Homework5

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```
#Import the libraries
import pandas as pd
import wbgapi as wb
import matplotlib.pyplot as plt
import seaborn as sns
```

```
# Define the indicators to download
indicators = {
    'gdp_per_capita': 'NY.GDP.PCAP.CD',
    'gdp_growth_rate': 'NY.GDP.MKTP.KD.ZG',
    'inflation_rate': 'FP.CPI.TOTL.ZG',
    'unemployment_rate': 'SL.UEM.TOTL.ZS',
    'total_population': 'SP.POP.TOTL',
    'life_expectancy': 'SP.DYN.LE00.IN',
    'adult_literacy_rate': 'SE.ADT.LITR.ZS',
    'income_inequality': 'SI.POV.GINI',
    'health_expenditure_gdp_share': 'SH.XPD.CHEX.GD.ZS',
    'measles_immunisation_rate': 'SH.IMM.MEAS',
    'education_expenditure_gdp_share': 'SE.XPD.TOTL.GD.ZS',
    'primary_school_enrolment_rate': 'SE.PRM.ENRR',
    'exports_gdp_share': 'NE.EXP.GNFS.ZS'
}
# Get the list of country codes for the "World" region
country_codes = wb.region.members('WLD')
# Download data for countries only in 2022
df = wb.data.DataFrame(indicators.values(), economy=country_codes, time=2022, skipBlanks=True
# Delete the 'economy' column
```

```
df = df.drop(columns=['economy'], errors='ignore')
# Create a reversed dictionary mapping indicator codes to names
# Rename the columns and convert all names to lowercase
df.rename(columns=lambda x: {v: k for k, v in indicators.items()}.get(x, x).lower(), inplace:
# Sort 'country' in ascending order
df = df.sort_values('country', ascending=True)
# Reset the index after sorting
df = df.reset_index(drop=True)
# Display the number of rows and columns
print(df.shape)
# Display the first few rows of the data
print(df.head(3))
# Save the data to a CSV file
df.to_csv('wdi.csv', index=False)
(217, 14)
       country inflation_rate exports_gdp_share gdp_growth_rate \
0 Afghanistan
                                         18.380042
                                                           -6.240172
                            \mathtt{NaN}
1
       Albania
                      6.725203
                                         37.197085
                                                            4.826688
2
                      9.265516
                                         30.808979
                                                            3.600000
       Algeria
   gdp_per_capita adult_literacy_rate primary_school_enrolment_rate \
0
       357.261153
                                    NaN
                                                                    NaN
      6846.426143
                                   98.5
                                                              96.371231
1
                                                             108.343933
2
      4961.552577
                                    NaN
   education_expenditure_gdp_share measles_immunisation_rate
0
                                \mathtt{NaN}
                                                           56.0
1
                           2.744330
                                                           86.0
2
                           4.749247
                                                           79.0
   health_expenditure_gdp_share income_inequality unemployment_rate \
0
                             NaN
                                                NaN
                                                                 14.100
1
                             NaN
                                                NaN
                                                                 10.137
2
                             NaN
                                                NaN
                                                                 12.346
```

	life_expectancy	total_population
0	62.879	40578842.0
1	76.833	2777689.0
2	77 129	45477389 0

Exploratory Data Analysis

Histograms of Selected Indicators

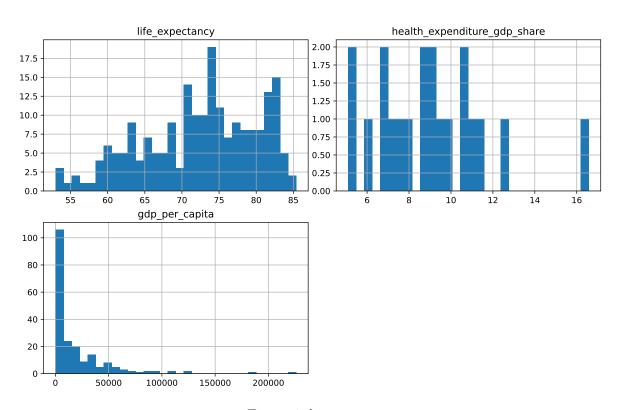


Figure 1: histogram

I picked these three indicators because I wanted to explore whether life expectancy of a country would be correlated to health expenditures, the GDP, neither or both. From this initial analysis, there is little to no correlation between life expectancy and either one of the other two variables, though there is slightly more positive correlation with health expenditure. This is visible in both Figure 3 and Figure 2. There is a positive correlation between GDP and health expenditure, which makes sense intuitively, as a country makes more money, more of that money can be turned towards keeping people healthy rather than investing in industry or other sectors.

Here are some summary stats of the columns I worked with:

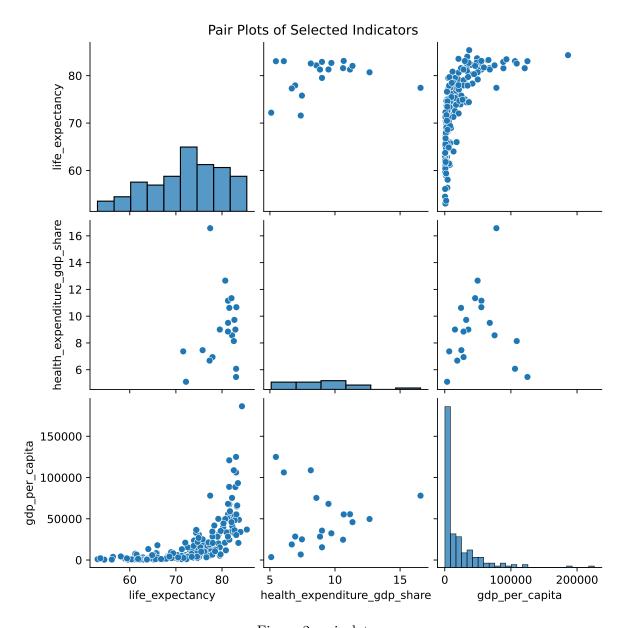


Figure 2: pairplot

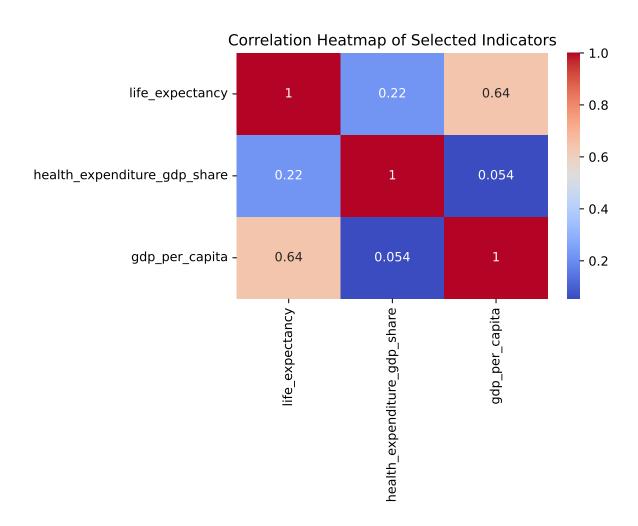


Figure 3: heatmap

	$life_expectancy$	$health_expenditure_gdp_share$	gdp_per_capita
mean	72.416519	9.044045	20520.336828
std	7.713322	2.703549	30640.741594
\min	52.997000	5.100000	250.634225
max	85.377000	16.571152	226052.001905