KITAVI DOUGLAS KIMANI

SCT211-0085/2022

```
import pandas as pd
```

```
dataset= pd.read_csv('my.csv')
```

```
dataset
```

```
{"type":"dataframe","variable_name":"dataset"}
```

```
dataset.head(30)
```

```
{"type":"dataframe","variable_name":"dataset"}
```

```
dataset.tail(10)
```

```
{"type":"dataframe"}
```

```
dataset.sample(40)
```

```
{"type":"dataframe"}
```

```
dataset.columns
```

```
Index(['ObjectId', 'Country', 'ISO2', 'ISO3', 'Indicator', 'Unit',
'Source',
       'CTS Code', 'CTS Name', 'CTS Full Descriptor', '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')
```

```
dataset.columns = ['ID', 'Country', 'ISO2', 'ISO3', 'Indicator',
'Unit', 'Source',
 'CTS_Code', 'CTS_Name', 'CTS_Full_Descriptor', '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'
]
```

```
dataset.describe()
```


```
{"type":"dataframe"}
```


```
my_columns = dataset.iloc[:, [1, 11, 16, 21, 26, 31, 36, 41, 46, 51,
56, 61, 66, 71]]
```

```
my_columns
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 225,\n
\"fields\": [\n    {\n      \"column\": \"Country\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 225,\n        \"samples\": [\n
\"Armenia, Rep. of\",\n          \"Spain\",\n          \"Maldives\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1962\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.3418123874389091,\n        \"min\": -0.908,\n        \"max\":
0.998,\n        \"num_unique_values\": 169,\n        \"samples\": [\n
0.093,\n          -0.118,\n          -0.776\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1967\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.3394841957312319,\n
\"min\": -1.048,\n        \"max\": 1.134,\n
\"num_unique_values\": 160,\n        \"samples\": [\n          -
0.159,\n          0.032,\n          -1.028\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1972\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.3844737091788439,\n
\"min\": -1.796,\n        \"max\": 0.933,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          0.304,\
n          -0.703,\n          -0.268\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.25342808077817564,\n
\"min\": -0.599,\n        \"max\": 1.079,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          -
0.039,\n          -0.022,\n          -0.279\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.31829855255580203,\n
\"min\": -0.682,\n        \"max\": 1.135,\n
\"num_unique_values\": 174,\n        \"samples\": [\n          0.238,\
n          0.709,\n          0.623\n        ],\n
```

```
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.47508396314884604,\n
\"min\": -1.652,\n        \"max\": 1.562,\n
\"num_unique_values\": 172,\n        \"samples\": [\n          0.368,\
n          0.505,\n          0.964\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5652350970020732,\n
\"min\": -1.344,\n        \"max\": 1.601,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          0.875,\
n          0.533,\n          0.807\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1997\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.4830883203093068,\n
\"min\": -0.429,\n        \"max\": 1.933,\n
\"num_unique_values\": 196,\n        \"samples\": [\n          0.079,\
n          1.321,\n          0.359\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.37852904375599056,\n
\"min\": 0.009,\n        \"max\": 2.255,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          1.135,\
n          1.13,\n          1.376\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2007\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5463201550082332,\n
\"min\": -0.219,\n        \"max\": 2.729,\n
\"num_unique_values\": 200,\n        \"samples\": [\n          0.547,\
n          1.08,\n          1.242\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.44211269170531653,\n
\"min\": -0.128,\n        \"max\": 2.144,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          0.533,\
n          0.795,\n          0.508\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2017\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.39399890441060664,\n
\"min\": 0.017,\n        \"max\": 2.493,\n
\"num_unique_values\": 194,\n        \"samples\": [\n          0.79,\n
1.124,\n          1.184\n        ],\n        \"semantic_type\": \"\",\
n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"2022\",\n      \"properties\": {\n        \"dtype\":
\"number\",\n        \"std\": 0.6692789604244717,\n        \"min\": -
1.305,\n        \"max\": 3.243,\n        \"num_unique_values\": 206,\n
\"samples\": [\n          1.216,\n          1.707,\n          1.074\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    }\n  ]\n}","type":"dataframe","variable_name":"my_columns"}
```

```
my_columns.describe()
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 8,\n
\"fields\": [\n    {\n      \"column\": \"1962\",\n
\"properties\": {\n        \"dtype\": \"number\",\n        \"std\":
66.80791808693246,\n        \"min\": -0.908,\n        \"max\": 189.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.01347619047619048,\n          -0.056,\n          189.0\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1967\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
67.53527830500084,\n        \"min\": -1.048,\n        \"max\": 191.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.11083246073298428,\n          -0.146,\n          191.0\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1972\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
67.92137580160988,\n        \"min\": -1.796,\n        \"max\": 192.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.08490625,\n          -0.045,\n          192.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 65.33820846769545,\n
\"min\": -0.599,\n        \"max\": 185.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.1658162162162162,\n          0.182,\n          185.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 67.80739834083896,\n
\"min\": -0.682,\n        \"max\": 192.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.17649479166666668,\n          0.181,\n          192.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 67.07211253384104,\n
\"min\": -1.652,\n        \"max\": 190.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.405021052631579,\n          0.491,\n          190.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 73.4486350743146,\n
\"min\": -1.344,\n        \"max\": 208.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.2364903846153846,\n          0.2985,\n          208.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1997\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 72.97889741647639,\n
\"min\": -0.429,\n        \"max\": 207.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.5439951690821256,\n          0.547,\n          207.0\n        ],\n
```

```
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 74.64205429898776,\n
\"min\": 0.009,\n        \"max\": 212.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.9249999999999998,\n          0.84,\n          212.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2007\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 76.3771649102675,\n
\"min\": -0.219,\n        \"max\": 217.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.0225483870967744,\n          0.921,\n          217.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 75.71665953709281,\n
\"min\": -0.128,\n        \"max\": 215.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.9022232558139536,\n          0.808,\n          215.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2017\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 75.2585459050908,\n
\"min\": 0.017,\n        \"max\": 214.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.2807850467289719,\n          1.282,\n          214.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2022\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 74.90859590103369,\n
\"min\": -1.305,\n        \"max\": 213.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.382112676056338,\n          1.315,\n          213.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    }\n  ]\n}","type":"dataframe"}
```


MEASURING CENTRE TENDENCY

```
from pandas.api.types import is_numeric_dtype

for col in my_columns.columns:
  if is_numeric_dtype(my_columns[col]):
    print('%s:'%(col))
    print('\t Mean = %.2f'% my_columns[col].mean())
    print('\t Standard Deviation=%.2f'%my_columns[col].std())
    print('\t Minimum Value =%.2f'%my_columns[col].min())
    print('\t Maximum Value =%.2f'%my_columns[col].max())
```

```
1962:
      Mean = -0.01
      Standard Deviation=0.34
```

```
      Minimum Value =-0.91
      Maximum Value =1.00
1967:
      Mean = -0.11
      Standard Deviation=0.34
      Minimum Value =-1.05
      Maximum Value =1.13
1972:
      Mean = -0.08
      Standard Deviation=0.38
      Minimum Value =-1.80
      Maximum Value =0.93
1977:
      Mean = 0.17
      Standard Deviation=0.25
      Minimum Value =-0.60
      Maximum Value =1.08
1982:
      Mean = 0.18
      Standard Deviation=0.32
      Minimum Value =-0.68
      Maximum Value =1.14
1987:
      Mean = 0.41
      Standard Deviation=0.48
      Minimum Value =-1.65
      Maximum Value =1.56
1992:
      Mean = 0.24
      Standard Deviation=0.57
      Minimum Value =-1.34
      Maximum Value =1.60
1997:
      Mean = 0.54
      Standard Deviation=0.48
      Minimum Value =-0.43
      Maximum Value =1.93
2002:
      Mean = 0.92
      Standard Deviation=0.38
      Minimum Value =0.01
      Maximum Value =2.25
2007:
      Mean = 1.02
      Standard Deviation=0.55
      Minimum Value =-0.22
      Maximum Value =2.73
2012:
      Mean = 0.90
```

```
      Standard Deviation=0.44
      Minimum Value =-0.13
      Maximum Value =2.14
2017:
      Mean = 1.28
      Standard Deviation=0.39
      Minimum Value =0.02
      Maximum Value =2.49
2022:
      Mean = 1.38
      Standard Deviation=0.67
      Minimum Value =-1.30
      Maximum Value =3.24
```

```
my_columns.value_counts()
```

```
Country                        1962    1967    1972    1977    1982
1987    1992    1997    2002    2007    2012    2017    2022
Afghanistan, Islamic Rep. of   -0.164  -0.371  -1.124   0.513  -0.346
0.391  -0.294   0.471  1.365   0.675   0.223  1.540   2.012    1
Namibia                        -0.051  -0.159   0.033   0.200   0.431
1.100   0.658   0.048  0.918   0.997  -0.128  0.818   0.239    1
Netherlands, The               -0.908   0.757  -0.116   0.159   0.470
-0.503   1.184   0.611  1.526   2.074   1.149  1.731   2.601    1
New Caledonia                   0.081   0.032  -0.207   0.159   0.194
0.069   0.467   0.549  1.030   1.146   0.870  1.768   2.421    1
New Zealand                     0.581  -0.184   0.119  -0.388  -0.062
0.397  -0.716  -0.128  0.420   0.237   0.125  0.627   1.319    1

..
