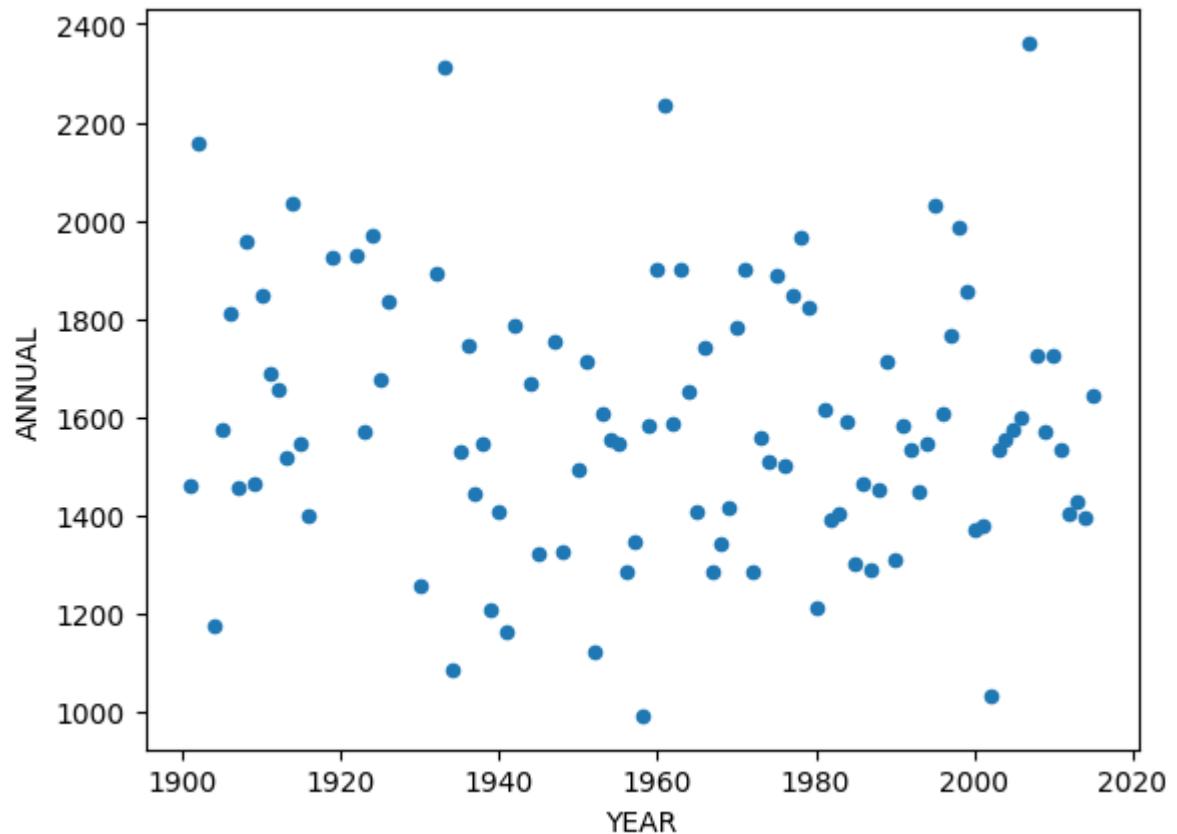
```
In [32]: plt.plot(y)
```

```
Out[32]: [
```



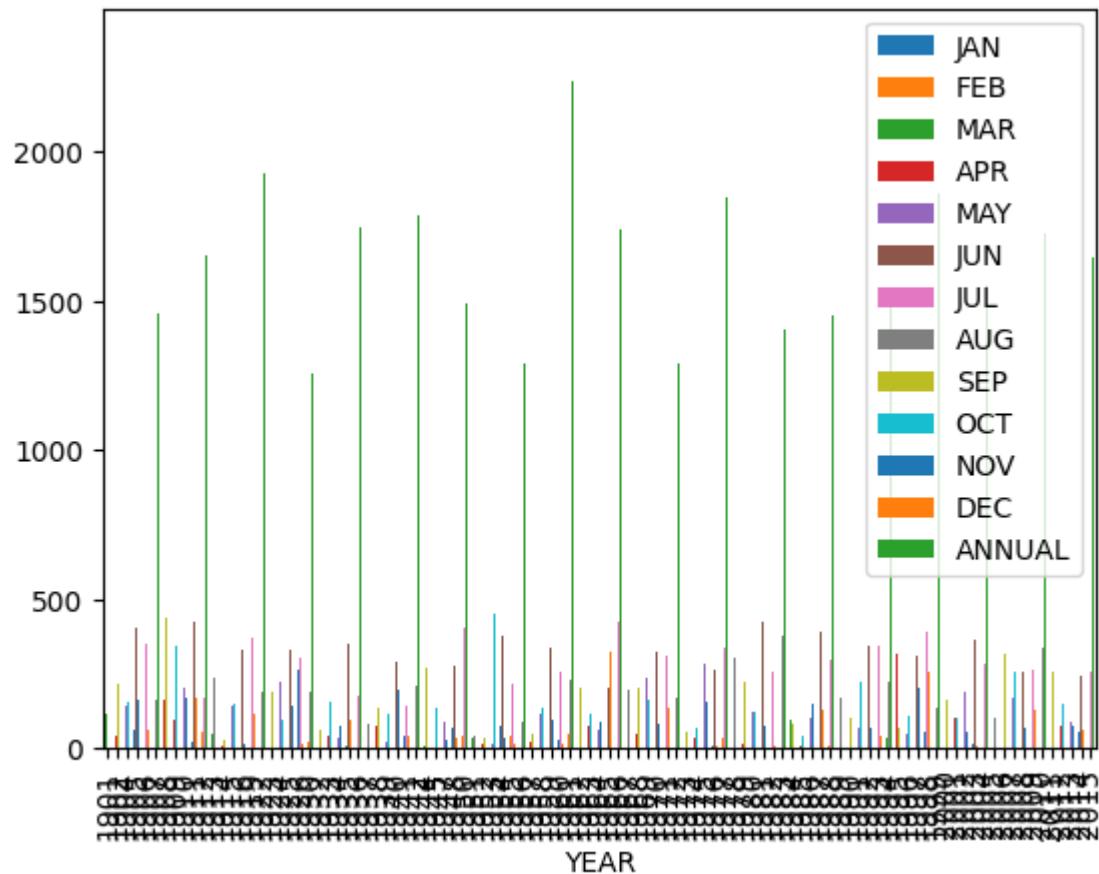
```
In [33]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[33]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



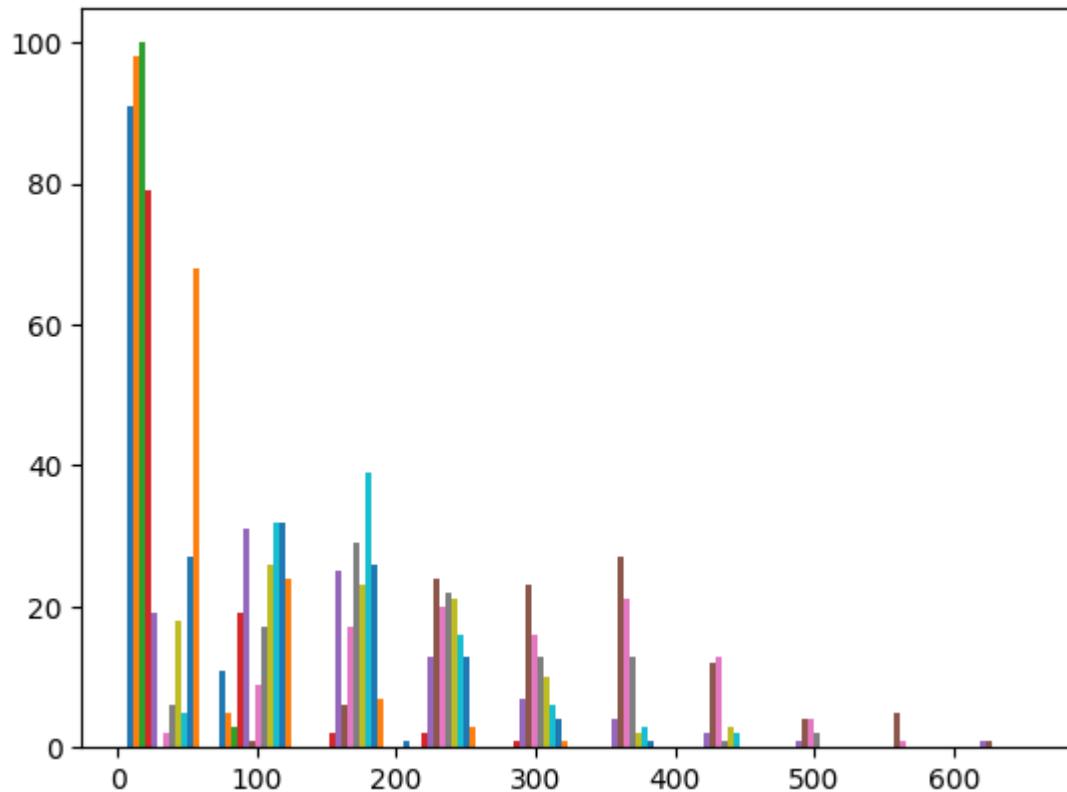
```
In [34]: x.plot.bar(x="YEAR")
```

```
Out[34]: <Axes: xlabel='YEAR'>
```



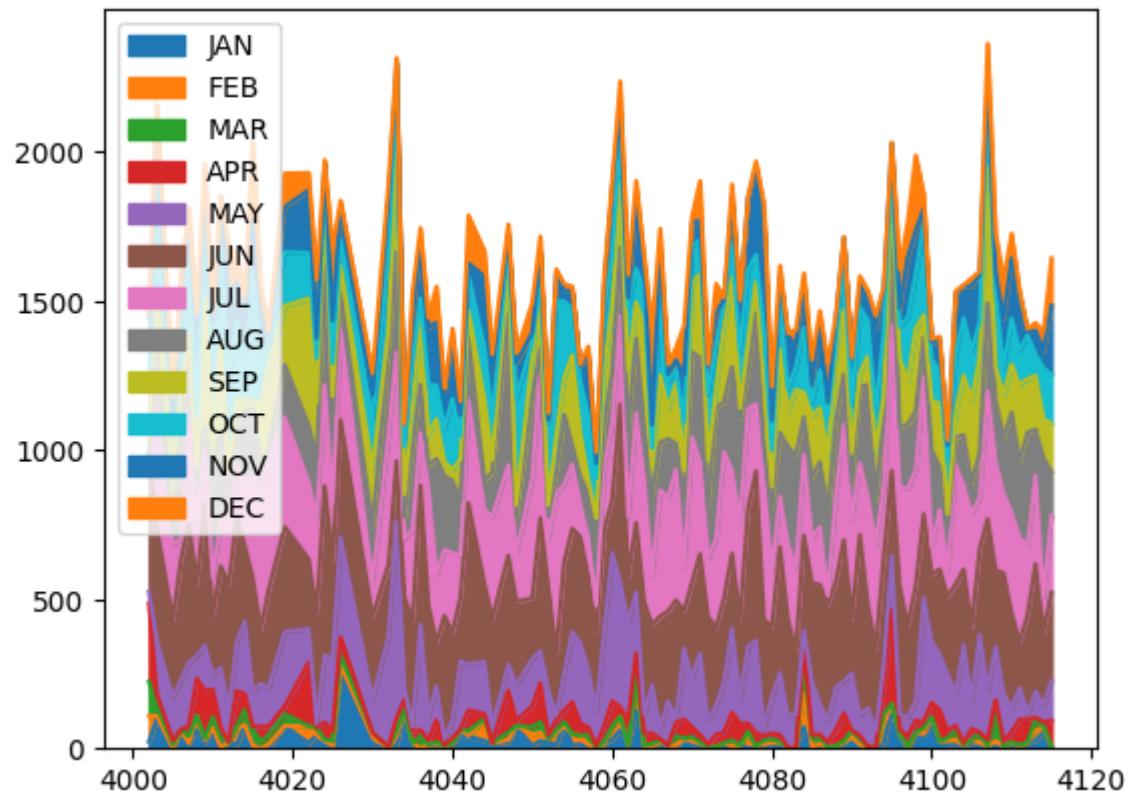
```
In [35]: plt.hist(y)
```

```
Out[35]: (array([[ 91.,  11.,  0.,  1.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 98.,  5.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [100.,  3.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.],
