

In [1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.linear_model import LogisticRegression
from sklearn.preprocessing import StandardScaler
import re
from sklearn.datasets import load_digits
from sklearn.model_selection import train_test_split
```

set7:

In [59]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\Book7.csv")
a
```

Out[59]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
0	3312	RAYALSEEMA	1901	7.0	50.2	0.0	12.1	38.9	53.0	73.4	60.3	109.0	81.0
1	3313	RAYALSEEMA	1902	10.0	0.2	1.7	11.0	36.8	73.6	41.3	148.3	181.7	188.0
2	3314	RAYALSEEMA	1903	30.0	0.1	0.0	3.6	80.5	67.5	127.5	140.6	219.7	98.0
3	3315	RAYALSEEMA	1904	14.8	0.0	1.7	7.1	58.8	39.8	75.1	19.4	84.7	111.0
4	3316	RAYALSEEMA	1905	6.5	6.8	17.0	18.3	44.2	66.1	50.9	219.3	36.5	180.0
...
110	3422	RAYALSEEMA	2011	0.8	12.1	0.0	34.6	33.0	44.5	128.9	163.6	71.2	107.0
111	3423	RAYALSEEMA	2012	2.7	0.0	2.5	32.7	38.8	47.0	139.7	120.0	69.5	113.0
112	3424	RAYALSEEMA	2013	1.3	30.6	11.5	26.8	38.9	73.8	95.7	110.3	163.2	169.0
113	3425	RAYALSEEMA	2014	0.2	0.7	12.5	5.1	46.7	66.3	68.7	115.1	81.4	104.0
114	3426	RAYALSEEMA	2015	1.9	0.0	13.4	73.4	39.7	73.0	43.1	123.6	136.3	106.0

115 rows × 20 columns



In [60]:

```
a.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):
#   Column          Non-Null Count  Dtype
---  -
0   index           115 non-null    int64
1   SUBDIVISION     115 non-null    object
2   YEAR            115 non-null    int64
3   JAN             115 non-null    float64
4   FEB             115 non-null    float64
5   MAR             115 non-null    float64
6   APR             115 non-null    float64
7   MAY             115 non-null    float64
8   JUN             115 non-null    float64
9   JUL             115 non-null    float64
10  AUG             115 non-null    float64
11  SEP             115 non-null    float64
12  OCT             115 non-null    float64
13  NOV             115 non-null    float64
14  DEC             115 non-null    float64
15  ANNUAL          115 non-null    float64
16  Jan-Feb        115 non-null    float64
17  Mar-May        115 non-null    float64
18  Jun-Sep        115 non-null    float64
19  Oct-Dec        115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.1+ KB
```

In [61]:

```
b=a.fillna(method='ffill')
b
```

Out[61]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
0	3312	RAYALSEEMA	1901	7.0	50.2	0.0	12.1	38.9	53.0	73.4	60.3	109.0	81.0
1	3313	RAYALSEEMA	1902	10.0	0.2	1.7	11.0	36.8	73.6	41.3	148.3	181.7	186.0
2	3314	RAYALSEEMA	1903	30.0	0.1	0.0	3.6	80.5	67.5	127.5	140.6	219.7	95.0
3	3315	RAYALSEEMA	1904	14.8	0.0	1.7	7.1	58.8	39.8	75.1	19.4	84.7	111.0
4	3316	RAYALSEEMA	1905	6.5	6.8	17.0	18.3	44.2	66.1	50.9	219.3	36.5	180.0
...
110	3422	RAYALSEEMA	2011	0.8	12.1	0.0	34.6	33.0	44.5	128.9	163.6	71.2	107.0
111	3423	RAYALSEEMA	2012	2.7	0.0	2.5	32.7	38.8	47.0	139.7	120.0	69.5	113.0
112	3424	RAYALSEEMA	2013	1.3	30.6	11.5	26.8	38.9	73.8	95.7	110.3	163.2	169.0
113	3425	RAYALSEEMA	2014	0.2	0.7	12.5	5.1	46.7	66.3	68.7	115.1	81.4	104.0
114	3426	RAYALSEEMA	2015	1.9	0.0	13.4	73.4	39.7	73.0	43.1	123.6	136.3	106.0

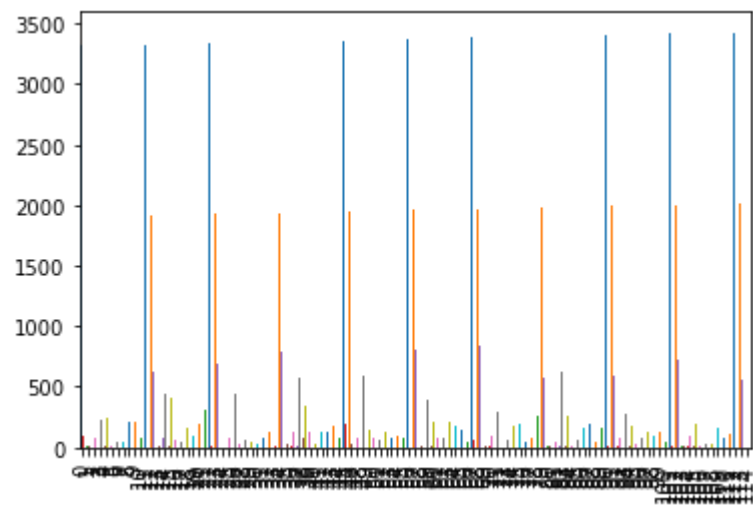
115 rows × 20 columns

In [62]:

```
b.plot.bar(legend=None)
```

Out[62]:

<AxesSubplot:>

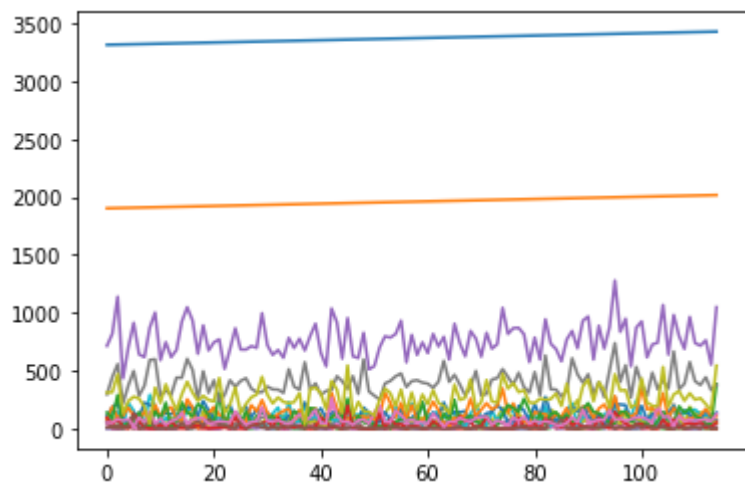


In [63]:

```
b.plot.line(legend=None)
```

Out[63]:

<AxesSubplot:>

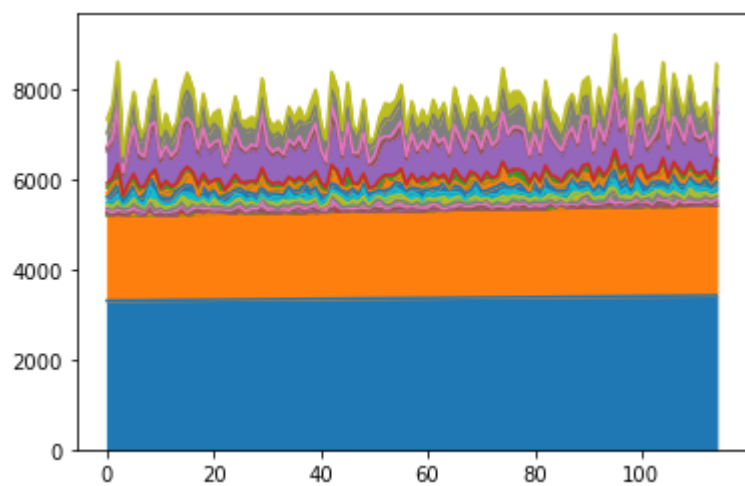


In [64]:

```
b.plot.area(legend=None)
```

Out[64]:

<AxesSubplot:>

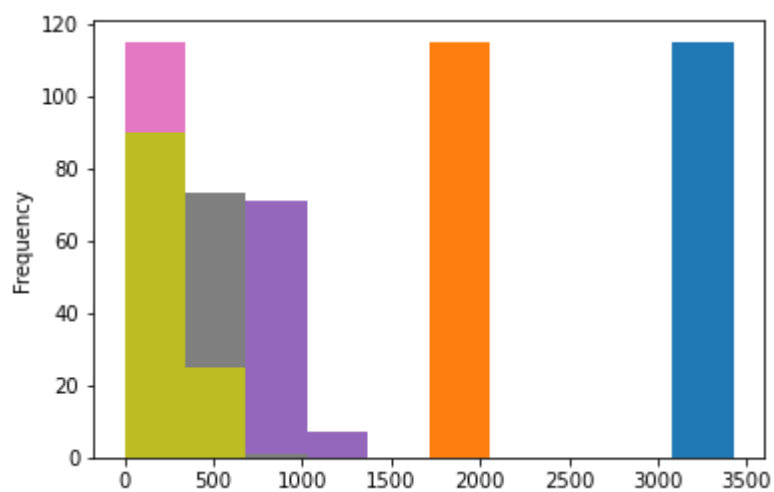


In [65]:

```
b.plot.hist(legend=None)
```

Out[65]:

<AxesSubplot:ylabel='Frequency'>

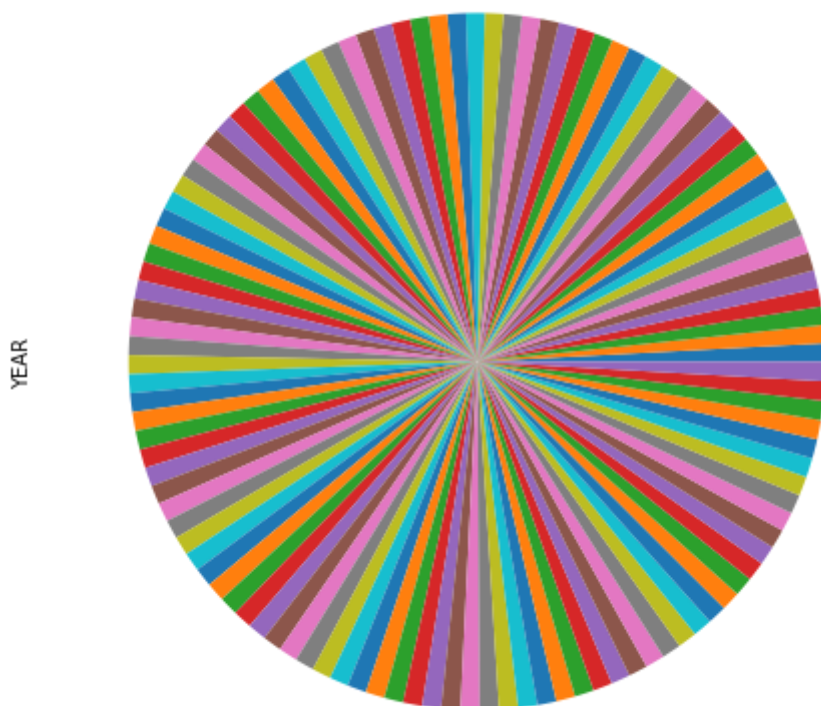


In [66]:

```
b.plot.pie(y='YEAR',figsize=(8,8),labels=None,legend=None)
```

Out[66]:

<AxesSubplot:ylabel='YEAR'>



set8:

In [67]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\Book8.csv")
a
```

Out[67]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	O
0	3197	TELANGANA	1901	6.9	41.8	7.8	45.2	22.0	123.6	237.8	177.2	77.7	7
1	3198	TELANGANA	1902	0.0	0.0	0.2	10.7	7.3	52.4	146.3	142.8	190.5	4
2	3199	TELANGANA	1903	12.9	4.6	0.0	9.9	40.7	99.2	505.2	246.7	191.9	15
3	3200	TELANGANA	1904	0.0	0.0	10.8	0.8	14.7	104.2	139.5	50.0	162.3	4
4	3201	TELANGANA	1905	0.0	4.3	12.8	27.6	32.2	129.5	82.4	237.3	179.1	1
...
110	3307	TELANGANA	2011	0.0	11.9	2.6	25.6	9.3	83.9	268.2	225.9	107.6	1
111	3308	TELANGANA	2012	6.7	0.0	0.2	14.0	8.4	124.4	300.3	229.9	202.4	8
112	3309	TELANGANA	2013	2.4	29.0	0.2	24.4	8.5	213.4	453.8	230.6	161.4	20
113	3310	TELANGANA	2014	0.2	2.9	58.3	10.3	73.3	62.3	146.0	205.2	146.8	2
114	3311	TELANGANA	2015	17.5	0.0	43.0	65.7	23.3	266.9	104.4	160.5	158.3	1

115 rows × 20 columns



In [68]:

```
a.info()
```

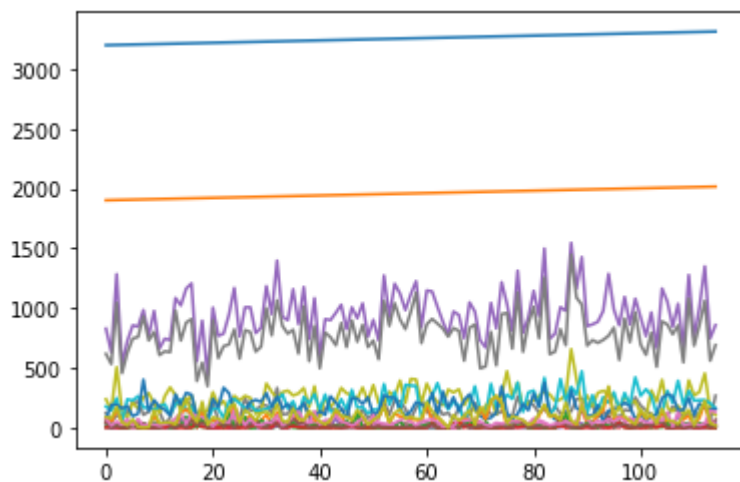
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):
#   Column          Non-Null Count  Dtype
---  -
0   index           115 non-null    int64
1   SUBDIVISION     115 non-null    object
2   YEAR            115 non-null    int64
3   JAN             115 non-null    float64
4   FEB             115 non-null    float64
5   MAR             115 non-null    float64
6   APR             115 non-null    float64
7   MAY             115 non-null    float64
8   JUN             115 non-null    float64
9   JUL             115 non-null    float64
10  AUG             115 non-null    float64
11  SEP             115 non-null    float64
12  OCT             115 non-null    float64
13  NOV             115 non-null    float64
14  DEC             115 non-null    float64
15  ANNUAL          115 non-null    float64
16  Jan-Feb         115 non-null    float64
17  Mar-May         115 non-null    float64
18  Jun-Sep         115 non-null    float64
19  Oct-Dec         115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.1+ KB
```

In [69]:

```
a.plot.line(legend=None)
```

Out[69]:

<AxesSubplot:>

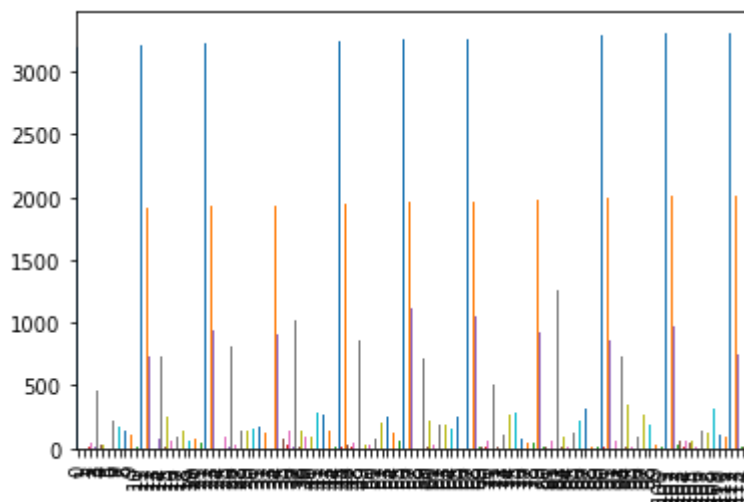


In [70]:

```
a.plot.bar(legend=None)
```

Out[70]:

<AxesSubplot:>

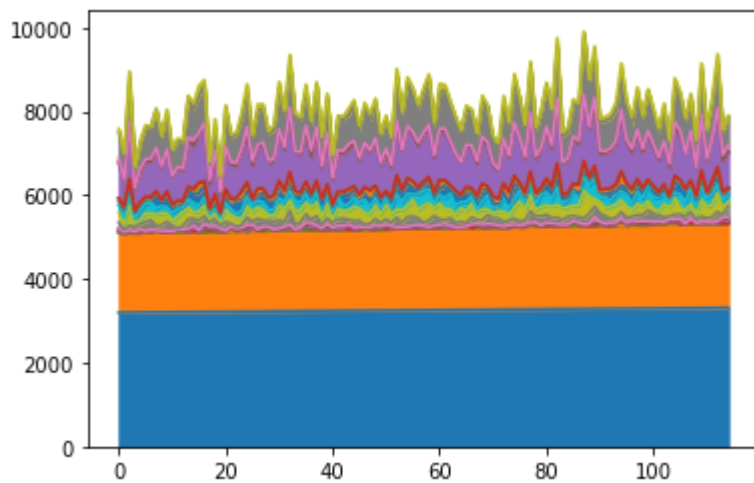


In [71]:

```
a.plot.area(legend=None)
```

Out[71]:

<AxesSubplot:>

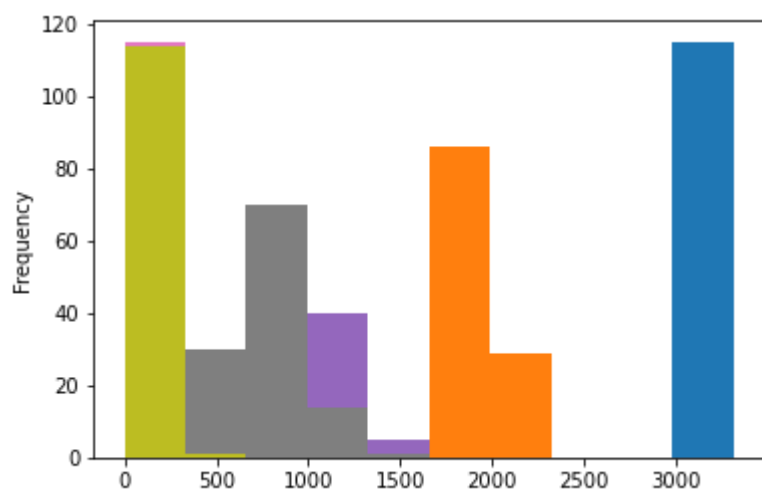


In [72]:

```
a.plot.hist(legend=None)
```

Out[72]:

<AxesSubplot:ylabel='Frequency'>

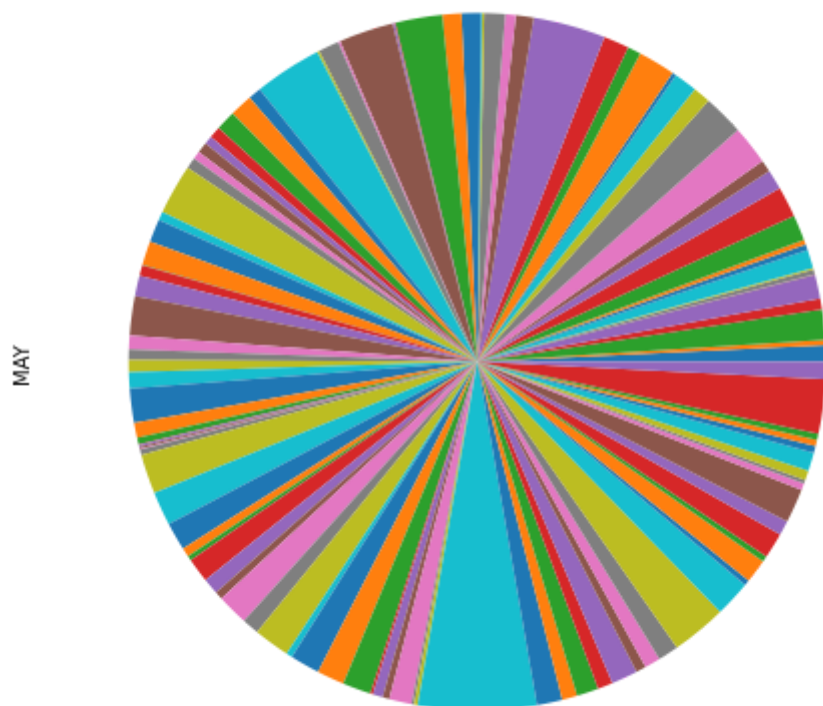


In [73]:

```
a.plot.pie(y='MAY',figsize=(8,8),labels=None,legend=None)
```

Out[73]:

<AxesSubplot:ylabel='MAY'>



set9:

In [74]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\Book9.csv")
a
```

Out[74]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	COASTAL
0	3082	COASTAL ANDHRA PRADESH	1901	18.8	80.9	7.2	28.7	68.7	77.7	113.0	133.7	125.3	1901
1	3083	COASTAL ANDHRA PRADESH	1902	2.0	0.0	2.8	23.9	37.6	72.6	144.5	236.1	204.5	1902
2	3084	COASTAL ANDHRA PRADESH	1903	0.8	13.3	0.2	6.2	73.4	154.0	248.6	258.0	216.5	1903
3	3085	COASTAL ANDHRA PRADESH	1904	1.3	0.0	5.4	3.0	136.3	107.8	120.2	117.7	116.8	1904
4	3086	COASTAL ANDHRA PRADESH	1905	1.1	16.7	68.0	37.0	68.8	84.4	64.6	210.8	170.2	1905
...
110	3192	COASTAL ANDHRA PRADESH	2011	0.0	17.9	0.9	62.3	67.9	86.8	196.0	215.8	129.7	2011
111	3193	COASTAL ANDHRA PRADESH	2012	37.6	0.0	2.7	24.0	39.3	95.4	221.9	221.2	246.5	2012
112	3194	COASTAL ANDHRA PRADESH	2013	2.0	29.6	0.2	48.0	28.2	127.5	162.4	123.1	132.0	2013
113	3195	COASTAL ANDHRA PRADESH	2014	0.4	1.2	9.1	6.0	112.9	45.7	151.8	177.8	144.5	2014
114	3196	COASTAL ANDHRA PRADESH	2015	2.0	0.6	5.5	32.3	34.1	283.8	116.0	192.0	201.8	2015

115 rows × 20 columns



In [75]:

```
a.info()
```

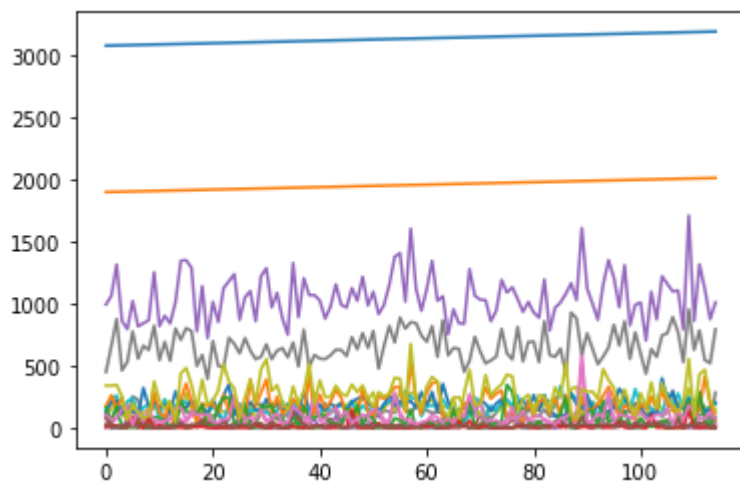
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):
#   Column          Non-Null Count  Dtype
---  -
0   index           115 non-null    int64
1   SUBDIVISION     115 non-null    object
2   YEAR            115 non-null    int64
3   JAN             115 non-null    float64
4   FEB             115 non-null    float64
5   MAR             115 non-null    float64
6   APR             115 non-null    float64
7   MAY             115 non-null    float64
8   JUN             115 non-null    float64
9   JUL             115 non-null    float64
10  AUG             115 non-null    float64
11  SEP             115 non-null    float64
12  OCT             115 non-null    float64
13  NOV             115 non-null    float64
14  DEC             115 non-null    float64
15  ANNUAL          115 non-null    float64
16  Jan-Feb         115 non-null    float64
17  Mar-May         115 non-null    float64
18  Jun-Sep         115 non-null    float64
19  Oct-Dec         115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.1+ KB
```

In [76]:

```
a.plot.line(legend=None)
```

Out[76]:

<AxesSubplot:>

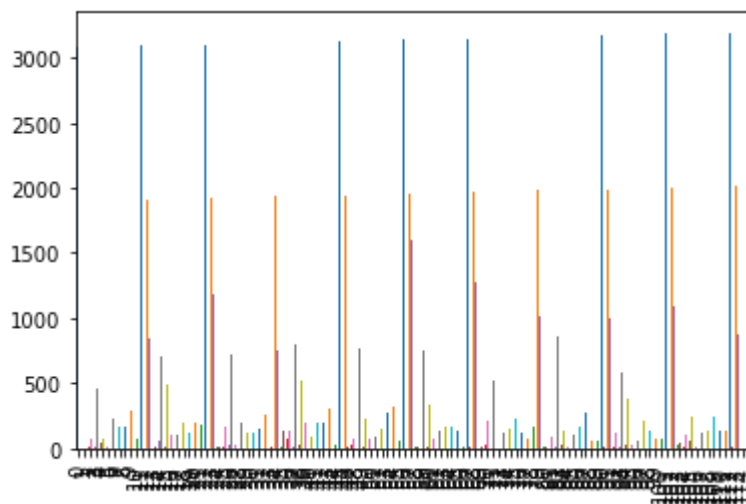


In [77]:

```
a.plot.bar(legend=None)
```

Out[77]:

<AxesSubplot:>

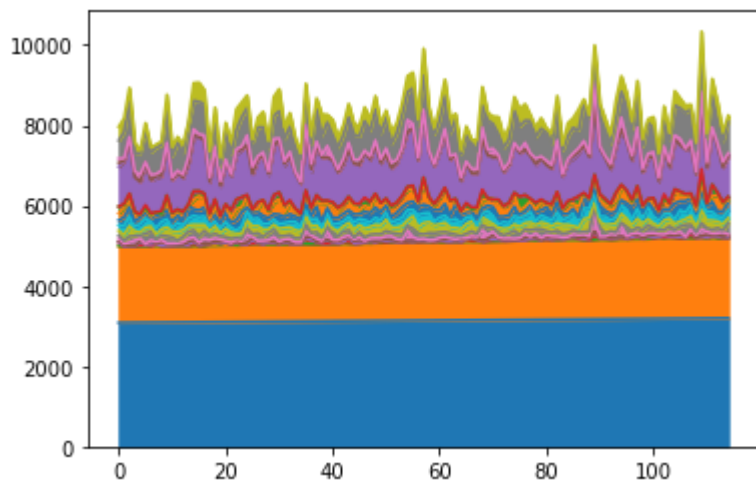


In [78]:

```
a.plot.area(legend=None)
```

Out[78]:

<AxesSubplot:>

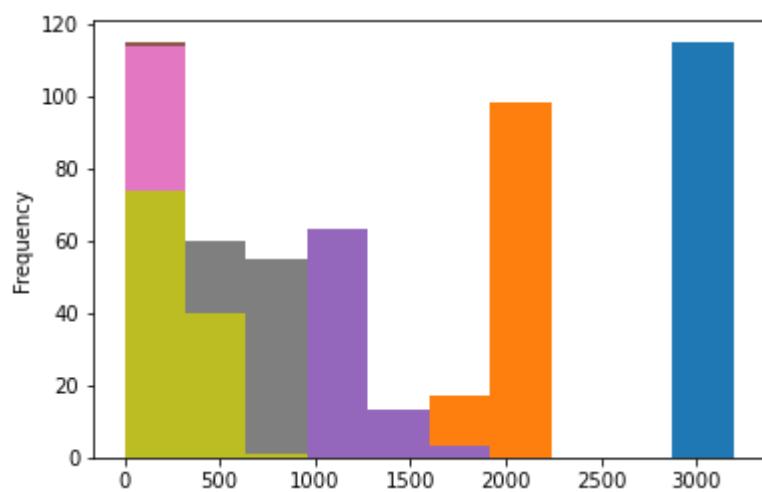


In [79]:

```
a.plot.hist(legend=None)
```

Out[79]:

<AxesSubplot:ylabel='Frequency'>

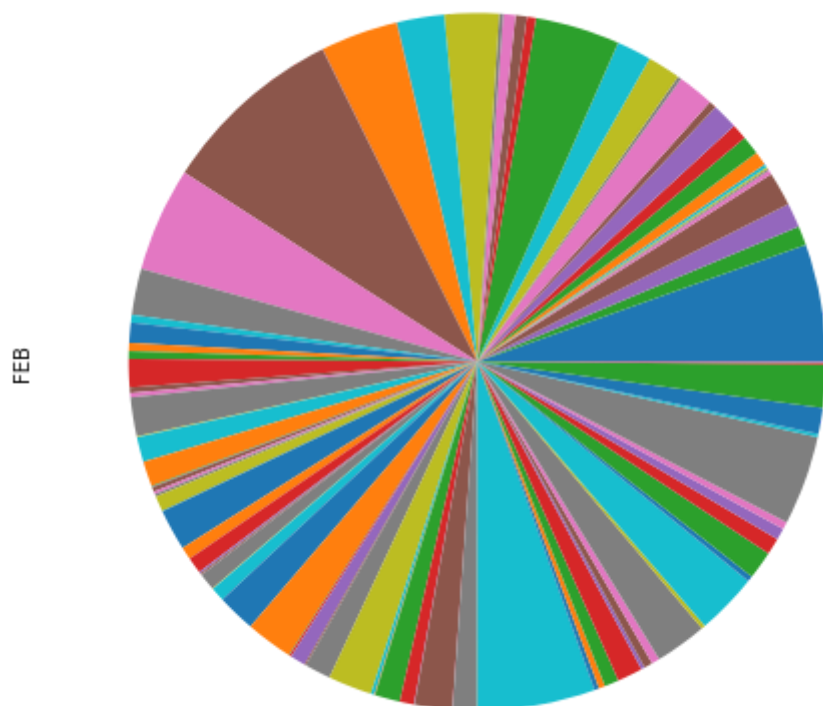


In [80]:

```
a.plot.pie(y='FEB',figsize=(8,8),labels=None,legend=None)
```

Out[80]:

<AxesSubplot:ylabel='FEB'>



set10:

In [81]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\Book10.csv")
a
```

Out[81]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
0	2967	CHHATTISGARH	1901	48.9	116.5	27.8	5.5	18.4	101.6	381.0	476.7	182.8
1	2968	CHHATTISGARH	1902	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1
2	2969	CHHATTISGARH	1903	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0
3	2970	CHHATTISGARH	1904	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8
4	2971	CHHATTISGARH	1905	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8
...
110	3077	CHHATTISGARH	2011	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2
111	3078	CHHATTISGARH	2012	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3
112	3079	CHHATTISGARH	2013	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9
113	3080	CHHATTISGARH	2014	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7
114	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 [82]:

```
a.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):
#   Column          Non-Null Count  Dtype
---  -
0   index           115 non-null    int64
1   SUBDIVISION     115 non-null    object
2   YEAR            115 non-null    int64
3   JAN             115 non-null    float64
4   FEB             115 non-null    float64
5   MAR             115 non-null    float64
6   APR             115 non-null    float64
7   MAY             115 non-null    float64
8   JUN             115 non-null    float64
9   JUL             115 non-null    float64
10  AUG             115 non-null    float64
11  SEP             115 non-null    float64
12  OCT             115 non-null    float64
13  NOV             115 non-null    float64
14  DEC             115 non-null    float64
15  ANNUAL          115 non-null    float64
16  Jan-Feb         115 non-null    float64
17  Mar-May         115 non-null    float64
18  Jun-Sep         115 non-null    float64
19  Oct-Dec         115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.1+ KB
```

In [83]:

```
b=a.fillna(method='ffill')
b
```

Out[83]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
0	2967	CHHATTISGARH	1901	48.9	116.5	27.8	5.5	18.4	101.6	381.0	476.7	182.8
1	2968	CHHATTISGARH	1902	0.6	6.5	0.4	13.9	10.3	37.2	403.8	236.6	198.1
2	2969	CHHATTISGARH	1903	6.2	13.9	0.4	6.8	51.1	110.7	365.9	396.0	212.0
3	2970	CHHATTISGARH	1904	0.0	8.6	32.3	0.2	77.5	369.5	303.6	483.6	86.8
4	2971	CHHATTISGARH	1905	50.3	22.6	19.0	24.6	31.8	40.4	443.7	270.8	338.8
...
110	3077	CHHATTISGARH	2011	0.3	11.5	2.6	35.0	16.8	183.5	272.6	379.8	382.2
111	3078	CHHATTISGARH	2012	36.6	4.8	1.1	14.9	9.4	147.3	430.6	442.2	245.3
112	3079	CHHATTISGARH	2013	2.8	19.7	4.9	45.8	5.7	263.6	418.8	336.6	140.9
113	3080	CHHATTISGARH	2014	2.3	29.0	21.4	17.3	25.0	104.9	416.7	327.7	252.7
114	3081	CHHATTISGARH	2015	15.8	1.2	21.2	37.0	13.0	257.6	248.6	286.6	216.9

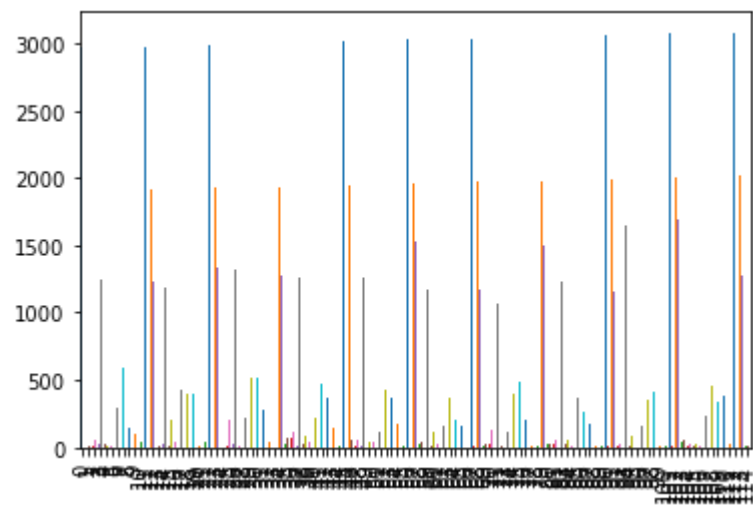
115 rows × 20 columns

In [84]:

```
b.plot.bar(legend=None)
```

Out[84]:

<AxesSubplot:>

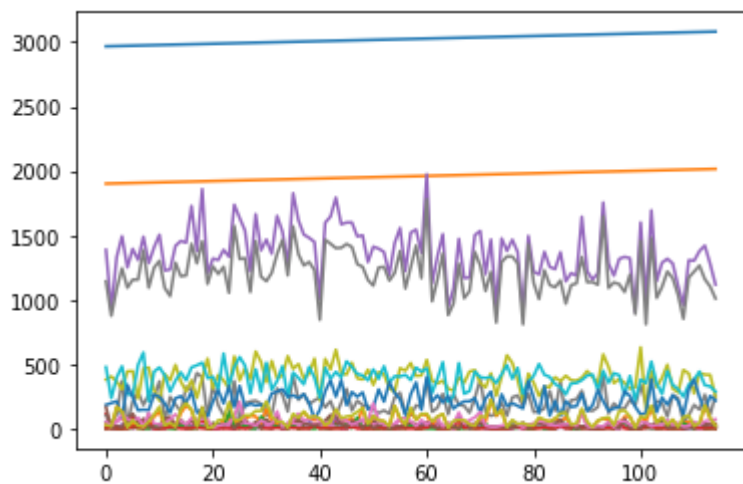


In [85]:

```
b.plot.line(legend=None)
```

Out[85]:

<AxesSubplot:>

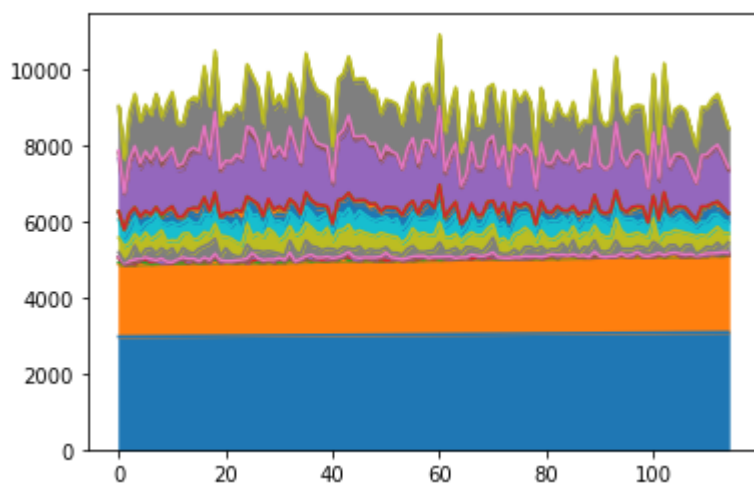


In [86]:

```
b.plot.area(legend=None)
```

Out[86]:

<AxesSubplot:>

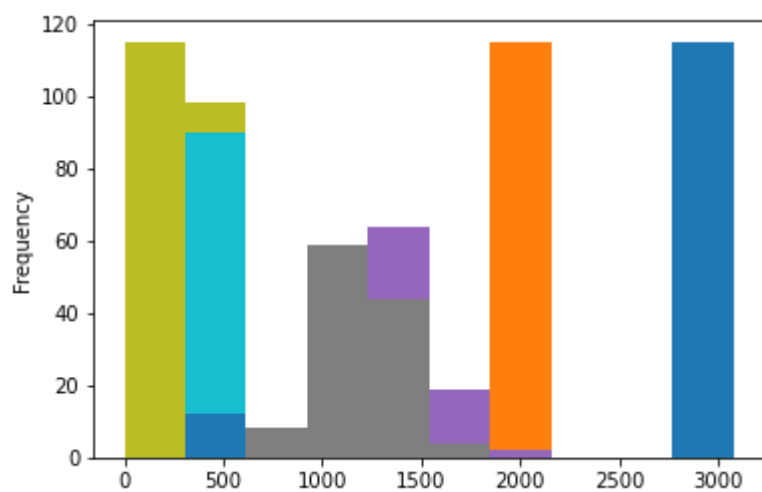


In [87]:

```
b.plot.hist(legend=None)
```

Out[87]:

<AxesSubplot:ylabel='Frequency'>

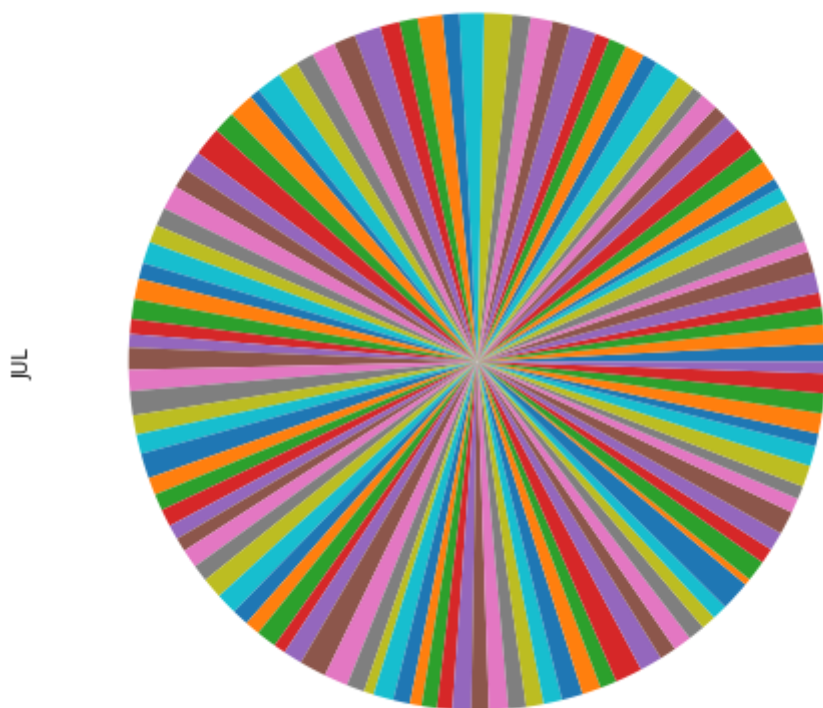


In [88]:

```
b.plot.pie(y='JUL',figsize=(8,8),labels=None,legend=None)
```

Out[88]:

<AxesSubplot:ylabel='JUL'>



set11:

In [89]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\Book11.csv")
a
```

Out[89]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	O
0	2852	VIDARBHA	1901	36.8	39.9	30.9	26.1	7.3	129.7	295.3	368.8	123.4	3
1	2853	VIDARBHA	1902	1.6	0.1	0.0	6.5	4.1	38.0	270.7	204.7	150.9	2
2	2854	VIDARBHA	1903	5.2	4.0	0.1	2.5	37.8	121.2	475.5	325.5	154.8	10
3	2855	VIDARBHA	1904	4.3	2.4	12.9	0.2	14.8	148.9	158.3	151.8	196.9	6
4	2856	VIDARBHA	1905	7.3	12.7	12.4	16.2	14.0	81.0	254.5	216.3	321.3	
...	
110	2962	VIDARBHA	2011	0.0	1.2	0.1	7.7	0.6	137.9	247.1	302.8	191.0	
111	2963	VIDARBHA	2012	3.1	0.1	0.0	0.6	0.2	125.5	370.5	316.2	249.4	3
112	2964	VIDARBHA	2013	6.6	13.0	3.8	2.8	0.5	366.7	535.5	326.1	131.7	13
113	2965	VIDARBHA	2014	1.2	18.3	49.6	2.6	4.0	63.3	337.6	191.7	224.9	1
114	2966	VIDARBHA	2015	26.3	4.7	66.3	28.1	12.8	254.6	137.2	288.9	167.5	

115 rows × 20 columns



In [90]:

```
a.info()
```

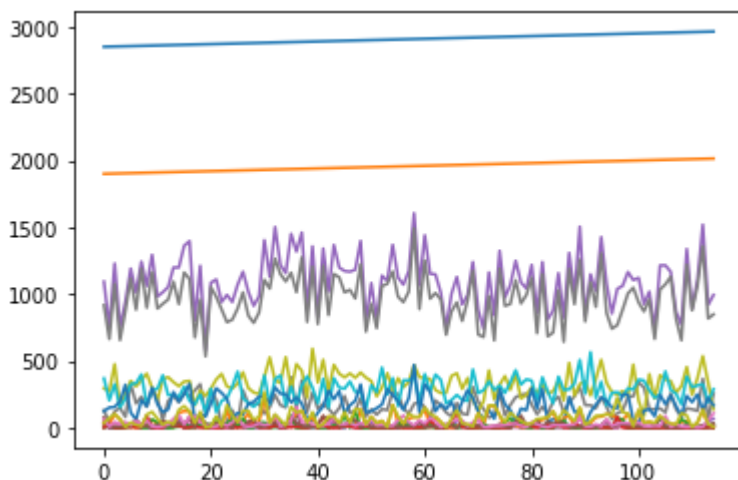
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):
#   Column          Non-Null Count  Dtype
---  -
0   index           115 non-null    int64
1   SUBDIVISION     115 non-null    object
2   YEAR            115 non-null    int64
3   JAN             115 non-null    float64
4   FEB             115 non-null    float64
5   MAR             115 non-null    float64
6   APR             115 non-null    float64
7   MAY             115 non-null    float64
8   JUN             115 non-null    float64
9   JUL             115 non-null    float64
10  AUG             115 non-null    float64
11  SEP             115 non-null    float64
12  OCT             115 non-null    float64
13  NOV             115 non-null    float64
14  DEC             115 non-null    float64
15  ANNUAL          115 non-null    float64
16  Jan-Feb        115 non-null    float64
17  Mar-May        115 non-null    float64
18  Jun-Sep        115 non-null    float64
19  Oct-Dec        115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.1+ KB
```

In [91]:

```
a.plot.line(legend=None)
```

Out[91]:

<AxesSubplot:>

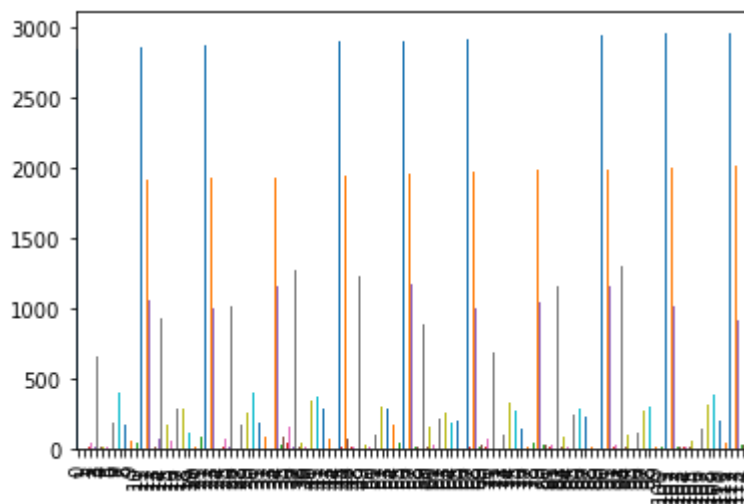


In [92]:

```
a.plot.bar(legend=None)
```

Out[92]:

<AxesSubplot:>

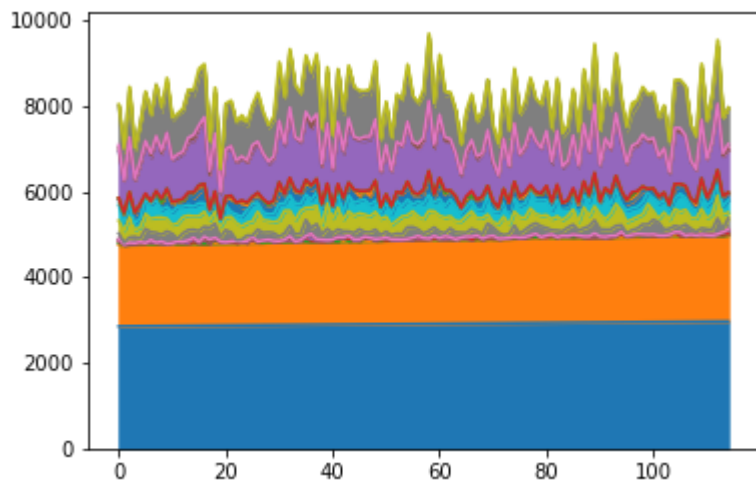


In [93]:

```
a.plot.area(legend=None)
```

Out[93]:

<AxesSubplot:>

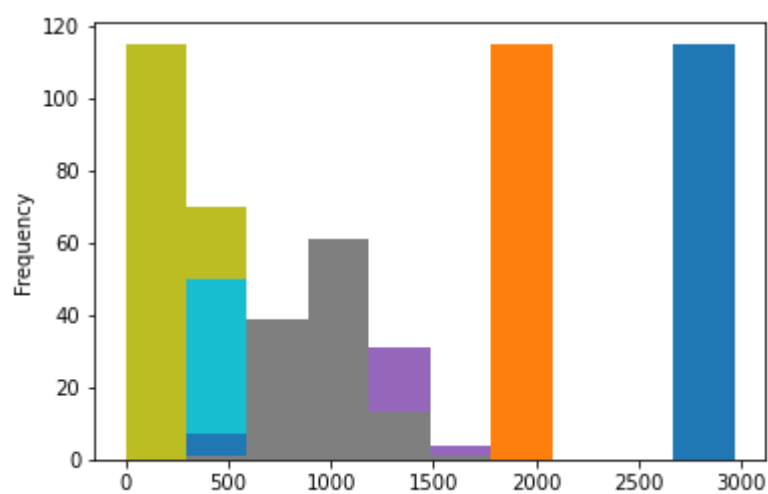


In [94]:

```
a.plot.hist(legend=None)
```

Out[94]:

<AxesSubplot:ylabel='Frequency'>

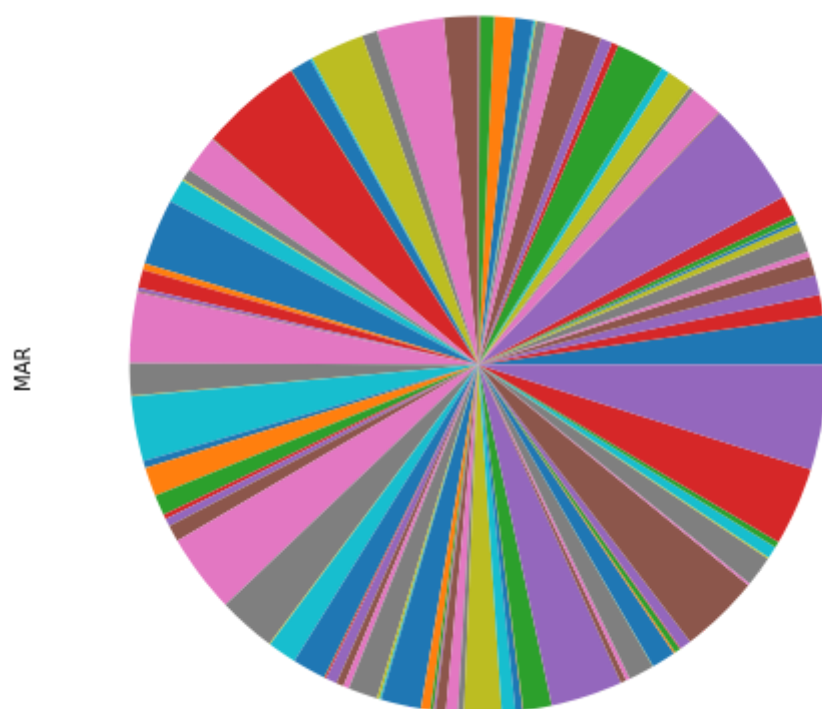


In [95]:

```
a.plot.pie(y='MAR',figsize=(8,8),labels=None,legend=None)
```

Out[95]:

<AxesSubplot:ylabel='MAR'>



set12:

In [96]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\Book12.csv")
a
```

Out[96]:

	index	SUBDIVISION	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	CO
0	2737	MATATHWADA	1901	15.8	3.3	32.1	48.5	26.5	193.1	184.1	249.8	74.0	1
1	2738	MATATHWADA	1902	1.3	0.0	0.4	7.2	0.8	52.4	120.9	85.2	273.3	0
2	2739	MATATHWADA	1903	2.6	0.8	0.0	1.7	58.3	104.4	264.2	281.9	173.3	1
3	2740	MATATHWADA	1904	0.0	0.9	12.1	0.3	7.2	79.2	118.4	57.3	339.0	0
4	2741	MATATHWADA	1905	1.3	2.0	0.0	6.6	4.8	84.6	94.8	137.6	157.8	0
...
110	2847	MATATHWADA	2011	0.0	3.8	0.7	3.5	3.1	79.2	230.1	228.5	90.0	0
111	2848	MATATHWADA	2012	0.0	0.0	0.0	0.6	2.3	72.2	161.1	101.4	120.0	0
112	2849	MATATHWADA	2013	1.5	9.4	2.6	7.9	6.4	160.9	293.4	136.9	154.1	0
113	2850	MATATHWADA	2014	1.4	13.4	79.0	11.9	7.0	30.4	105.0	178.9	84.5	0
114	2851	MATATHWADA	2015	10.1	1.6	32.0	39.6	12.3	118.3	27.4	112.2	154.3	0

