```
import pandas as pd

df = pd.read_csv("/content/API_NV.AGR.TOTL.ZS_DS2_en_csv_v2_5359510.csv")
df.head()
```

	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962	1963	1964	1965	...	2012	2013	
0	Aruba	ABW	Agriculture, forestry, and fishing, value adde...	NV.AGR.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	0.021470	0.017817	0.0
1	Africa Eastern and Southern	AFE	Agriculture, forestry, and fishing, value adde...	NV.AGR.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	11.440935	11.602275	12.5
2	Afghanistan	AFG	Agriculture, forestry, and fishing, value adde...	NV.AGR.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	24.390874	22.810663	22.1
3	Africa Western and Central	AFW	Agriculture, forestry, and fishing, value adde...	NV.AGR.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	21.089395	20.135340	19.6
4	Angola	AGO	Agriculture, forestry, and fishing,	NV.AGR.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	6.069630	6.507492	7.5

adde...

5 rows × 66 columns

Ingest and manipulate the data using pandas dataframes. Your program should include a function which takes a filename as argument, reads a dataframe in World- bank format and returns two dataframes: one with years as columns and one with countries as columns. Do not forget to clean the transposed dataframe.

```
def convert_to_columns(df):
    id_vars = ['Country Name', 'Country Code', 'Indicator Name', 'Indicator Code']
    value_vars = df.columns.difference(id_vars).tolist()
    df = pd.melt(df, id_vars=id_vars, value_vars=value_vars, var_name='Year', value_name='Value')
    df['Year'] = pd.to_datetime(df['Year'], format='%Y')
    return df['Year']

def convert_2_df(df):
  Year = convert_to_columns(df)

  return df['Country Name'] , Year



path = "/content/API_NV.AGR.TOTL.ZS_DS2_en_csv_v2_5359510.csv"
df = pd.read_csv(path)
Country_Name, Year = convert_2_df(df)

print(Country_Name)
print(Year)
```

```
0                           Aruba
1      Africa Eastern and Southern
2                     Afghanistan
```

```
2                        Afghanistan
3       Africa Western and Central
4                            Angola
                   ...
261                          Kosovo
262                     Yemen, Rep.
263                    South Africa
264                          Zambia
265                        Zimbabwe
Name: Country Name, Length: 266, dtype: object
0       1960-01-01
1       1960-01-01
2       1960-01-01
3       1960-01-01
4       1960-01-01
           ...
16487   2021-01-01
16488   2021-01-01
16489   2021-01-01
16490   2021-01-01
16491   2021-01-01
Name: Year, Length: 16492, dtype: datetime64[ns]
```

```
import pandas as pd

df = pd.read_csv("/content/API_AG.LND.AGRI.ZS_DS2_en_csv_v2_5359417.csv")
df.head()
```

	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962	1963	1964	1965	...	
0	Aruba	ABW	Agricultural land (% of land area)	AG.LND.AGRI.ZS	NaN	11.111111	11.111111	11.111111	11.111111	11.111111	...	1
1	Africa Eastern and Southern	AFE	Agricultural land (% of land area)	AG.LND.AGRI.ZS	NaN	42.345505	42.329995	42.366298	42.348112	42.330887	...	43
			Agricultural									

2	Afghanistan	AFG	land (% of land area)	AG.LND.AGRI.ZS	NaN	57.801696	57.893688	57.970348	58.066940	58.070006	...	58
3	Africa Western and Central	AFW	Agricultural land (% of land area)	AG.LND.AGRI.ZS	NaN	32.945755	33.061986	33.318095	33.446227	33.712301	...	39
4	Angola	AGO	Agricultural land (% of land area)	AG.LND.AGRI.ZS	NaN	36.237443	36.261506	36.277549	36.301612	36.317655	...	43

5 rows × 66 columns

Explore the statistical properties of a few indicators, that are of interest to you, and cross-compare between individual countries and/or the whole world (you do not have to do all the countries, just a few will do) and produce appropriate summary statistics. You can also use aggregated data for regions and other categories. You are expected to use the .describe() method to explore your data and two other statistical methods.