       [ 79.,  19.,  2.,  2.,  1.,  0.,  0.,  0.,  0.,  0.],
       [ 19.,  31.,  25.,  13.,  7.,  4.,  2.,  1.,  0.,  1.],
       [ 0.,  1.,  6.,  24.,  23.,  27.,  12.,  4.,  5.,  1.],
       [ 2.,  9.,  17.,  20.,  16.,  21.,  13.,  4.,  1.,  0.],
       [ 6.,  17.,  29.,  22.,  13.,  13.,  1.,  2.,  0.,  0.],
       [ 18.,  26.,  23.,  21.,  10.,  2.,  3.,  0.,  0.,  0.],
       [ 5.,  32.,  39.,  16.,  6.,  3.,  2.,  0.,  0.,  0.],
       [ 27.,  32.,  26.,  13.,  4.,  1.,  0.,  0.,  0.,  0.],
       [ 68.,  24.,  7.,  3.,  1.,  0.,  0.,  0.,  0.,  0.]]),
array([ 0. ,  66.08, 132.16, 198.24, 264.32, 330.4 , 396.48, 462.56,
      528.64, 594.72, 660.8 ]),
<a list of 12 BarContainer objects>)
```



In [36]: `y.plot.area()`

Out[36]: <Axes: >



ARUNACHAL PRADESH

In [37]:

```
x=df[df[ "SUBDIVISION" ]=="ARUNACHAL PRADESH"]  
x
```

Out[37]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
112	112	ARUNACHAL PRADESH	1918	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8
113	113	ARUNACHAL PRADESH	1919	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7
114	114	ARUNACHAL PRADESH	1920	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7
115	115	ARUNACHAL PRADESH	1921	78.9	54.3	180.3	358.0	598.0	1233.2	1433.0	885.9	603.4
116	116	ARUNACHAL PRADESH	1922	50.7	59.4	170.4	299.5	350.5	1109.3	918.7	488.3	207.6
...
202	202	ARUNACHAL PRADESH	2011	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7
203	203	ARUNACHAL PRADESH	2012	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9
204	204	ARUNACHAL PRADESH	2013	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1
205	205	ARUNACHAL PRADESH	2014	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0
206	206	ARUNACHAL PRADESH	2015	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2

91 rows × 20 columns



In [38]: `x=x.drop(["SUBDIVISION","index","Jan-Feb","Mar-May","Jun-Sep","Oct-Dec"],axis=1)`

Out[38]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AN
112	1918	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8	125.2	7.8	13.7	112
113	1919	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7	948.3	40.7	8.6	113
114	1920	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7	103.3	0.0	0.0	114
115	1921	78.9	54.3	180.3	358.0	598.0	1233.2	1433.0	885.9	603.4	246.3	4.6	15.5	115
116	1922	50.7	59.4	170.4	299.5	350.5	1109.3	918.7	488.3	207.6	483.5	30.3	19.0	116
...
202	2011	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7	51.9	16.2	15.2	202
203	2012	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9	248.1	22.0	26.2	203
204	2013	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1	164.1	13.3	14.6	204
205	2014	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0	35.1	20.1	10.2	205
206	2015	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2	65.2	33.8	29.8	206

91 rows × 14 columns

In [39]: `y=x.drop(["YEAR","ANNUAL"],axis=1)`
y

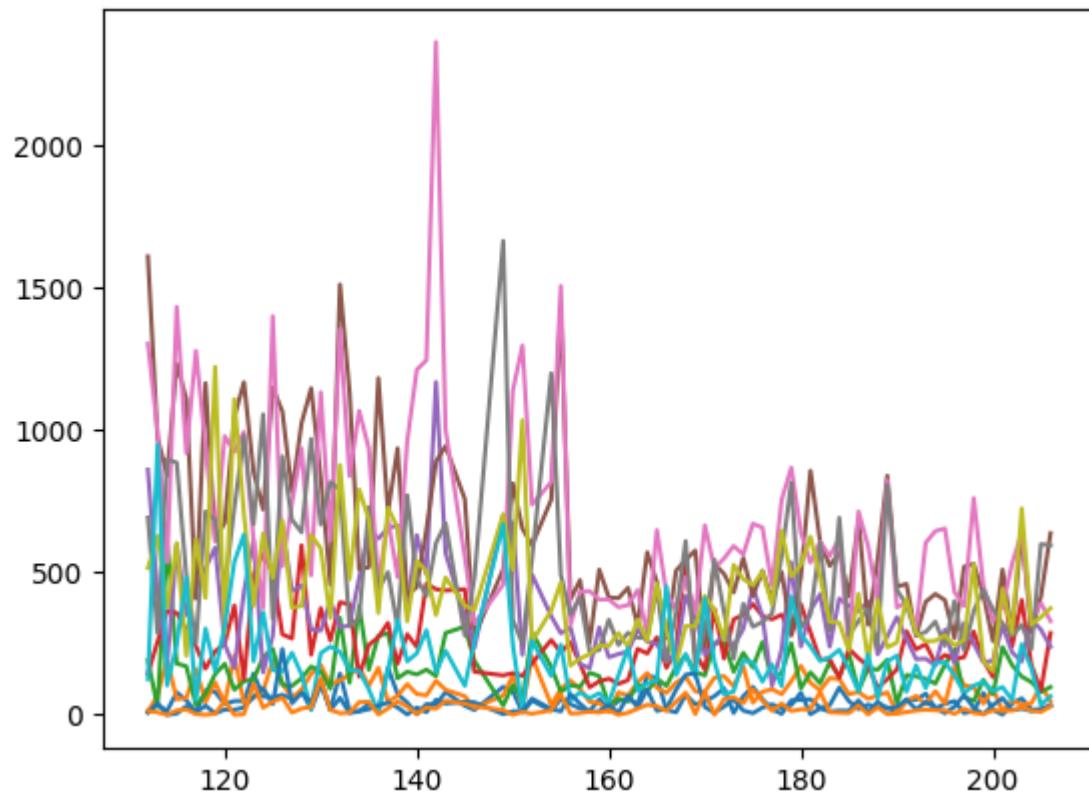
Out[39]:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
112	10.4	11.0	191.2	144.6	861.1	1609.9	1303.0	692.6	515.8	125.2	7.8	13.7	112
113	34.5	67.8	28.5	256.9	420.6	973.6	999.0	286.7	628.7	948.3	40.7	8.6	113
114	14.0	196.3	605.6	364.7	173.6	840.6	535.4	896.5	376.7	103.3	0.0	0.0	114
115	78.9	54.3	180.3	358.0	598.0	1233.2	1433.0	885.9	603.4	246.3	4.6	15.5	115
116	50.7	59.4	170.4	299.5	350.5	1109.3	918.7	488.3	207.6	483.5	30.3	19.0	116
...
202	40.0	51.3	174.5	240.8	219.6	288.4	531.4	277.6	286.7	51.9	16.2	15.2	202
203	57.8	35.8	134.2	403.4	187.4	645.8	638.9	316.0	724.9	248.1	22.0	26.2	203
204	18.5	40.5	115.1	175.1	335.8	290.0	329.6	230.2	316.1	164.1	13.3	14.6	204
205	19.0	101.9	80.3	86.7	299.0	415.8	392.4	599.6	343.0	35.1	20.1	10.2	205
206	30.8	47.5	97.5	287.1	238.9	637.9	329.3	595.5	374.2	65.2	33.8	29.8	206

91 rows × 12 columns

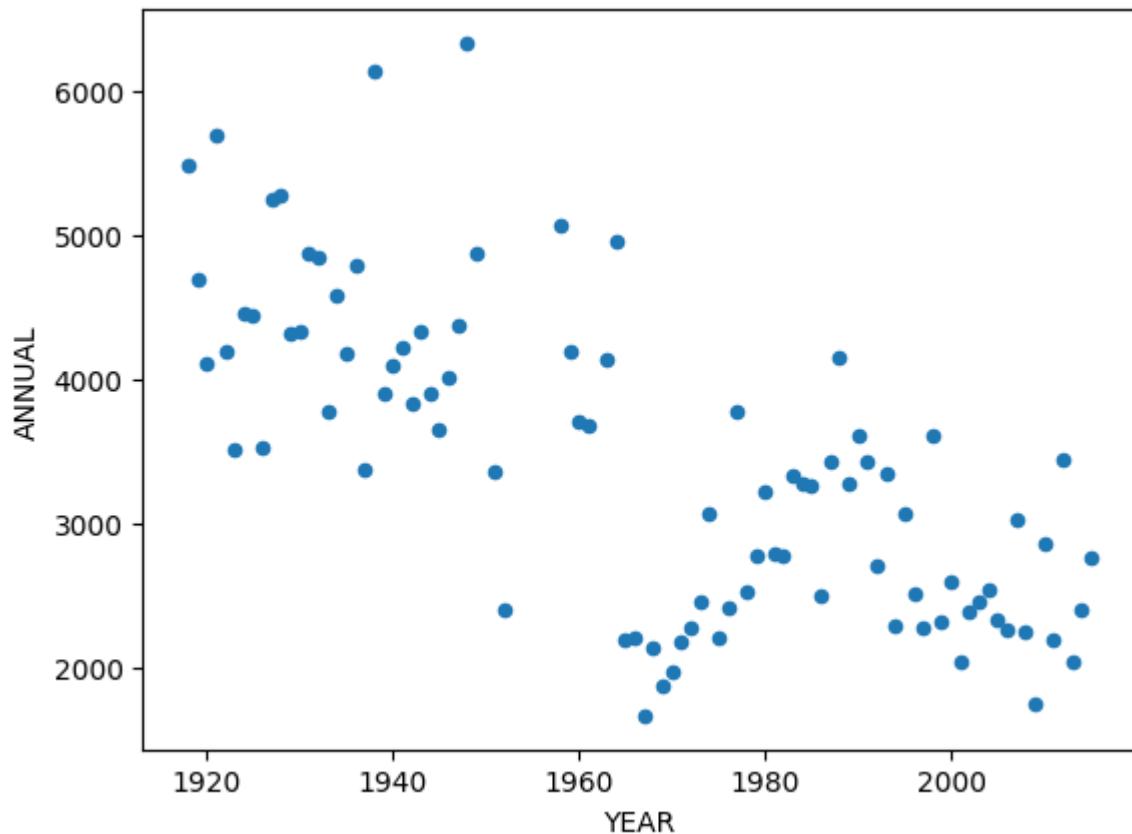
```
In [40]: plt.plot(y)
```

```
Out[40]: [
```



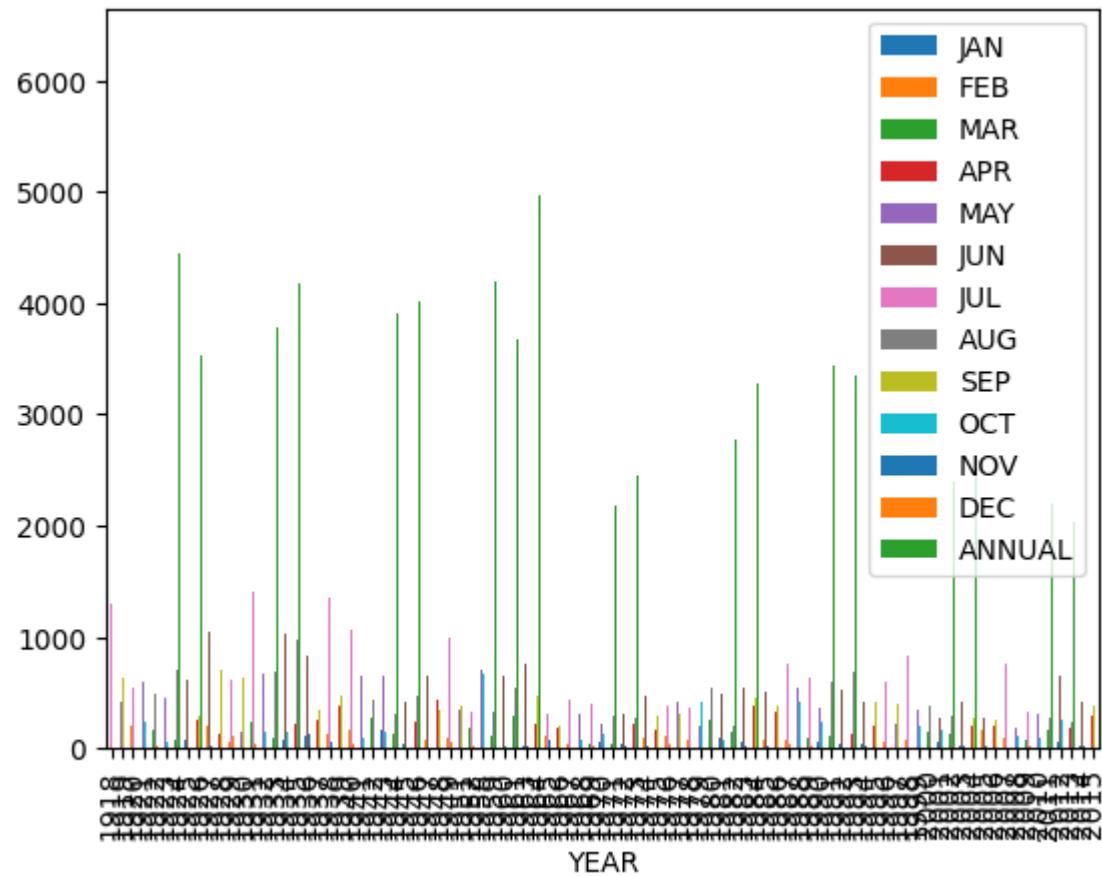
```
In [41]: x.plot.scatter(x="YEAR",y="ANNUAL")
```

```
Out[41]: <Axes: xlabel='YEAR', ylabel='ANNUAL'>
```



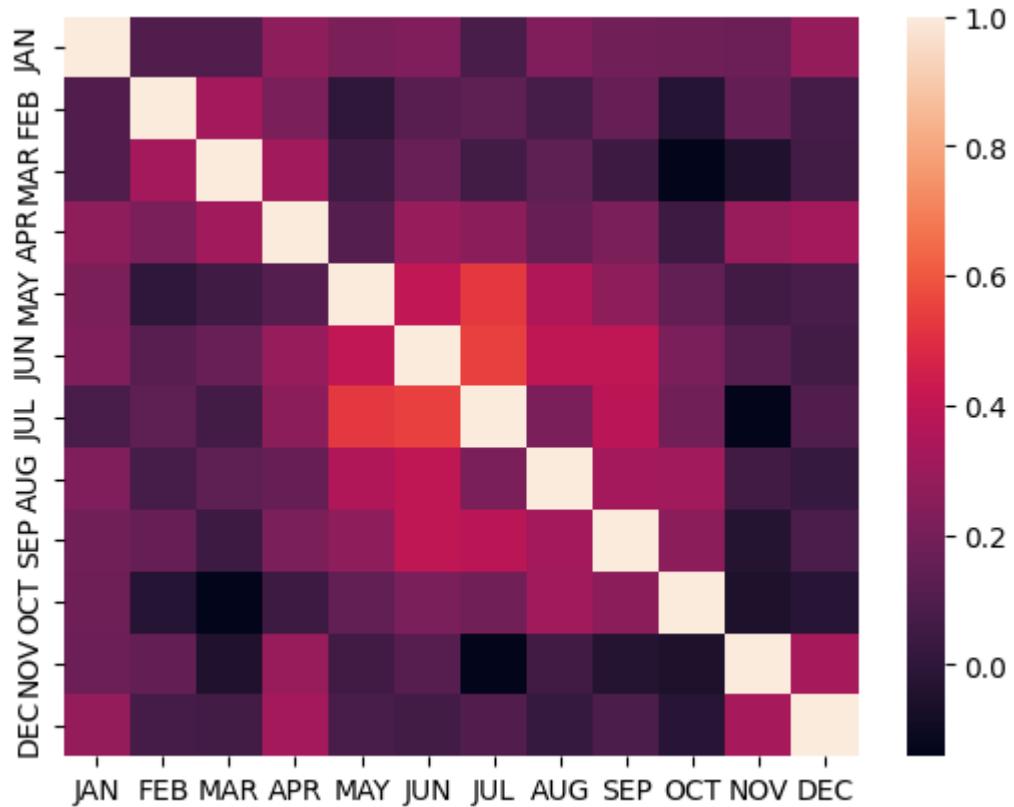
```
In [42]: x.plot.bar(x="YEAR")
```

```
Out[42]: <Axes: xlabel='YEAR'>
```



In [43]: `sns.heatmap(y.corr())`

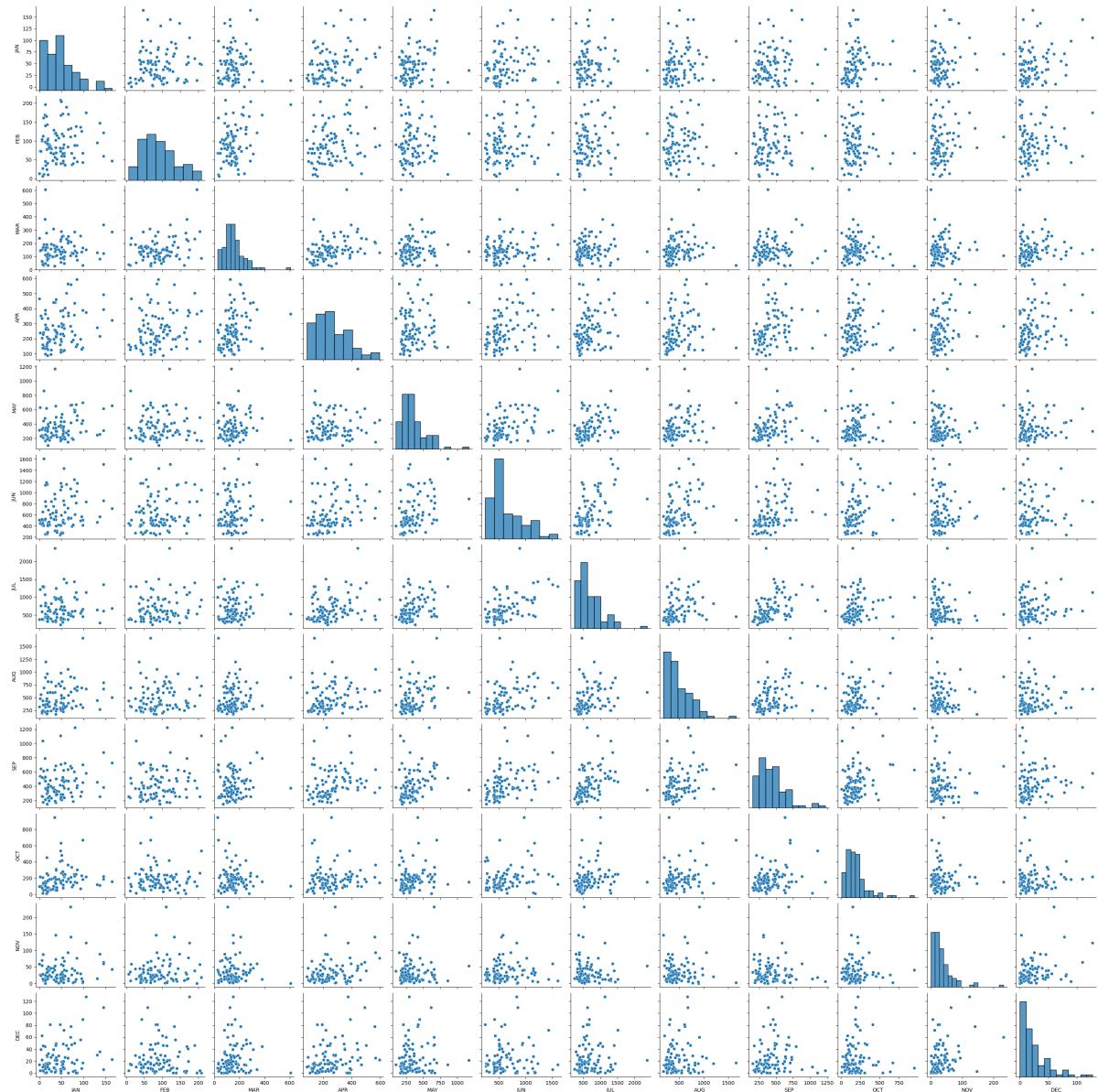
Out[43]: <Axes: >



```
In [44]: sns.pairplot(y)
```

C:\Users\Gokul Jana\AppData\Local\Programs\Python\Python311\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight
self._figure.tight_layout(*args, **kwargs)

Out[44]: <seaborn.axisgrid.PairGrid at 0x1a45a8047d0>



```
In [45]: x.plot.pie(y="ANNUAL", subplots=True)
```

```
Out[45]: array([<Axes: ylabel='ANNUAL'>], dtype=object)
```