TASK-1 : Create a bar chart or histogram to visualize the distribution of a categorical or continuous variable, such as the distribution of ages or genders in a population.

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

[ ]:
```
from google.colab import files
raw = files.upload()
```

```
<IPython.core.display.HTML object>
```

```
Saving WorldBank Data.csv to WorldBank Data.csv
```

[ ]:
```
df = pd.read_csv('WorldBank Data.csv')
```

[ ]:
```
df_copy = df.copy()
```

[ ]:
```
df.shape
```

[ ]:
```
(266, 67)
```

[ ]:
```
df.columns
```

[ ]:
```
Index(['Country Name', 'Country Code', 'Indicator Name', 'Indicator Code',
       '1960', '1961', '1962', '1963', '1964', '1965', '1966', '1967', '1968',
       '1969', '1970', '1971', '1972', '1973', '1974', '1975', '1976', '1977',
       '1978', '1979', '1980', '1981', '1982', '1983', '1984', '1985', '1986',
       '1987', '1988', '1989', '1990', '1991', '1992', '1993', '1994', '1995',
       '1996', '1997', '1998', '1999', '2000', '2001', '2002', '2003', '2004',
       '2005', '2006', '2007', '2008', '2009', '2010', '2011', '2012', '2013',
       '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022'],
      dtype='object')
```

[ ]:
```
df.head(10)
```

[ ]:

	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962	1963	1964	1965	…	2013	2014	2015	2016	2017	2018	2019	2020	2021
0	Aruba	ABW	Population, total	SP.POP.TOTL	54608.0	55811.0	56682.0	57475.0	58178.0	58782.0	…	102880.0	103594.0	104257.0	104874.0	105439.0	105962.0	106442.0	106585.0	106537.0
1	Africa Eastern and Southern	AFE	Population, total	SP.POP.TOTL	130692579.0	134169237.0	137835590.0	141630546.0	145605995.0	149742351.0	…	567892149.0	583651101.0	600008424.0	616377605.0	632746570.0	649757148.0	667242986.0	685112979.0	702977106.0
2	Afghanistan	AFG	Population, total	SP.POP.TOTL	8622466.0	8790140.0	8969047.0	9157465.0	9355514.0	9565147.0	…	31541209.0	32716210.0	33753499.0	34636207.0	35643418.0	36686784.0	37769499.0	38972230.0	40099462.0
3	Africa Western and Central	AFW	Population, total	SP.POP.TOTL	97256290.0	99314028.0	101445032.0	103667517.0	105959979.0	108336203.0	…	387204553.0	397855507.0	408690375.0	419778384.0	431138704.0	442646825.0	454306063.0	466189102.0	478185907.0
4	Angola	AGO	Population, total	SP.POP.TOTL	5357195.0	5441333.0	5521400.0	5599827.0	5673199.0	5736582.0	…	26147002.0	27128337.0	28127721.0	29154746.0	30208628.0	31273533.0	32353588.0	33428486.0	34503774.0
5	Albania	ALB	Population, total	SP.POP.TOTL	1608800.0	1659800.0	1711319.0	1762621.0	1814135.0	1864791.0	…	2895092.0	2889104.0	2880703.0	2876101.0	2873457.0	2866376.0	2854191.0	2837849.0	2811666.0
6	Andorra	AND	Population, total	SP.POP.TOTL	9443.0	10216.0	11014.0	11839.0	12690.0	13563.0	…	71367.0	71621.0	71746.0	72540.0	73837.0	75013.0	76343.0	77700.0	79034.0
7	Arab World	ARB	Population, total	SP.POP.TOTL	93359407.0	95760348.0	98268683.0	100892507.0	103618568.0	106444103.0	…	389131555.0	397922915.0	406501999.0	415077960.0	423664839.0	432545676.0	441467739.0	449228296.0	456520777.0
8	United Arab Emirates	ARE	Population, total	SP.POP.TOTL	133426.0	140984.0	148877.0	157006.0	165305.0	173797.0	…	8751847.0	8835951.0	8916899.0	8994263.0	9068296.0	9140169.0	9211657.0	9287289.0	9365145.0
9	Argentina	ARG	Population, total	SP.POP.TOTL	20349744.0	20680653.0	21020359.0	21364017.0	21708487.0	22053661.0	…	42202935.0	42669500.0	43131966.0	43590368.0	44044811.0	44494502.0	44938712.0	45376763.0	45808747.0

```
          2022
0     106445.0
1  720839314.0
2   41128771.0
3  490330870.0
4   35588987.0
5    2775634.0
6      79824.0
7  464684914.0
8    9441129.0
9   46234830.0

[10 rows x 67 columns]
```

[ ]:
```
df.tail()
```

[ ]:
```
     Country Name Country Code     Indicator Name Indicator Code        1960  \
261        Kosovo          XKX  Population, total    SP.POP.TOTL    947000.0
262   Yemen, Rep.          YEM  Population, total    SP.POP.TOTL   5542459.0
263  South Africa          ZAF  Population, total    SP.POP.TOTL  16520441.0
264        Zambia          ZMB  Population, total    SP.POP.TOTL   3119430.0
265      Zimbabwe          ZWE  Population, total    SP.POP.TOTL   3806310.0

           1961        1962        1963        1964        1965  … \
261    966000.0    994000.0   1022000.0   1050000.0   1078000.0  …
262   5646668.0   5753386.0   5860197.0   5973803.0   6097298.0  …
263  16989464.0  17503133.0  18042215.0  18603097.0  19187194.0  …
264   3219451.0   3323427.0   3431381.0   3542764.0   3658024.0  …
265   3925952.0   4049778.0   4177931.0   4310332.0   4447149.0  …

           2013        2014        2015        2016        2017        2018  \
261   1818117.0   1812771.0   1788196.0   1777557.0   1791003.0   1797085.0
262  26984002.0  27753304.0  28516545.0  29274002.0  30034389.0  30790513.0
263  53873616.0  54729551.0  55876504.0  56422274.0  56641209.0  57339635.0
264  15234976.0  15737793.0  16248230.0  16767761.0  17298054.0  17835893.0
265  13555422.0  13855753.0  14154937.0  14452704.0  14751101.0  15052184.0

           2019        2020        2021        2022
261   1788878.0   1790133.0   1786038.0   1761985.0
262  31546691.0  32284046.0  32981641.0  33696614.0
263  58087055.0  58801927.0  59392255.0  59893885.0
264  18380477.0  18927715.0  19473125.0  20017675.0
265  15354608.0  15669666.0  15993524.0  16320537.0

[5 rows x 67 columns]
```

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 266 entries, 0 to 265
Data columns (total 67 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Country Name    266 non-null    object
 1   Country Code    266 non-null    object
 2   Indicator Name  266 non-null    object
 3   Indicator Code  266 non-null    object
 4   1960            264 non-null    float64
 5   1961            264 non-null    float64
 6   1962            264 non-null    float64
 7   1963            264 non-null    float64
 8   1964            264 non-null    float64
 9   1965            264 non-null    float64
 10  1966            264 non-null    float64
 11  1967            264 non-null    float64
 12  1968            264 non-null    float64
 13  1969            264 non-null    float64
 14  1970            264 non-null    float64
 15  1971            264 non-null    float64
 16  1972            264 non-null    float64
 17  1973            264 non-null    float64
 18  1974            264 non-null    float64
 19  1975            264 non-null    float64
 20  1976            264 non-null    float64
 21  1977            264 non-null    float64
 22  1978            264 non-null    float64
 23  1979            264 non-null    float64
 24  1980            264 non-null    float64
 25  1981            264 non-null    float64
 26  1982            264 non-null    float64
 27  1983            264 non-null    float64
 28  1984            264 non-null    float64
 29  1985            264 non-null    float64
 30  1986            264 non-null    float64
 31  1987            264 non-null    float64
 32  1988            264 non-null    float64
 33  1989            264 non-null    float64
 34  1990            265 non-null    float64
 35  1991            265 non-null    float64
 36  1992            265 non-null    float64
 37  1993            265 non-null    float64
 38  1994            265 non-null    float64
 39  1995            265 non-null    float64
```

```
 40  1996            265 non-null    float64
 41  1997            265 non-null    float64
 42  1998            265 non-null    float64
 43  1999            265 non-null    float64
 44  2000            265 non-null    float64
 45  2001            265 non-null    float64
 46  2002            265 non-null    float64
 47  2003            265 non-null    float64
 48  2004            265 non-null    float64
 49  2005            265 non-null    float64
 50  2006            265 non-null    float64
 51  2007            265 non-null    float64
 52  2008            265 non-null    float64
 53  2009            265 non-null    float64
 54  2010            265 non-null    float64
 55  2011            265 non-null    float64
 56  2012            265 non-null    float64
 57  2013            265 non-null    float64
 58  2014            265 non-null    float64
 59  2015            265 non-null    float64
 60  2016            265 non-null    float64
 61  2017            265 non-null    float64
 62  2018            265 non-null    float64
 63  2019            265 non-null    float64
 64  2020            265 non-null    float64
 65  2021            265 non-null    float64
 66  2022            265 non-null    float64
dtypes: float64(63), object(4)
memory usage: 139.4+ KB
```

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

[ ]:

	1960	1961	1962	1963	1964	\
count	2.640000e+02	2.640000e+02	2.640000e+02	2.640000e+02	2.640000e+02	
mean	1.172712e+08	1.188807e+08	1.210511e+08	1.237333e+08	1.264378e+08	
std	3.695439e+08	3.740897e+08	3.808061e+08	3.895039e+08	3.982439e+08	
min	2.646000e+03	2.888000e+03	3.171000e+03	3.481000e+03	3.811000e+03	
25%	5.132212e+05	5.231345e+05	5.337595e+05	5.449288e+05	5.566630e+05	
50%	3.757486e+06	3.887144e+06	4.023896e+06	4.139356e+06	4.224612e+06	
75%	2.670606e+07	2.748694e+07	2.830289e+07	2.914708e+07	3.001684e+07	
max	3.031474e+09	3.072422e+09	3.126850e+09	3.193429e+09	3.260442e+09	

	1965	1966	1967	1968	1969	\
count	2.640000e+02	2.640000e+02	2.640000e+02	2.640000e+02	2.640000e+02	
mean	1.291813e+08	1.320404e+08	1.348980e+08	1.378358e+08	1.408789e+08	
std	4.071153e+08	4.164504e+08	4.257424e+08	4.353218e+08	4.452927e+08	
min	4.161000e+03	4.531000e+03	4.930000e+03	5.354000e+03	5.646000e+03	

```
25%    5.651150e+05  5.691470e+05  5.773872e+05  5.832700e+05  5.875942e+05
50%    4.277636e+06  4.331825e+06  4.385700e+06  4.450934e+06  4.530800e+06
75%    3.084892e+07  3.163010e+07  3.209247e+07  3.249927e+07  3.277149e+07
max    3.328209e+09  3.398480e+09  3.468371e+09  3.540164e+09  3.614573e+09

       …          2013          2014          2015          2016  \
count  …  2.650000e+02  2.650000e+02  2.650000e+02  2.650000e+02
mean   …  2.927787e+08  2.966774e+08  3.005462e+08  3.044051e+08
std    …  9.186849e+08  9.301446e+08  9.414558e+08  9.526720e+08
min    …  1.069400e+04  1.089900e+04  1.087700e+04  1.085200e+04
25%    …  1.697753e+06  1.743309e+06  1.788196e+06  1.777557e+06
50%    …  1.014958e+07  1.028212e+07  1.035808e+07  1.032545e+07
75%    …  6.023395e+07  6.078914e+07  6.073058e+07  6.062750e+07
max    …  7.229732e+09  7.317970e+09  7.405278e+09  7.492157e+09

              2017          2018          2019          2020          2021  \
count  2.650000e+02  2.650000e+02  2.650000e+02  2.650000e+02  2.650000e+02
mean   3.082575e+08  3.120276e+08  3.157110e+08  3.192936e+08  3.225180e+08
std    9.638572e+08  9.746880e+08  9.851690e+08  9.952294e+08  1.004211e+09
min    1.082800e+04  1.086500e+04  1.095600e+04  1.106900e+04  1.120400e+04
25%    1.791003e+06  1.797085e+06  1.788878e+06  1.790133e+06  1.786038e+06
50%    1.030030e+07  1.039533e+07  1.044767e+07  1.060623e+07  1.050577e+07
75%    6.053671e+07  6.042176e+07  5.987258e+07  6.170452e+07  6.358833e+07
max    7.578221e+09  7.661777e+09  7.742682e+09  7.820964e+09  7.888161e+09

              2022
count  2.650000e+02
mean   3.254839e+08
std    1.012174e+09
min    1.131200e+04
25%    1.761985e+06
50%    1.052607e+07
75%    6.549775e+07
max    7.951150e+09

[8 rows x 63 columns]
```

[ ]:
```
pd.options.display.max_rows = 300
df.isnull().sum()
```

[ ]:
```
Country Name      0
Country Code      0
Indicator Name    0
Indicator Code    0
1960              2
1961              2
1962              2
```

1963	2
1964	2
1965	2
1966	2
1967	2
1968	2
1969	2
1970	2
1971	2
1972	2
1973	2
1974	2
1975	2
1976	2
1977	2
1978	2
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2009	1

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2010              1
2011              1
2012              1
2013              1
2014              1
2015              1
2016              1
2017              1
2018              1
2019              1
2020              1
2021              1
2022              1
dtype: int64
```

[ ]:
```
df = df.fillna(method = "ffill")
```

[ ]:
```
pd.options.display.max_columns=300
df.isnull().sum()
```

[ ]:
```
Country Name      0
Country Code      0
Indicator Name    0
Indicator Code    0
1960              0
1961              0
1962              0
1963              0
1964              0
1965              0
1966              0
1967              0
1968              0
1969              0
1970              0
1971              0
1972              0
1973              0
1974              0
1975              0
1976              0
1977              0
1978              0
1979              0
1980              0
1981              0
1982              0
```

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1983              0
1984              0
1985              0
1986              0
1987              0
1988              0
1989              0
1990              0
1991              0
1992              0
1993              0
1994              0
1995              0
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2005              0
2006              0
2007              0
2008              0
2009              0
2010              0
2011              0
2012              0
2013              0
2014              0
2015              0
2016              0
2017              0
2018              0
2019              0
2020              0
2021              0
2022              0
dtype: int64
```

[ ]:
```
df.dtypes
```

[ ]:
```
Country Name       object
Country Code       object
Indicator Name     object
```

```
Indicator Code     object
1960              float64
1961              float64
1962              float64
1963              float64
1964              float64
1965              float64
1966              float64
1967              float64
1968              float64
1969              float64
1970              float64
1971              float64
1972              float64
1973              float64
1974              float64
1975              float64
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2004              float64
2005              float64
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2006            float64
2007            float64
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2010            float64
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2012            float64
2013            float64
2014            float64
2015            float64
2016            float64
2017            float64
2018            float64
2019            float64
2020            float64
2021            float64
2022            float64
dtype: object
```
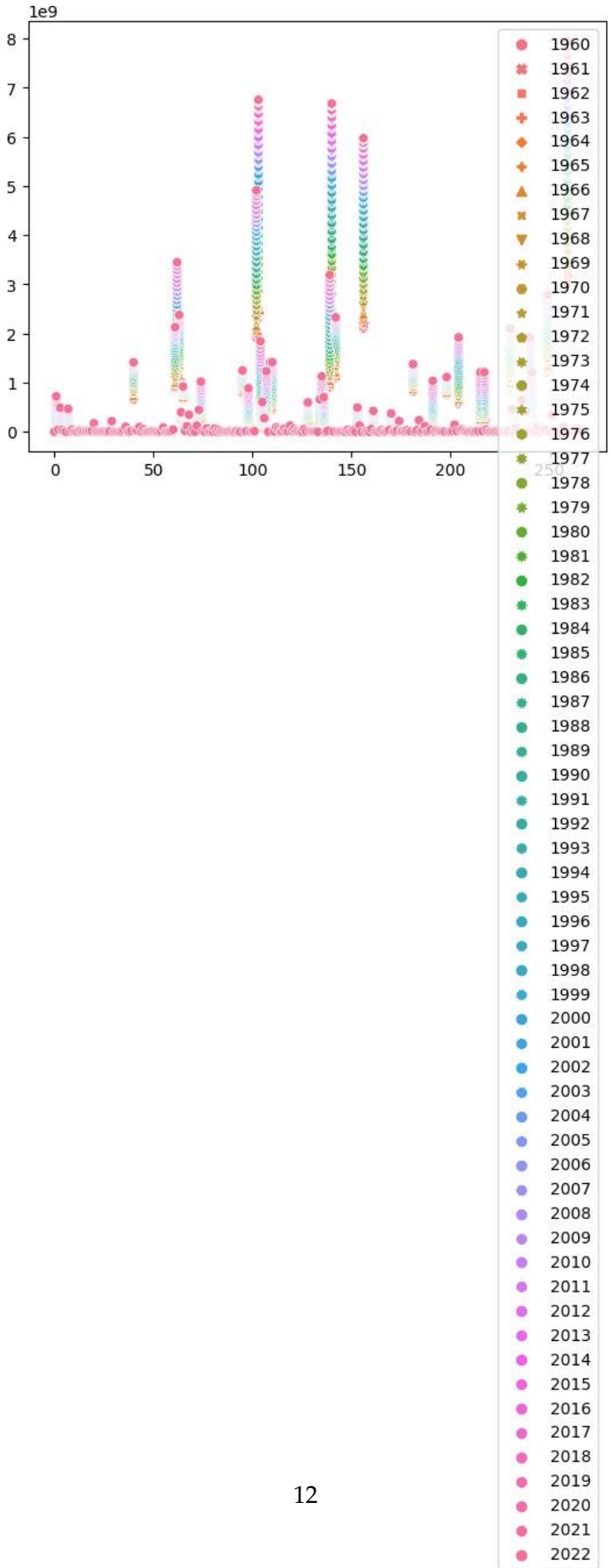

[ ]:
```
df.duplicated().sum()
```

[ ]:
```
0
```

[ ]:
```
sns.scatterplot(df)
```

[ ]:
```
<Axes: >
```


1e9
8
7
6
5
4
3
2
1
0
0
50
100
150
200
250
1960
1961
1962
1963
1964
1965
1966
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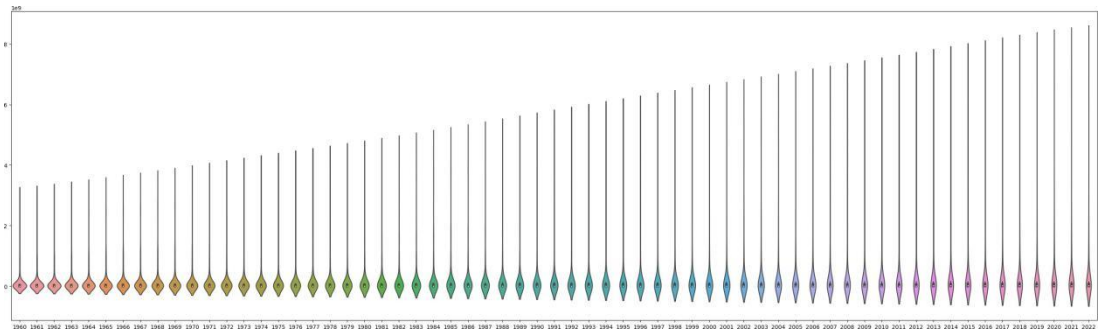
2019
2020
2021
2022

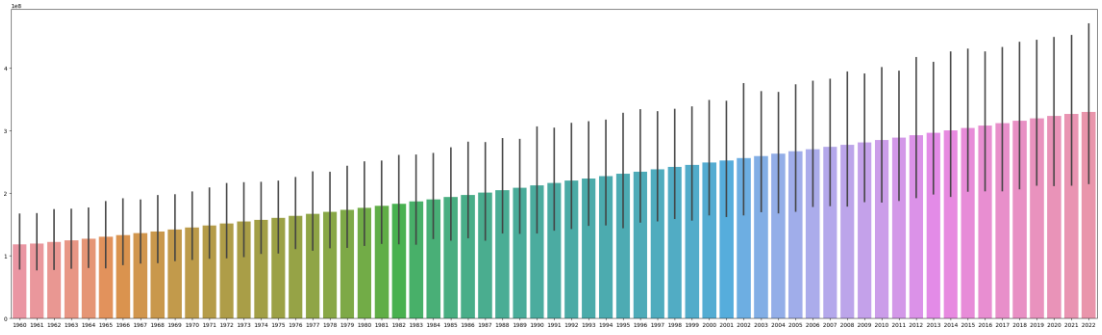
[ ]:
```
dim = (35, 10)
fig, ax = plt.subplots(figsize=dim)
sns.violinplot(ax=ax, data=df)
```

[ ]: <Axes: >



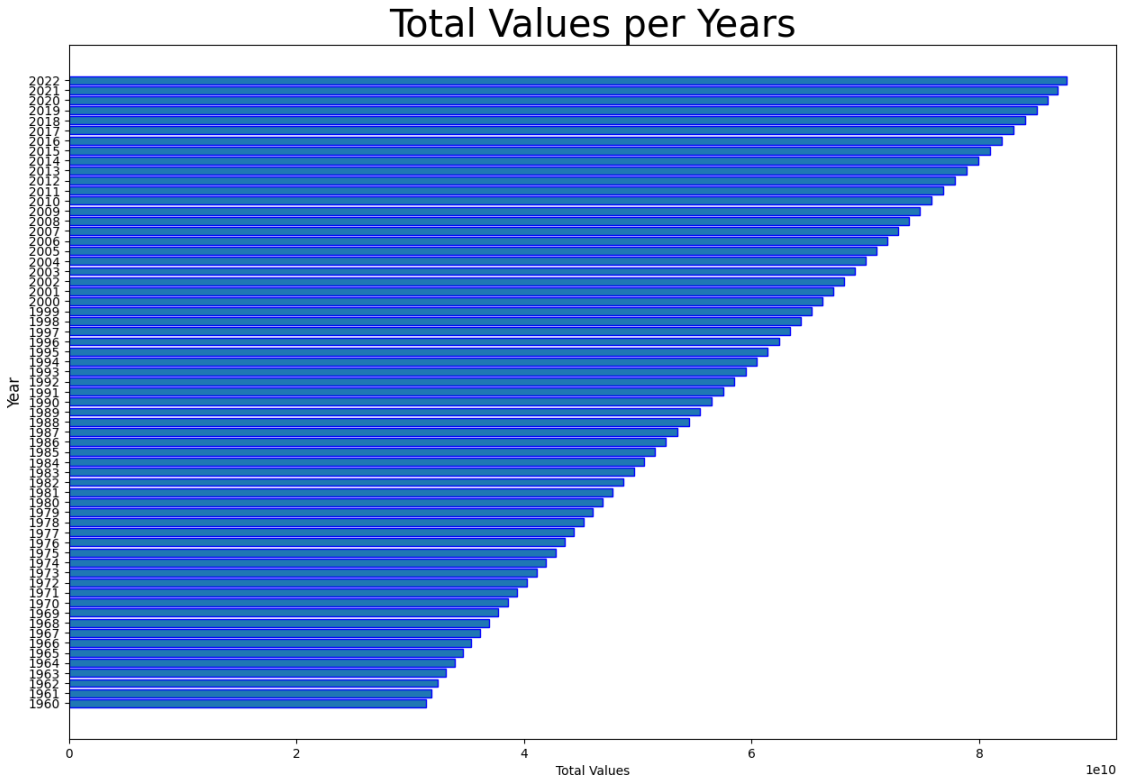
[ ]:
```
dim2 = (35, 10)
fig, ax = plt.subplots(figsize=dim2)
sns.barplot(ax=ax,data=df)
```

[ ]: <Axes: >

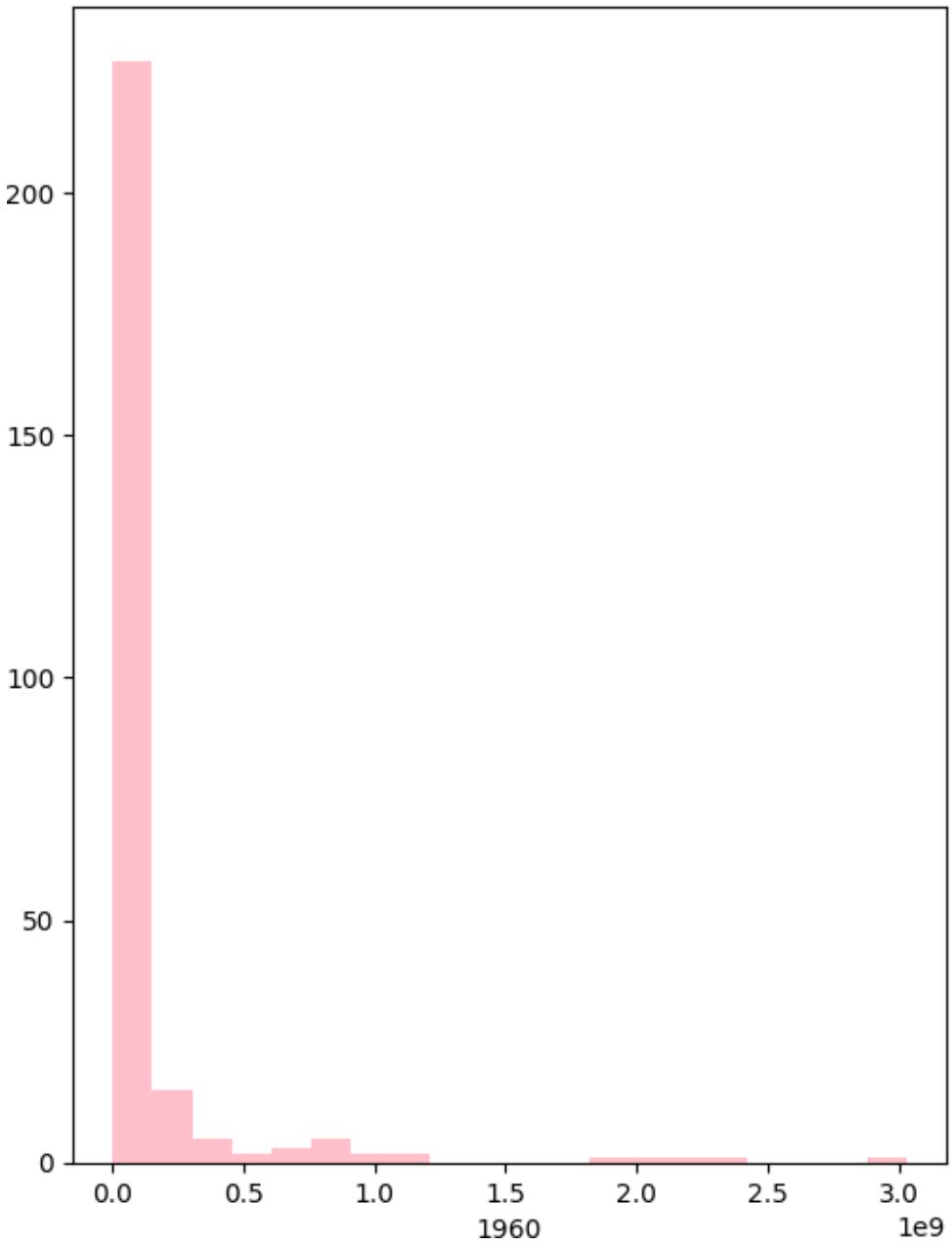


[ ]:
```
Years = ['1960', '1961', '1962', '1963', '1964', '1965', '1966', '1967', '1968',
       '1969', '1970', '1971', '1972', '1973', '1974', '1975', '1976', '1977',
       '1978', '1979', '1980', '1981', '1982', '1983', '1984', '1985', '1986',
       '1987', '1988', '1989', '1990', '1991', '1992', '1993', '1994', '1995',
       '1996', '1997', '1998', '1999', '2000', '2001', '2002', '2003', '2004',
       '2005', '2006', '2007', '2008', '2009', '2010', '2011', '2012', '2013',
       '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022']
```

[ ]:
```
Years = df.columns[4:]
values = df[Years].sum()
plt.figure (figsize=(15,10))
plt.barh(Years,values,edgecolor='blue')
plt.xlabel('Total Values')
plt.ylabel('Year', size=12)
plt.title('Total Values per Years', size=30)
plt.show()
```



[ ]:
```
for i in Years:
  fig = plt.figure(figsize=(6,8))
  plt.hist(df[i],color ='pink',bins=20)
  plt.xlabel(i)
  plt.show()
```


200
150
100
50
0
0.0
0.5
1.0
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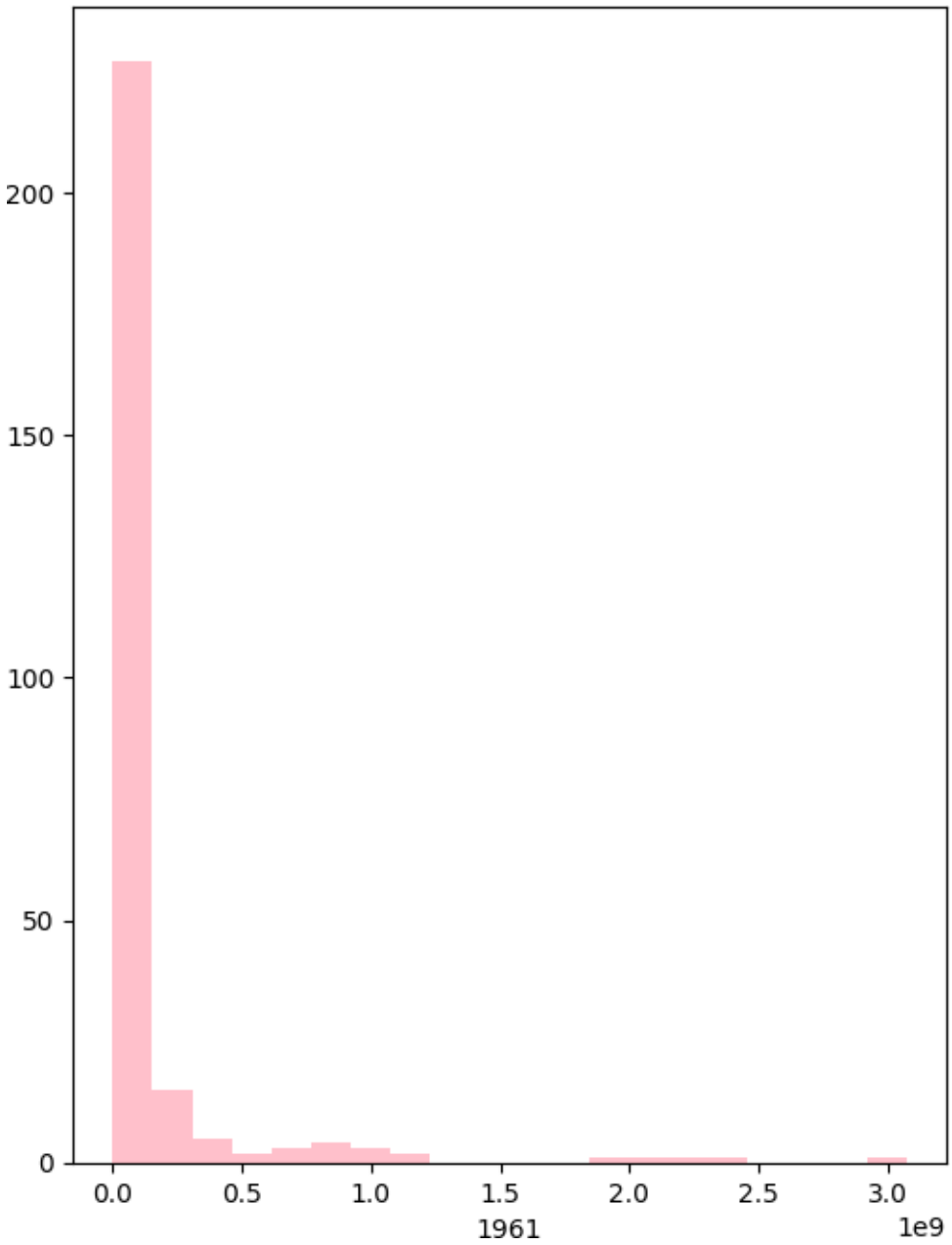
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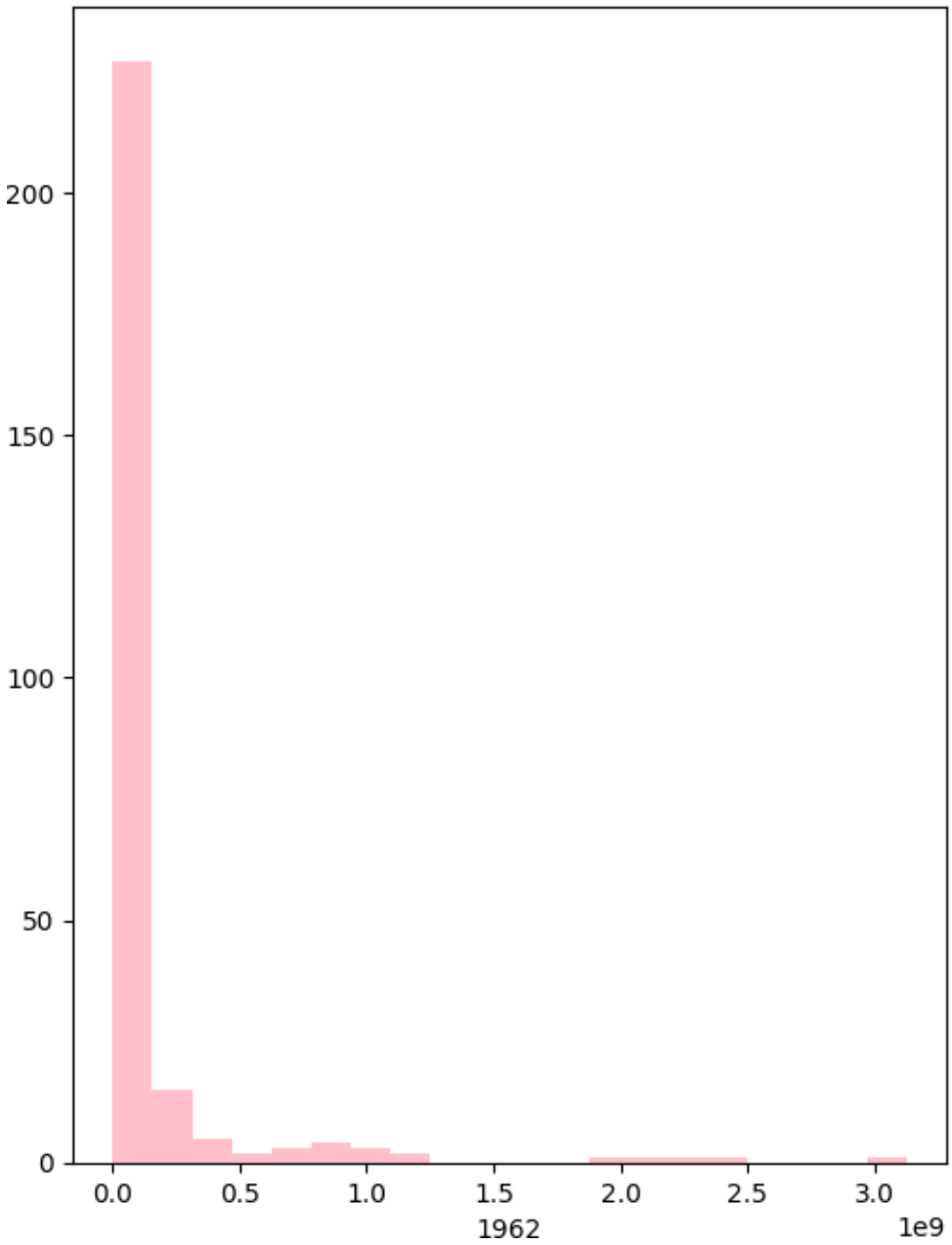
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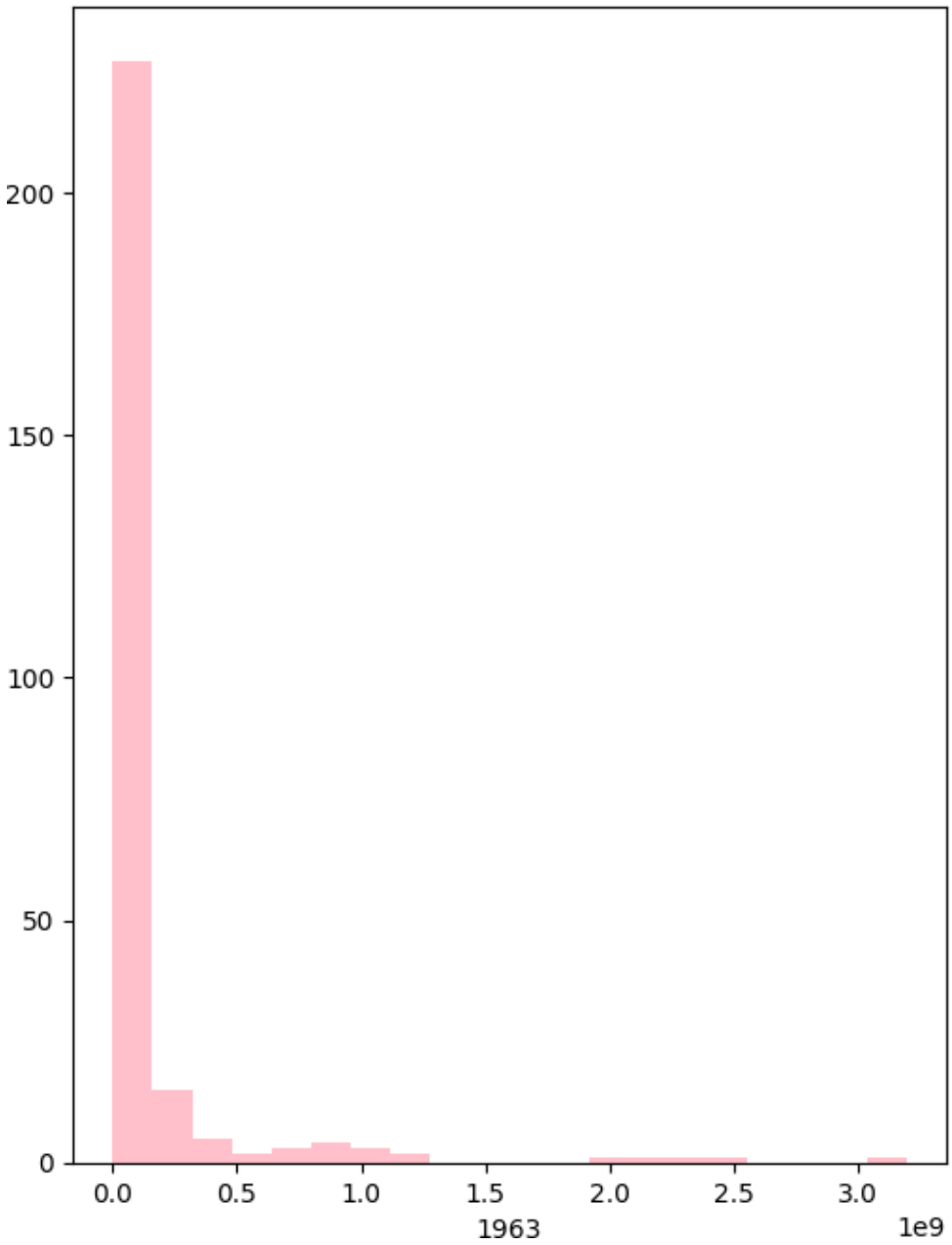
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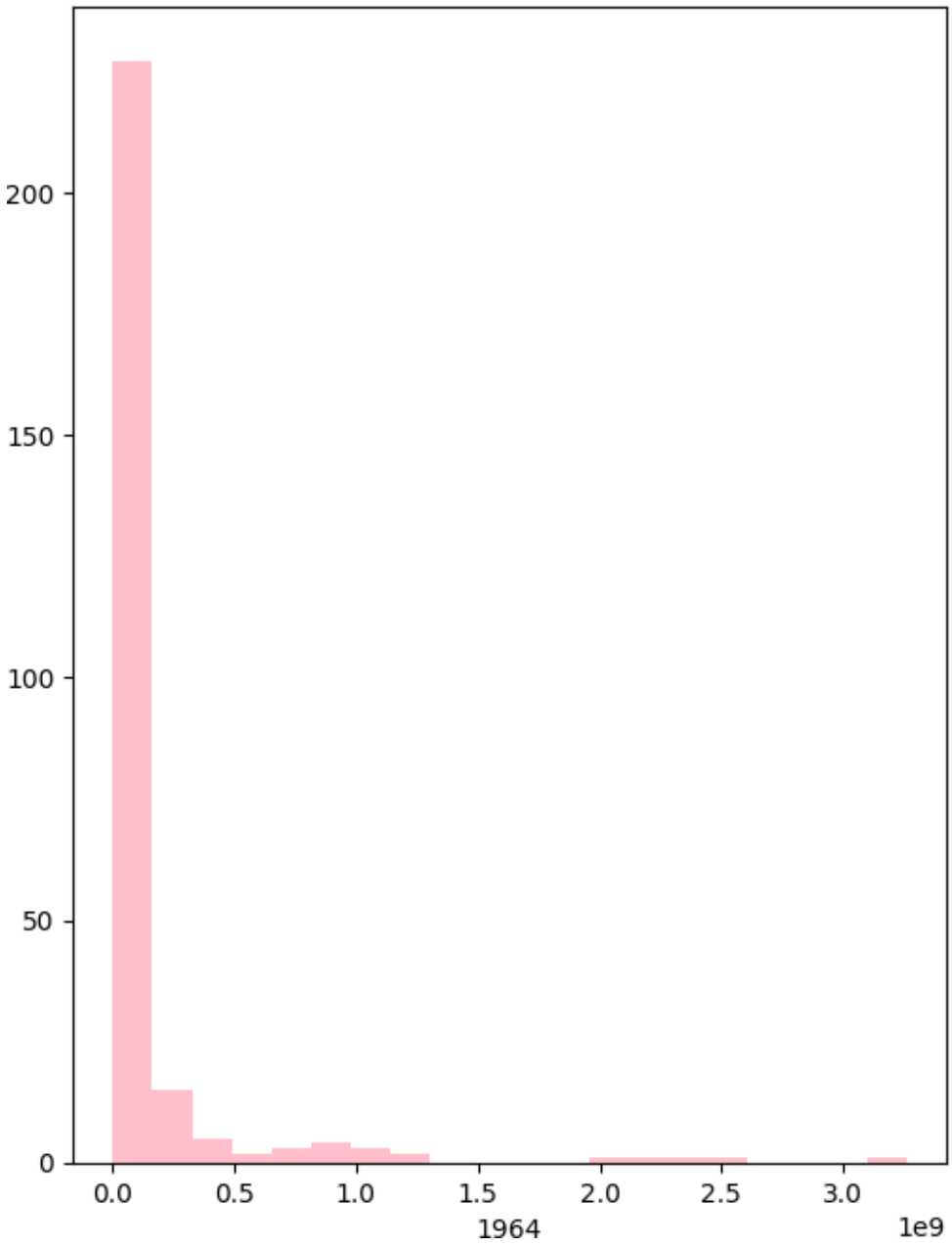
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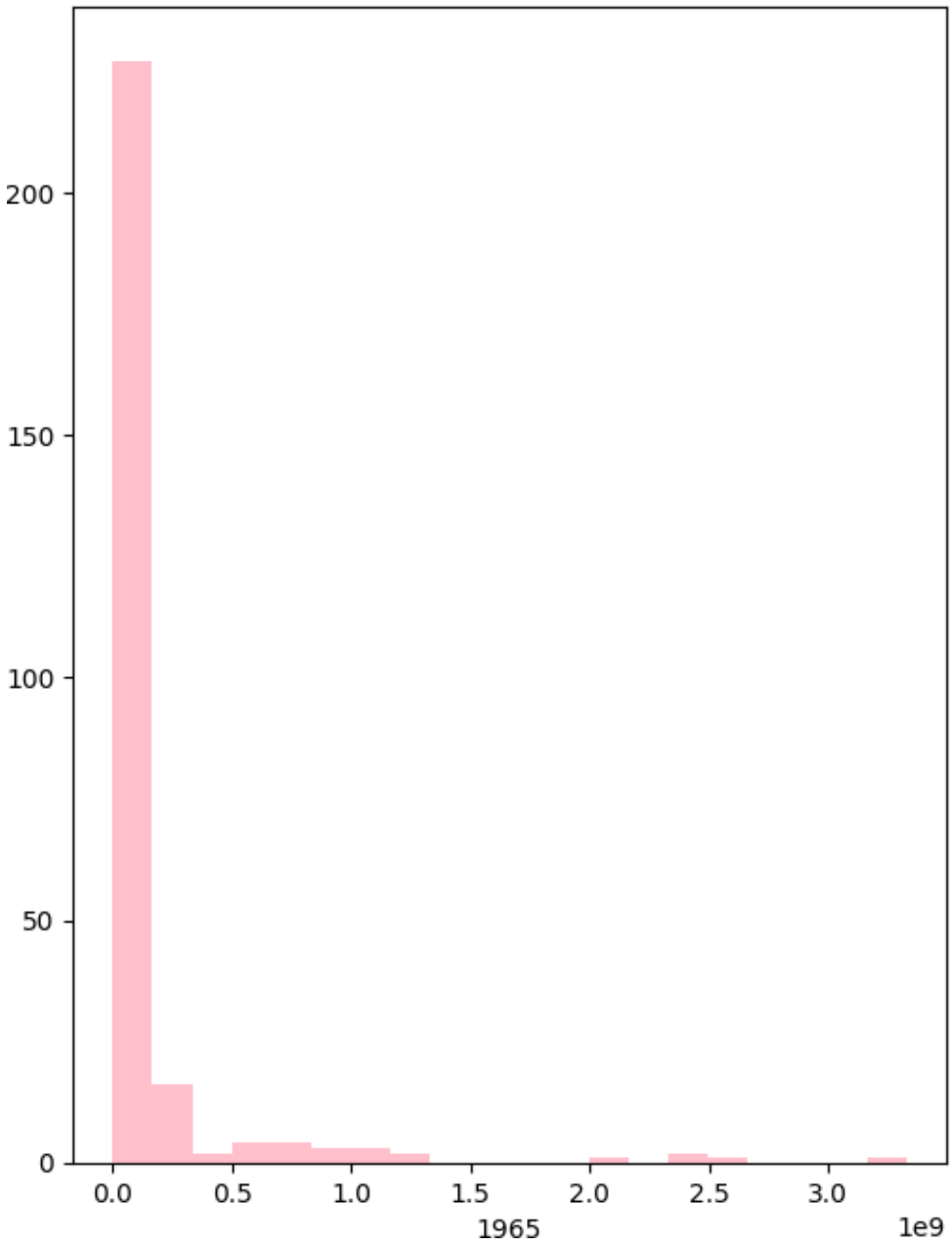
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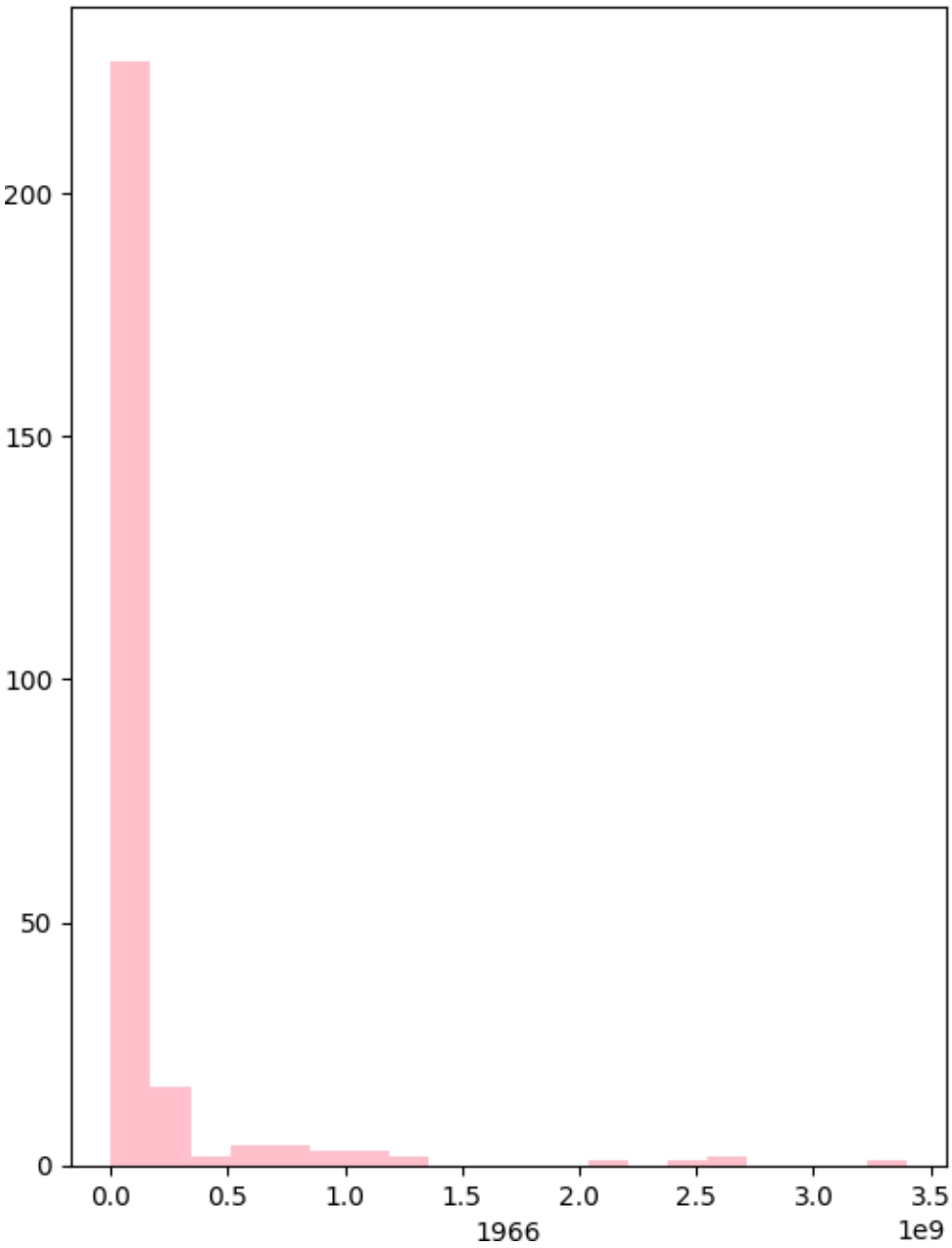
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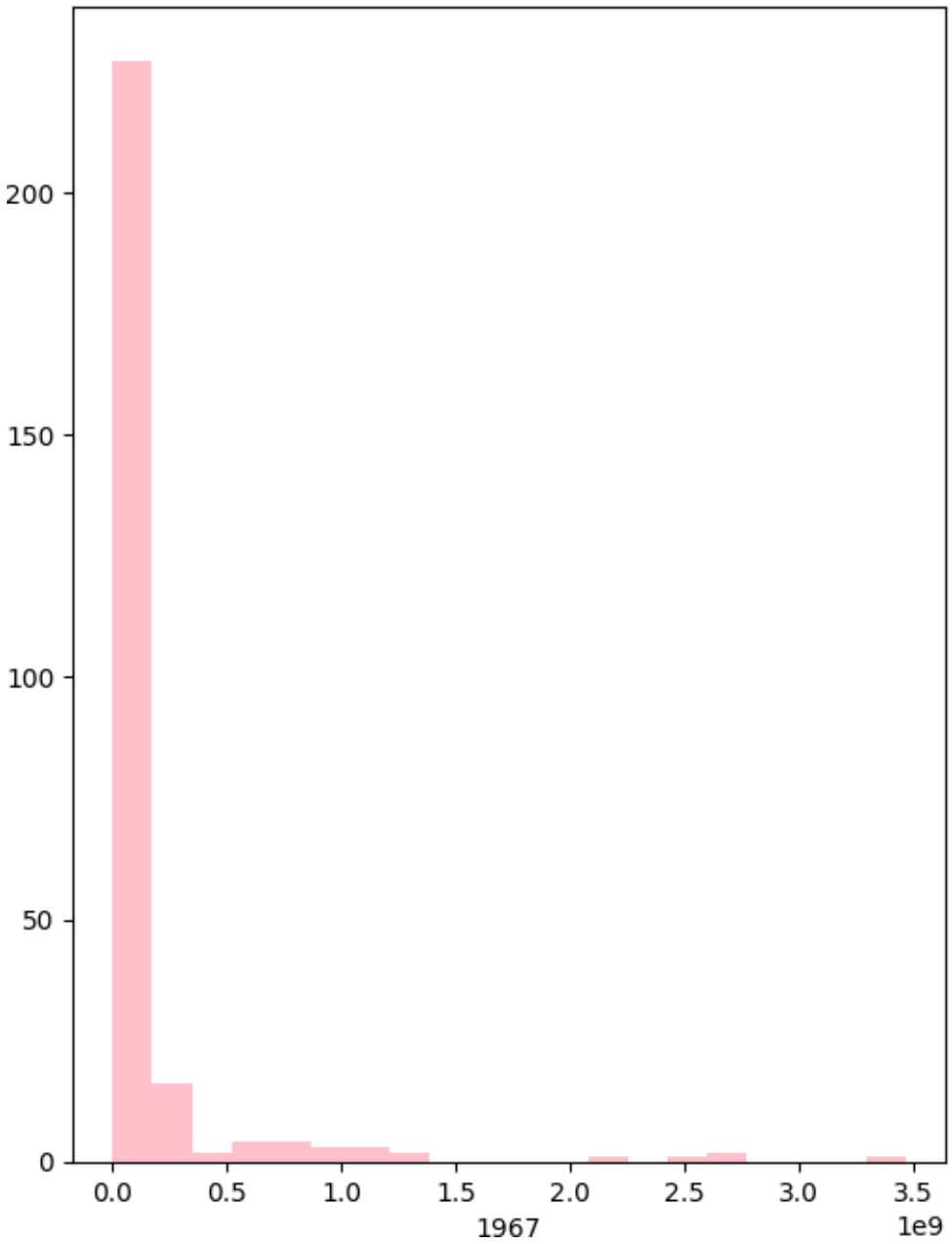
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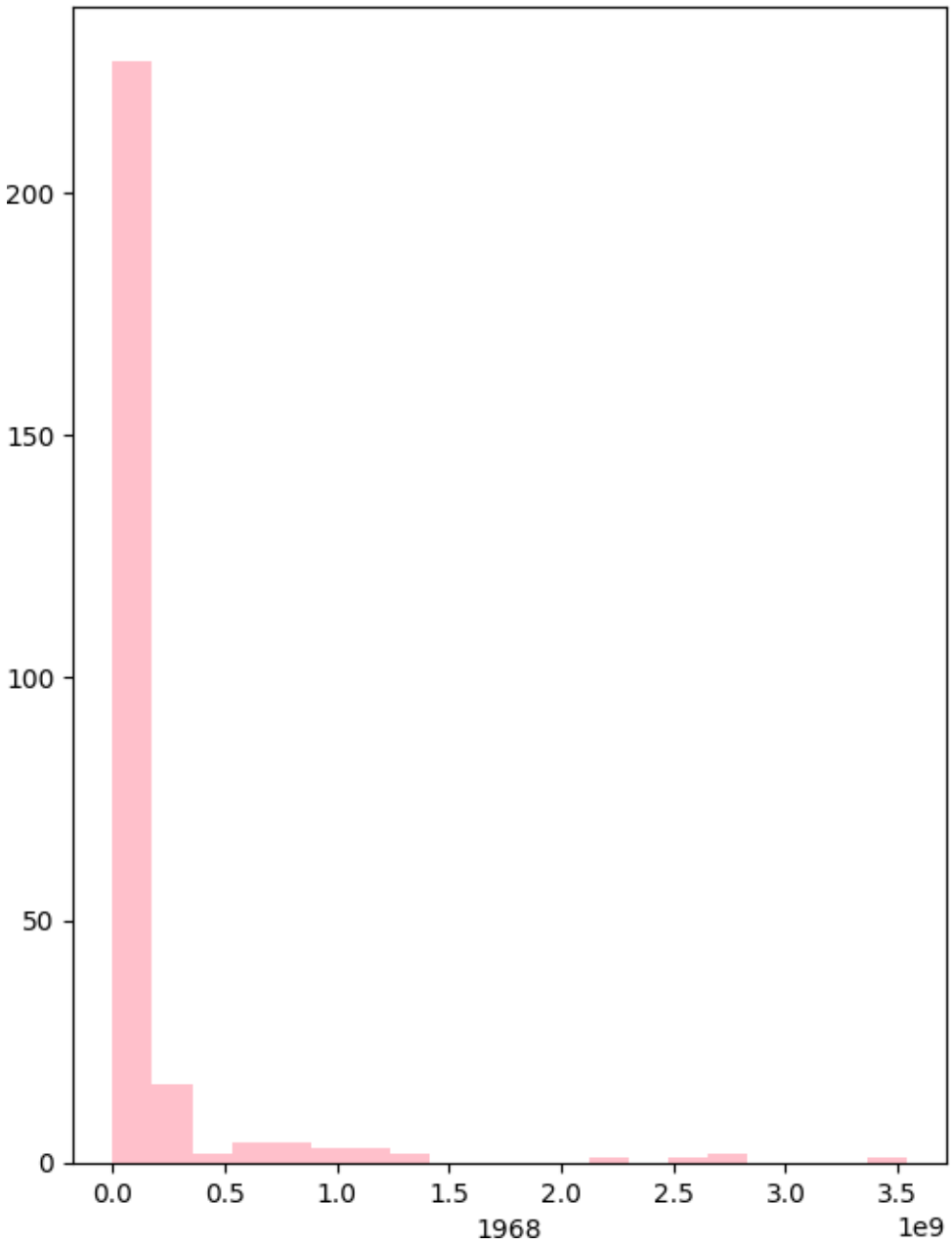
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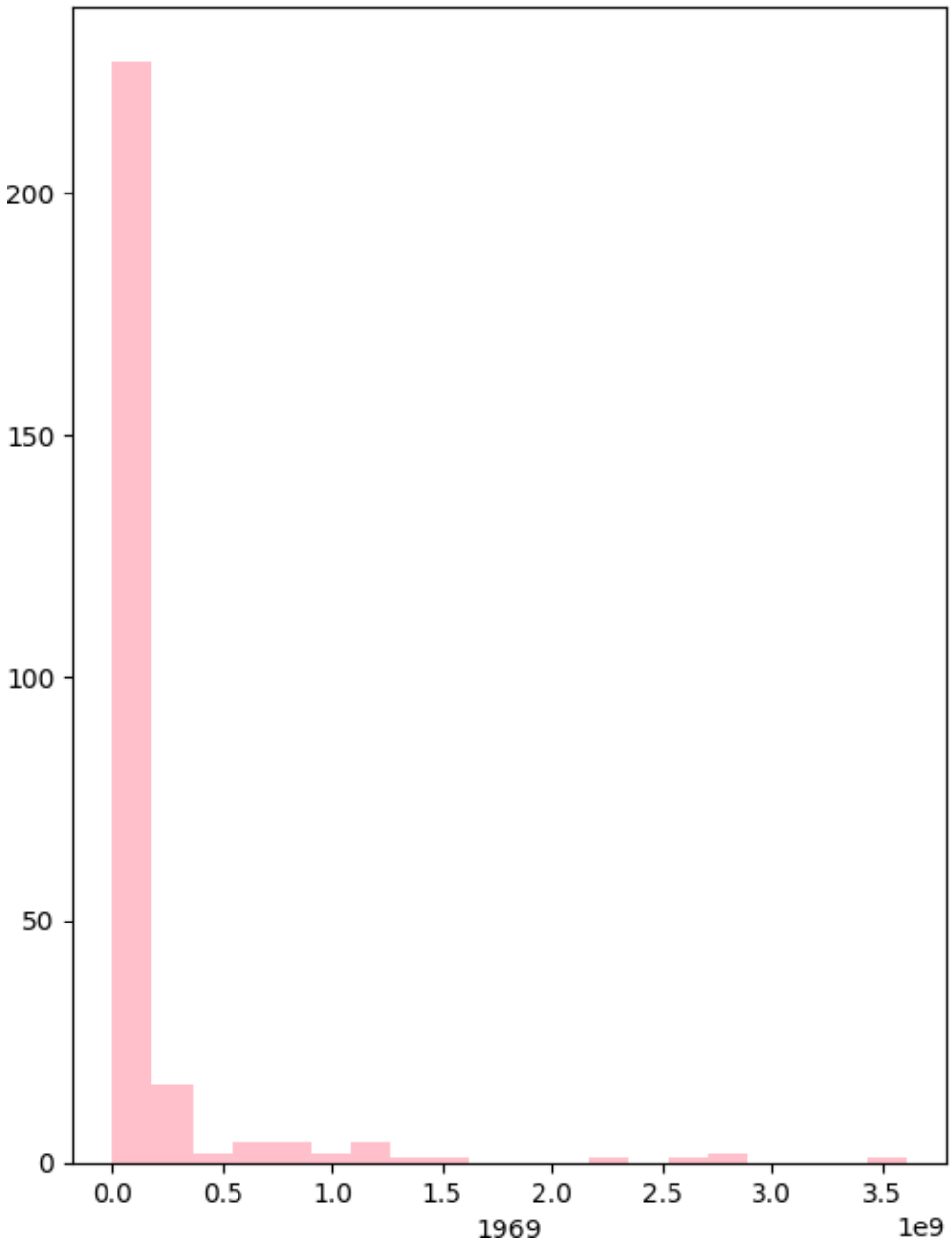
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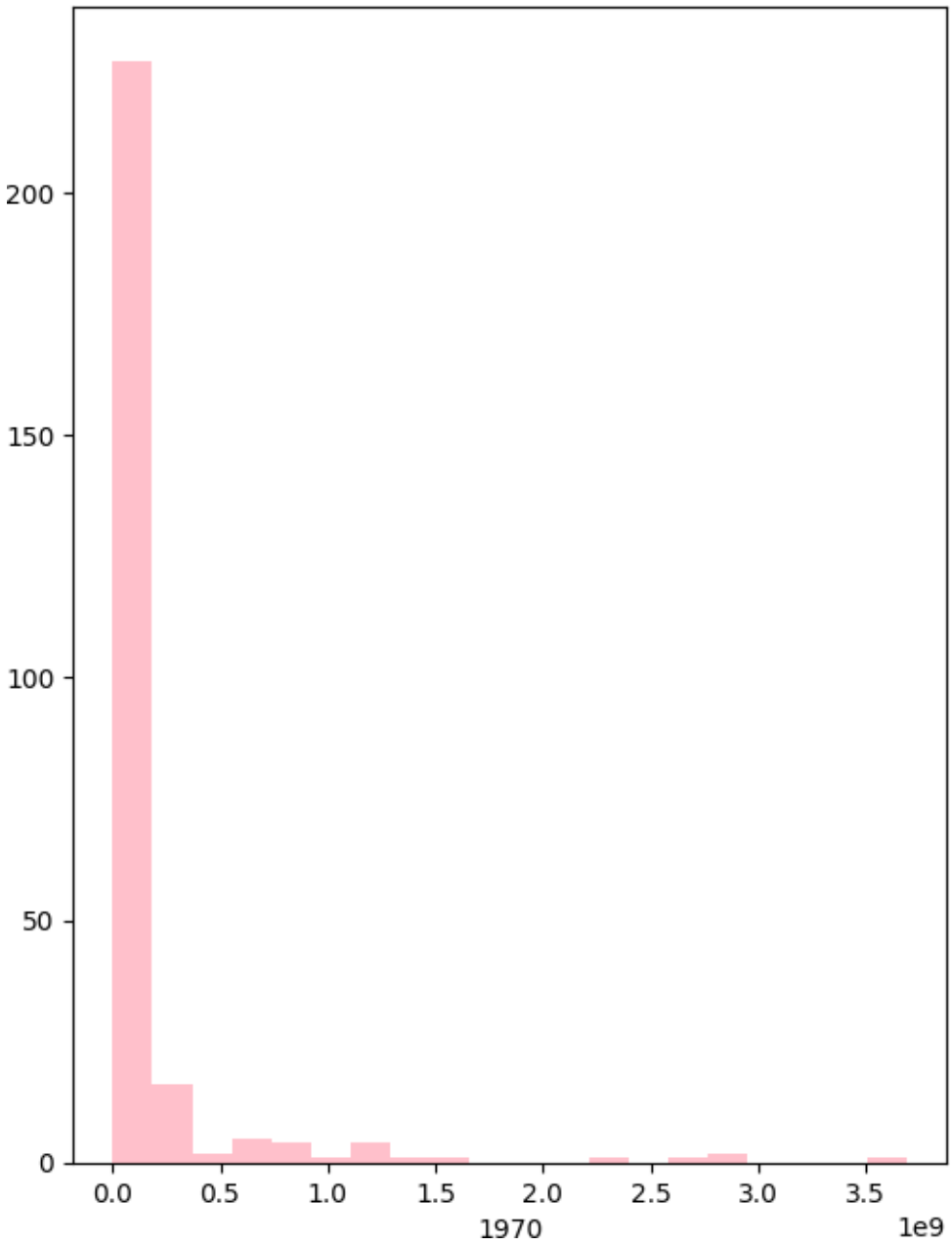
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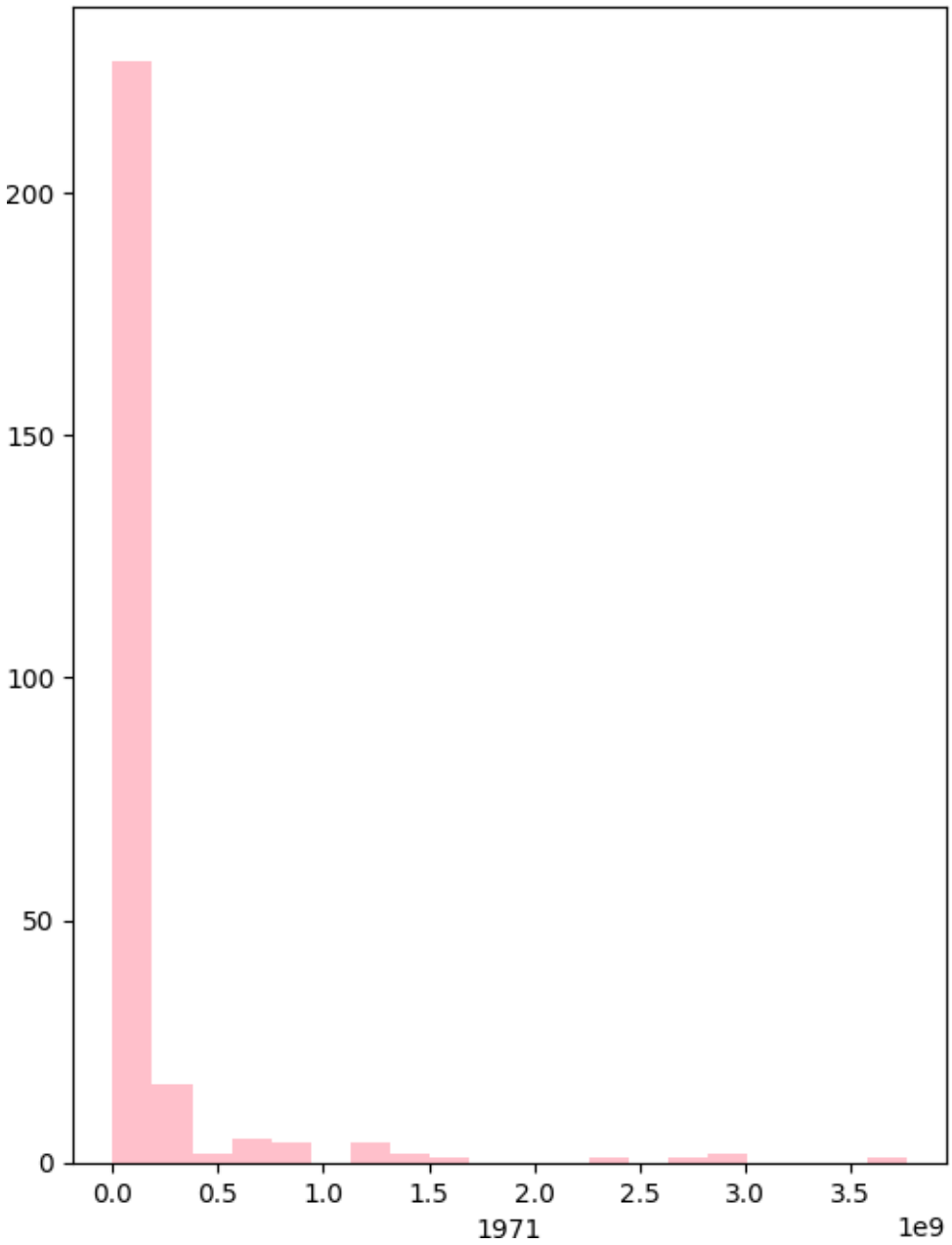
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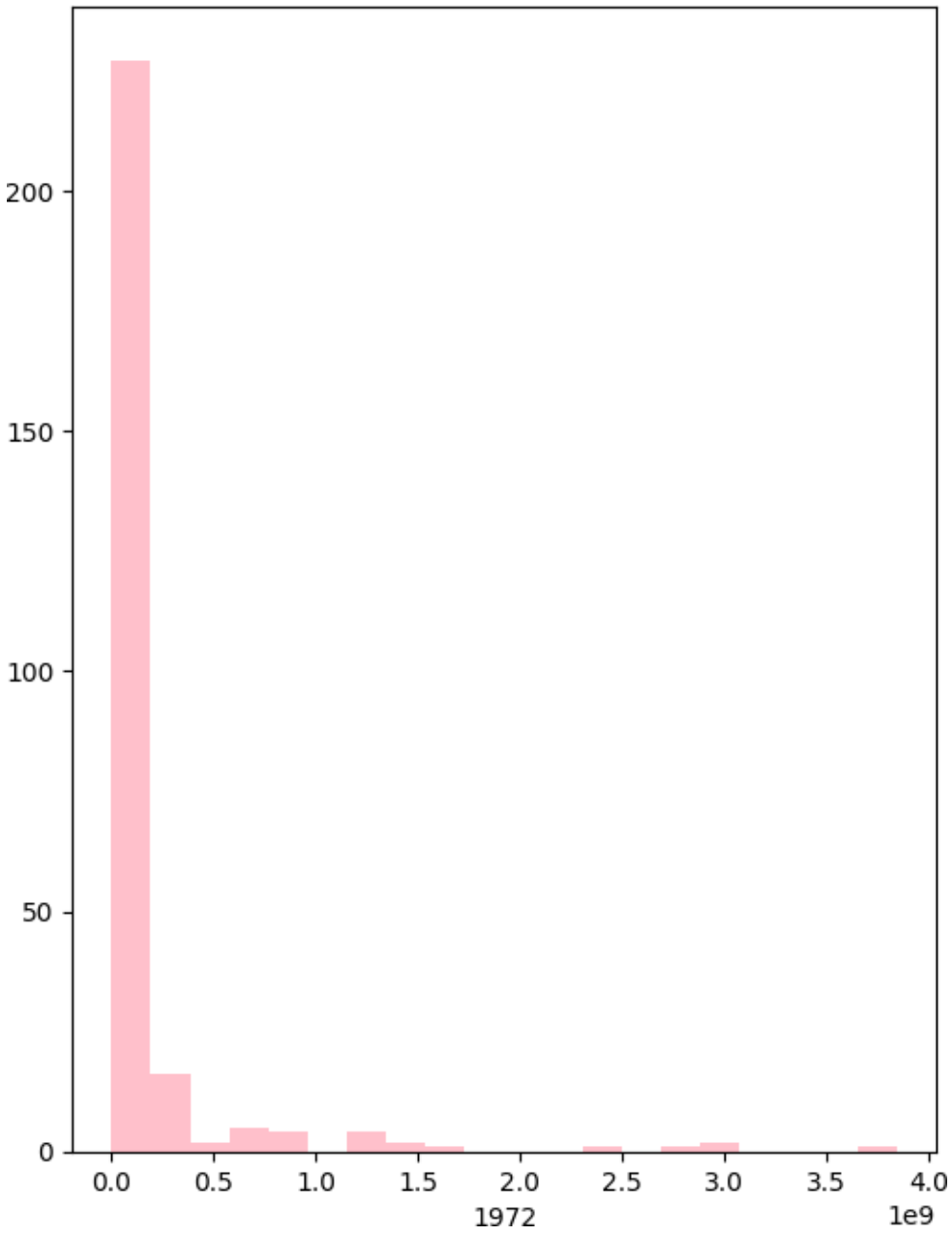
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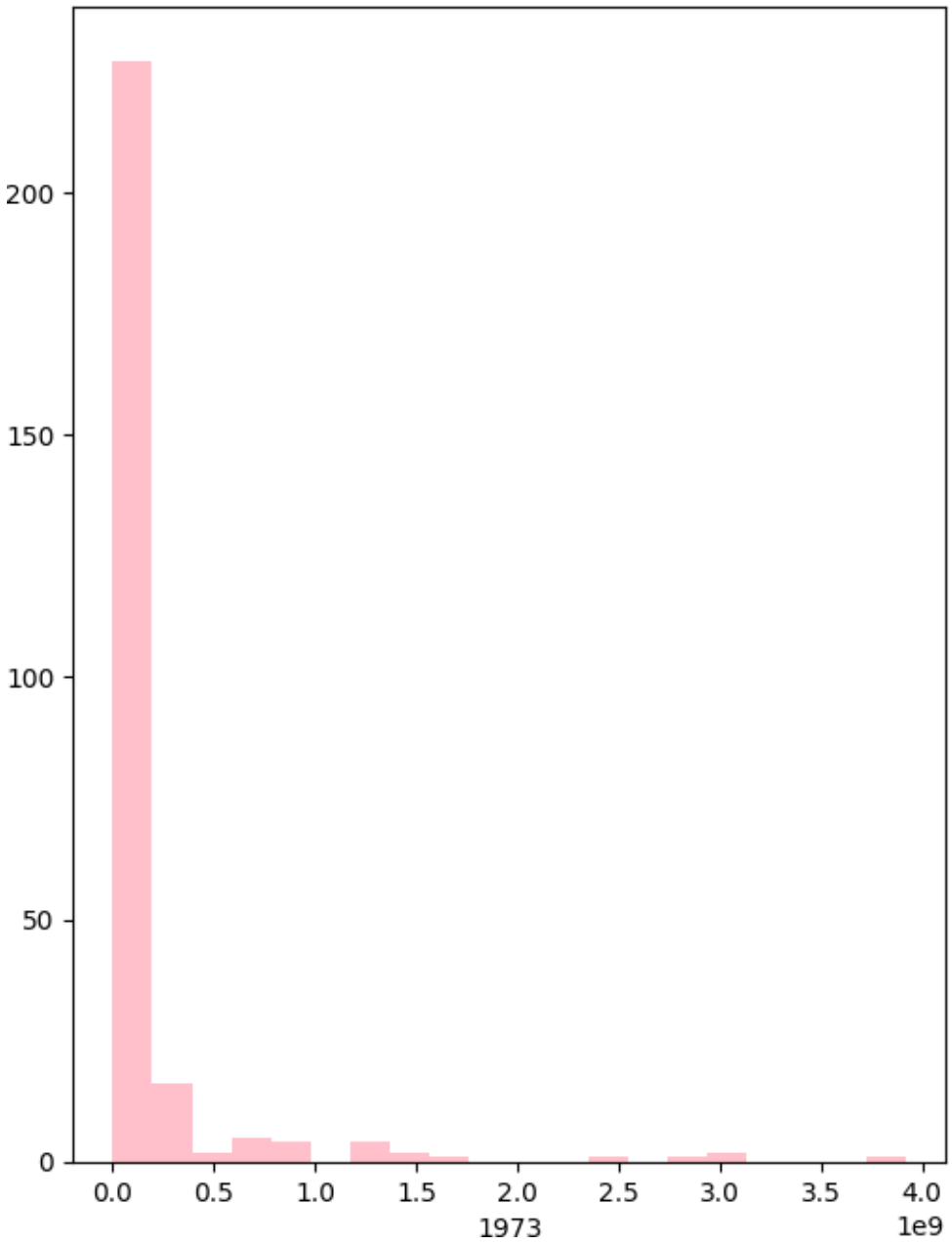
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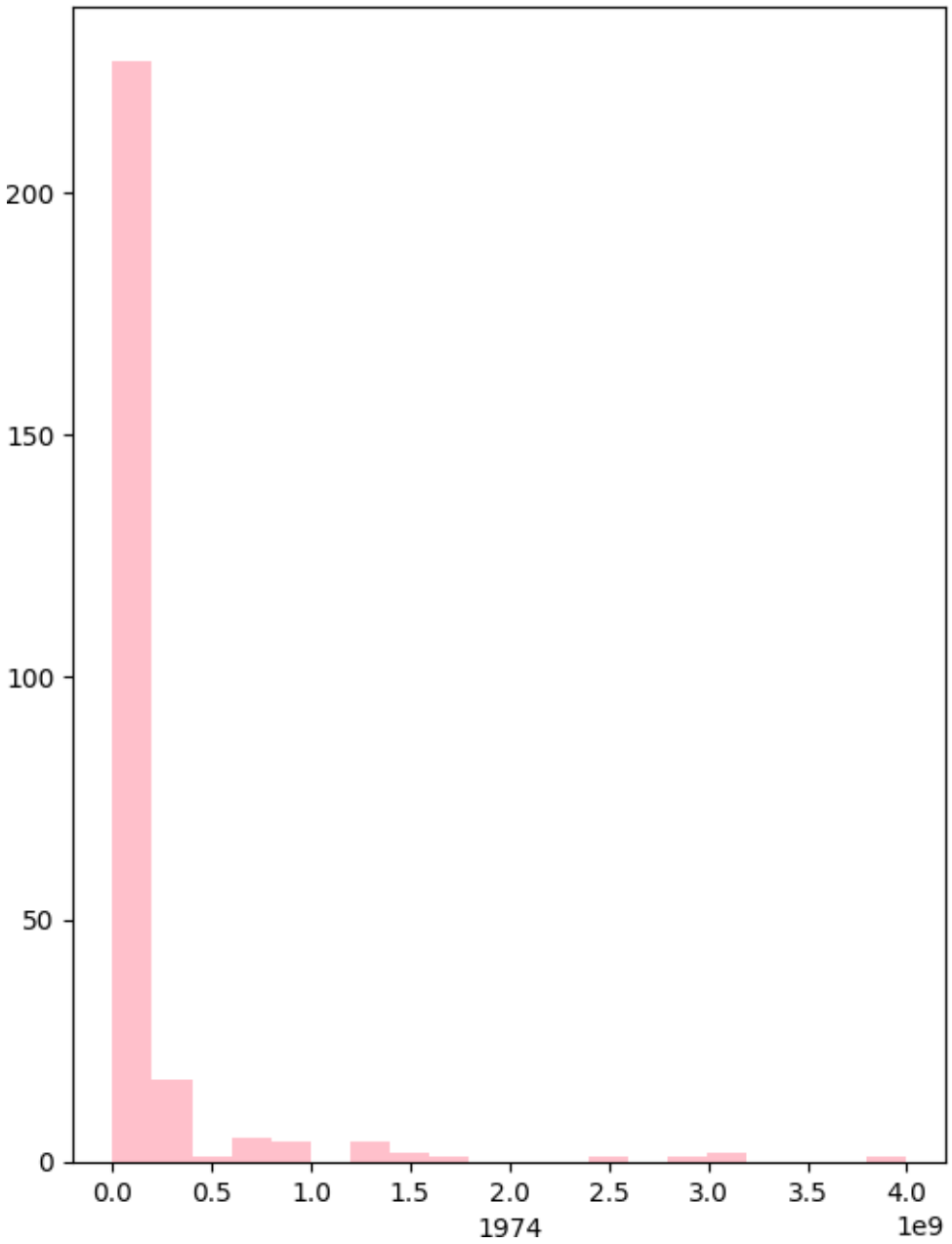
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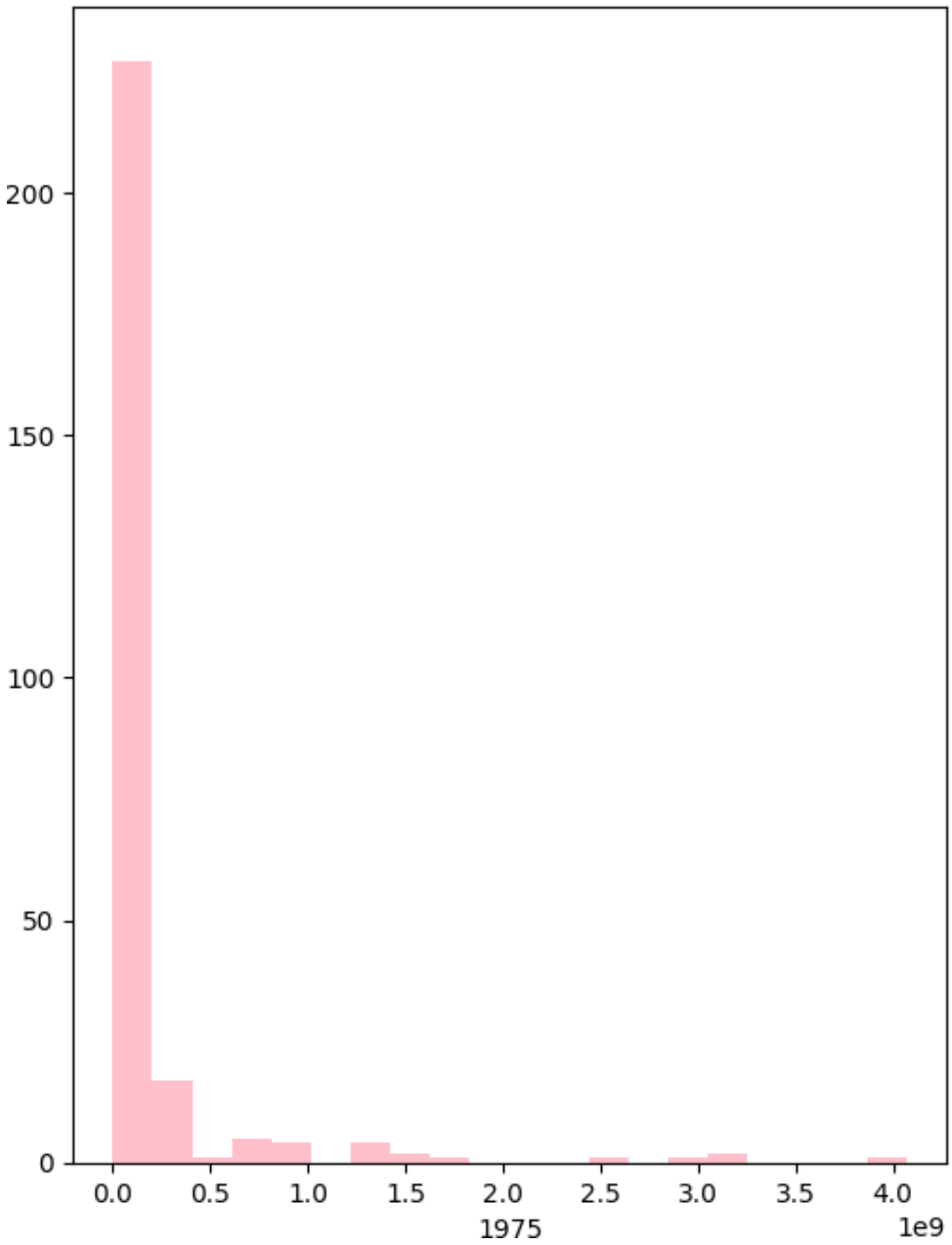
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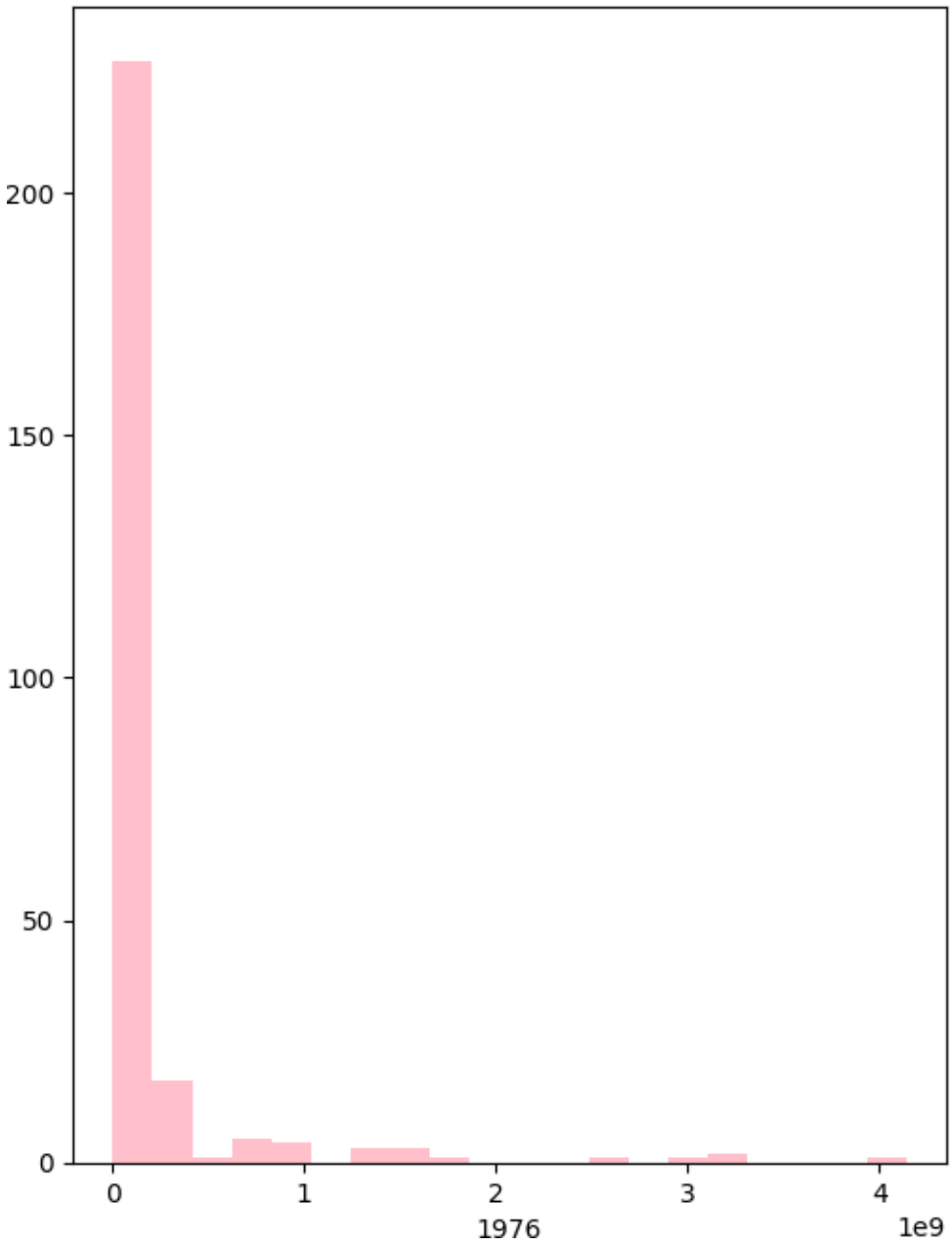
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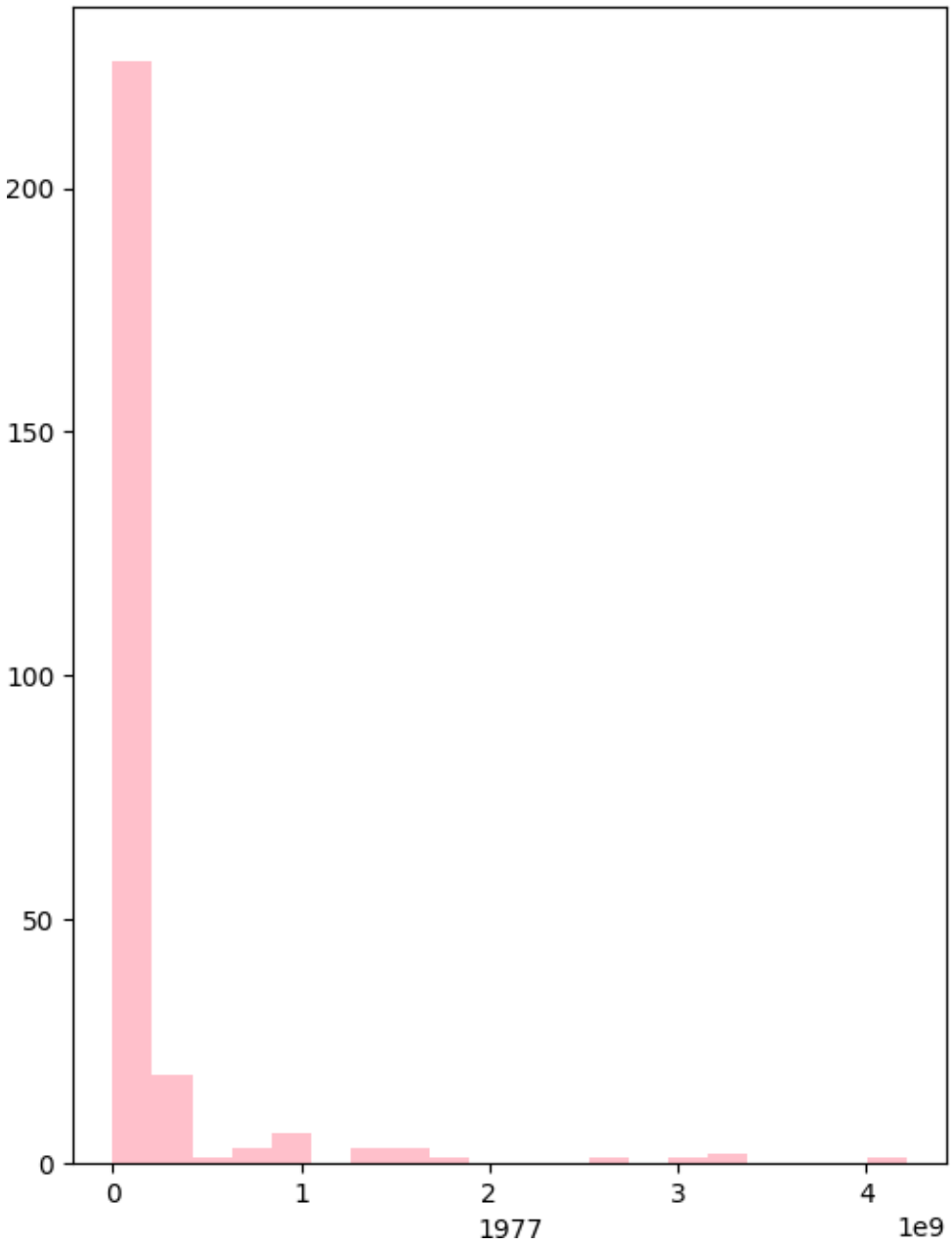
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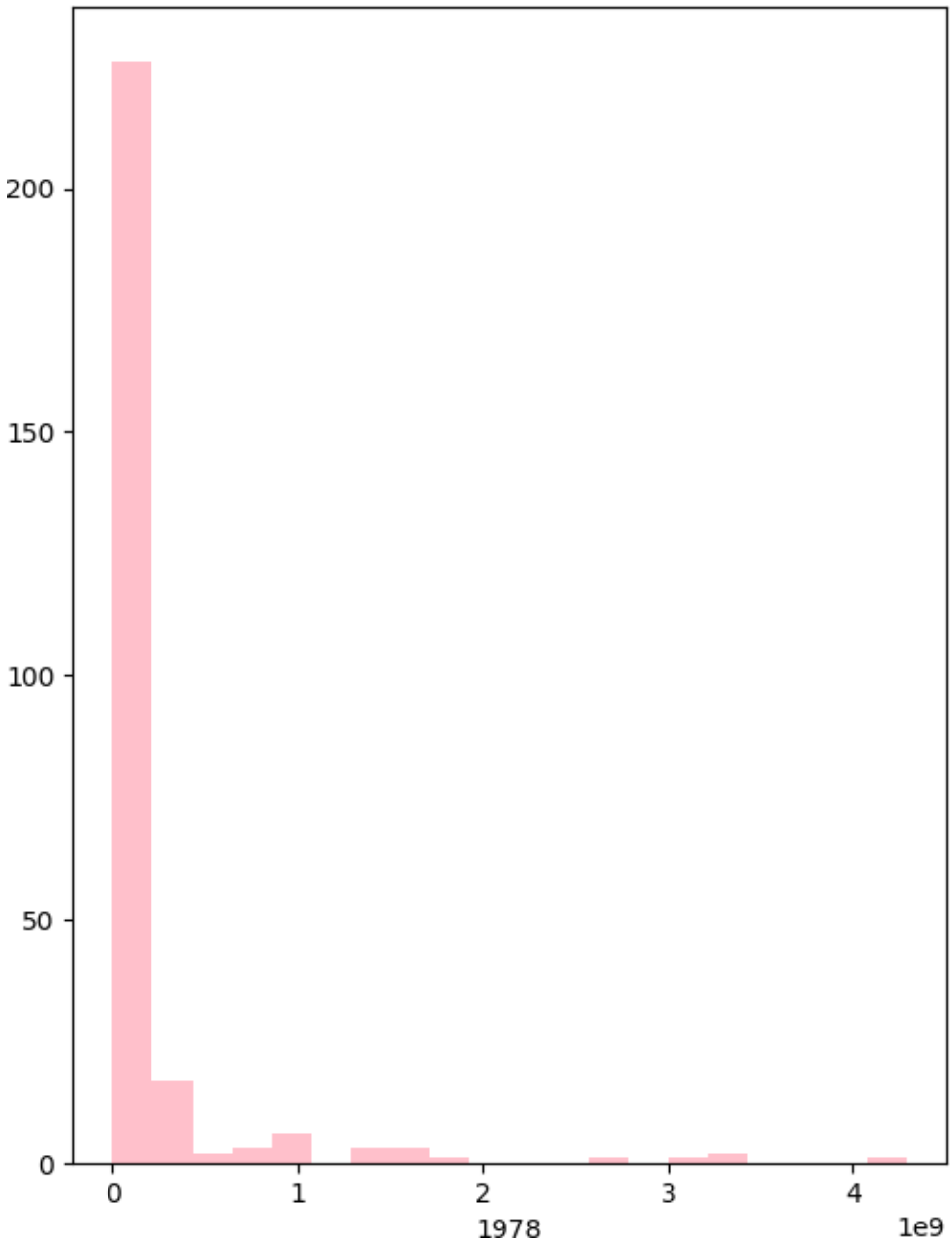
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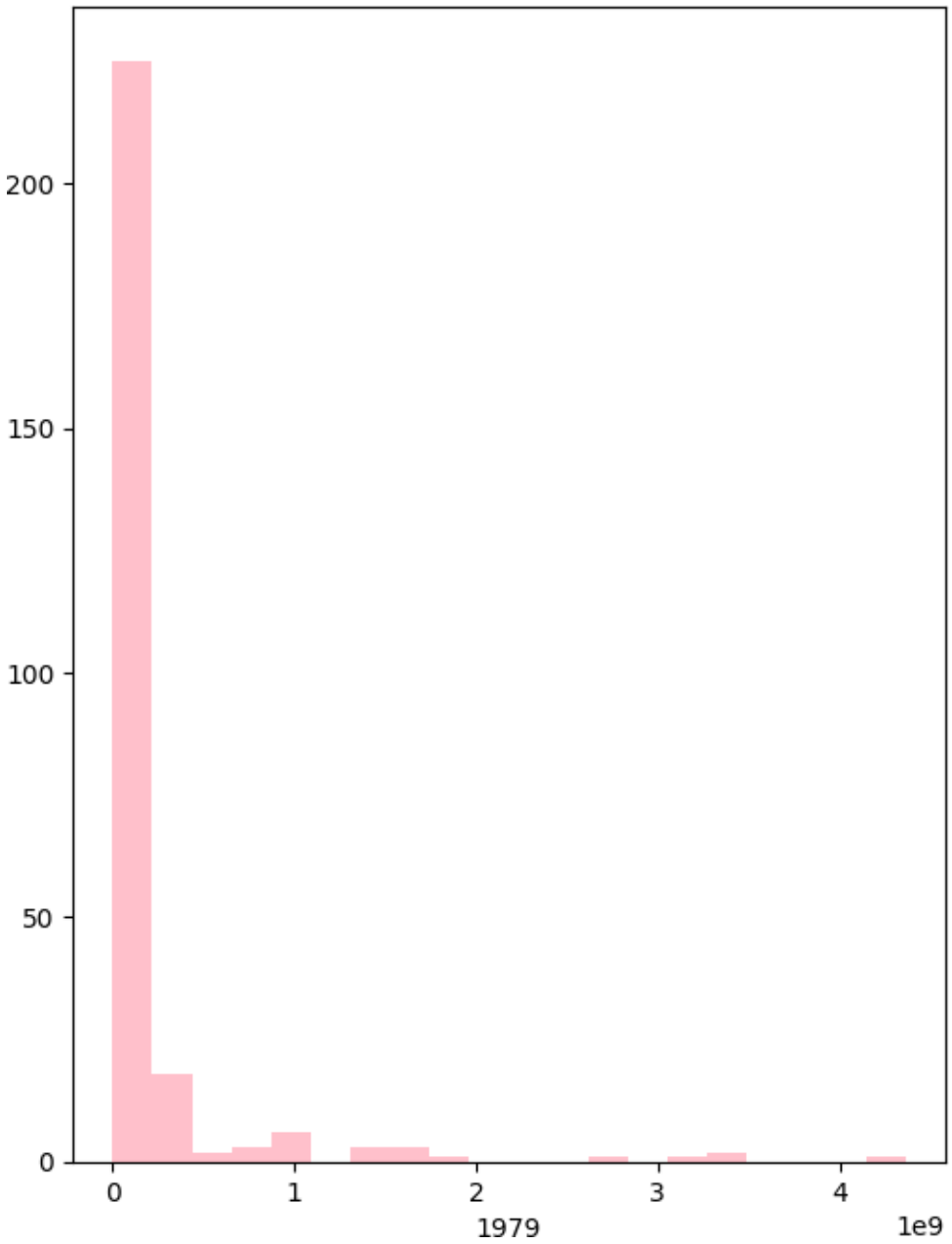
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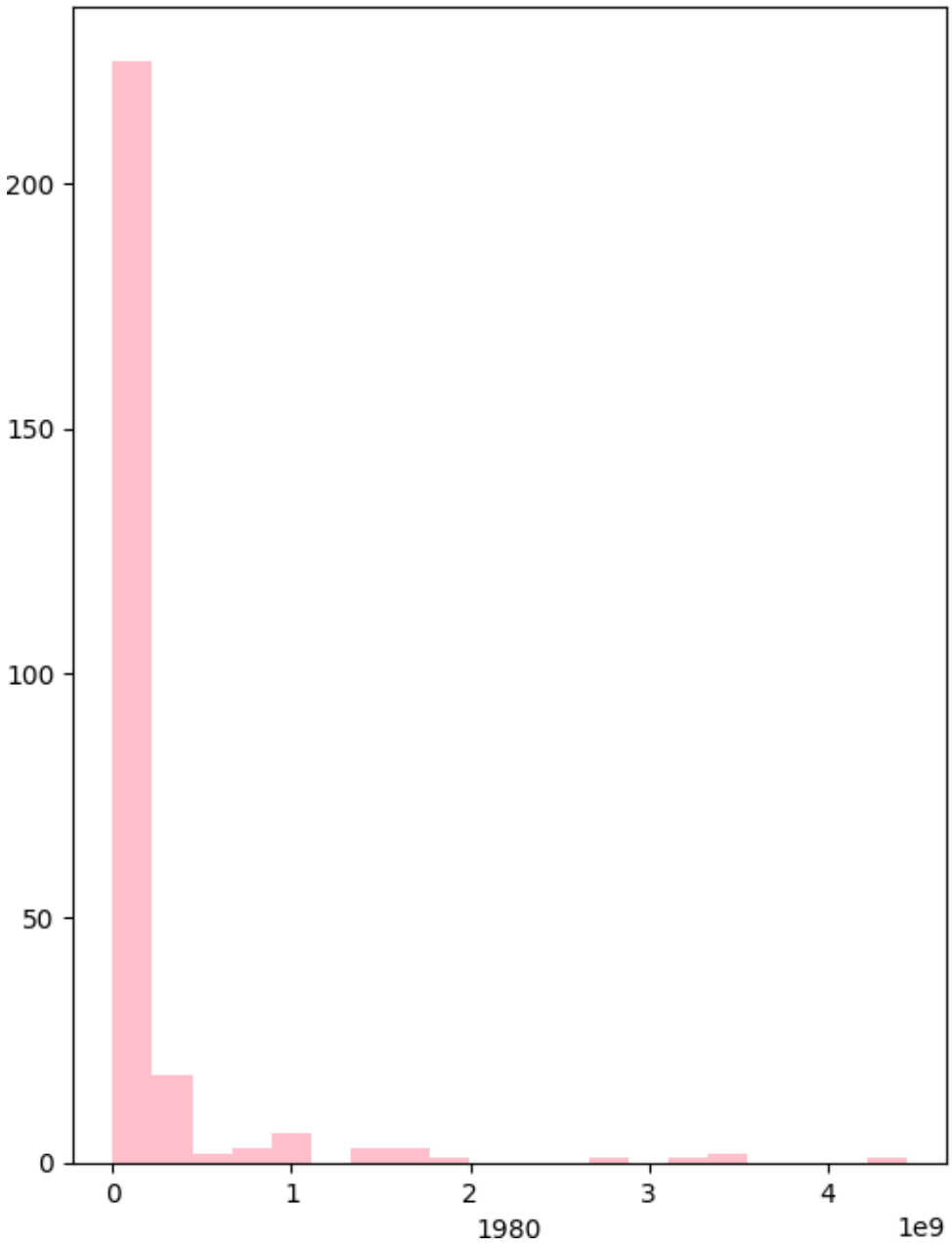
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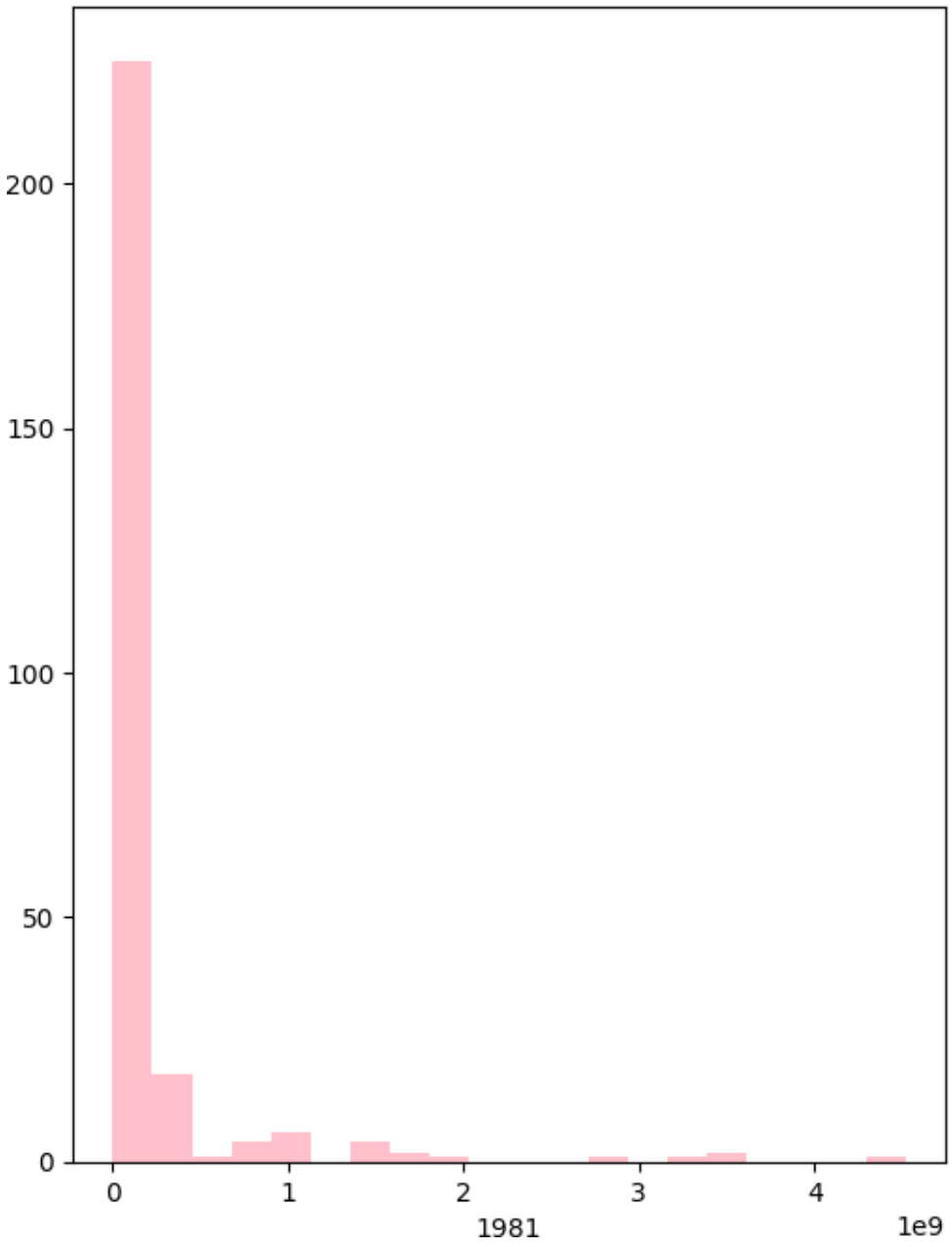
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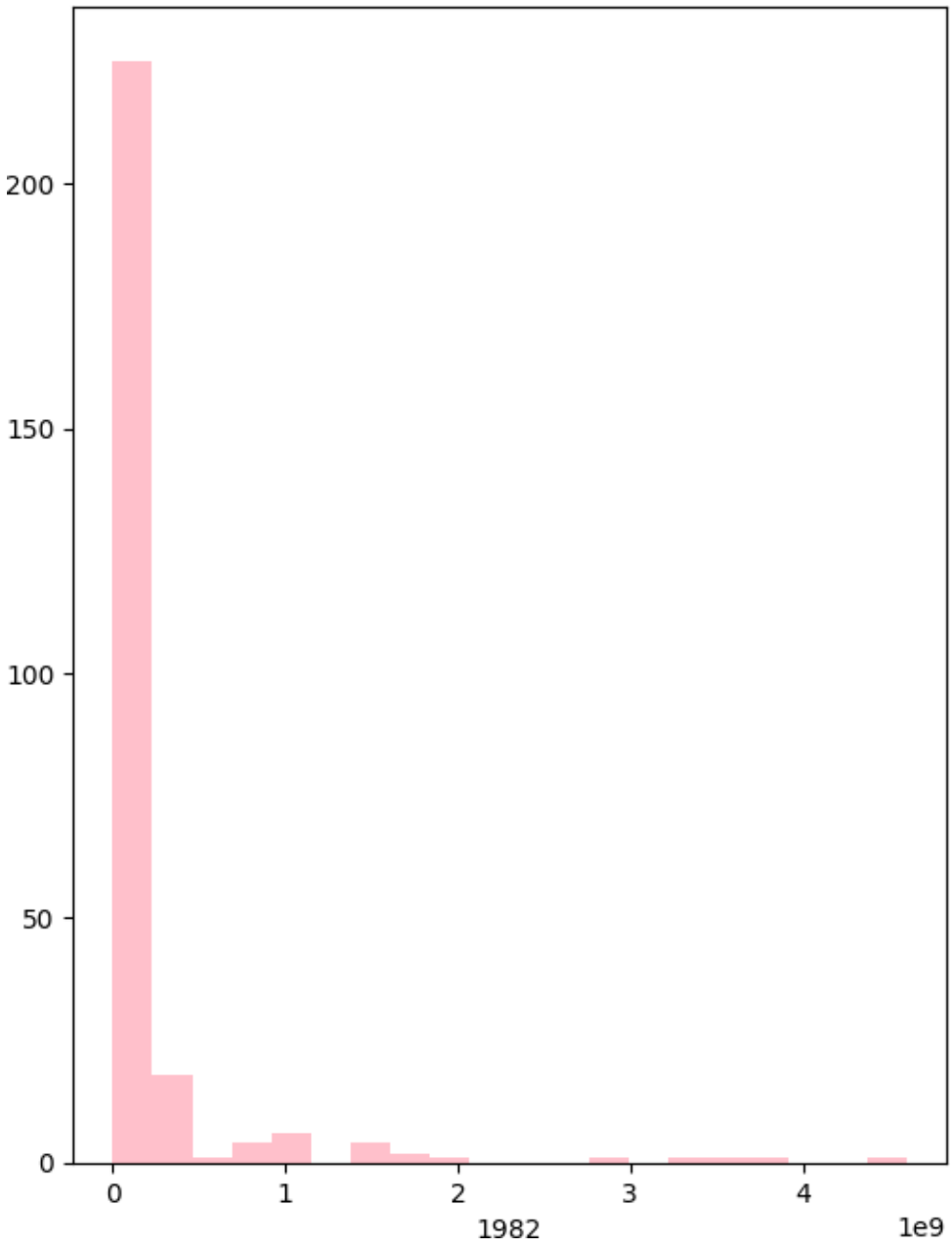
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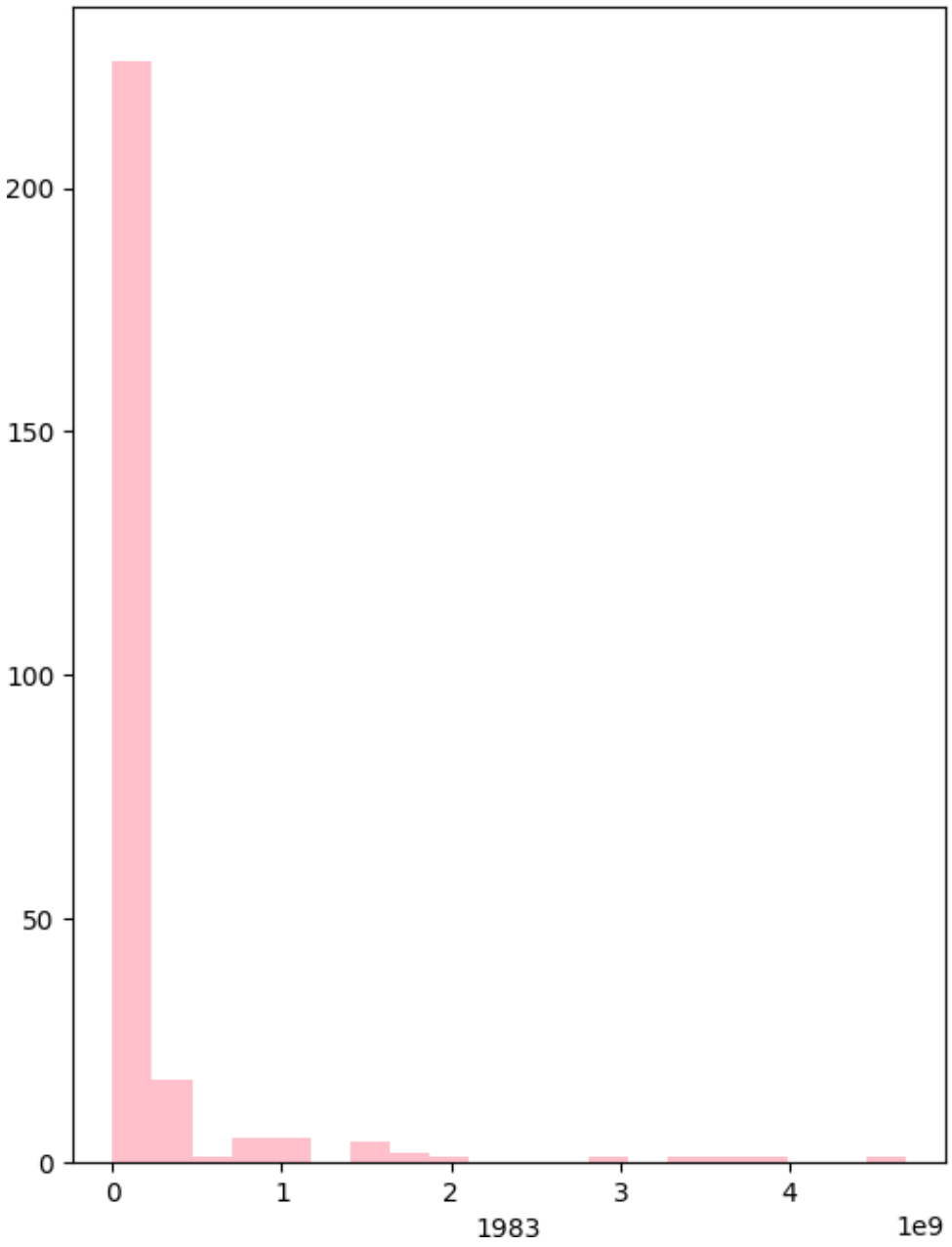
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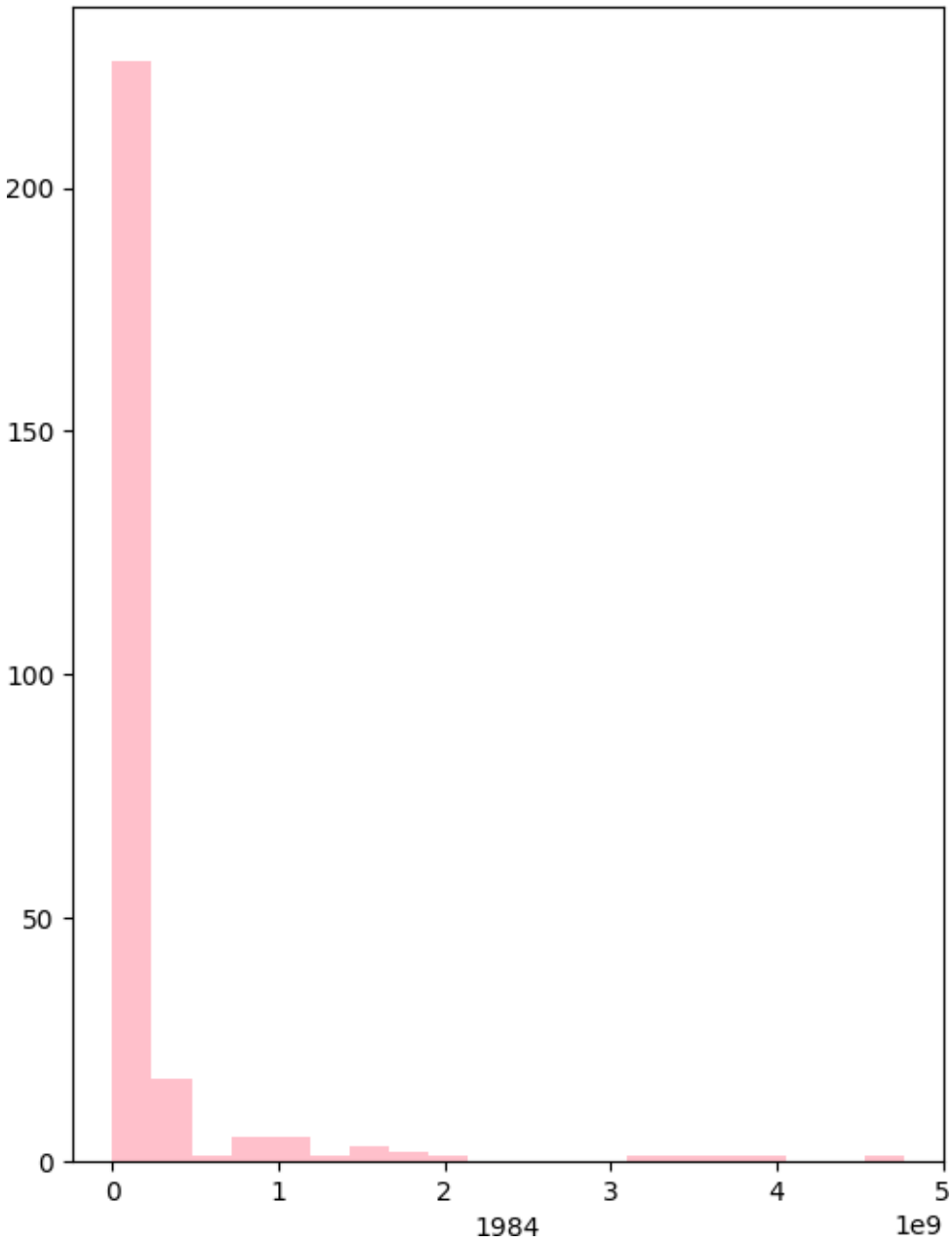
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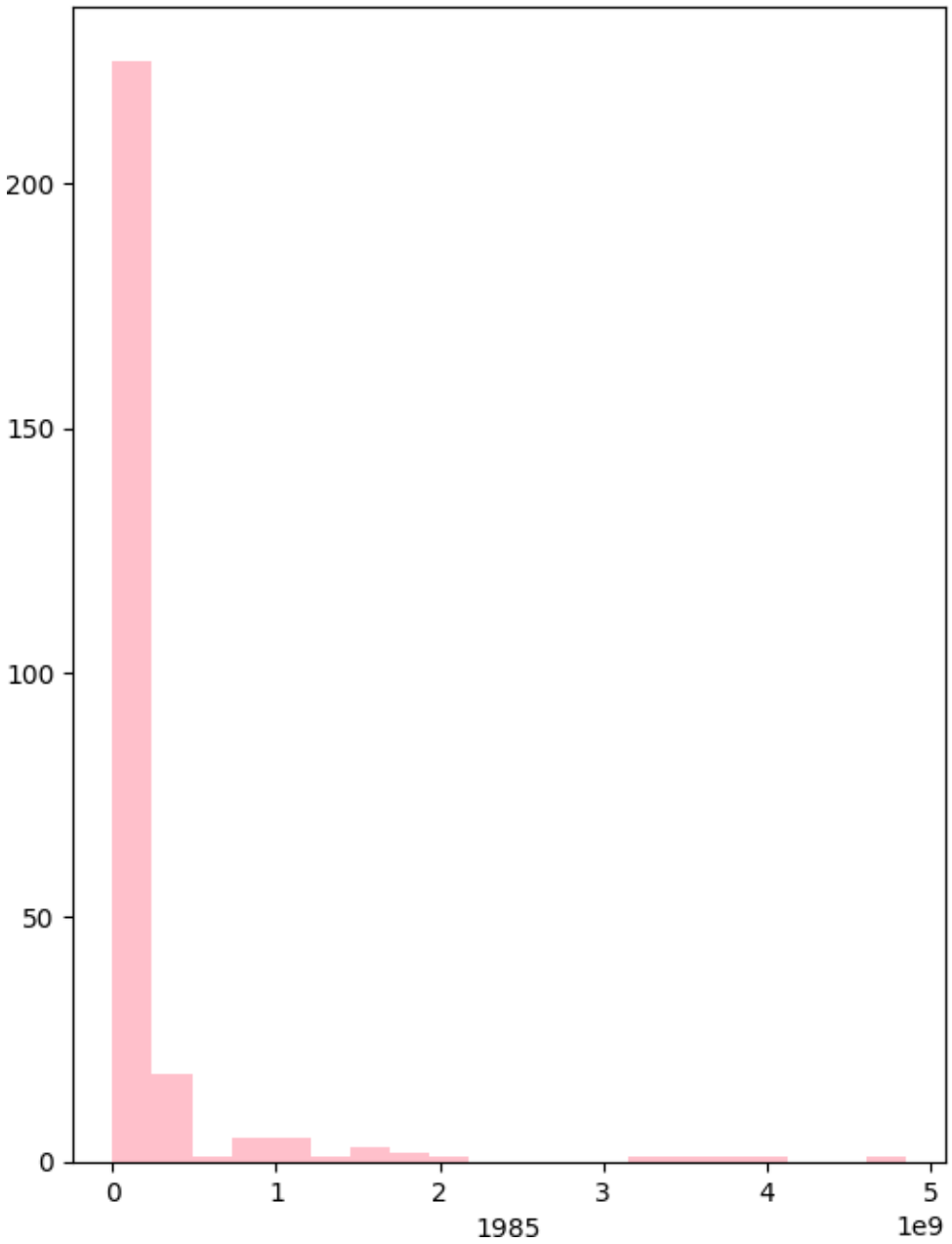
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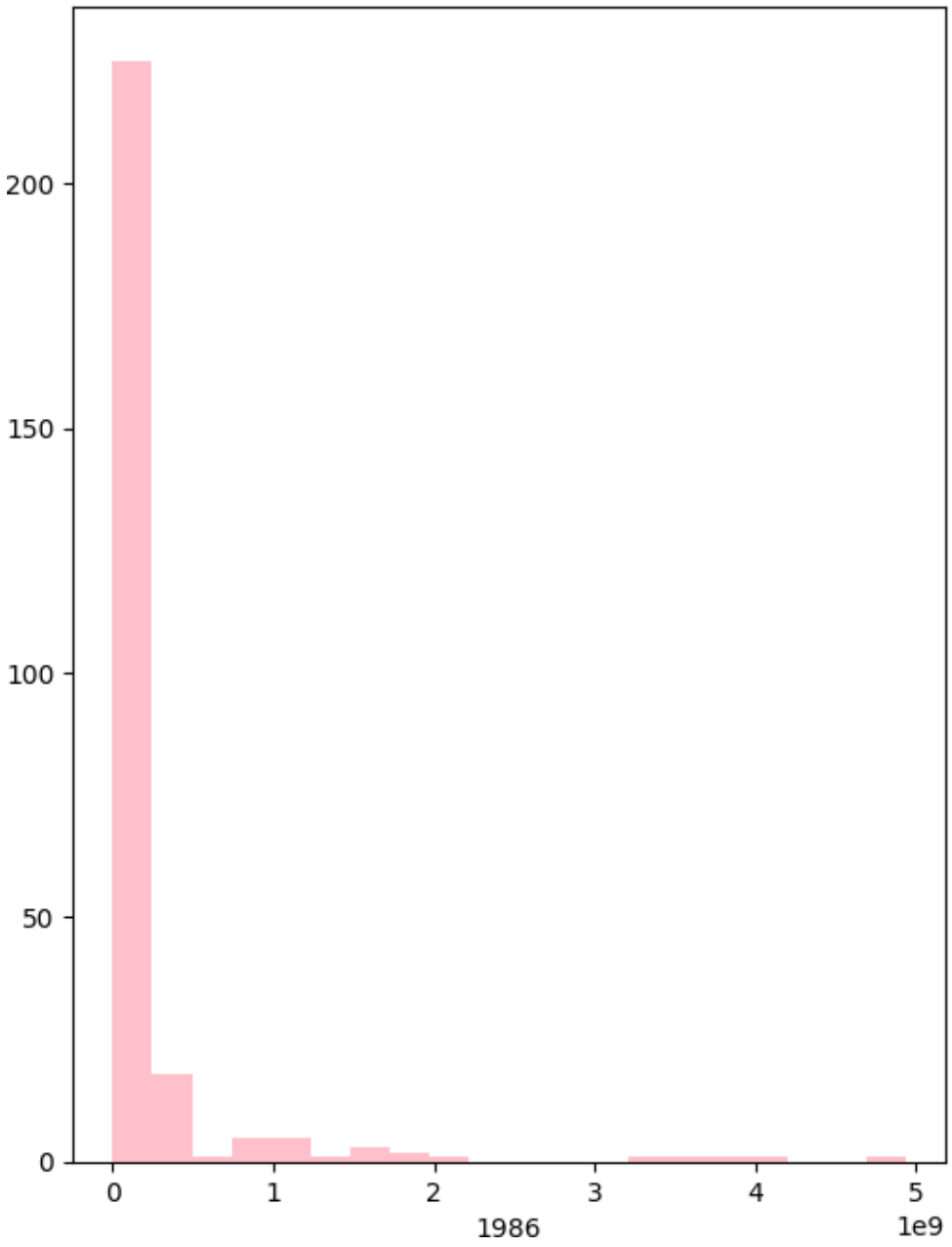
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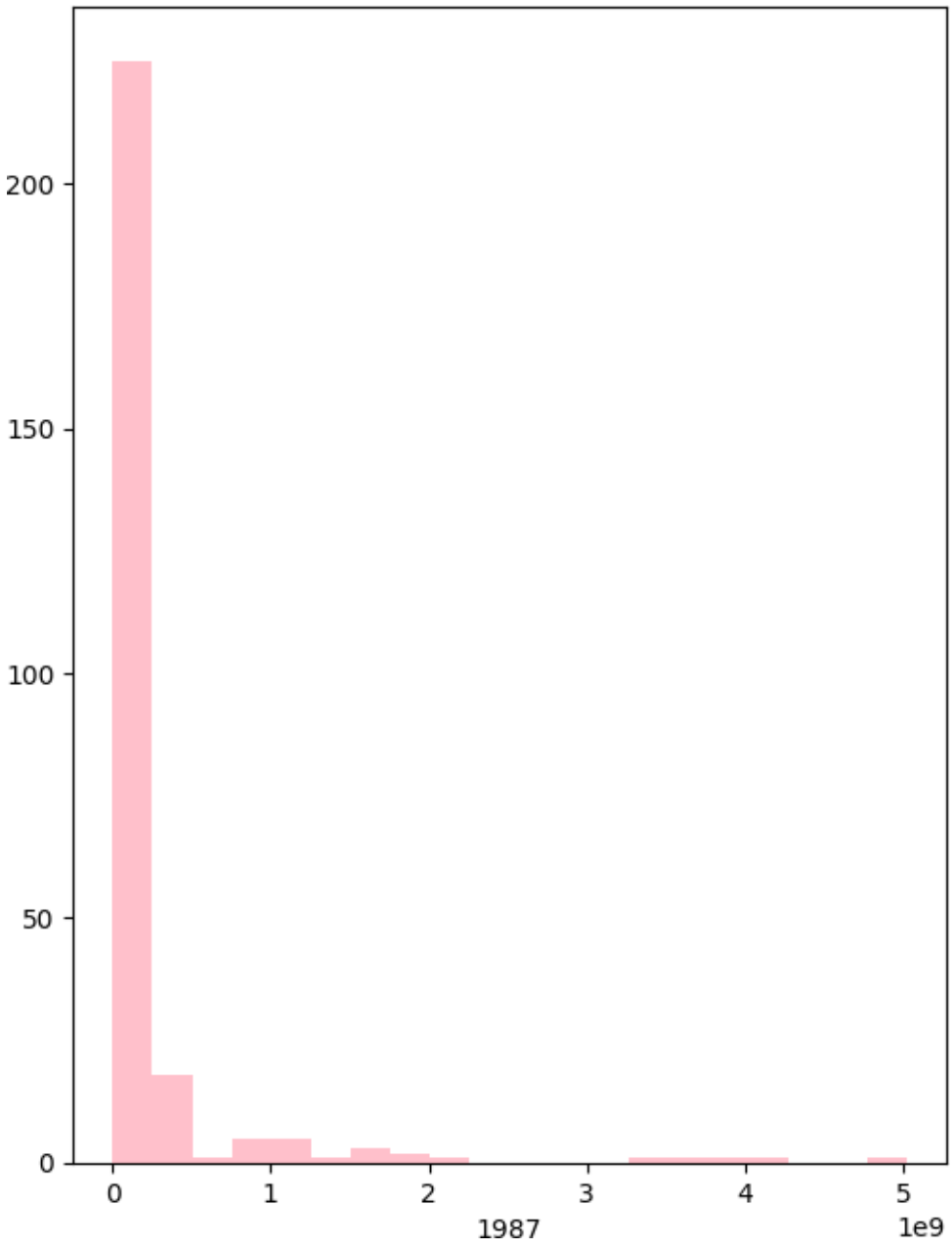
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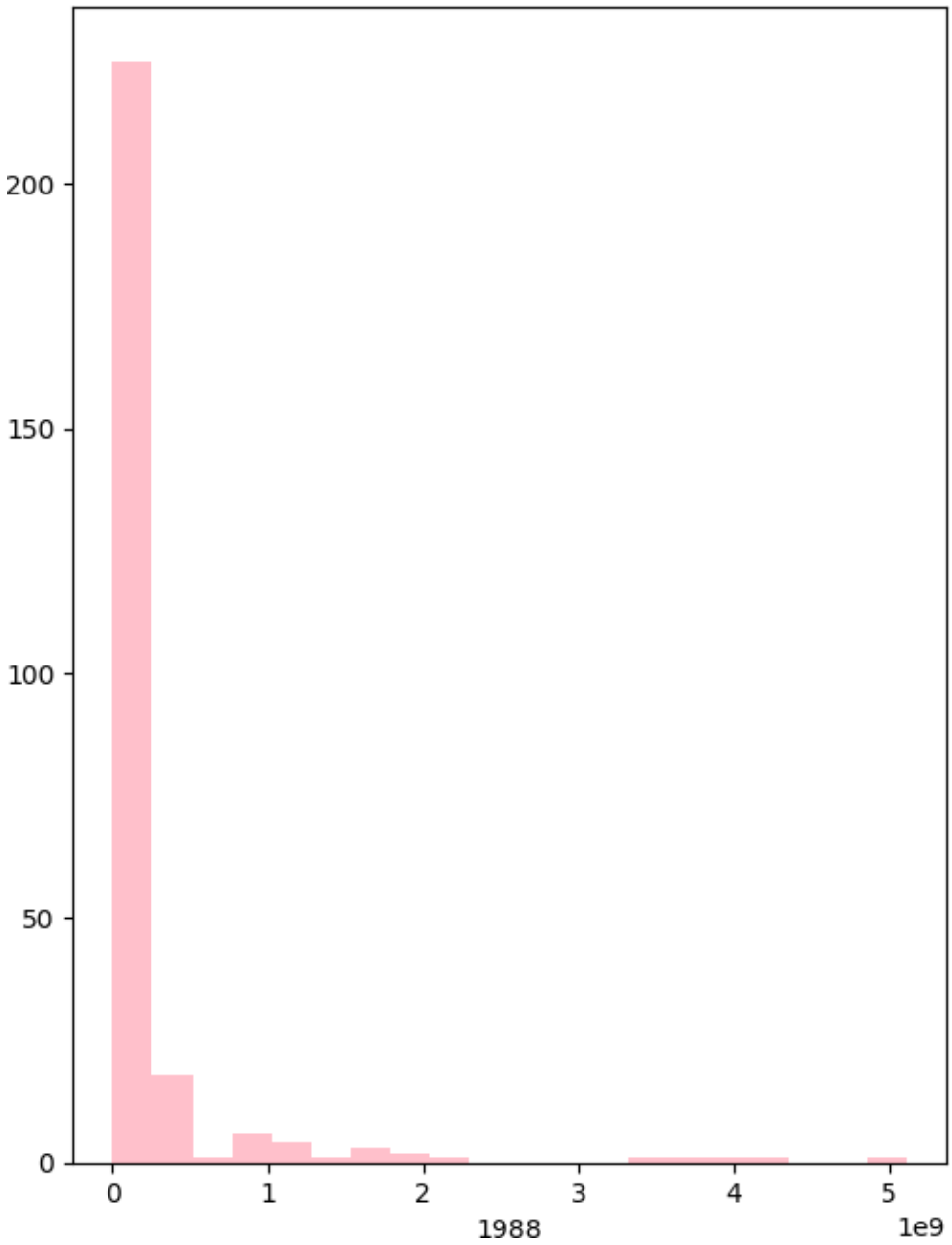
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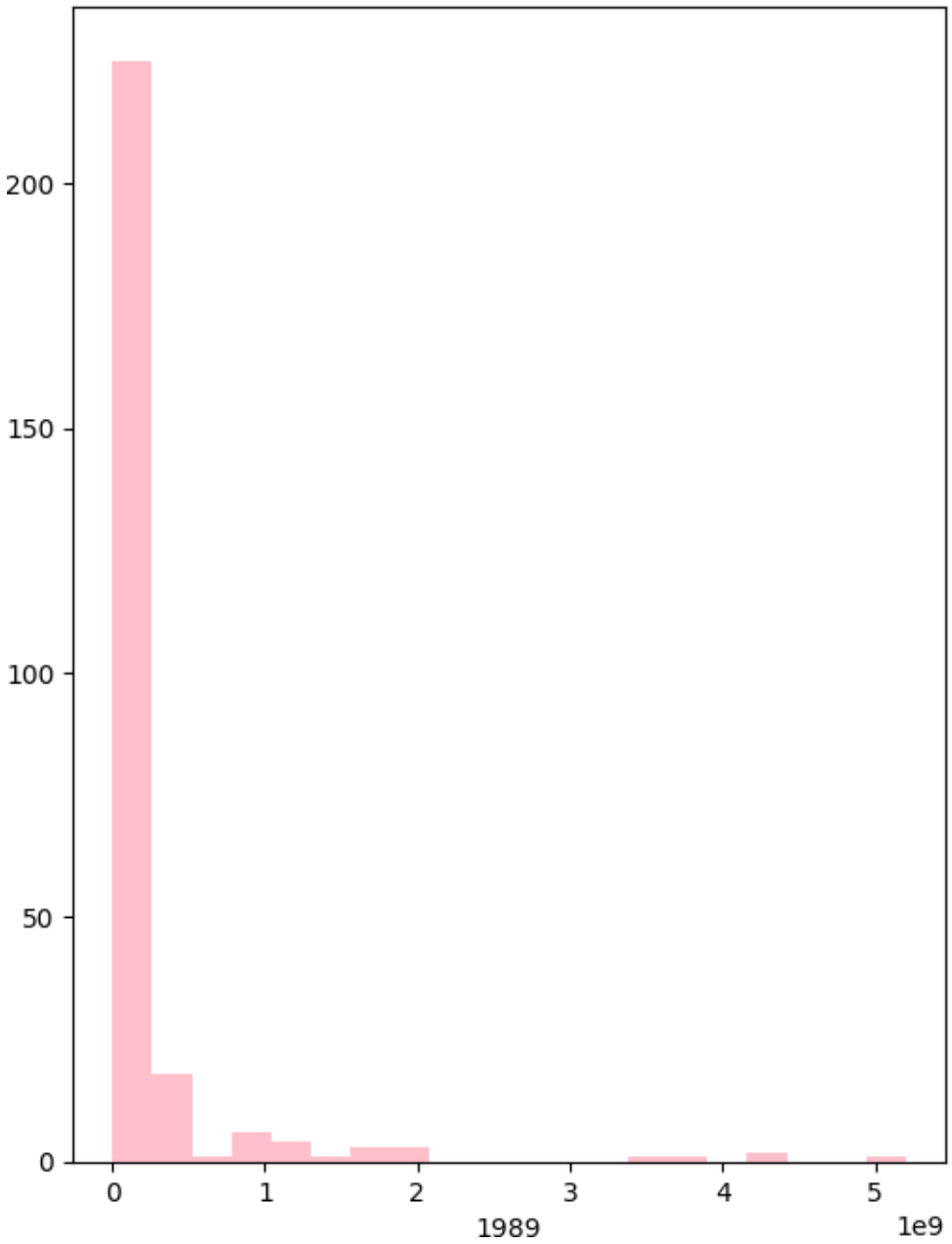
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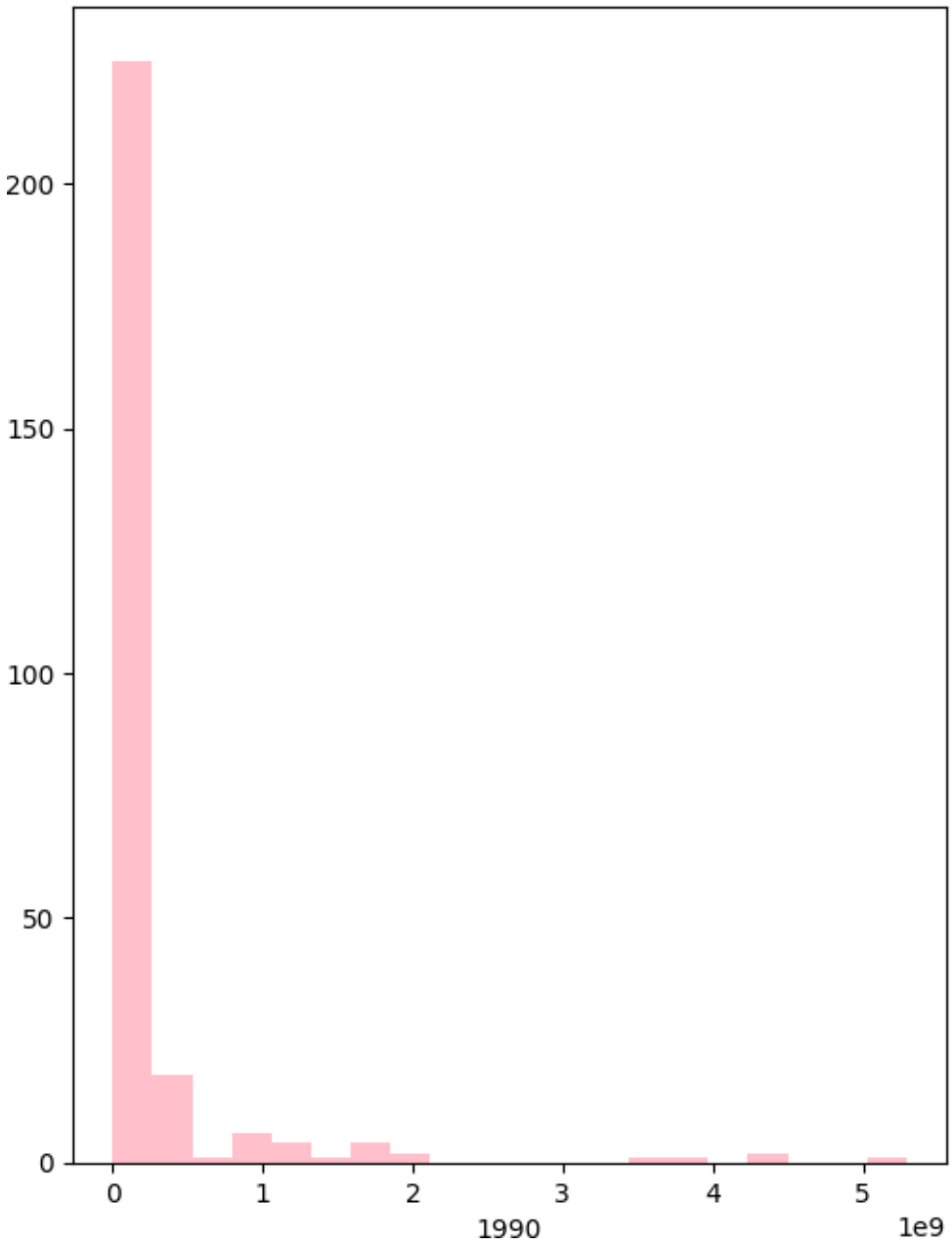
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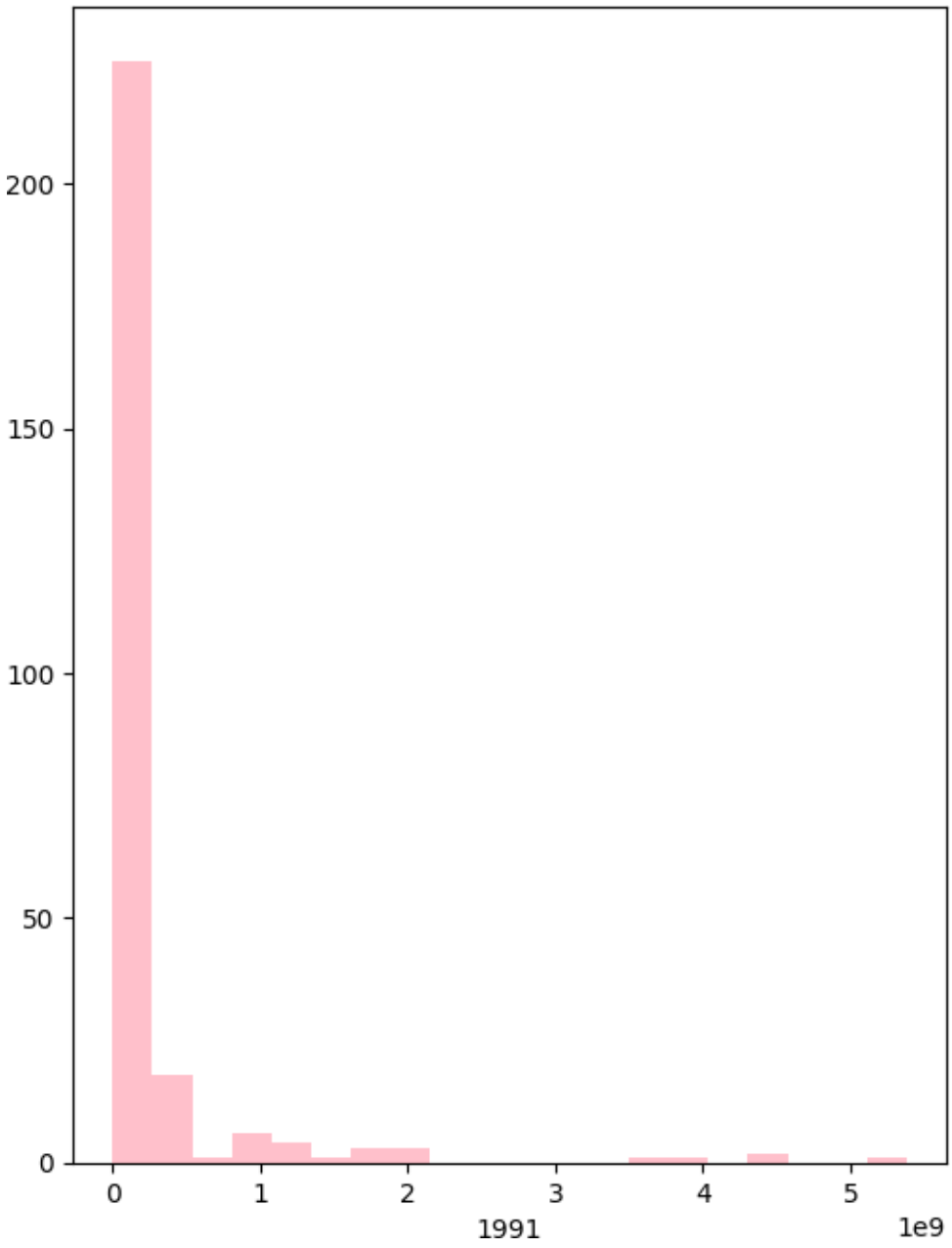
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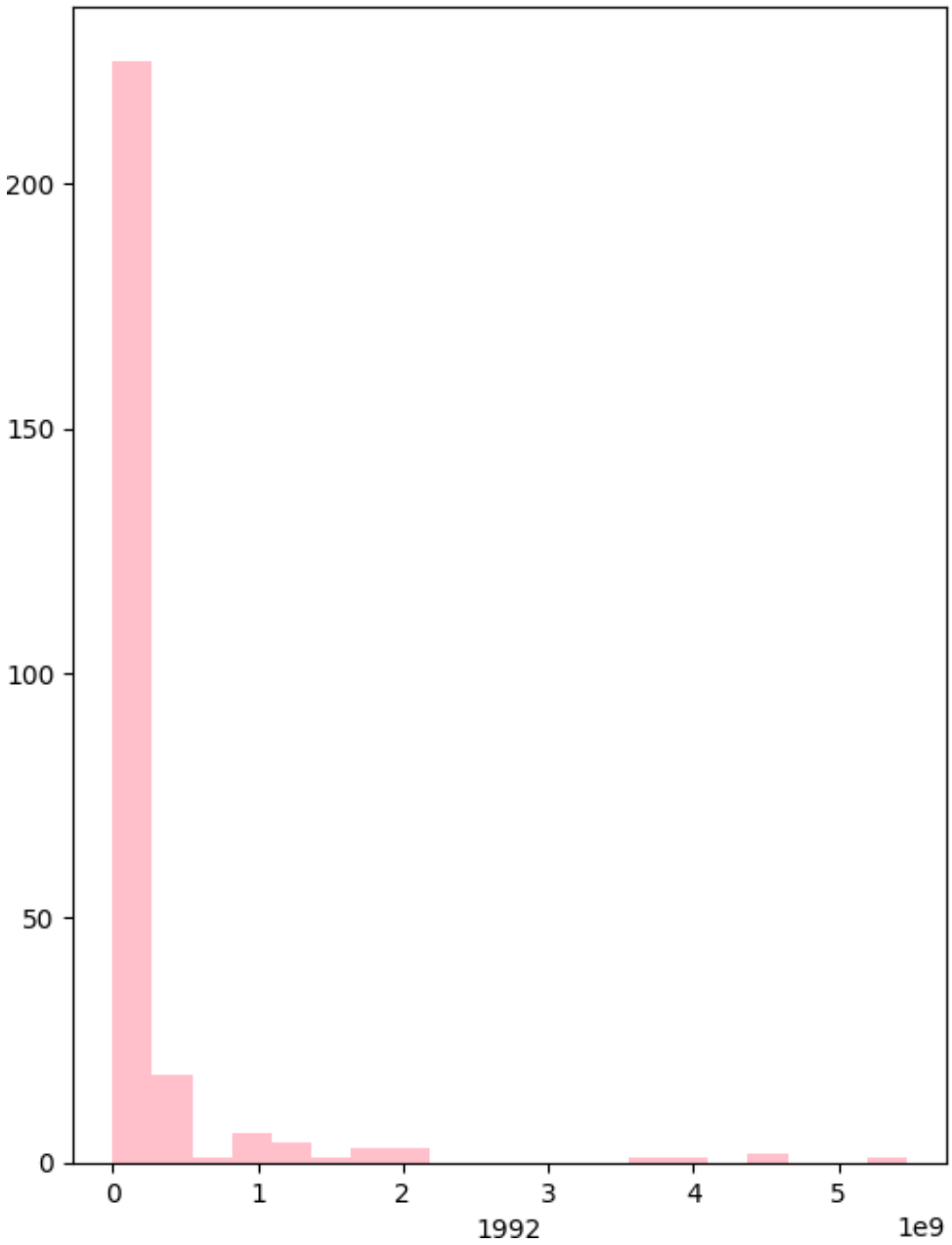
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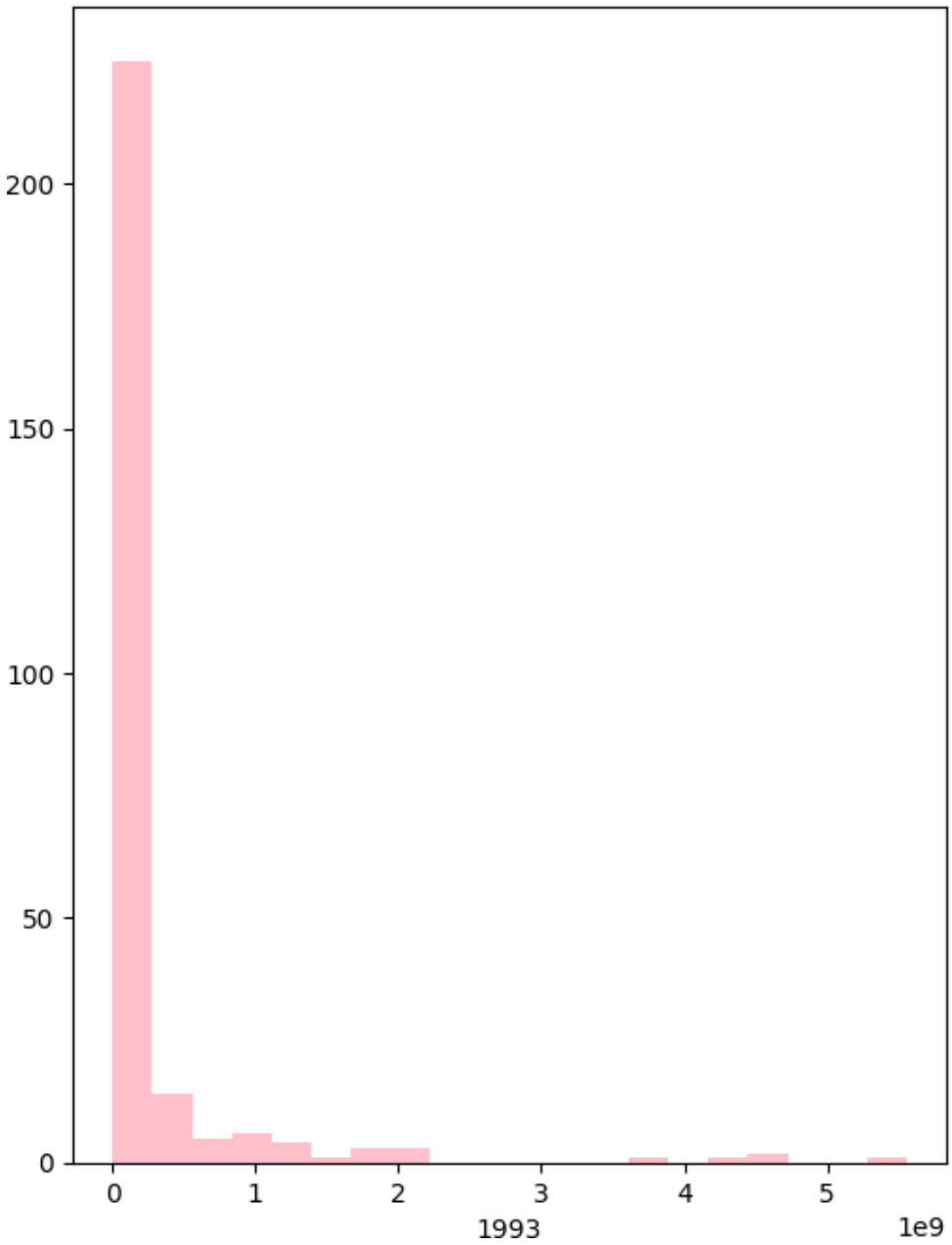
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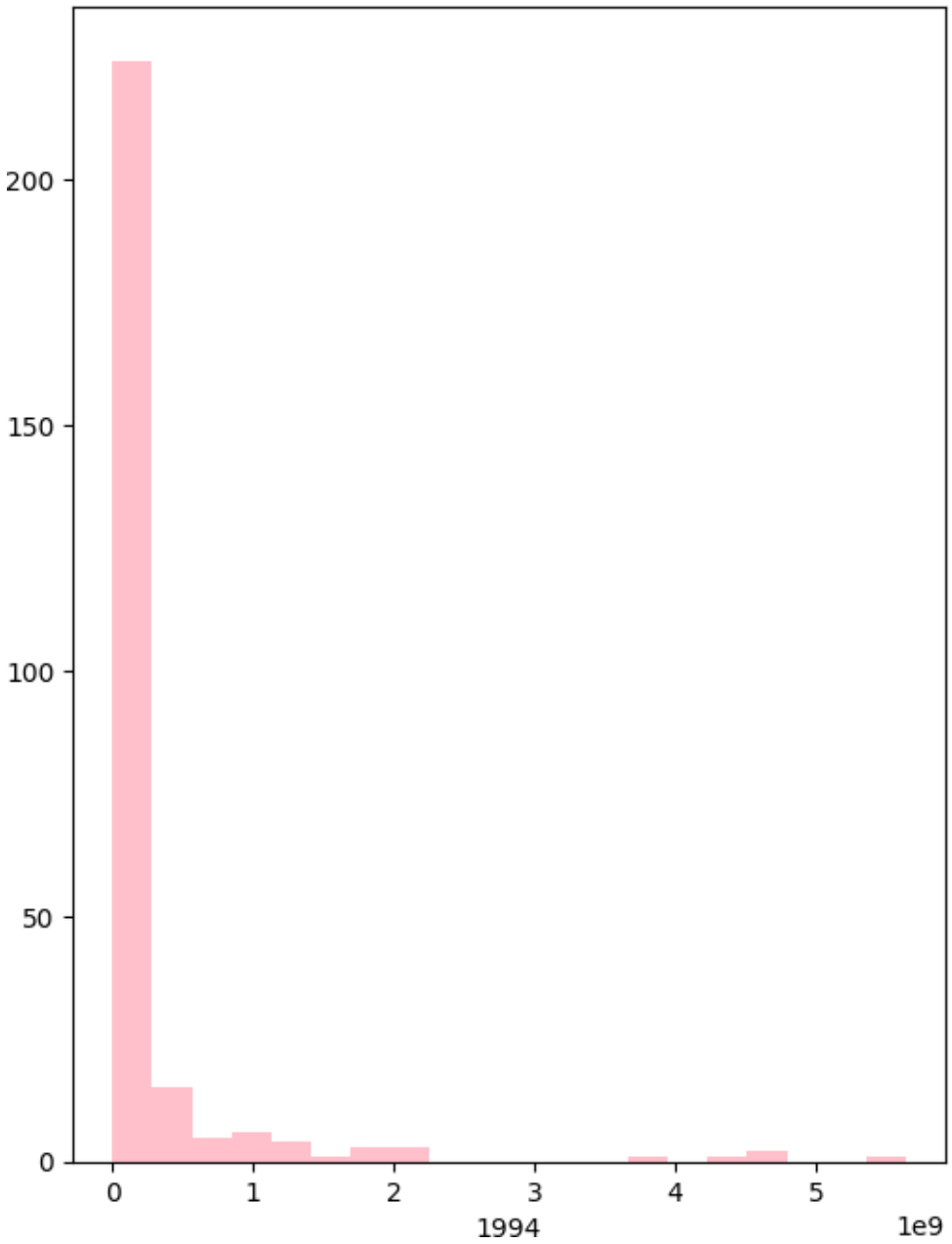
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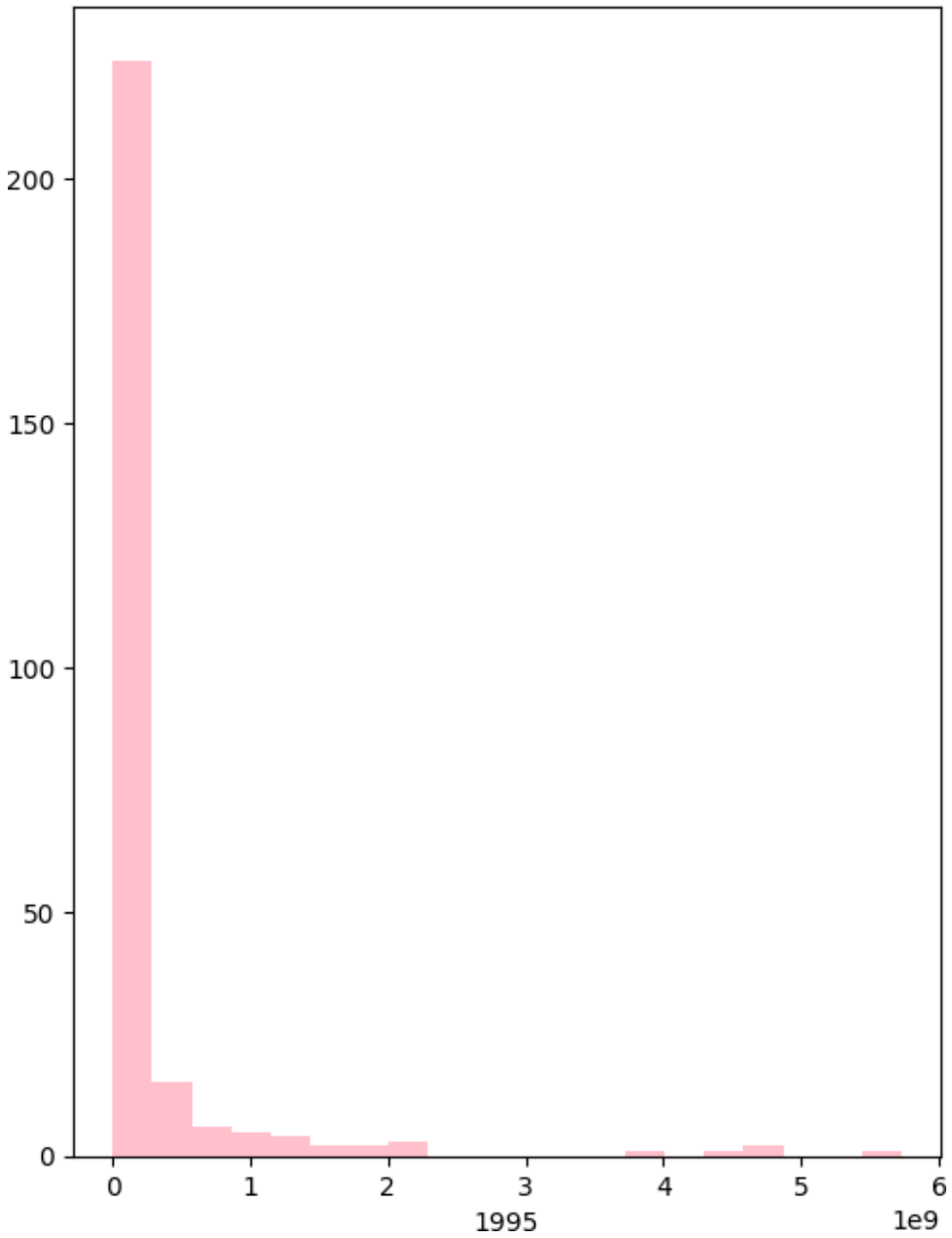
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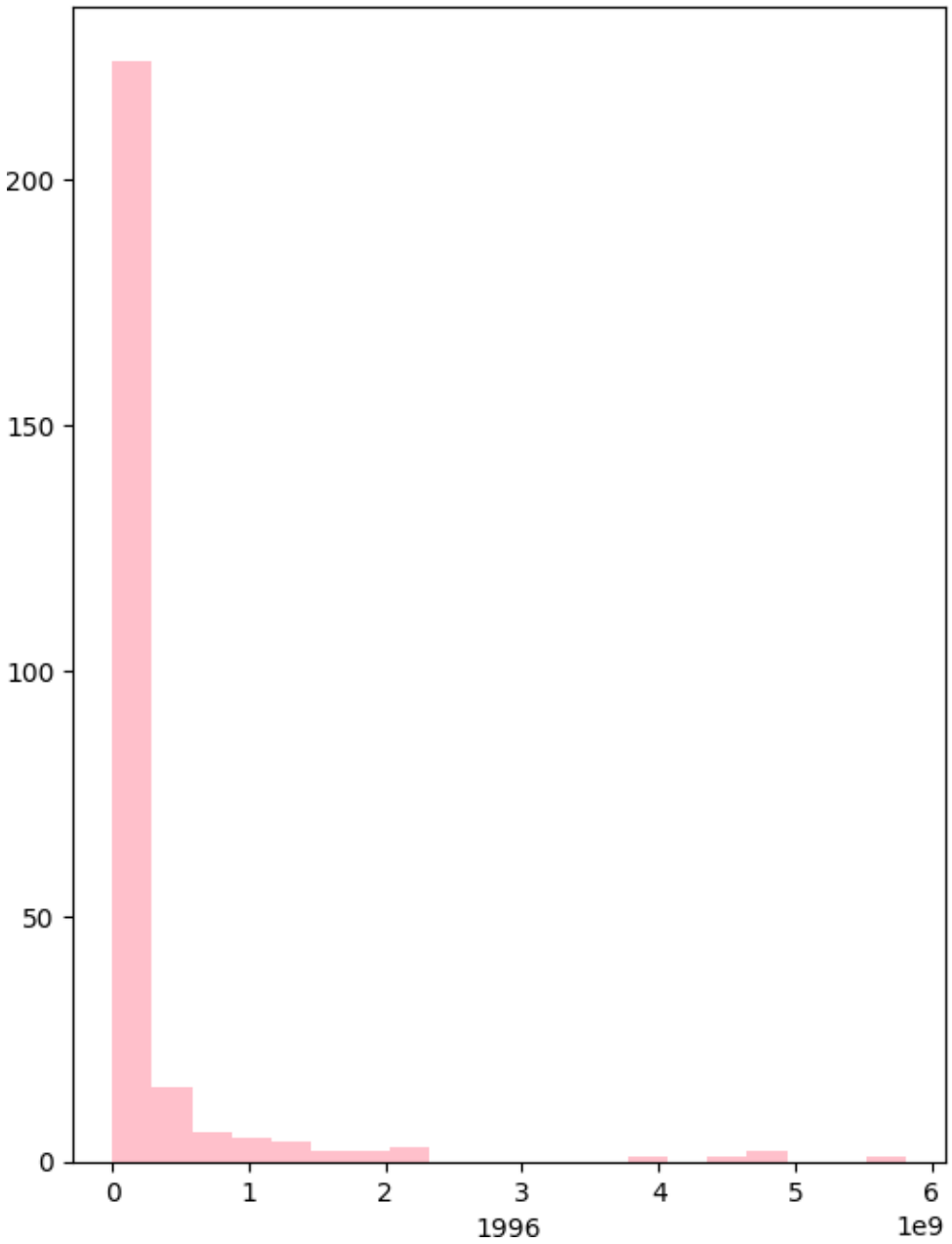
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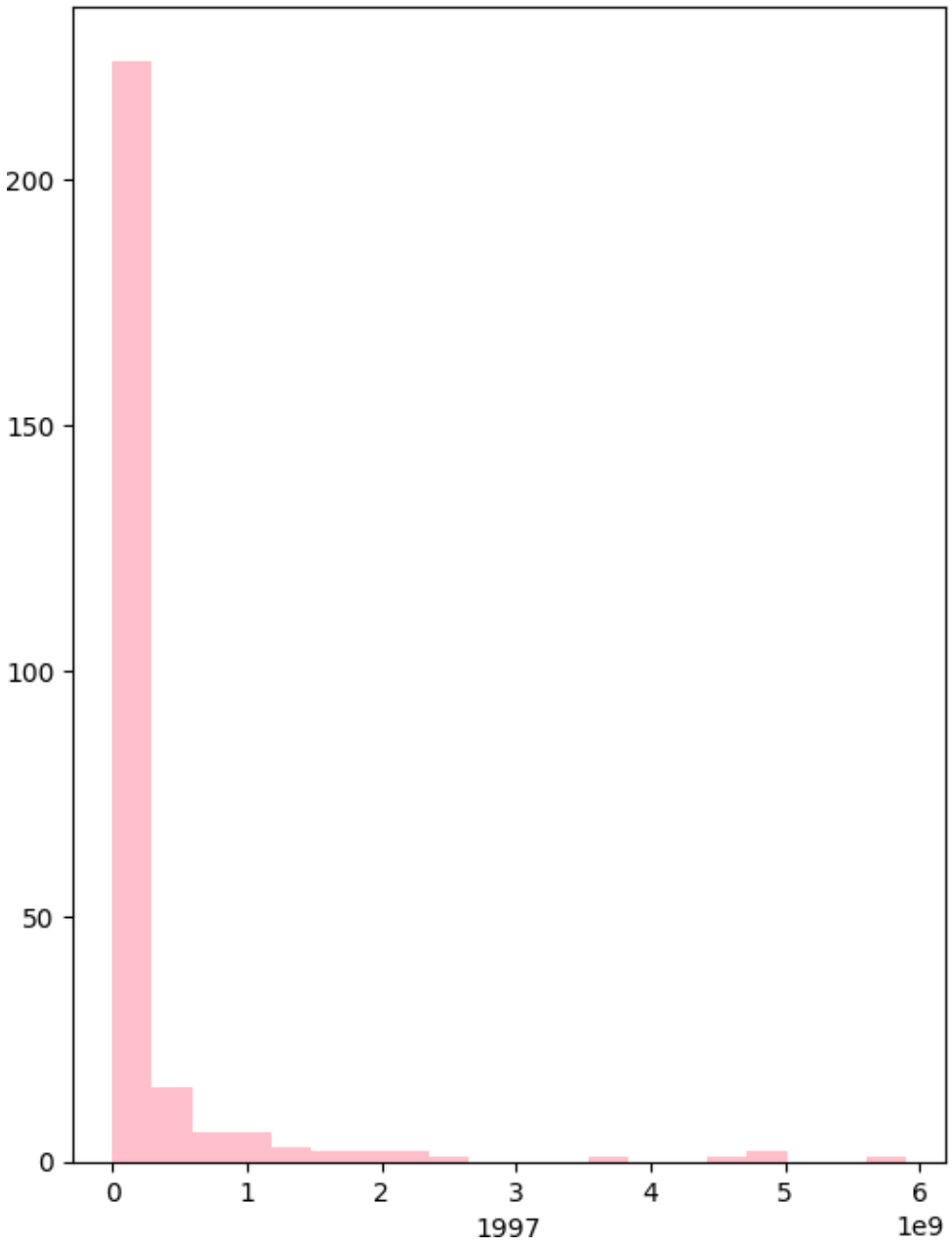
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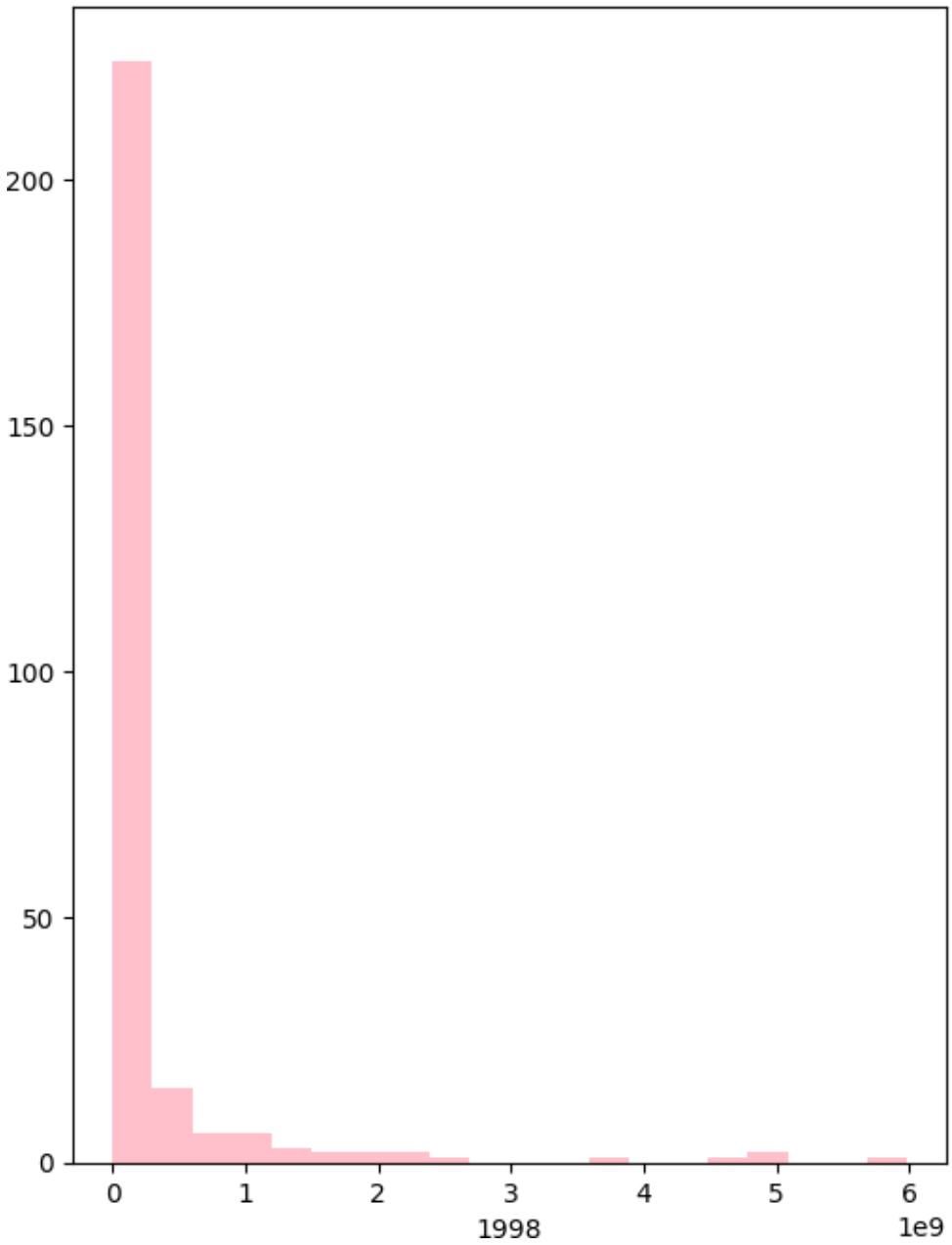
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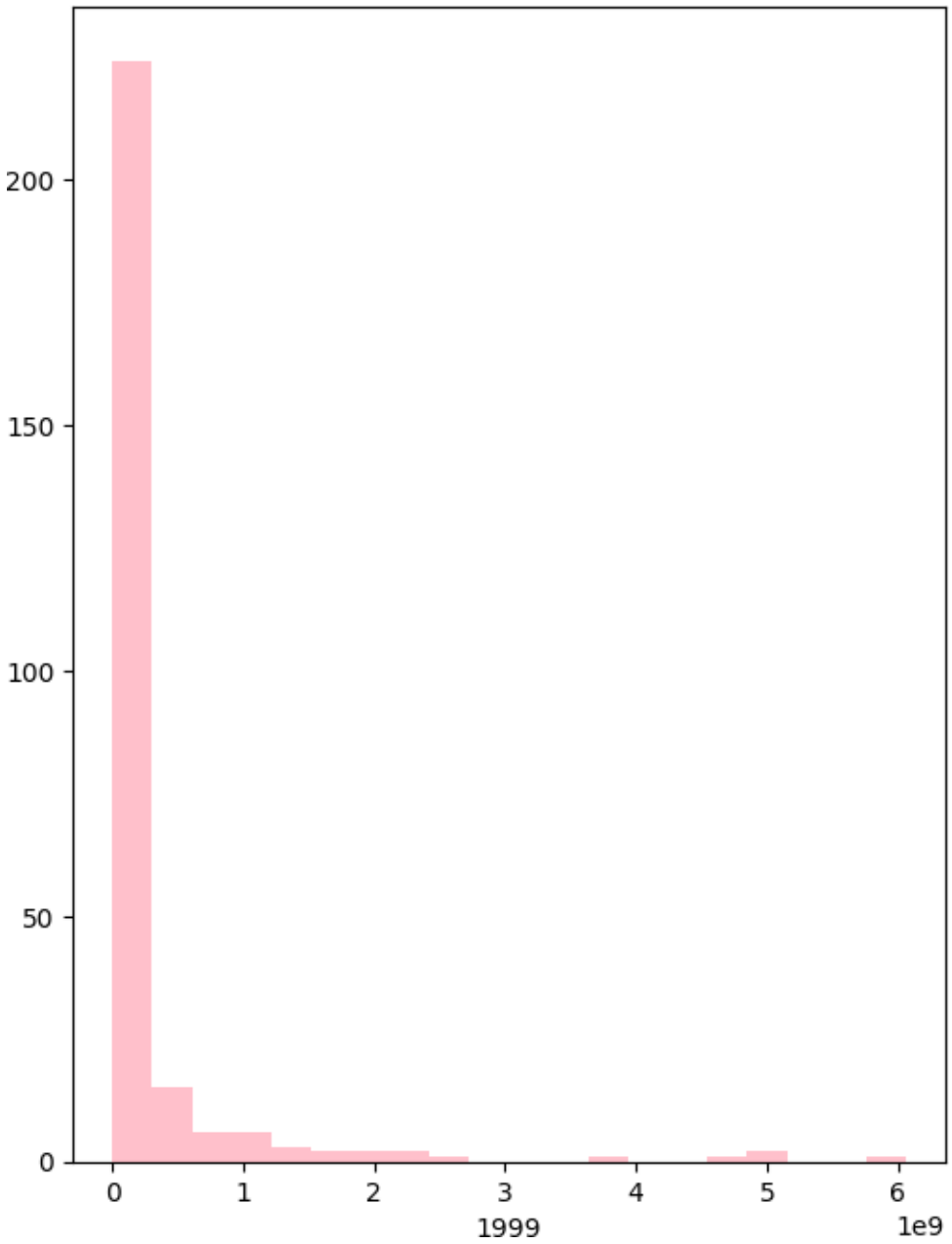
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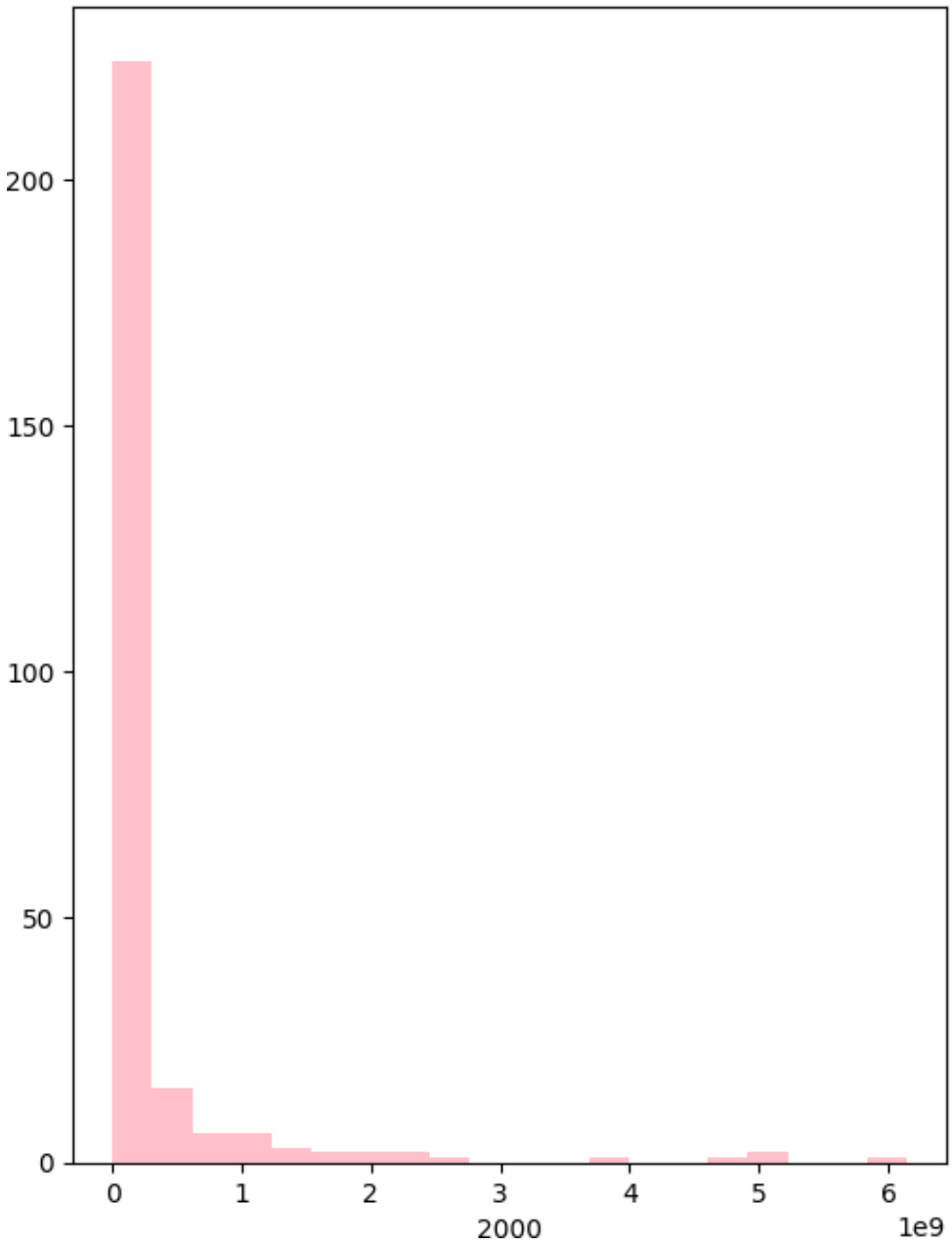
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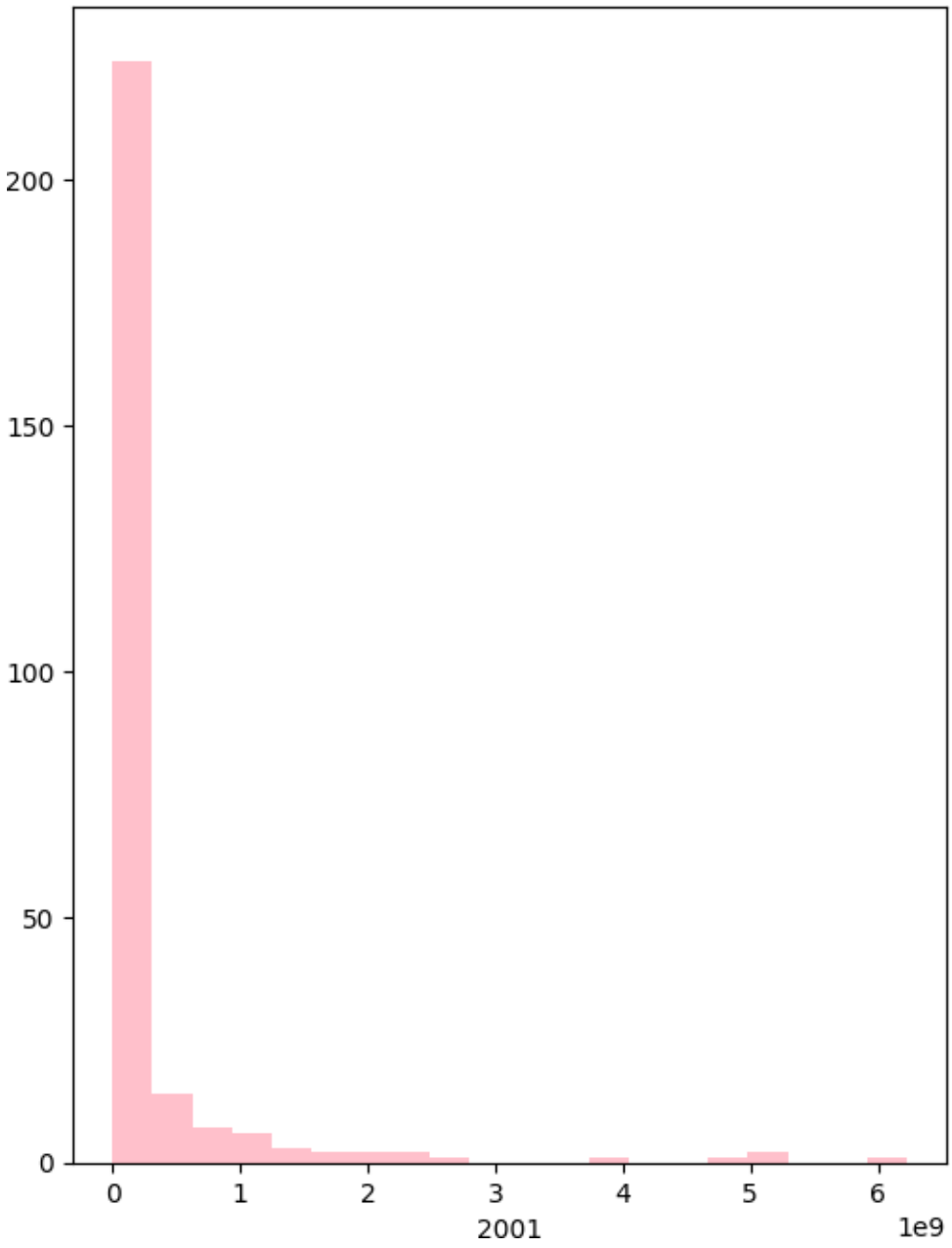
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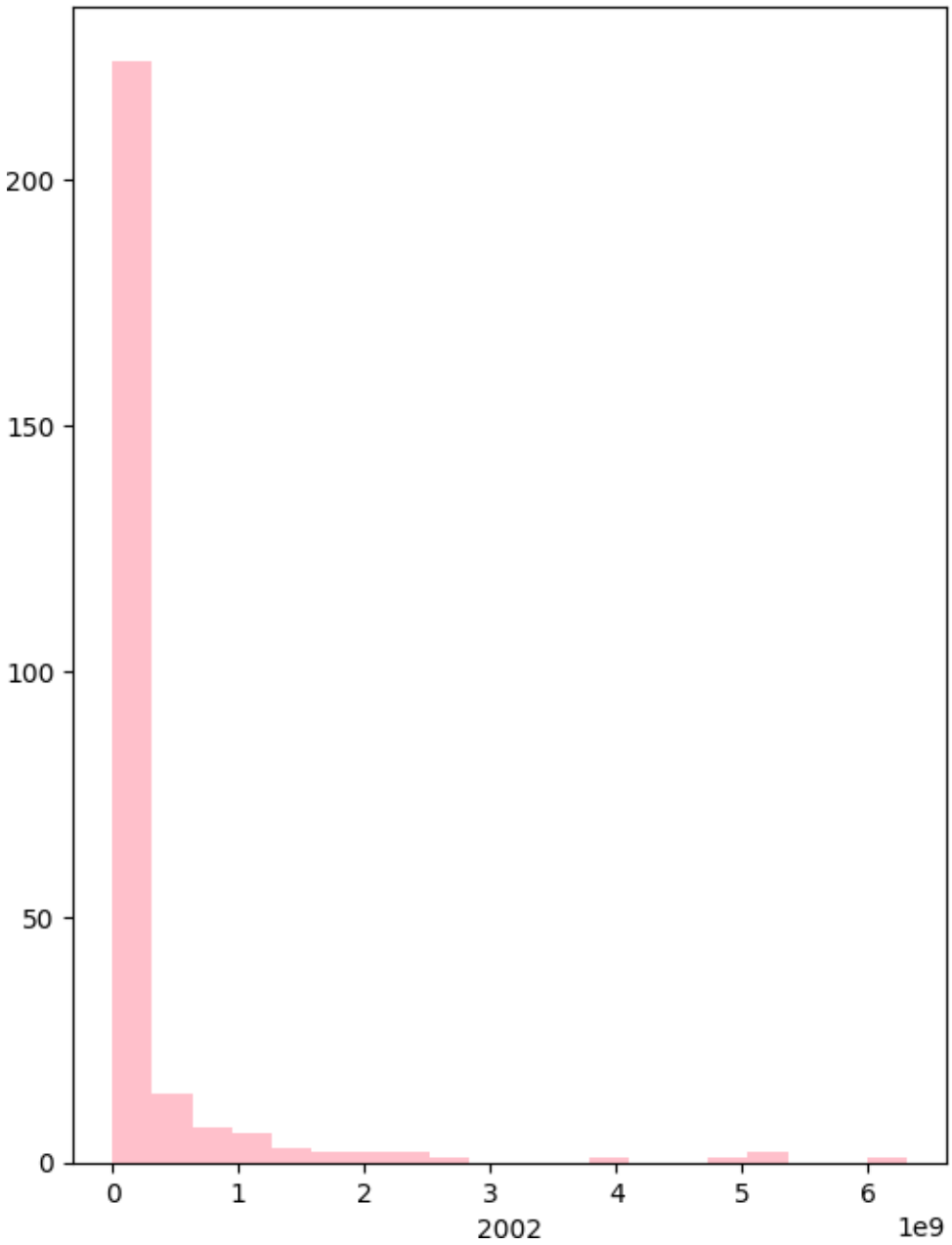
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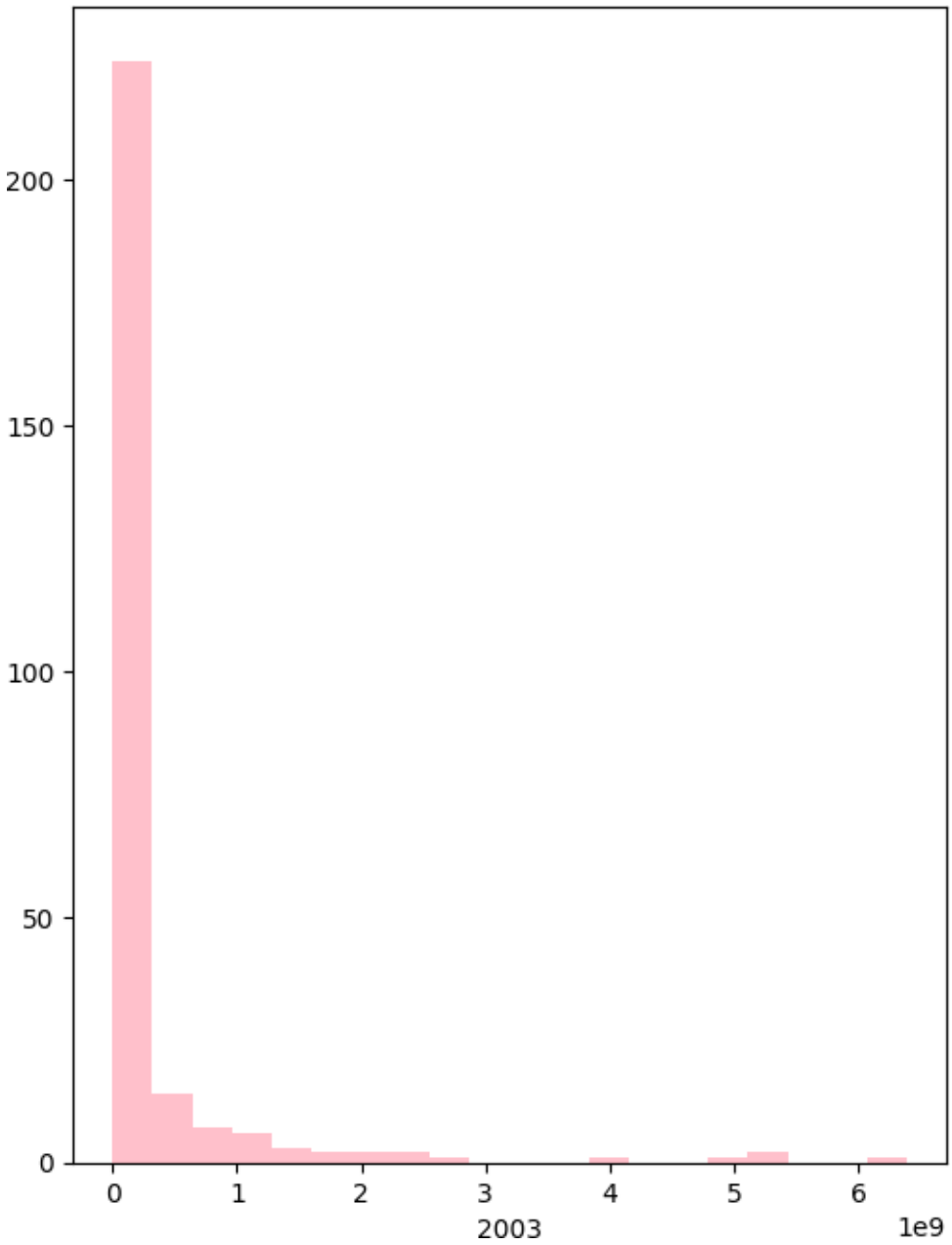
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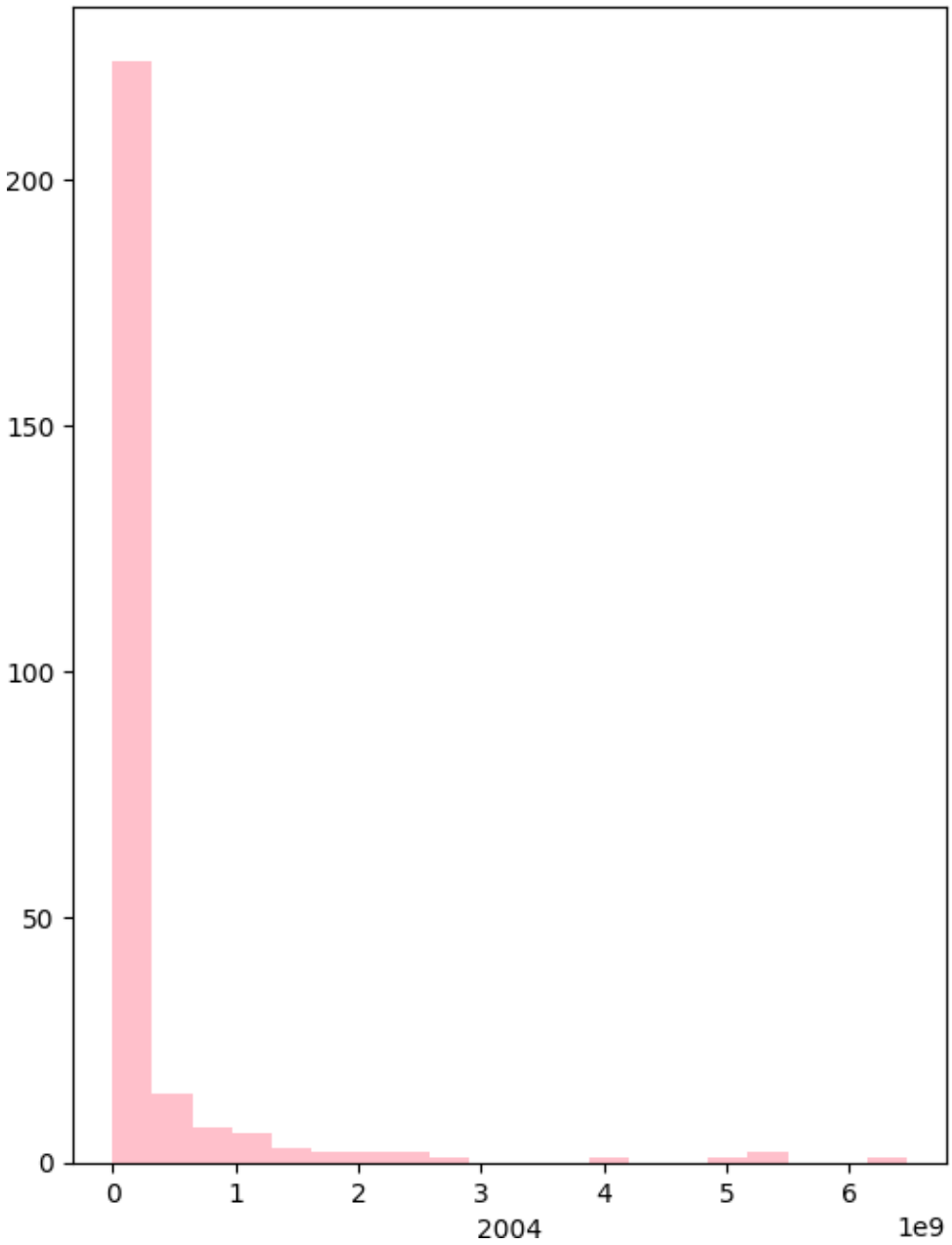
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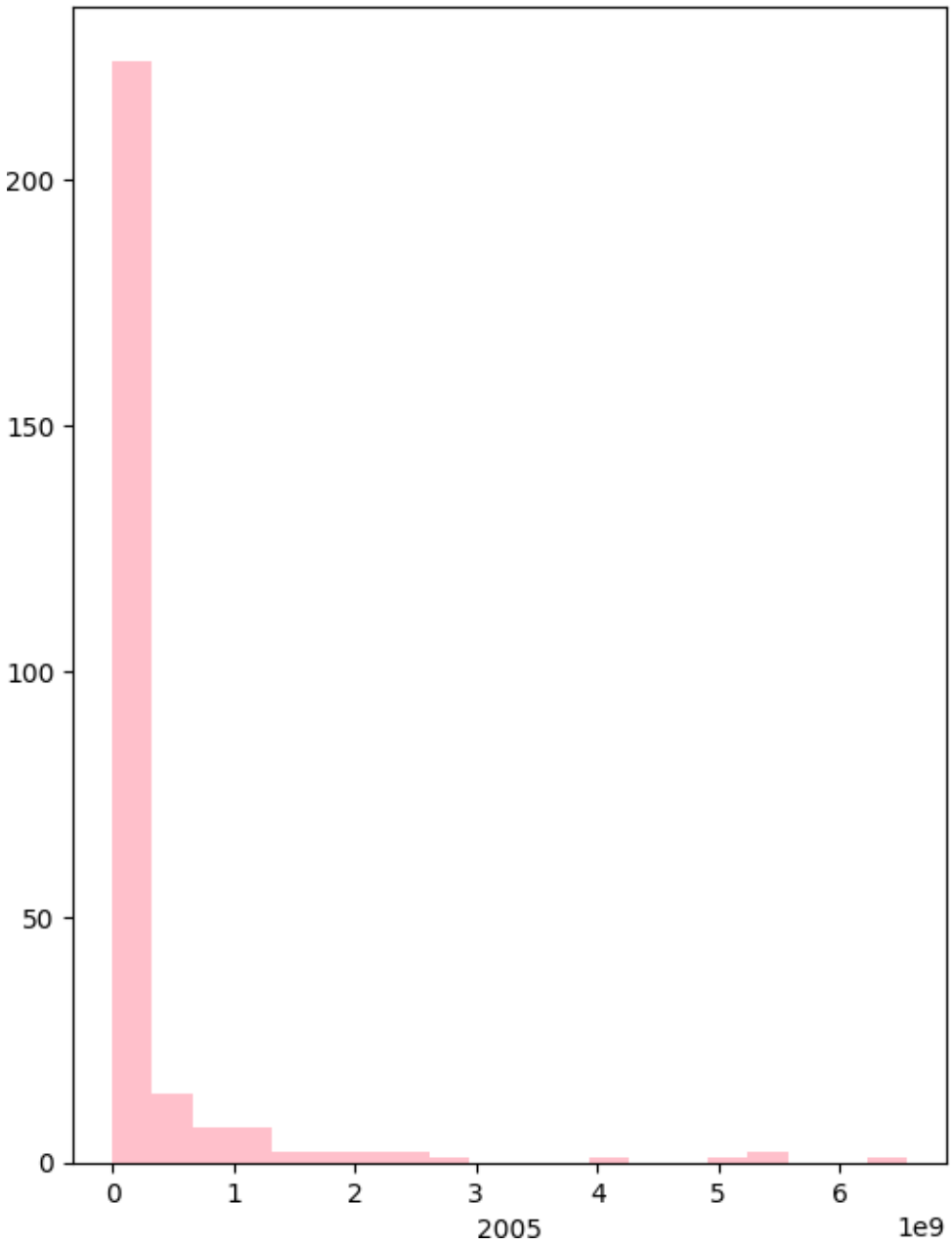
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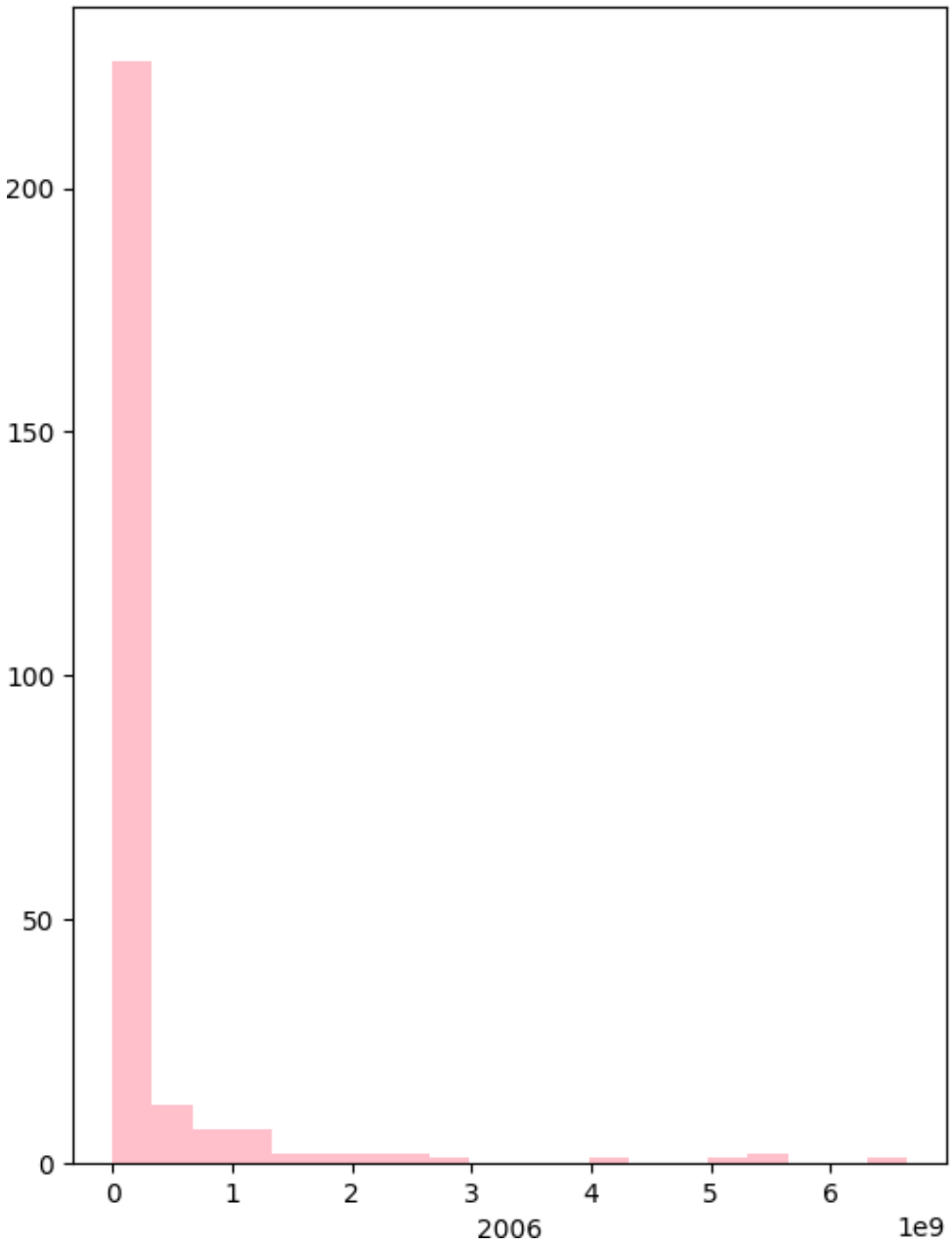
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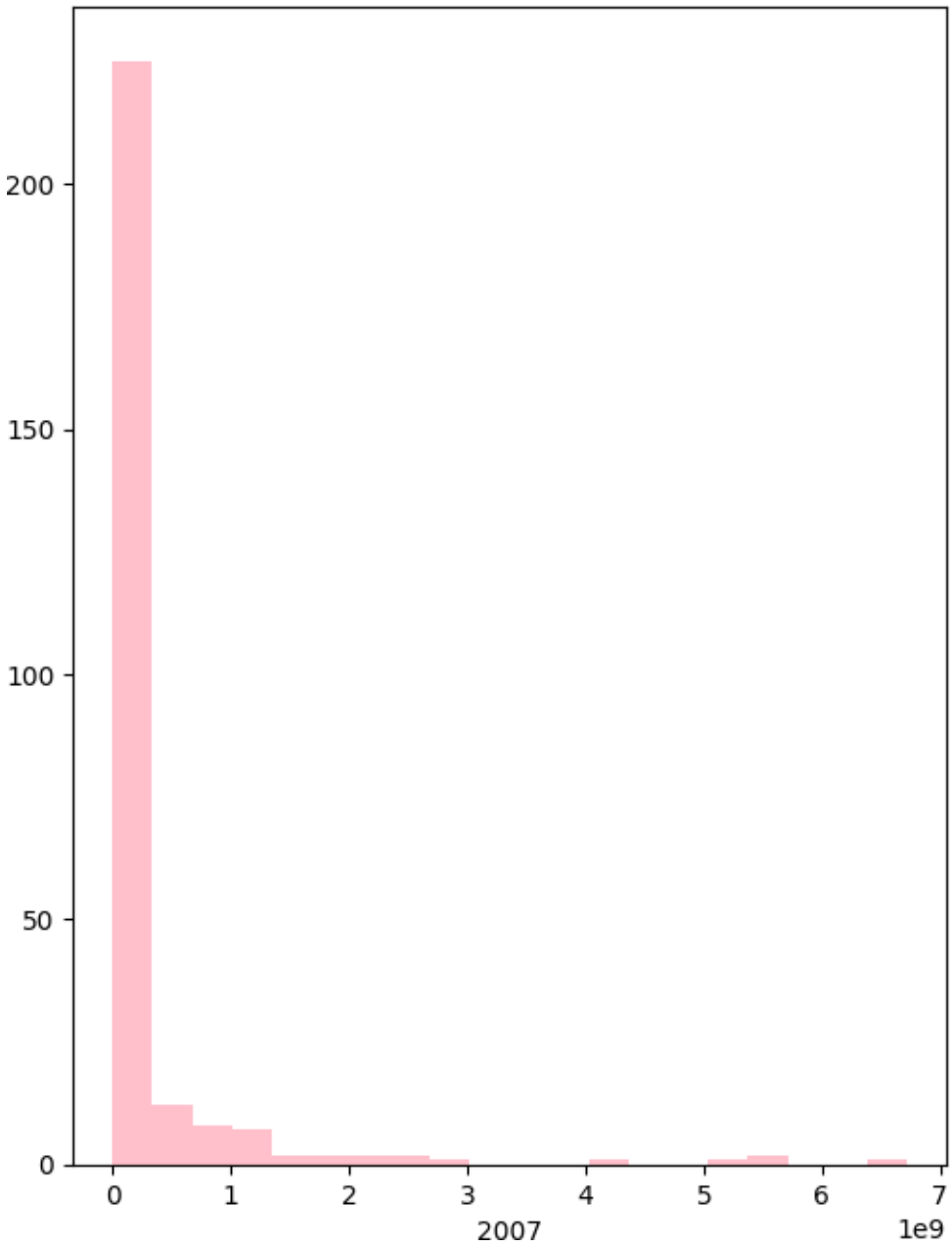
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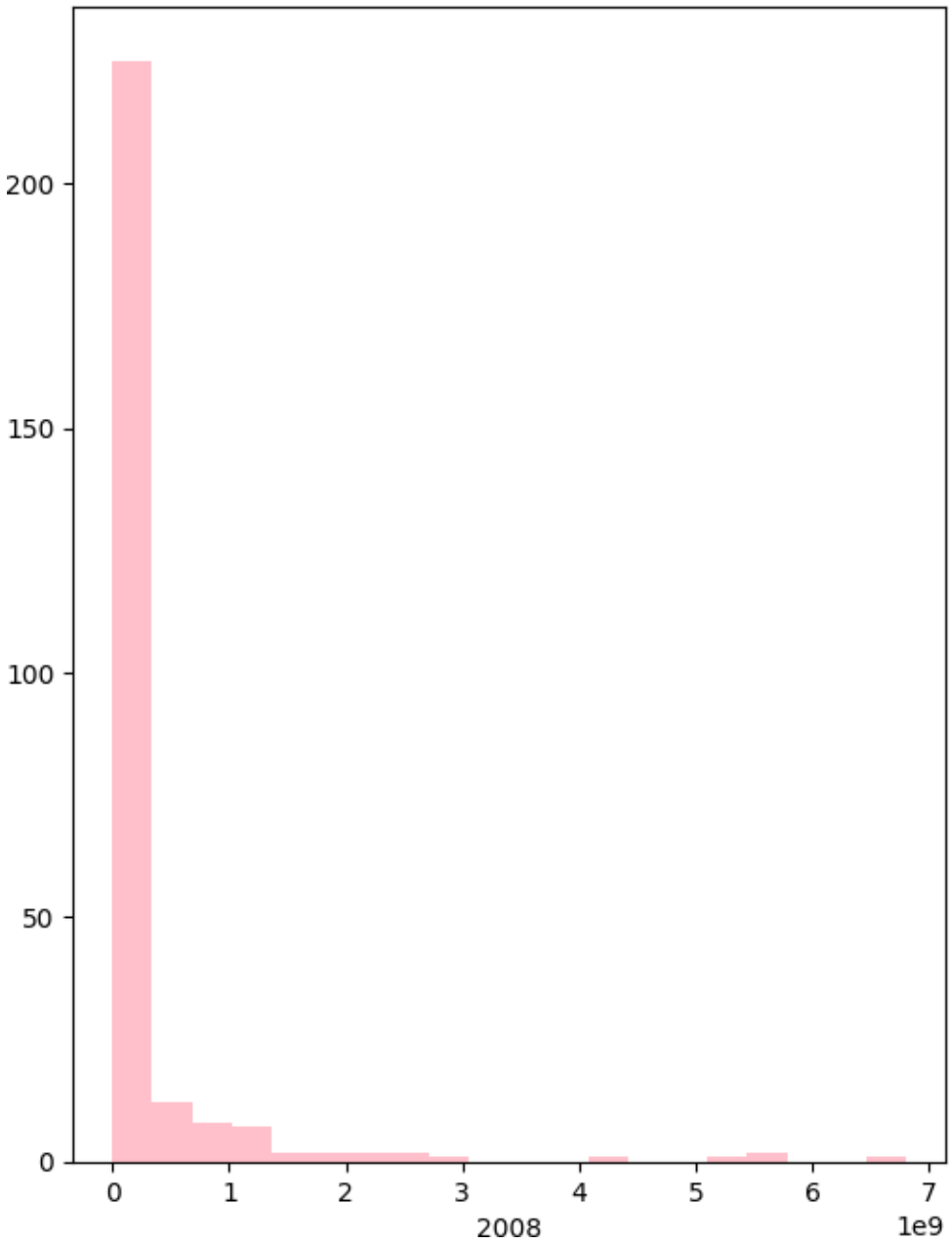
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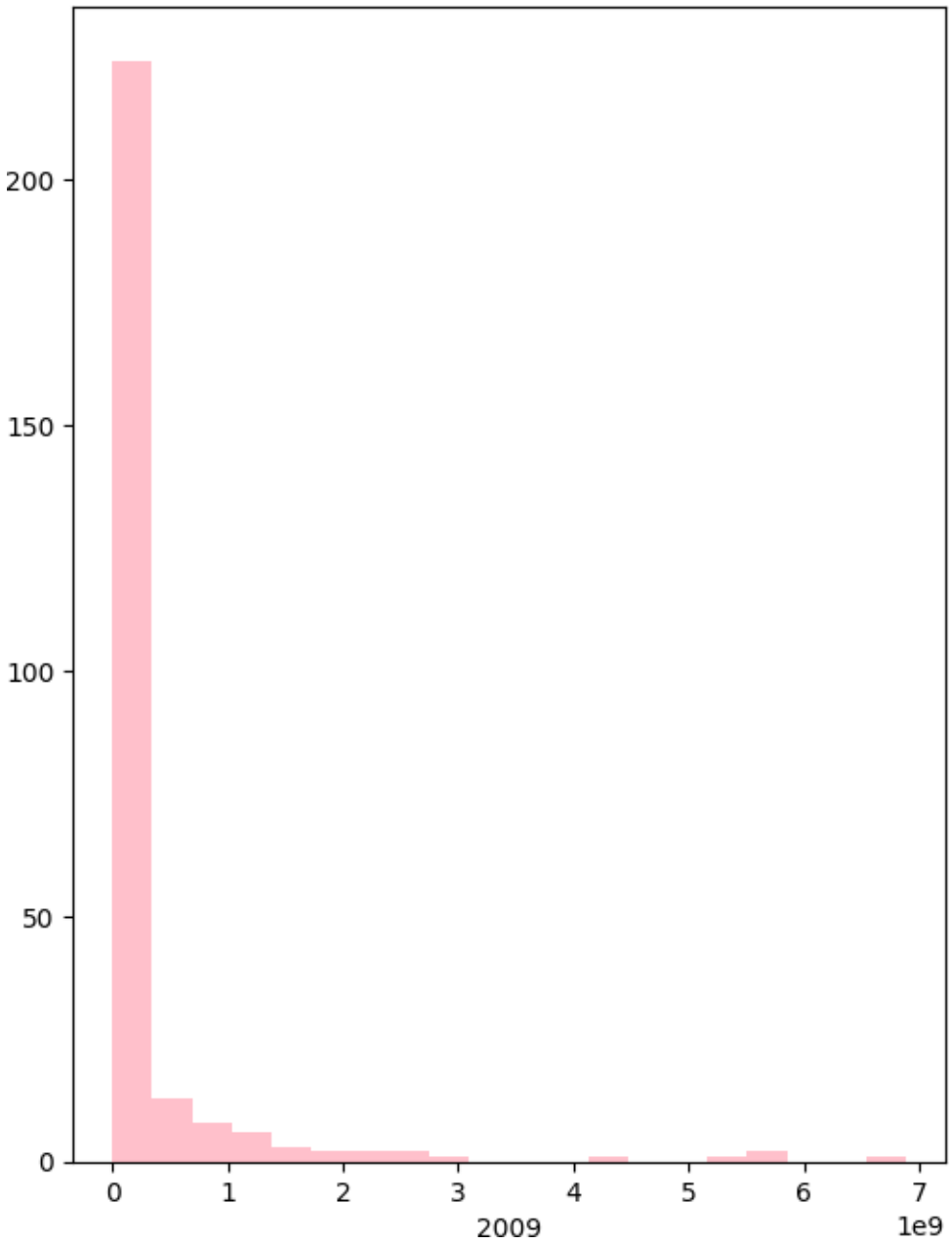
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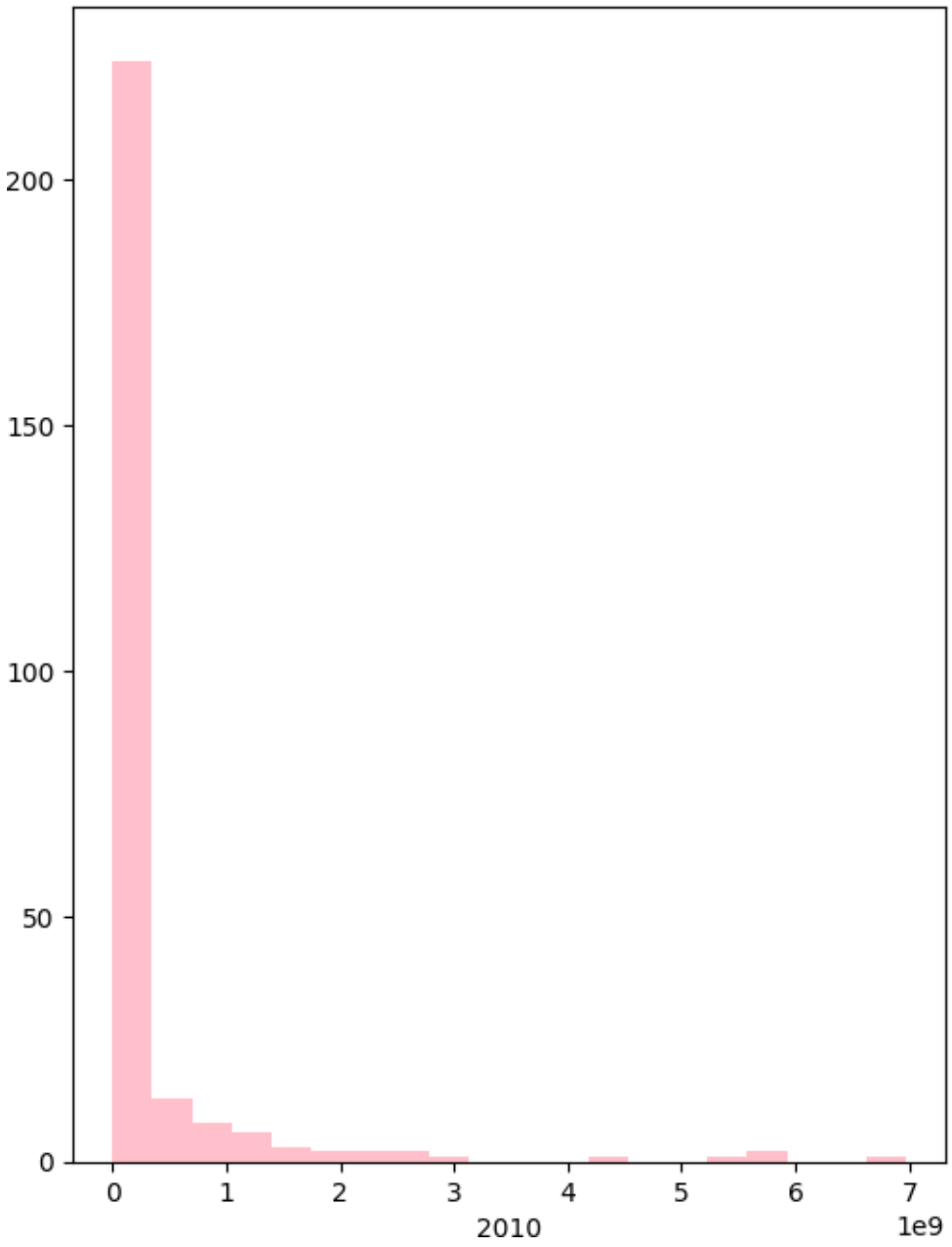
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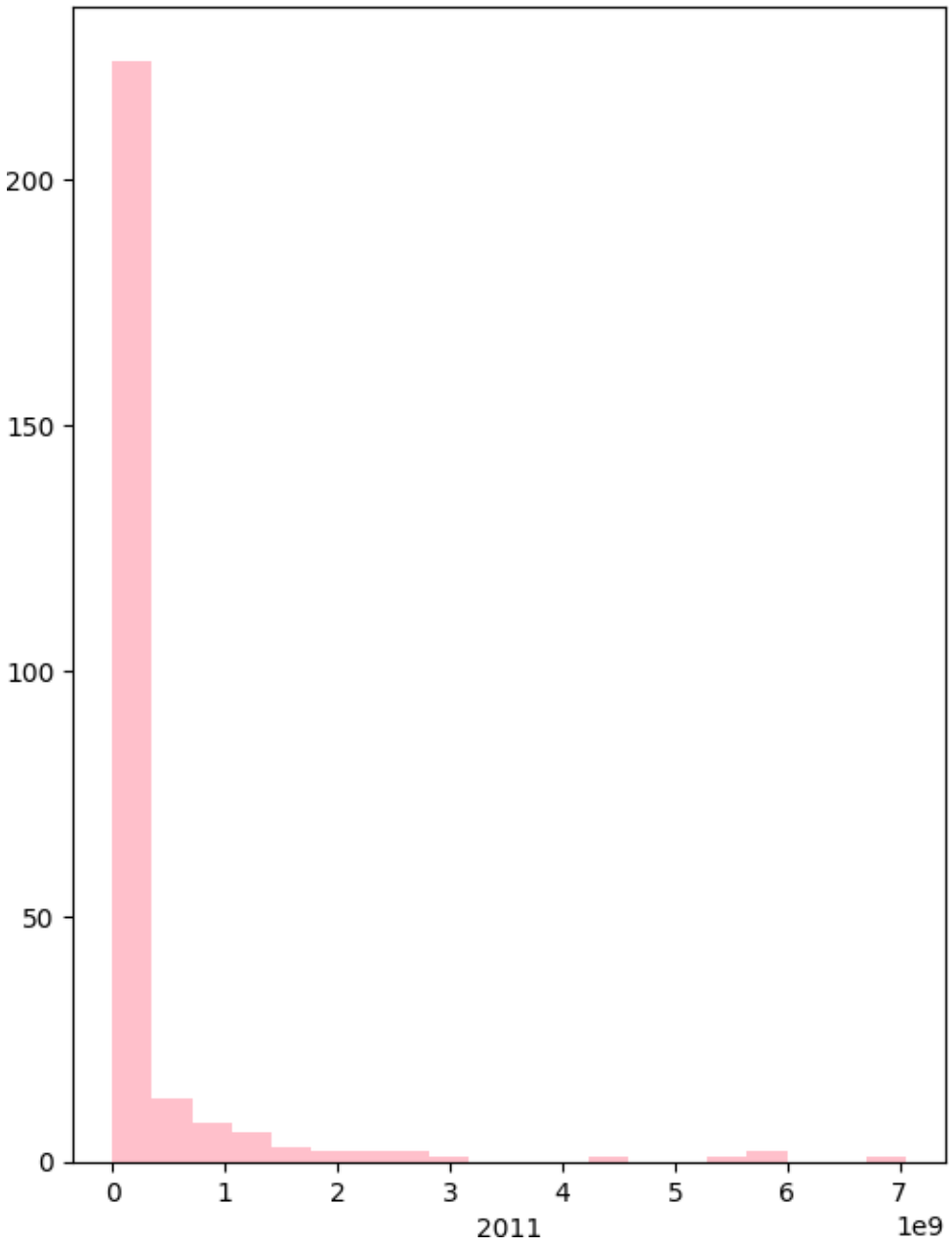
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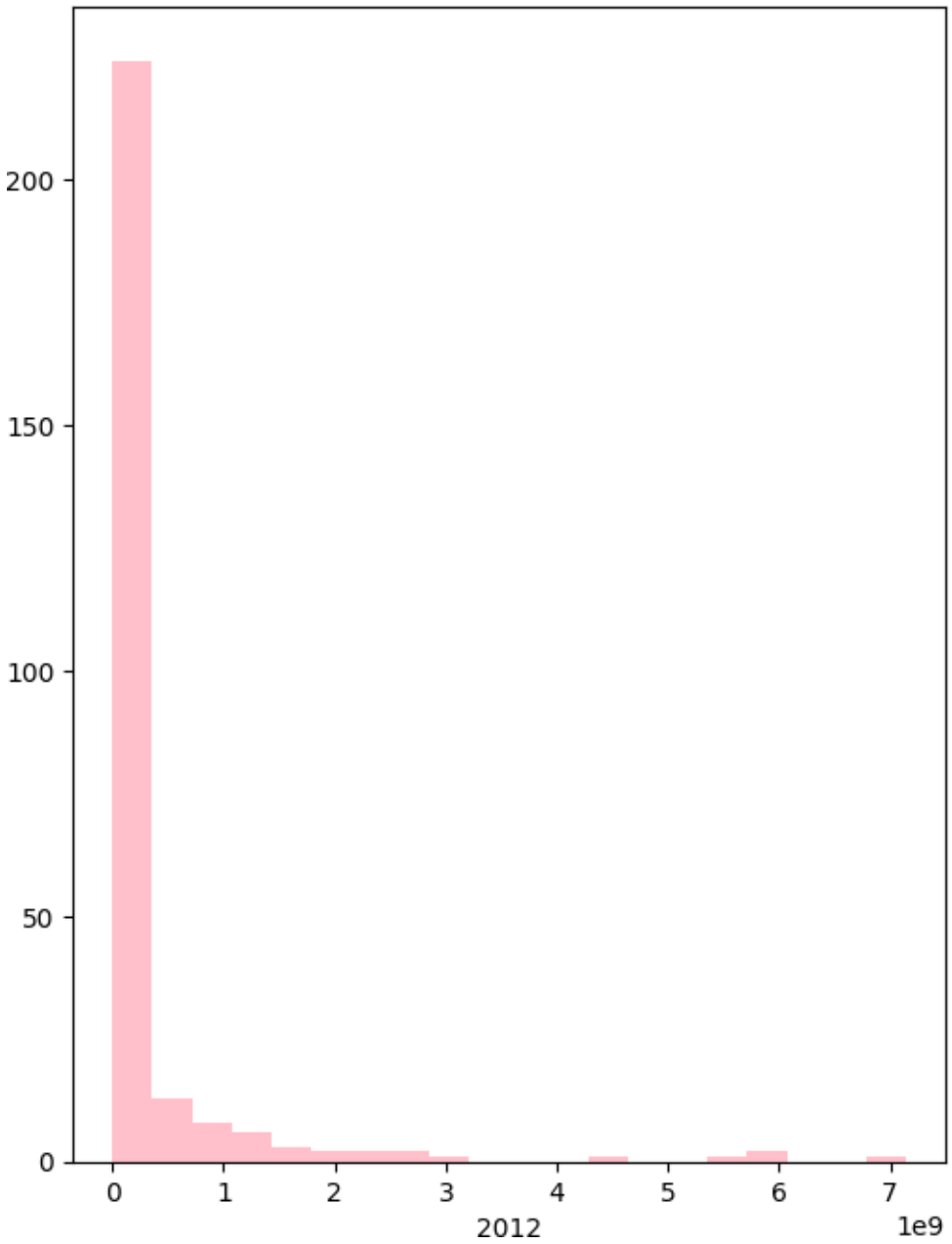
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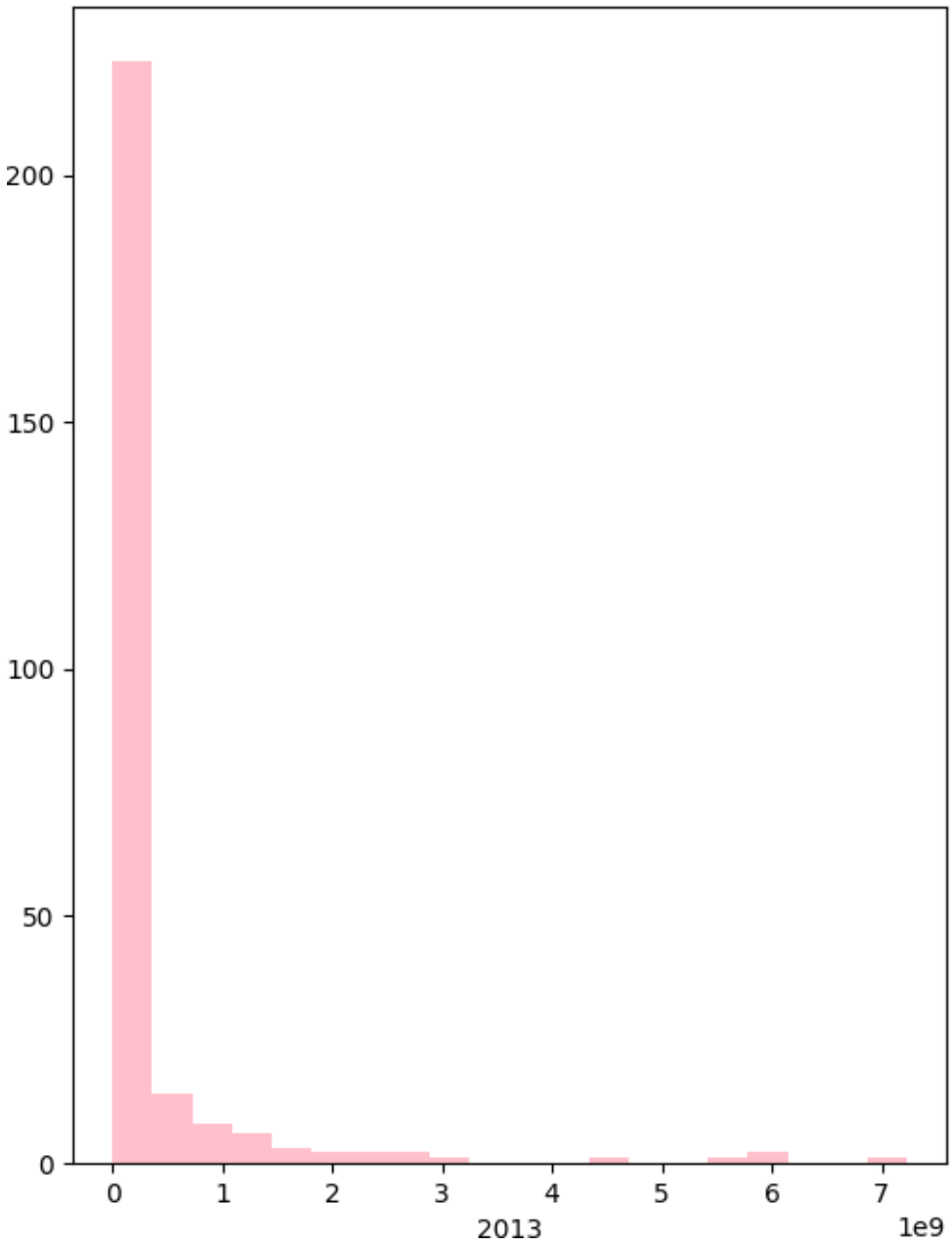
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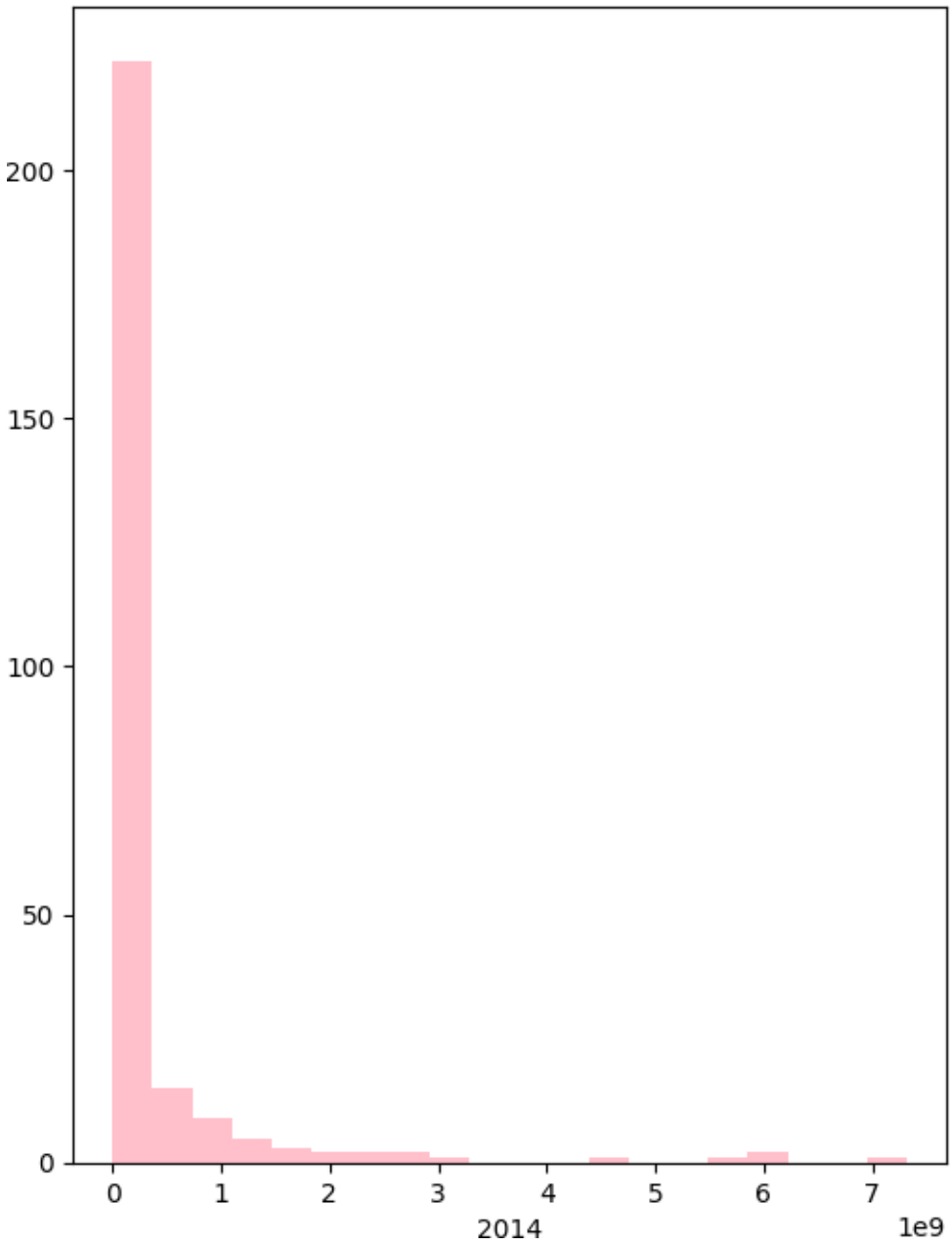
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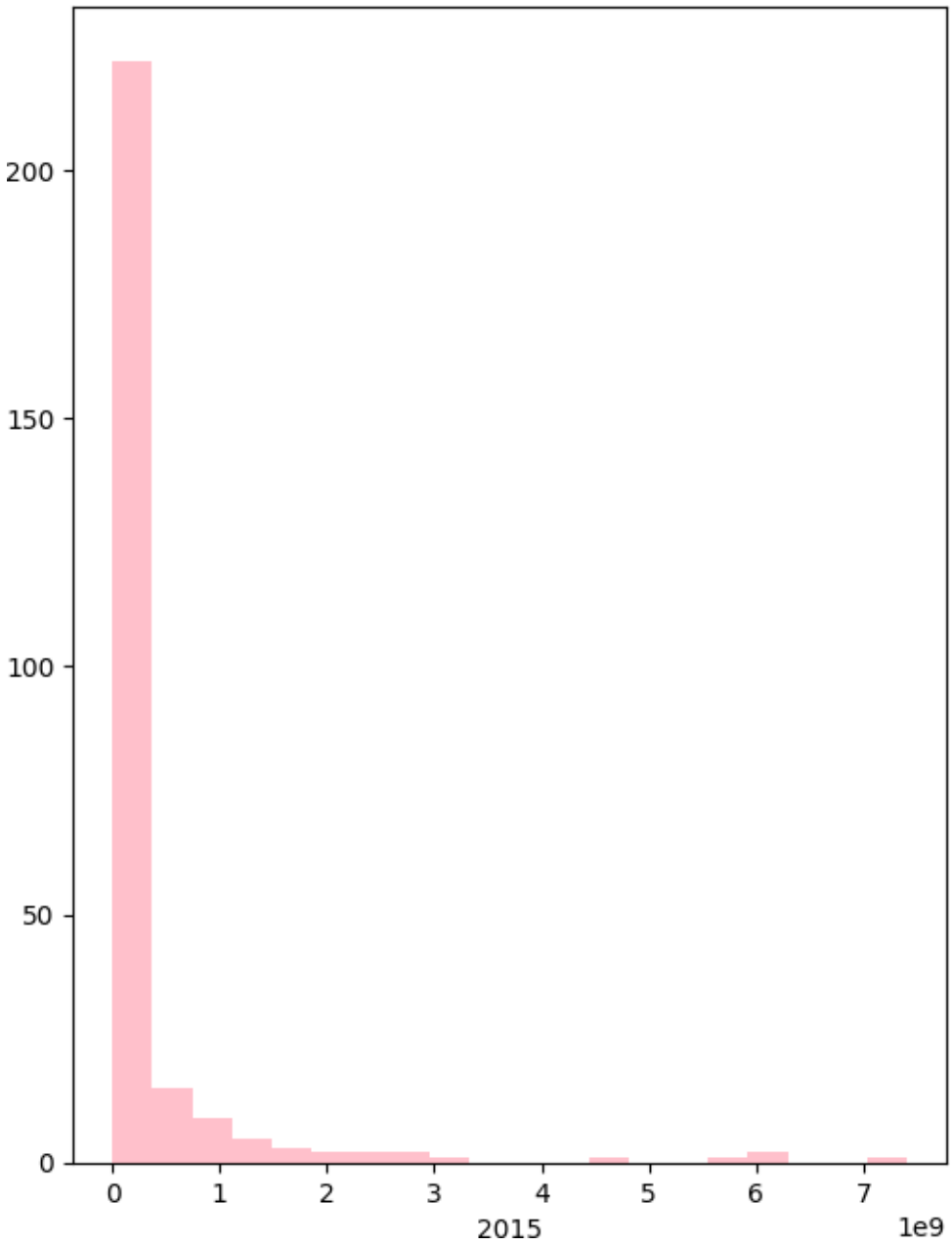
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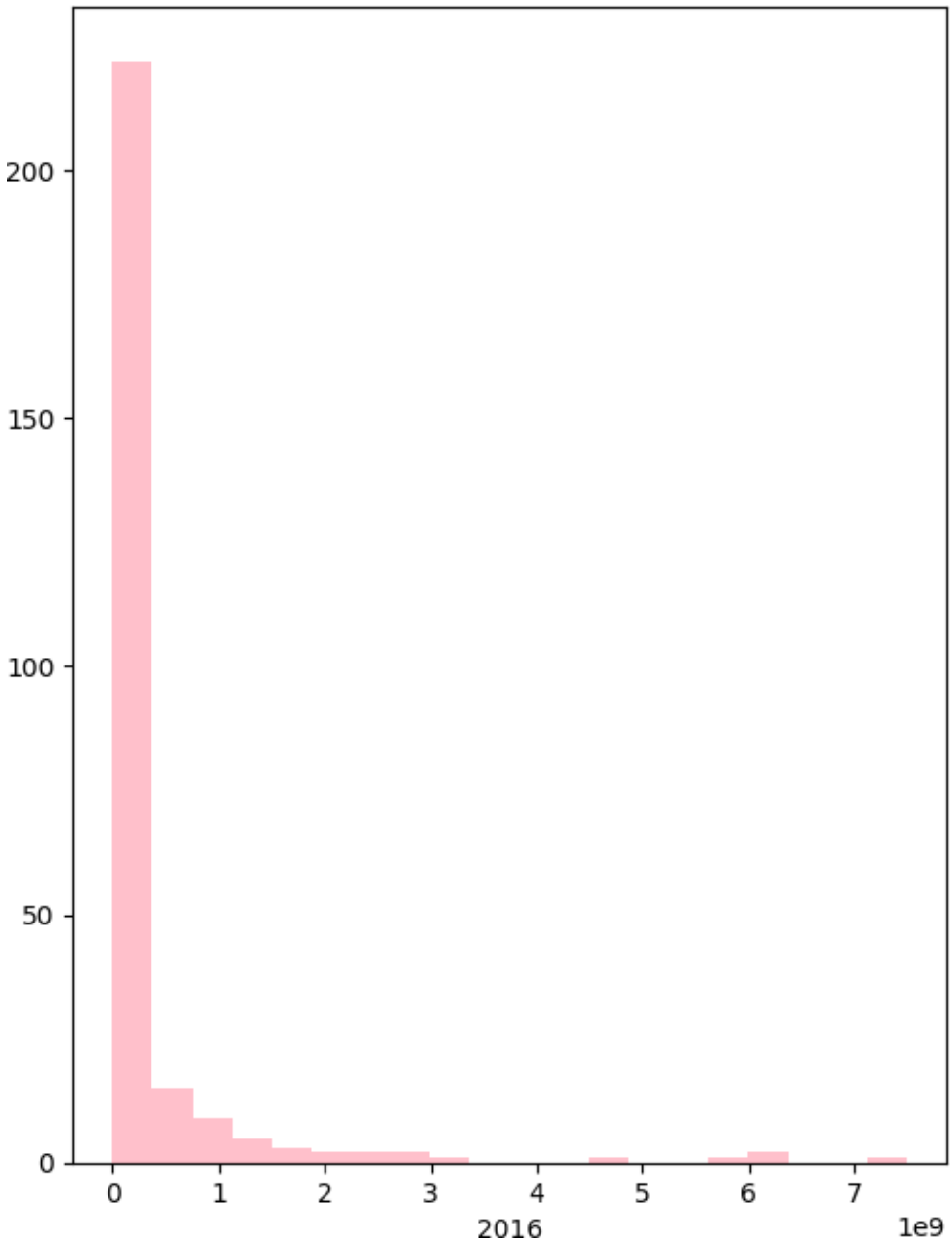
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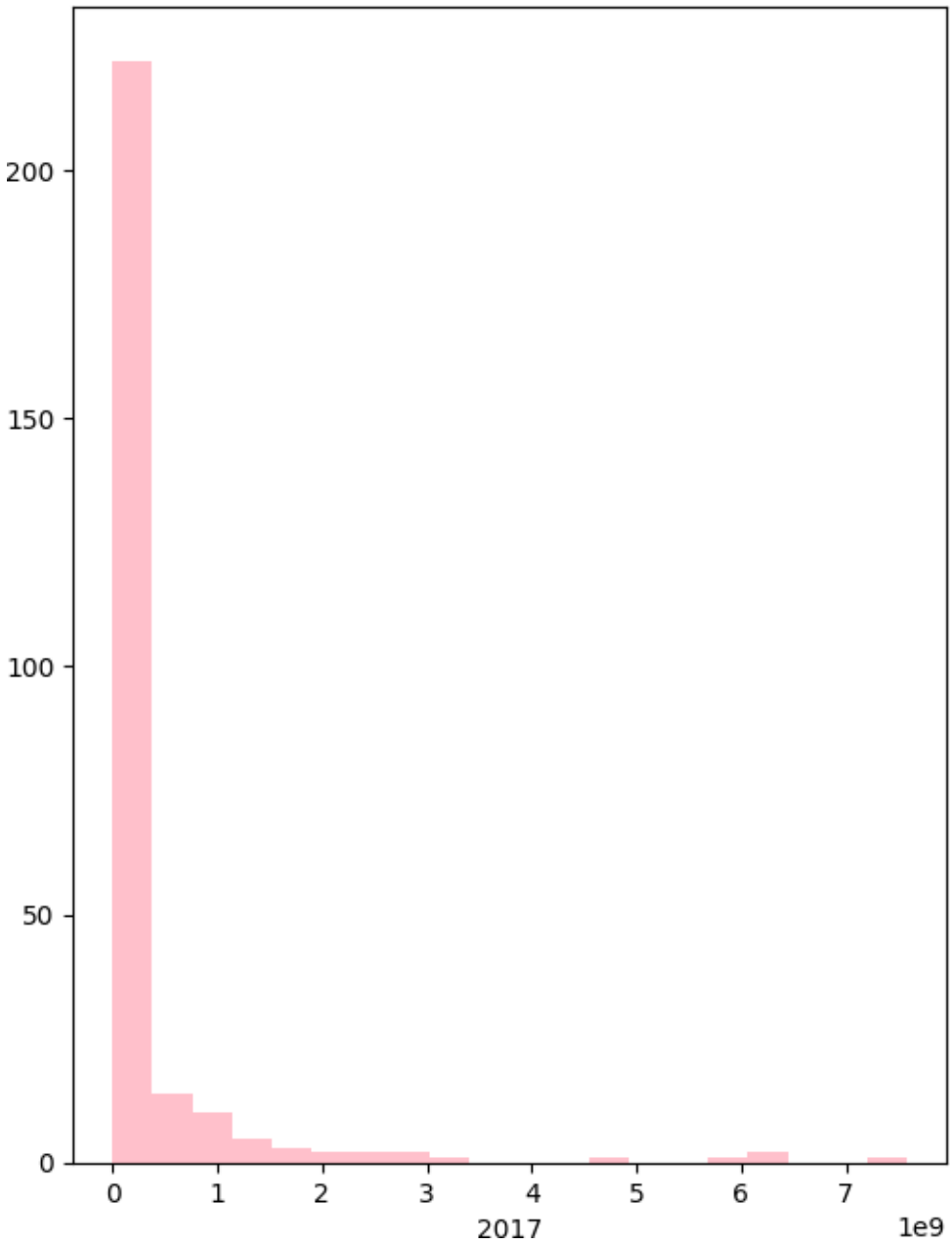
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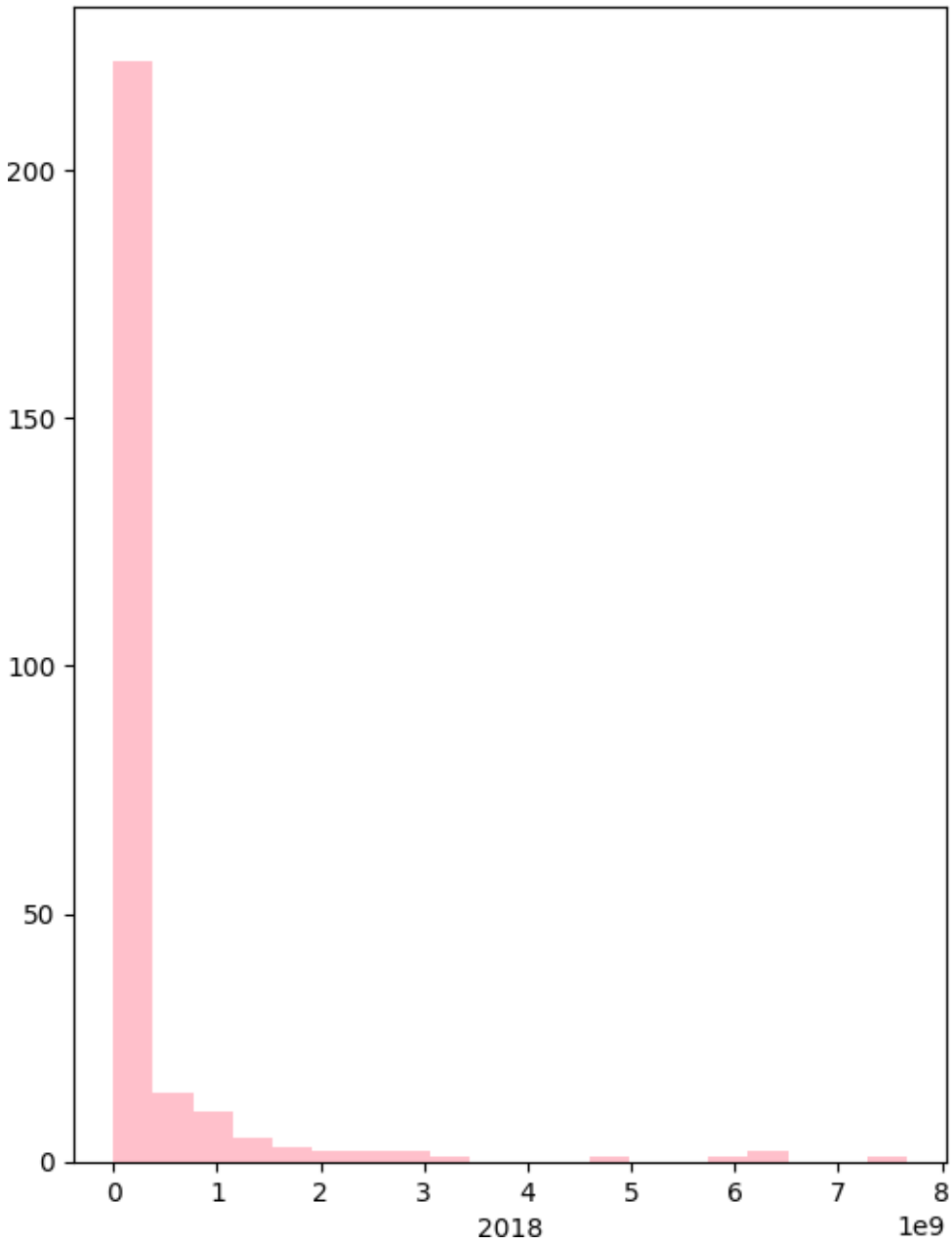
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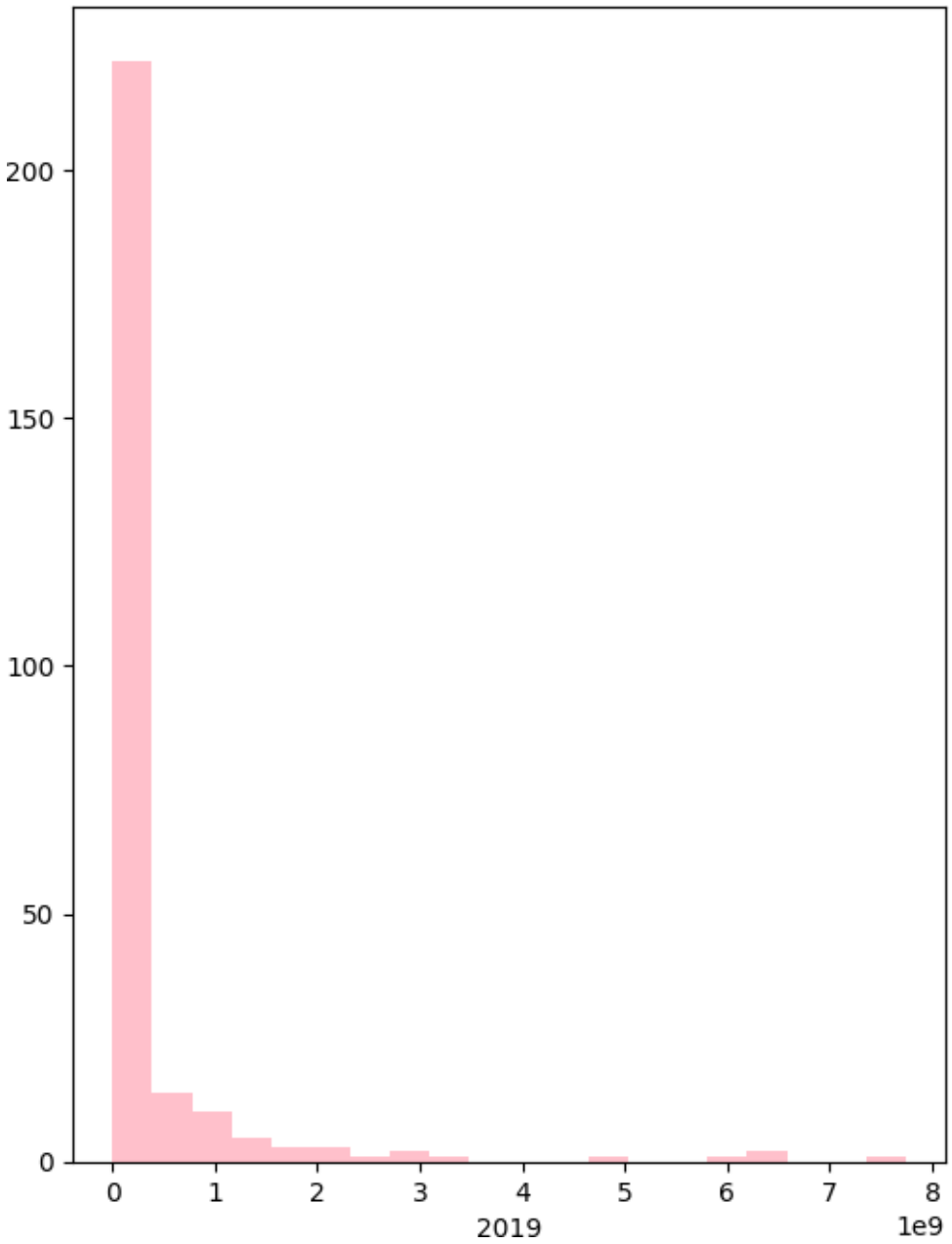
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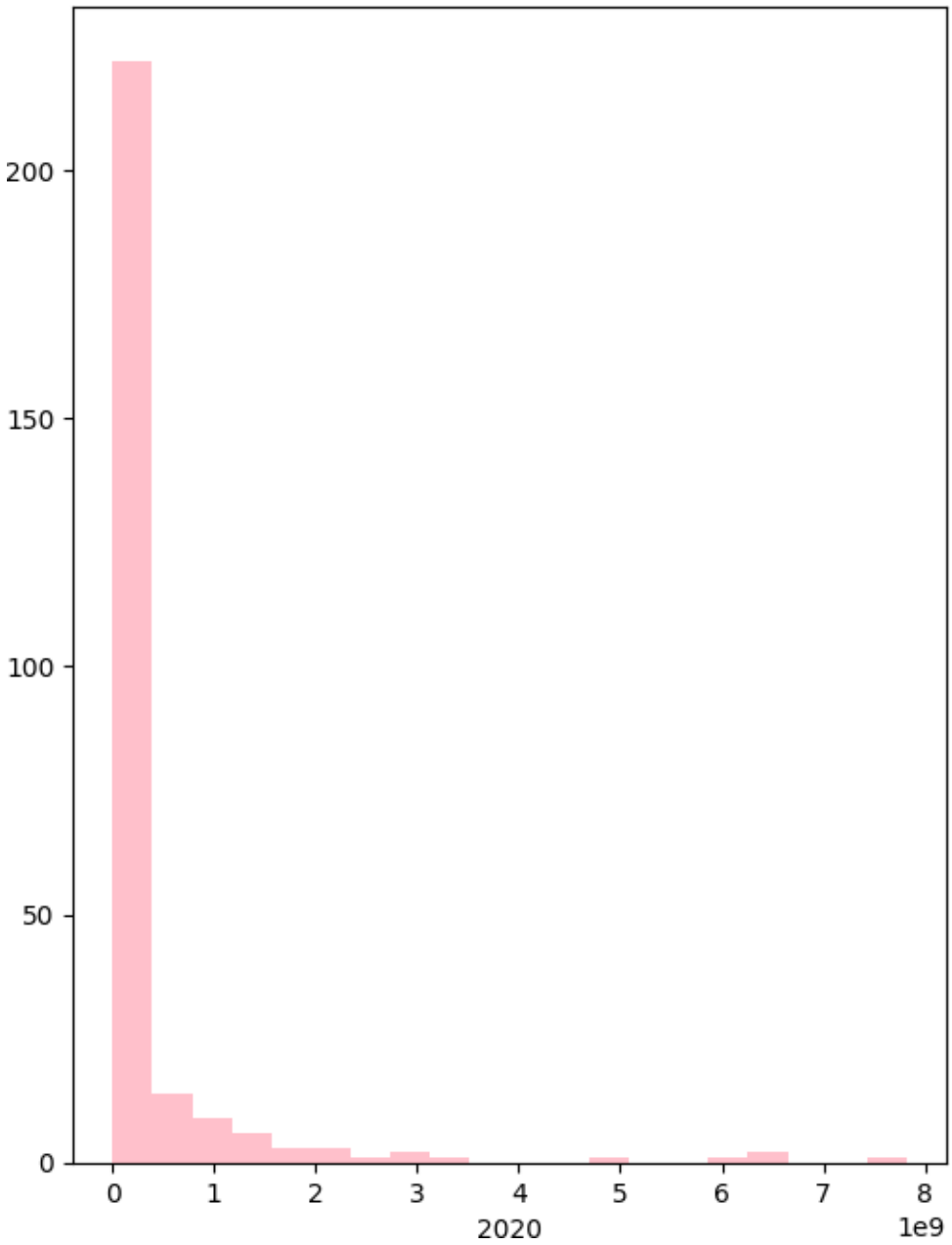
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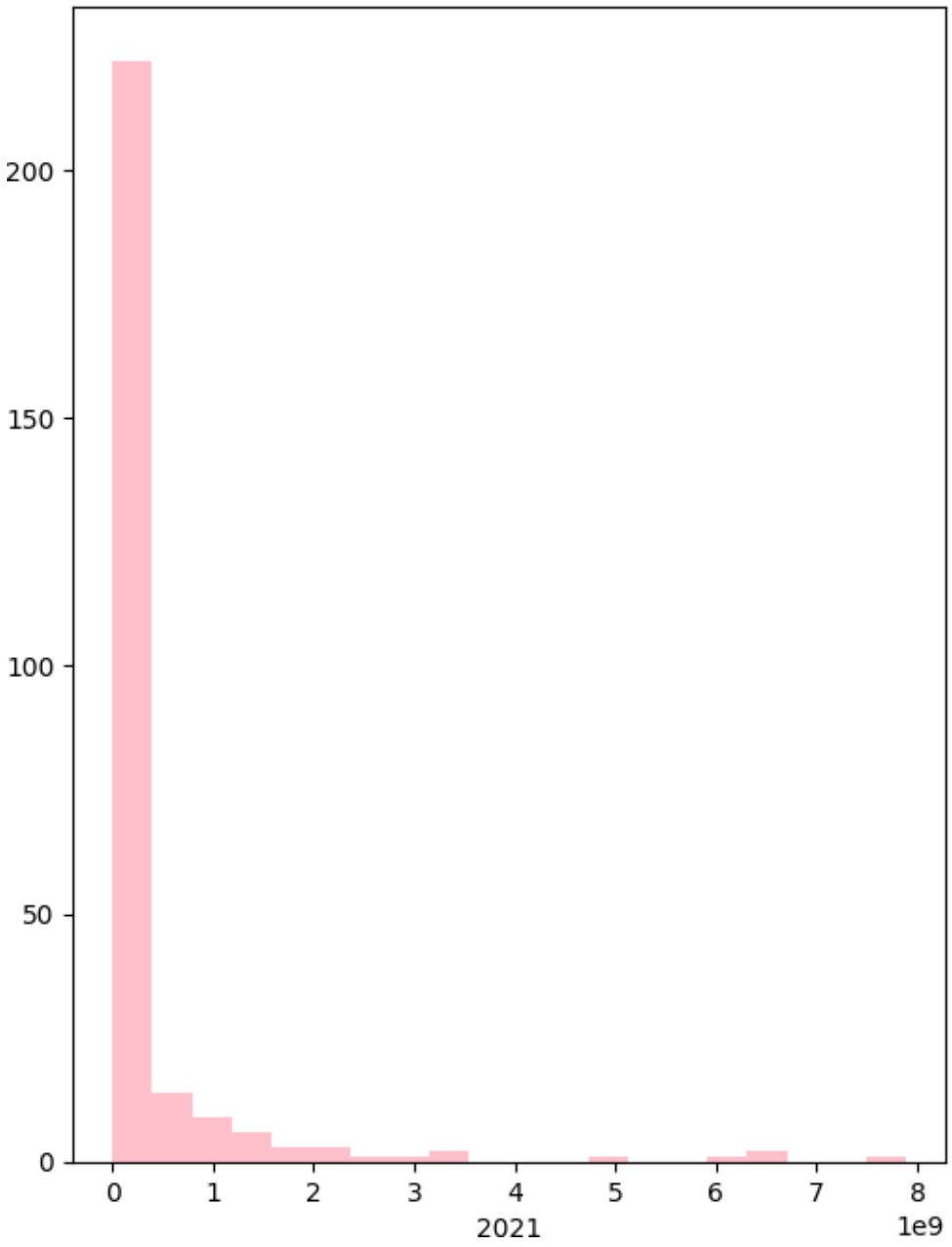
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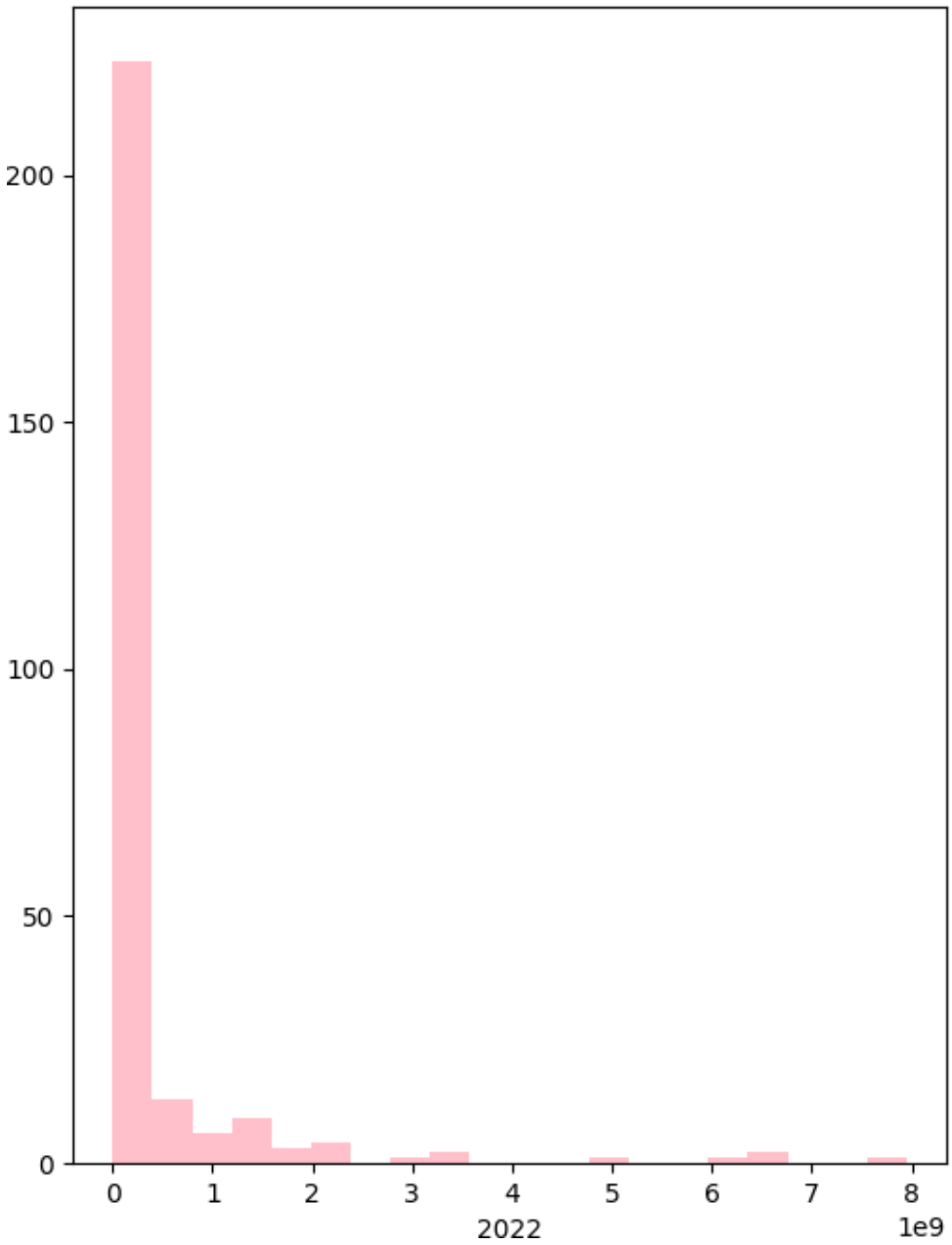
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