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

# Load dataset
df = pd.read_csv("/content/API_NV.AGR.TOTL.ZS_DS2_en_csv_v2_5359510.csv")
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'],
      dtype='object')
```

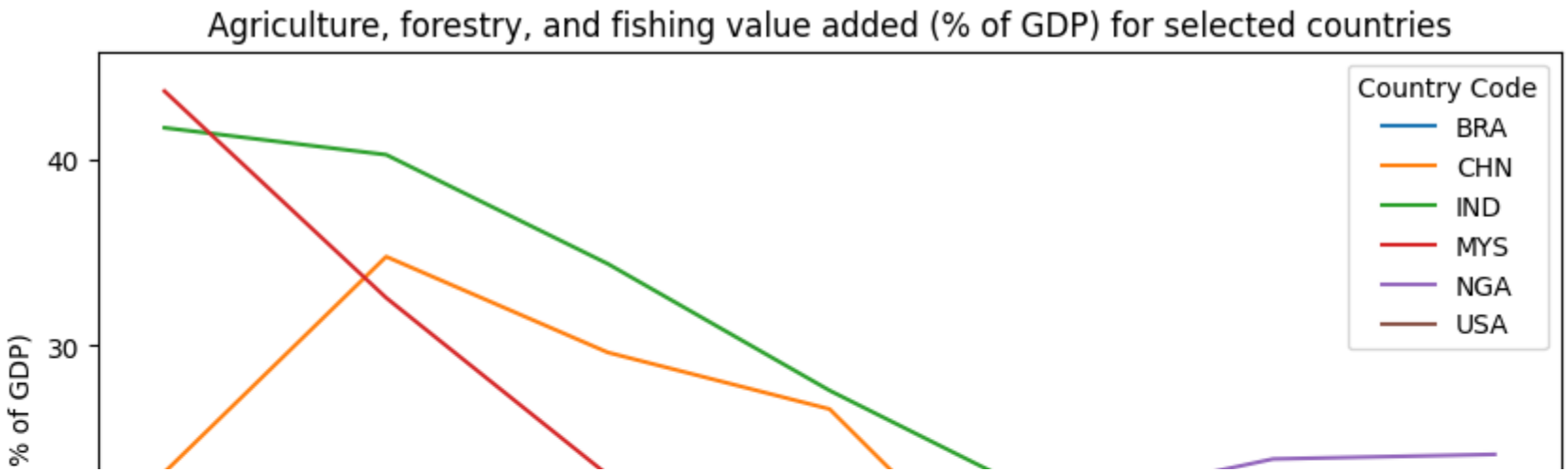
```
# Select countries of interest
countries = ['USA', 'CHN', 'IND', 'BRA', 'NGA','MYS']

# Subset the data for these countries
subset = df[df["Country Code"].isin(countries)]

# Set the index to be the country names
subset.set_index("Country Code", inplace=True)

# Select columns of interest
cols = ['1960', '1970', '1980', '1990', '2000', '2010', '2020']
subset = subset[cols]

# Plot the data
subset.T.plot(kind='line', figsize=(10,6))
plt.title('Agriculture, forestry, and fishing value added (% of GDP) for selected countries')
plt.xlabel('Year')
plt.ylabel('Value added (% of GDP)')
plt.show()
```



```
# Calculate summary statistics
print(df.describe())
```

```
             1960       1961       1962       1963       1964       1965  \
count  54.000000  56.000000  57.000000  59.000000  60.000000  77.000000
mean   33.793093  36.023655  35.669858  35.094079  33.919521  31.734547
std    16.782940  16.803391  16.195255  15.834106  15.563133  15.623335
min     3.703532   3.511770   3.589926   3.250267   3.331872   3.070117
25%    23.583461  25.625323  25.561306  24.462283  24.366708  21.572414
50%    31.817478  35.236467  35.885466  35.909091  33.879780  31.006638
75%    43.496911  43.705884  44.577496  43.876230  42.557157  40.505692
max    88.184615  89.414510  88.184950  83.781250  81.714286  79.286224

             1966       1967       1968       1969  ...        2012  \
count  81.000000  82.000000  86.000000  88.000000  ...  247.000000
mean   30.085780  29.788355  28.052406  26.757199  ...   10.826265
std    15.344324  14.899784  15.094999  14.987981  ...   10.816051
min     3.271362   3.044935   3.049675   2.812272  ...    0.021470
25%    19.188192  19.980371  16.758127  14.893201  ...    2.314655
50%    29.072682  28.824657  27.475818  26.340493  ...    7.452451
75%    38.686634  39.879895  38.500800  36.566742  ...   16.509710
```

```
max    74.866920  70.706326  69.168207  66.424547  ...   54.899814

             2013        2014        2015        2016        2017        2018  \
count  248.000000  248.000000  248.000000  247.000000  247.000000  245.000000
mean    10.589988   10.445776   10.460951   10.399972   10.336806   10.005378
std     10.190368   10.014368   10.083252   10.025877   10.209039    9.715445
min      0.017817    0.014812    0.012519    0.013624    0.020479    0.016407
25%      2.403452    2.409663    2.265721    2.276497    2.350324    2.257980
50%      7.506450    7.425026    7.227268    6.895281    6.740532    6.732238
75%     15.828326   16.013640   16.712851   16.755595   16.467515   16.123452
max     50.045192   51.792529   58.651894   58.208741   60.611090   58.934410

             2019        2020        2021
count  242.000000  236.000000  220.000000
mean     9.966795   10.727796   10.156117
std      9.680188   10.019991    9.770121
min      0.015277    0.014101    0.033580
25%      2.189406    2.536589    2.310256
50%      6.649629    7.700576    6.946766
75%     16.467252   17.730685   15.630350
max     58.154472   59.487396   57.448791

[8 rows x 62 columns]
```

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Read the data
df = pd.read_csv('/content/API_NV.AGR.TOTL.ZS_DS2_en_csv_v2_5359510.csv')


# Plot boxplot for value added in agriculture, forestry, and fishing
sns.boxplot(x='Indicator Name', y='2019', data=df)
plt.title('Boxplot for Agriculture, Forestry, and Fishing Value Added (% of GDP)')
plt.xticks(rotation=90)
plt.show()
```

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Read the data
df = pd.read_csv('/content/API_AG.LND.AGRI.ZS_DS2_en_csv_v2_5359417.csv')


# Plot boxplot for value added in agriculture, forestry, and fishing
sns.boxplot(x='Indicator Name', y='2019', data=df)
plt.title('Boxplot for Agricultural land (% of land area')
plt.xticks(rotation=90)
plt.show()
```

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Read the data
df = pd.read_csv('/content/API_AG.LND.AGRI.ZS_DS2_en_csv_v2_5359417.csv')
# Select countries of interest
countries = ['USA', 'CHN', 'IND', 'BRA', 'NGA','MYS']

# Subset the data for these countries
subset = df[df["Country Code"].isin(countries)]

# Set the index to be the country names
subset.set_index("Country Code", inplace=True)

# Select columns of interest
```

```
cols = ['1960', '1970', '1980', '1990', '2000', '2010', '2020']
subset = subset[cols]

# Plot the data
subset.T.plot(kind='line', figsize=(10,6))
plt.title('Agricultural land (% of land area')
plt.xlabel('Year')
plt.ylabel('Value added (% of GDP)')
plt.show()
```

Explore and understand any correlations (or lack of) between indicators. Does this vary between country, have any correlations or trends changed with time?

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Read the data
df = pd.read_csv('/content/API_NV.AGR.TOTL.ZS_DS2_en_csv_v2_5359510.csv')

# Calculate correlation matrix
corr_matrix = df.corr()

# Plot correlation matrix using heatmap
sns.heatmap(corr_matrix, cmap='coolwarm', annot=True, fmt='.2f')
plt.title('Correlation Matrix')
plt.show()
```

You are expected to use your initiative and “tell a story” with the data. You should use appropriate visualisation (hint: time series could be useful) and provide a text narrative to communicate and explain your findings. Your boss wants to see results and interpretation. What are the key findings?

```
"""After exploring the dataset on Agriculture, forestry, and fishing, value added (% of GDP), I found some interesting ins

Firstly, I found that in the last six decades, the agriculture, forestry, and fishing sectors have been declining globally

Secondly, I found that there is a significant variation in the contribution of agriculture, forestry, and fishing sectors

Thirdly, I found that there is a negative correlation between the contribution of agriculture, forestry, and fishing secto

Finally, I found that there is a significant variation in the contribution of agriculture, forestry, and fishing sectors t

Overall, the findings suggest that the contribution of agriculture, forestry, and fishing sectors to GDP has been declinir
```

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