Greenland                       0.842  -0.371  -0.841   0.760  -0.642
-0.121  -1.228   0.391  1.186   1.363   1.625  1.210   1.413    1
Grenada                         0.053  -0.233  -0.117  -0.127   0.085
0.442   0.388   0.630  0.627   0.678   0.584  0.920   0.698    1
Guadeloupe                      0.048  -0.238  -0.147   0.074   0.099
0.589   0.401   0.510  0.695   0.921   0.671  0.907   0.773    1
Guatemala                      -0.131  -0.366   0.429   0.225   0.457
0.310   0.445   0.710  0.556   0.597   0.520  1.069   0.916    1
Zimbabwe                        0.237  -0.043  -0.397   0.433   0.170
1.070   1.010  -0.025  0.487   0.127   0.334  0.088  -0.490    1
Length: 166, dtype: int64
```

```
my_columns['1977'].value_counts()
```

```
 0.076    3
 0.203    2
 0.337    2
 0.236    2
 0.394    2
         ..
```

```
 0.489    1
-0.144    1
 0.330    1
 0.760    1
 0.433    1
Name: 1977, Length: 167, dtype: int64
```

```
my_columns.describe(include='all')
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 11,\n
\"fields\": [\n    {\n      \"column\": \"Country\",\n
\"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 3,\n        \"samples\": [\n          \"225\",\
n          \"Afghanistan, Islamic Rep. of\",\n          \"1\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1962\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
66.80791808693246,\n        \"min\": -0.908,\n        \"max\": 189.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.01347619047619048,\n          -0.056,\n          189.0\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1967\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
67.53527830500084,\n        \"min\": -1.048,\n        \"max\": 191.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.11083246073298428,\n          -0.146,\n          191.0\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1972\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
67.92137580160988,\n        \"min\": -1.796,\n        \"max\": 192.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.08490625,\n          -0.045,\n          192.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 65.33820846769545,\n
\"min\": -0.599,\n        \"max\": 185.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.1658162162162162,\n          0.182,\n          185.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 67.80739834083896,\n
\"min\": -0.682,\n        \"max\": 192.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.17649479166666668,\n          0.181,\n          192.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 67.07211253384104,\n
\"min\": -1.652,\n        \"max\": 190.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.405021052631579,\n          0.491,\n          190.0\n        ],\n
```

```
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 73.4486350743146,\n
\"min\": -1.344,\n        \"max\": 208.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.2364903846153846,\n          0.2985,\n          208.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1997\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 72.97889741647639,\n
\"min\": -0.429,\n        \"max\": 207.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.5439951690821256,\n          0.547,\n          207.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 74.64205429898776,\n
\"min\": 0.009,\n        \"max\": 212.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.9249999999999998,\n          0.84,\n          212.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2007\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 76.3771649102675,\n
\"min\": -0.219,\n        \"max\": 217.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.0225483870967744,\n          0.921,\n          217.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 75.71665953709281,\n
\"min\": -0.128,\n        \"max\": 215.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.9022232558139536,\n          0.808,\n          215.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2017\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 75.25854590509083,\n
\"min\": 0.017,\n        \"max\": 214.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.2807850467289719,\n          1.282,\n          214.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2022\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 74.90859590103369,\n
\"min\": -1.305,\n        \"max\": 213.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.382112676056338,\n          1.315,\n          213.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    }\n  ]\n}","type":"dataframe"}
```


STATISTICS

```
print('Covariance')
my_columns.cov()
```

```
Covariance
```

```
<ipython-input-21-eca33f628836>:2: FutureWarning: The default value of
numeric_only in DataFrame.cov is deprecated. In a future version, it
will default to False. Select only valid columns or specify the value
of numeric_only to silence this warning.
  my_columns.cov()
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 13,\n
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\"max\": 0.11683570820668696,\n        \"num_unique_values\": 13,\n
\"samples\": [\n          -0.01557000046554935,\n          -
0.04402819897179786,\n          0.11683570820668696\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
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\"min\": -0.06292953596757853,\n        \"max\": 0.11524951915128133,\
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0.06292953596757853\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"1972\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.06020954071368436,\n        \"min\": -0.07287558865248227,\
n        \"max\": 0.14782003304973818,\n        \"num_unique_values\":
13,\n        \"samples\": [\n          -0.010008131982811525,\n
0.0286546531251797,\n          -0.07287558865248227\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.021654488016240137,\n
\"min\": -0.017544460853858777,\n        \"max\":
0.06422579212690954,\n        \"num_unique_values\": 13,\n
\"samples\": [\n          0.0027514761813045704,\n
0.010465799441340785,\n          0.006324622548722003\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.04274222724876838,\n
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n        \"num_unique_values\": 13,\n        \"samples\": [\n
0.03815578440896119,\n          0.02747148318095567,\n          -
0.03815610968255774\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"1987\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.08575082933616673,\n        \"min\": -0.114341266387337,\n
\"max\": 0.22570477204121409,\n        \"num_unique_values\": 13,\n
\"samples\": [\n          -0.0030425963474524334,\n          -
0.08949663051438536,\n          0.014925239664194123\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
```

\"dtype\": \"number\",\n   \"std\": 0.09680380235408993,\n
\"min\": -0.1026298231850117,\n   \"max\": 0.31949071488294306,\n
\"num_unique_values\": 13,\n   \"samples\": [\n
0.050641779346733654,\n   0.1417888160075776,\n   -
0.1026298231850117\n   ],\n   \"semantic_type\": \"\",\n
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\"1997\",\n   \"properties\": {\n   \"dtype\": \"number\",\n
\"std\": 0.06813318797379933,\n   \"min\": -0.03664672576652066,\
n   \"max\": 0.23337432521926746,\n   \"num_unique_values\":
13,\n   \"samples\": [\n   0.10366619787202597,\n
0.05456464624581541,\n   -0.03664672576652066\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2002\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.064308862055709,\n
\"min\": -0.028815683832264207,\n   \"max\":
0.16606322704238705,\n   \"num_unique_values\": 13,\n
\"samples\": [\n   0.09511327458843391,\n
0.15098181828029794,\n   -0.016600601810926943\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2007\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.10981954347368977,\n
\"min\": -0.08949663051438536,\n   \"max\": 0.29846571176821973,\
n   \"num_unique_values\": 13,\n   \"samples\": [\n
0.10568593006093435,\n   0.29846571176821973,\n   -
0.04402819897179786\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"2012\",\n   \"properties\": {\n   \"dtype\": \"number\",\n
\"std\": 0.0760875119496455,\n   \"min\": -0.0554315465970493,\n
\"max\": 0.19546363216692023,\n   \"num_unique_values\": 13,\n
\"samples\": [\n   0.06215838639383471,\n
0.1414238134668693,\n   0.018802302394106803\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2017\",\n   \"properties\": {\n
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\"min\": -0.01557000046554935,\n   \"max\": 0.19168502575337576,\
n   \"num_unique_values\": 13,\n   \"samples\": [\n
0.15523513667675834,\n   0.10568593006093435,\n   -
0.01557000046554935\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"2022\",\n   \"properties\": {\n   \"dtype\": \"number\",\n
\"std\": 0.14796246902213392,\n   \"min\": -0.114341266387337,\n
\"max\": 0.4479343268668614,\n   \"num_unique_values\": 13,\n
\"samples\": [\n   0.19168502575337576,\n
0.25177002230576445,\n   -0.006743258081727445\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   }\n]\n}","type":"dataframe"}

```
print('Correlation')
my_columns.corr()
```

```
Correlation

<ipython-input-22-92fd49235e9c>:2: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future version, it will default to False. Select only valid columns or specify the value of numeric_only to silence this warning.
  my_columns.corr()
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 13,\n  \"fields\": [\n    {\n      \"column\": \"1962\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.414178160665609,\n        \"min\": -0.5570005826546497,\n        \"max\": 1.0,\n        \"num_unique_values\": 13,\n        \"samples\": [\n          -0.11167489232220965,\n          -0.2827423243155094,\n          1.0\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"1967\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.3911285699988312,\n        \"min\": -0.5395866556261767,\n        \"max\": 1.0,\n        \"num_unique_values\": 13,\n        \"samples\": [\n          0.2656641724117877,\n          0.4493517582290633,\n          -0.5395866556261767\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"1972\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.3873177285870638,\n        \"min\": -0.5546517277963406,\n        \"max\": 1.0,\n        \"num_unique_values\": 13,\n        \"samples\": [\n          -0.06362939309893603,\n          0.1646174080865412,\n          -0.5546517277963406\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.2902131222472633,\n        \"min\": -0.11095843511250704,\n        \"max\": 1.0,\n        \"num_unique_values\": 13,\n        \"samples\": [\n          0.027545855618948525,\n          0.09041632055110377,\n          0.07250482919605752\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.3436394993331109,\n        \"min\": -0.3508971755858687,\n        \"max\": 1.0,\n        \"num_unique_values\": 13,\n        \"samples\": [\n          0.2943882471540574,\n          0.1897725116715811,\n          -0.3508971755858687\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n        \"dtype\": \"number\",\n        \"std\": 0.39436101848632815,\n        \"min\": -0.4131341185607546,\n        \"max\": 1.0,\n        \"num_unique_values\": 13,\n        \"samples\": [\n          -0.015664304538638825,\n          -0.4131341185607546,\n          0.09114736305841736\n        ],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n      }\n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
```

\"std\": 0.37114069979990205,\n   \"min\": -0.5570005826546497,\n
\"max\": 1.0,\n   \"num_unique_values\": 13,\n
\"samples\": [\n   0.21986583061122933,\n
0.47049353257935705,\n   -0.5570005826546497\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"1997\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.31837803581656665,\n
\"min\": -0.2277604062070909,\n   \"max\": 1.0,\n
\"num_unique_values\": 13,\n   \"samples\": [\n
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0.2277604062070909\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
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\"max\": 1.0,\n   \"num_unique_values\": 13,\n
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\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2007\",\n   \"properties\": {\n
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\"num_unique_values\": 13,\n   \"samples\": [\n
0.48701022658946114,\n   1.0,\n   -0.2827423243155094\n
],\n   \"semantic_type\": \"\",\n   \"description\": \"\"\n
}\n   },\n   {\n   \"column\": \"2012\",\n   \"properties\":
{\n   \"dtype\": \"number\",\n   \"std\":
0.36086879886632933,\n   \"min\": -0.2946559655872378,\n
\"max\": 1.0,\n   \"num_unique_values\": 13,\n
\"samples\": [\n   0.3565923841649101,\n
0.5818632364209078,\n   0.1377552816681117\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2017\",\n   \"properties\": {\n
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\"min\": -0.11167489232220965,\n   \"max\": 1.0,\n
\"num_unique_values\": 13,\n   \"samples\": [\n   1.0,\n
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\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2022\",\n   \"properties\": {\n
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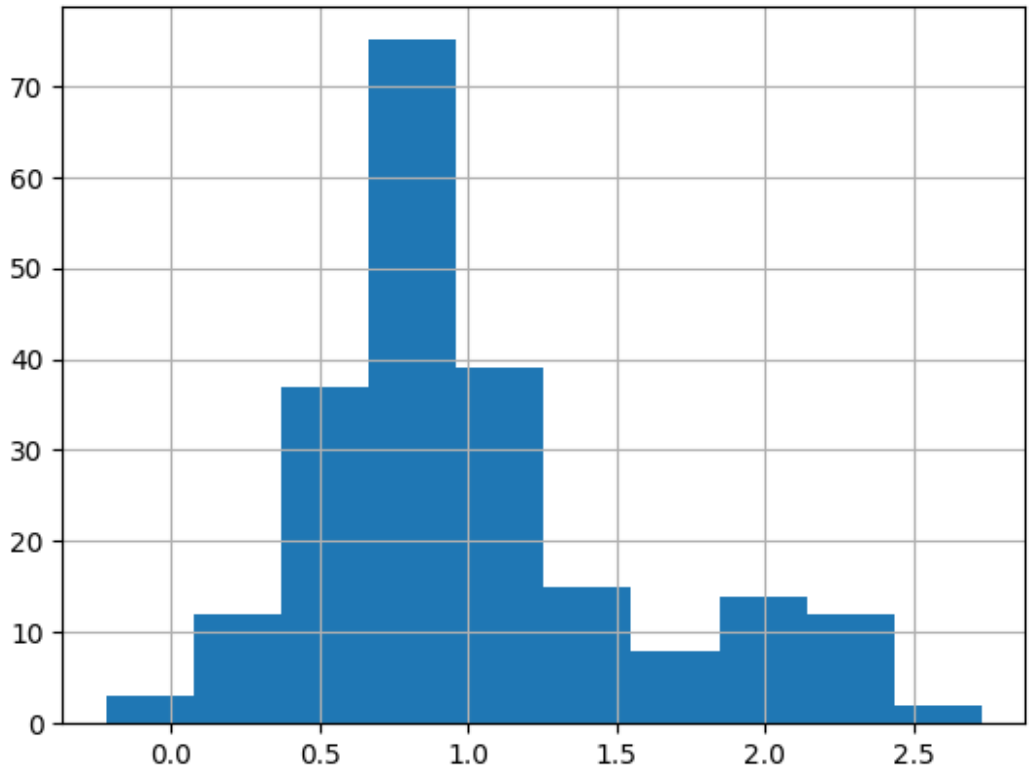
\"min\": -0.37703609593702236,\n   \"max\": 1.0,\n
\"num_unique_values\": 13,\n   \"samples\": [\n
0.7228789630360235,\n   0.6835477975598144,\n   -
0.030936388520995728\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   }\n]\n}","type":"dataframe"}

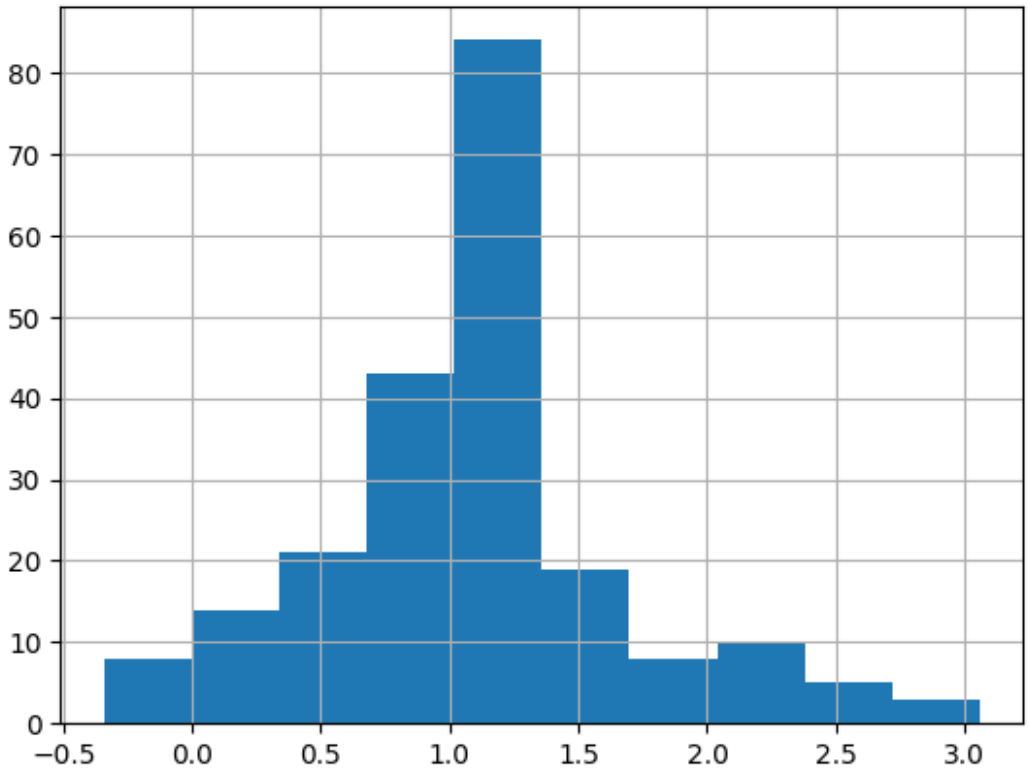
```
%matplotlib inline
my_columns['2007'].hist()
```

```
<Axes: >
```



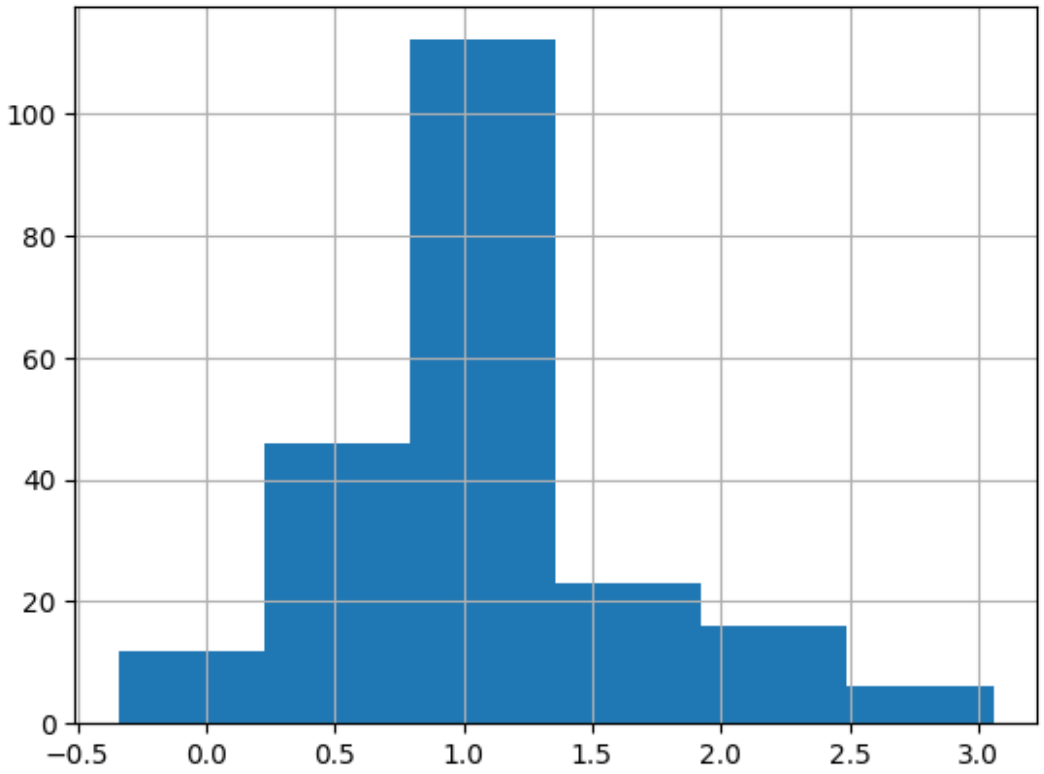

```
dataset['2010'].hist()
```

```
<Axes: >
```



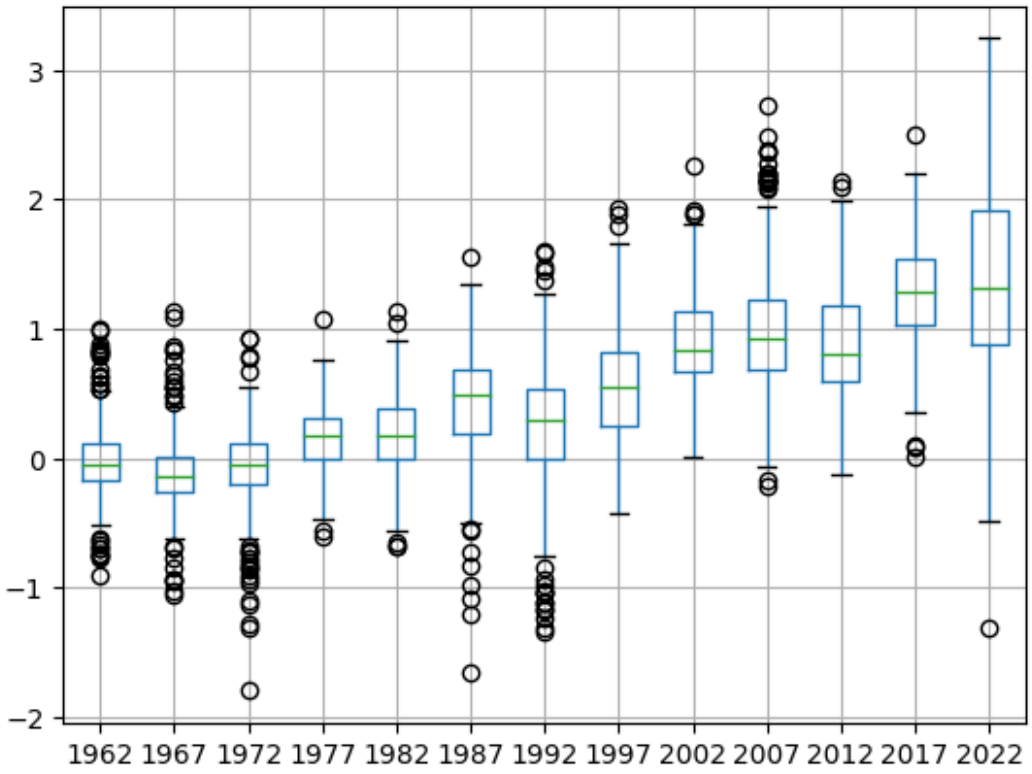

```
dataset['2010'].hist(bins=6)
```

```
<Axes: >
```




```
x = my_columns['2012']
type(x)
pd.core.series.Series
y = pd.DataFrame(x)
type(y)
pd.core.frame.DataFrame
my_columns.boxplot()

<Axes: >
```




```
type(dataset)
pd.core.frame.DataFrame
my_columns['2012'].boxplot()
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-43-709ea2fda5f7> in <cell line: 3>()
      1 type(dataset)
      2 pd.core.frame.DataFrame
----> 3 my_columns['2012'].boxplot()

/usr/local/lib/python3.10/dist-packages/pandas/core/generic.py in __getattr__(self, name)
   5900         ):
   5901             return self[name]
-> 5902         return object.__getattribute__(self, name)
   5903
   5904     def __setattr__(self, name: str, value) -> None:

AttributeError: 'Series' object has no attribute 'boxplot'
```

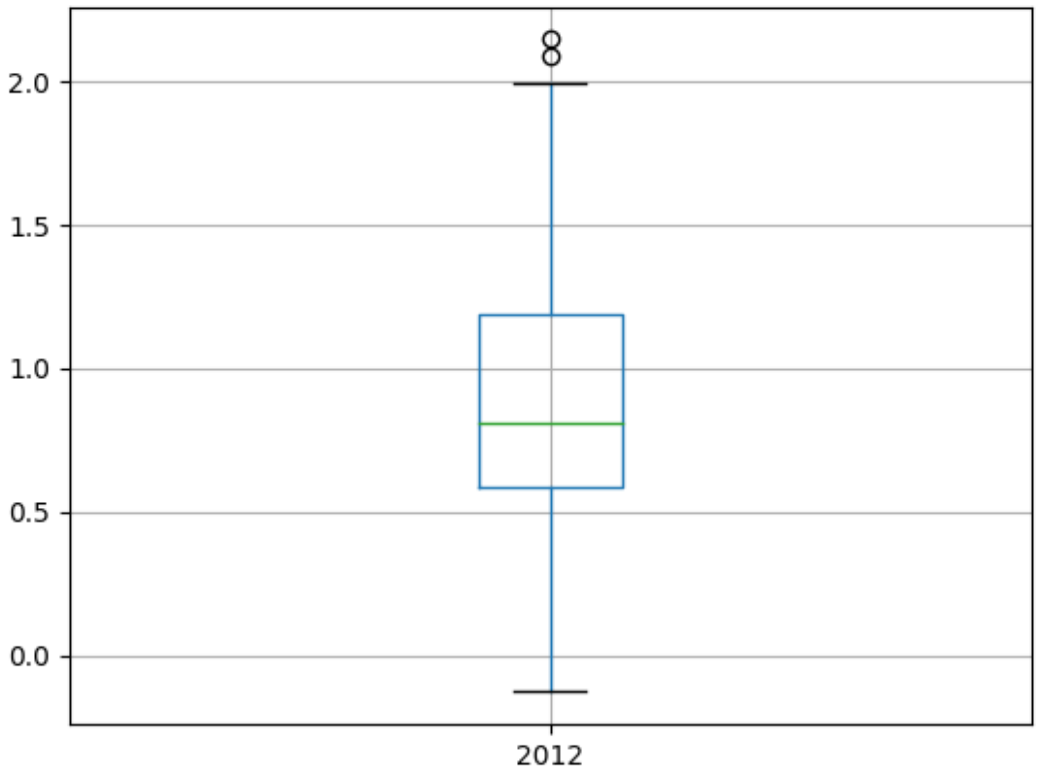
```
x = pd.DataFrame(dataset['1997'])
type(x)
pd.core.frame.DataFrame
```

```
x = (my_columns['2012'])
x = pd.DataFrame(x)
type(x)

pd.core.frame.DataFrame
type(x)
pd.core.frame.DataFrame

x.boxplot()

<Axes: >
```




```
dataset.head(30)

{"type":"dataframe","variable_name":"dataset"}

x=pd.DataFrame(dataset[14:43])

type(x)

pandas.core.frame.DataFrame

x=pd.DataFrame(x)
type(x)

pandas.core.frame.DataFrame
```

```
dataset.describe()
```


```
{"type":"dataframe"}
```


```
import matplotlib.pyplot as plt
my_columns.head(2)
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 225,\n
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\"Armenia, Rep. of\",\n          \"Spain\",\n          \"Maldives\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1962\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.3418123874389091,\n        \"min\": -0.908,\n        \"max\":
0.998,\n        \"num_unique_values\": 169,\n        \"samples\": [\n
0.093,\n          -0.118,\n          -0.776\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1967\",\n      \"properties\": {\n
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\"min\": -1.048,\n        \"max\": 1.134,\n
\"num_unique_values\": 160,\n        \"samples\": [\n          -
0.159,\n          0.032,\n          -1.028\n        ],\n
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\"num_unique_values\": 167,\n        \"samples\": [\n          0.304,\
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\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
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\"min\": -0.599,\n        \"max\": 1.079,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          -
0.039,\n          -0.022,\n          -0.279\n        ],\n
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\"min\": -0.682,\n        \"max\": 1.135,\n
\"num_unique_values\": 174,\n        \"samples\": [\n          0.238,\
n          0.709,\n          0.623\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
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\"min\": -1.652,\n        \"max\": 1.562,\n
\"num_unique_values\": 172,\n        \"samples\": [\n          0.368,\
n          0.505,\n          0.964\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
```
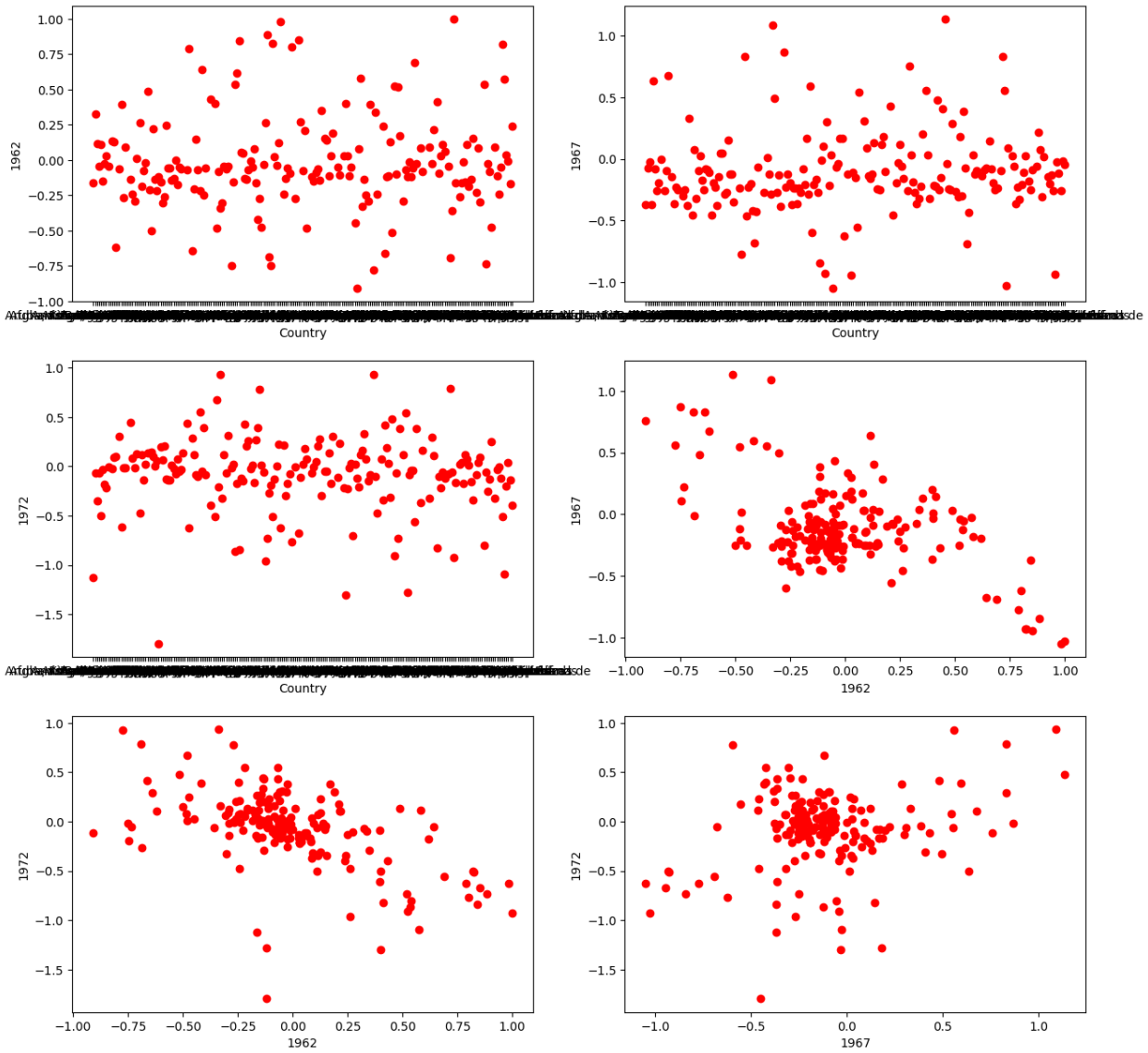

\"dtype\": \"number\",\n   \"std\": 0.5652350970020732,\n\"min\": -1.344,\n   \"max\": 1.601,\n\"num_unique_values\": 191,\n   \"samples\": [\n   0.875,\n   0.533,\n   0.807\n   ],\n\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\n   },\n   {\n   \"column\": \"1997\",\n   \"properties\": {\n\"dtype\": \"number\",\n   \"std\": 0.4830883203093068,\n\"min\": -0.429,\n   \"max\": 1.933,\n\"num_unique_values\": 196,\n   \"samples\": [\n   0.079,\n   1.321,\n   0.359\n   ],\n\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\n   },\n   {\n   \"column\": \"2002\",\n   \"properties\": {\n\"dtype\": \"number\",\n   \"std\": 0.37852904375599056,\n\"min\": 0.009,\n   \"max\": 2.255,\n\"num_unique_values\": 191,\n   \"samples\": [\n   1.135,\n   1.13,\n   1.376\n   ],\n\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\n   },\n   {\n   \"column\": \"2007\",\n   \"properties\": {\n\"dtype\": \"number\",\n   \"std\": 0.5463201550082332,\n\"min\": -0.219,\n   \"max\": 2.729,\n\"num_unique_values\": 200,\n   \"samples\": [\n   0.547,\n   1.08,\n   1.242\n   ],\n\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\n   },\n   {\n   \"column\": \"2012\",\n   \"properties\": {\n\"dtype\": \"number\",\n   \"std\": 0.44211269170531653,\n\"min\": -0.128,\n   \"max\": 2.144,\n\"num_unique_values\": 191,\n   \"samples\": [\n   0.533,\n   0.795,\n   0.508\n   ],\n\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\n   },\n   {\n   \"column\": \"2017\",\n   \"properties\": {\n\"dtype\": \"number\",\n   \"std\": 0.39399890441060664,\n\"min\": 0.017,\n   \"max\": 2.493,\n\"num_unique_values\": 194,\n   \"samples\": [\n   0.79,\n1.124,\n   1.184\n   ],\n   \"semantic_type\": \"\",\n   \"description\": \"\"\n   }\n   },\n   {\n\"column\": \"2022\",\n   \"properties\": {\n   \"dtype\": \"number\",\n   \"std\": 0.6692789604244717,\n   \"min\": -1.305,\n   \"max\": 3.243,\n   \"num_unique_values\": 206,\n\"samples\": [\n   1.216,\n   1.707,\n   1.074\n],\n   \"semantic_type\": \"\",\n   \"description\": \"\"\n}\n   }\n]\n}","type":"dataframe","variable_name":"my_columns"}

```
fig, axes=plt.subplots(3,2, figsize=(15,15))
index=0


for i in range(3):
 for j in range(i+1,4):
  ax1=int(index/2)
  ax2=int(index % 2)
```

```
  axes[ax1]
[ax2].scatter(my_columns[my_columns.columns[i]],my_columns[my_columns.
columns[j]], color='red')
  axes[ax1][ax2].set_xlabel(my_columns.columns[i])
  axes[ax1][ax2].set_ylabel(my_columns.columns[j])
  index = index +1
```




```
import pandas as pd

dataset=pd.read_csv('my.csv',header=None)

dataset
```


```
{"type":"dataframe","variable_name":"dataset"}
```

```
my_columns.head(20)
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 225,\n
\"fields\": [\n    {\n      \"column\": \"Country\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 225,\n        \"samples\": [\n
\"Armenia, Rep. of\",\n          \"Spain\",\n          \"Maldives\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1962\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.3418123874389091,\n        \"min\": -0.908,\n        \"max\":
0.998,\n        \"num_unique_values\": 169,\n        \"samples\": [\n
0.093,\n          -0.118,\n          -0.776\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1967\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.3394841957312319,\n
\"min\": -1.048,\n        \"max\": 1.134,\n
\"num_unique_values\": 160,\n        \"samples\": [\n          -
0.159,\n          0.032,\n          -1.028\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1972\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.3844737091788439,\n
\"min\": -1.796,\n        \"max\": 0.933,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          0.304,\
n          -0.703,\n          -0.268\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.25342808077817564,\n
\"min\": -0.599,\n        \"max\": 1.079,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          -
0.039,\n          -0.022,\n          -0.279\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.31829855255580203,\n
\"min\": -0.682,\n        \"max\": 1.135,\n
\"num_unique_values\": 174,\n        \"samples\": [\n          0.238,\
n          0.709,\n          0.623\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.47508396314884604,\n
\"min\": -1.652,\n        \"max\": 1.562,\n
\"num_unique_values\": 172,\n        \"samples\": [\n          0.368,\
n          0.505,\n          0.964\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5652350970020732,\n
\"min\": -1.344,\n        \"max\": 1.601,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          0.875,\
n          0.533,\n          0.807\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
```

```
n    },\n    {\n      \"column\": \"1997\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.4830883203093068,\n
\"min\": -0.429,\n        \"max\": 1.933,\n
\"num_unique_values\": 196,\n        \"samples\": [\n          0.079,\
n          1.321,\n          0.359\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.37852904375599056,\n
\"min\": 0.009,\n        \"max\": 2.255,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          1.135,\
n          1.13,\n          1.376\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2007\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5463201550082332,\n
\"min\": -0.219,\n        \"max\": 2.729,\n
\"num_unique_values\": 200,\n        \"samples\": [\n          0.547,\
n          1.08,\n          1.242\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.44211269170531653,\n
\"min\": -0.128,\n        \"max\": 2.144,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          0.533,\
n          0.795,\n          0.508\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2017\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.39399890441060664,\n
\"min\": 0.017,\n        \"max\": 2.493,\n
\"num_unique_values\": 194,\n        \"samples\": [\n          0.79,\n
1.124,\n          1.184\n        ],\n        \"semantic_type\": \"\",\
n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"2022\",\n      \"properties\": {\n        \"dtype\":
\"number\",\n        \"std\": 0.6692789604244717,\n        \"min\": -
1.305,\n        \"max\": 3.243,\n        \"num_unique_values\": 206,\n
\"samples\": [\n          1.216,\n          1.707,\n          1.074\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    }\n  ]\n}","type":"dataframe","variable_name":"my_columns"}
```


```
my_columns.tail(10)
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 10,\n
\"fields\": [\n    {\n      \"column\": \"Country\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 10,\n        \"samples\": [\n
\"Zambia\",\n          \"Venezuela, Rep. Bolivariana de\",\n
\"Western Sahara\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"1962\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.3390552888378072,\n        \"min\": -0.24,\n
\"max\": 0.822,\n        \"num_unique_values\": 10,\n
\"samples\": [\n          -0.168,\n          -0.113,\n          0.576\
```

```
n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"1967\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.2683748622108015,\n        \"min\": -0.934,\n
\"max\": -0.014,\n        \"num_unique_values\": 10,\n
\"samples\": [\n          -0.014,\n          -0.199,\n          -
0.026\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"1972\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.3374410236536815,\n        \"min\": -1.096,\n
\"max\": 0.041,\n        \"num_unique_values\": 10,\n
\"samples\": [\n          -0.139,\n          -0.029,\n          -
1.096\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"1977\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.2255831948035531,\n        \"min\": -0.14,\n
\"max\": 0.51,\n        \"num_unique_values\": 10,\n
\"samples\": [\n          0.51,\n          0.168,\n          0.119\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1982\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.2652931502235886,\n        \"min\": -0.562,\n        \"max\":
0.418,\n        \"num_unique_values\": 10,\n        \"samples\": [\n
0.34,\n          0.116,\n          0.418\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5361424872798898,\n
\"min\": -0.294,\n        \"max\": 1.109,\n
\"num_unique_values\": 10,\n        \"samples\": [\n          0.958,\n
0.415,\n          1.109\n        ],\n        \"semantic_type\": \"\",\
n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"1992\",\n      \"properties\": {\n        \"dtype\":
\"number\",\n        \"std\": 0.5696849519203087,\n        \"min\": -
1.045,\n        \"max\": 1.01,\n        \"num_unique_values\": 9,\n
\"samples\": [\n          0.544,\n          0.454,\n          0.529\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1997\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.4783283507289852,\n        \"min\": -0.121,\n        \"max\":
1.536,\n        \"num_unique_values\": 10,\n        \"samples\": [\n
0.339,\n          0.609,\n          1.536\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.2478361914204174,\n
\"min\": 0.452,\n        \"max\": 1.249,\n
\"num_unique_values\": 9,\n        \"samples\": [\n          0.711,\n
0.864,\n          1.249\n        ],\n        \"semantic_type\": \"\",\
n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"2007\",\n      \"properties\": {\n        \"dtype\":
```

\"number\",\n   \"std\": 0.30971483299606073,\n   \"min\":
0.127,\n   \"max\": 1.195,\n   \"num_unique_values\": 9,\n
\"samples\": [\n   0.78,\n   0.76,\n   0.903\n
],\n   \"semantic_type\": \"\",\n   \"description\": \"\"\n
}\n   },\n   {\n   \"column\": \"2012\",\n   \"properties\":
{\n   \"dtype\": \"number\",\n   \"std\":
0.3410905305047327,\n   \"min\": 0.334,\n   \"max\": 1.344,\
n   \"num_unique_values\": 9,\n   \"samples\": [\n
0.972,\n   0.513,\n   1.344\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"2017\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.654759879650548,\n
\"min\": 0.088,\n   \"max\": 2.204,\n
\"num_unique_values\": 9,\n   \"samples\": [\n   0.105,\n
0.726,\n   2.204\n   ],\n   \"semantic_type\": \"\",\
n   \"description\": \"\"\n   }\n   },\n   {\n
\"column\": \"2022\",\n   \"properties\": {\n   \"dtype\":
\"number\",\n   \"std\": 0.694272720990182,\n   \"min\": -
0.49,\n   \"max\": 1.97,\n   \"num_unique_values\": 9,\n
\"samples\": [\n   0.686,\n   0.533,\n   1.97\n
],\n   \"semantic_type\": \"\",\n   \"description\": \"\"\n
}\n   }\n]\n}","type":"dataframe"}

```
my_columns.sample(20)
```

{"summary":"{\n \"name\": \"my_columns\",\n \"rows\": 20,\n
\"fields\": [\n   {\n   \"column\": \"Country\",\n
\"properties\": {\n   \"dtype\": \"string\",\n
\"num_unique_values\": 20,\n   \"samples\": [\n
\"Togo\",\n   \"Georgia\",\n   \"Romania\"\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"1962\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.30735962841022335,\n
\"min\": -0.339,\n   \"max\": 0.789,\n
\"num_unique_values\": 17,\n   \"samples\": [\n   -0.156,\
n   -0.071,\n   0.111\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"1967\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.40912801822182465,\n
\"min\": -0.774,\n   \"max\": 1.088,\n
\"num_unique_values\": 17,\n   \"samples\": [\n   -0.231,\
n   -0.269,\n   -0.249\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"1972\",\n   \"properties\": {\n
\"dtype\": \"number\",\n   \"std\": 0.4644091043212553,\n
\"min\": -1.096,\n   \"max\": 0.933,\n
\"num_unique_values\": 17,\n   \"samples\": [\n   0.118,\n
0.263,\n   -0.058\n   ],\n   \"semantic_type\":
\"\",\n   \"description\": \"\"\n   }\n   },\n   {\n
\"column\": \"1977\",\n   \"properties\": {\n   \"dtype\":

```
\"number\",\n        \"std\": 0.22143451096669375,\n        \"min\": -
0.227,\n        \"max\": 0.563,\n        \"num_unique_values\": 16,\n
\"samples\": [\n          0.387,\n          0.358,\n          -0.055\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1982\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.2812646074637986,\n        \"min\": -0.343,\n        \"max\":
0.623,\n        \"num_unique_values\": 17,\n        \"samples\": [\n
0.173,\n          0.282,\n          0.089\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.7651588887283477,\n
\"min\": -1.652,\n        \"max\": 1.27,\n
\"num_unique_values\": 16,\n        \"samples\": [\n          0.964,\n
0.828,\n          0.525\n        ],\n        \"semantic_type\": \"\",\
n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"1992\",\n      \"properties\": {\n        \"dtype\":
\"number\",\n        \"std\": 0.5943885491565438,\n        \"min\": -
1.157,\n        \"max\": 1.165,\n        \"num_unique_values\": 20,\n
\"samples\": [\n          0.046,\n          -1.157,\n          0.364\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1997\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.6014438657798502,\n        \"min\": -0.422,\n        \"max\":
1.889,\n        \"num_unique_values\": 20,\n        \"samples\": [\n
0.554,\n          0.266,\n          -0.422\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.4036419074794938,\n
\"min\": 0.359,\n        \"max\": 2.255,\n
\"num_unique_values\": 20,\n        \"samples\": [\n          0.732,\n
1.06,\n          1.22\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"2007\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.5407805737518392,\n        \"min\": 0.23,\n        \"max\":
2.197,\n        \"num_unique_values\": 20,\n        \"samples\": [\n
0.847,\n          0.908,\n          2.126\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.4348139832158115,\n
\"min\": 0.416,\n        \"max\": 1.828,\n
\"num_unique_values\": 20,\n        \"samples\": [\n          0.571,\n
1.22,\n          1.828\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"2017\",\n      \"properties\": {\n        \"dtype\": \"number\",\n
\"std\": 0.46767660891508755,\n        \"min\": 0.017,\n
\"max\": 2.204,\n        \"num_unique_values\": 20,\n
\"samples\": [\n          1.243,\n          0.809,\n          1.153\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
```

```
}\n    },\n    {\n      \"column\": \"2022\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.8349986117227666,\n        \"min\": -1.305,\n        \"max\":
2.712,\n        \"num_unique_values\": 20,\n        \"samples\": [\n
0.975,\n          1.51,\n          1.949\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    }\n  ]\n}","type":"dataframe"}
```


```
my_columns.head(5)
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 225,\n
\"fields\": [\n    {\n      \"column\": \"Country\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 225,\n        \"samples\": [\n
\"Armenia, Rep. of\",\n          \"Spain\",\n          \"Maldives\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1962\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
0.3418123874389091,\n        \"min\": -0.908,\n        \"max\":
0.998,\n        \"num_unique_values\": 169,\n        \"samples\": [\n
0.093,\n          -0.118,\n          -0.776\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1967\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.3394841957312319,\n
\"min\": -1.048,\n        \"max\": 1.134,\n
\"num_unique_values\": 160,\n        \"samples\": [\n          -
0.159,\n          0.032,\n          -1.028\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1972\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.3844737091788439,\n
\"min\": -1.796,\n        \"max\": 0.933,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          0.304,\
n          -0.703,\n          -0.268\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.25342808077817564,\n
\"min\": -0.599,\n        \"max\": 1.079,\n
\"num_unique_values\": 167,\n        \"samples\": [\n          -
0.039,\n          -0.022,\n          -0.279\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.31829855255580203,\n
\"min\": -0.682,\n        \"max\": 1.135,\n
\"num_unique_values\": 174,\n        \"samples\": [\n          0.238,\
n          0.709,\n          0.623\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.47508396314884604,\n
\"min\": -1.652,\n        \"max\": 1.562,\n
\"num_unique_values\": 172,\n        \"samples\": [\n          0.368,\
```

```
n          0.505,\n          0.964\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5652350970020732,\n
\"min\": -1.344,\n        \"max\": 1.601,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          0.875,\
n          0.533,\n          0.807\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1997\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.4830883203093068,\n
\"min\": -0.429,\n        \"max\": 1.933,\n
\"num_unique_values\": 196,\n        \"samples\": [\n          0.079,\
n          1.321,\n          0.359\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.37852904375599056,\n
\"min\": 0.009,\n        \"max\": 2.255,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          1.135,\
n          1.13,\n          1.376\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2007\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.5463201550082332,\n
\"min\": -0.219,\n        \"max\": 2.729,\n
\"num_unique_values\": 200,\n        \"samples\": [\n          0.547,\
n          1.08,\n          1.242\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.44211269170531653,\n
\"min\": -0.128,\n        \"max\": 2.144,\n
\"num_unique_values\": 191,\n        \"samples\": [\n          0.533,\
n          0.795,\n          0.508\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2017\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 0.39399890441060664,\n
\"min\": 0.017,\n        \"max\": 2.493,\n
\"num_unique_values\": 194,\n        \"samples\": [\n          0.79,\n
1.124,\n          1.184\n        ],\n        \"semantic_type\": \"\",\
n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"2022\",\n      \"properties\": {\n        \"dtype\":
\"number\",\n        \"std\": 0.6692789604244717,\n        \"min\": -
1.305,\n        \"max\": 3.243,\n        \"num_unique_values\": 206,\n
\"samples\": [\n          1.216,\n          1.707,\n          1.074\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    }\n  ]\n}","type":"dataframe","variable_name":"my_columns"}
```


```
from pandas.api.types import is_numeric_dtype
for col in dataset.columns:
 if is_numeric_dtype(dataset[col]):
  print('%s:'%(col))
  print('\t Mean = %.2f'%dataset[col].mean())
```

```
  print('\t Standard Deviation= %.2f'%dataset[col].std())
  print('\t Minimum = %.2f'%dataset[col].min())
  print('\t Maximum = %.2f'%dataset[col].max())
```

```
10:
      Mean = 10.54
      Standard Deviation= 142.63
      Minimum = -0.69
      Maximum = 1961.00
11:
      Mean = 10.31
      Standard Deviation= 142.34
      Minimum = -0.91
      Maximum = 1962.00
12:
      Mean = 10.38
      Standard Deviation= 142.79
      Minimum = -1.27
      Maximum = 1963.00
13:
      Mean = 10.32
      Standard Deviation= 142.87
      Minimum = -0.88
      Maximum = 1964.00
14:
      Mean = 10.15
      Standard Deviation= 142.95
      Minimum = -1.06
      Maximum = 1965.00
15:
      Mean = 10.29
      Standard Deviation= 141.51
      Minimum = -1.80
      Maximum = 1966.00
16:
      Mean = 10.13
      Standard Deviation= 141.96
      Minimum = -1.05
      Maximum = 1967.00
17:
      Mean = 10.05
      Standard Deviation= 142.04
      Minimum = -1.63
      Maximum = 1968.00
18:
      Mean = 10.47
      Standard Deviation= 142.46
      Minimum = -0.90
      Maximum = 1969.00
19:
```

```
      Mean = 10.46
      Standard Deviation= 142.91
      Minimum = -1.29
      Maximum = 1970.00
20:
      Mean = 10.07
      Standard Deviation= 142.26
      Minimum = -0.87
      Maximum = 1971.00
21:
      Mean = 10.13
      Standard Deviation= 141.95
      Minimum = -1.80
      Maximum = 1972.00
22:
      Mean = 10.40
      Standard Deviation= 141.64
      Minimum = -0.99
      Maximum = 1973.00
23:
      Mean = 10.07
      Standard Deviation= 142.10
      Minimum = -0.98
      Maximum = 1974.00
24:
      Mean = 10.43
      Standard Deviation= 143.66
      Minimum = -1.09
      Maximum = 1975.00
25:
      Mean = 10.16
      Standard Deviation= 143.37
      Minimum = -0.96
      Maximum = 1976.00
26:
      Mean = 10.79
      Standard Deviation= 144.95
      Minimum = -0.60
      Maximum = 1977.00
27:
      Mean = 10.48
      Standard Deviation= 143.49
      Minimum = -0.87
      Maximum = 1978.00
28:
      Mean = 10.65
      Standard Deviation= 143.56
      Minimum = -1.24
      Maximum = 1979.00
```

```
29:
       Mean = 10.56
       Standard Deviation= 142.88
       Minimum = -0.76
       Maximum = 1980.00
30:
       Mean = 10.50
       Standard Deviation= 142.95
       Minimum = -0.91
       Maximum = 1981.00
31:
       Mean = 10.45
       Standard Deviation= 142.66
       Minimum = -0.68
       Maximum = 1982.00
32:
       Mean = 10.72
       Standard Deviation= 143.46
       Minimum = -2.06
       Maximum = 1983.00
33:
       Mean = 10.58
       Standard Deviation= 144.31
       Minimum = -1.46
       Maximum = 1984.00
34:
       Mean = 10.57
       Standard Deviation= 144.38
       Minimum = -1.19
       Maximum = 1985.00
35:
       Mean = 10.55
       Standard Deviation= 143.69
       Minimum = -0.77
       Maximum = 1986.00
36:
       Mean = 10.81
       Standard Deviation= 143.75
       Minimum = -1.65
       Maximum = 1987.00
37:
       Mean = 10.90
       Standard Deviation= 143.81
       Minimum = -0.50
       Maximum = 1988.00
38:
       Mean = 10.67
       Standard Deviation= 143.90
       Minimum = -1.54
```

```
       Maximum = 1989.00
39:
       Mean = 11.03
       Standard Deviation= 144.33
       Minimum = -0.74
       Maximum = 1990.00
40:
       Mean = 10.90
       Standard Deviation= 144.80
       Minimum = -0.70
       Maximum = 1991.00
41:
       Mean = 9.77
       Standard Deviation= 137.77
       Minimum = -1.34
       Maximum = 1992.00
42:
       Mean = 9.71
       Standard Deviation= 137.52
       Minimum = -1.35
       Maximum = 1993.00
43:
       Mean = 10.15
       Standard Deviation= 137.89
       Minimum = -0.42
       Maximum = 1994.00
44:
       Mean = 10.08
       Standard Deviation= 137.30
       Minimum = -0.33
       Maximum = 1995.00
45:
       Mean = 9.74
       Standard Deviation= 137.39
       Minimum = -0.79
       Maximum = 1996.00
46:
       Mean = 10.14
       Standard Deviation= 138.43
       Minimum = -0.43
       Maximum = 1997.00
47:
       Mean = 10.44
       Standard Deviation= 137.48
       Minimum = -0.61
       Maximum = 1998.00
48:
       Mean = 10.26
       Standard Deviation= 137.89
```

```
      Minimum = -0.27
      Maximum = 1999.00
49:
      Mean = 10.19
      Standard Deviation= 137.97
      Minimum = -0.72
      Maximum = 2000.00
50:
      Mean = 10.42
      Standard Deviation= 138.35
      Minimum = -0.19
      Maximum = 2001.00
51:
      Mean = 10.32
      Standard Deviation= 137.11
      Minimum = 0.01
      Maximum = 2002.00
52:
      Mean = 10.16
      Standard Deviation= 136.55
      Minimum = -0.25
      Maximum = 2003.00
53:
      Mean = 10.14
      Standard Deviation= 136.94
      Minimum = -0.62
      Maximum = 2004.00
54:
      Mean = 10.26
      Standard Deviation= 137.32
      Minimum = -0.39
      Maximum = 2005.00
55:
      Mean = 10.16
      Standard Deviation= 136.43
      Minimum = -0.51
      Maximum = 2006.00
56:
      Mean = 10.22
      Standard Deviation= 135.86
      Minimum = -0.22
      Maximum = 2007.00
57:
      Mean = 10.23
      Standard Deviation= 137.53
      Minimum = -0.14
      Maximum = 2008.00
58:
      Mean = 10.34
```

```
       Standard Deviation= 137.59
       Minimum = -0.32
       Maximum = 2009.00
59:
       Mean = 10.40
       Standard Deviation= 136.69
       Minimum = -0.34
       Maximum = 2010.00
60:
       Mean = 10.04
       Standard Deviation= 136.15
       Minimum = -0.48
       Maximum = 2011.00
61:
       Mean = 10.21
       Standard Deviation= 136.84
       Minimum = -0.13
       Maximum = 2012.00
62:
       Mean = 10.20
       Standard Deviation= 136.59
       Minimum = 0.12
       Maximum = 2013.00
63:
       Mean = 10.39
       Standard Deviation= 136.64
       Minimum = -0.09
       Maximum = 2014.00
64:
       Mean = 10.55
       Standard Deviation= 136.70
       Minimum = -0.43
       Maximum = 2015.00
65:
       Mean = 10.85
       Standard Deviation= 137.71
       Minimum = 0.25
       Maximum = 2016.00
66:
       Mean = 10.66
       Standard Deviation= 137.47
       Minimum = 0.02
       Maximum = 2017.00
67:
       Mean = 10.73
       Standard Deviation= 137.86
       Minimum = 0.24
       Maximum = 2018.00
68:
```

```
       Mean = 10.87
       Standard Deviation= 137.92
       Minimum = 0.05
       Maximum = 2019.00
69:
       Mean = 11.03
       Standard Deviation= 138.30
       Minimum = 0.23
       Maximum = 2020.00
70:
       Mean = 10.78
       Standard Deviation= 138.06
       Minimum = -0.42
       Maximum = 2021.00
71:
       Mean = 10.82
       Standard Deviation= 138.13
       Minimum = -1.30
       Maximum = 2022.00
```

```
my_columns['2002'].value_counts()
```

```
0.827    3
0.634    3
0.776    3
1.531    2
0.734    2
        ..
0.862    1
0.435    1
1.186    1
0.695    1
0.487    1
Name: 2002, Length: 191, dtype: int64
```

```
my_columns.describe(include='all')
```


```
{"summary":"{\n  \"name\": \"my_columns\",\n  \"rows\": 11,\n
\"fields\": [\n    {\n      \"column\": \"Country\",\n
\"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 3,\n        \"samples\": [\n          \"225\",\
n          \"Afghanistan, Islamic Rep. of\",\n          \"1\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1962\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
66.80791808693246,\n        \"min\": -0.908,\n        \"max\": 189.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.01347619047619048,\n          -0.056,\n          189.0\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1967\",\n      \"properties\":
```

```
{\n        \"dtype\": \"number\",\n        \"std\":
67.53527830500084,\n        \"min\": -1.048,\n        \"max\": 191.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.11083246073298428,\n          -0.146,\n          191.0\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"1972\",\n      \"properties\":
{\n        \"dtype\": \"number\",\n        \"std\":
67.92137580160988,\n        \"min\": -1.796,\n        \"max\": 192.0,\
n        \"num_unique_values\": 8,\n        \"samples\": [\n
-0.08490625,\n          -0.045,\n          192.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1977\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 65.33820846769545,\n
\"min\": -0.599,\n        \"max\": 185.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.1658162162162162,\n          0.182,\n          185.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1982\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 67.80739834083896,\n
\"min\": -0.682,\n        \"max\": 192.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.17649479166666668,\n          0.181,\n          192.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1987\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 67.07211253384104,\n
\"min\": -1.652,\n        \"max\": 190.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.405021052631579,\n          0.491,\n          190.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1992\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 73.4486350743146,\n
\"min\": -1.344,\n        \"max\": 208.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.2364903846153846,\n          0.2985,\n          208.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"1997\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 72.97889741647639,\n
\"min\": -0.429,\n        \"max\": 207.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.5439951690821256,\n          0.547,\n          207.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2002\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 74.64205429898776,\n
\"min\": 0.009,\n        \"max\": 212.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.9249999999999998,\n          0.84,\n          212.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2007\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 76.3771649102675,\n
```

```
\"min\": -0.219,\n        \"max\": 217.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.0225483870967744,\n          0.921,\n          217.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2012\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 75.71665953709281,\n
\"min\": -0.128,\n        \"max\": 215.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
0.9022232558139536,\n          0.808,\n          215.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2017\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 75.25854590509083,\n
\"min\": 0.017,\n        \"max\": 214.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.2807850467289719,\n          1.282,\n          214.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"2022\",\n      \"properties\": {\n
\"dtype\": \"number\",\n        \"std\": 74.90859590103369,\n
\"min\": -1.305,\n        \"max\": 213.0,\n
\"num_unique_values\": 8,\n        \"samples\": [\n
1.382112676056338,\n          1.315,\n          213.0\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    }\n  ]\n}","type":"dataframe"}
```