115 rows × 20 columns

In [97]:

```
a.info()
```

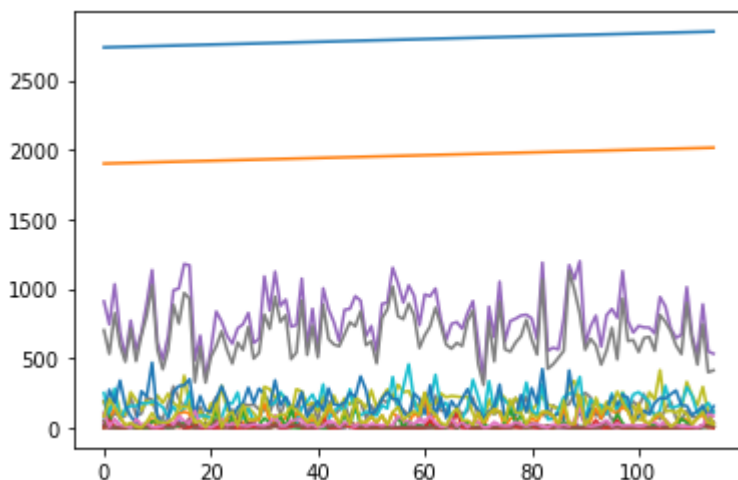
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 115 entries, 0 to 114
Data columns (total 20 columns):
#   Column          Non-Null Count  Dtype
---  -
0   index           115 non-null    int64
1   SUBDIVISION     115 non-null    object
2   YEAR            115 non-null    int64
3   JAN             115 non-null    float64
4   FEB             115 non-null    float64
5   MAR             115 non-null    float64
6   APR             115 non-null    float64
7   MAY             115 non-null    float64
8   JUN             115 non-null    float64
9   JUL             115 non-null    float64
10  AUG             115 non-null    float64
11  SEP             115 non-null    float64
12  OCT             115 non-null    float64
13  NOV             115 non-null    float64
14  DEC             115 non-null    float64
15  ANNUAL          115 non-null    float64
16  Jan-Feb         115 non-null    float64
17  Mar-May         115 non-null    float64
18  Jun-Sep         115 non-null    float64
19  Oct-Dec         115 non-null    float64
dtypes: float64(17), int64(2), object(1)
memory usage: 18.1+ KB
```

In [98]:

```
a.plot.line(legend=None)
```

Out[98]:

<AxesSubplot:>

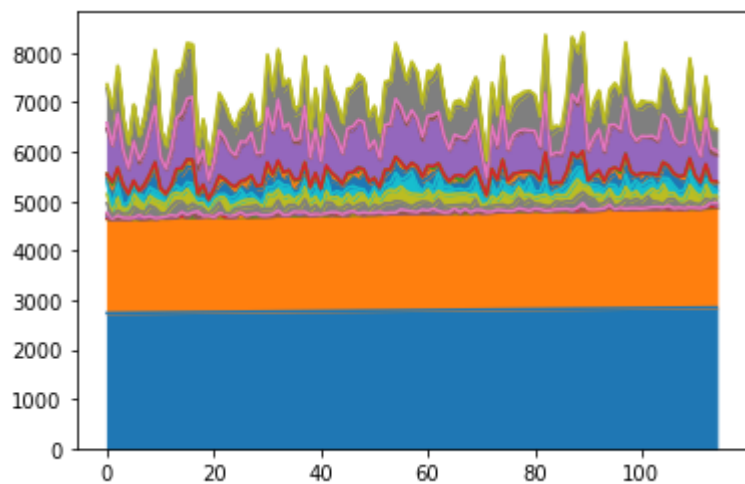


In [99]:

```
a.plot.area(legend=None)
```

Out[99]:

<AxesSubplot:>

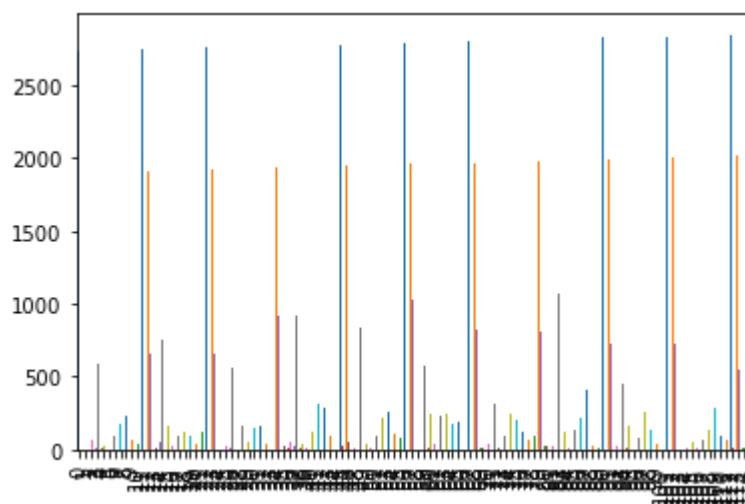


In [100]:

```
a.plot.bar(legend=None)
```

Out[100]:

<AxesSubplot:>

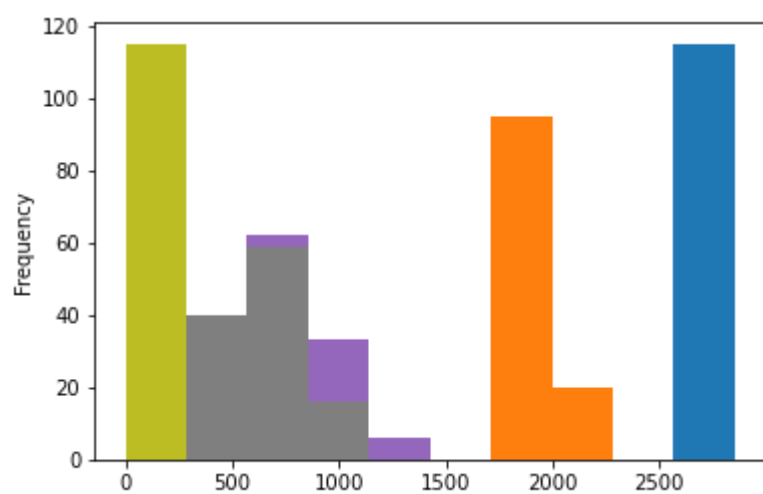


In [101]:

```
a.plot.hist(legend=None)
```

Out[101]:

<AxesSubplot:ylabel='Frequency'>

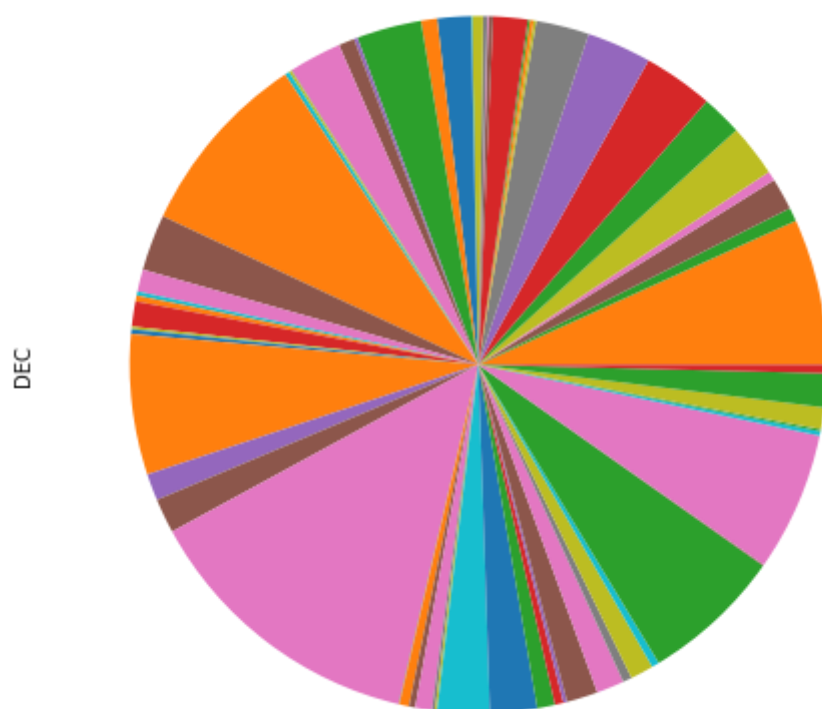


In [102]:

```
a.plot.pie(y='DEC',figsize=(8,8),labels=None,legend=None)
```

Out[102]:

<AxesSubplot:ylabel='DEC'>



In []: