

# task1

October 12, 2024

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

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

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

Saving API_SP.POP.TOTL_DS2_en_csv_v2_5871594.csv to
API_SP.POP.TOTL_DS2_en_csv_v2_5871594.csv
```

```
[3]: df = pd.read_csv('API_SP.POP.TOTL_DS2_en_csv_v2_5871594.csv')
```

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

```
[5]:
```

	Country Name	Country Code	Indicator Name	Indicator Code	\
0	Aruba	ABW	Population, total	SP.POP.TOTL	
1	Africa Eastern and Southern	AFE	Population, total	SP.POP.TOTL	
2	Afghanistan	AFG	Population, total	SP.POP.TOTL	
3	Africa Western and Central	AFW	Population, total	SP.POP.TOTL	
4	Angola	AGO	Population, total	SP.POP.TOTL	

	1960	1961	1962	1963	1964	\
0	54608.0	55811.0	56682.0	57475.0	58178.0	
1	130692579.0	134169237.0	137835590.0	141630546.0	145605995.0	
2	8622466.0	8790140.0	8969047.0	9157465.0	9355514.0	
3	97256290.0	99314028.0	101445032.0	103667517.0	105959979.0	
4	5357195.0	5441333.0	5521400.0	5599827.0	5673199.0	

	1965	...	2013	2014	2015	2016	\
0	58782.0	...	102880.0	103594.0	104257.0	104874.0	
1	149742351.0	...	567892149.0	583651101.0	600008424.0	616377605.0	
2	9565147.0	...	31541209.0	32716210.0	33753499.0	34636207.0	
3	108336203.0	...	387204553.0	397855507.0	408690375.0	419778384.0	
4	5736582.0	...	26147002.0	27128337.0	28127721.0	29154746.0	

	2017	2018	2019	2020	2021	\
0	105439.0	105962.0	106442.0	106585.0	106537.0	
1	632746570.0	649757148.0	667242986.0	685112979.0	702977106.0	
2	35643418.0	36686784.0	37769499.0	38972230.0	40099462.0	
3	431138704.0	442646825.0	454306063.0	466189102.0	478185907.0	
4	30208628.0	31273533.0	32353588.0	33428486.0	34503774.0	
			2022			
0			106445.0			
1			720839314.0			
2			41128771.0			
3			490330870.0			
4			35588987.0			

[5 rows x 67 columns]

[6]: 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]

[7]: 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

```

[8]: 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  ...  2.927778e+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]

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

[9]: 0

[10]: df.isna().sum().any()

[10]: True

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

```
<ipython-input-11-779d711b7f64>:1: FutureWarning: DataFrame.fillna with 'method'  
is deprecated and will raise in a future version. Use obj.ffill() or obj.bfill()  
instead.
```

```
df = df.fillna(method="ffill")
```

```
[11]:
```

	Country Name	Country Code	Indicator Name	Indicator Code	\
0	Aruba	ABW	Population, total	SP.POP.TOTL	
1	Africa Eastern and Southern	AFE	Population, total	SP.POP.TOTL	
2	Afghanistan	AFG	Population, total	SP.POP.TOTL	
3	Africa Western and Central	AFW	Population, total	SP.POP.TOTL	
4	Angola	AGO	Population, total	SP.POP.TOTL	

	1960	1961	1962	1963	1964	\
0	54608.0	55811.0	56682.0	57475.0	58178.0	
1	130692579.0	134169237.0	137835590.0	141630546.0	145605995.0	
2	8622466.0	8790140.0	8969047.0	9157465.0	9355514.0	
3	97256290.0	99314028.0	101445032.0	103667517.0	105959979.0	
4	5357195.0	5441333.0	5521400.0	5599827.0	5673199.0	

	1965	...	2013	2014	2015	2016	\
0	58782.0	...	102880.0	103594.0	104257.0	104874.0	
1	149742351.0	...	567892149.0	583651101.0	600008424.0	616377605.0	
2	9565147.0	...	31541209.0	32716210.0	33753499.0	34636207.0	
3	108336203.0	...	387204553.0	397855507.0	408690375.0	419778384.0	
4	5736582.0	...	26147002.0	27128337.0	28127721.0	29154746.0	

	2017	2018	2019	2020	2021	\
0	105439.0	105962.0	106442.0	106585.0	106537.0	
1	632746570.0	649757148.0	667242986.0	685112979.0	702977106.0	
2	35643418.0	36686784.0	37769499.0	38972230.0	40099462.0	
3	431138704.0	442646825.0	454306063.0	466189102.0	478185907.0	
4	30208628.0	31273533.0	32353588.0	33428486.0	34503774.0	

	2022
0	106445.0
1	720839314.0
2	41128771.0
3	490330870.0
4	35588987.0

```
[5 rows x 67 columns]
```

```
[12]: df.isna().sum().any()
```

```
[12]: False
```

```
[13]: df['Country Name'].unique()
```

[13]: array(['Aruba', 'Africa Eastern and Southern', 'Afghanistan',  
'Africa Western and Central', 'Angola', 'Albania', 'Andorra',  
'Arab World', 'United Arab Emirates', 'Argentina', 'Armenia',  
'American Samoa', 'Antigua and Barbuda', 'Australia', 'Austria',  
'Azerbaijan', 'Burundi', 'Belgium', 'Benin', 'Burkina Faso',  
'Bangladesh', 'Bulgaria', 'Bahrain', 'Bahamas, The',  
'Bosnia and Herzegovina', 'Belarus', 'Belize', 'Bermuda',  
'Bolivia', 'Brazil', 'Barbados', 'Brunei Darussalam', 'Bhutan',  
'Botswana', 'Central African Republic', 'Canada',  
'Central Europe and the Baltics', 'Switzerland', 'Channel Islands',  
'Chile', 'China', "Cote d'Ivoire", 'Cameroon', 'Congo, Dem. Rep.',  
'Congo, Rep.', 'Colombia', 'Comoros', 'Cabo Verde', 'Costa Rica',  
'Caribbean small states', 'Cuba', 'Curacao', 'Cayman Islands',  
'Cyprus', 'Czechia', 'Germany', 'Djibouti', 'Dominica', 'Denmark',  
'Dominican Republic', 'Algeria',  
'East Asia & Pacific (excluding high income)',  
'Early-demographic dividend', 'East Asia & Pacific',  
'Europe & Central Asia (excluding high income)',  
'Europe & Central Asia', 'Ecuador', 'Egypt, Arab Rep.',  
'Euro area', 'Eritrea', 'Spain', 'Estonia', 'Ethiopia',  
'European Union', 'Fragile and conflict affected situations',  
'Finland', 'Fiji', 'France', 'Faroe Islands',  
'Micronesia, Fed. Sts.', 'Gabon', 'United Kingdom', 'Georgia',  
'Ghana', 'Gibraltar', 'Guinea', 'Gambia, The', 'Guinea-Bissau',  
'Equatorial Guinea', 'Greece', 'Grenada', 'Greenland', 'Guatemala',  
'Guam', 'Guyana', 'High income', 'Hong Kong SAR, China',  
'Honduras', 'Heavily indebted poor countries (HIPC)', 'Croatia',  
'Haiti', 'Hungary', 'IBRD only', 'IDA & IBRD total', 'IDA total',  
'IDA blend', 'Indonesia', 'IDA only', 'Isle of Man', 'India',  
'Not classified', 'Ireland', 'Iran, Islamic Rep.', 'Iraq',  
'Iceland', 'Israel', 'Italy', 'Jamaica', 'Jordan', 'Japan',  
'Kazakhstan', 'Kenya', 'Kyrgyz Republic', 'Cambodia', 'Kiribati',  
'St. Kitts and Nevis', 'Korea, Rep.', 'Kuwait',  
'Latin America & Caribbean (excluding high income)', 'Lao PDR',  
'Lebanon', 'Liberia', 'Libya', 'St. Lucia',  
'Latin America & Caribbean',  
'Least developed countries: UN classification', 'Low income',  
'Liechtenstein', 'Sri Lanka', 'Lower middle income',  
'Low & middle income', 'Lesotho', 'Late-demographic dividend',  
'Lithuania', 'Luxembourg', 'Latvia', 'Macao SAR, China',  
'St. Martin (French part)', 'Morocco', 'Monaco', 'Moldova',  
'Madagascar', 'Maldives', 'Middle East & North Africa', 'Mexico',  
'Marshall Islands', 'Middle income', 'North Macedonia', 'Mali',  
'Malta', 'Myanmar',  
'Middle East & North Africa (excluding high income)', 'Montenegro',  
'Mongolia', 'Northern Mariana Islands', 'Mozambique', 'Mauritania',  
'Mauritius', 'Malawi', 'Malaysia', 'North America', 'Namibia',

```
'New Caledonia', 'Niger', 'Nigeria', 'Nicaragua', 'Netherlands',
'Norway', 'Nepal', 'Nauru', 'New Zealand', 'OECD members', 'Oman',
'Other small states', 'Pakistan', 'Panama', 'Peru', 'Philippines',
'Palau', 'Papua New Guinea', 'Poland', 'Pre-demographic dividend',
'Puerto Rico', "Korea, Dem. People's Rep.", 'Portugal', 'Paraguay',
'West Bank and Gaza', 'Pacific island small states',
'Post-demographic dividend', 'French Polynesia', 'Qatar',
'Romania', 'Russian Federation', 'Rwanda', 'South Asia',
'Saudi Arabia', 'Sudan', 'Senegal', 'Singapore', 'Solomon Islands',
'Sierra Leone', 'El Salvador', 'San Marino', 'Somalia', 'Serbia',
'Sub-Saharan Africa (excluding high income)', 'South Sudan',
'Sub-Saharan Africa', 'Small states', 'Sao Tome and Principe',
'Suriname', 'Slovak Republic', 'Slovenia', 'Sweden', 'Eswatini',
'Sint Maarten (Dutch part)', 'Seychelles', 'Syrian Arab Republic',
'Turks and Caicos Islands', 'Chad',
'East Asia & Pacific (IDA & IBRD countries)',
'Europe & Central Asia (IDA & IBRD countries)', 'Togo', 'Thailand',
'Tajikistan', 'Turkmenistan',
'Latin America & the Caribbean (IDA & IBRD countries)',
'Timor-Leste', 'Middle East & North Africa (IDA & IBRD countries)',
'Tonga', 'South Asia (IDA & IBRD)',
'Sub-Saharan Africa (IDA & IBRD countries)', 'Trinidad and Tobago',
'Tunisia', 'Turkiye', 'Tuvalu', 'Tanzania', 'Uganda', 'Ukraine',
'Upper middle income', 'Uruguay', 'United States', 'Uzbekistan',
'St. Vincent and the Grenadines', 'Venezuela, RB',
'British Virgin Islands', 'Virgin Islands (U.S.)', 'Vietnam',
'Vanuatu', 'World', 'Samoa', 'Kosovo', 'Yemen, Rep.',
'South Africa', 'Zambia', 'Zimbabwe'], dtype=object)
```

[14]: df['Country Code'].unique()

```
[14]: array(['ABW', 'AFE', 'AFG', 'AFW', 'AGO', 'ALB', 'AND', 'ARB', 'ARE',
'ARG', 'ARM', 'ASM', 'ATG', 'AUS', 'AUT', 'AZE', 'BDI', 'BEL',
'BEN', 'BFA', 'BGD', 'BGR', 'BHR', 'BHS', 'BIH', 'BLR', 'BLZ',
'BMU', 'BOL', 'BRA', 'BRB', 'BRN', 'BTN', 'BWA', 'CAF', 'CAN',
'CEB', 'CHE', 'CHI', 'CHL', 'CHN', 'CIV', 'CMR', 'COD', 'COG',
'COL', 'COM', 'CPV', 'CRI', 'CSS', 'CUB', 'CUW', 'CYM', 'CYP',
'CZE', 'DEU', 'DJI', 'DMA', 'DNK', 'DOM', 'DZA', 'EAP', 'EAR',
'EAS', 'ECA', 'ECS', 'ECU', 'EGY', 'EMU', 'ERI', 'ESP', 'EST',
'ETH', 'EUU', 'FCS', 'FIN', 'FJI', 'FRA', 'FRO', 'FSM', 'GAB',
'GBR', 'GEO', 'GHA', 'GIB', 'GIN', 'GMB', 'GNB', 'GNQ', 'GRC',
'GRD', 'GRL', 'GTM', 'GUM', 'GUY', 'HIC', 'HKG', 'HND', 'HPC',
'HRV', 'HTI', 'HUN', 'IBD', 'IBT', 'IDA', 'IDB', 'IDN', 'IDX',
'IMN', 'IND', 'INX', 'IRL', 'IRN', 'IRQ', 'ISL', 'ISR', 'ITA',
'JAM', 'JOR', 'JPN', 'KAZ', 'KEN', 'KGZ', 'KHM', 'KIR', 'KNA',
'KOR', 'KWT', 'LAC', 'LAO', 'LBN', 'LBR', 'LBY', 'LCA', 'LCN',
'LDC', 'LIC', 'LIE', 'LKA', 'LMC', 'LMY', 'LSO', 'LTE', 'LTU',
```

```
'LUX', 'LVA', 'MAC', 'MAF', 'MAR', 'MCO', 'MDA', 'MDG', 'MDV',
'MEA', 'MEX', 'MHL', 'MIC', 'MKD', 'MLI', 'MLT', 'MMR', 'MNA',
'MNE', 'MNG', 'MNP', 'MOZ', 'MRT', 'MUS', 'MWI', 'MYS', 'NAC',
'NAM', 'NCL', 'NER', 'NGA', 'NIC', 'NLD', 'NOR', 'NPL', 'NRU',
'NZL', 'OED', 'OMN', 'OSS', 'PAK', 'PAN', 'PER', 'PHL', 'PLW',
'PNG', 'POL', 'PRE', 'PRI', 'PRK', 'PRT', 'PRY', 'PSE', 'PSS',
'PST', 'PYF', 'QAT', 'ROU', 'RUS', 'RWA', 'SAS', 'SAU', 'SDN',
'SEN', 'SGP', 'SLB', 'SLE', 'SLV', 'SMR', 'SOM', 'SRB', 'SSA',
'SSD', 'SSF', 'SST', 'STP', 'SUR', 'SVK', 'SVN', 'SWE', 'SWZ',
'SXM', 'SYC', 'SYR', 'TCA', 'TCD', 'TEA', 'TEC', 'TGO', 'THA',
'TJK', 'TKM', 'TLA', 'TLS', 'TMN', 'TON', 'TSA', 'TSS', 'TTO',
'TUN', 'TUR', 'TUV', 'TZA', 'UGA', 'UKR', 'UMC', 'URY', 'USA',
'UZB', 'VCT', 'VEN', 'VGB', 'VIR', 'VNM', 'VUT', 'WLD', 'WSM',
'XKK', 'YEM', 'ZAF', 'ZMB', 'ZWE'], dtype=object)
```

```
[16]: df['Indicator Name'].unique()
```

```
[16]: array(['Population, total'], dtype=object)
```

```
[17]: df['Indicator Code'].unique()
```

```
[17]: array(['SP.POP.TOTL'], dtype=object)
```

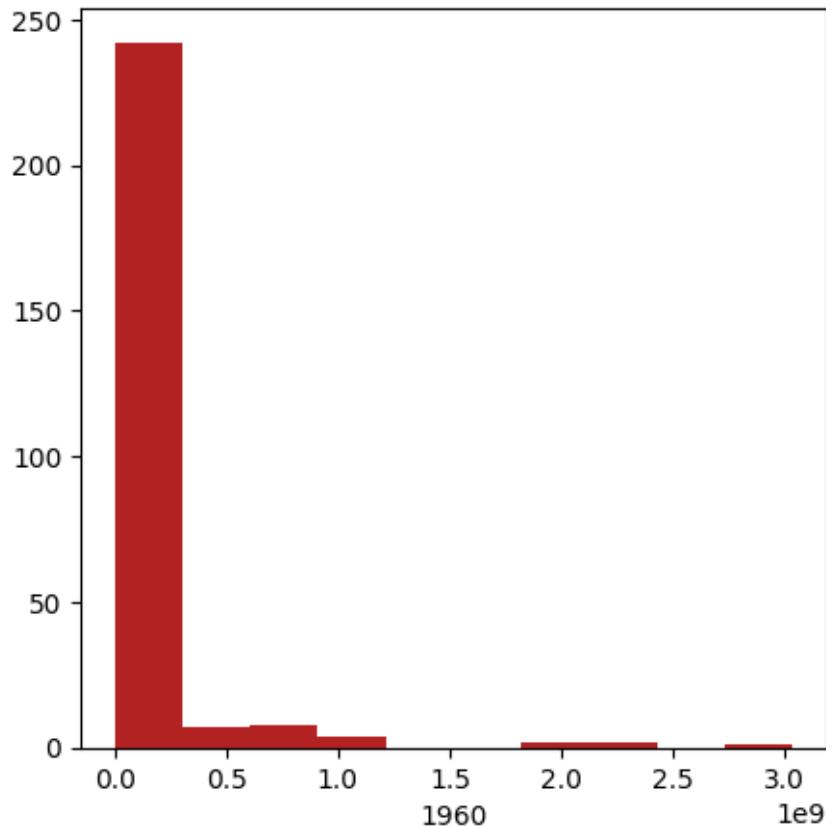
```
[19]: df.drop(['Indicator Name', 'Indicator Code', 'Country Code'], axis = 1, inplace = True)
```

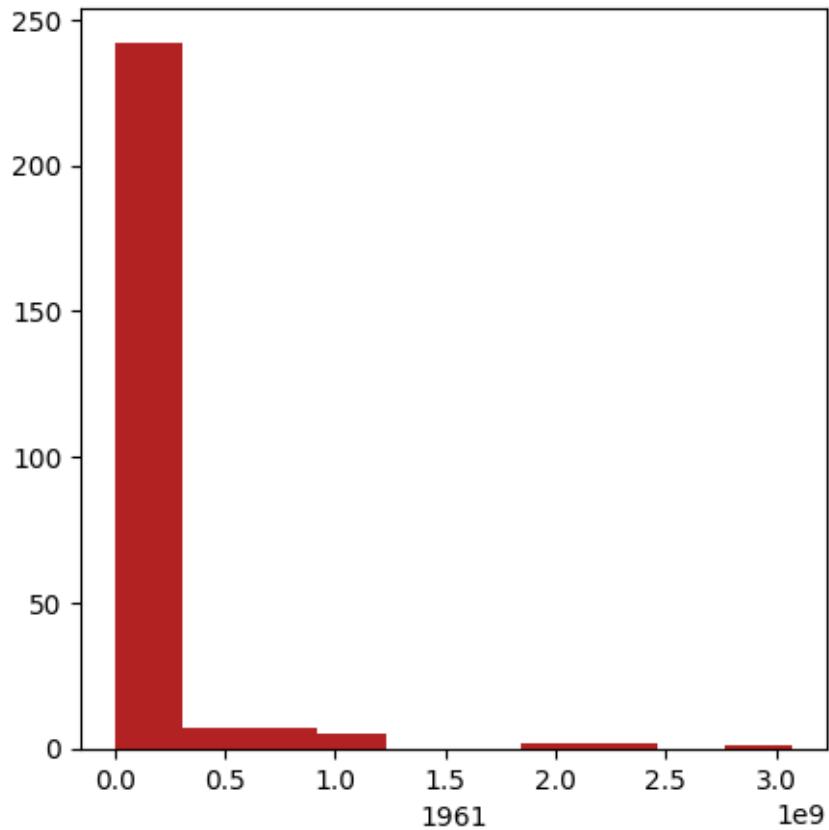
```
[20]: df.columns
```

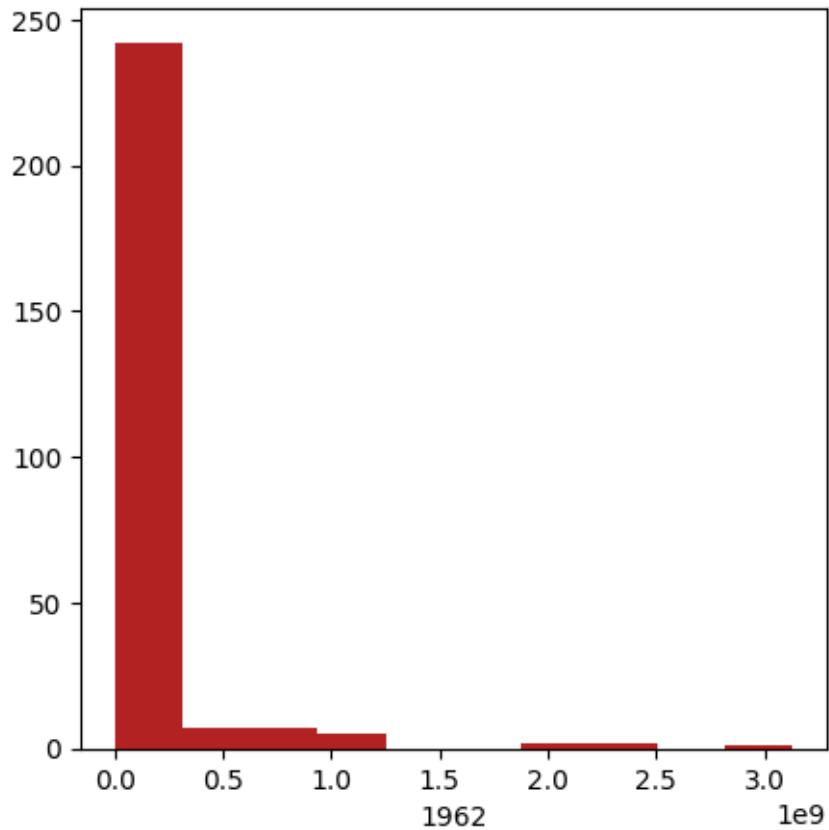
```
[20]: Index(['Country Name', '1960', '1961', '1962', '1963', '1964', '1965', '1966',
       '1967', '1968', '1969', '1970', '1971', '1972', '1973', '1974', '1975',
       '1976', '1977', '1978', '1979', '1980', '1981', '1982', '1983', '1984',
       '1985', '1986', '1987', '1988', '1989', '1990', '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')
```

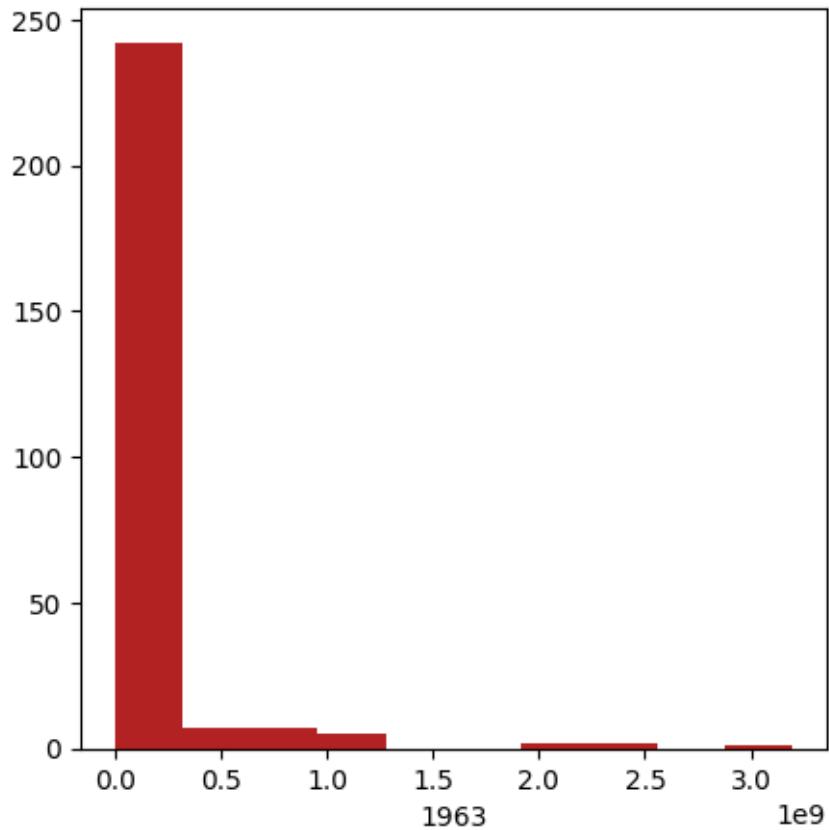
```
[21]: cols = ['1960', '1961', '1962', '1963', '1964', '1965', '1966',
       '1967', '1968', '1969', '1970', '1971', '1972', '1973', '1974', '1975',
       '1976', '1977', '1978', '1979', '1980', '1981', '1982', '1983', '1984',
       '1985', '1986', '1987', '1988', '1989', '1990', '1991', '1992', '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']
```

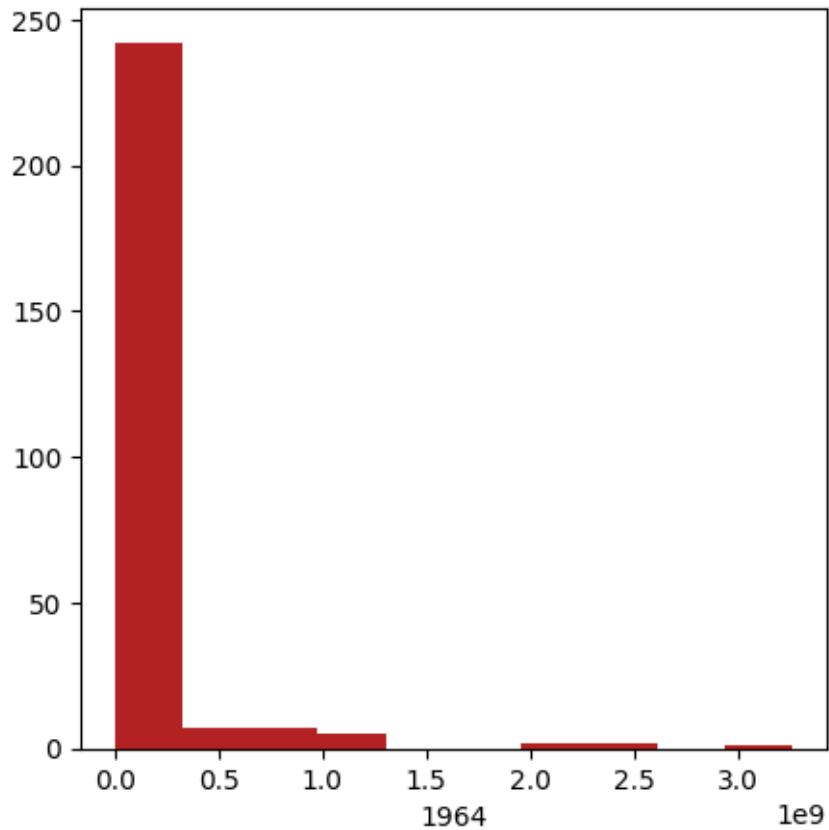
```
[23]: for i in cols:  
    fig = plt.figure(figsize=(5,5))  
    plt.hist(df[i],color='#B22222',bins=10)  
    plt.xlabel(i)  
    plt.show()
```

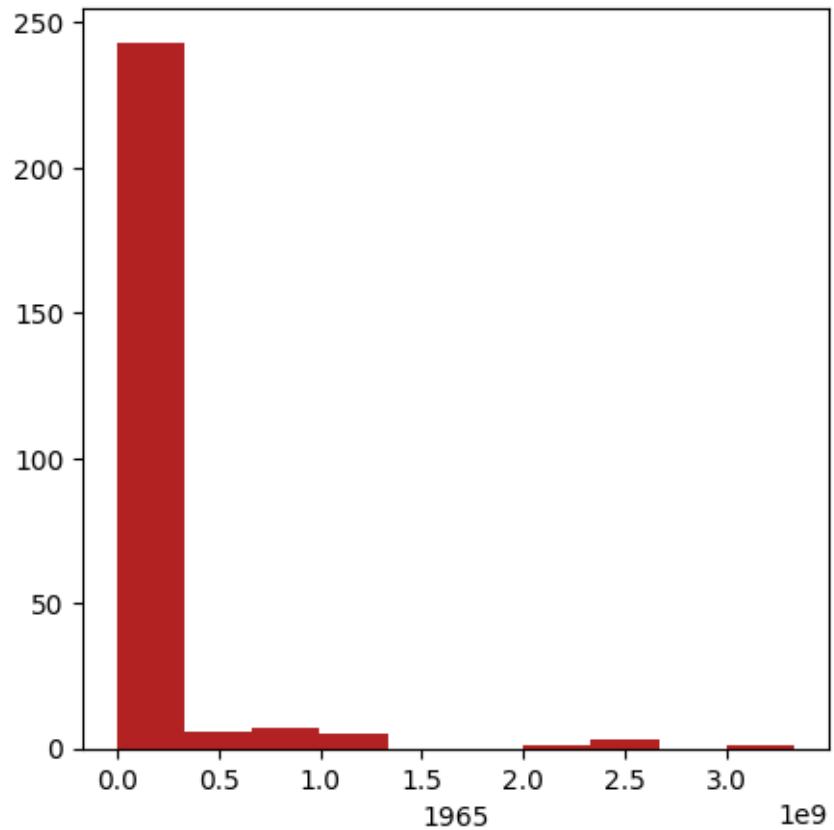


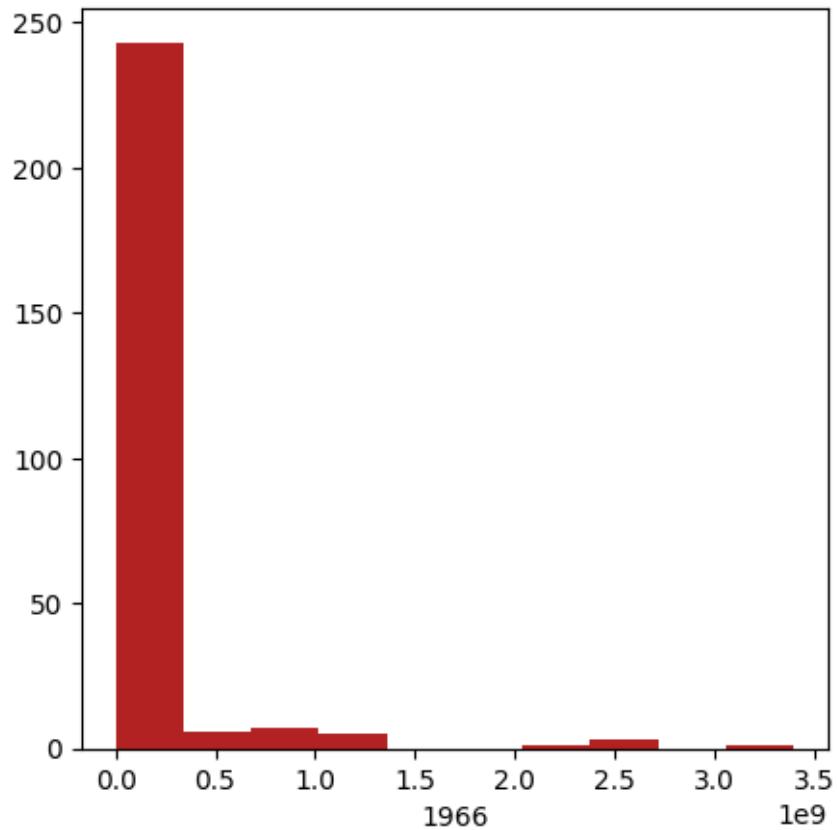


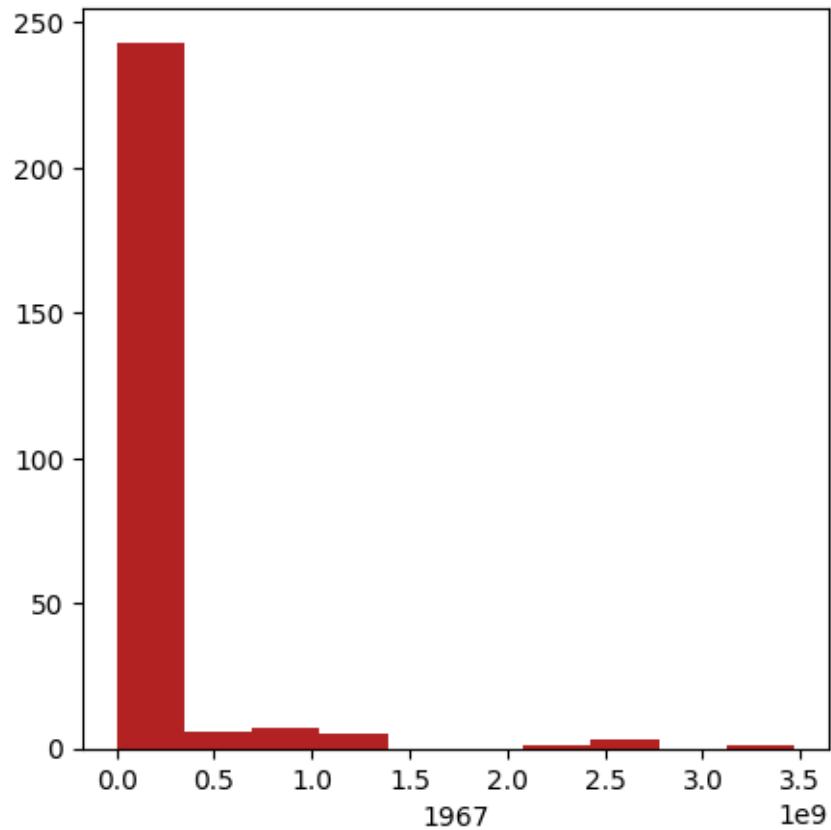


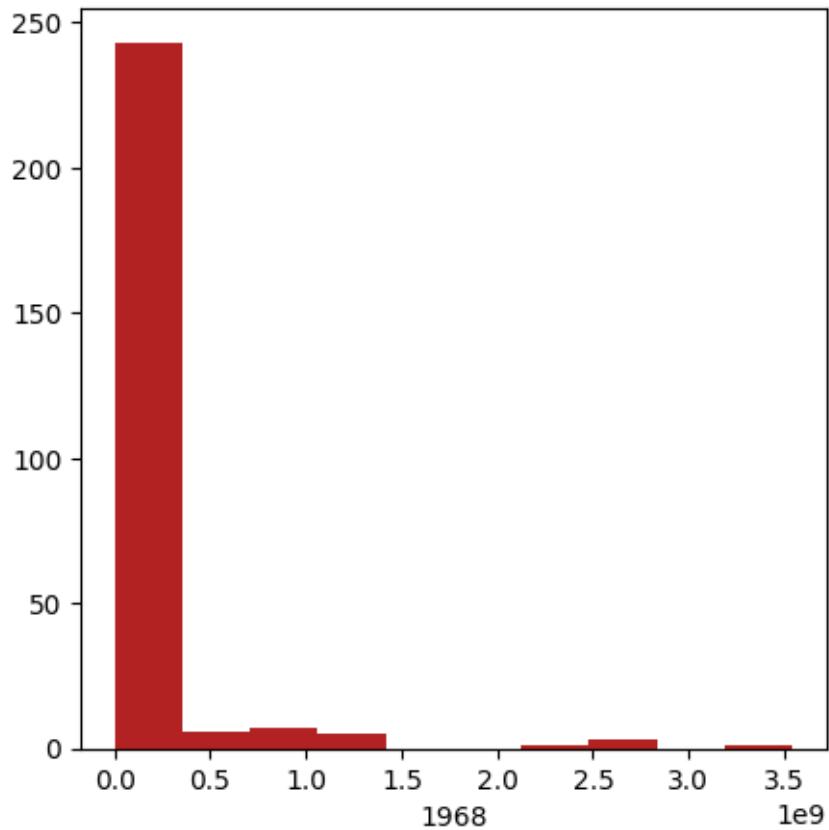


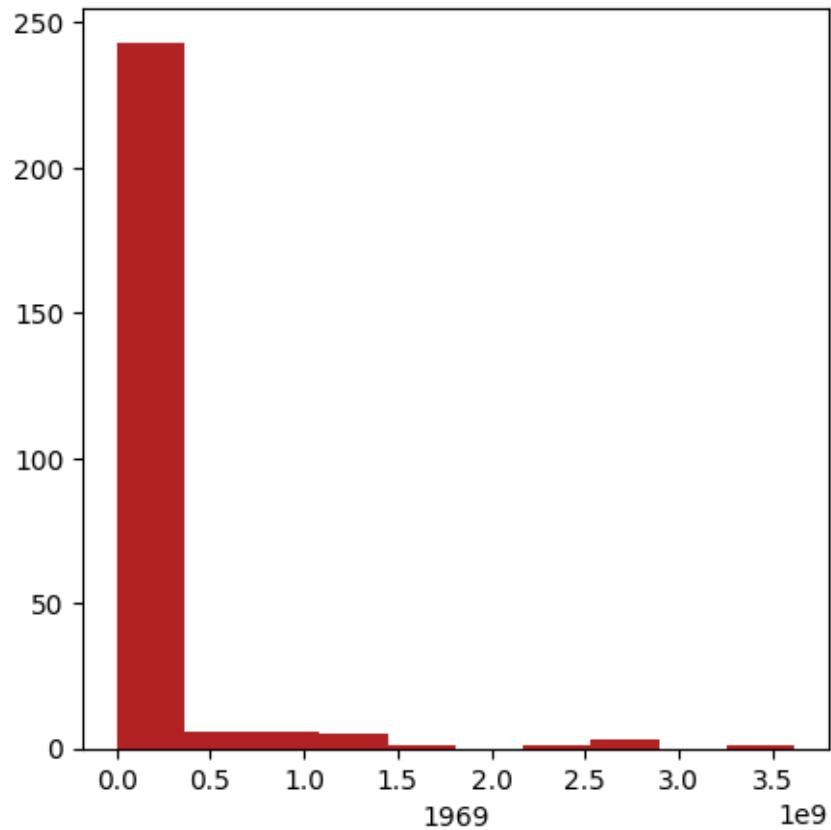


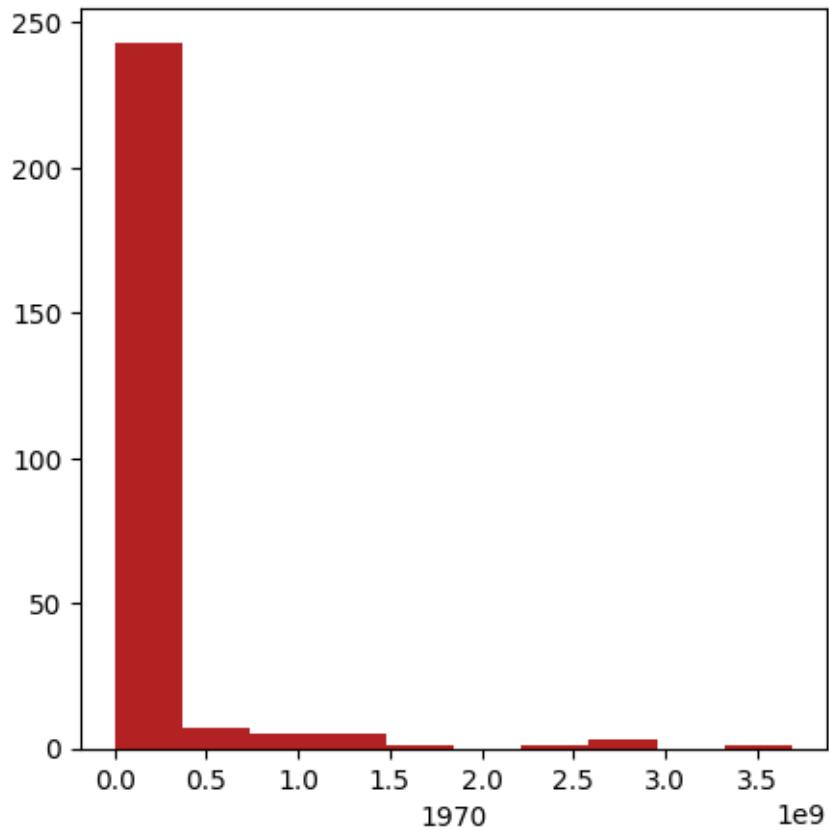


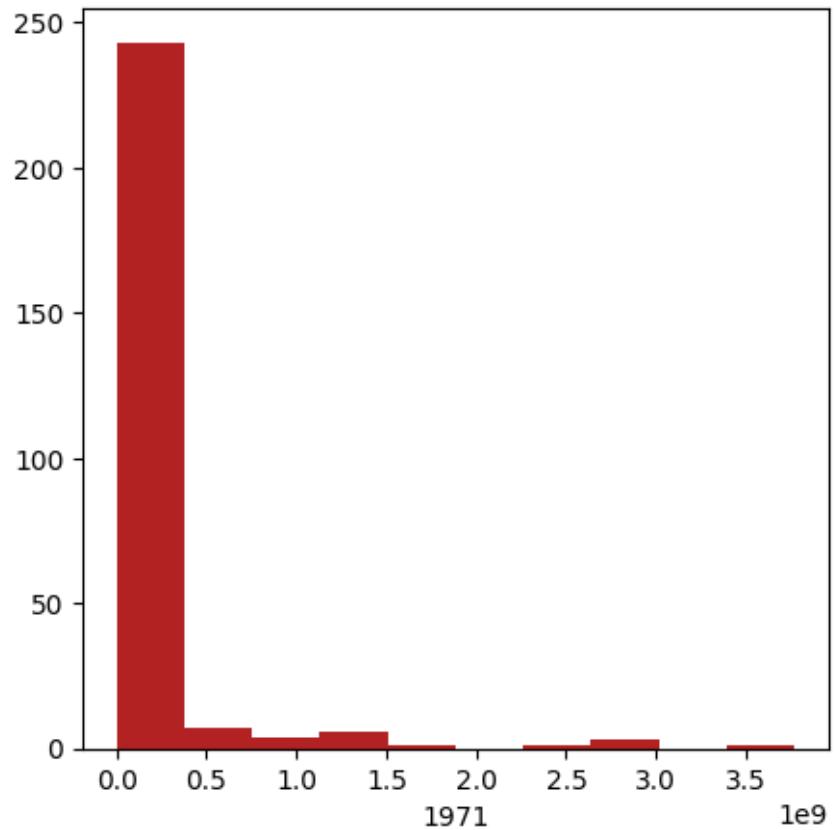


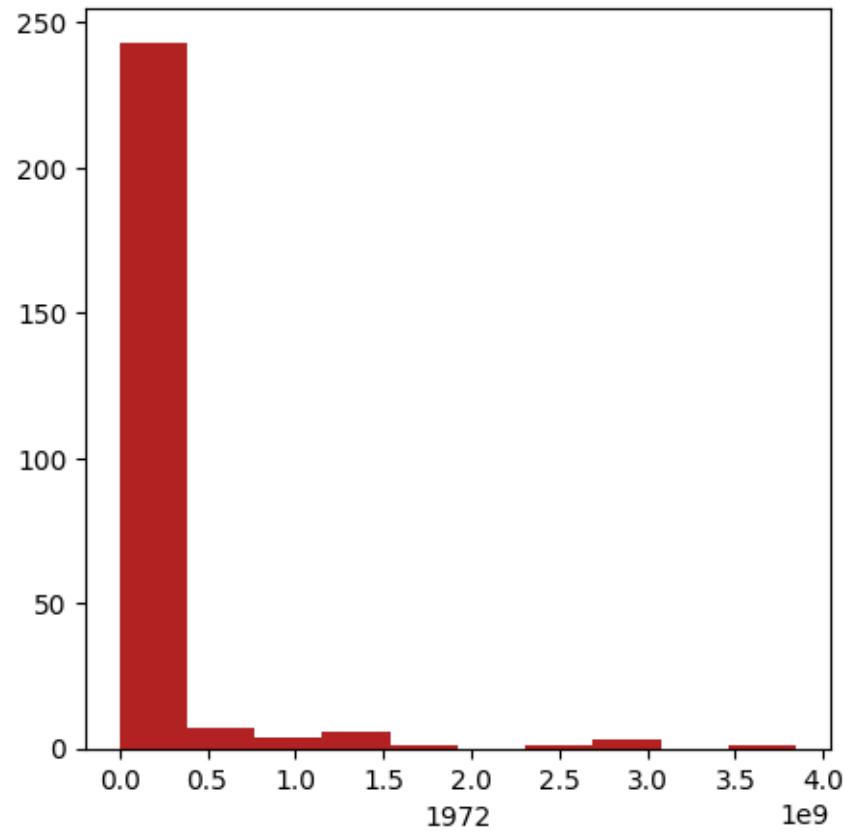


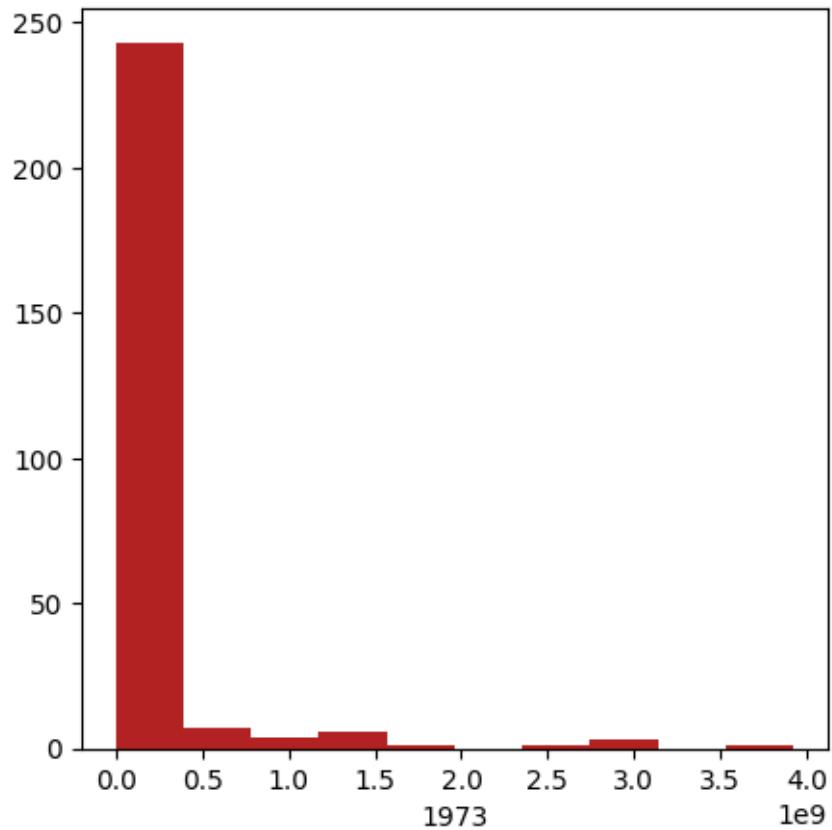


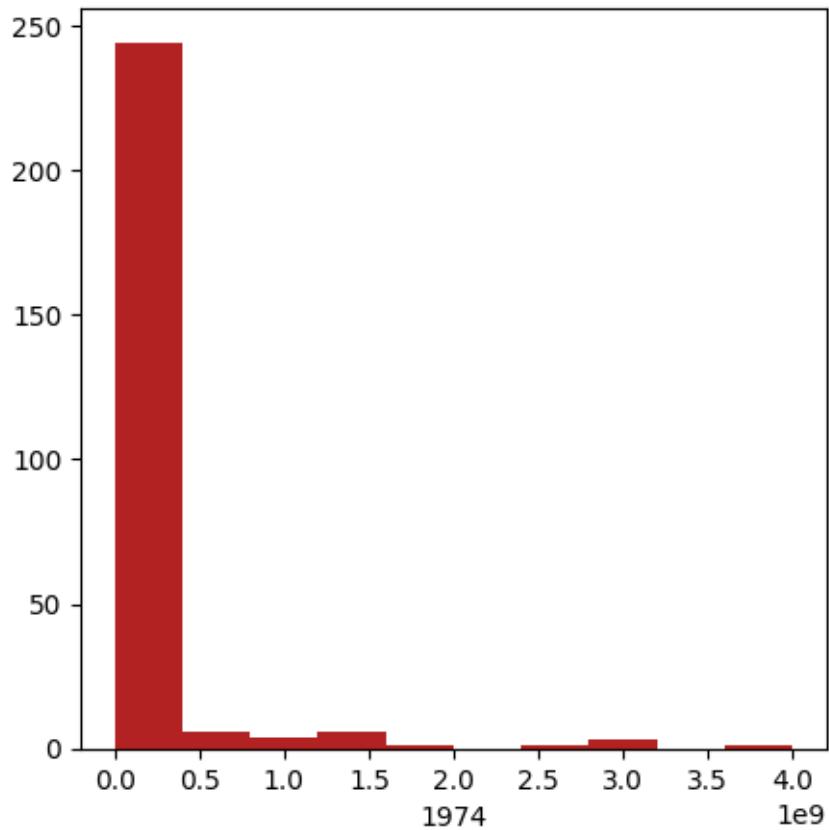


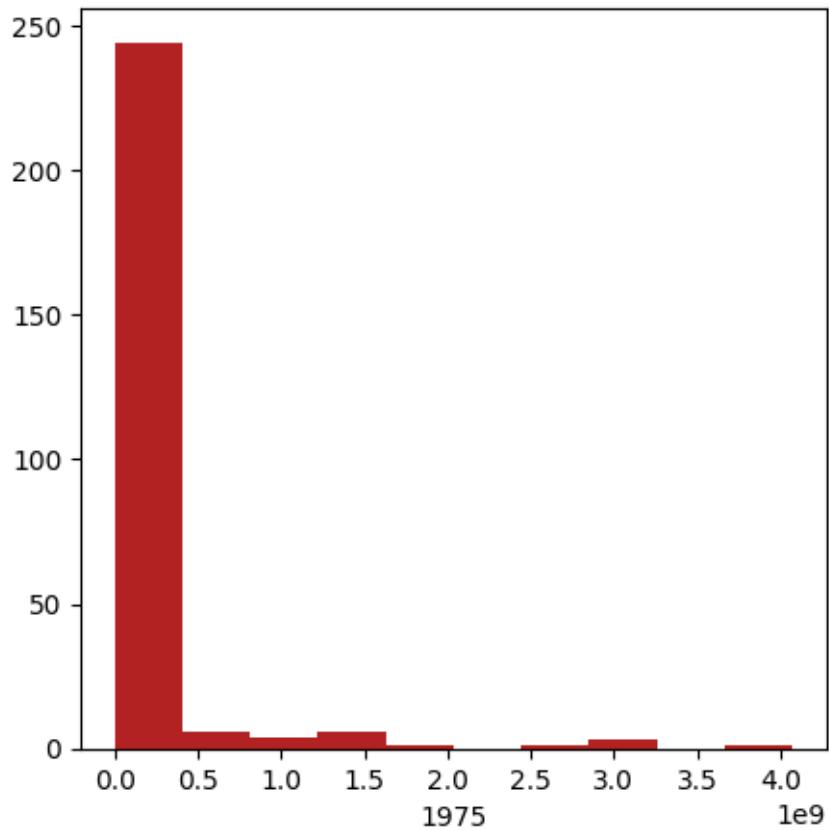


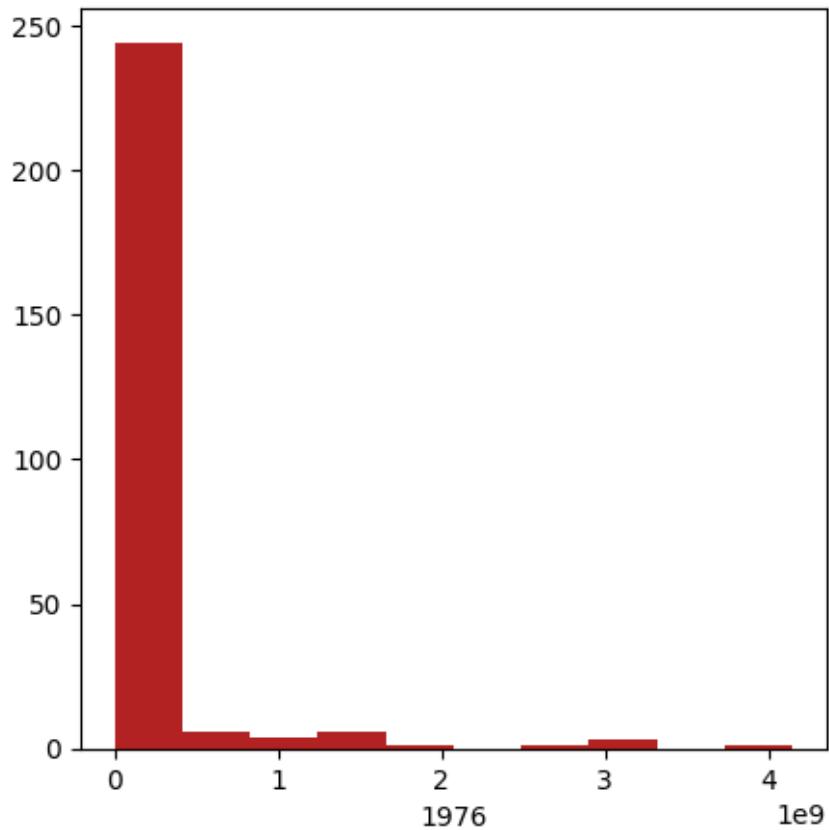


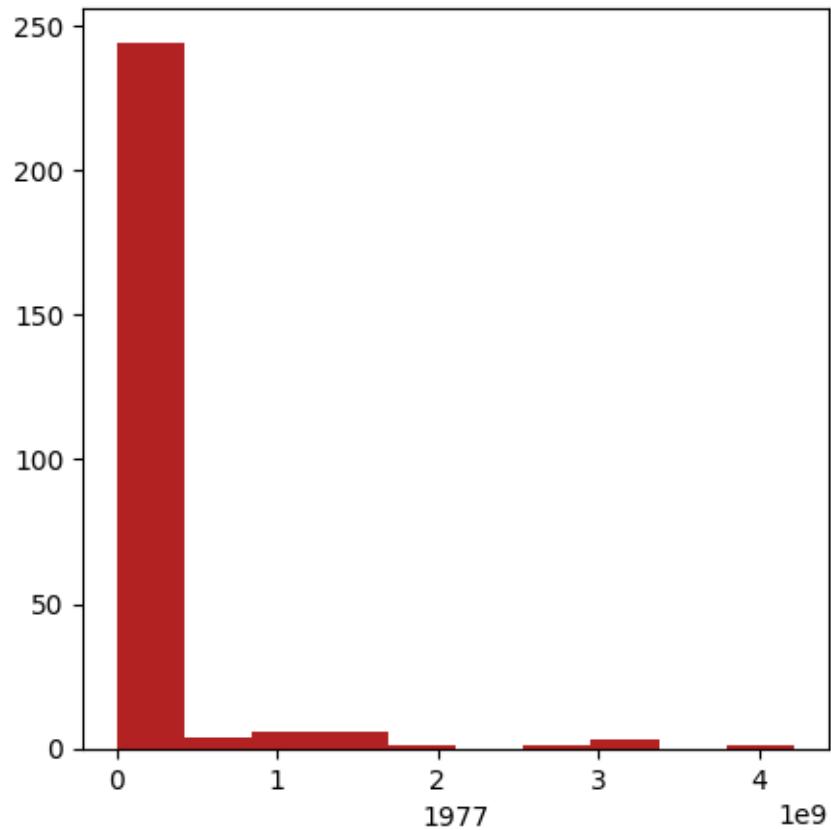


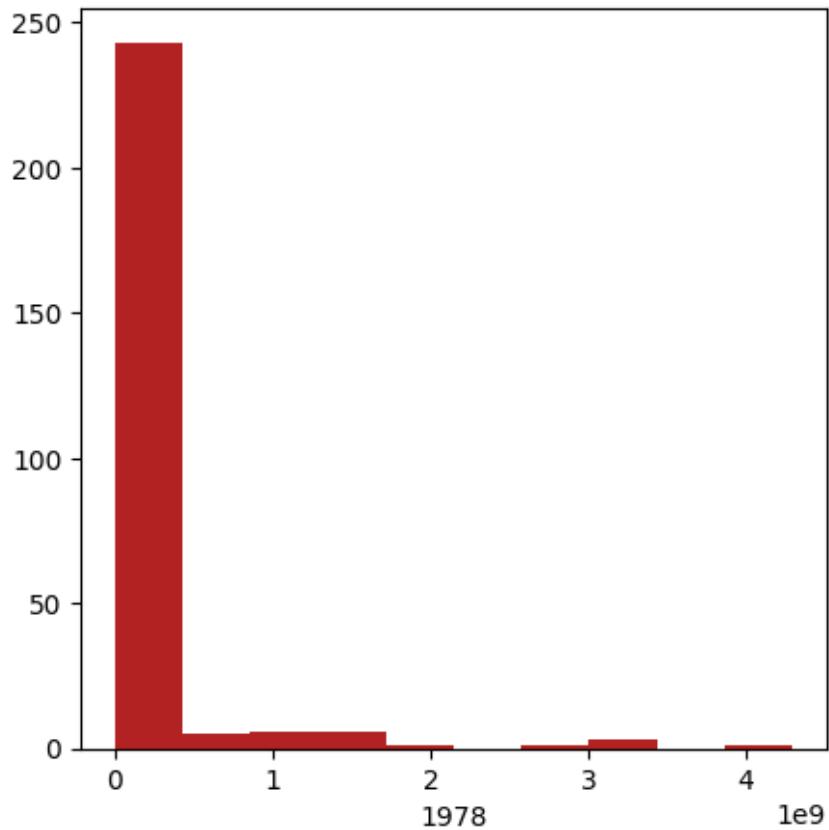


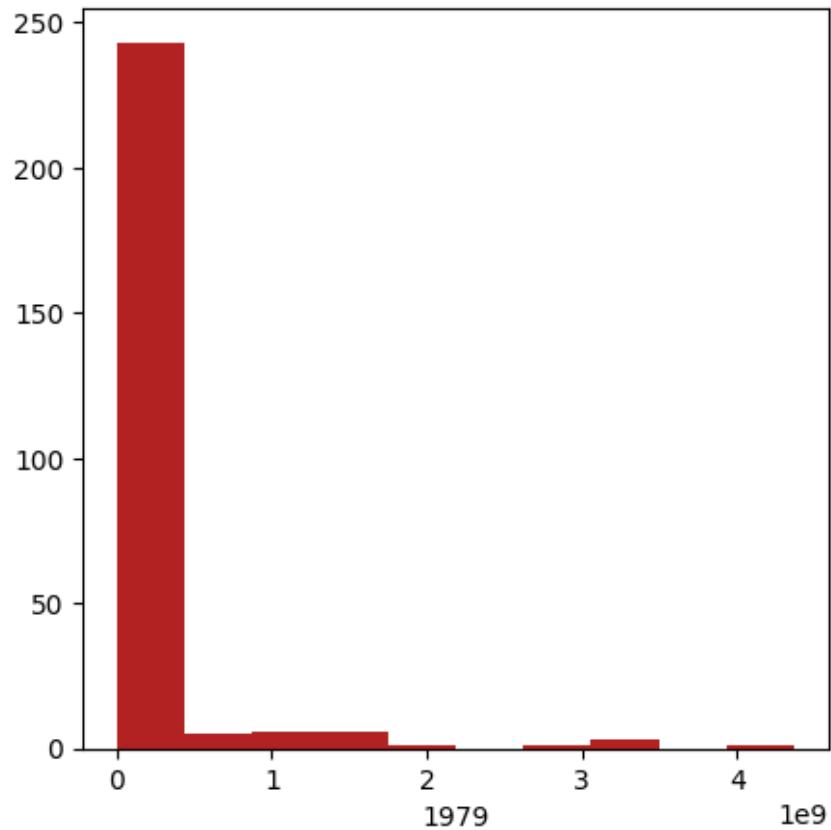


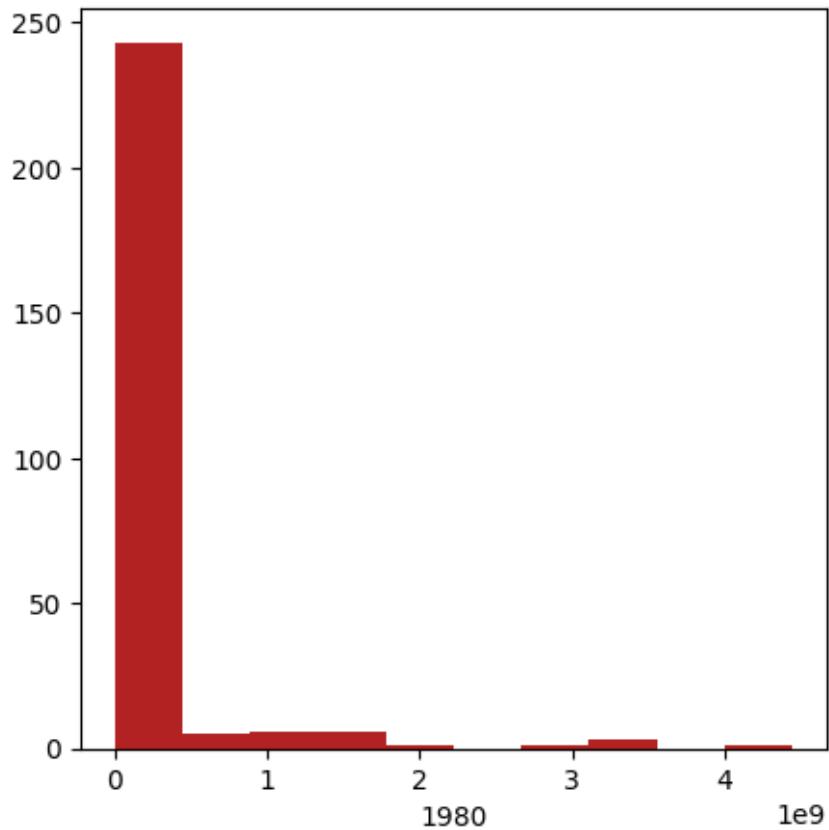


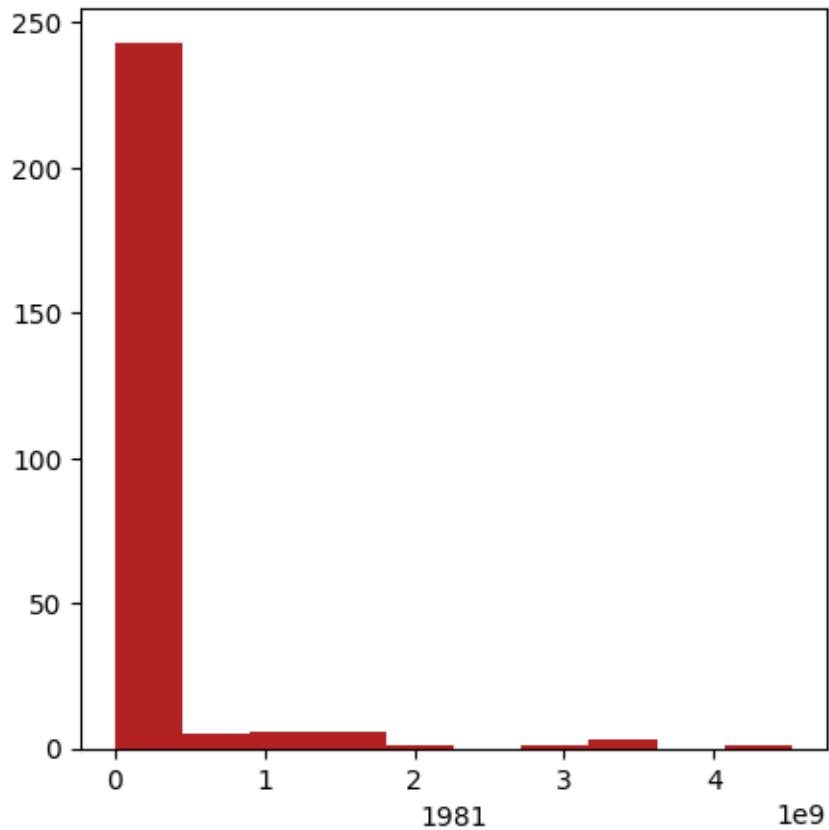


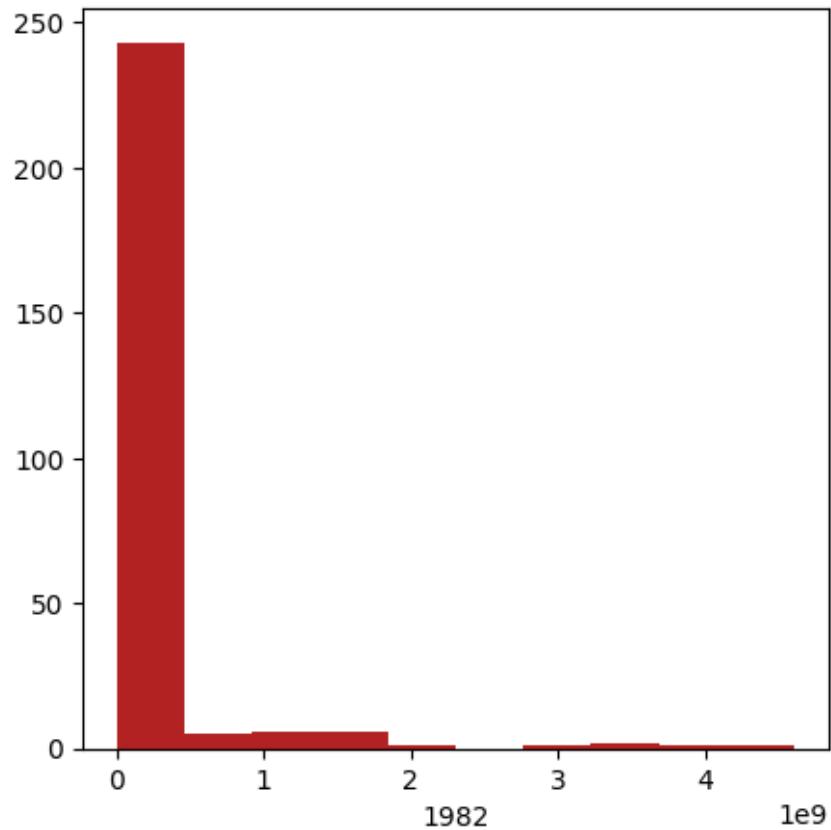


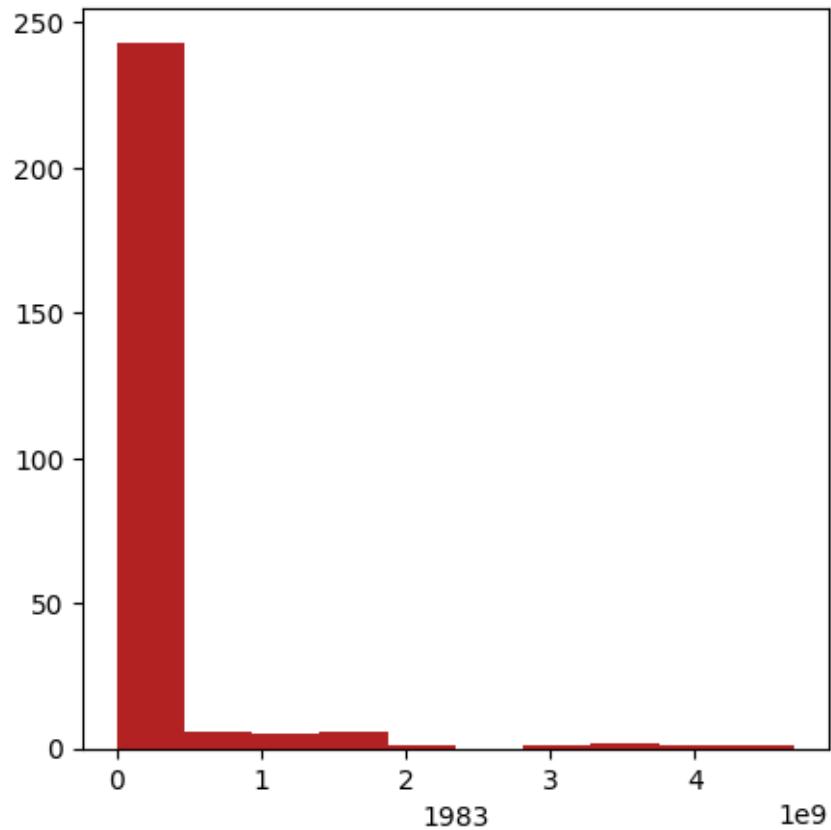


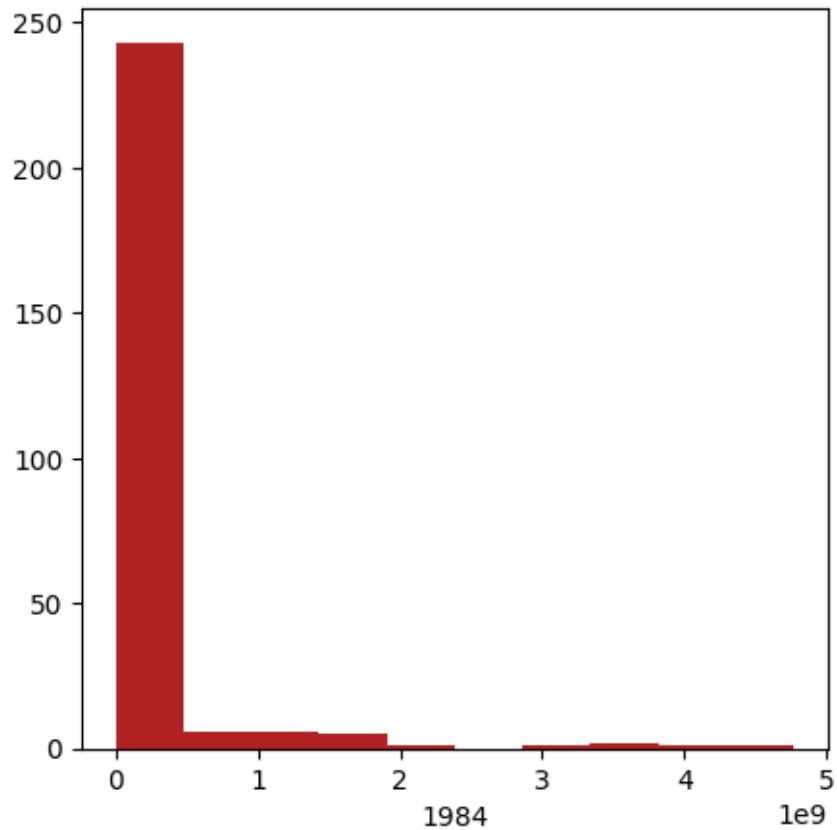


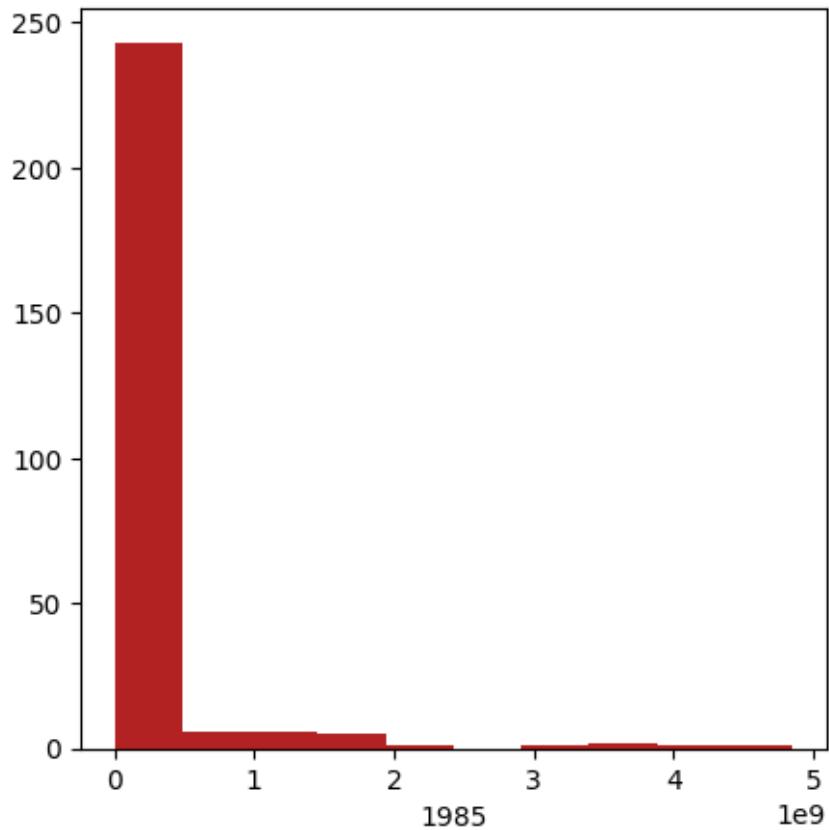


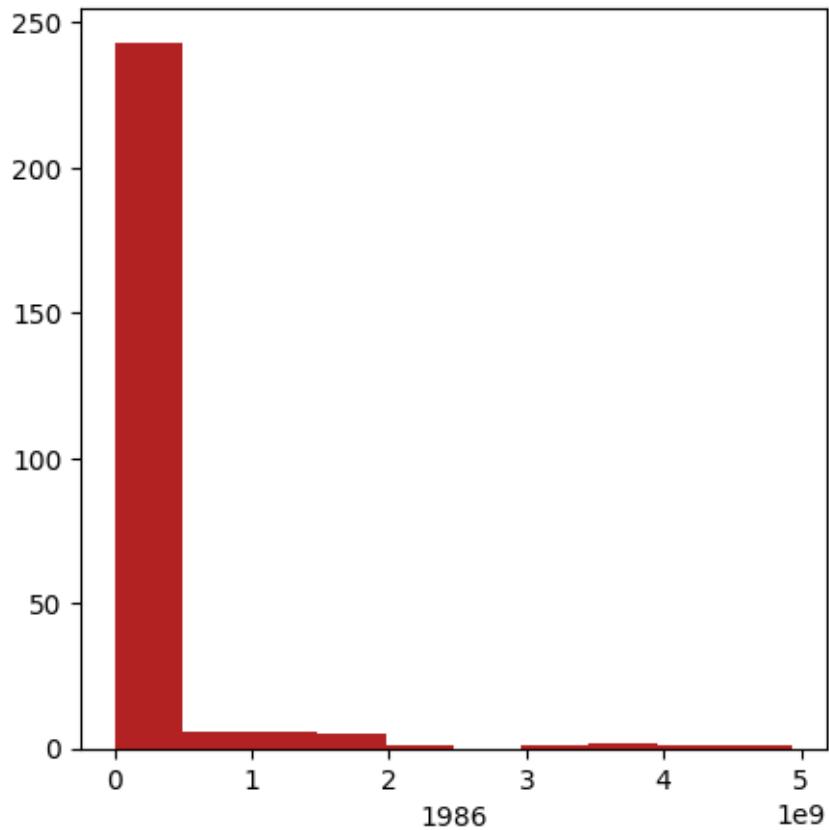


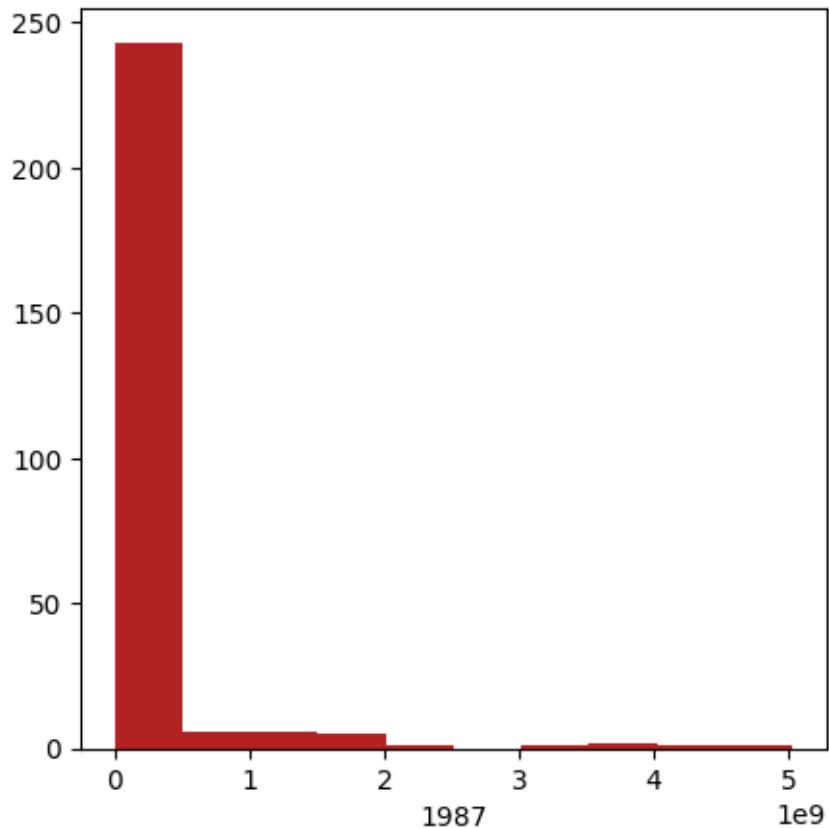


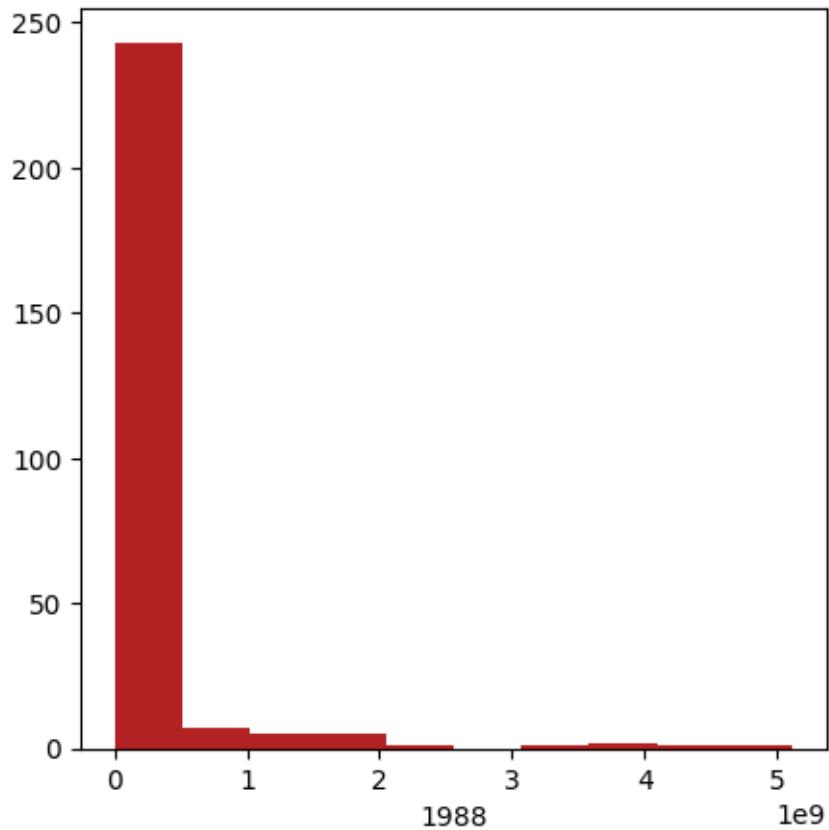


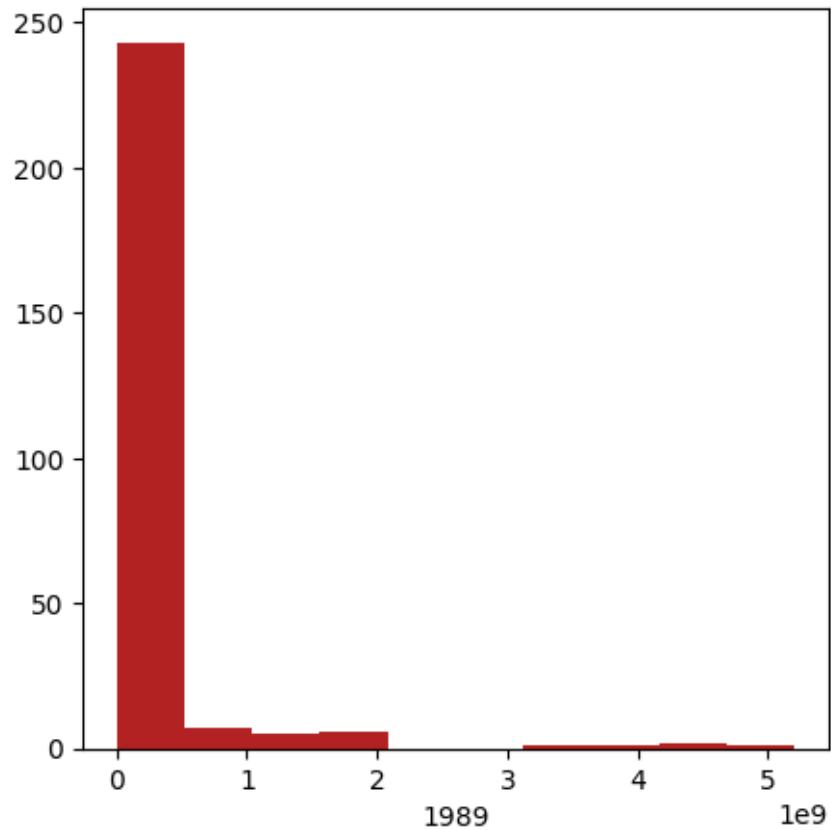


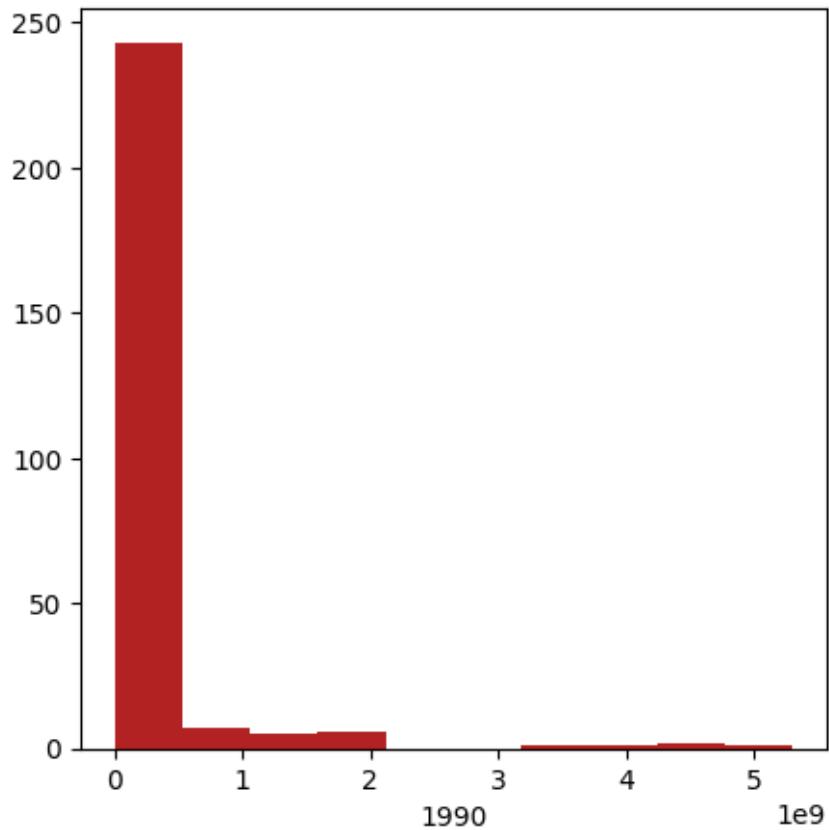


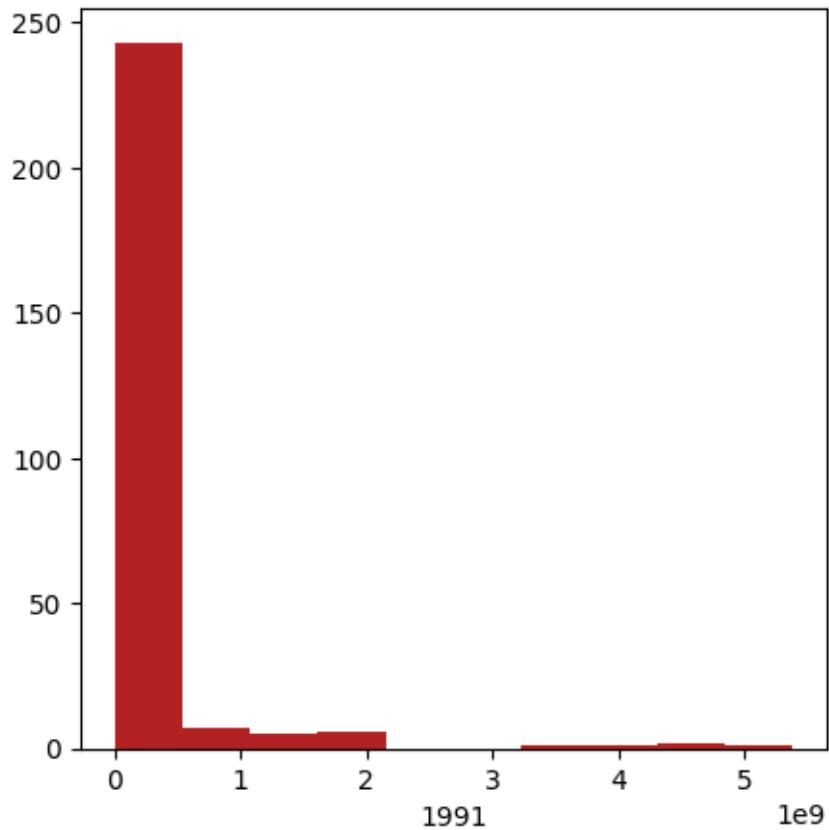


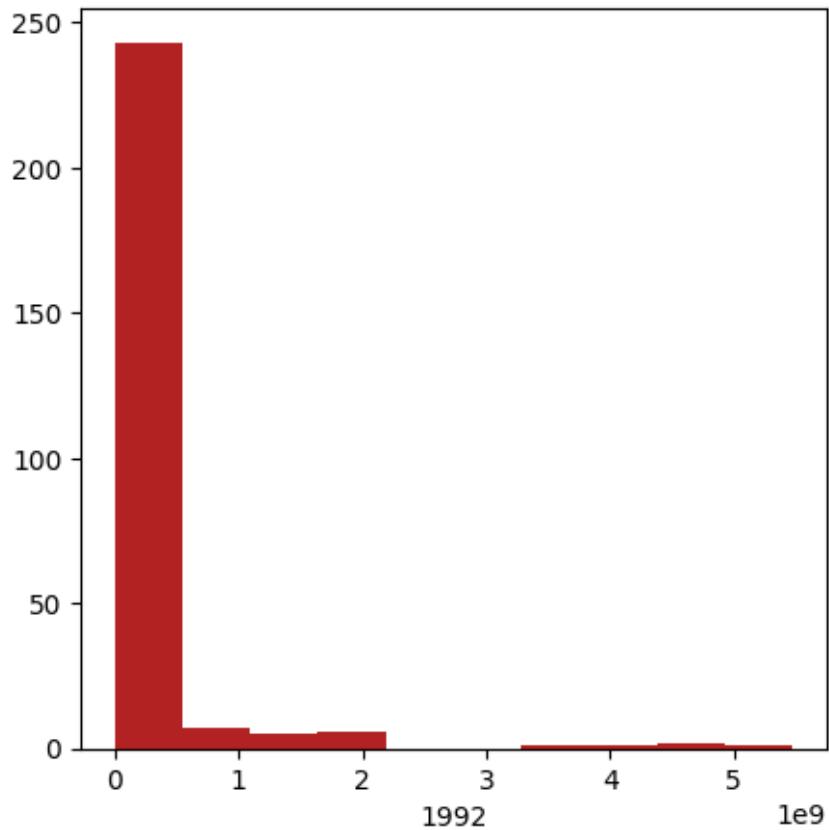


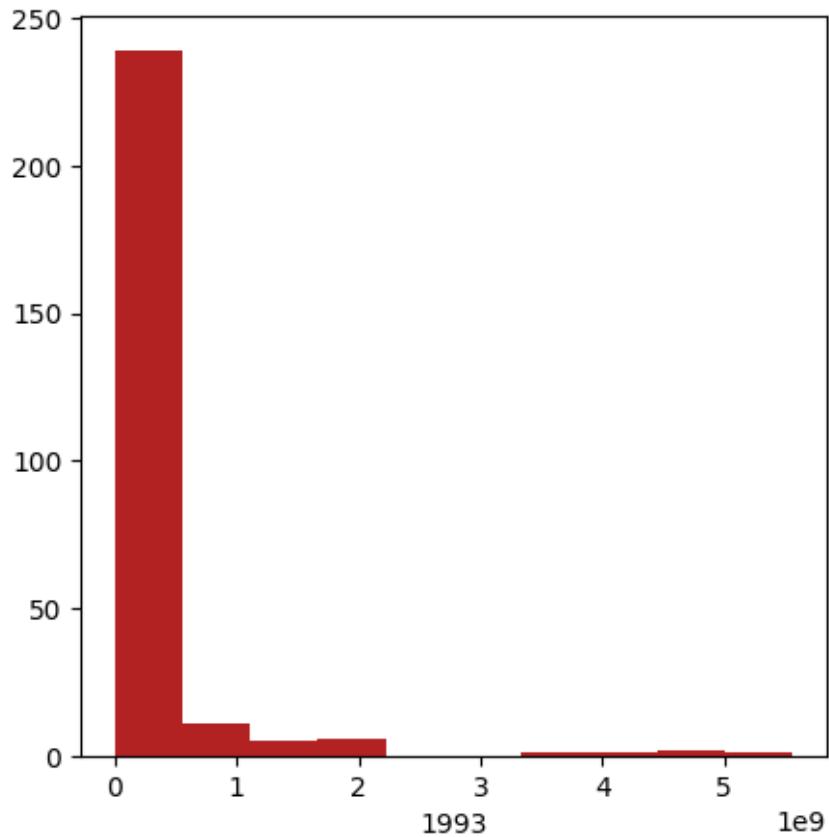


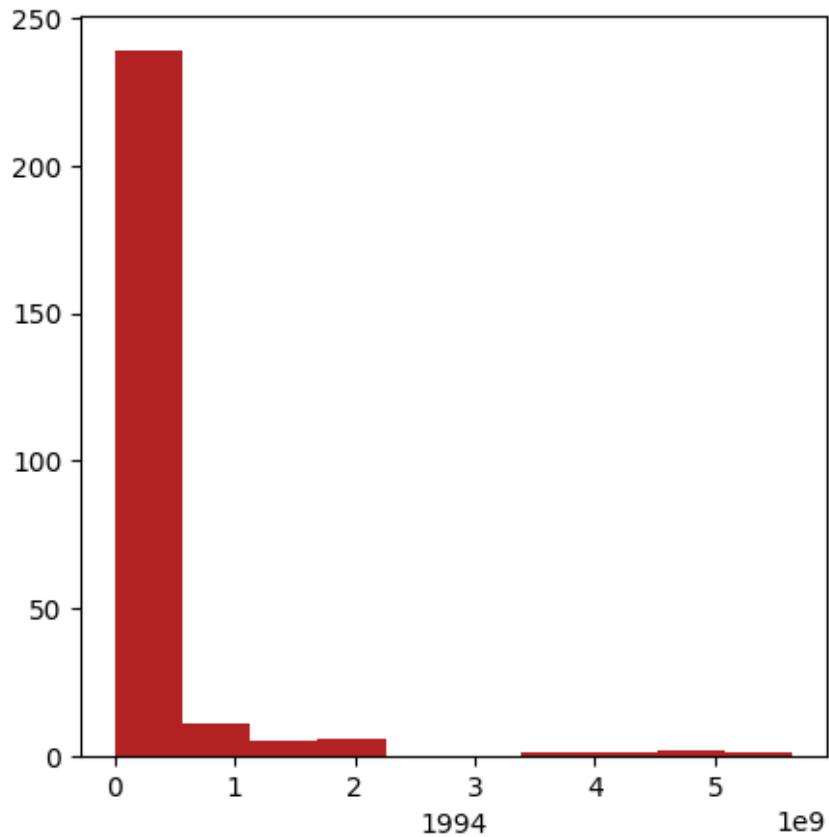


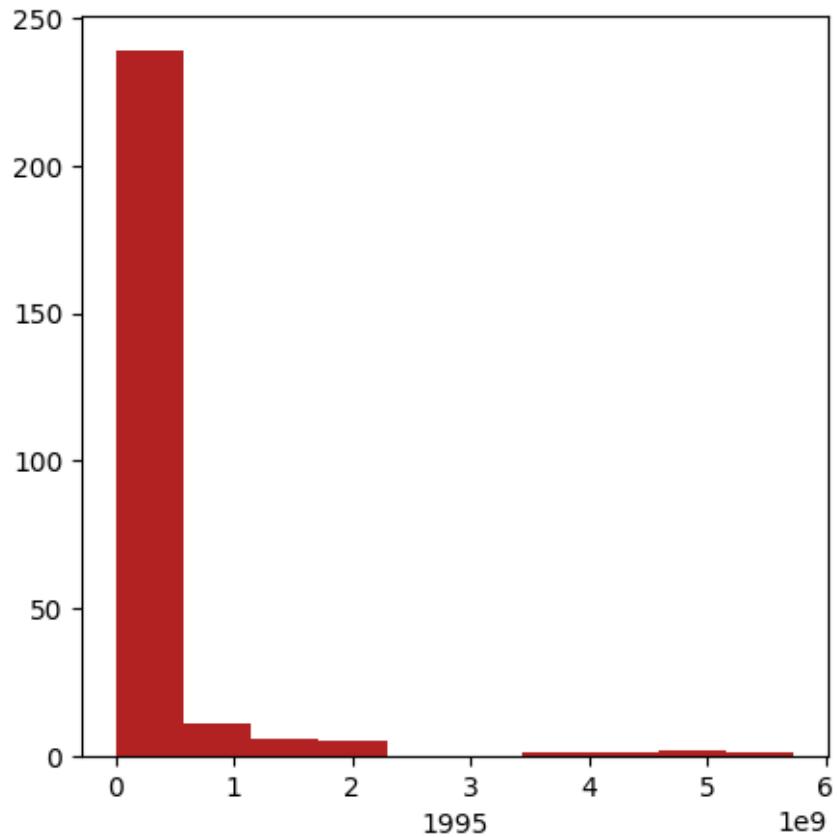


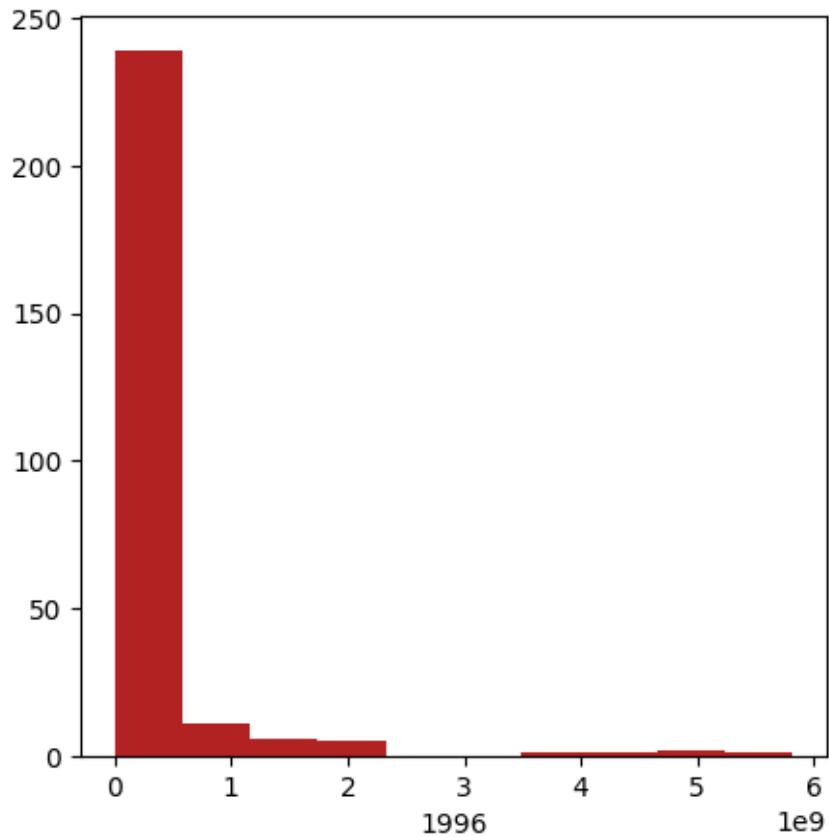


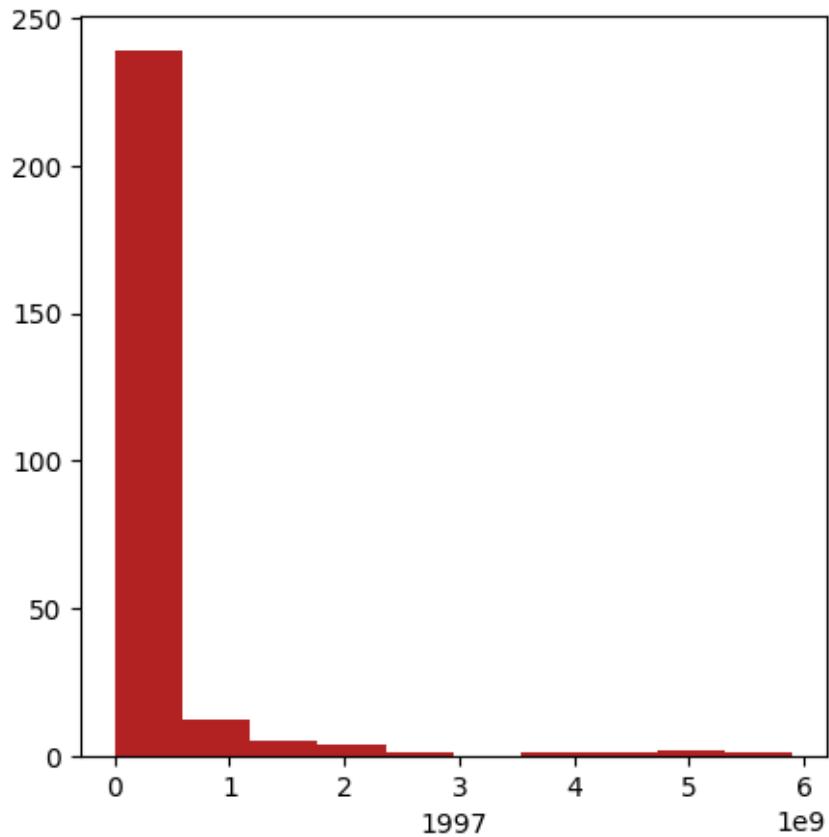


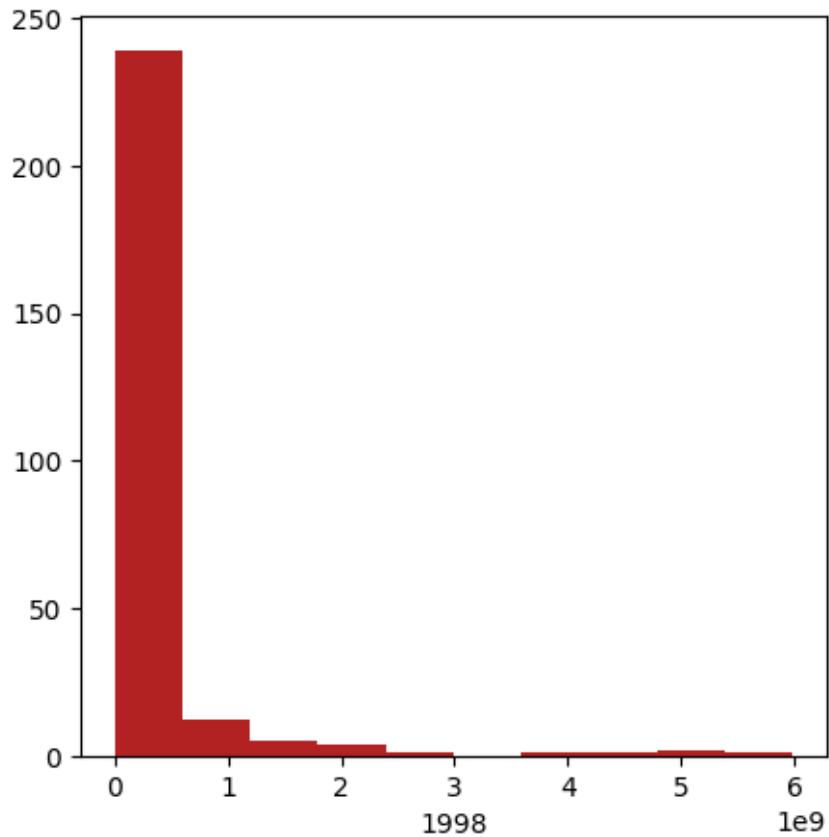


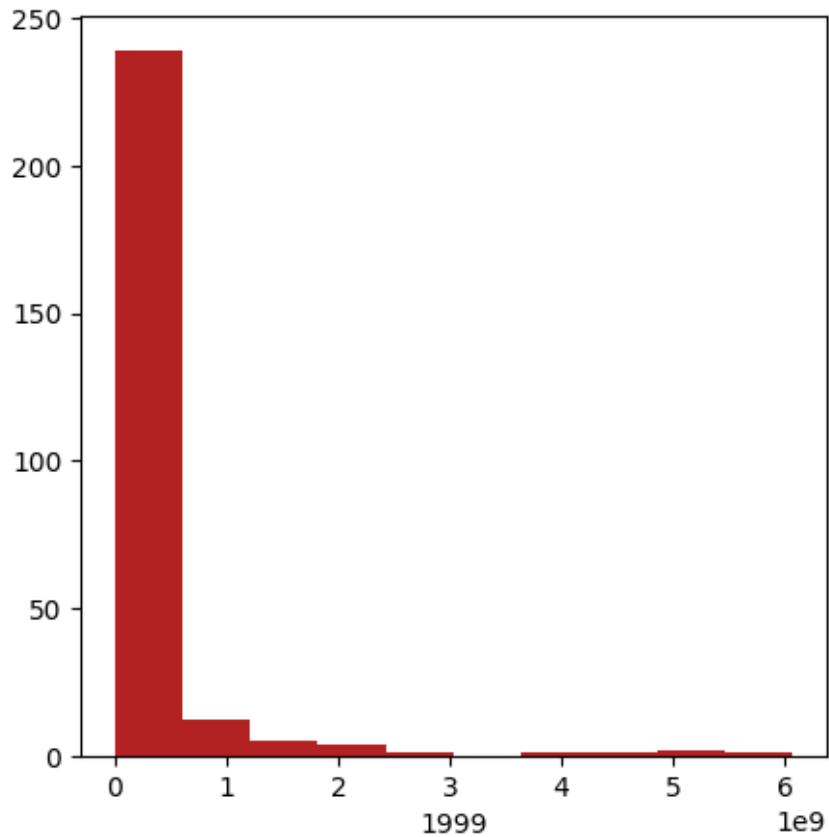


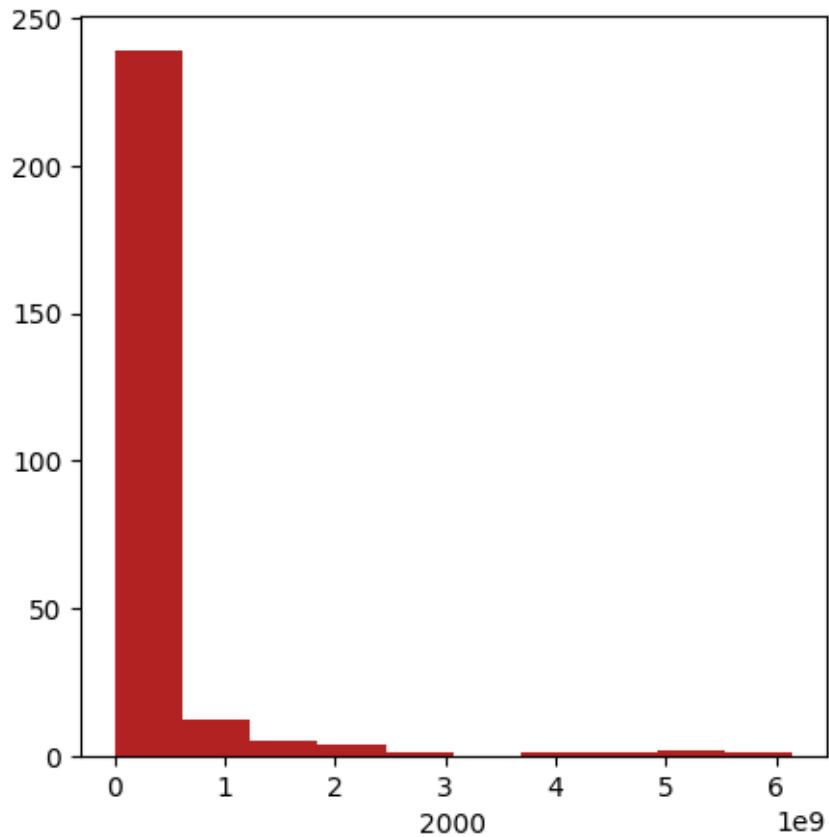


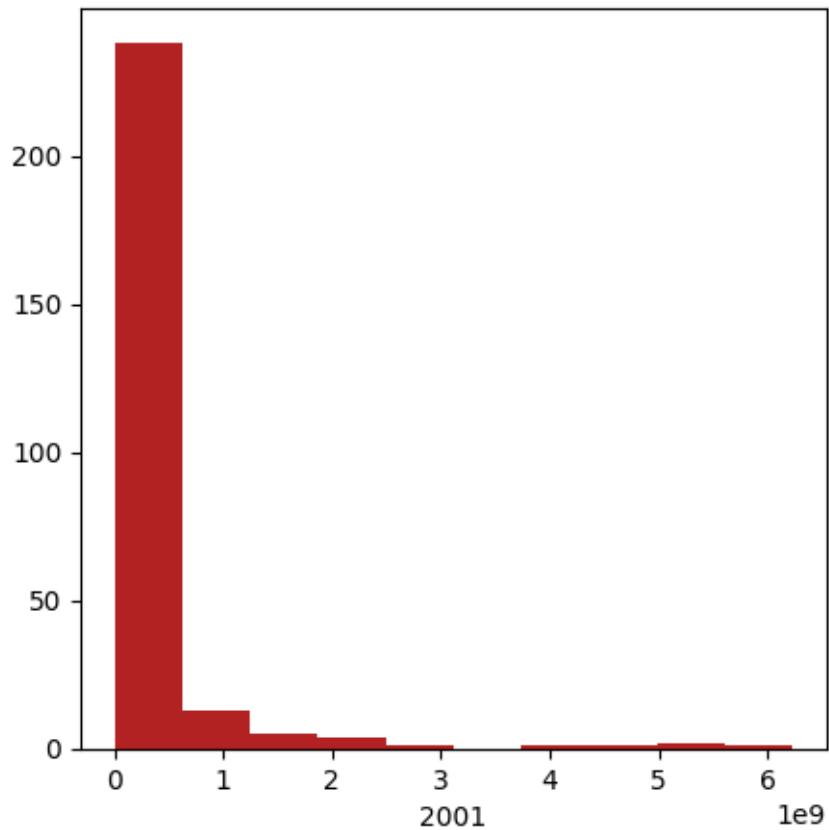


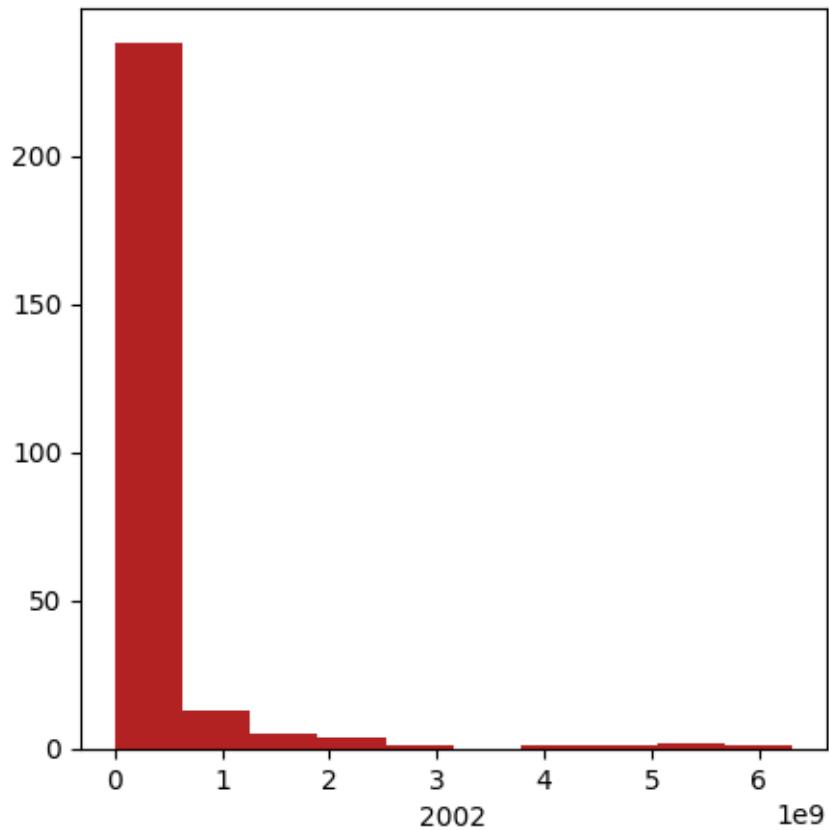


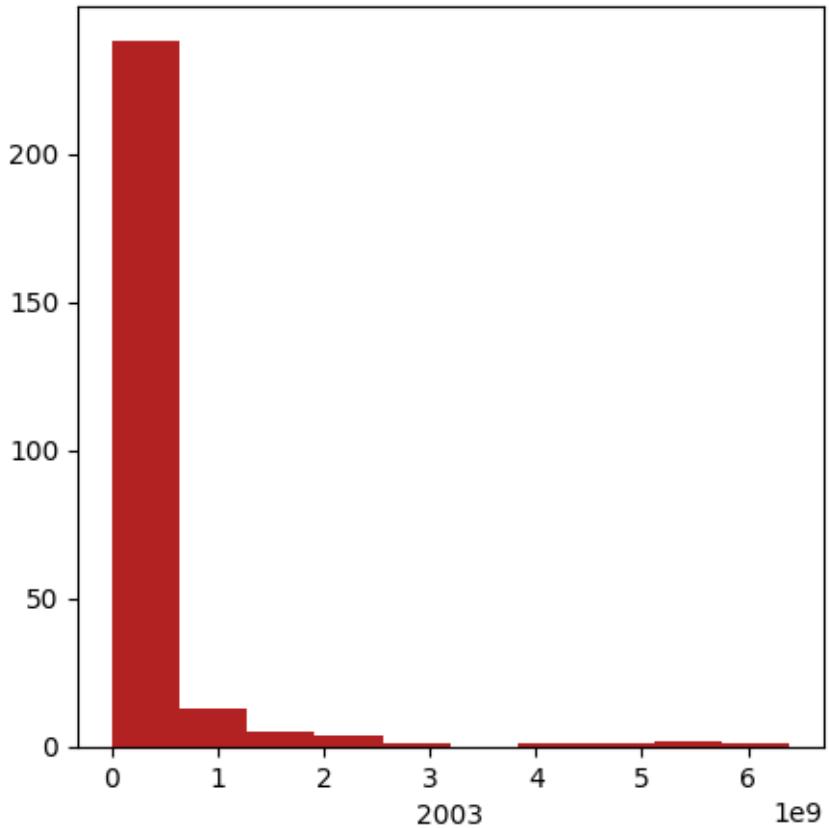


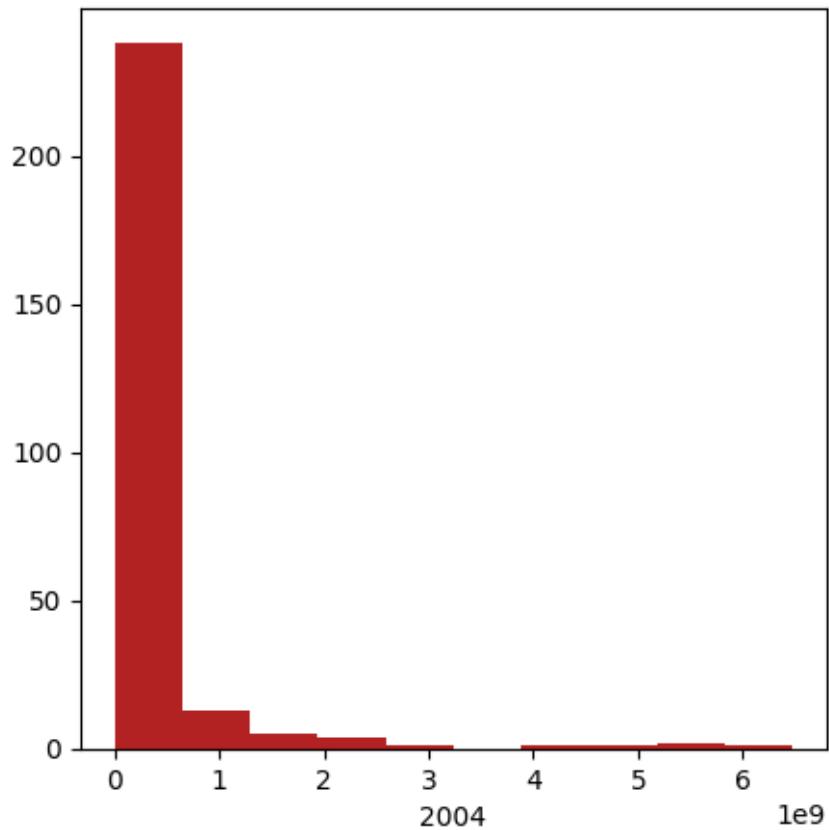


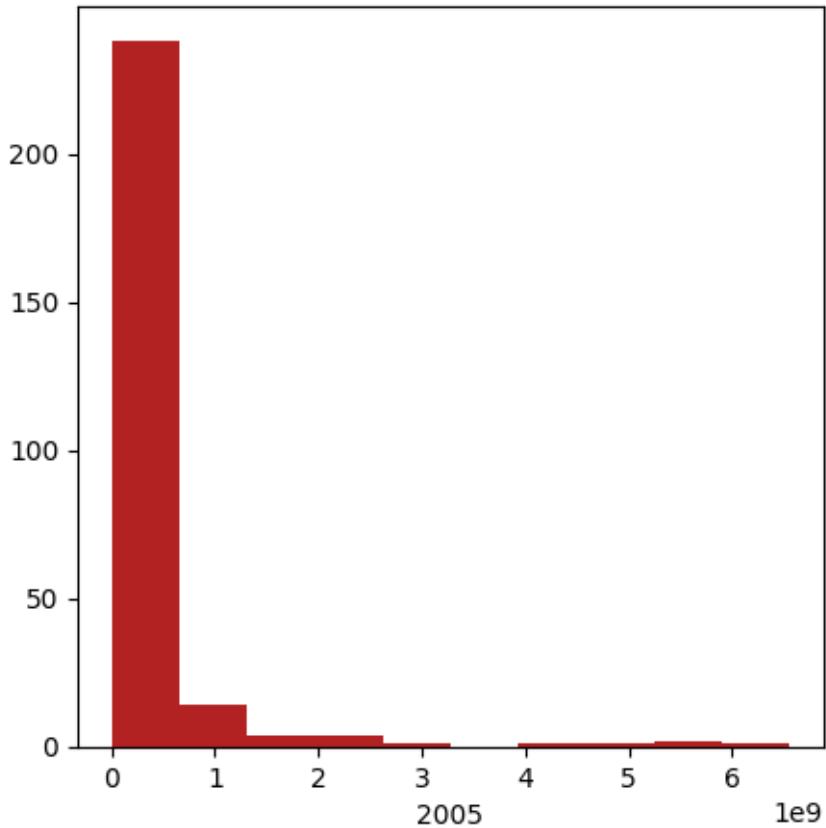


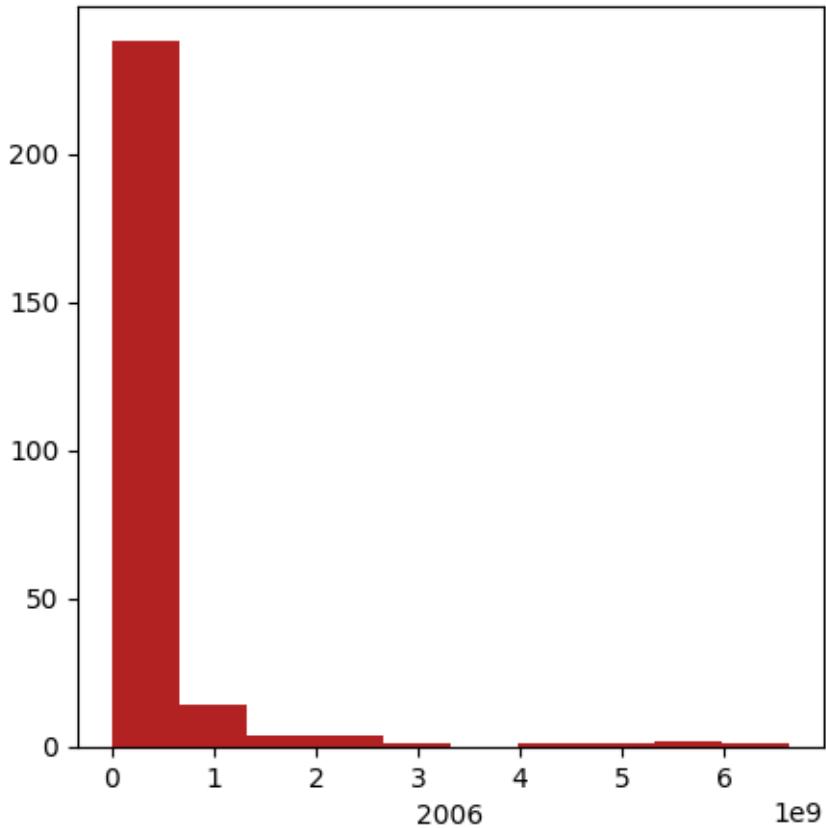


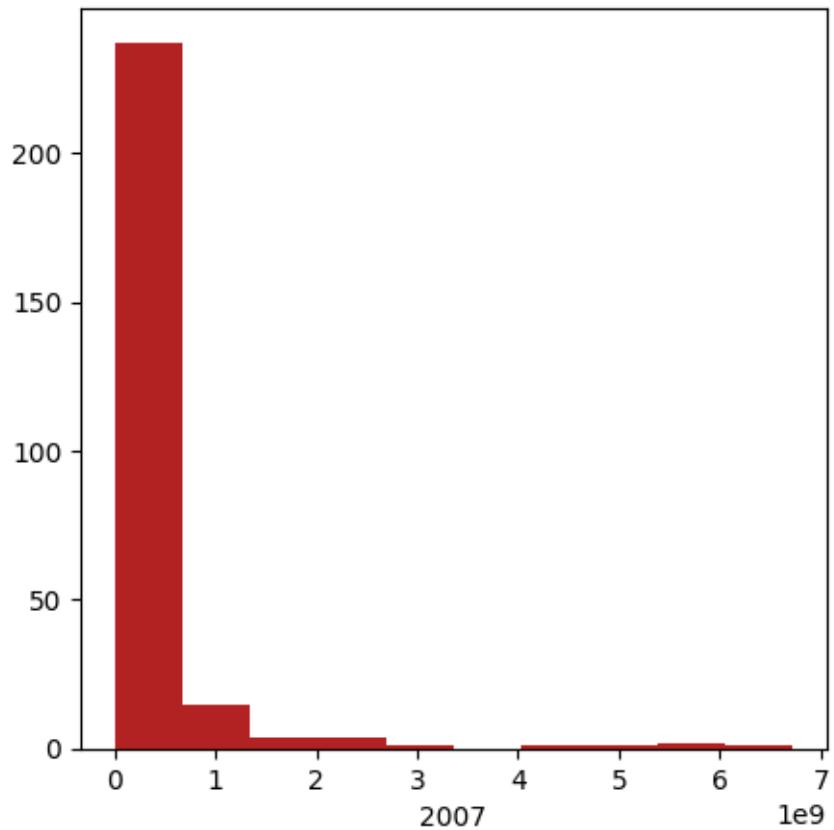


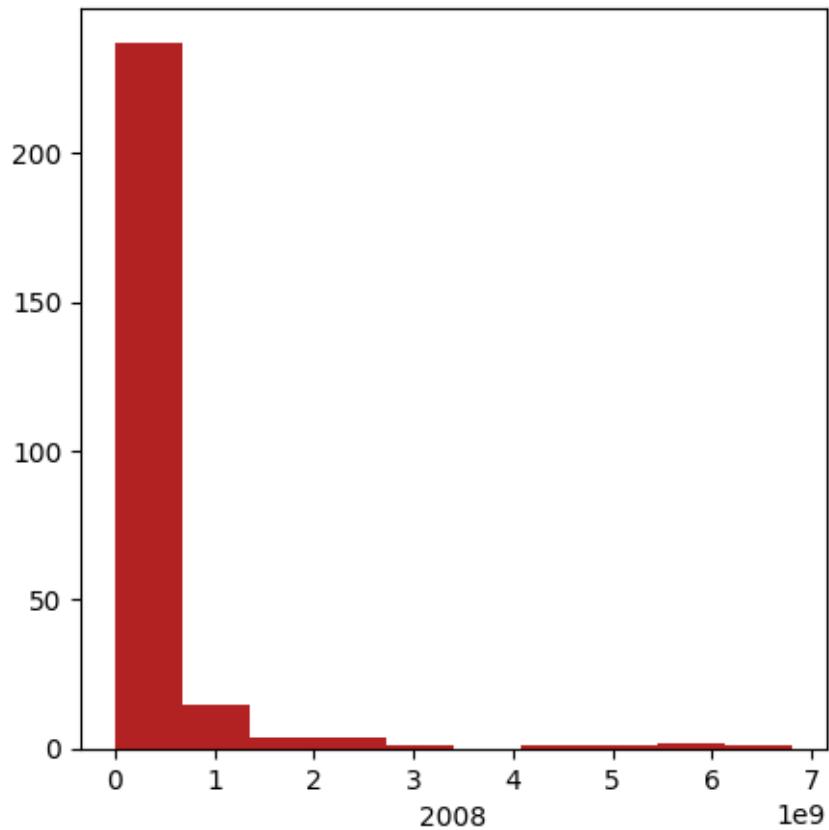


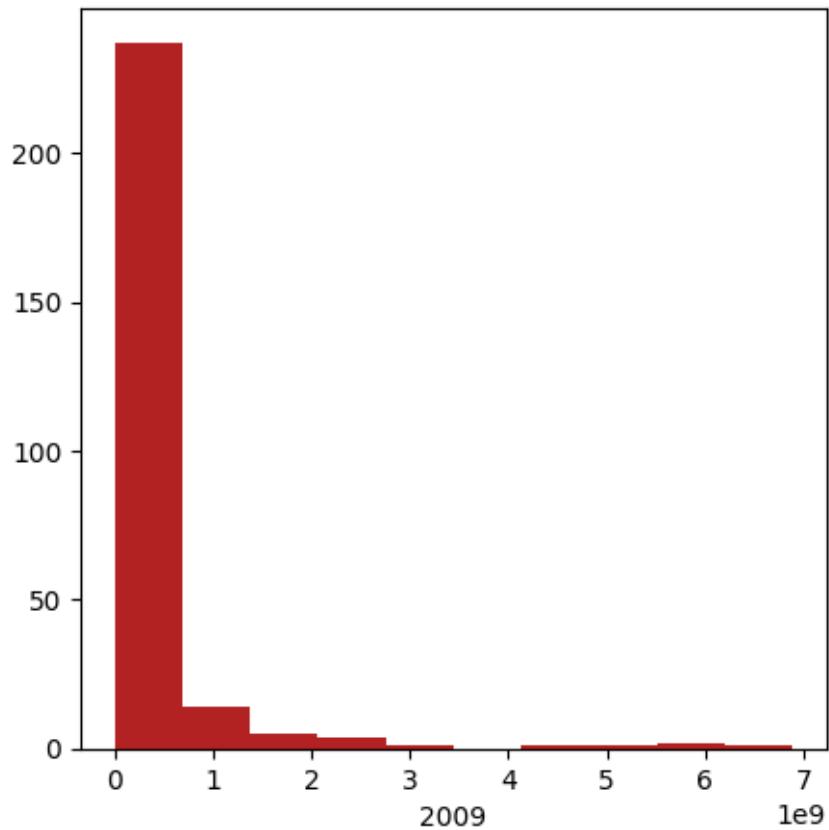


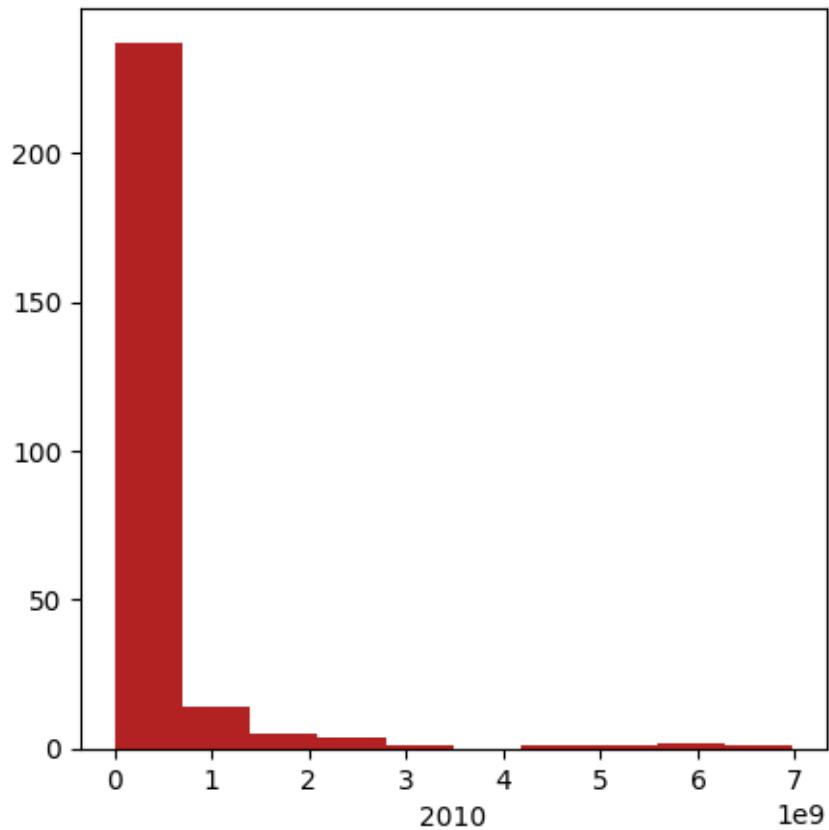


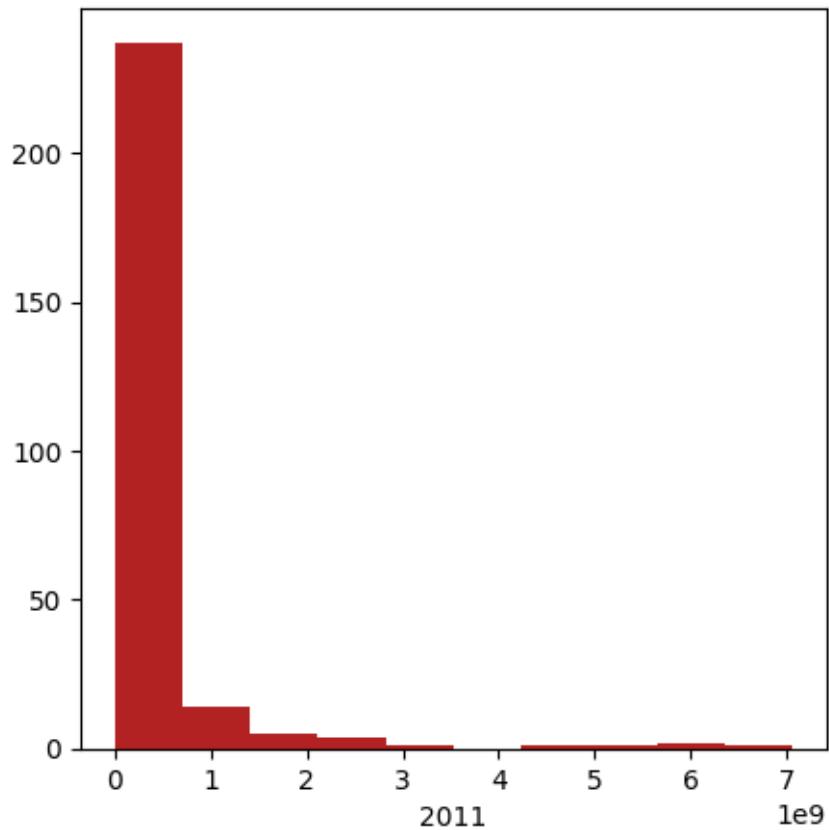


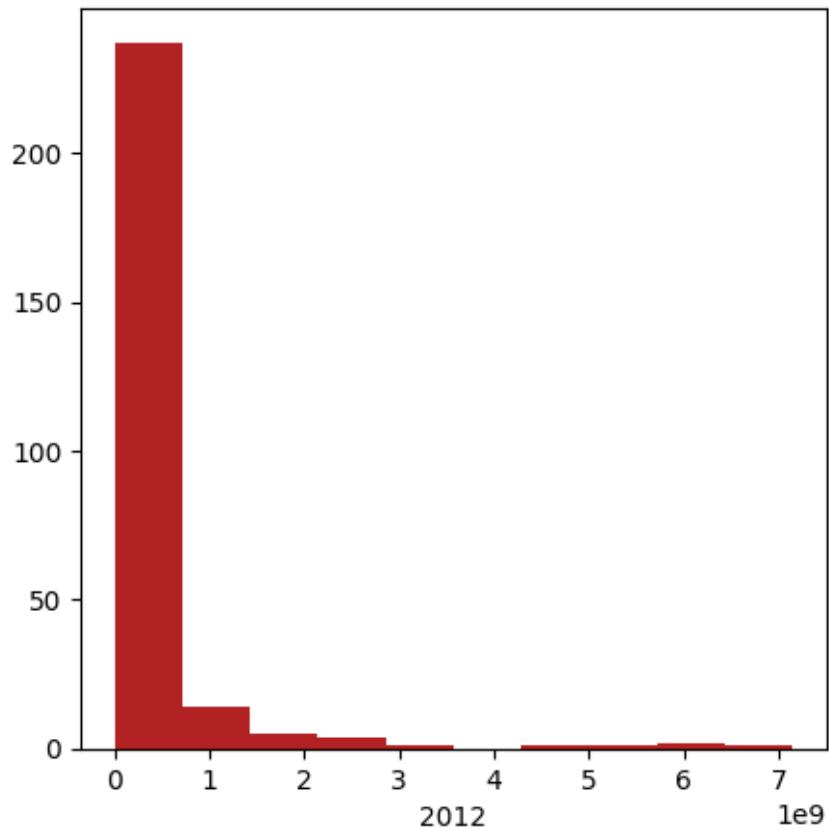


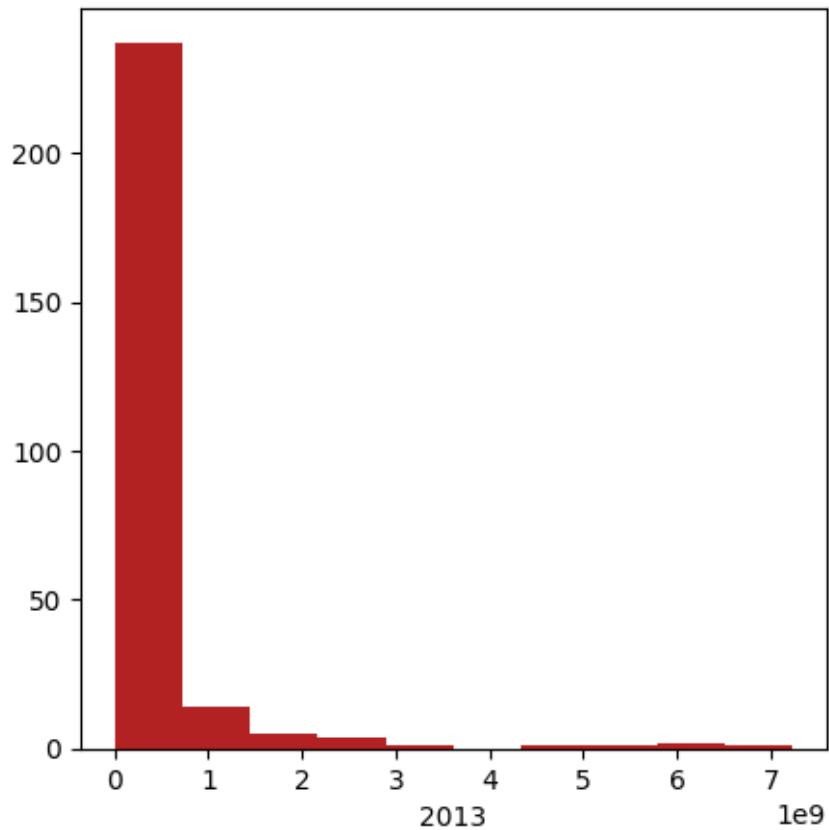


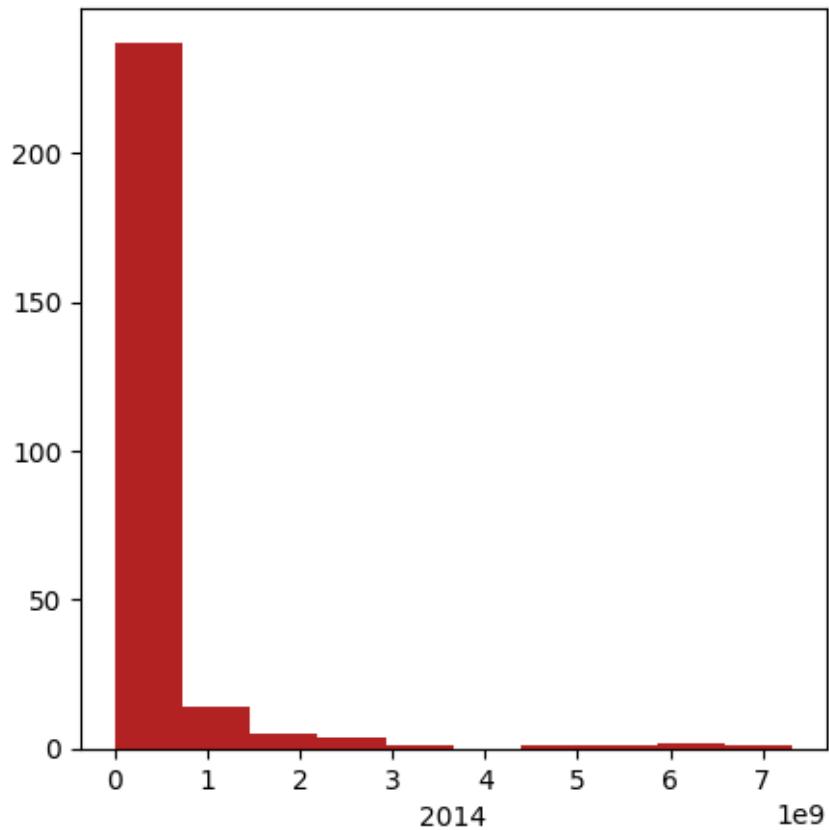


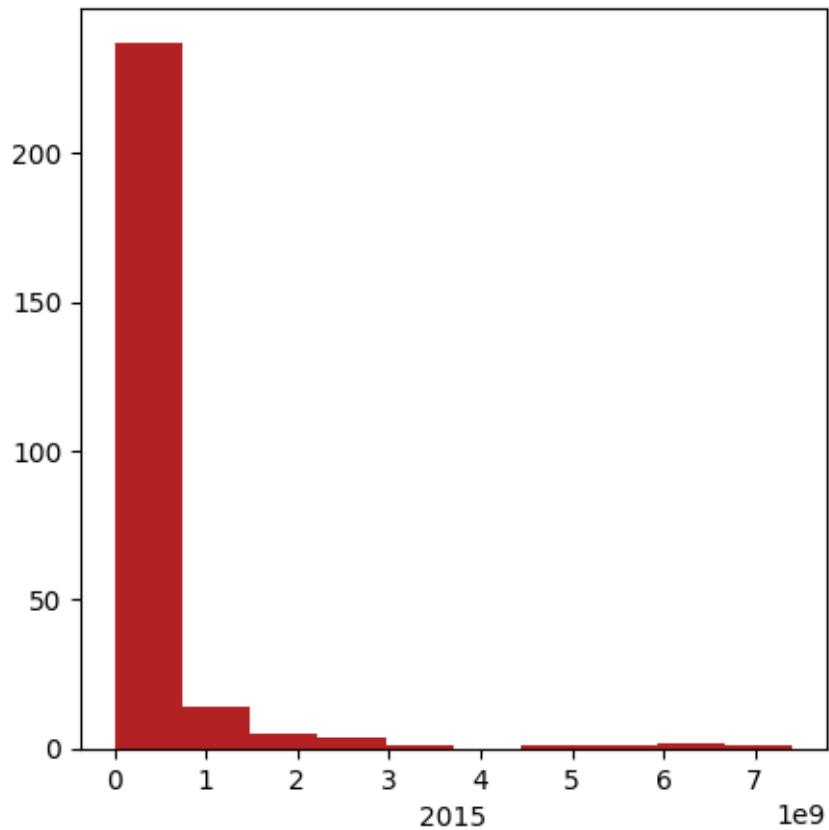


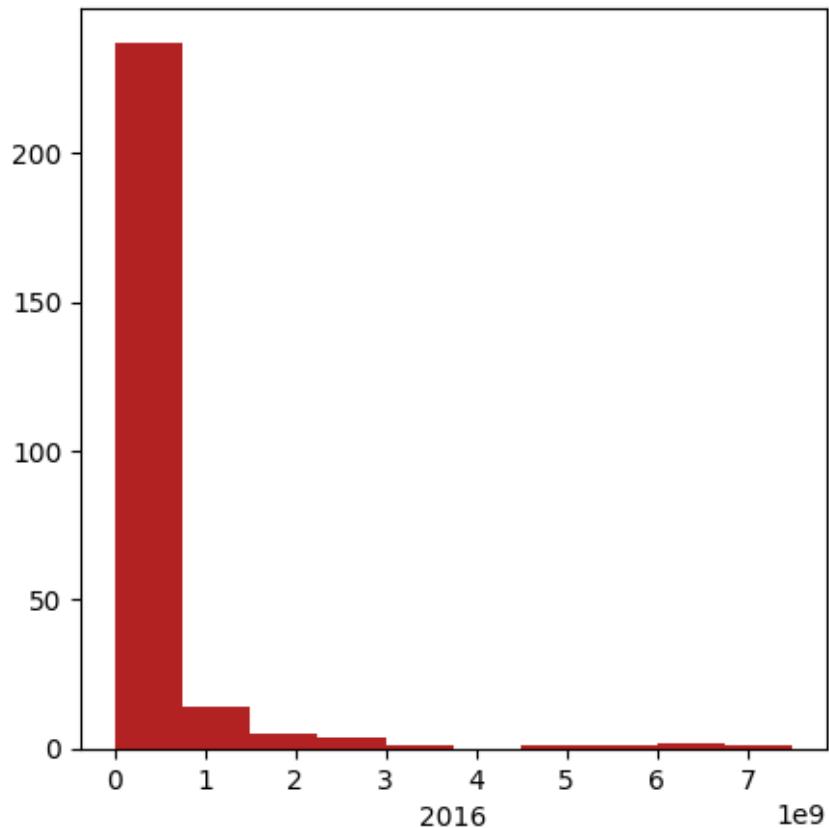


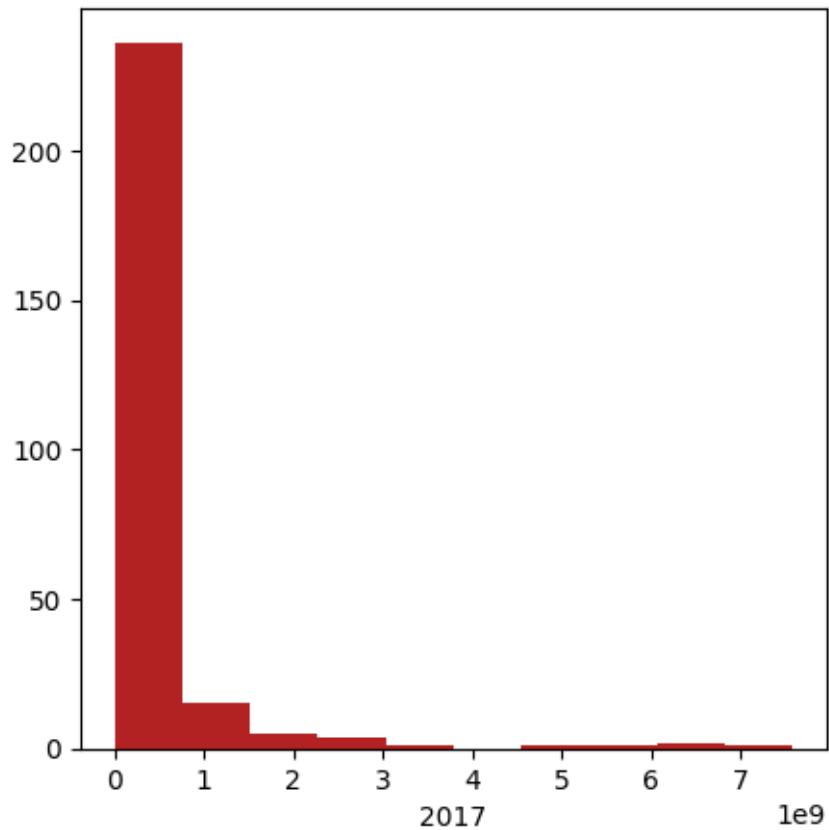


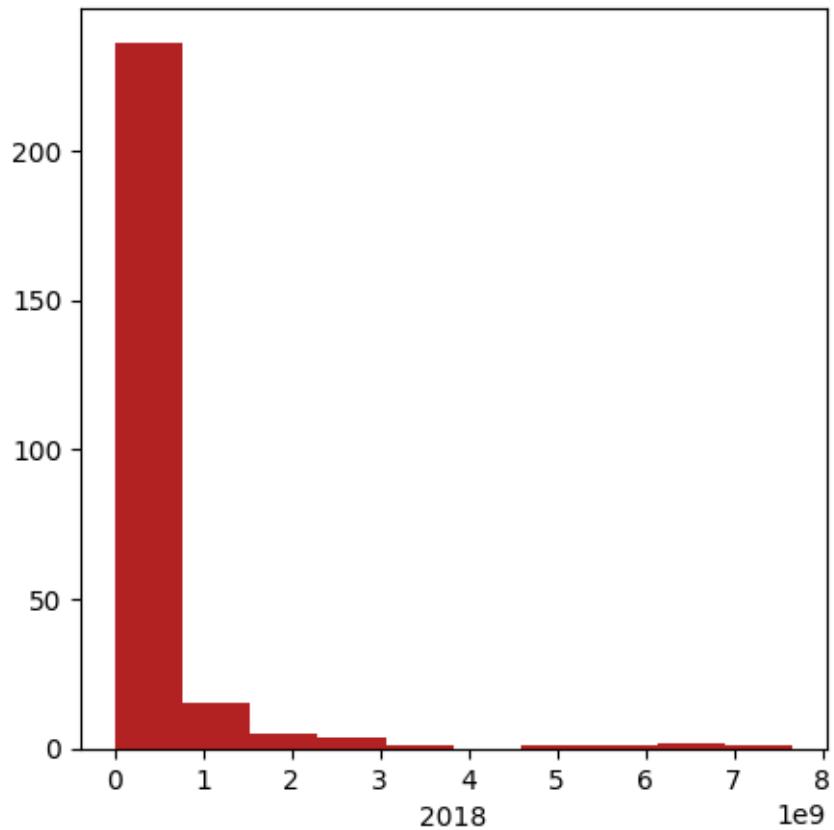


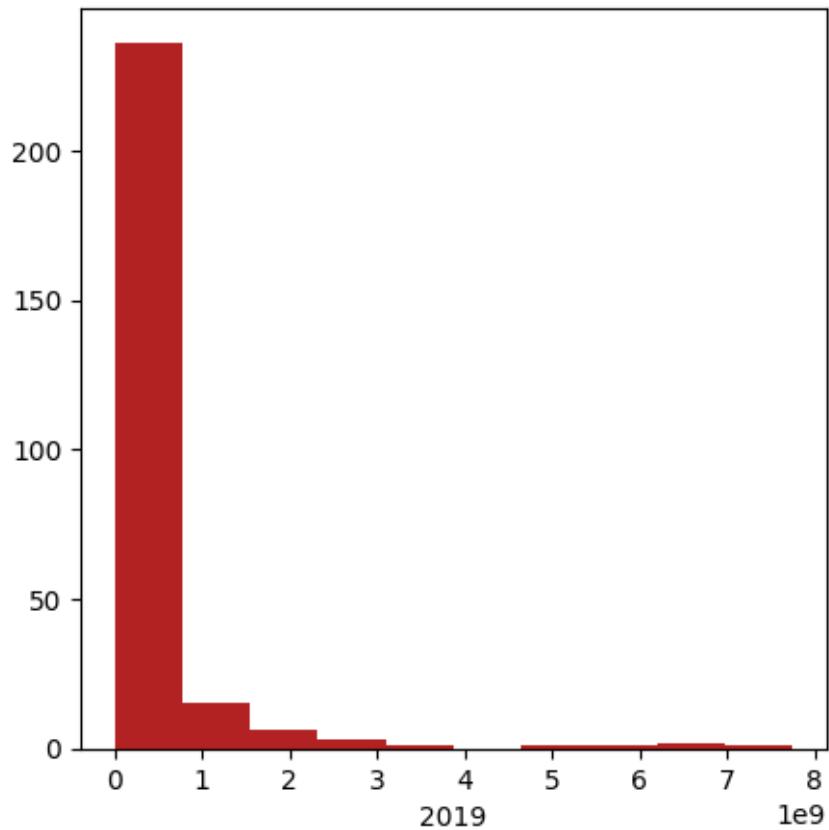


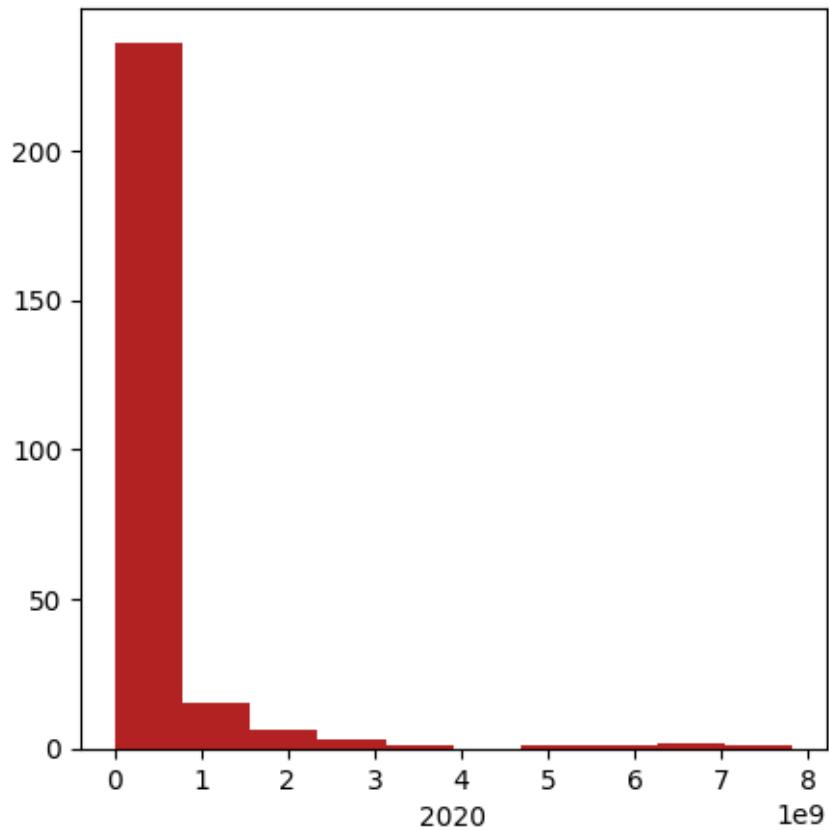


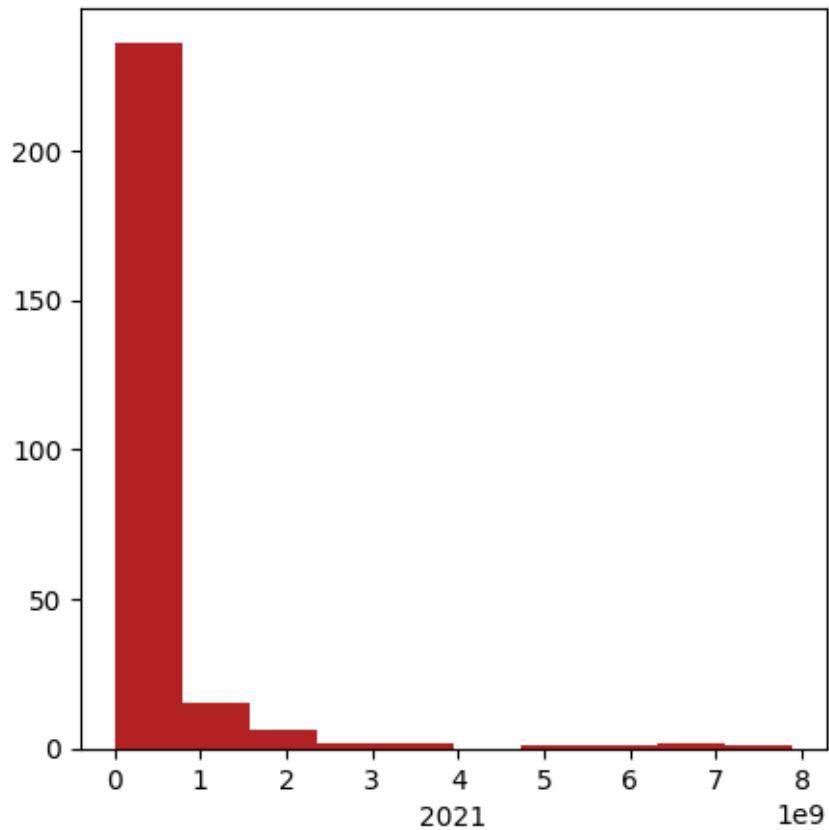


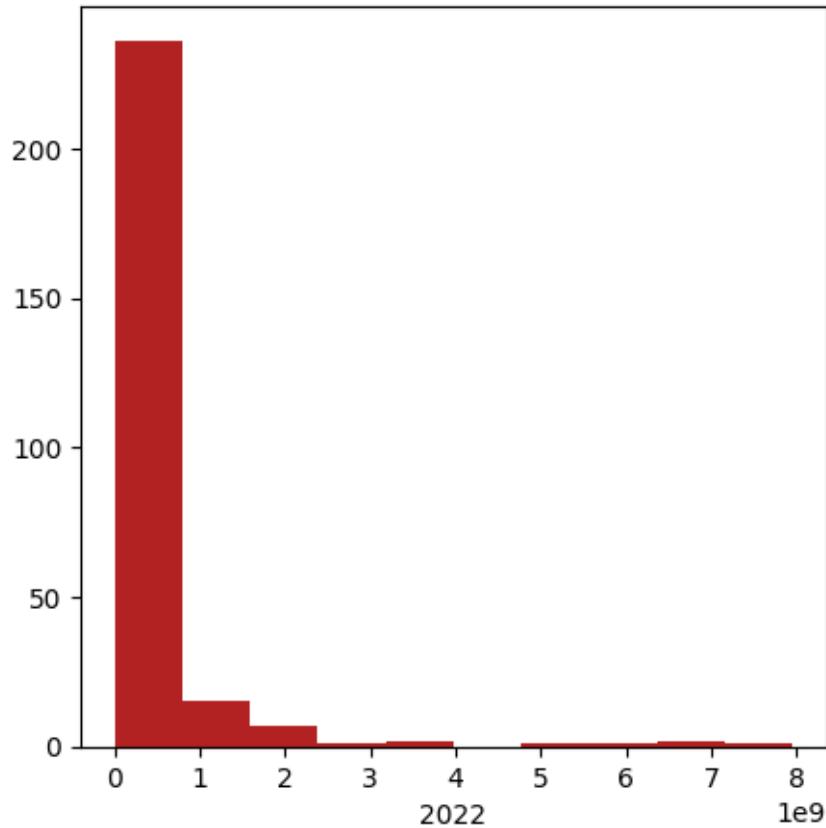




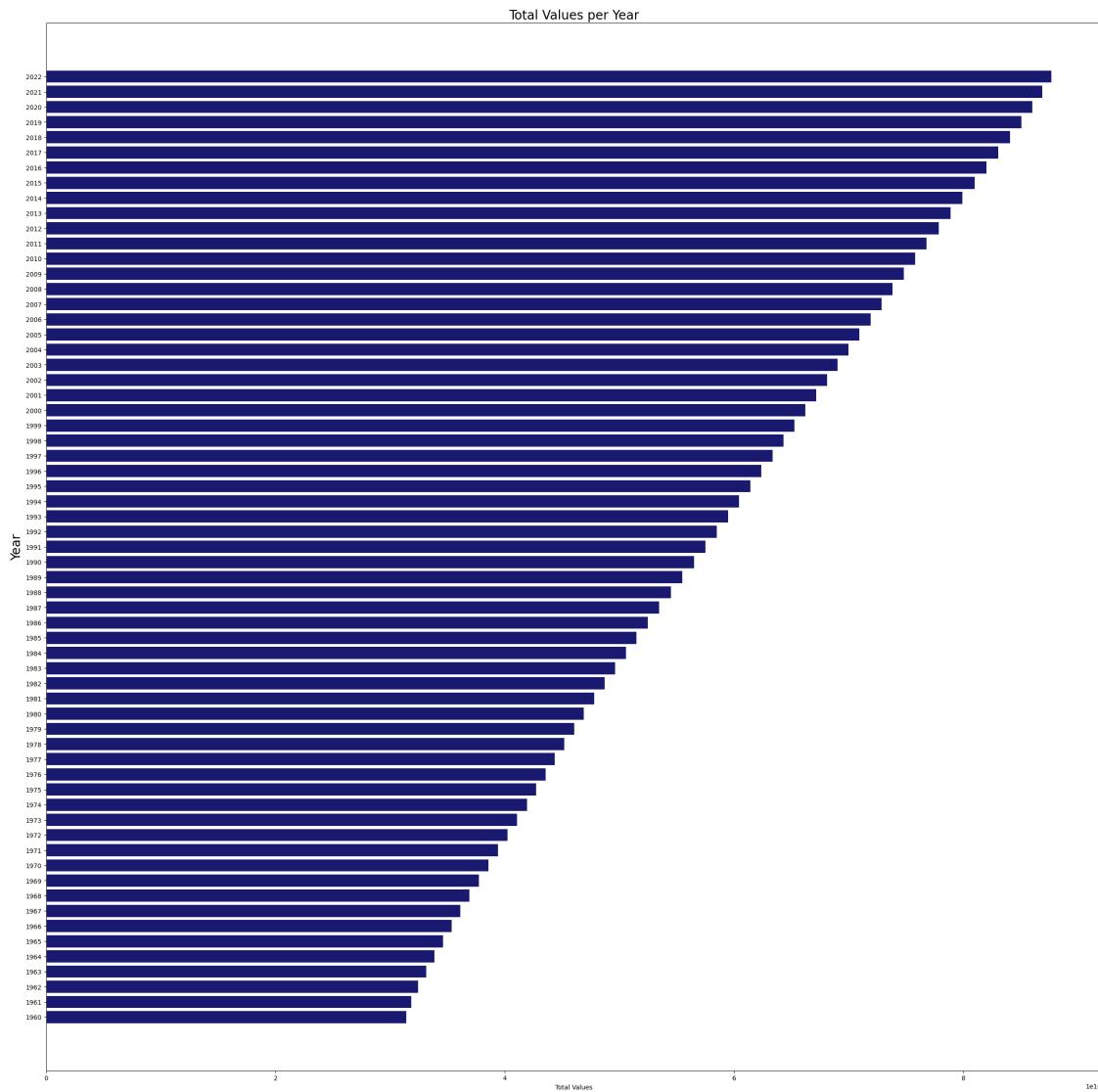








```
[24]: years = df.columns[1:]
total_values = df[years].sum()
plt.figure(figsize=(30, 30))
plt.barh(years, total_values,color="#191970")
plt.xlabel('Total Values')
plt.ylabel('Year', size=20)
plt.title('Total Values per Year', size=20)
plt.show()
```



```
[25]: country_by_1960 = df.sort_values(by='1960').head(20)
country_by_1960
```

	Country Name	1960	1961	1962	1963	1964	\
225	Sint Maarten (Dutch part)	2646.0	2888.0	3171.0	3481.0	3811.0	
147	St. Martin (French part)	4135.0	4258.0	4388.0	4524.0	4666.0	
179	Nauru	4582.0	4753.0	4950.0	5198.0	5484.0	
245	Tuvalu	5404.0	5436.0	5471.0	5503.0	5525.0	
228	Turks and Caicos Islands	5604.0	5625.0	5633.0	5634.0	5642.0	
255	British Virgin Islands	7850.0	7885.0	7902.0	7919.0	7949.0	
52	Cayman Islands	8473.0	8626.0	8799.0	8985.0	9172.0	
164	Northern Mariana Islands	8702.0	8965.0	9252.0	9561.0	9890.0	
6	Andorra	9443.0	10216.0	11014.0	11839.0	12690.0	

188		Palau	9446.0	9639.0	9851.0	10076.0	10318.0	
155		Marshall Islands	15374.0	15867.0	16387.0	16947.0	17537.0	
212		San Marino	15556.0	15895.0	16242.0	16583.0	16926.0	
137		Liechtenstein	16472.0	16834.0	17221.0	17625.0	18058.0	
11		American Samoa	20085.0	20626.0	21272.0	21949.0	22656.0	
149		Monaco	21797.0	21907.0	22106.0	22442.0	22766.0	
84		Gibraltar	21822.0	21907.0	22249.0	22796.0	23347.0	
91		Greenland	32500.0	33700.0	35000.0	36400.0	37600.0	
256		Virgin Islands (U.S.)	32500.0	34300.0	35000.0	39800.0	40800.0	
78		Faroe Islands	34154.0	34572.0	34963.0	35385.0	35841.0	
200		Qatar	36385.0	40111.0	45123.0	50950.0	57531.0	

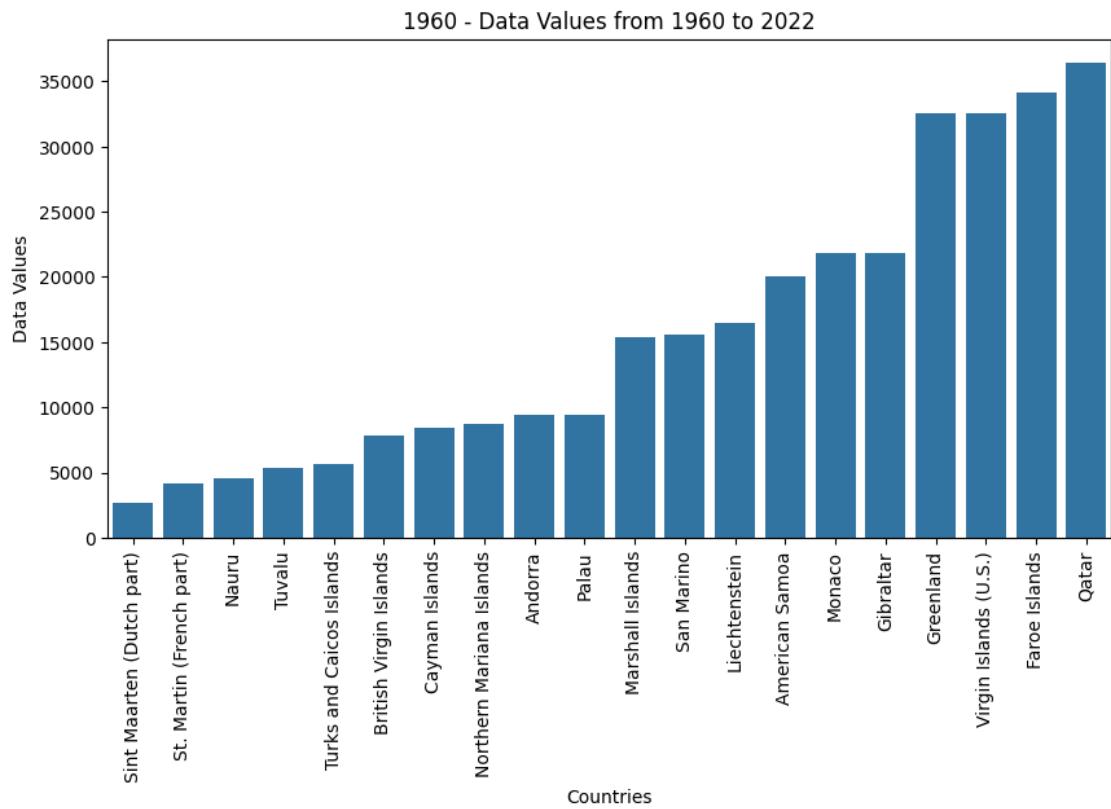
	1965	1966	1967	1968	...	2013	2014	2015	\
225	4161.0	4531.0	4930.0	5354.0	...	36607.0	37685.0	38825.0	
147	4832.0	5044.0	5294.0	5497.0	...	35639.0	35261.0	35020.0	
179	5804.0	6021.0	6114.0	6288.0	...	10694.0	10940.0	11185.0	
245	5548.0	5591.0	5657.0	5729.0	...	10918.0	10899.0	10877.0	
228	5650.0	5652.0	5662.0	5668.0	...	33594.0	34985.0	36538.0	
255	8018.0	8139.0	8337.0	8649.0	...	28657.0	28971.0	29366.0	
52	9366.0	9566.0	9771.0	9981.0	...	58212.0	59559.0	60911.0	
164	10229.0	10577.0	10720.0	10440.0	...	52141.0	51856.0	51514.0	
6	13563.0	14546.0	15745.0	17079.0	...	71367.0	71621.0	71746.0	
188	10563.0	10813.0	10992.0	11079.0	...	17805.0	17796.0	17794.0	
155	18154.0	18794.0	19665.0	21001.0	...	51352.0	50419.0	49410.0	
212	17273.0	17588.0	17907.0	18291.0	...	33285.0	33389.0	33570.0	
137	18500.0	18957.0	19467.0	20011.0	...	36806.0	37096.0	37355.0	
11	23391.0	24122.0	24848.0	25608.0	...	52995.0	52217.0	51368.0	
149	23022.0	23198.0	23281.0	23481.0	...	35425.0	36110.0	36760.0	
84	23910.0	24477.0	25047.0	25610.0	...	32411.0	32452.0	32520.0	
91	39200.0	40500.0	41900.0	43400.0	...	56483.0	56295.0	56114.0	
256	43500.0	46200.0	49100.0	55700.0	...	108041.0	107882.0	107712.0	
78	36346.0	36825.0	37234.0	37630.0	...	48418.0	48465.0	48816.0	
200	64843.0	73102.0	82517.0	93022.0	...	2035501.0	2214465.0	2414573.0	

	2016	2017	2018	2019	2020	2021	\
225	39969.0	40574.0	40895.0	41608.0	42310.0	42846.0	
147	34811.0	34496.0	33852.0	33121.0	32553.0	31948.0	
179	11437.0	11682.0	11924.0	12132.0	12315.0	12511.0	
245	10852.0	10828.0	10865.0	10956.0	11069.0	11204.0	
228	38246.0	39844.0	41487.0	43080.0	44276.0	45114.0	
255	29739.0	30060.0	30335.0	30610.0	30910.0	31122.0	
52	62255.0	63581.0	64884.0	66134.0	67311.0	68136.0	
164	51133.0	50729.0	50304.0	49858.0	49587.0	49481.0	
6	72540.0	73837.0	75013.0	76343.0	77700.0	79034.0	
188	17816.0	17837.0	17864.0	17916.0	17972.0	18024.0	
155	48329.0	47187.0	45989.0	44728.0	43413.0	42050.0	
212	33834.0	34056.0	34156.0	34178.0	34007.0	33745.0	

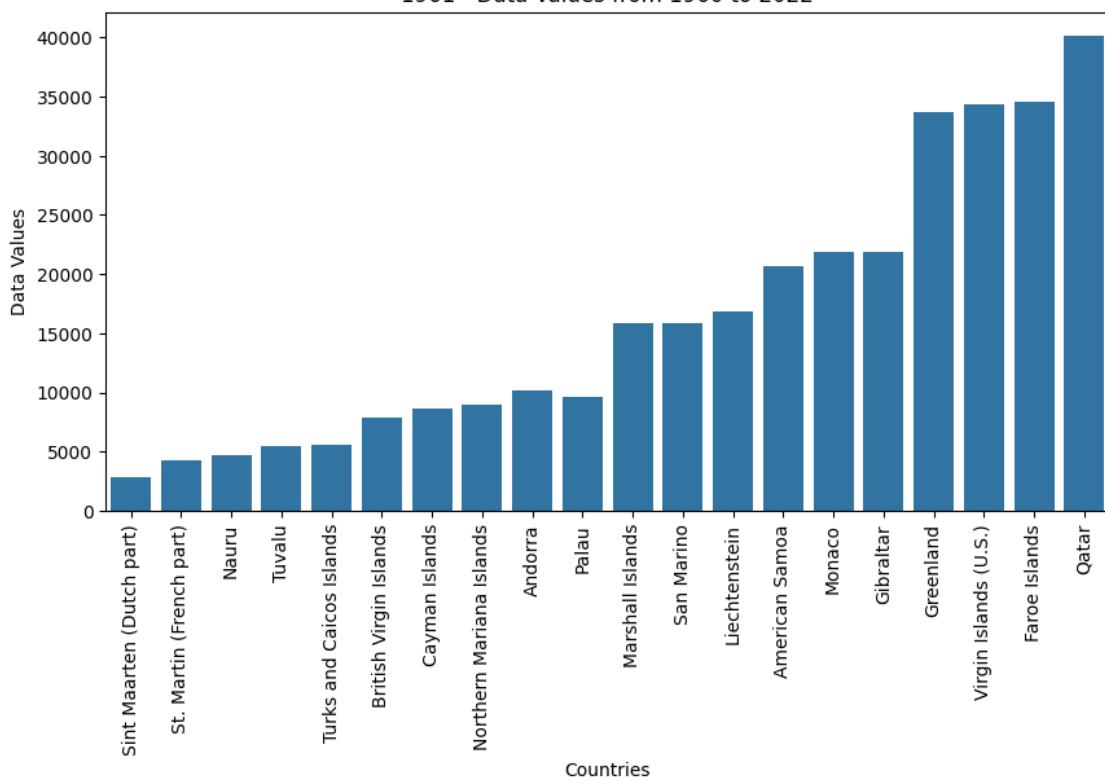
137	37609.0	37889.0	38181.0	38482.0	38756.0	39039.0
11	50448.0	49463.0	48424.0	47321.0	46189.0	45035.0
149	37071.0	37044.0	37029.0	37034.0	36922.0	36686.0
84	32565.0	32602.0	32648.0	32685.0	32709.0	32669.0
91	56186.0	56172.0	56023.0	56225.0	56367.0	56653.0
256	107516.0	107281.0	107001.0	106669.0	106290.0	105870.0
78	49500.0	50230.0	50955.0	51681.0	52415.0	52889.0
200	2595166.0	2711755.0	2766732.0	2807235.0	2760385.0	2688235.0
	2022					
225	43389.0					
147	31791.0					
179	12668.0					
245	11312.0					
228	45703.0					
255	31305.0					
52	68706.0					
164	49551.0					
6	79824.0					
188	18055.0					
155	41569.0					
212	33660.0					
137	39327.0					
11	44273.0					
149	36469.0					
84	32649.0					
91	56661.0					
256	105413.0					
78	53090.0					
200	2695122.0					

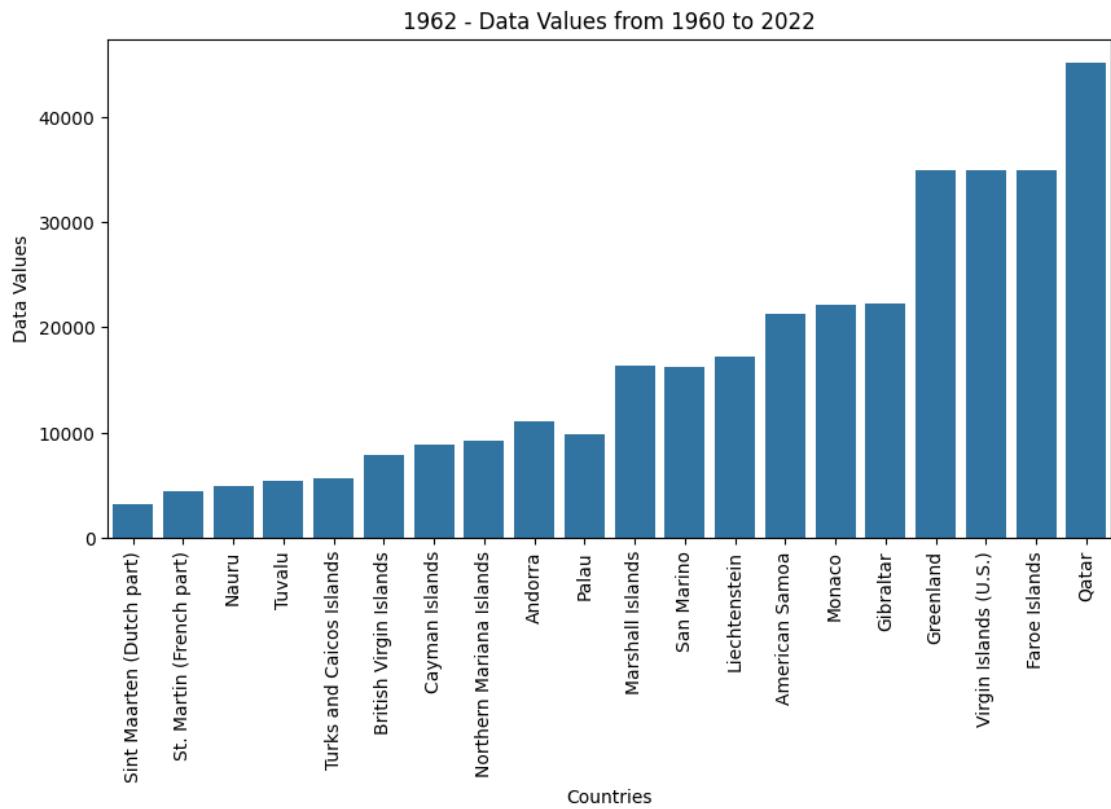
[20 rows x 64 columns]

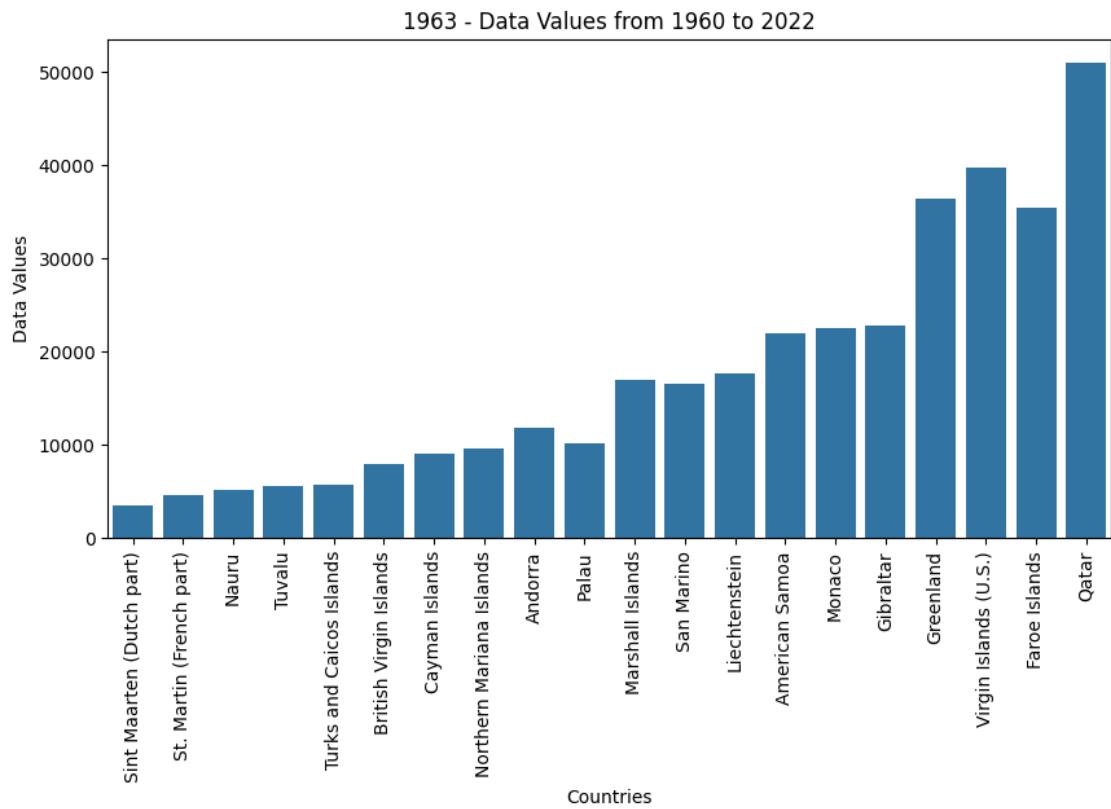
```
[27]: country_by_1960_t = country_by_1960.set_index('Country Name').T
for country_name, data_values in country_by_1960_t.iterrows():
    fig = plt.figure(figsize=(10, 5))
    sns.barplot(x=data_values.index, y=data_values.values)
    plt.xlabel('Countries')
    plt.ylabel('Data Values')
    plt.title(f'{country_name} - Data Values from 1960 to 2022')
    plt.xticks(rotation=90)
    plt.show()
```

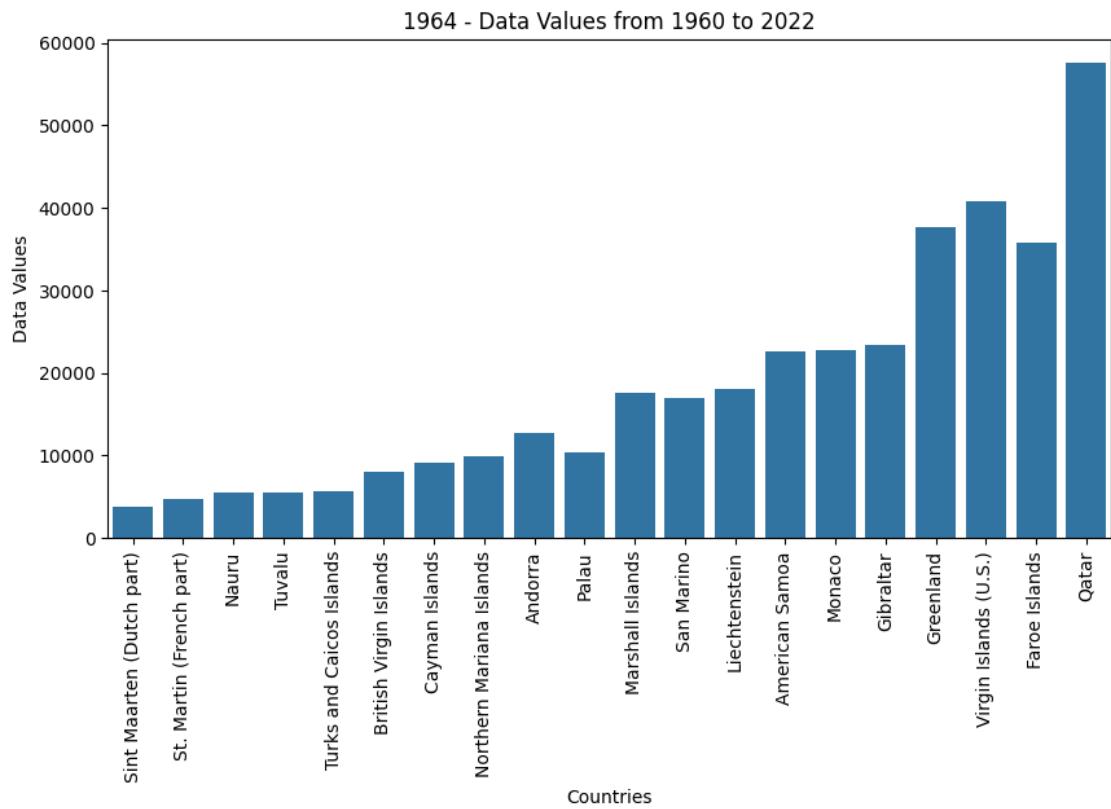


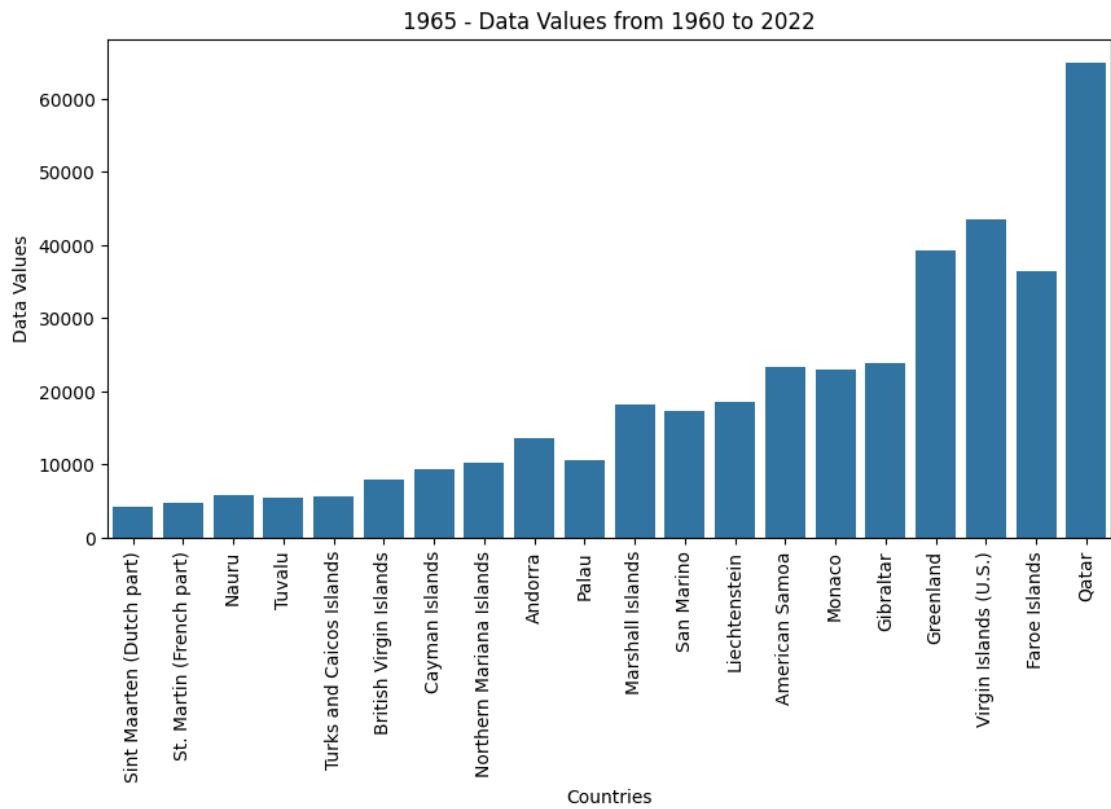
1961 - Data Values from 1960 to 2022

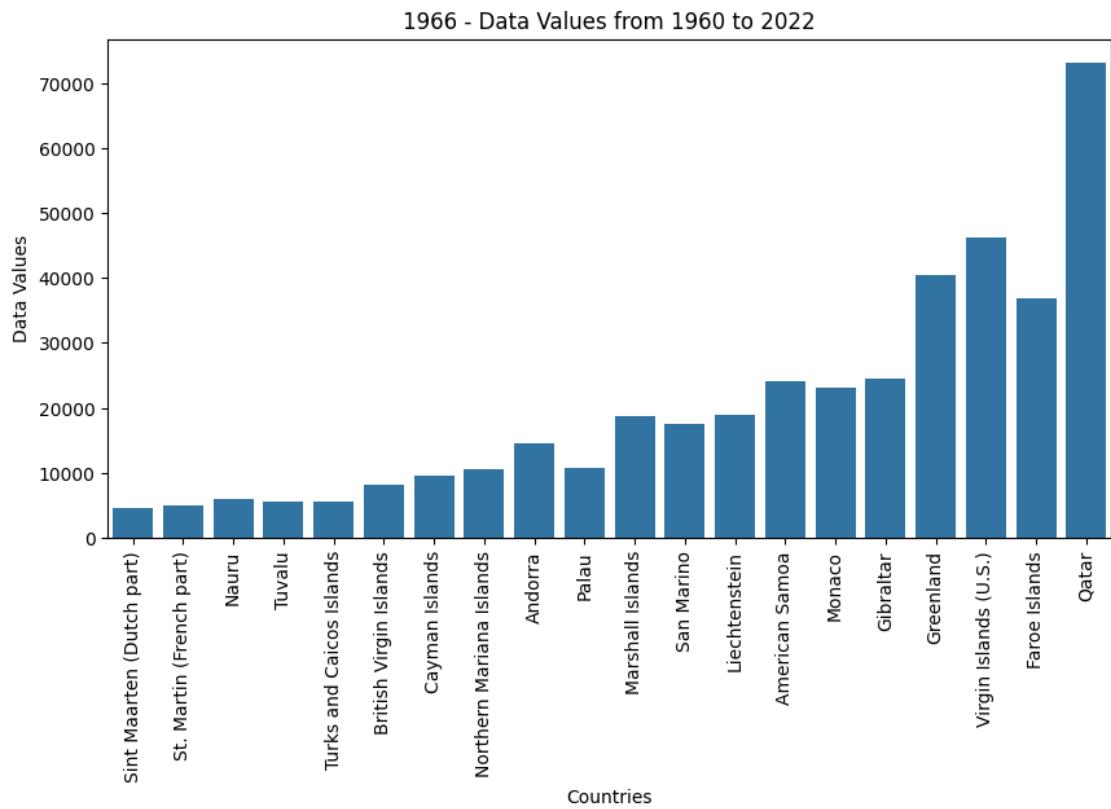




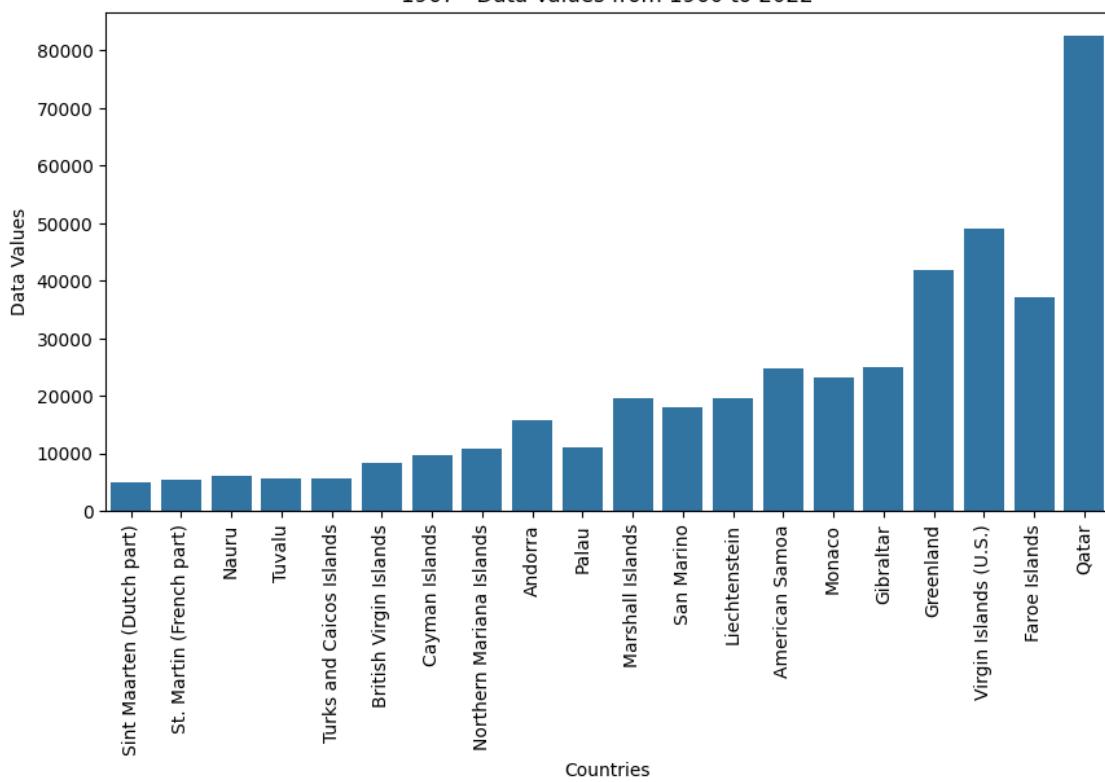


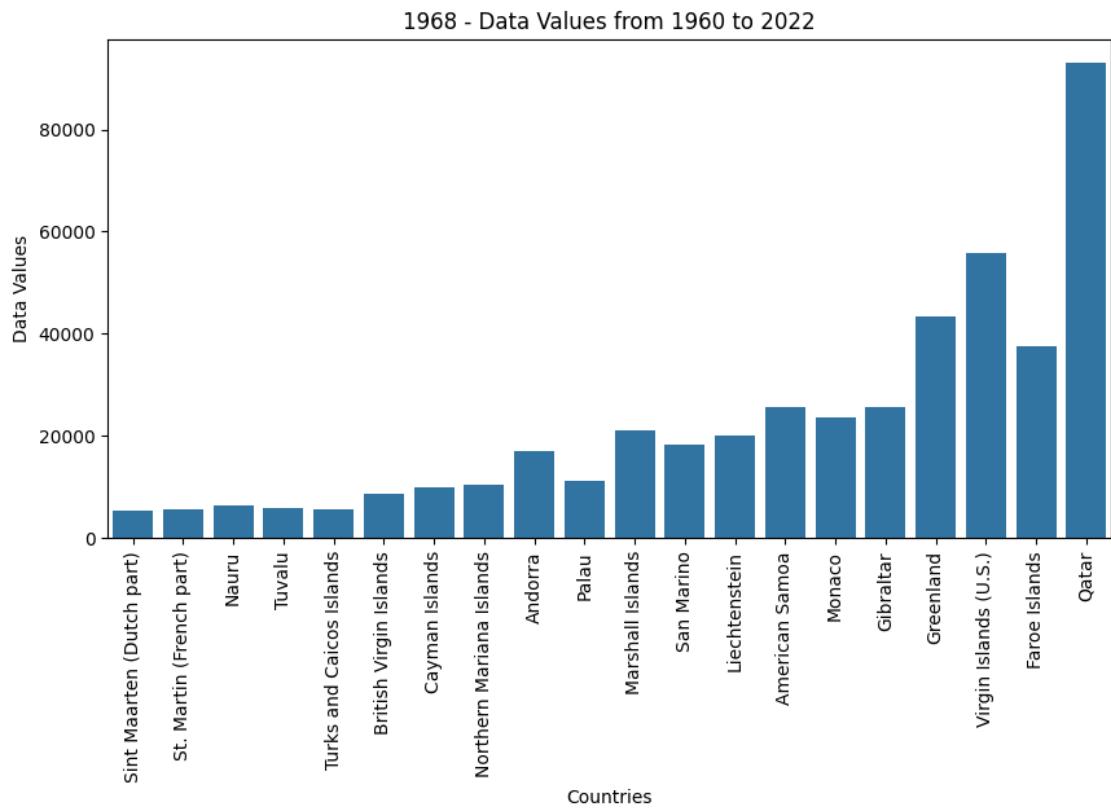


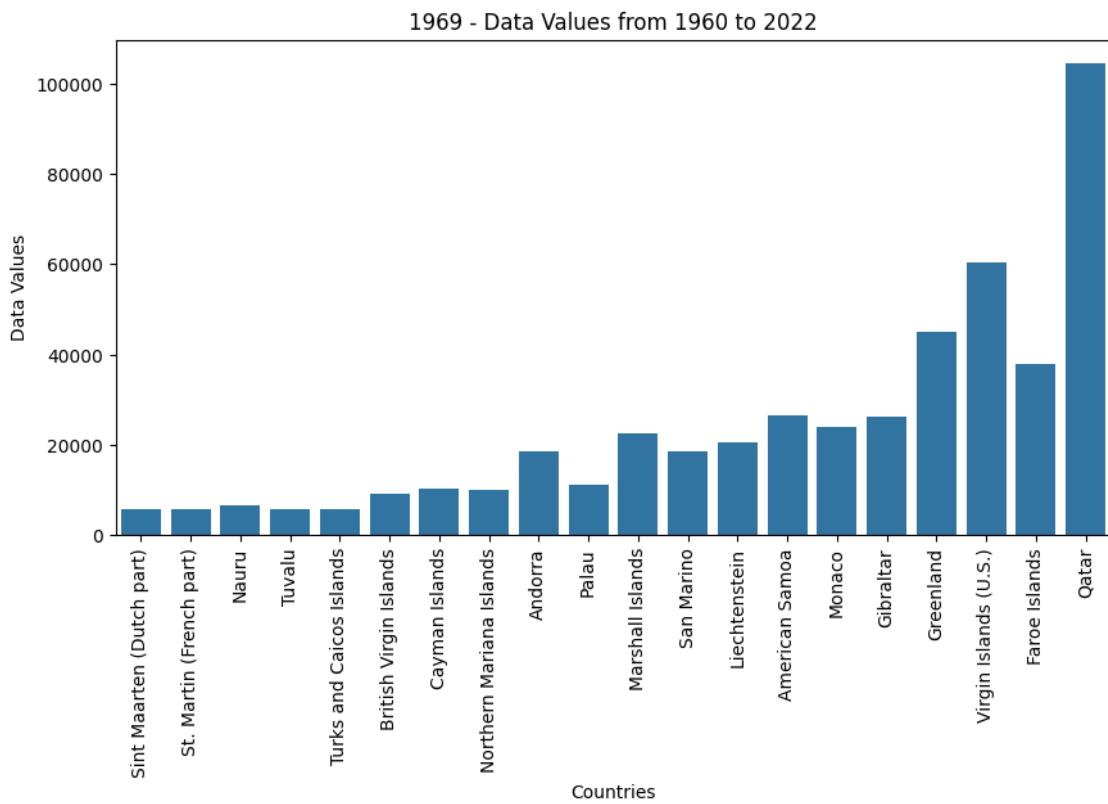


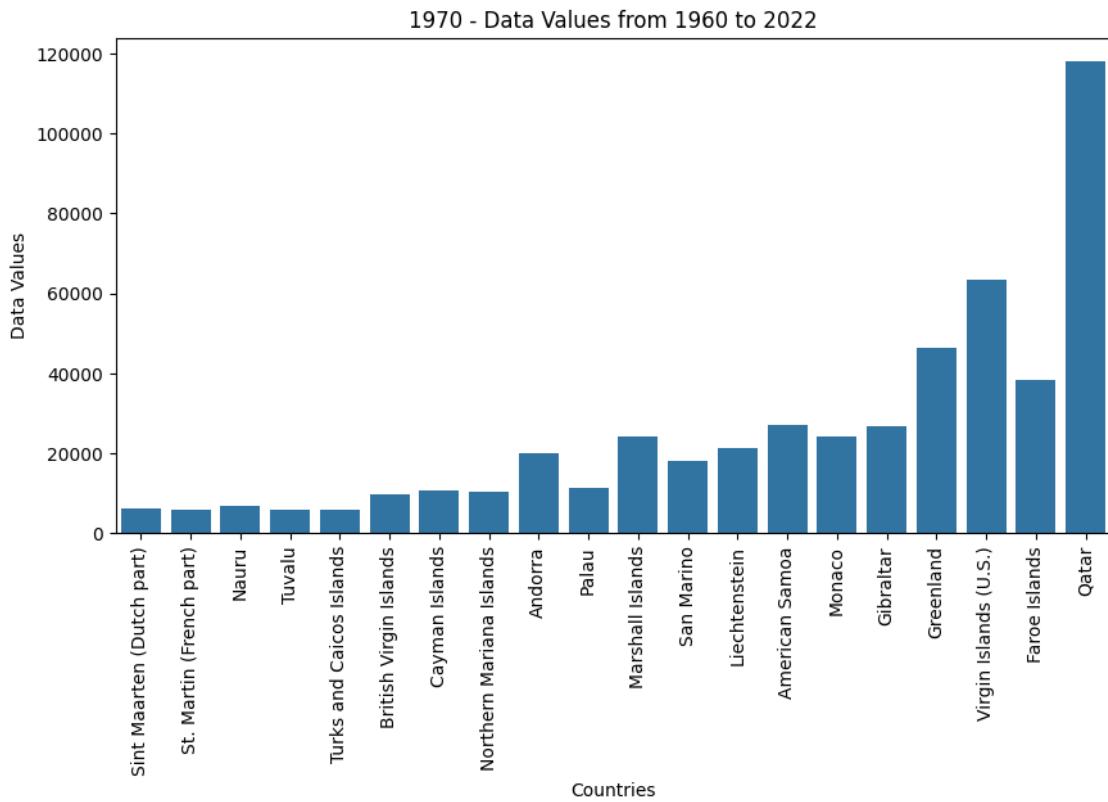


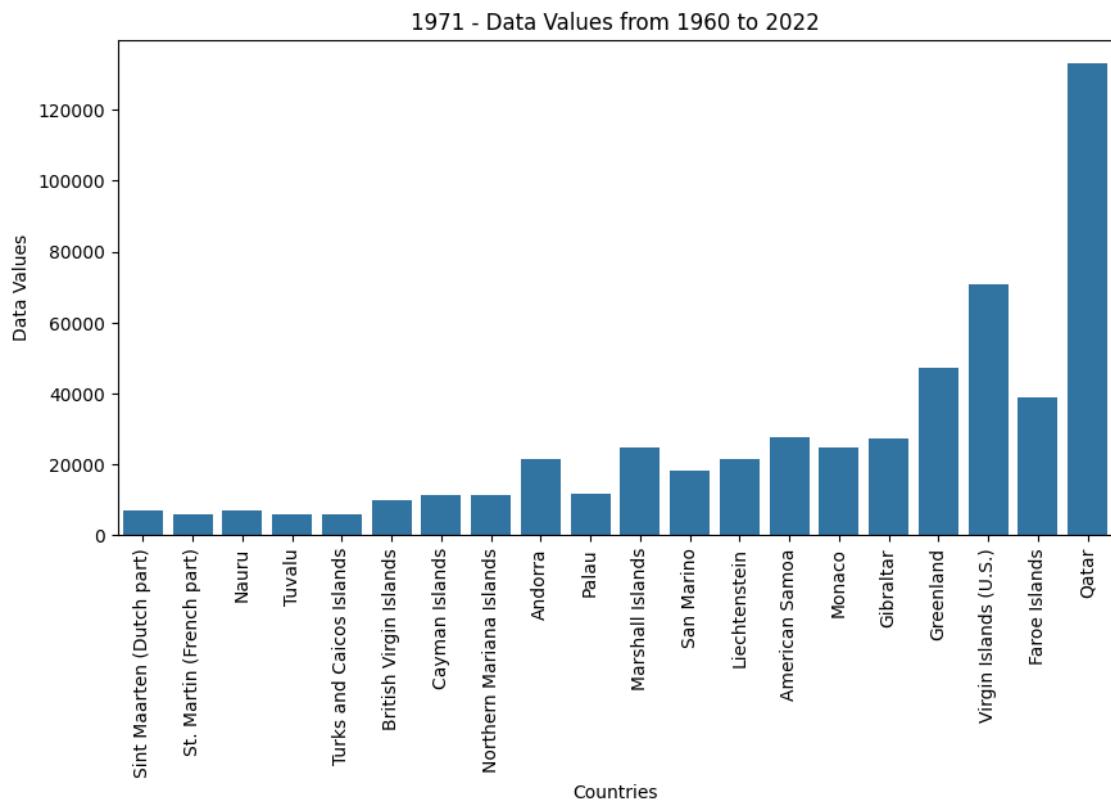
1967 - Data Values from 1960 to 2022

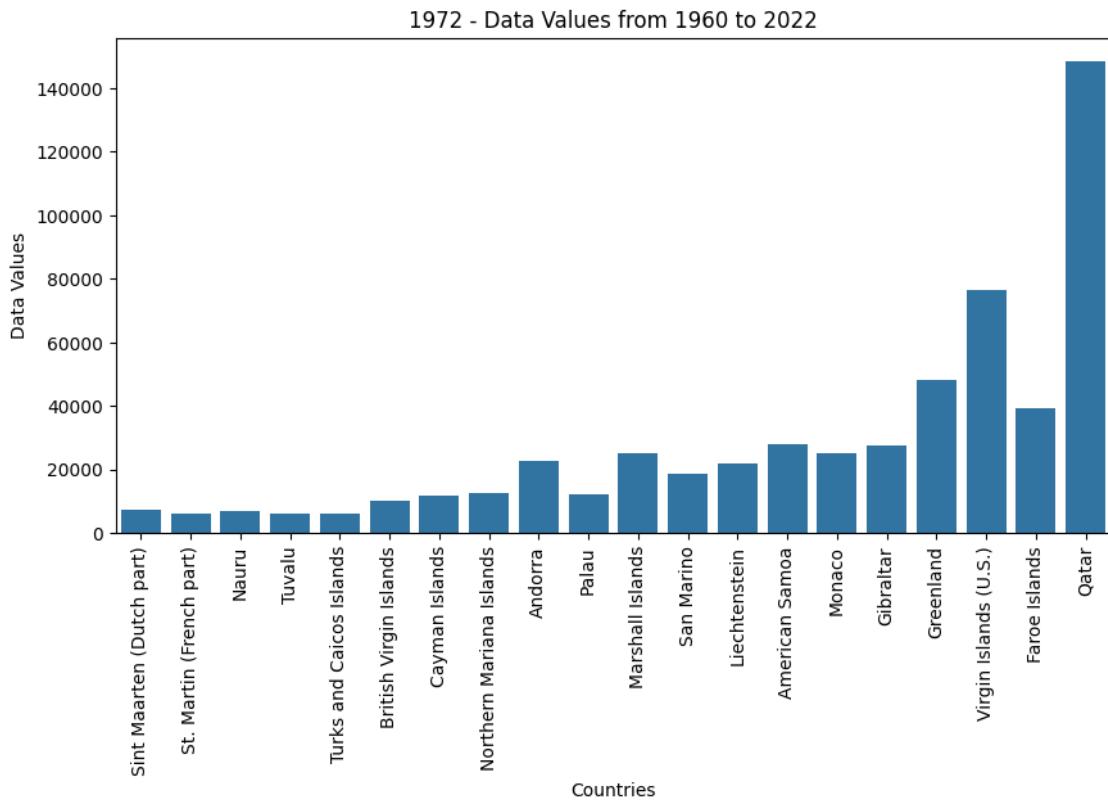




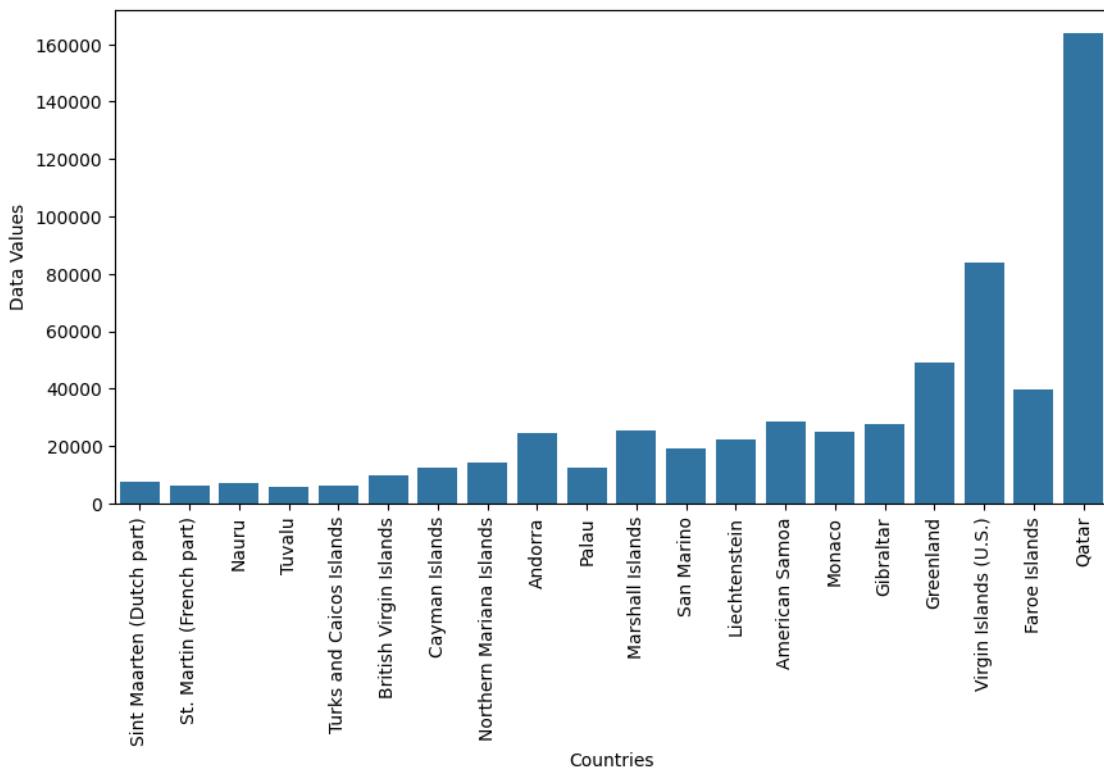




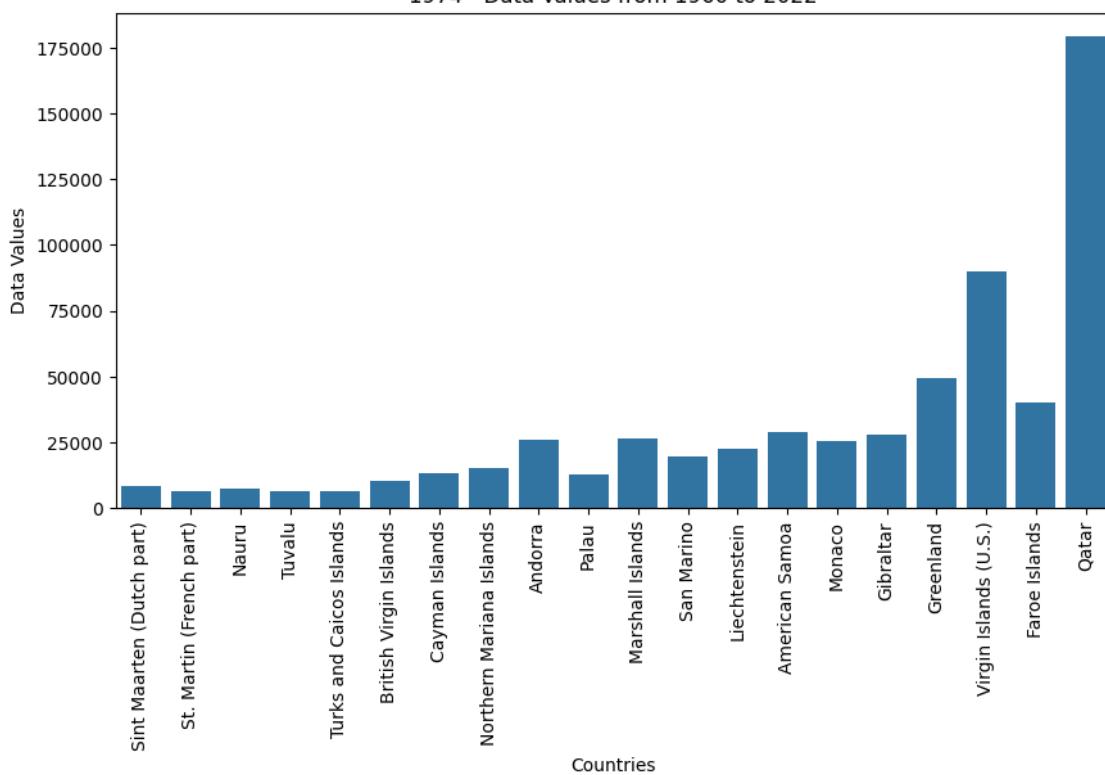


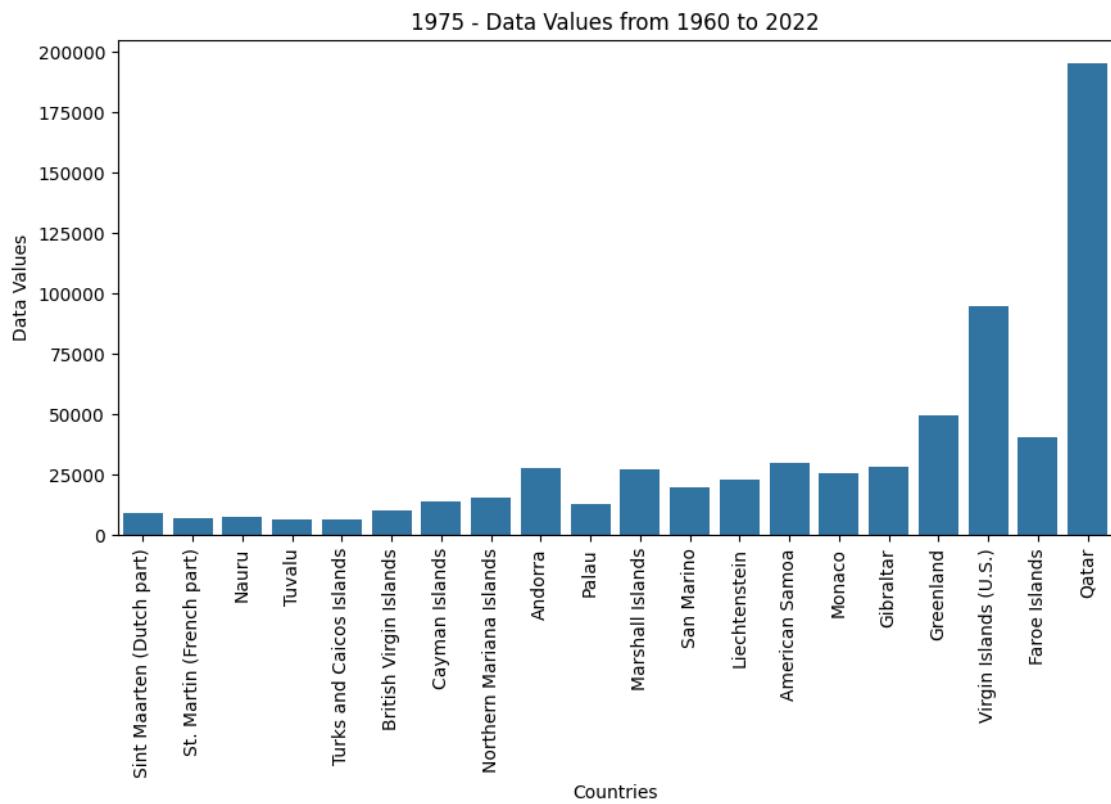


1973 - Data Values from 1960 to 2022

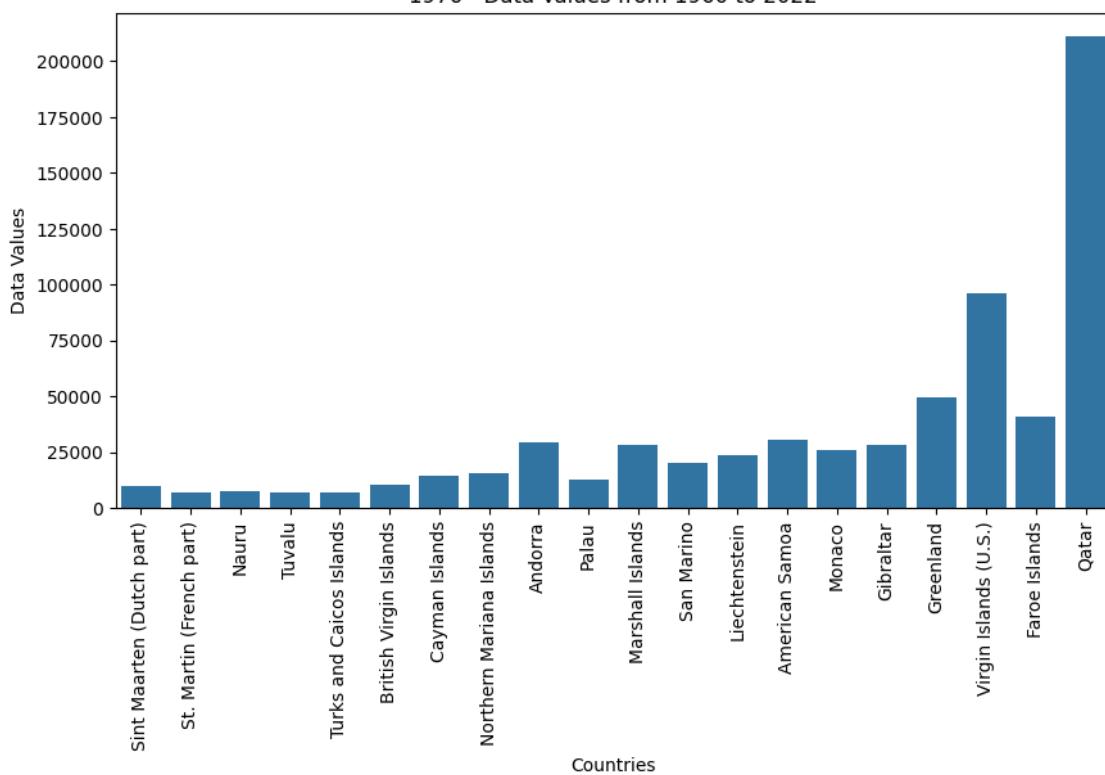


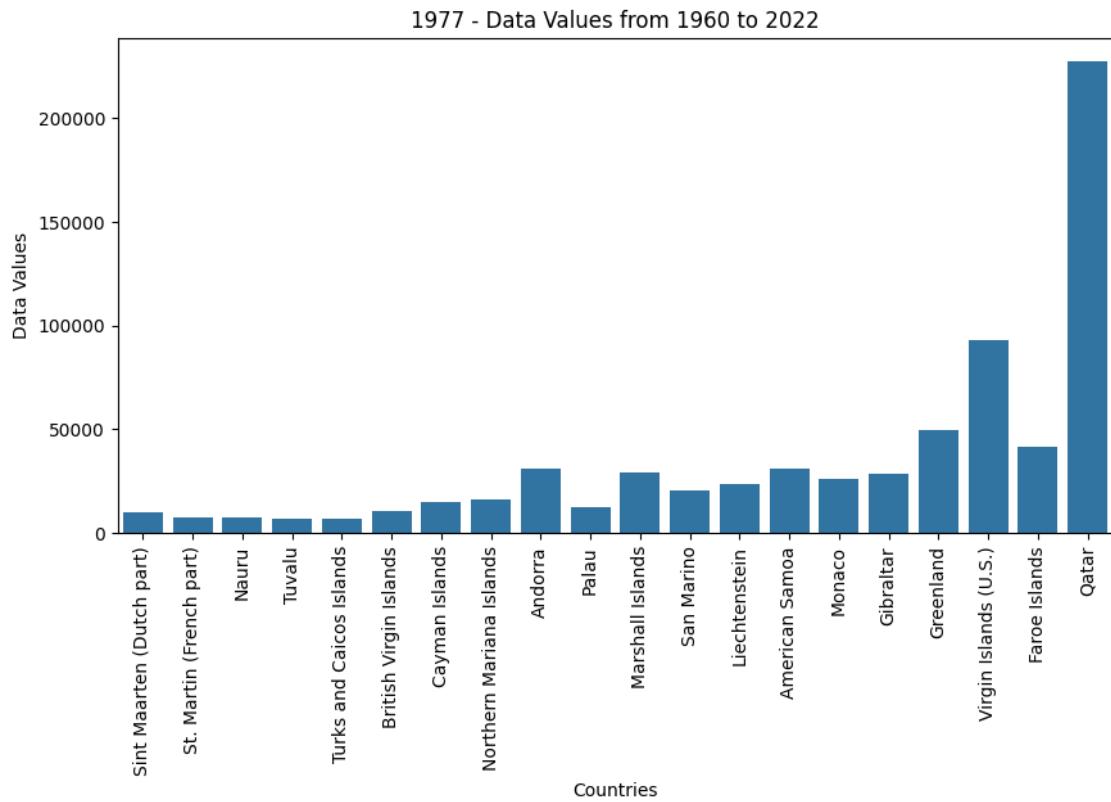
1974 - Data Values from 1960 to 2022

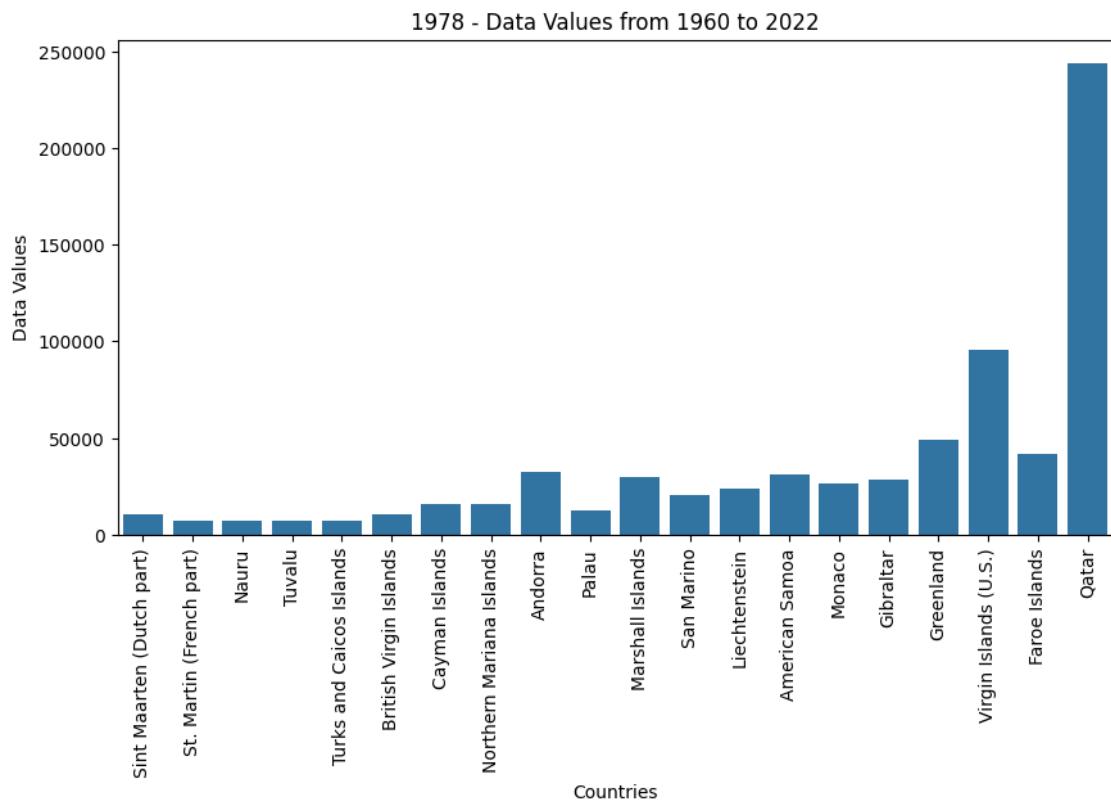




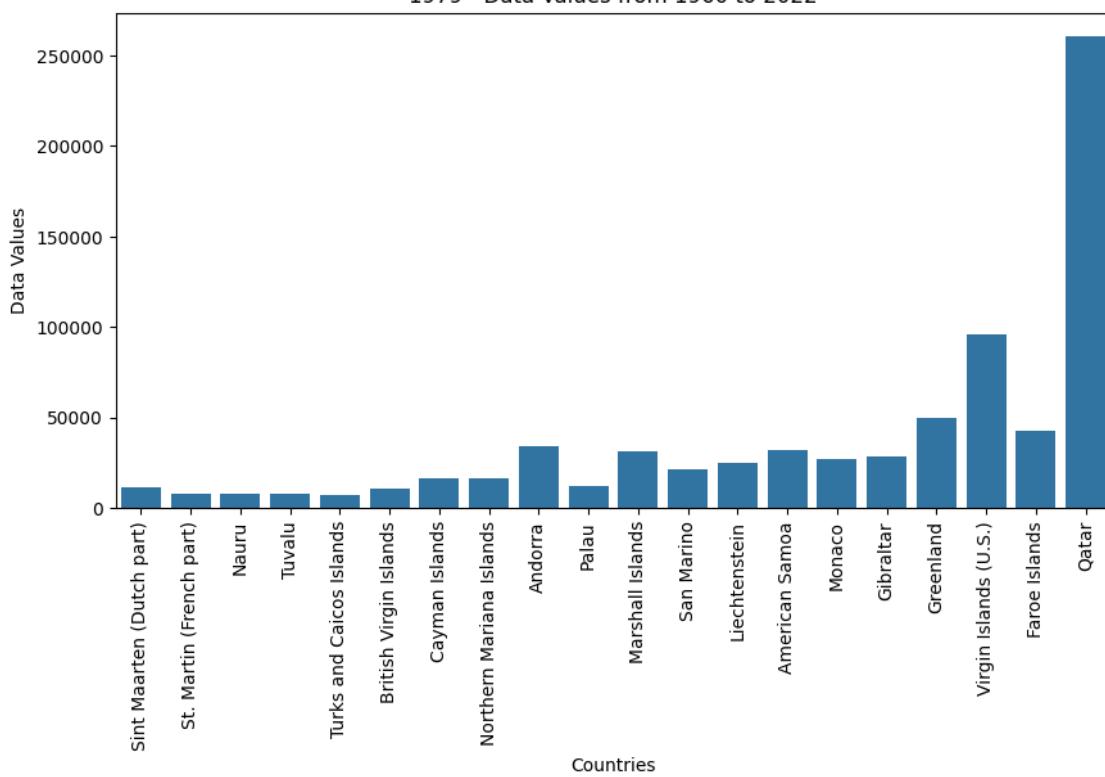
1976 - Data Values from 1960 to 2022

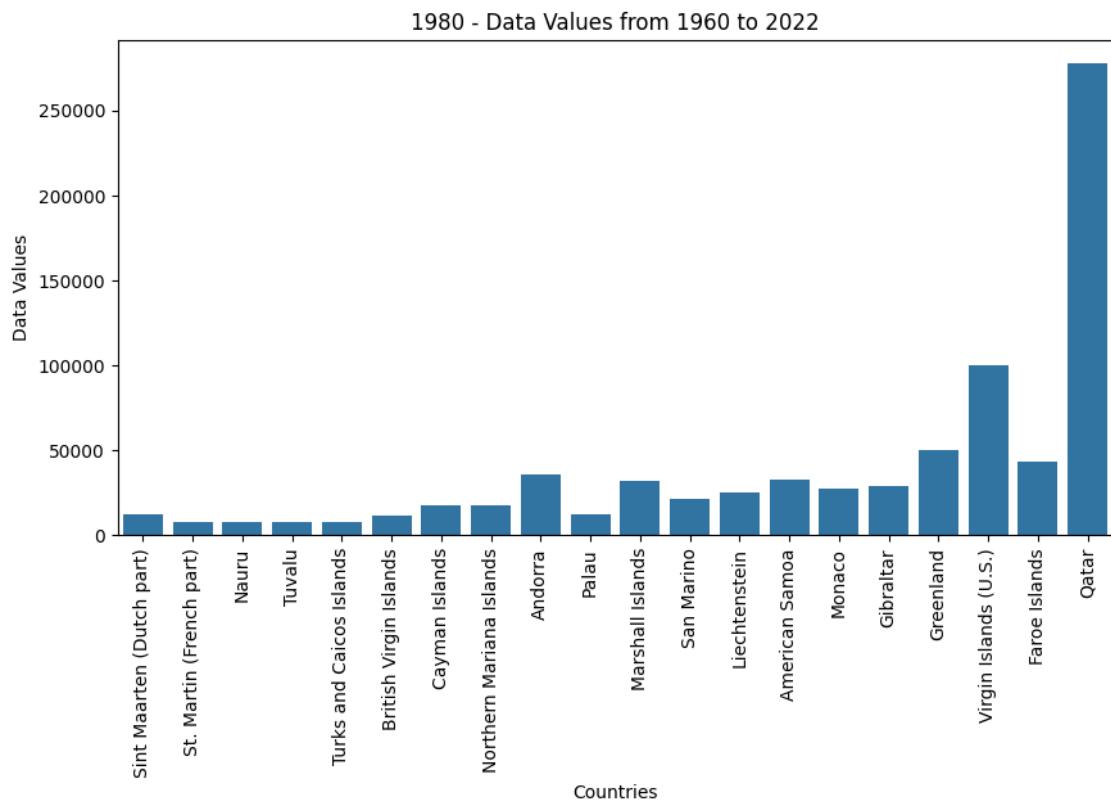


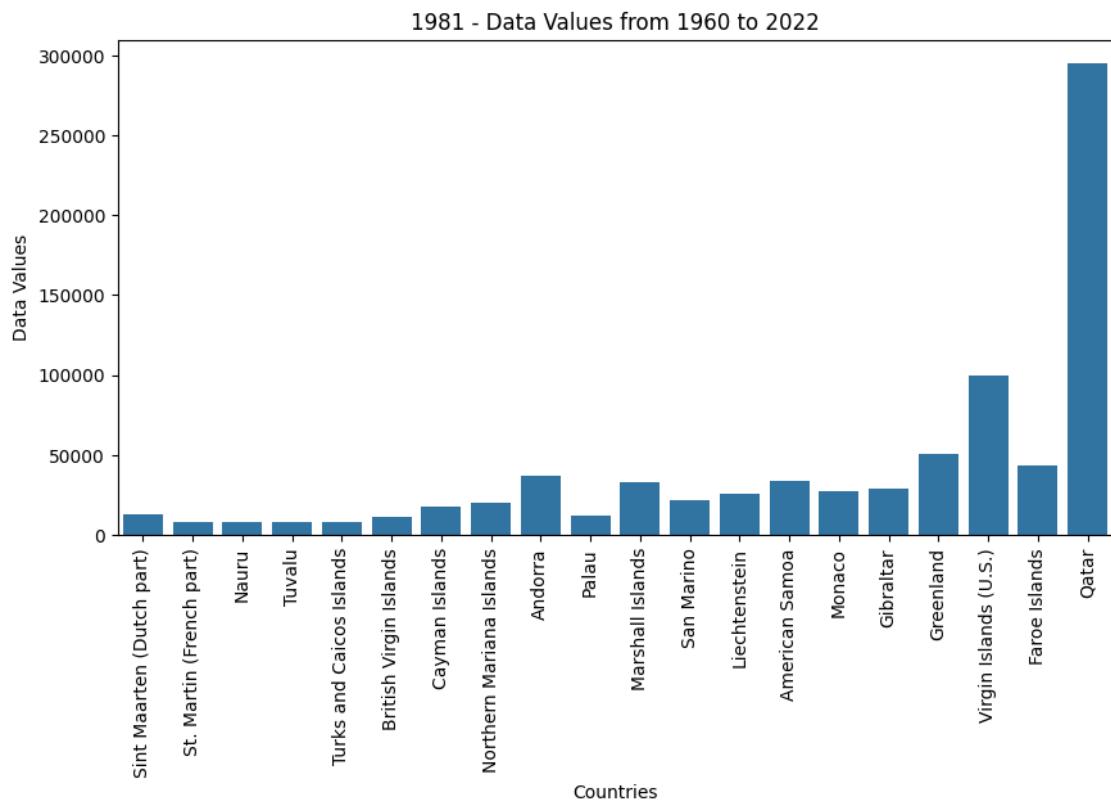


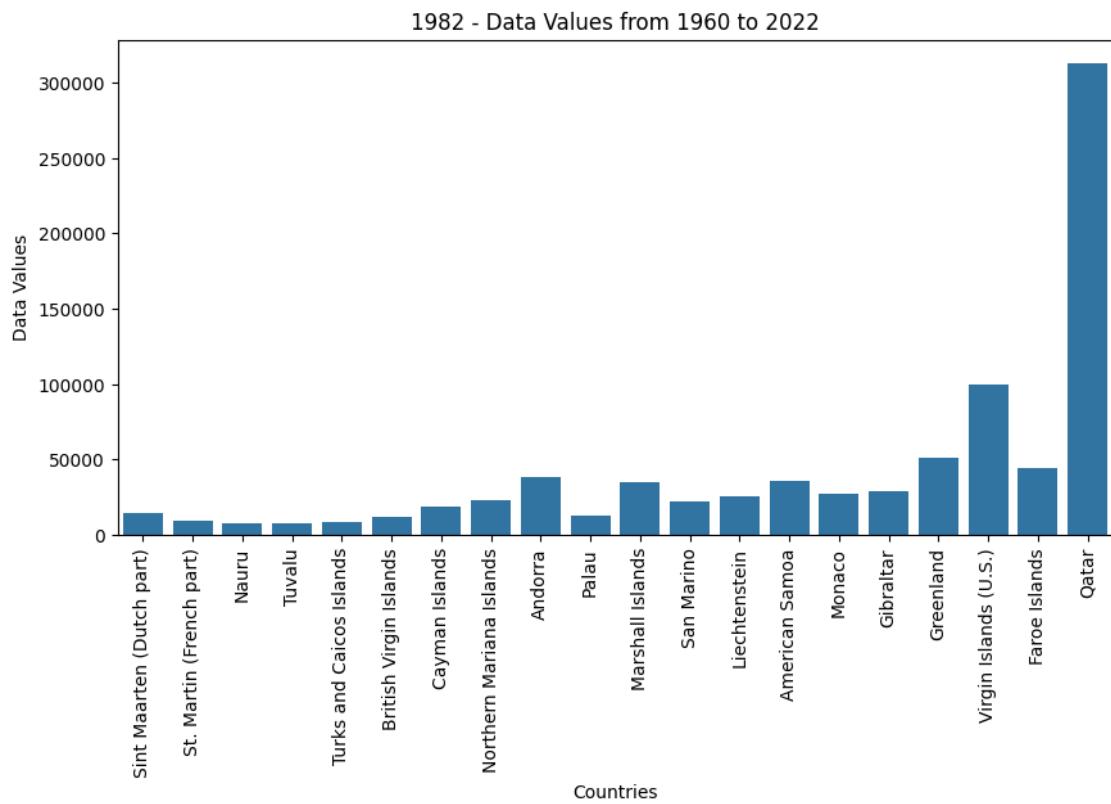


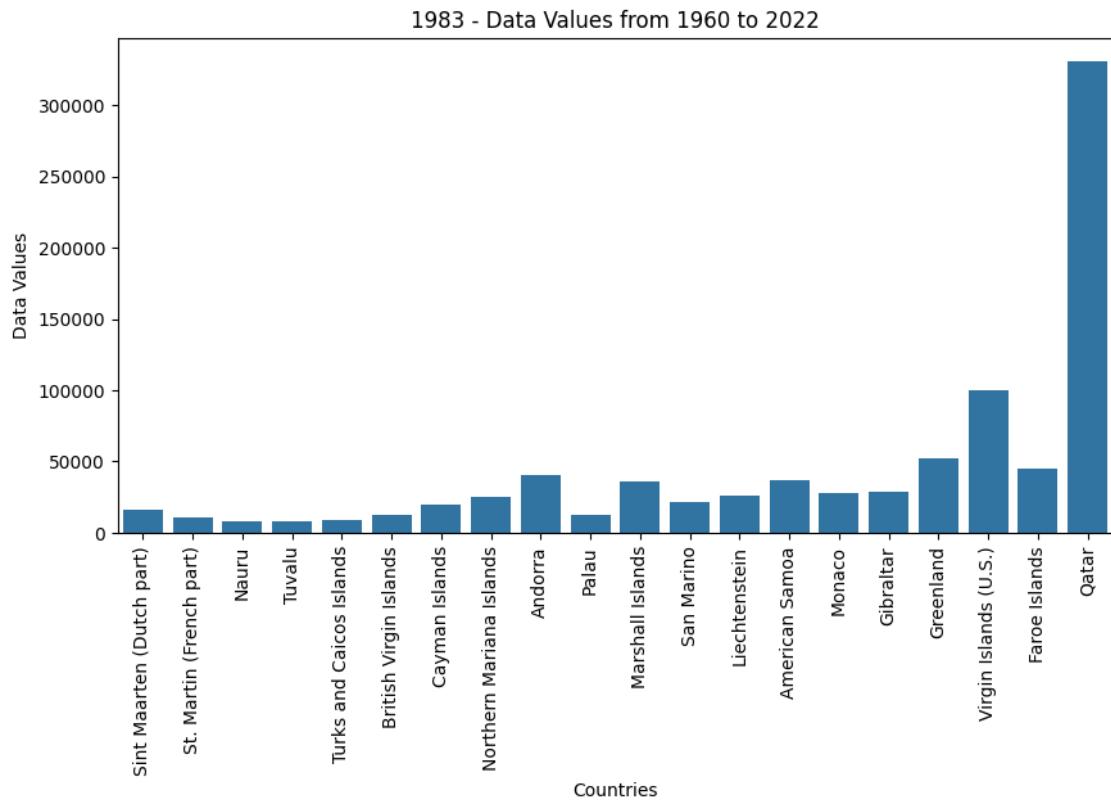
1979 - Data Values from 1960 to 2022



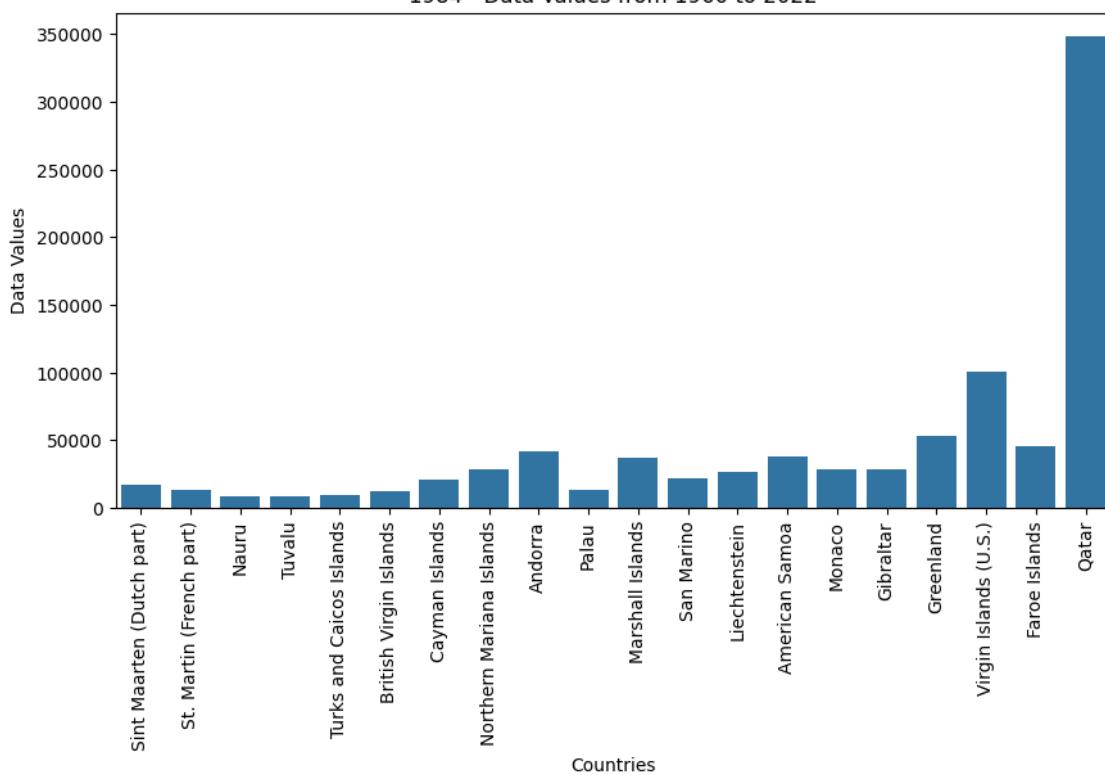




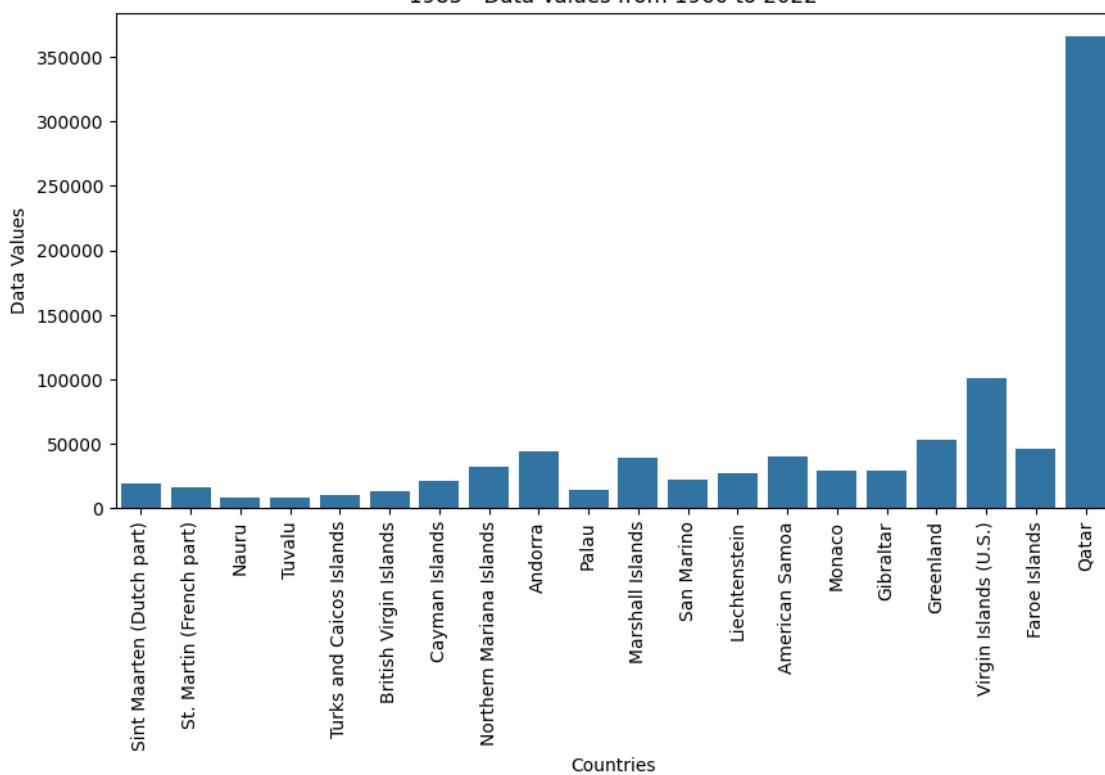


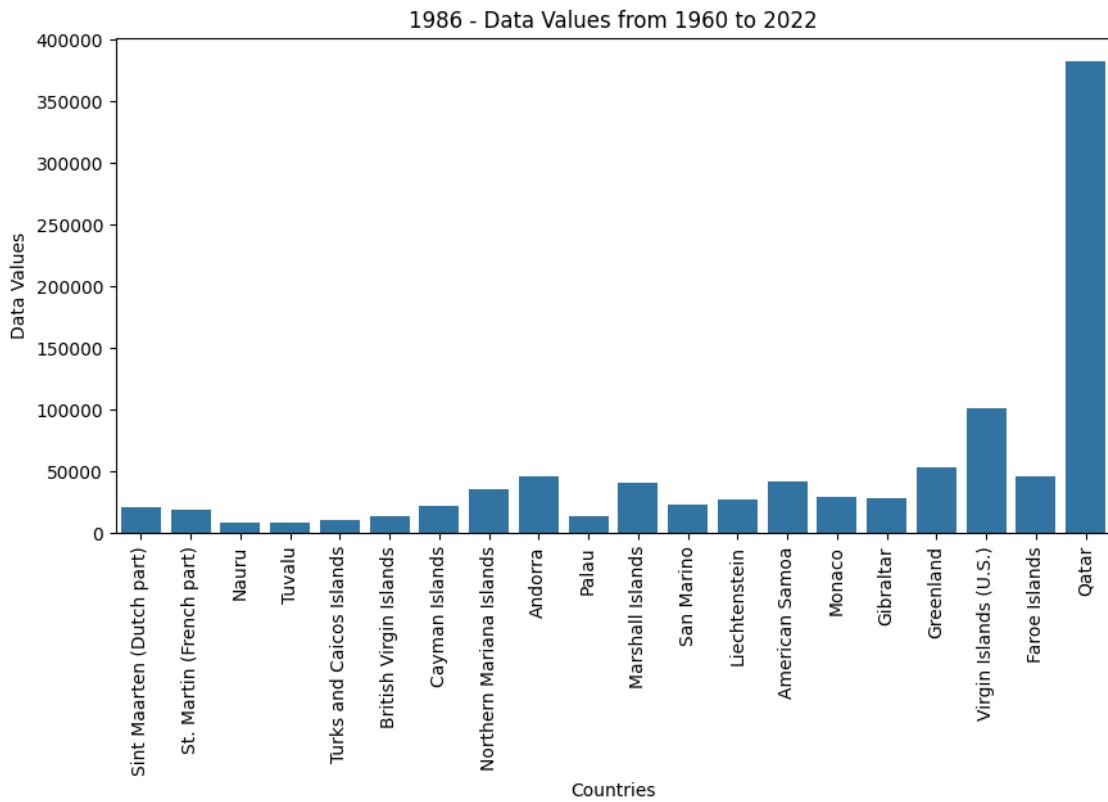


1984 - Data Values from 1960 to 2022

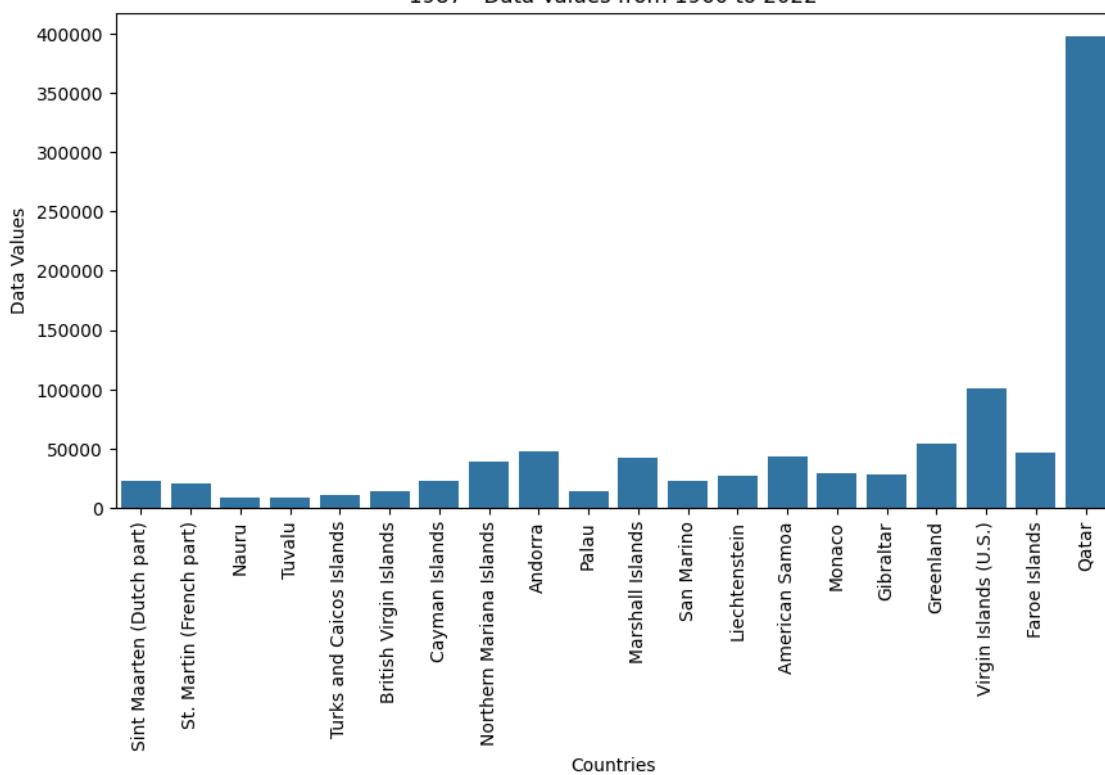


1985 - Data Values from 1960 to 2022

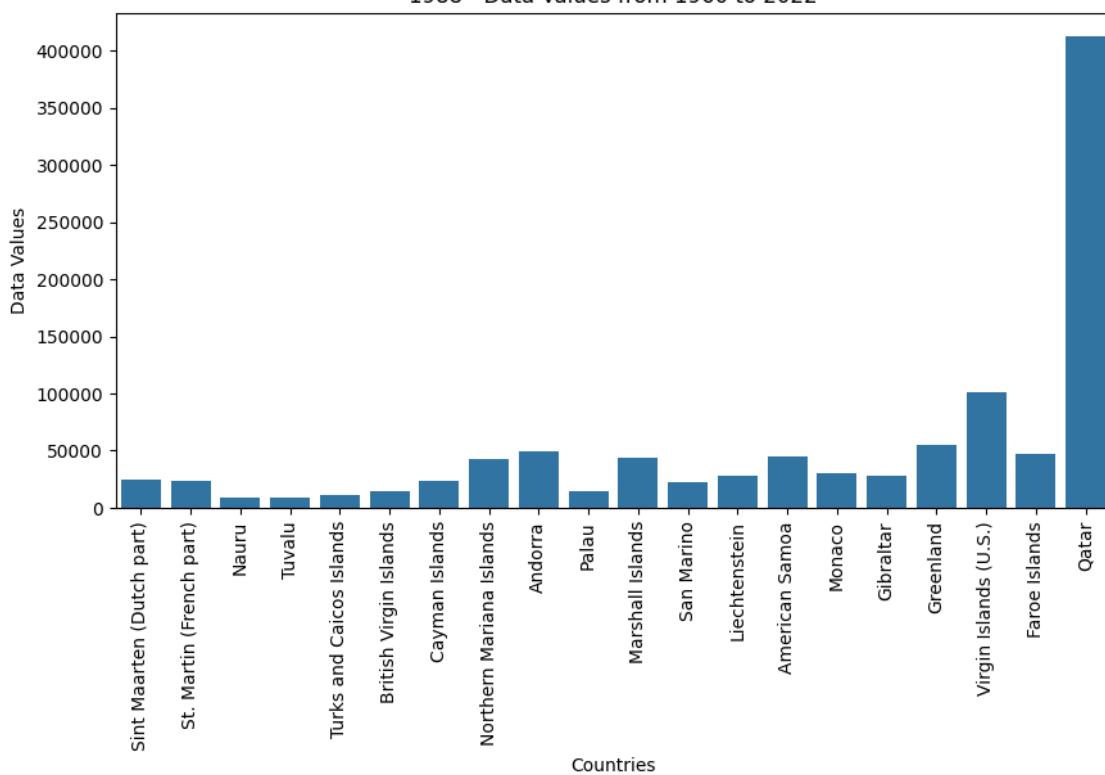




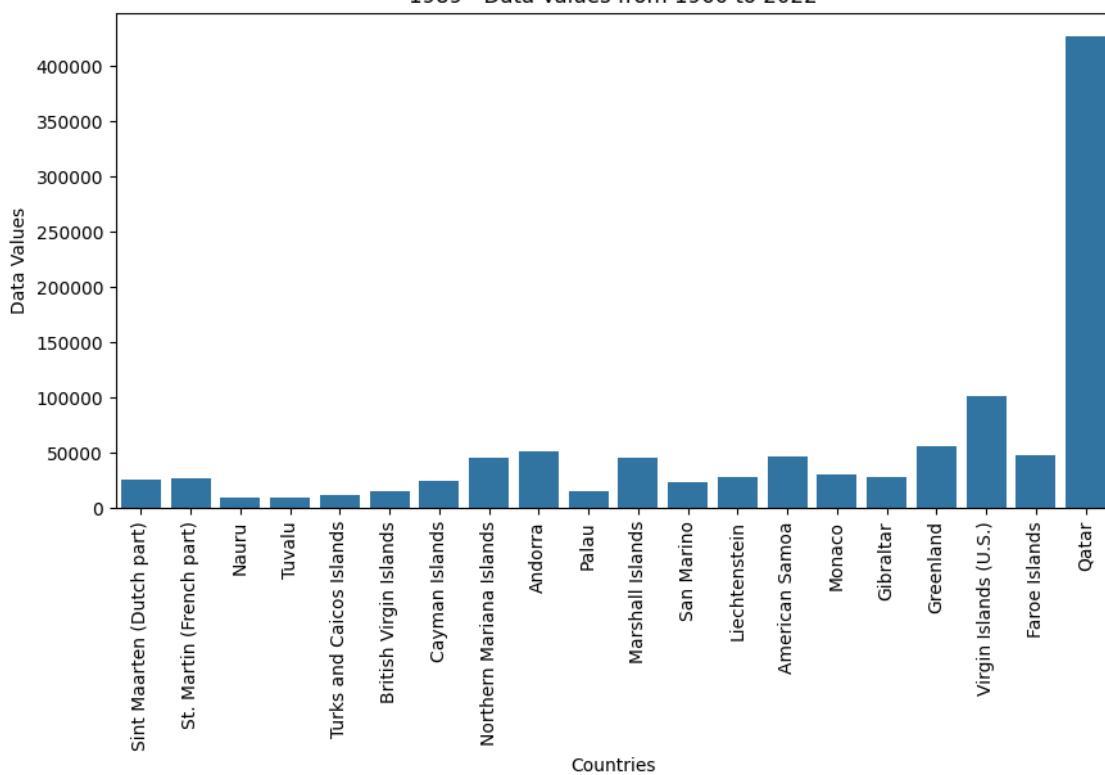
1987 - Data Values from 1960 to 2022

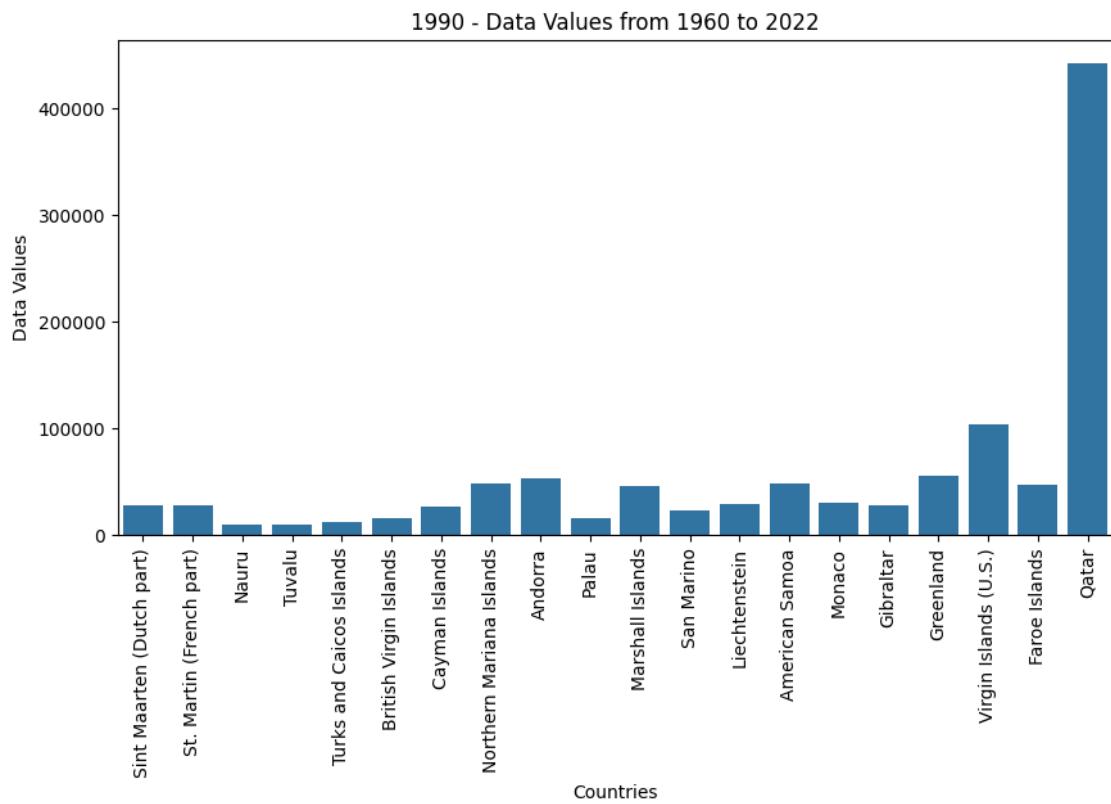


1988 - Data Values from 1960 to 2022

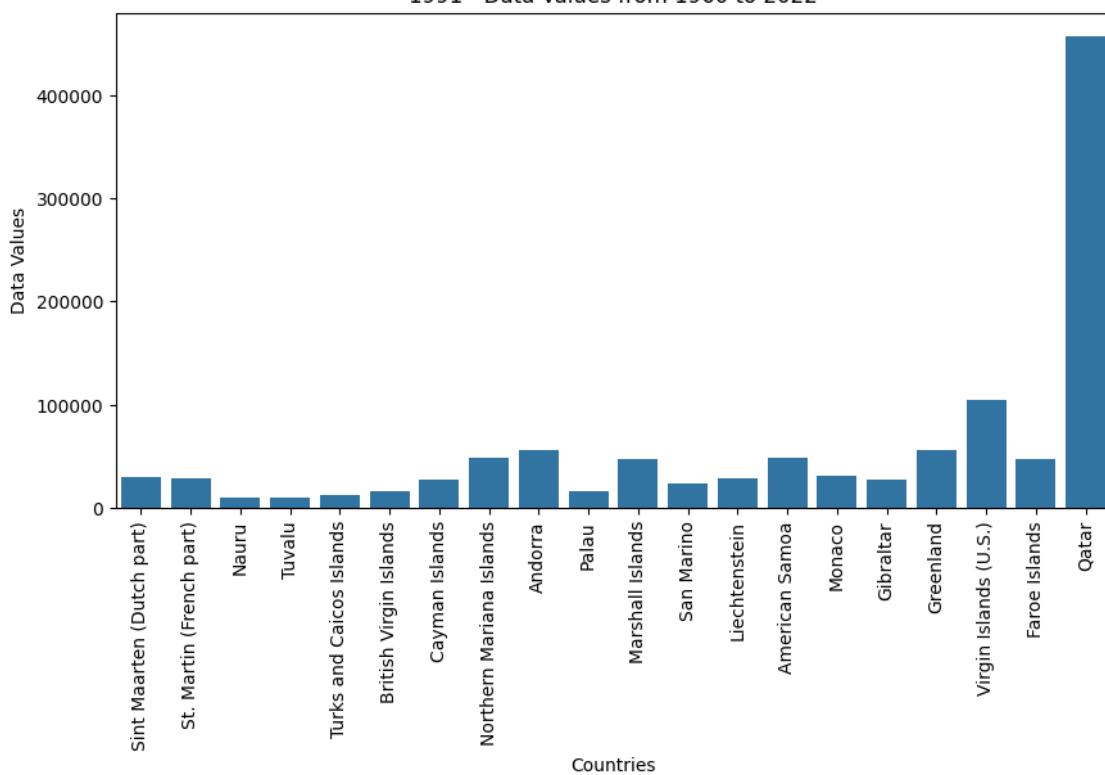


1989 - Data Values from 1960 to 2022

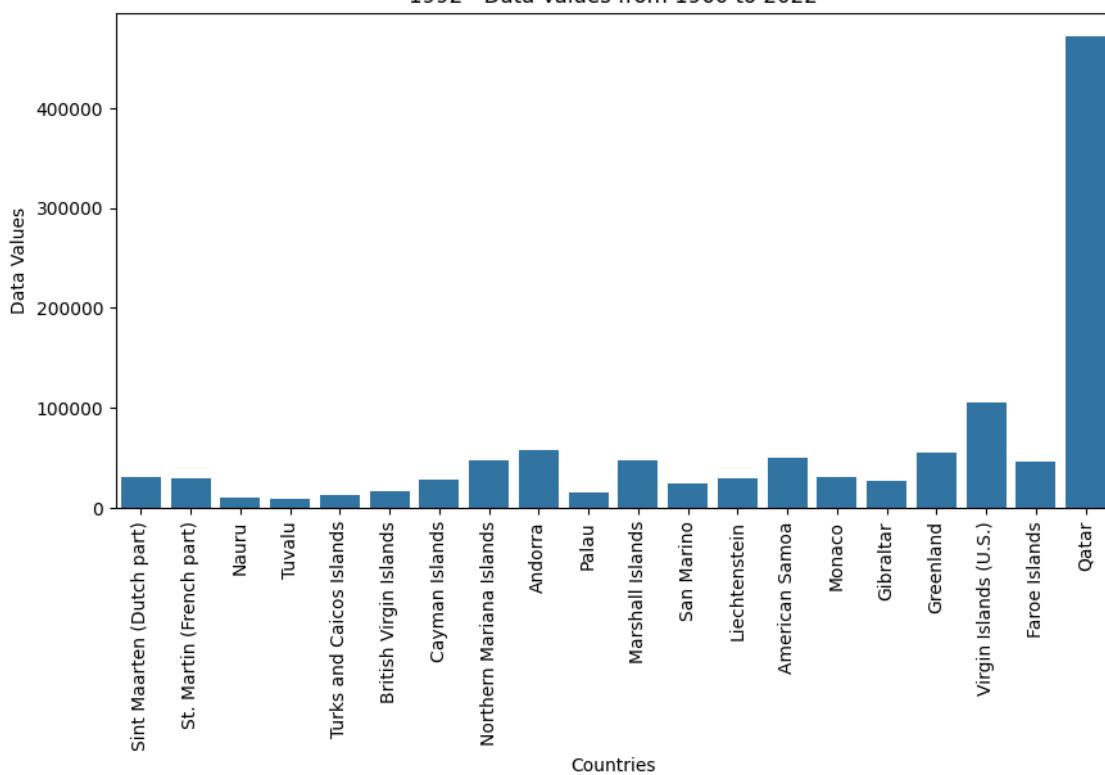


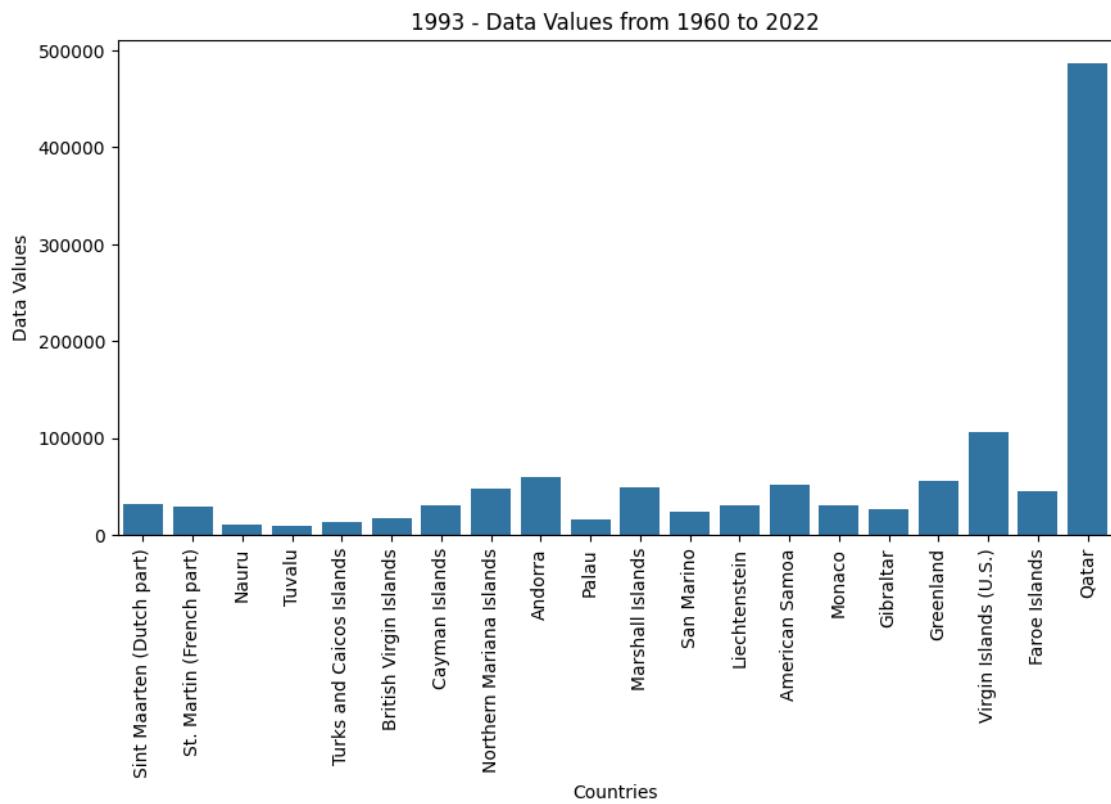


1991 - Data Values from 1960 to 2022

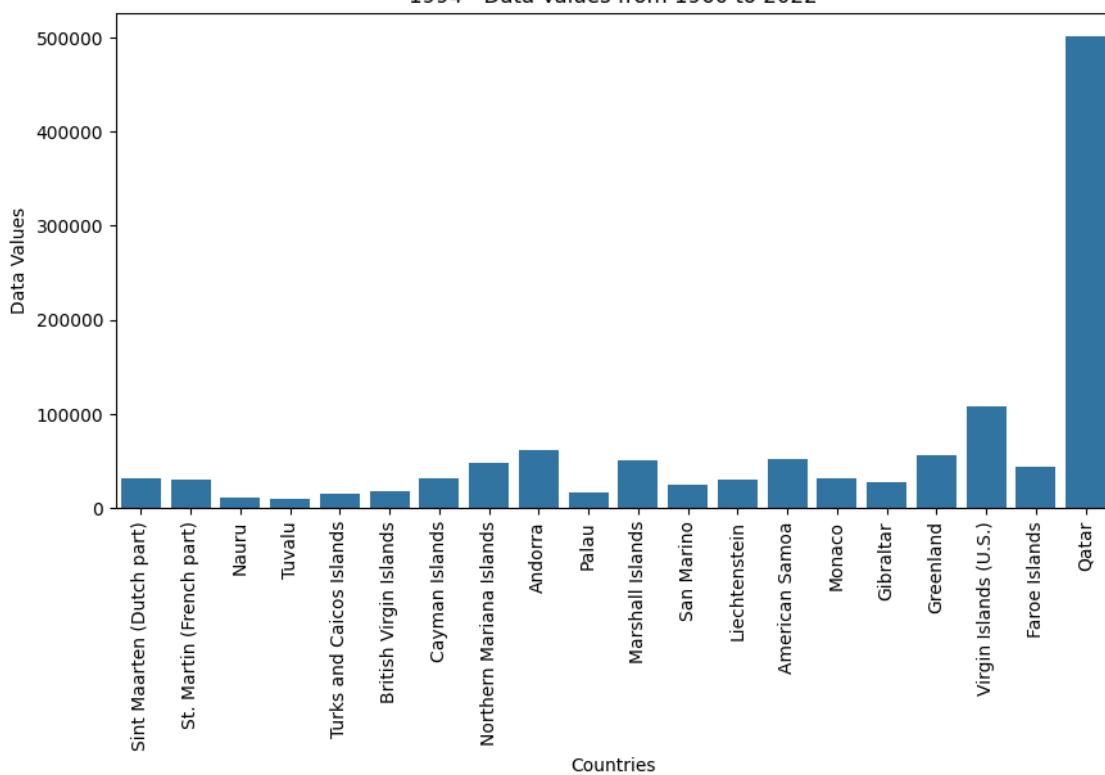


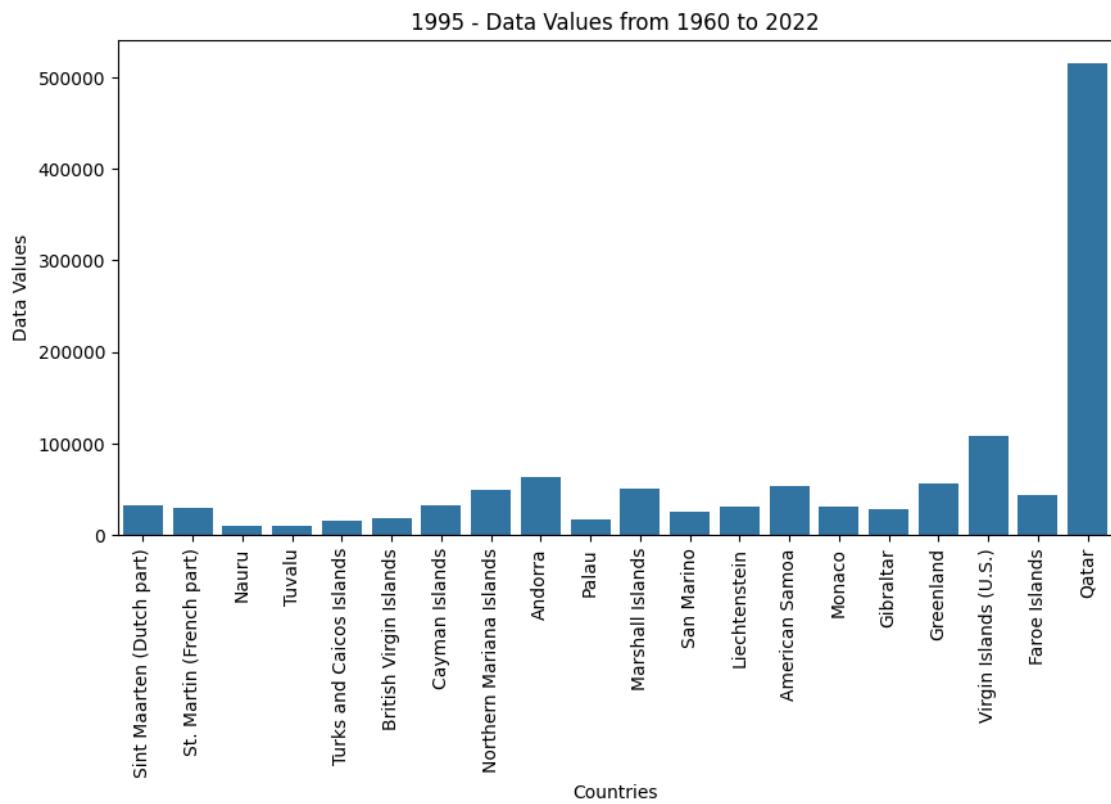
1992 - Data Values from 1960 to 2022



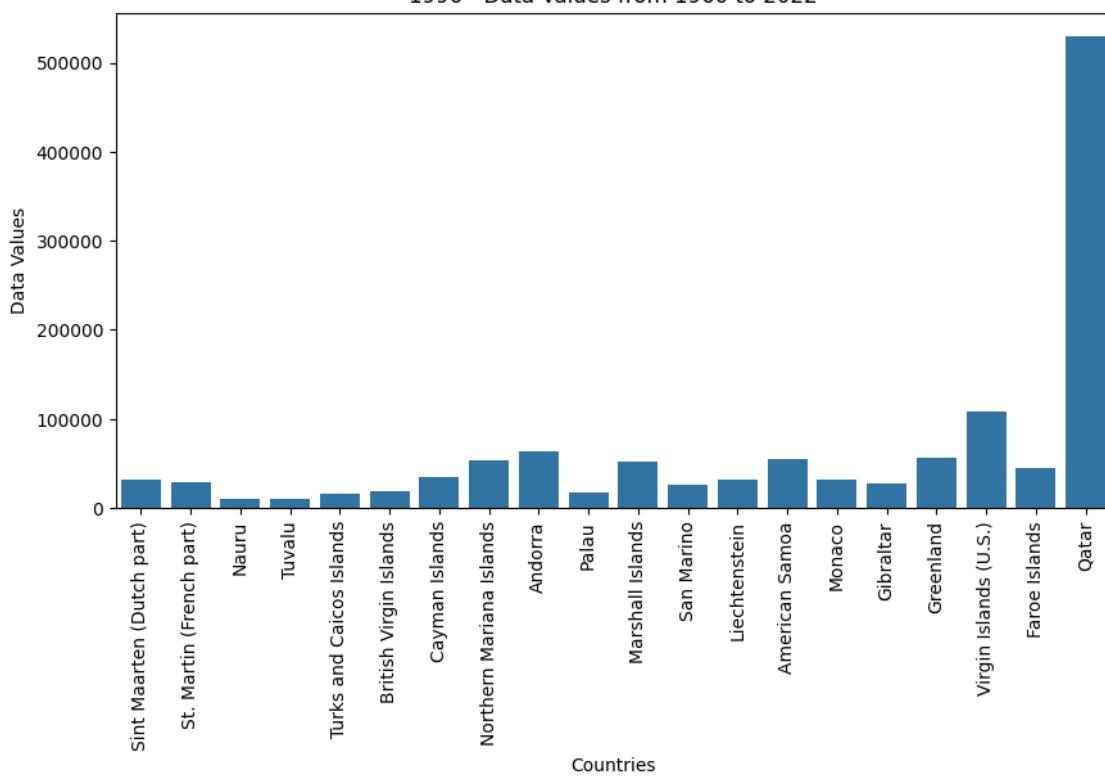


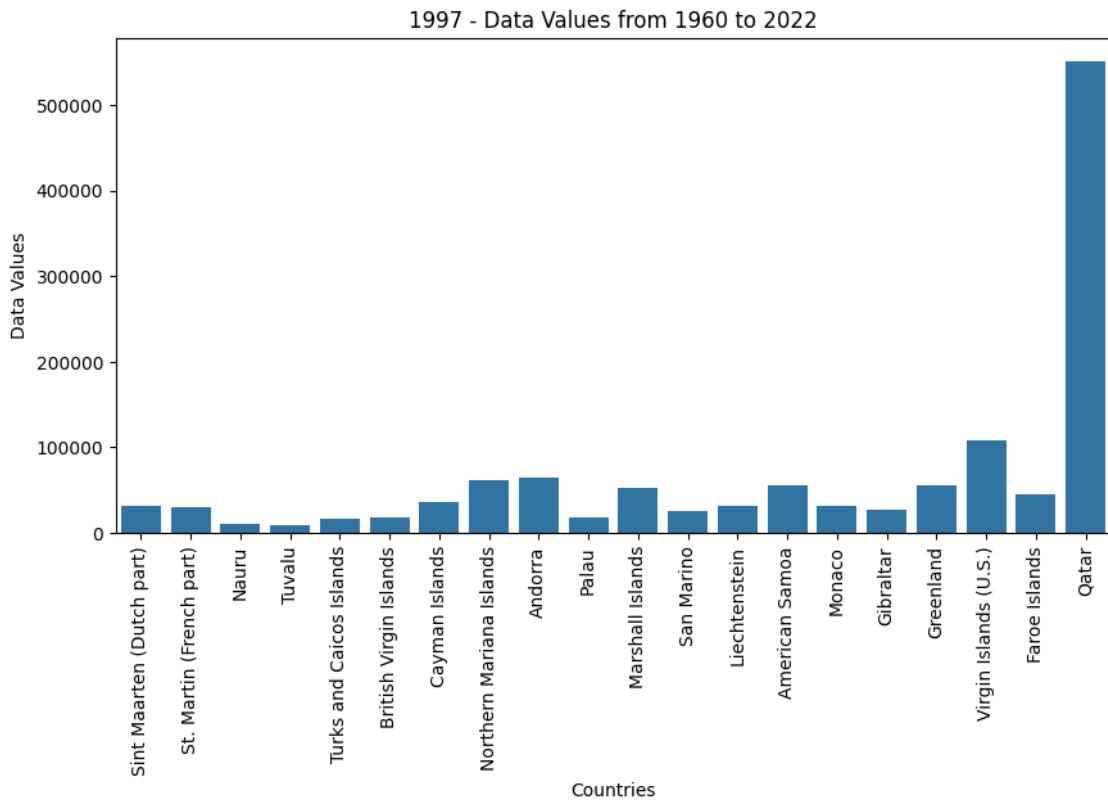
1994 - Data Values from 1960 to 2022

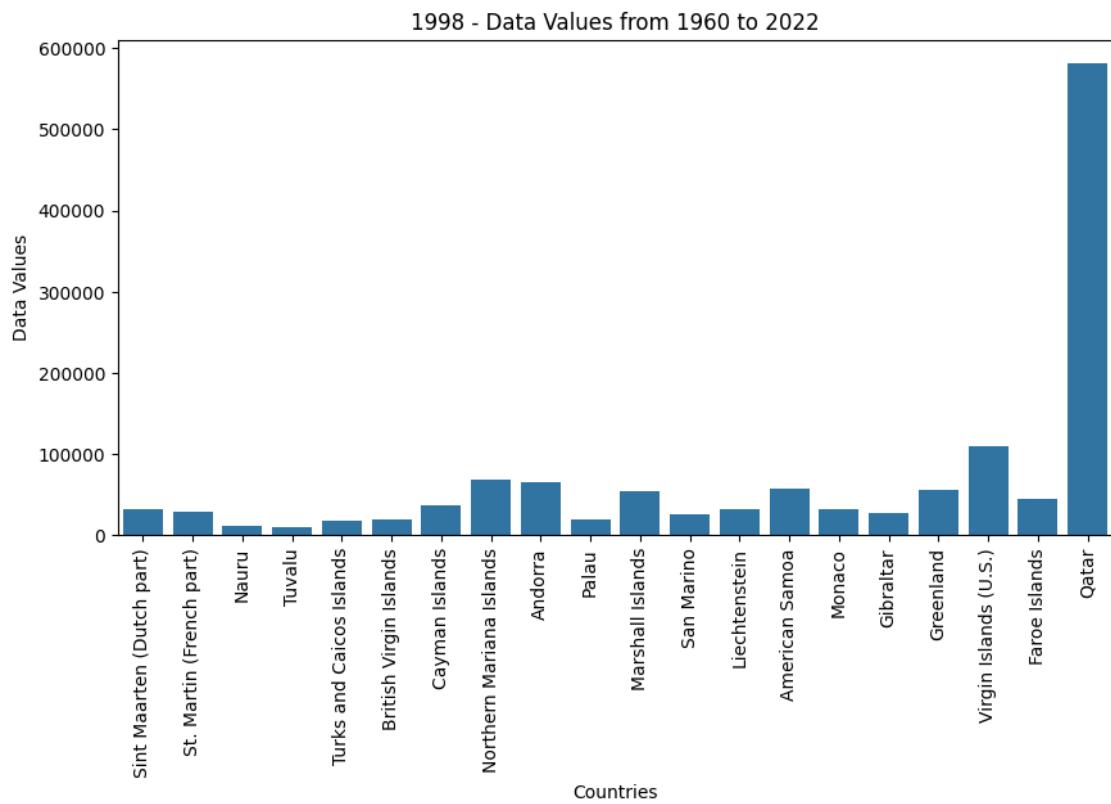




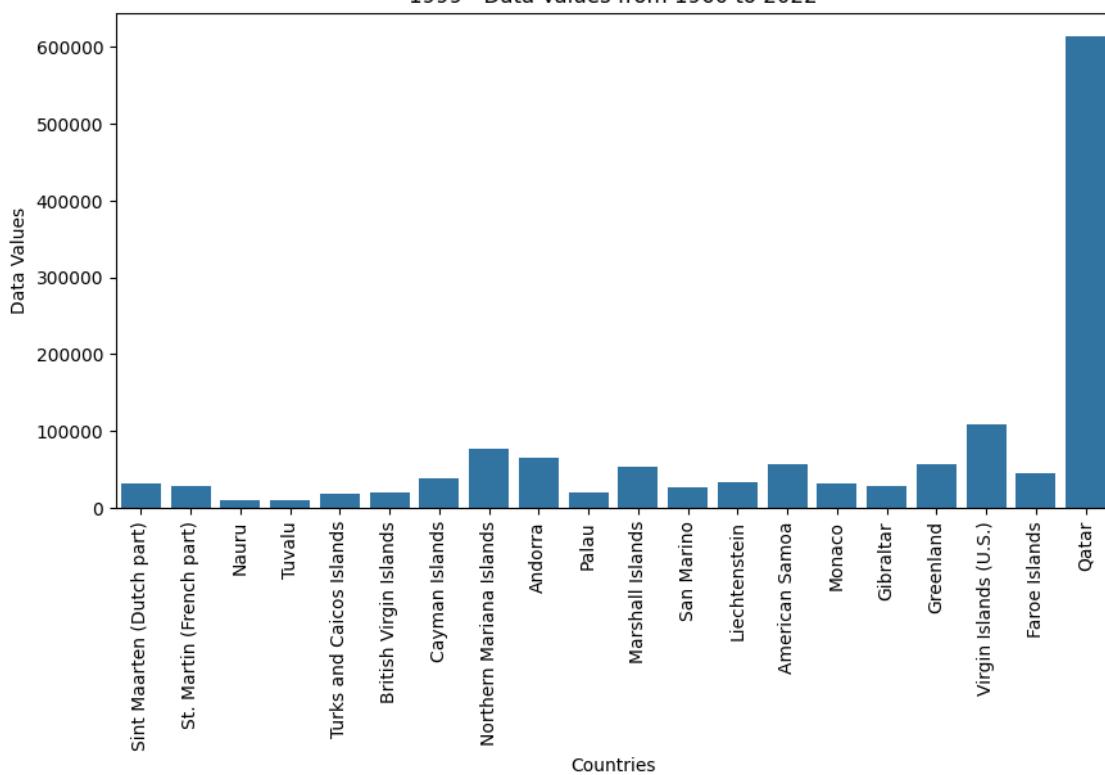
1996 - Data Values from 1960 to 2022



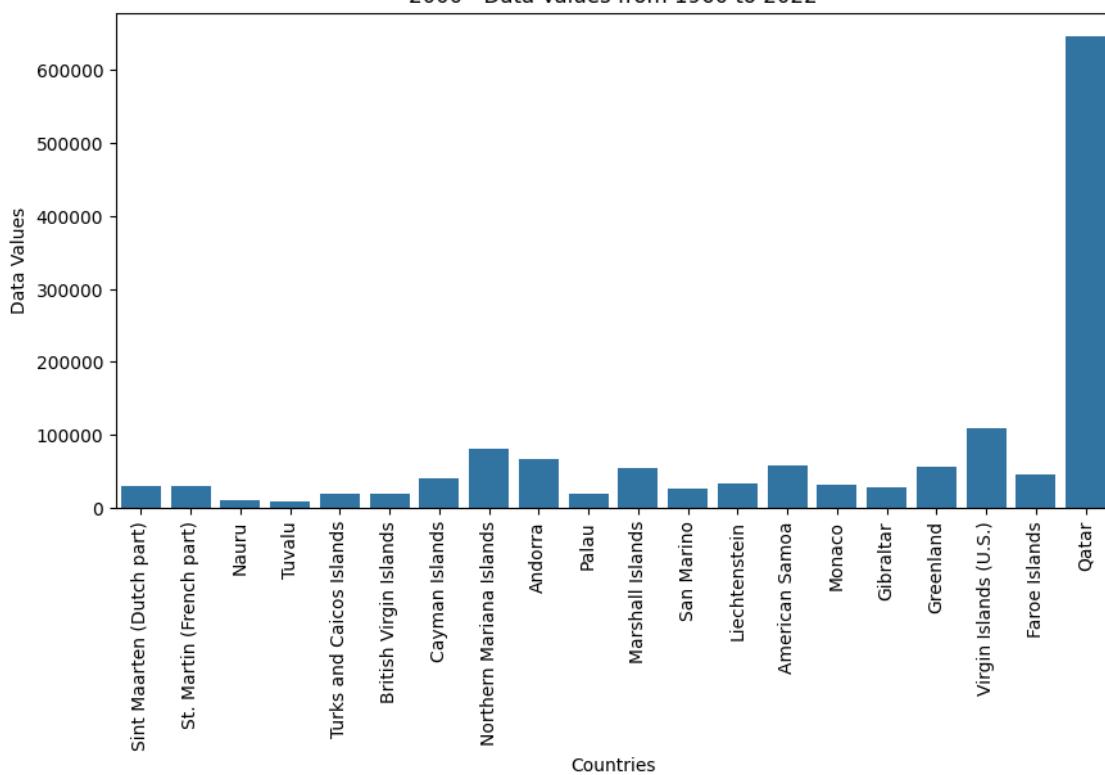


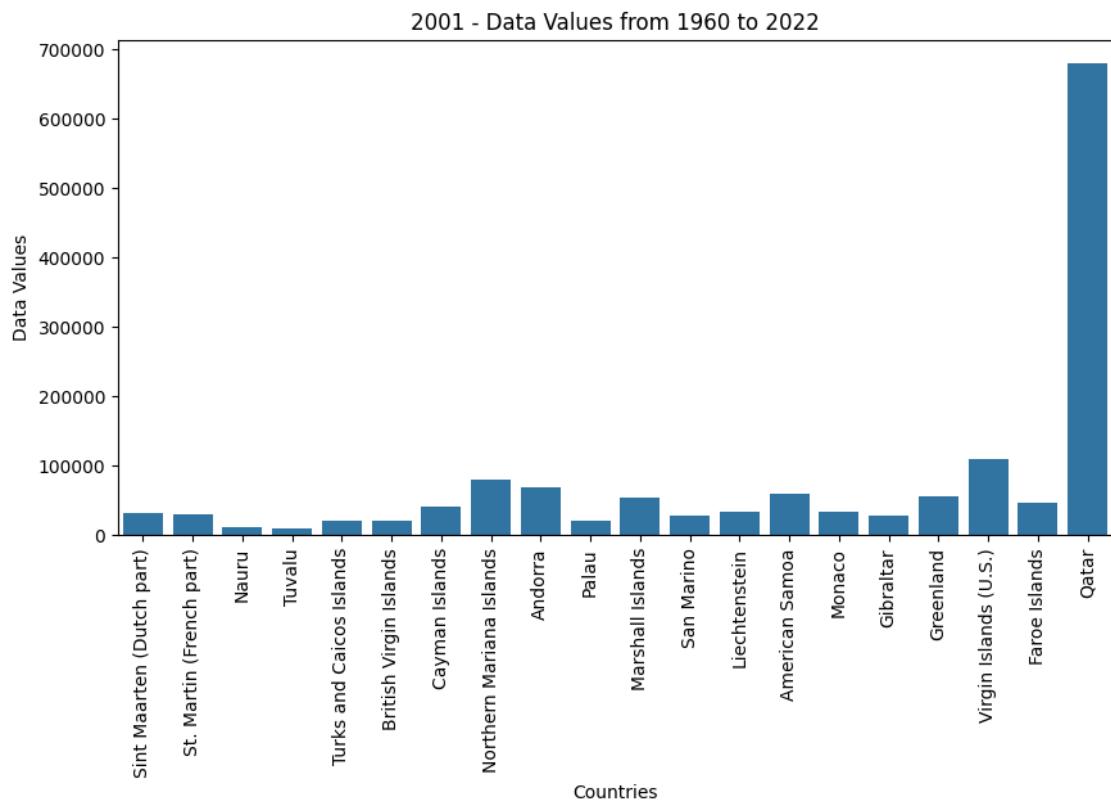


1999 - Data Values from 1960 to 2022

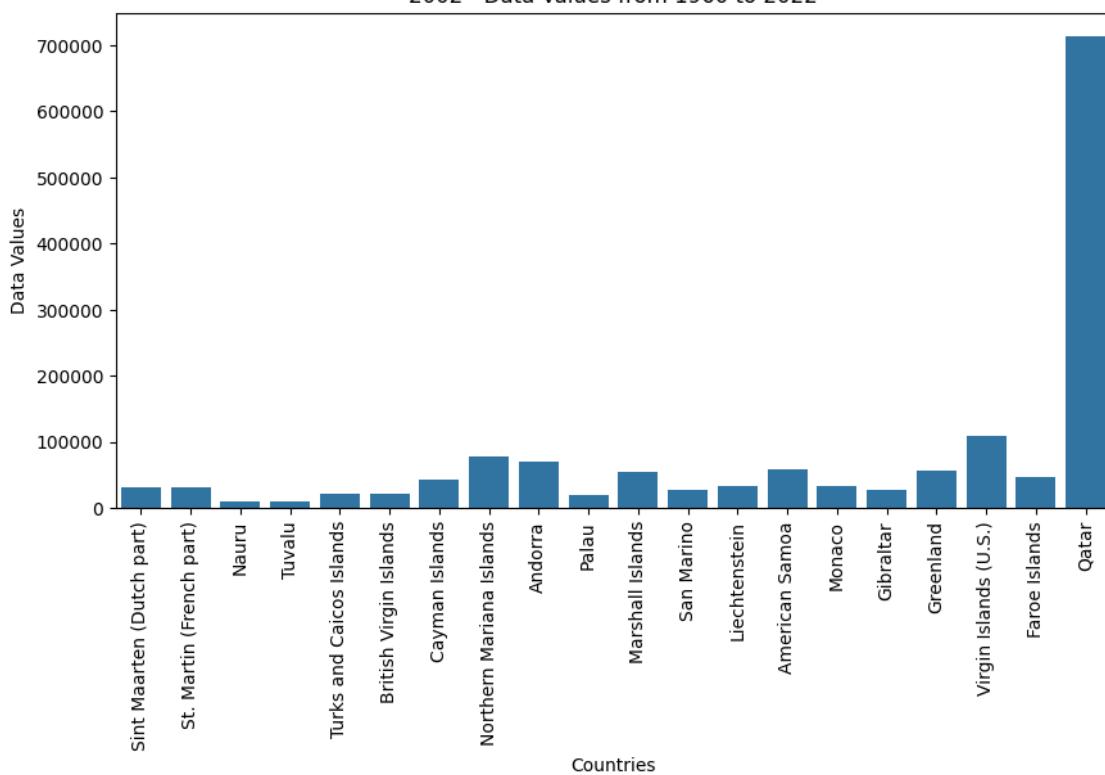


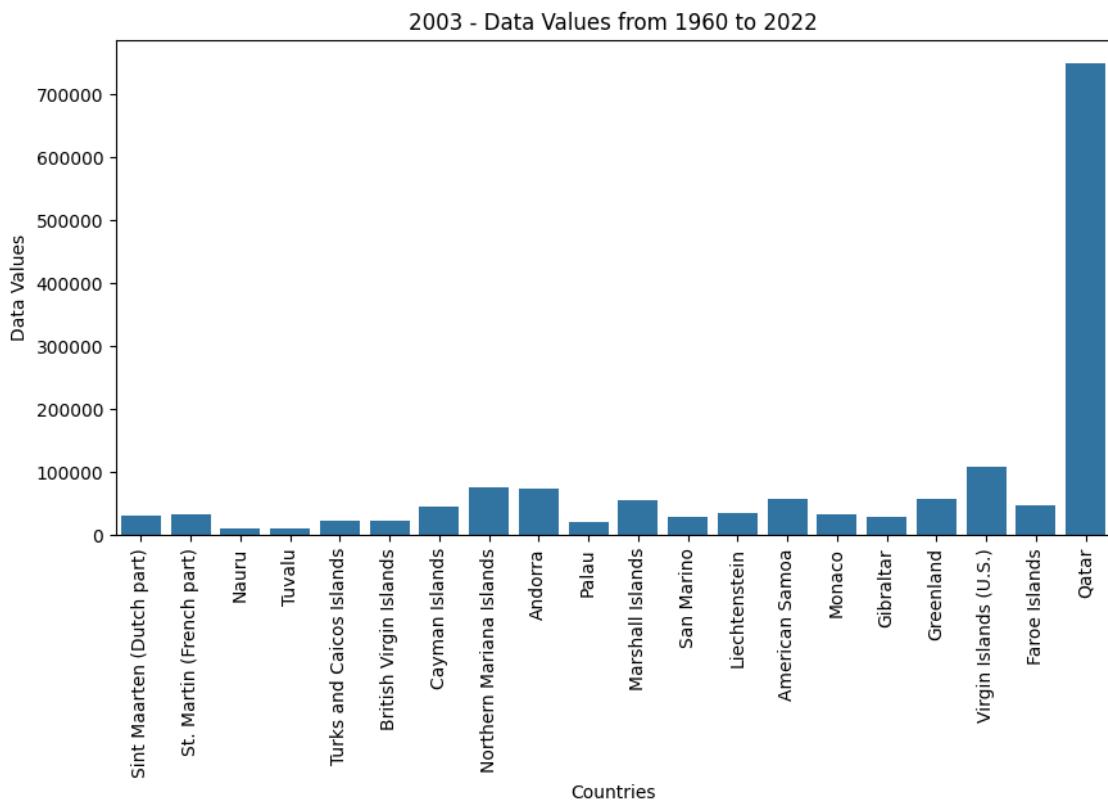
2000 - Data Values from 1960 to 2022



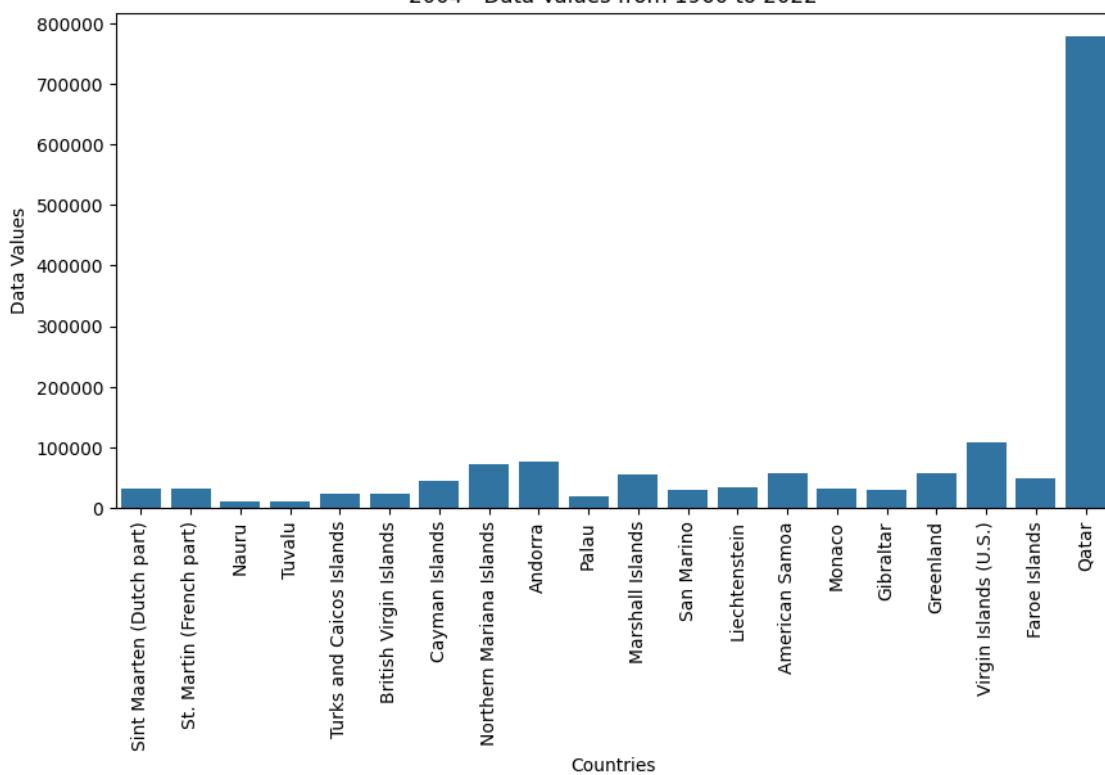


2002 - Data Values from 1960 to 2022

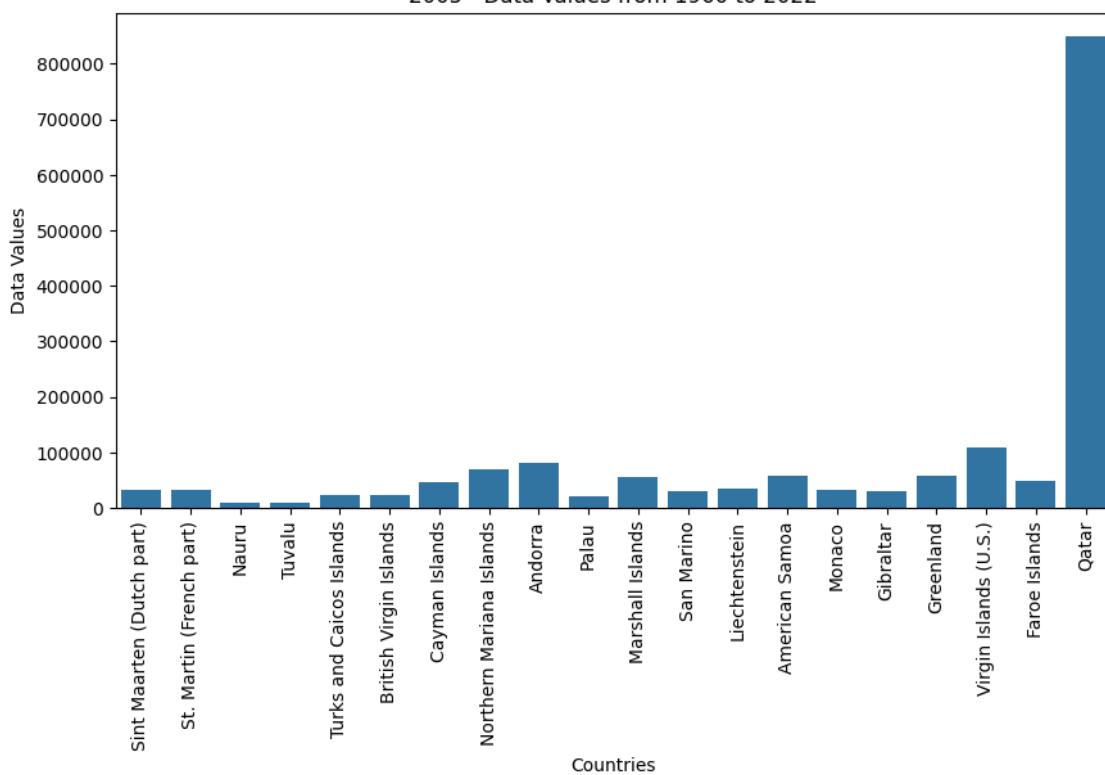


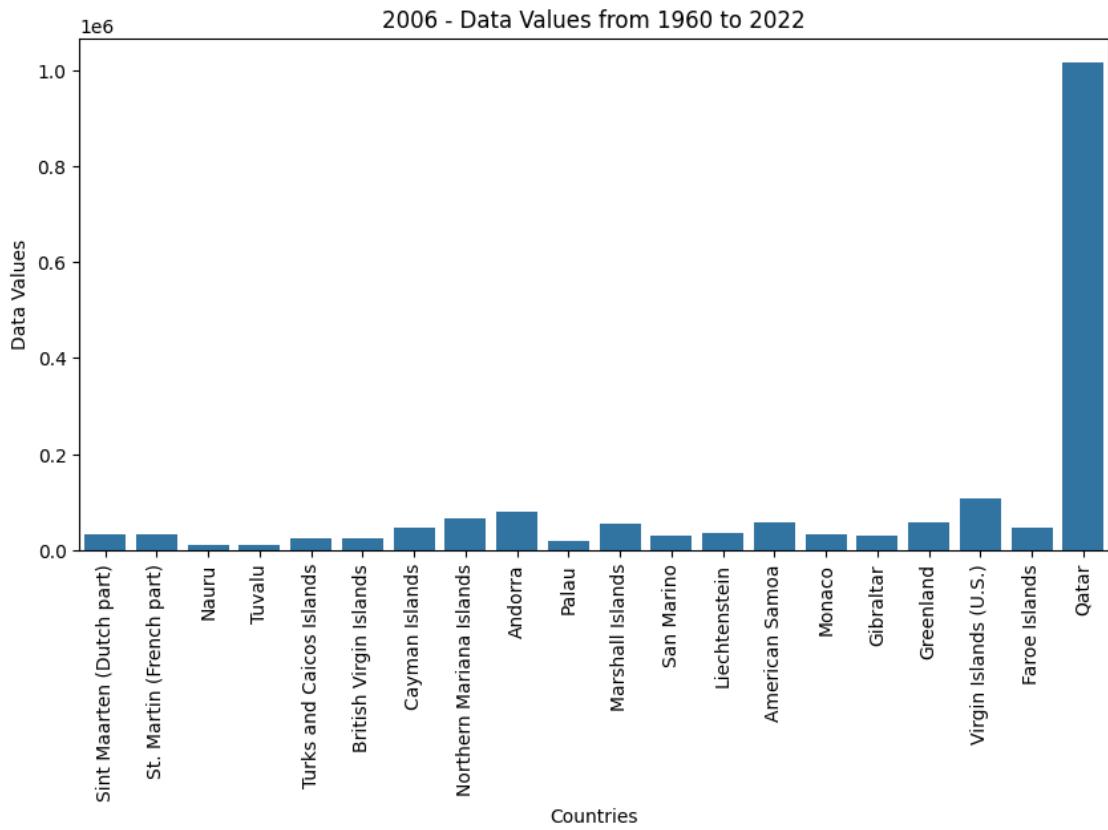


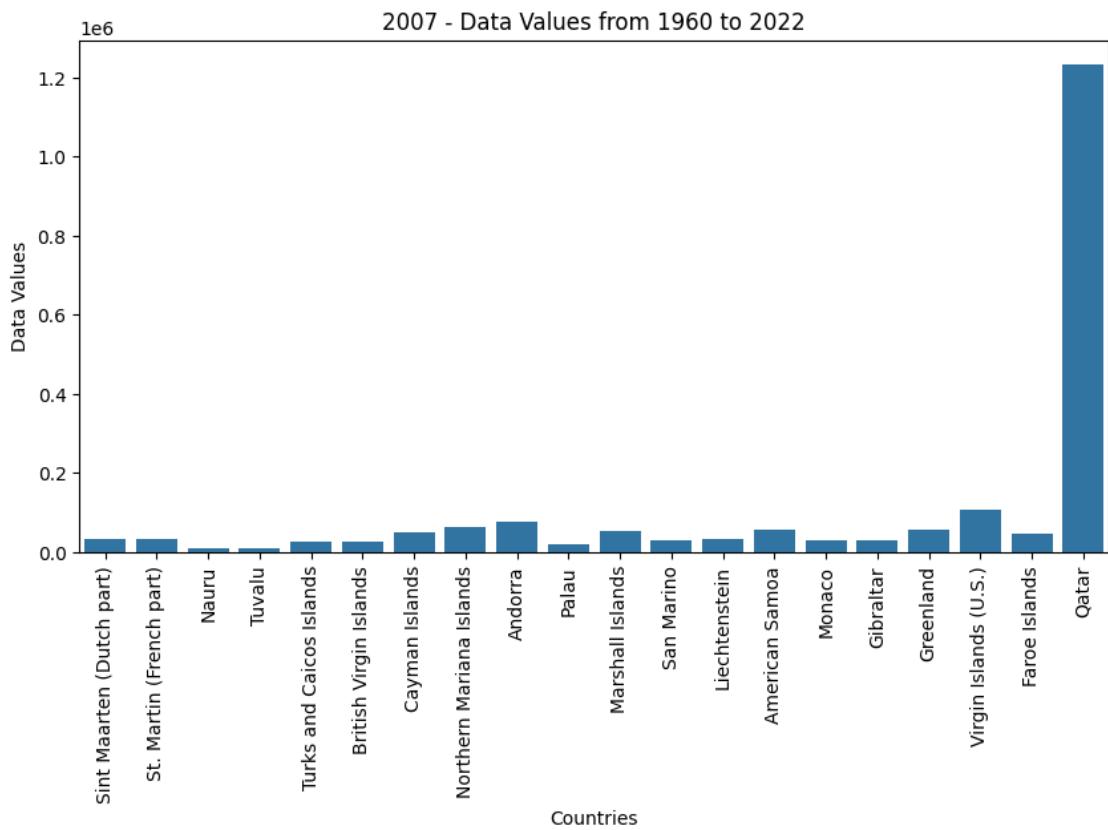
2004 - Data Values from 1960 to 2022

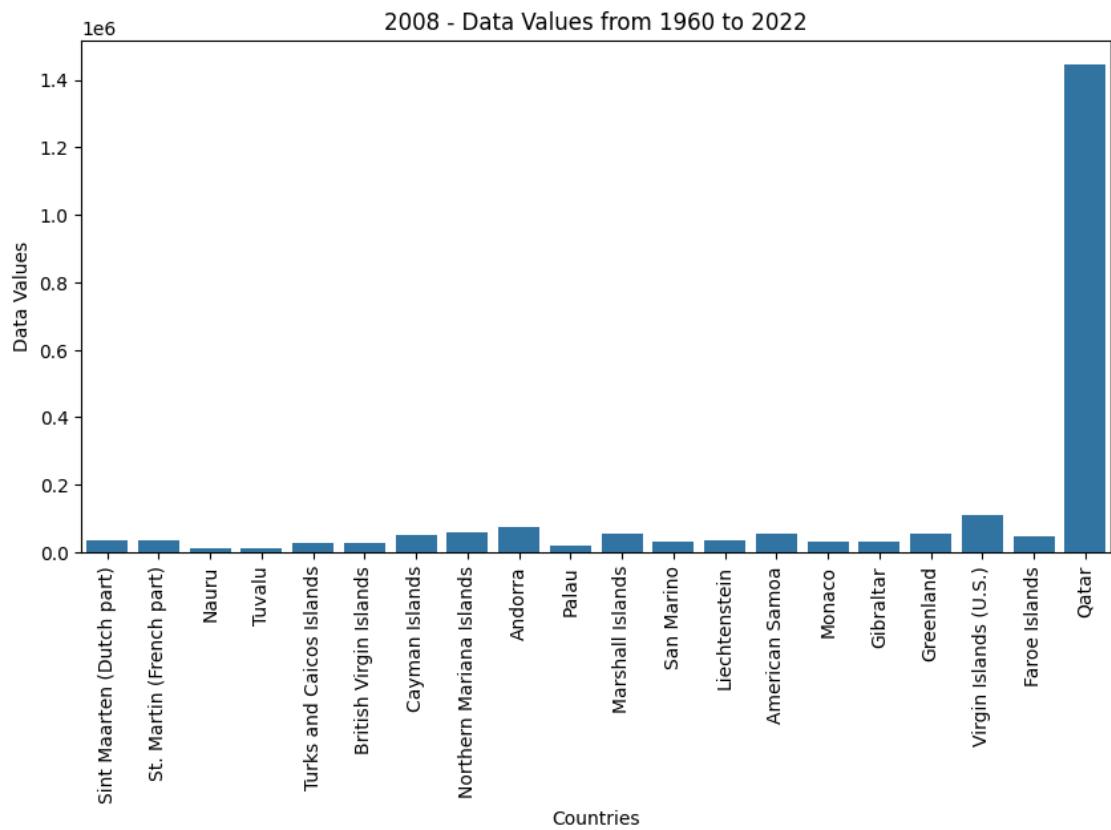


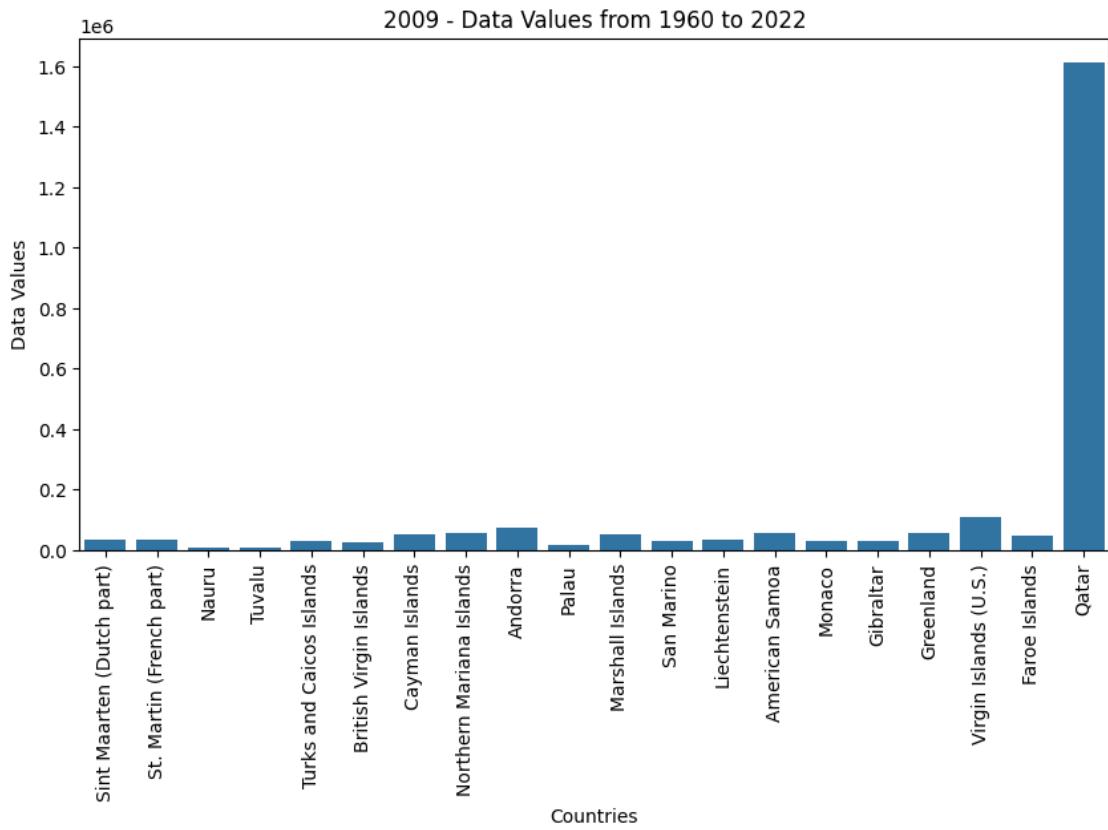
2005 - Data Values from 1960 to 2022

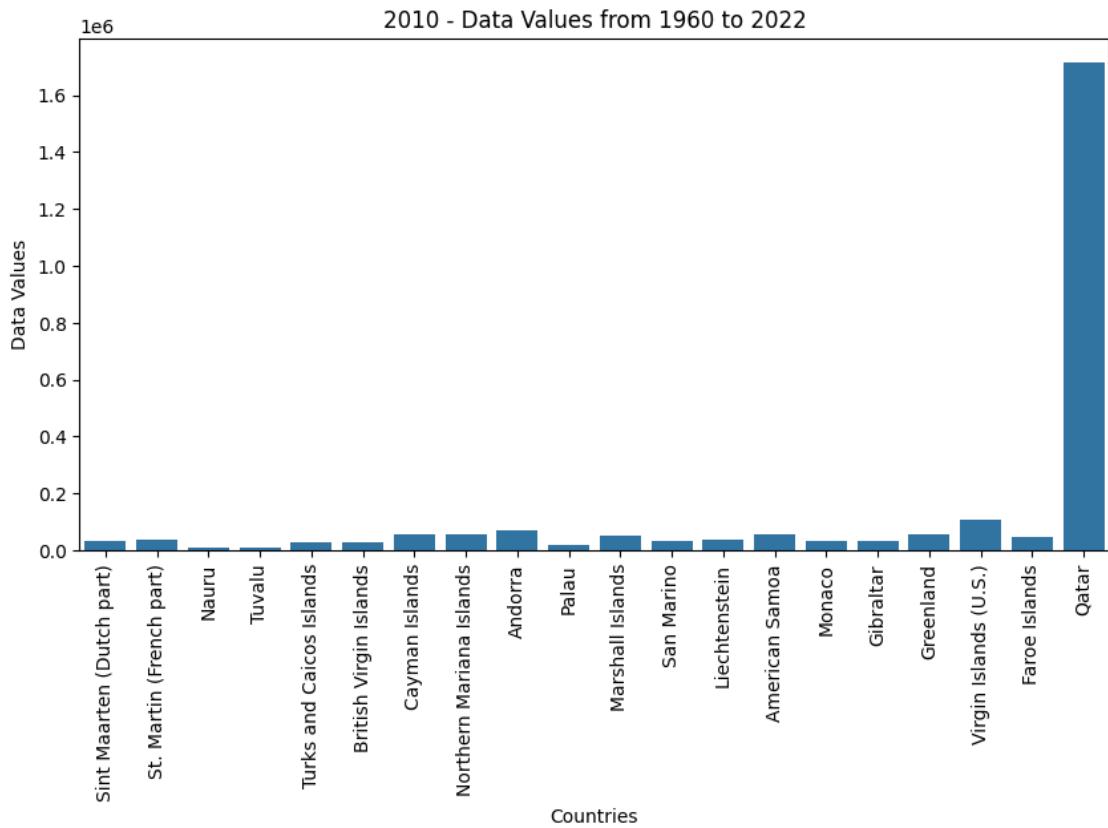


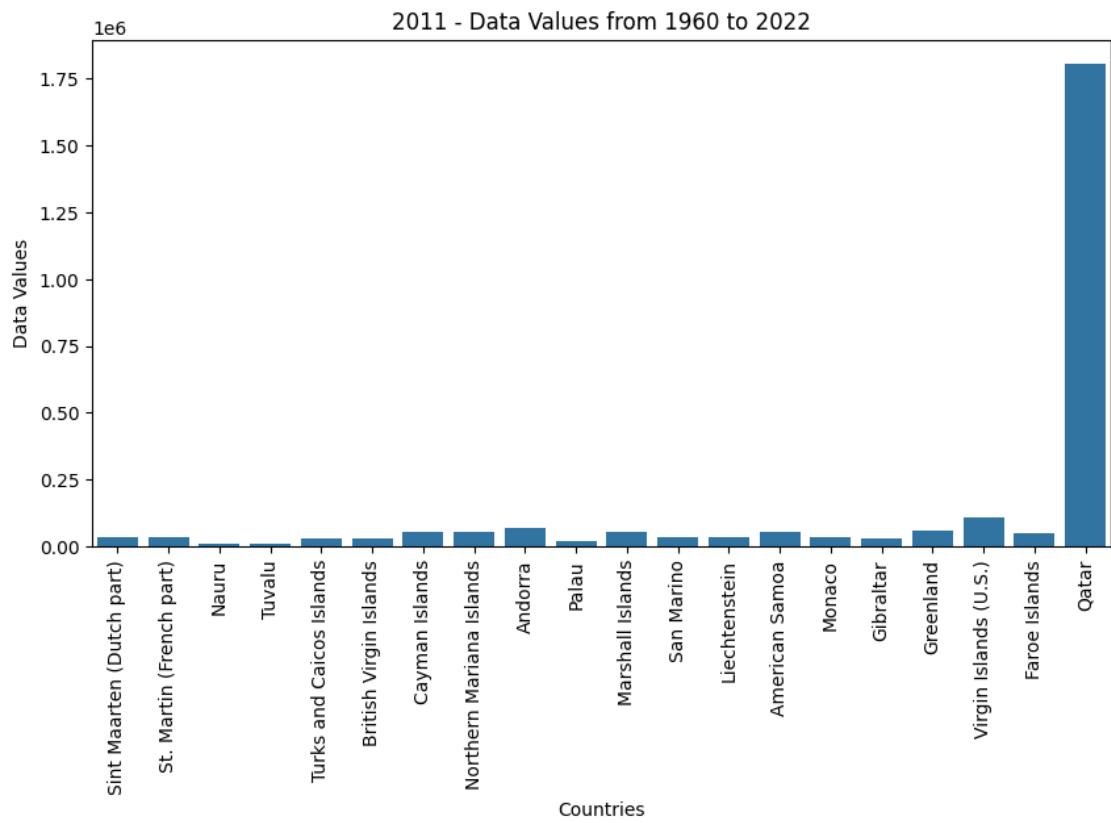


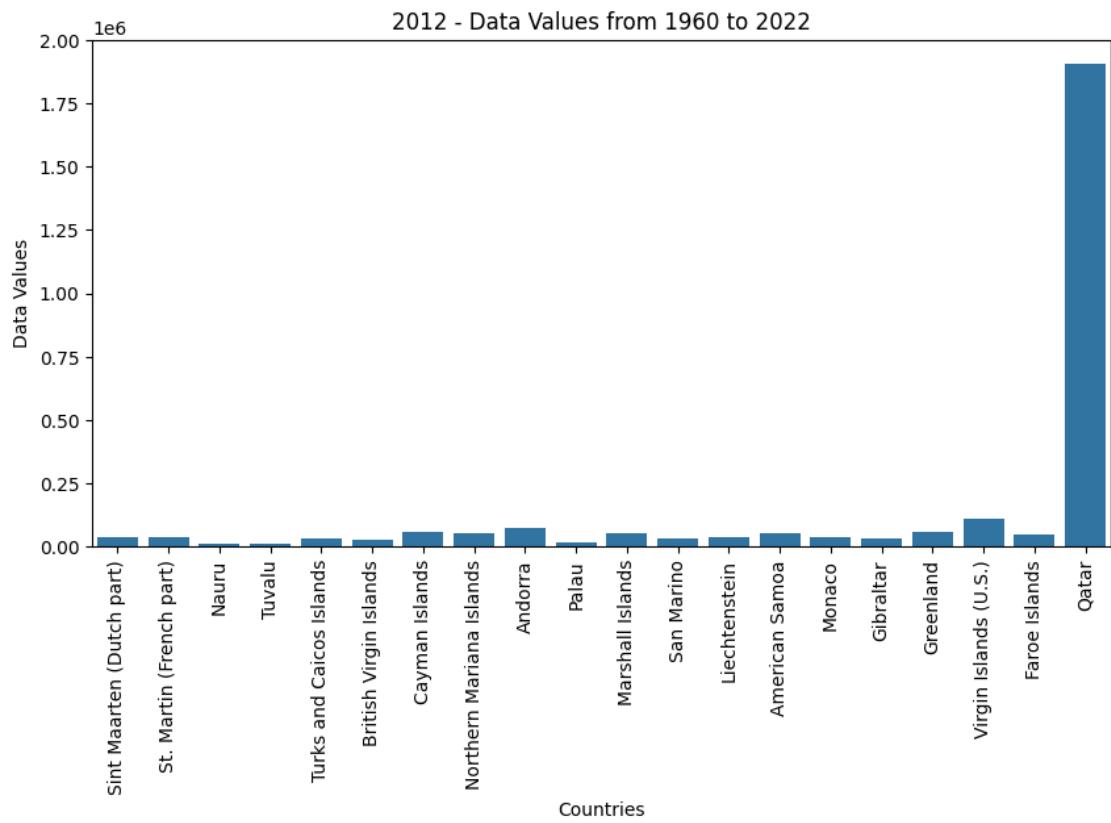


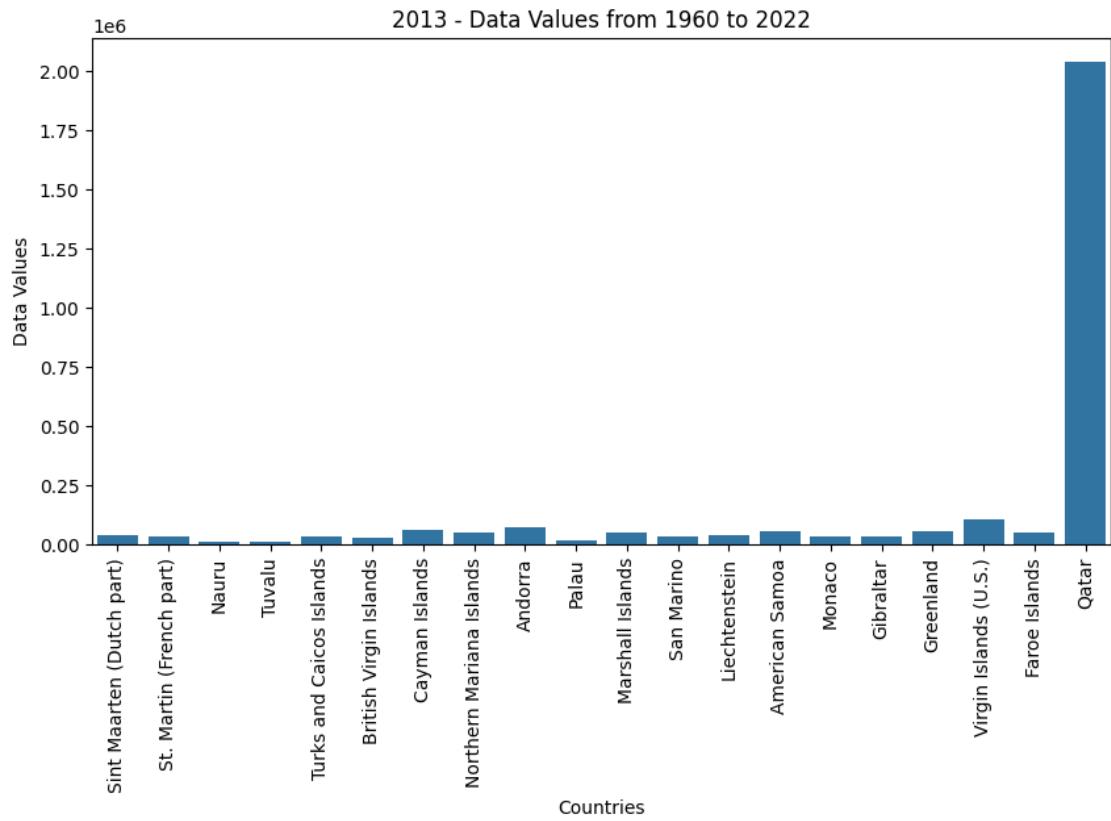


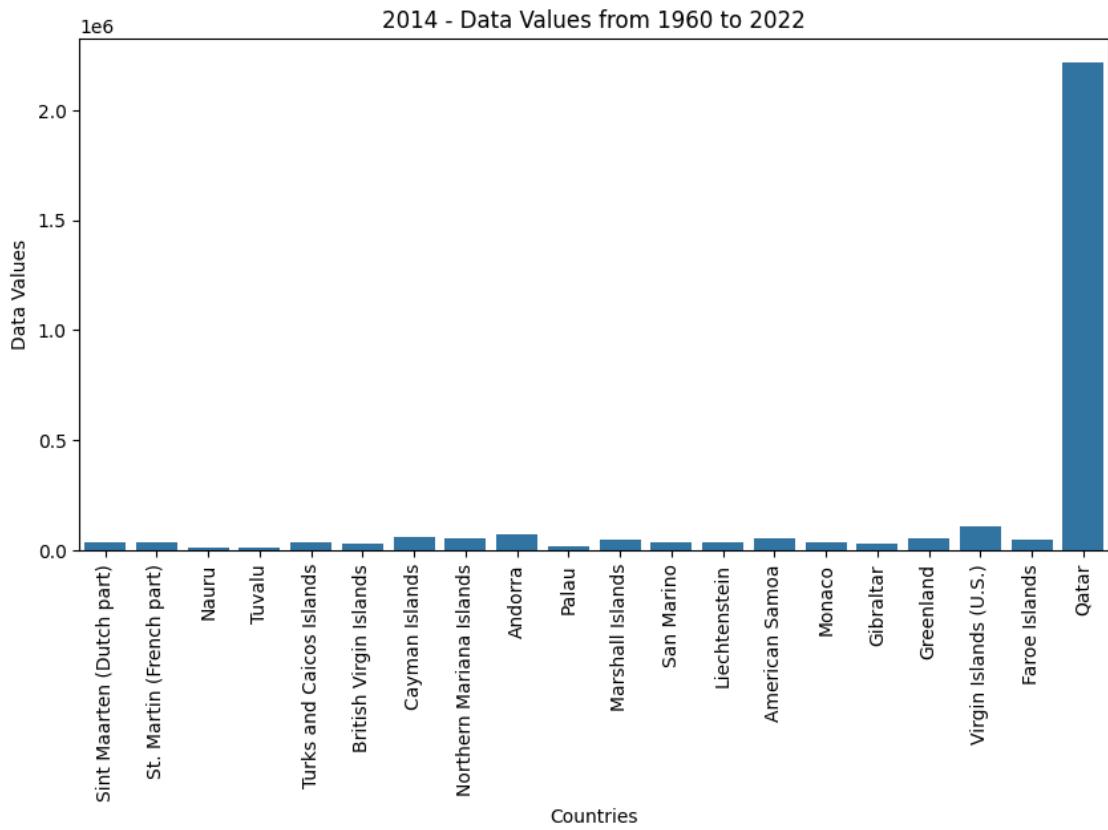


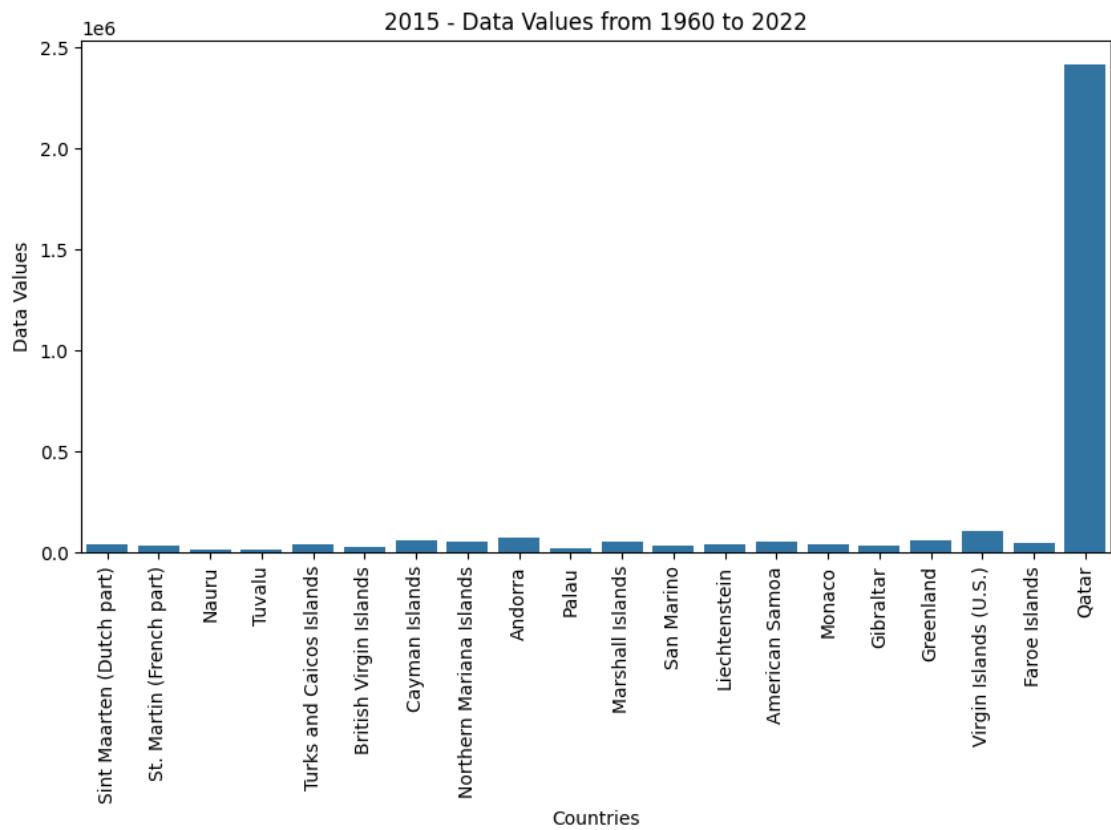


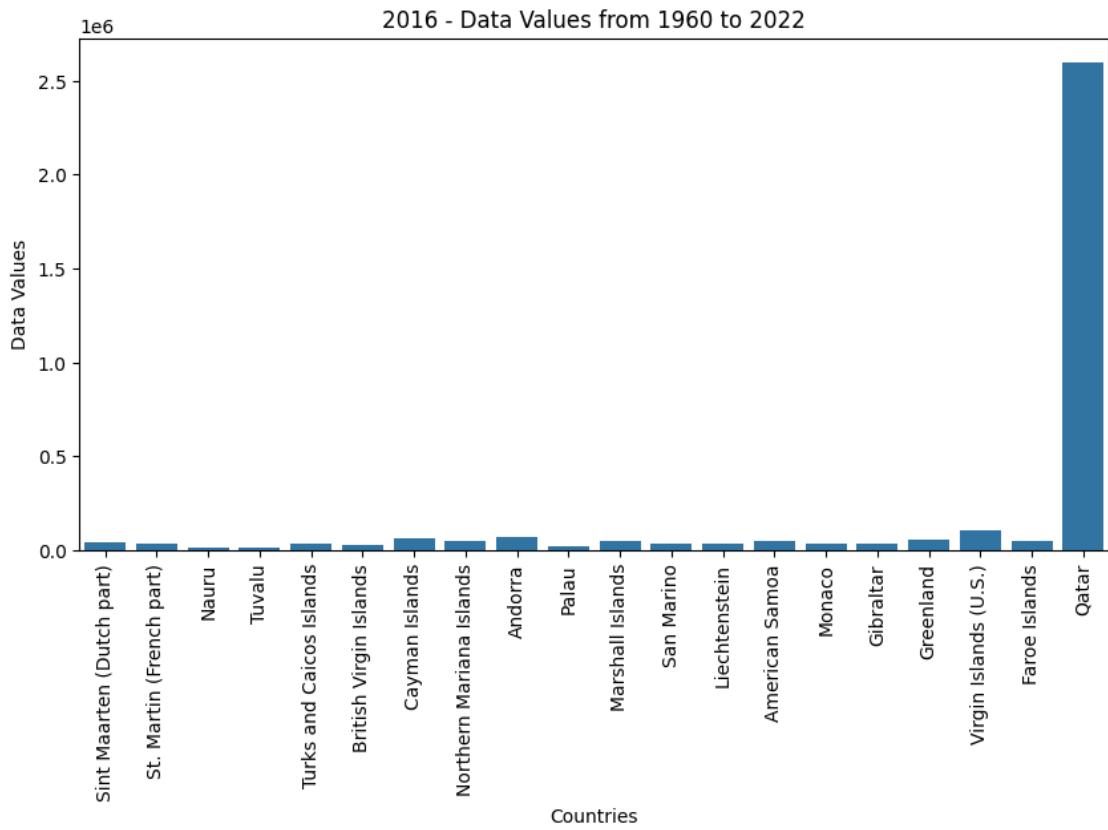


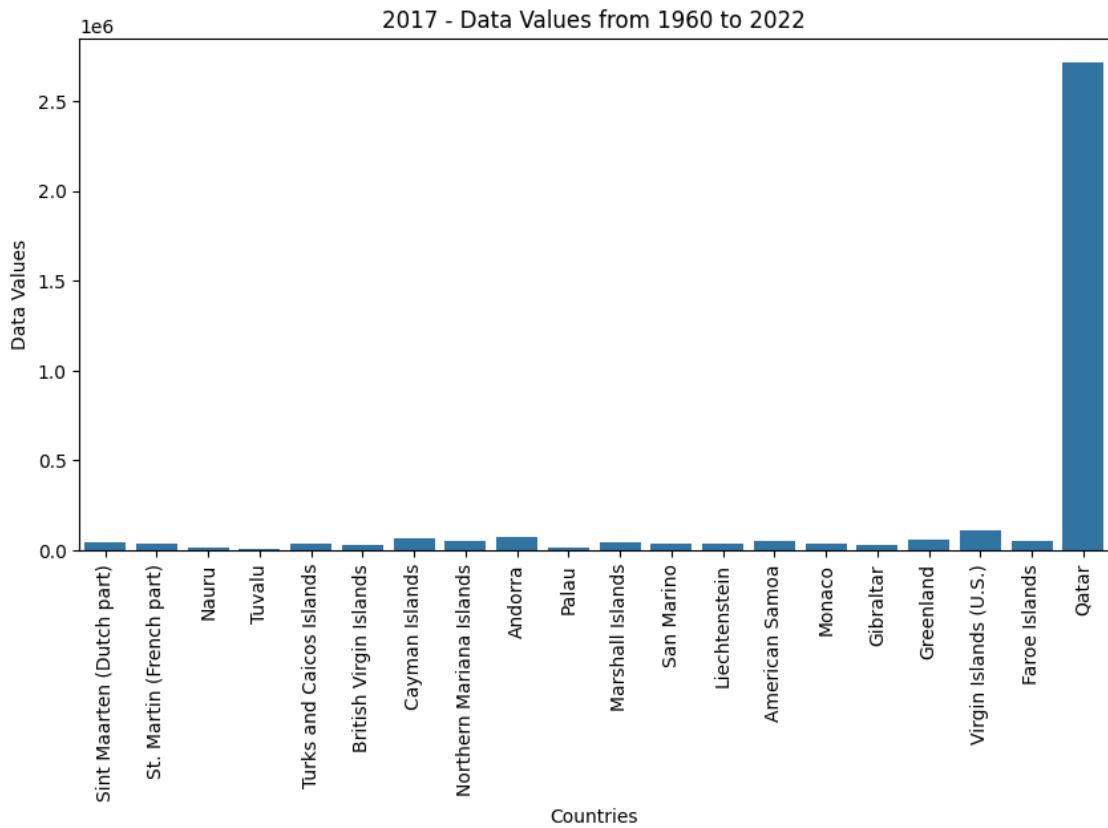


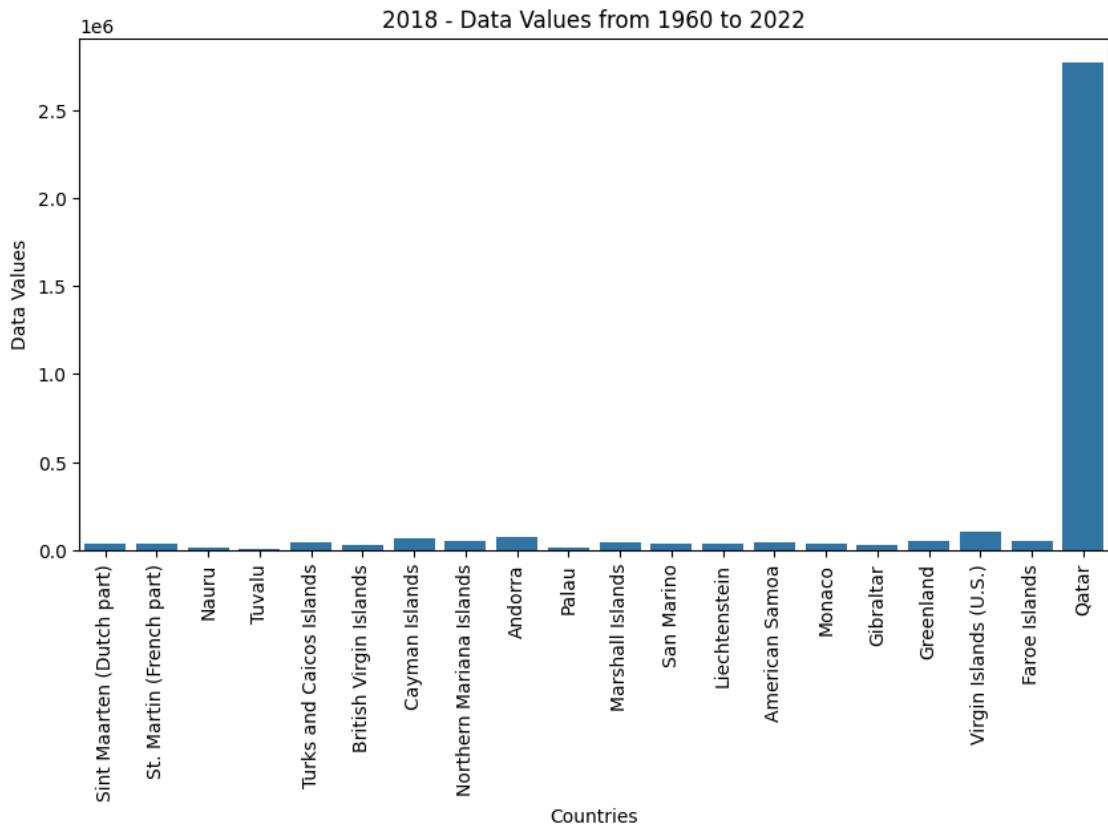


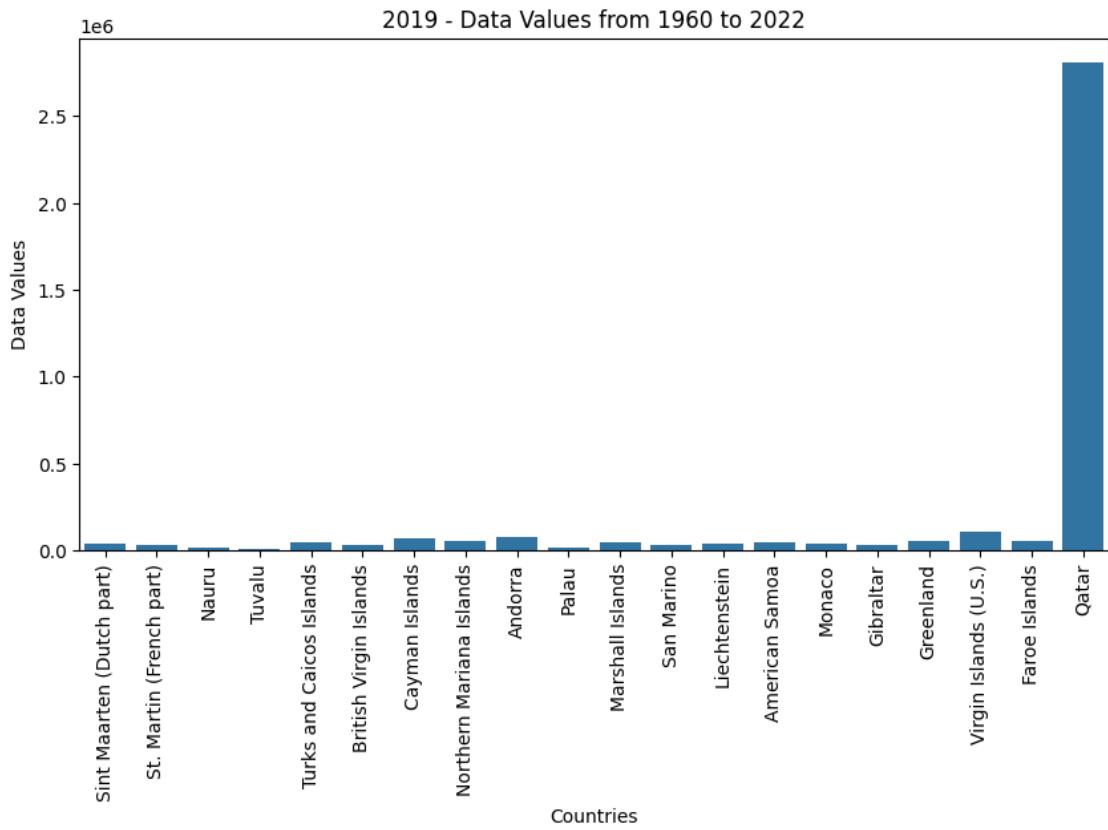


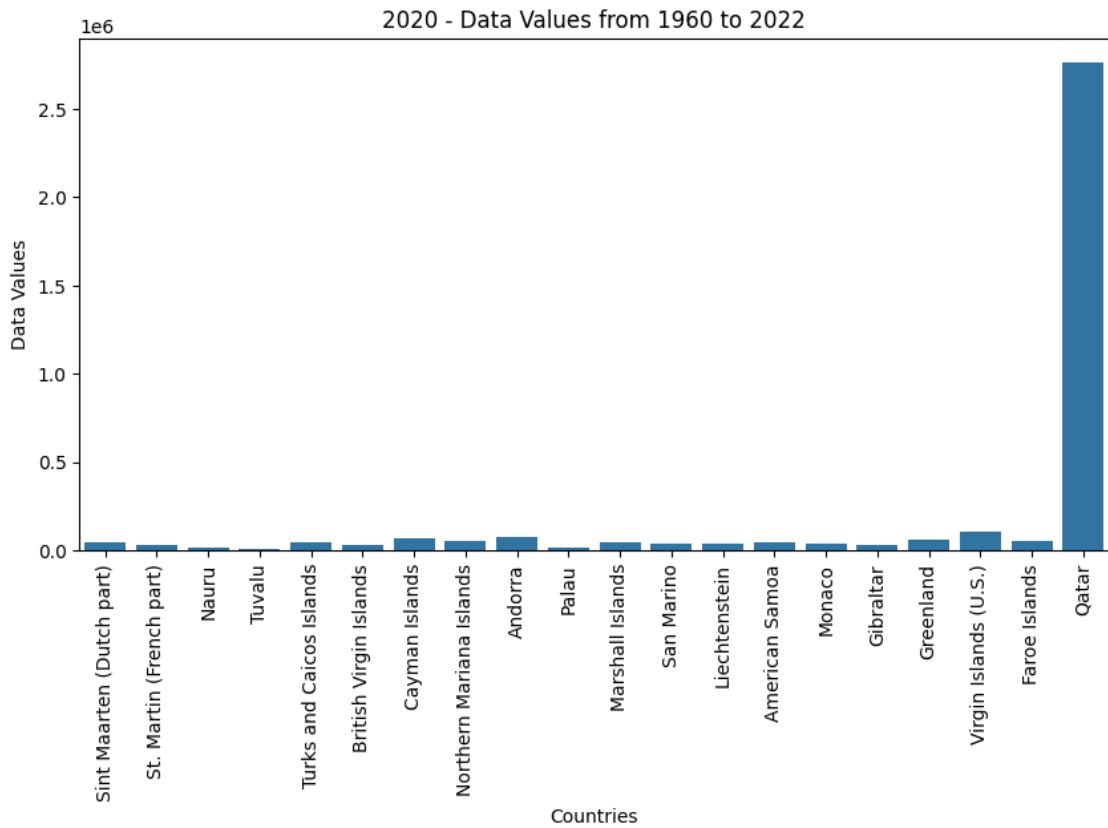


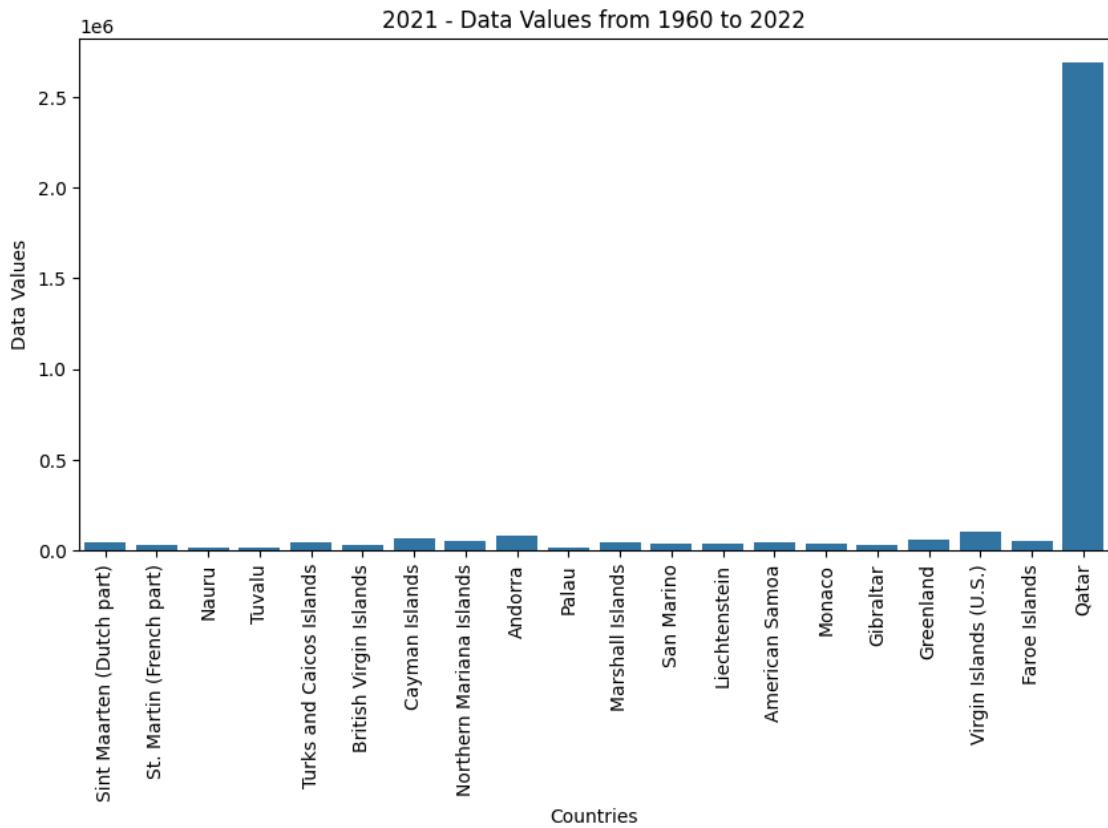


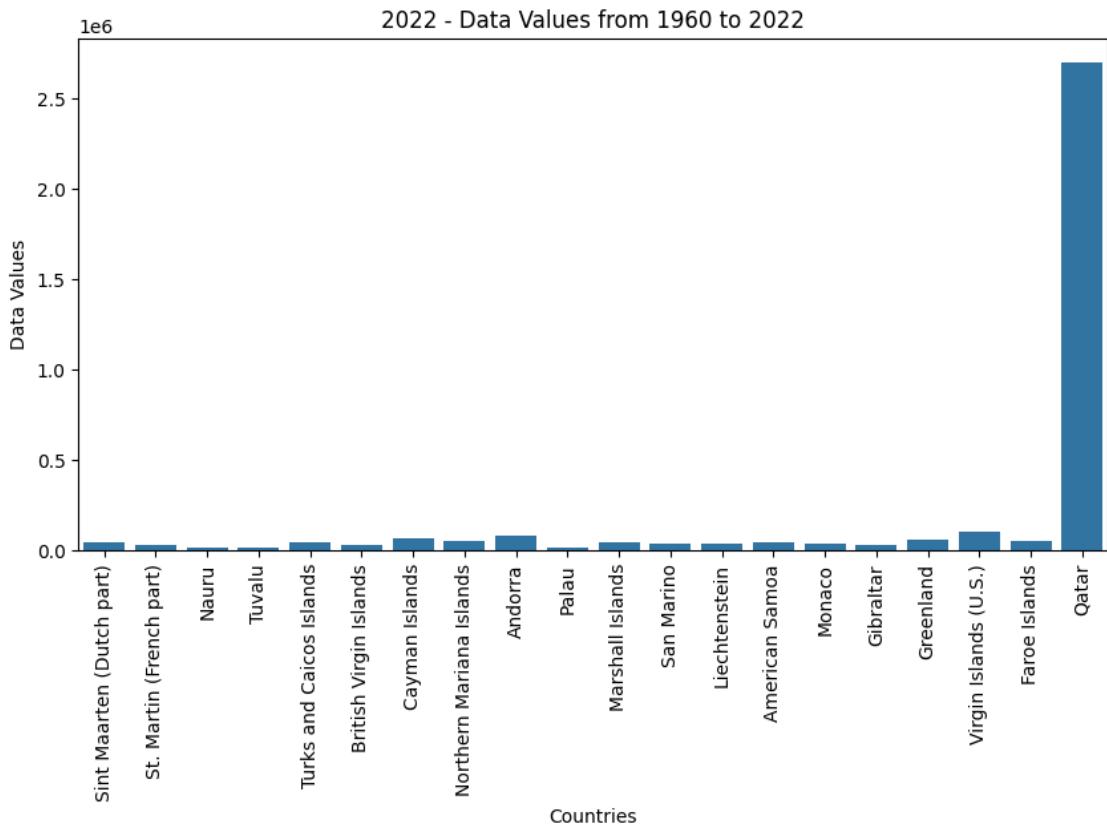












```
[28]: country_by_2022 = df.sort_values(by='2022').head(20)
country_by_2022
```

```
[28]:
```

	Country Name	1960	1961	1962	1963	1964	\
245	Tuvalu	5404.0	5436.0	5471.0	5503.0	5525.0	
179	Nauru	4582.0	4753.0	4950.0	5198.0	5484.0	
188	Palau	9446.0	9639.0	9851.0	10076.0	10318.0	
255	British Virgin Islands	7850.0	7885.0	7902.0	7919.0	7949.0	
147	St. Martin (French part)	4135.0	4258.0	4388.0	4524.0	4666.0	
84	Gibraltar	21822.0	21907.0	22249.0	22796.0	23347.0	
212	San Marino	15556.0	15895.0	16242.0	16583.0	16926.0	
149	Monaco	21797.0	21907.0	22106.0	22442.0	22766.0	
137	Liechtenstein	16472.0	16834.0	17221.0	17625.0	18058.0	
155	Marshall Islands	15374.0	15867.0	16387.0	16947.0	17537.0	
225	Sint Maarten (Dutch part)	2646.0	2888.0	3171.0	3481.0	3811.0	
11	American Samoa	20085.0	20626.0	21272.0	21949.0	22656.0	
228	Turks and Caicos Islands	5604.0	5625.0	5633.0	5634.0	5642.0	
125	St. Kitts and Nevis	56660.0	56247.0	55404.0	54391.0	53255.0	
164	Northern Mariana Islands	8702.0	8965.0	9252.0	9561.0	9890.0	
78	Faroe Islands	34154.0	34572.0	34963.0	35385.0	35841.0	
91	Greenland	32500.0	33700.0	35000.0	36400.0	37600.0	

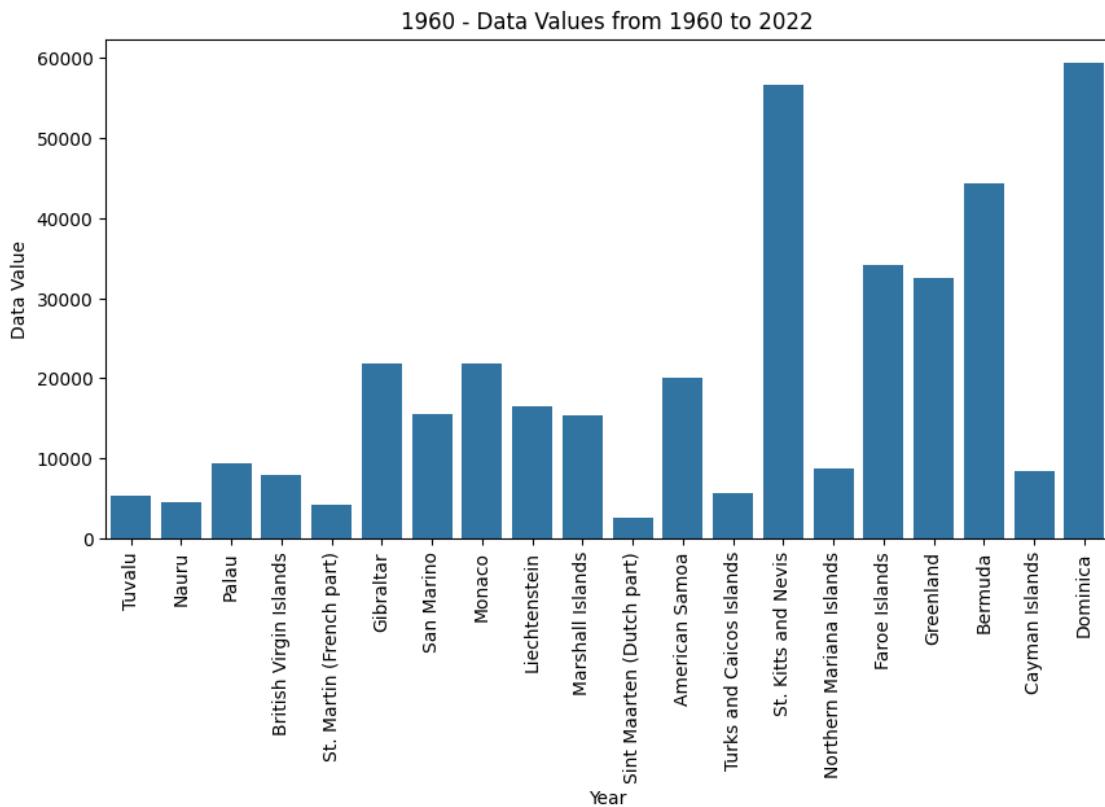
27	Bermuda	44400.0	45500.0	46600.0	47700.0	48900.0
52	Cayman Islands	8473.0	8626.0	8799.0	8985.0	9172.0
57	Dominica	59379.0	60395.0	61224.0	62031.0	62843.0

	1965	1966	1967	1968	...	2013	2014	2015	\
245	5548.0	5591.0	5657.0	5729.0	...	10918.0	10899.0	10877.0	
179	5804.0	6021.0	6114.0	6288.0	...	10694.0	10940.0	11185.0	
188	10563.0	10813.0	10992.0	11079.0	...	17805.0	17796.0	17794.0	
255	8018.0	8139.0	8337.0	8649.0	...	28657.0	28971.0	29366.0	
147	4832.0	5044.0	5294.0	5497.0	...	35639.0	35261.0	35020.0	
84	23910.0	24477.0	25047.0	25610.0	...	32411.0	32452.0	32520.0	
212	17273.0	17588.0	17907.0	18291.0	...	33285.0	33389.0	33570.0	
149	23022.0	23198.0	23281.0	23481.0	...	35425.0	36110.0	36760.0	
137	18500.0	18957.0	19467.0	20011.0	...	36806.0	37096.0	37355.0	
155	18154.0	18794.0	19665.0	21001.0	...	51352.0	50419.0	49410.0	
225	4161.0	4531.0	4930.0	5354.0	...	36607.0	37685.0	38825.0	
11	23391.0	24122.0	24848.0	25608.0	...	52995.0	52217.0	51368.0	
228	5650.0	5652.0	5662.0	5668.0	...	33594.0	34985.0	36538.0	
125	52016.0	50683.0	49269.0	47772.0	...	47767.0	47789.0	47790.0	
164	10229.0	10577.0	10720.0	10440.0	...	52141.0	51856.0	51514.0	
78	36346.0	36825.0	37234.0	37630.0	...	48418.0	48465.0	48816.0	
91	39200.0	40500.0	41900.0	43400.0	...	56483.0	56295.0	56114.0	
27	50100.0	51000.0	52000.0	53000.0	...	65001.0	65138.0	65237.0	
52	9366.0	9566.0	9771.0	9981.0	...	58212.0	59559.0	60911.0	
57	63744.0	64728.0	65760.0	66865.0	...	68819.0	69371.0	70007.0	

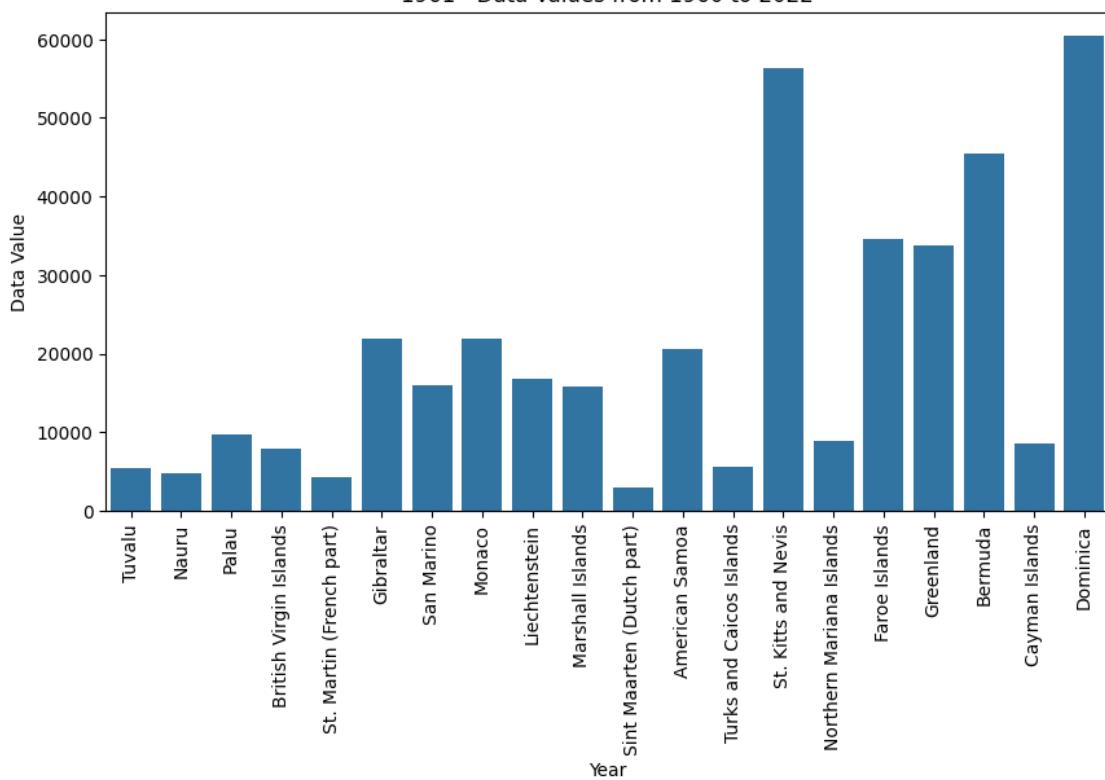
	2016	2017	2018	2019	2020	2021	2022
245	10852.0	10828.0	10865.0	10956.0	11069.0	11204.0	11312.0
179	11437.0	11682.0	11924.0	12132.0	12315.0	12511.0	12668.0
188	17816.0	17837.0	17864.0	17916.0	17972.0	18024.0	18055.0
255	29739.0	30060.0	30335.0	30610.0	30910.0	31122.0	31305.0
147	34811.0	34496.0	33852.0	33121.0	32553.0	31948.0	31791.0
84	32565.0	32602.0	32648.0	32685.0	32709.0	32669.0	32649.0
212	33834.0	34056.0	34156.0	34178.0	34007.0	33745.0	33660.0
149	37071.0	37044.0	37029.0	37034.0	36922.0	36686.0	36469.0
137	37609.0	37889.0	38181.0	38482.0	38756.0	39039.0	39327.0
155	48329.0	47187.0	45989.0	44728.0	43413.0	42050.0	41569.0
225	39969.0	40574.0	40895.0	41608.0	42310.0	42846.0	43389.0
11	50448.0	49463.0	48424.0	47321.0	46189.0	45035.0	44273.0
228	38246.0	39844.0	41487.0	43080.0	44276.0	45114.0	45703.0
125	47788.0	47785.0	47761.0	47712.0	47642.0	47606.0	47657.0
164	51133.0	50729.0	50304.0	49858.0	49587.0	49481.0	49551.0
78	49500.0	50230.0	50955.0	51681.0	52415.0	52889.0	53090.0
91	56186.0	56172.0	56023.0	56225.0	56367.0	56653.0	56661.0
27	64554.0	63873.0	63918.0	63911.0	63893.0	63764.0	63532.0
52	62255.0	63581.0	64884.0	66134.0	67311.0	68136.0	68706.0
57	70075.0	70403.0	70823.0	71428.0	71995.0	72412.0	72737.0

[20 rows x 64 columns]

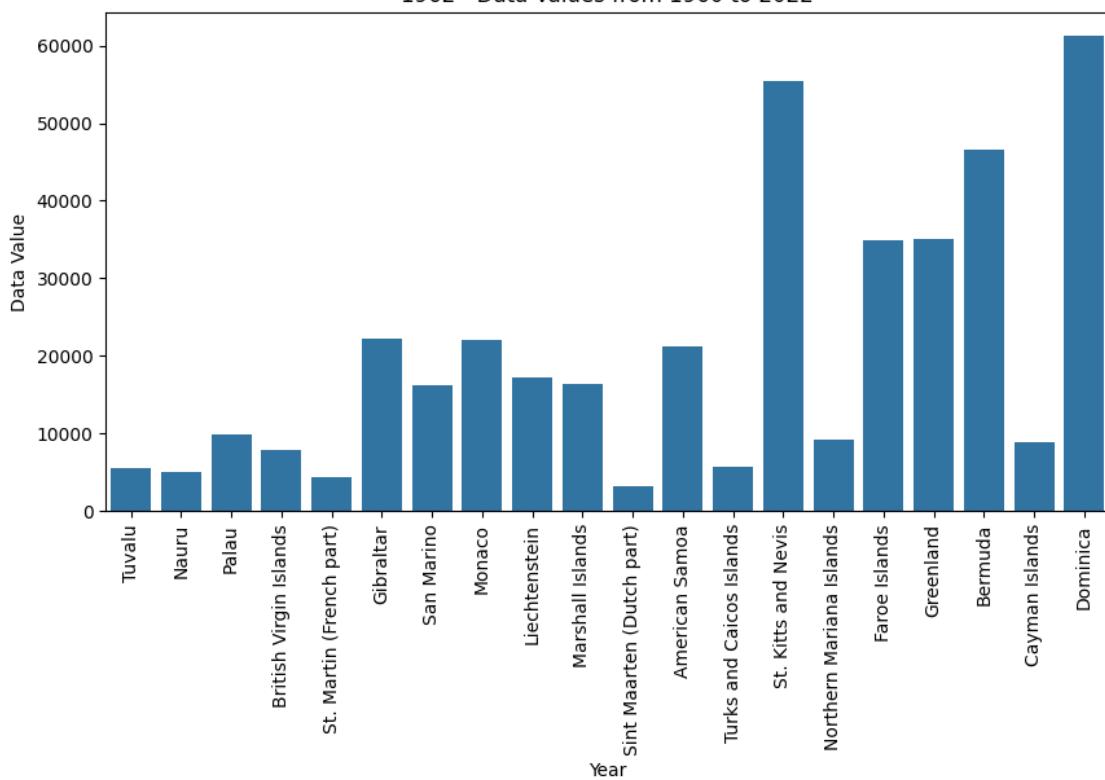
```
[30]: country_by_2022_t = country_by_2022.set_index('Country Name').T
for country_name, data_values in country_by_2022_t.iterrows():
    fig = plt.figure(figsize=(10, 5))
    sns.barplot(x=data_values.index, y=data_values.values)
    plt.xlabel('Year')
    plt.ylabel('Data Value')
    plt.title(f"{country_name} - Data Values from 1960 to 2022")
    plt.xticks(rotation=90)
    plt.show()
```



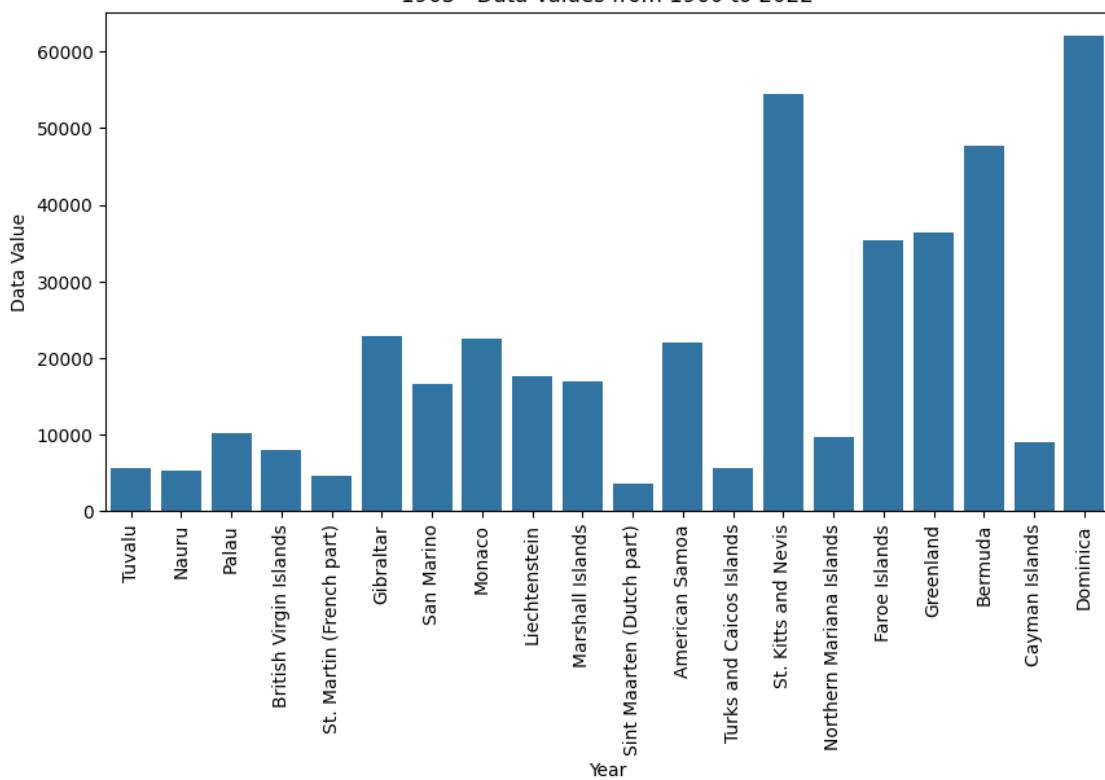
1961 - Data Values from 1960 to 2022



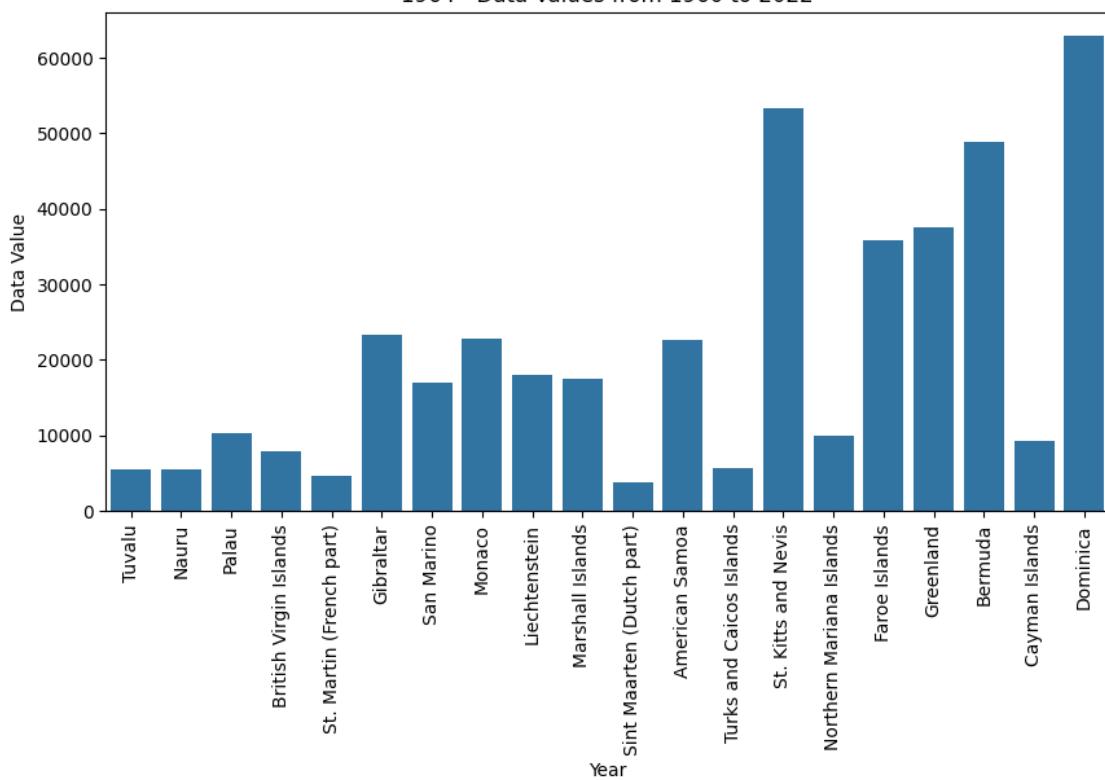
1962 - Data Values from 1960 to 2022



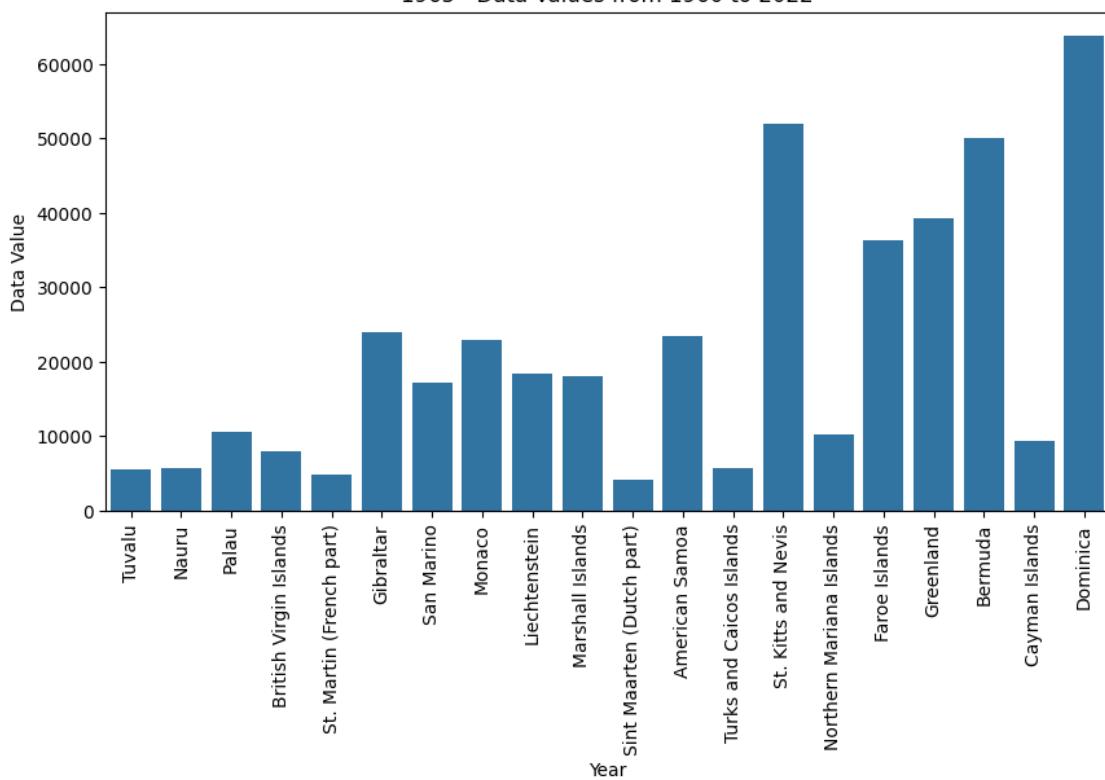
1963 - Data Values from 1960 to 2022



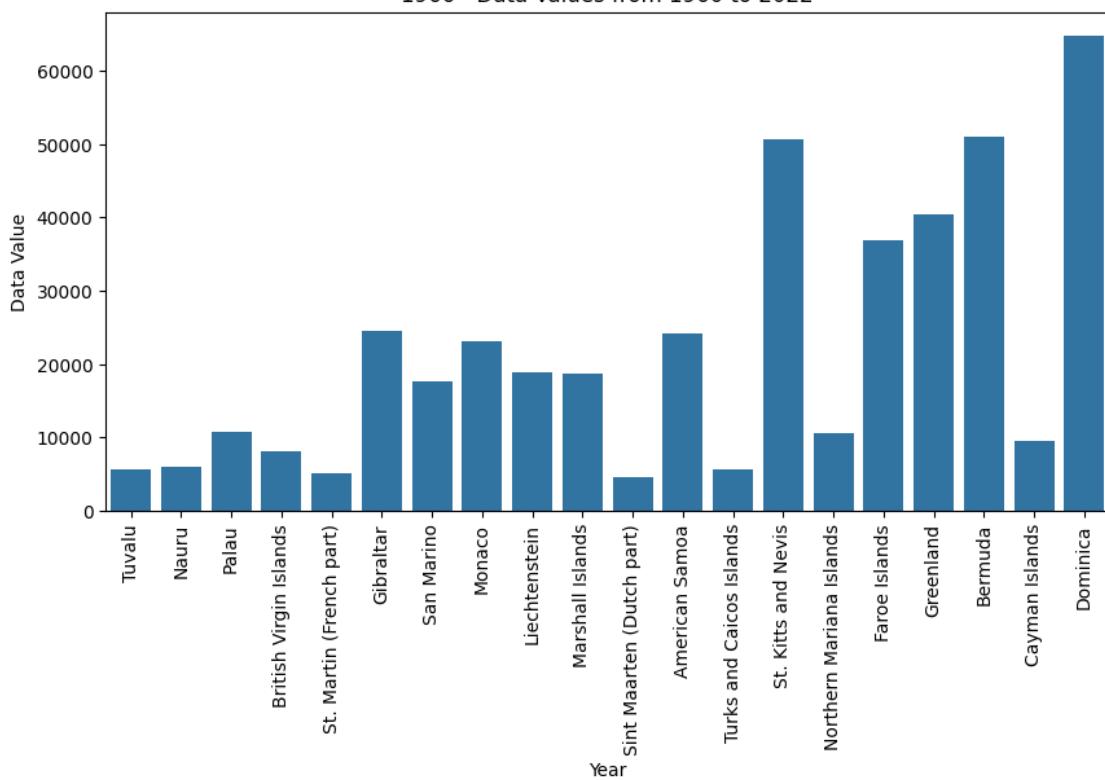
1964 - Data Values from 1960 to 2022



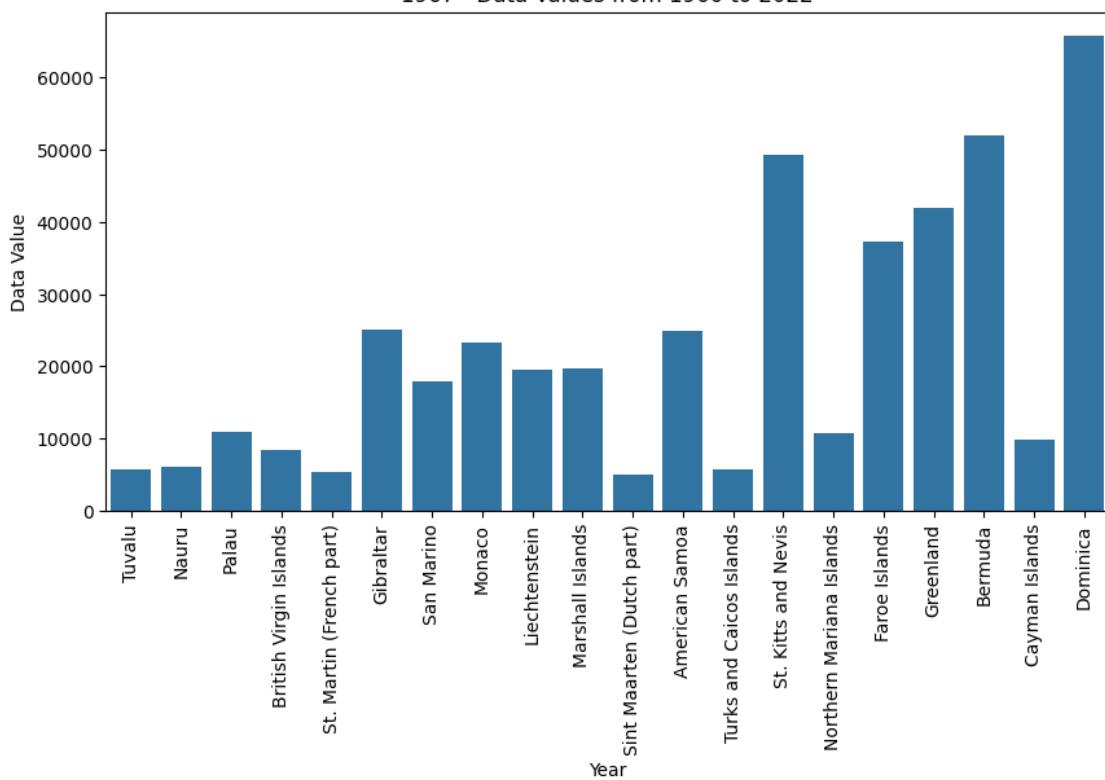
1965 - Data Values from 1960 to 2022

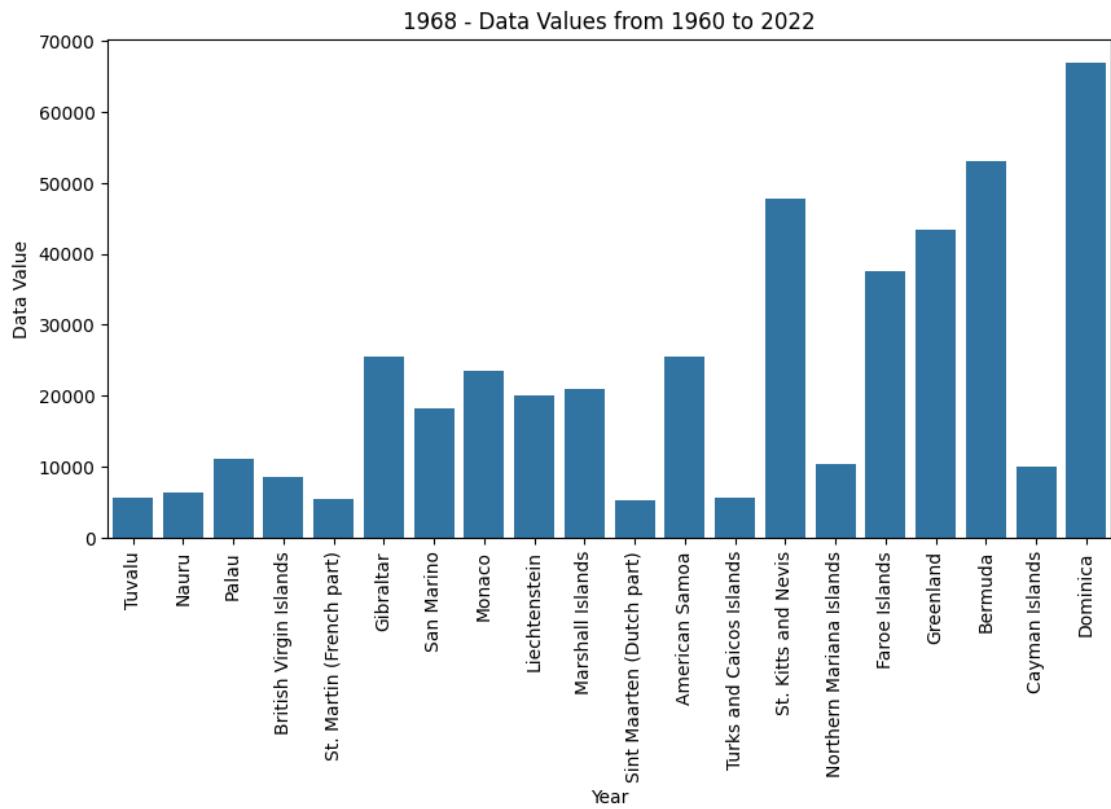


1966 - Data Values from 1960 to 2022

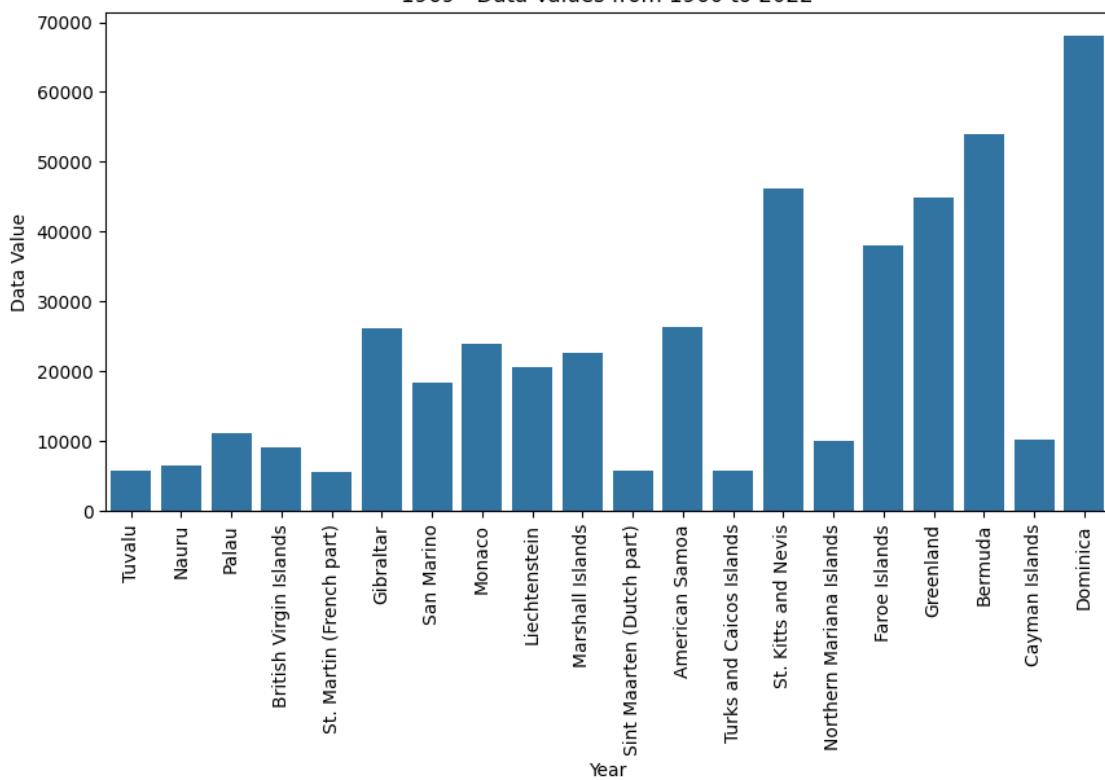


1967 - Data Values from 1960 to 2022

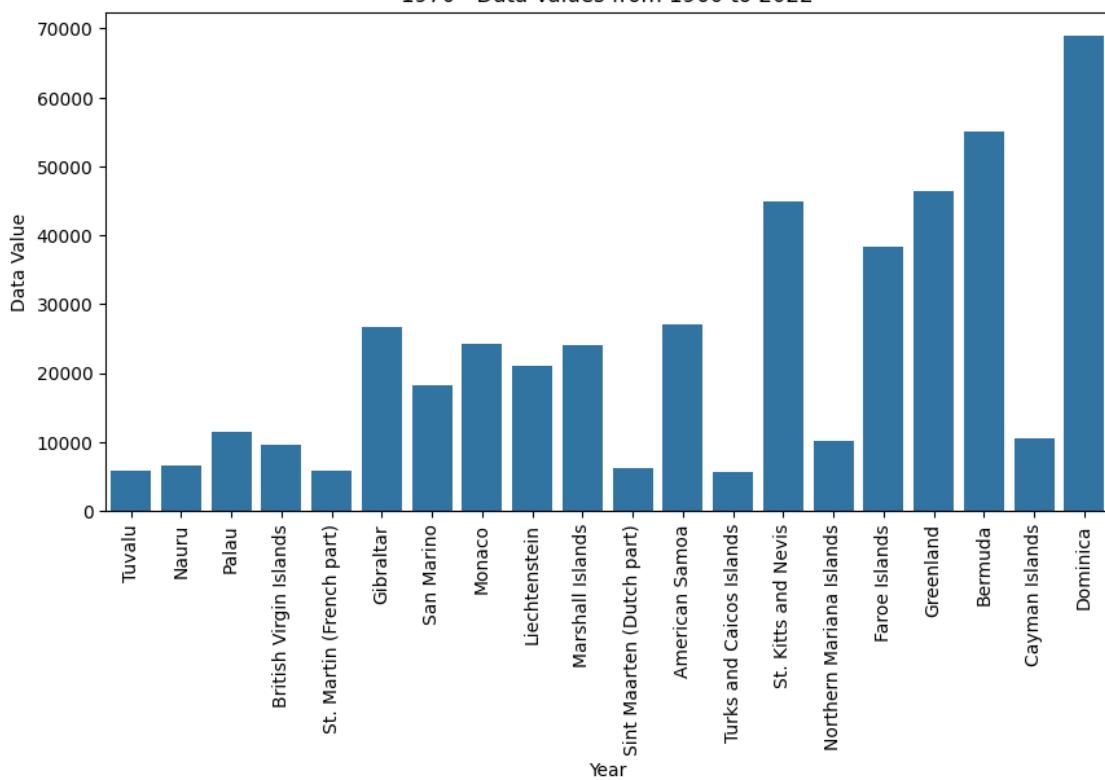




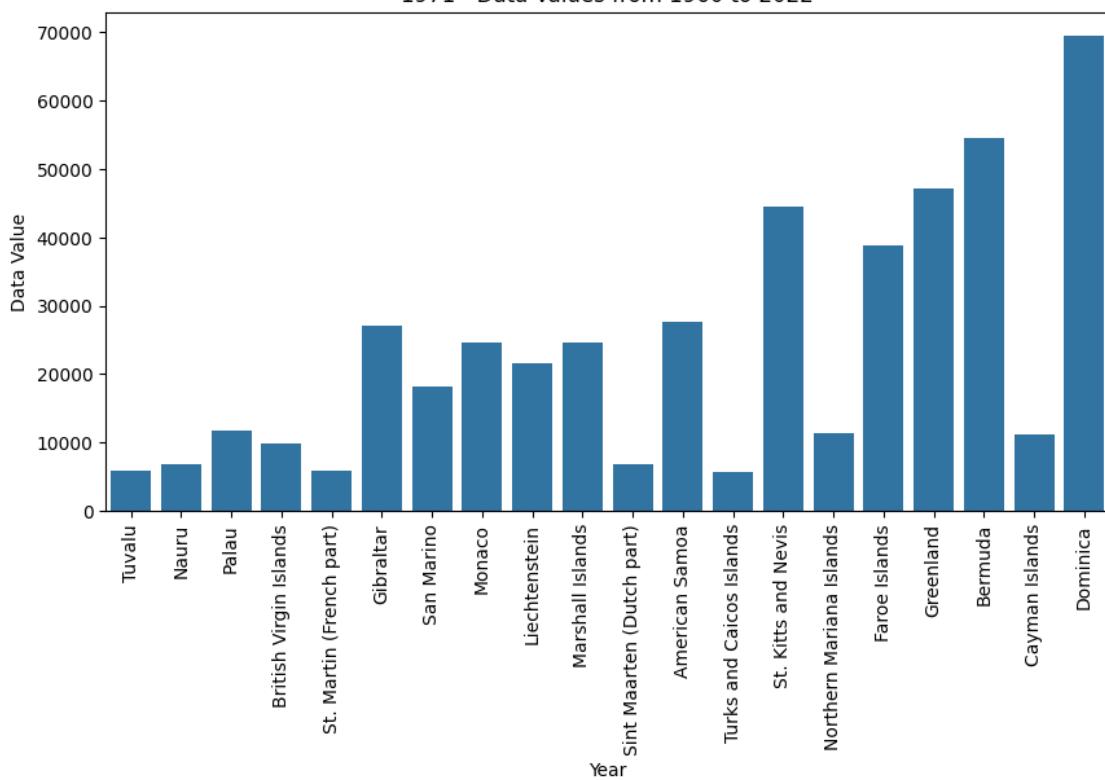
1969 - Data Values from 1960 to 2022



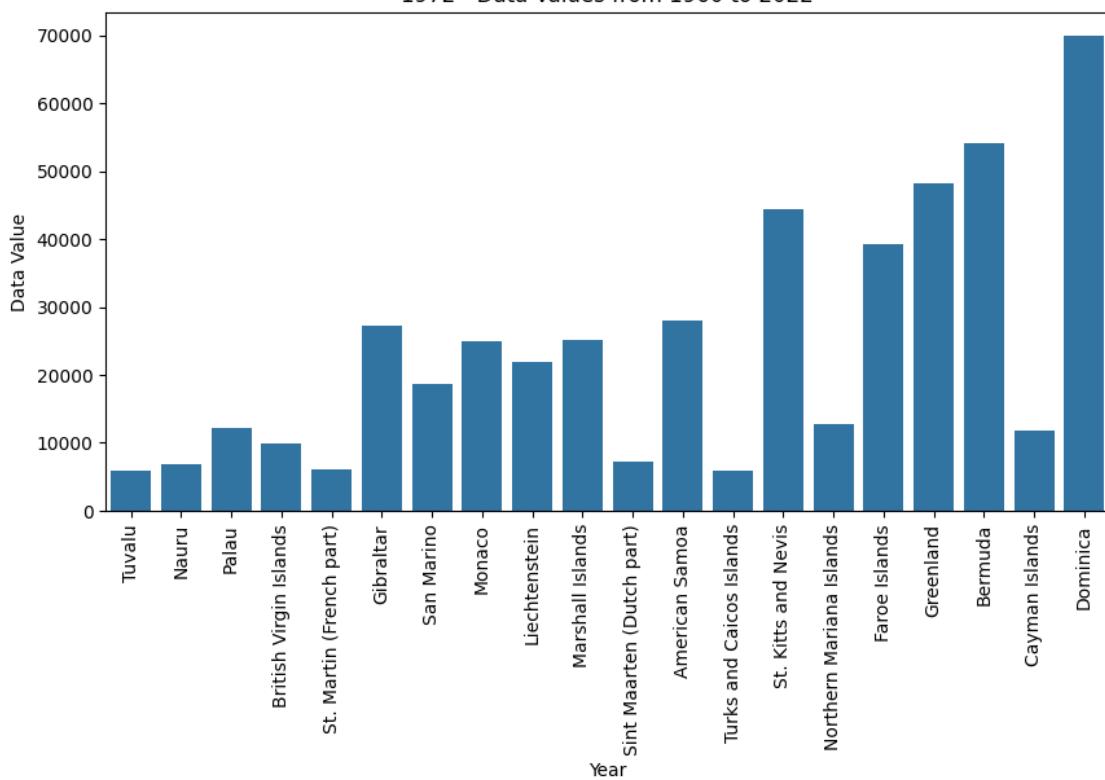
1970 - Data Values from 1960 to 2022



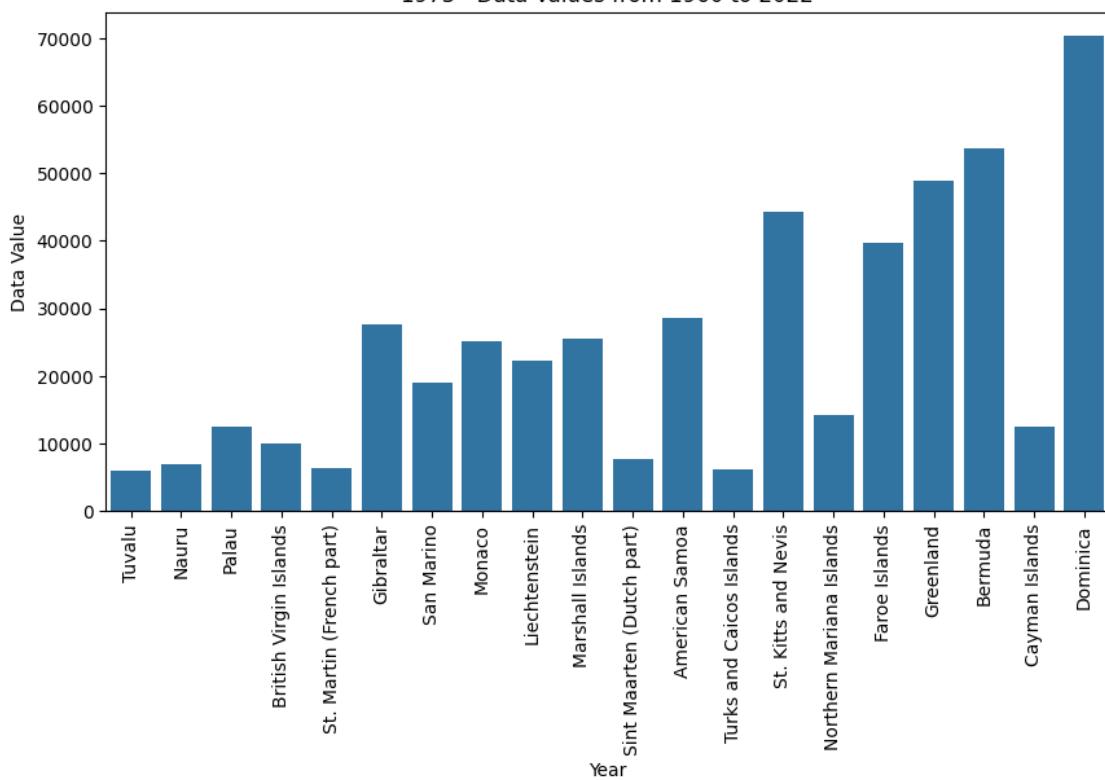
1971 - Data Values from 1960 to 2022



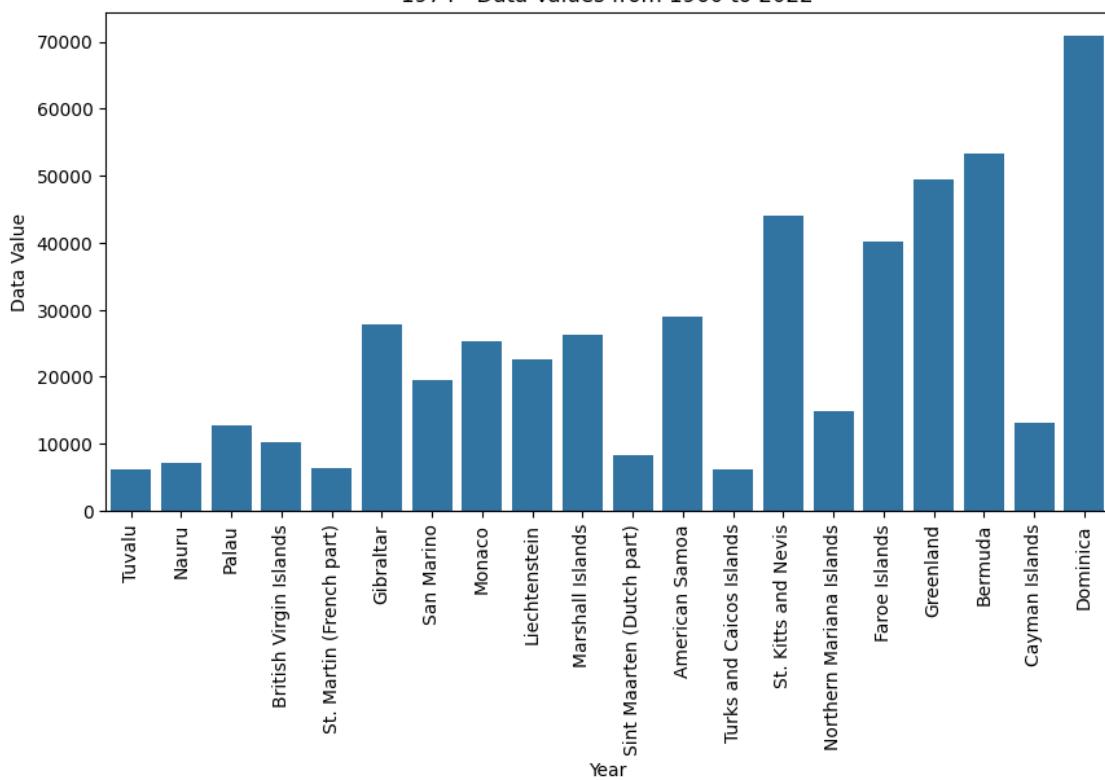
1972 - Data Values from 1960 to 2022



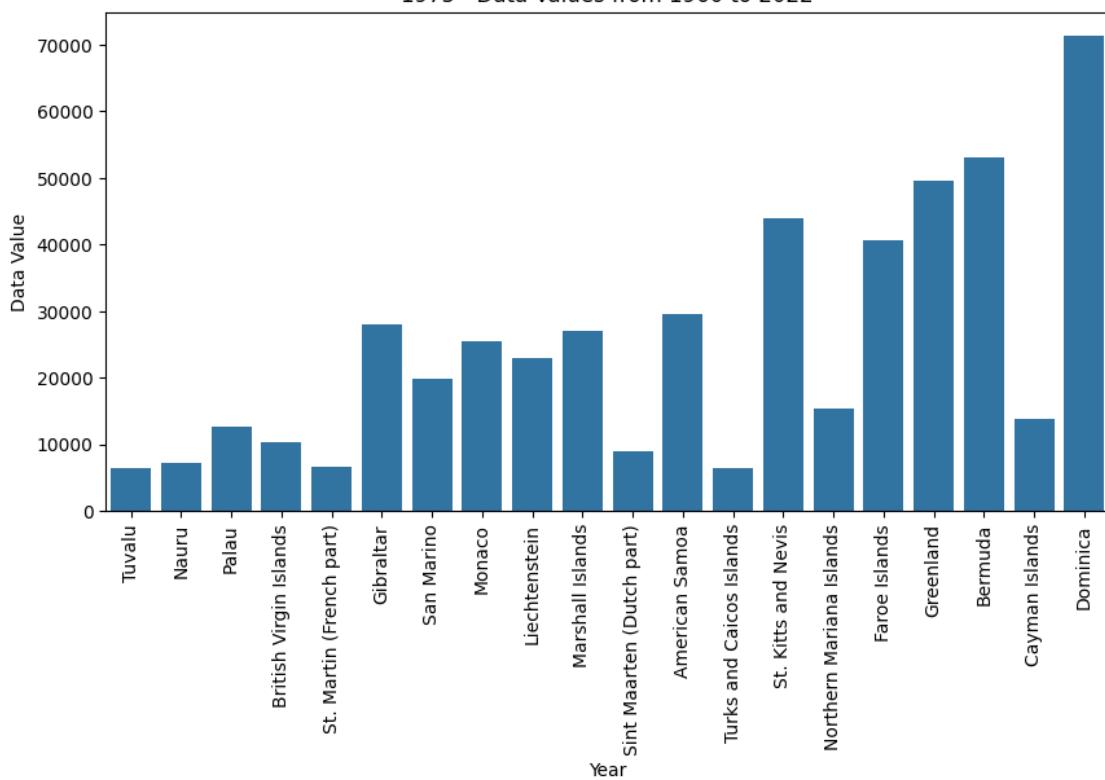
1973 - Data Values from 1960 to 2022



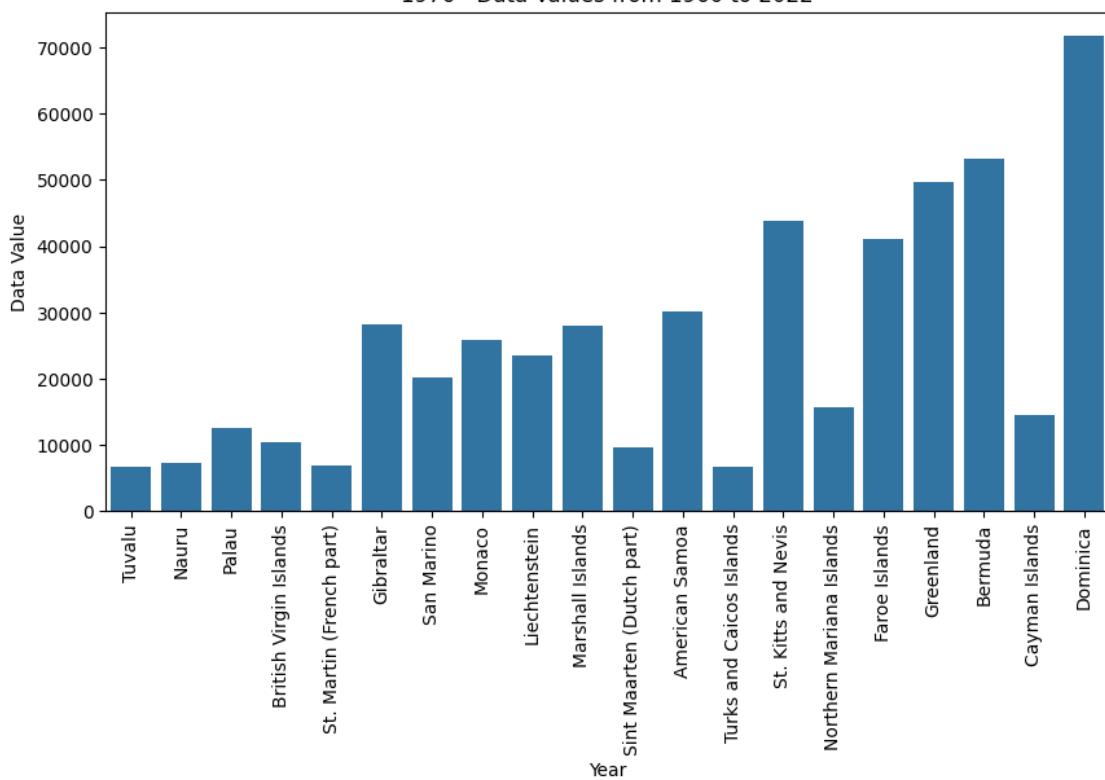
1974 - Data Values from 1960 to 2022



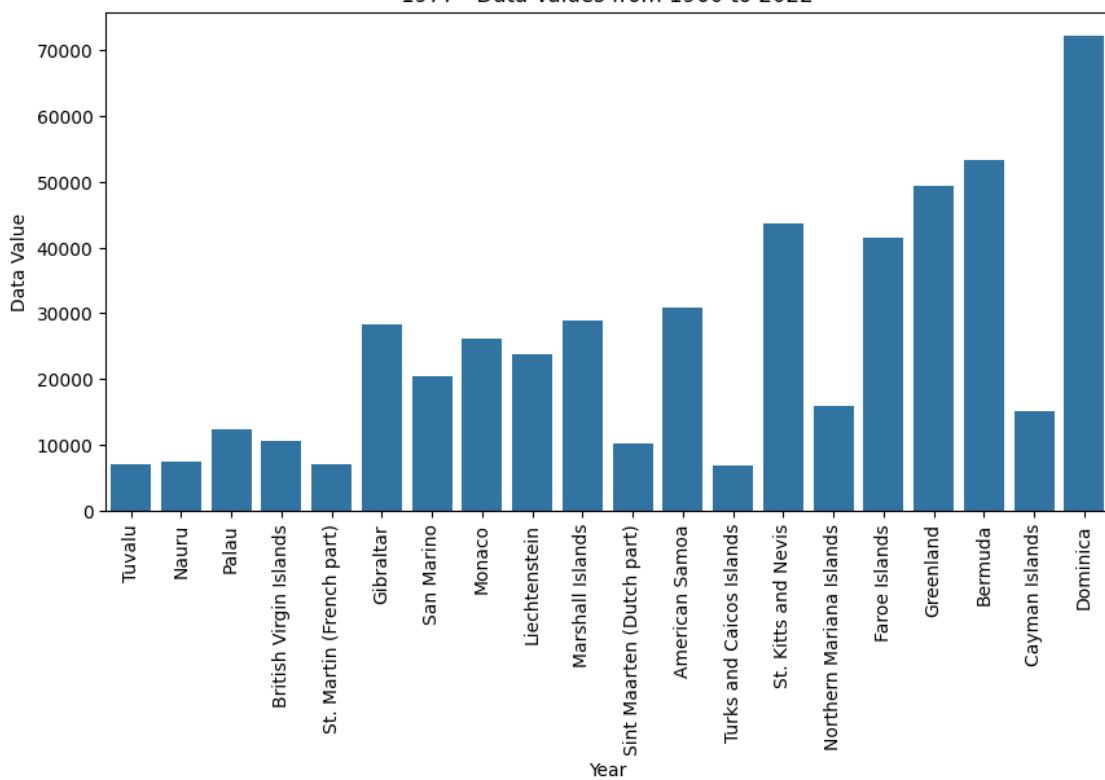
1975 - Data Values from 1960 to 2022



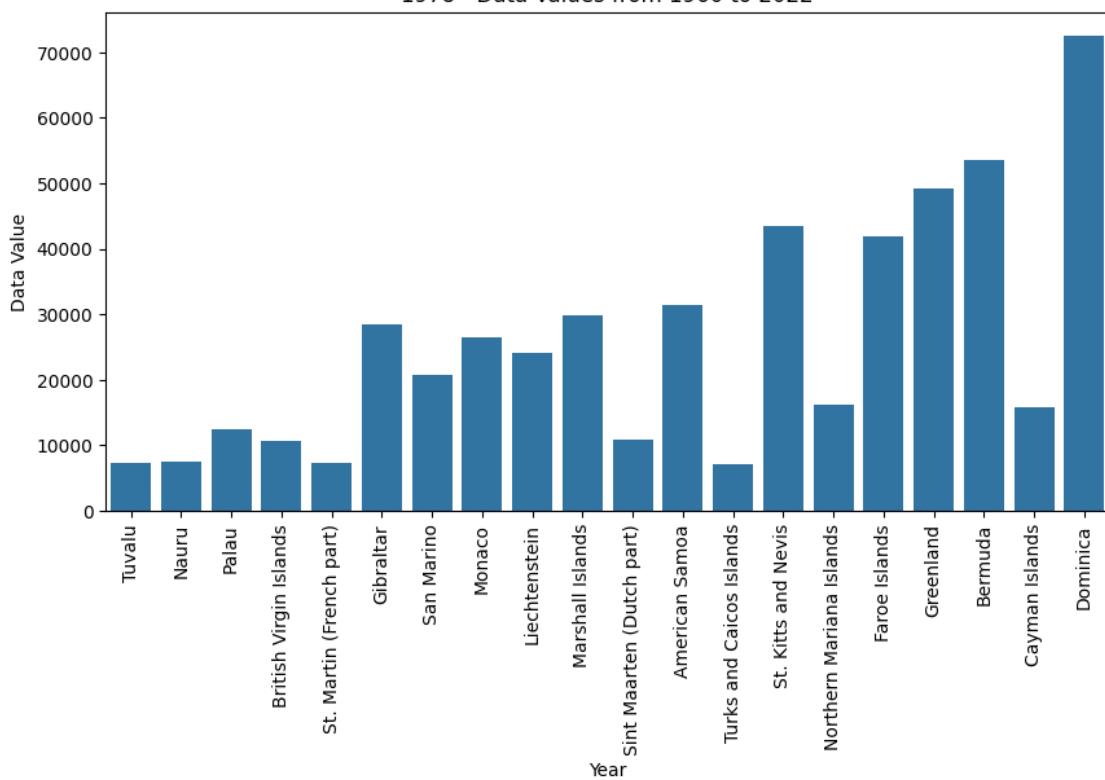
1976 - Data Values from 1960 to 2022

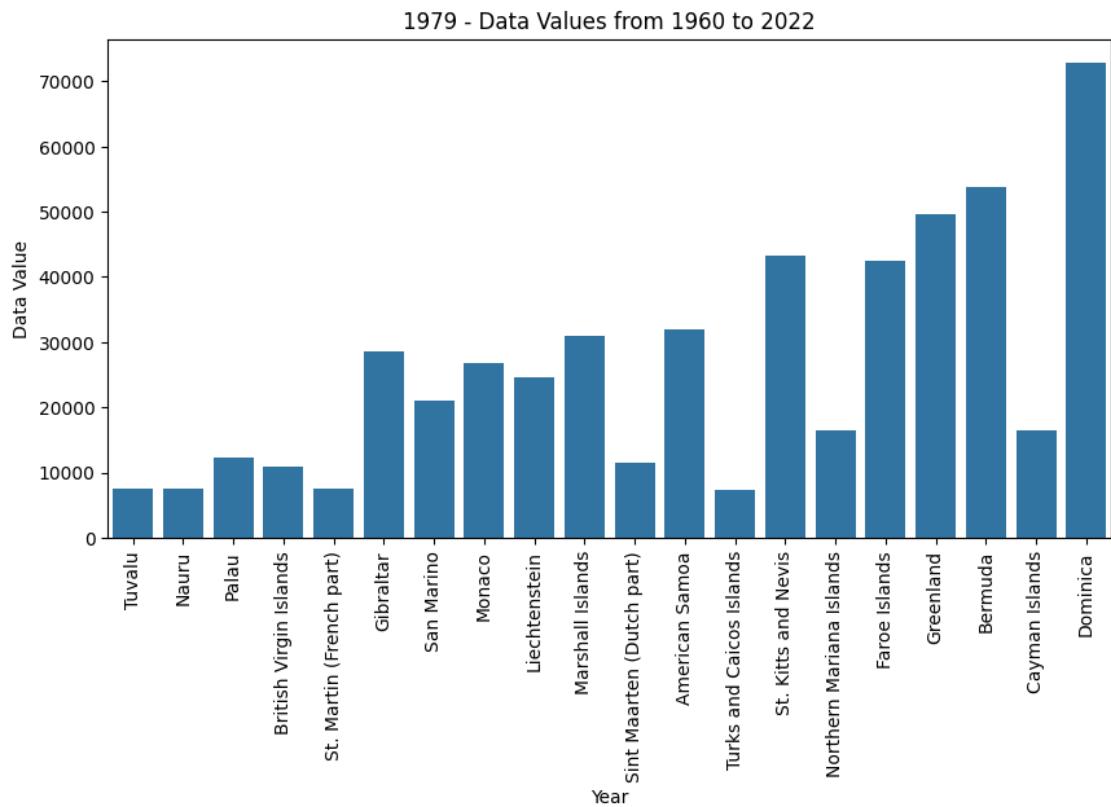


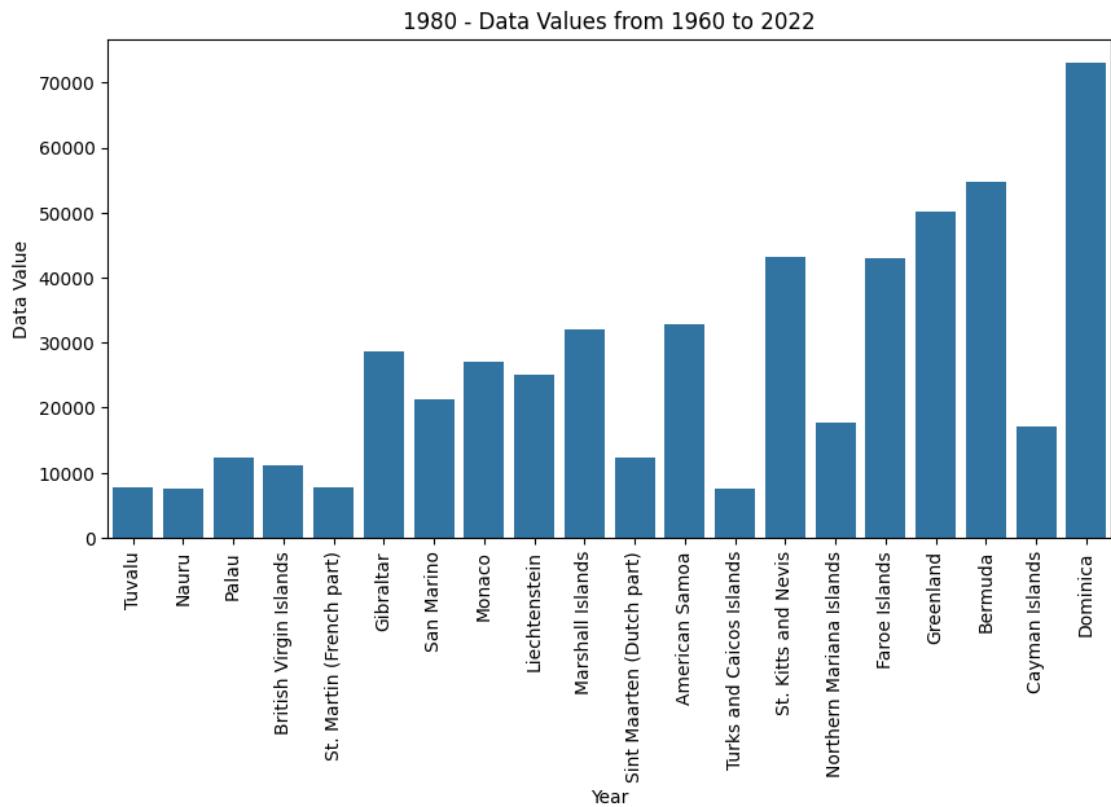
1977 - Data Values from 1960 to 2022



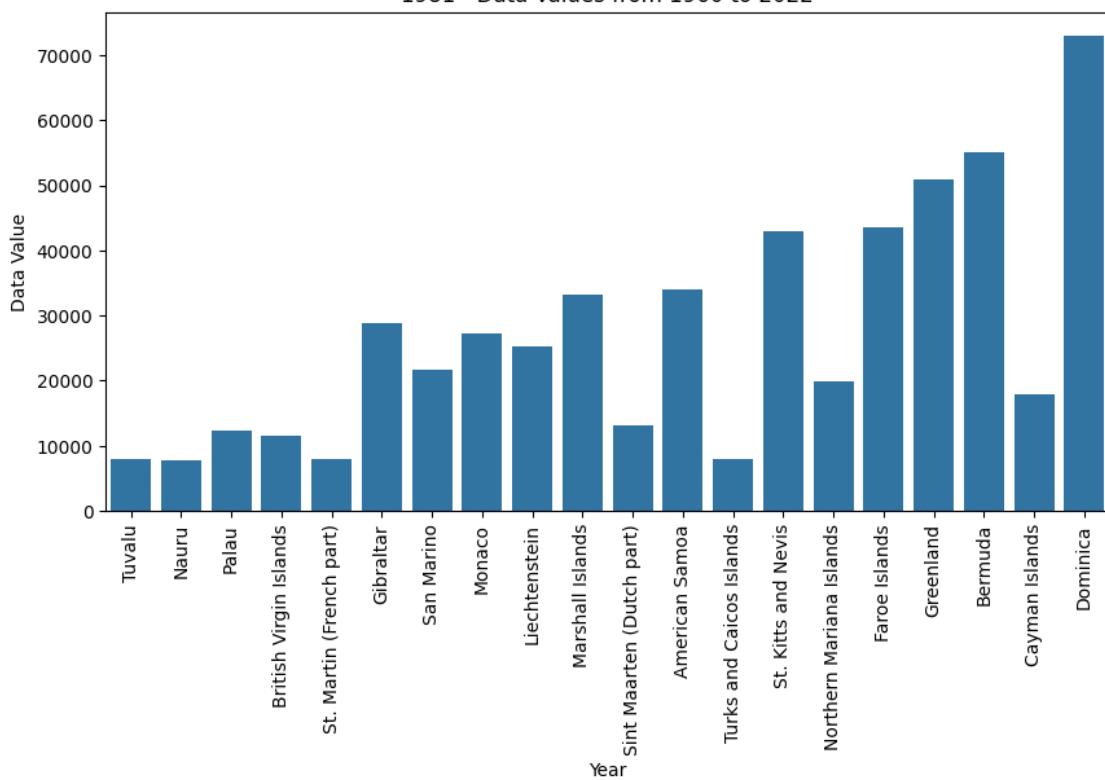
1978 - Data Values from 1960 to 2022



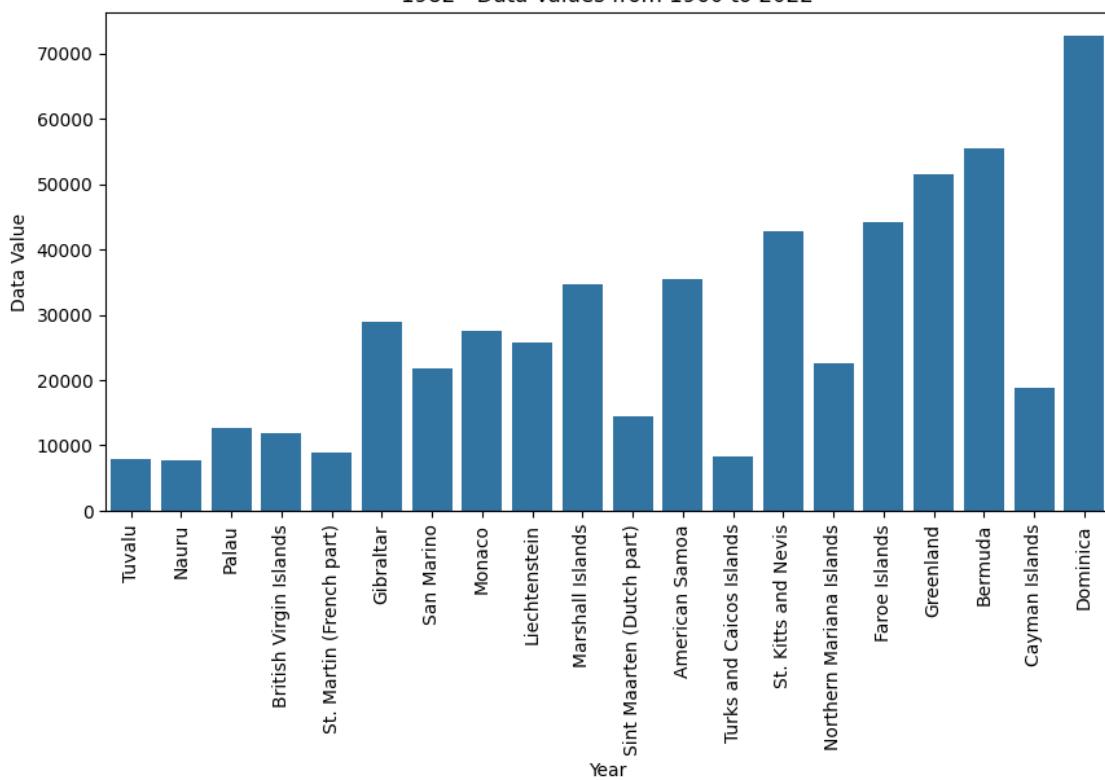




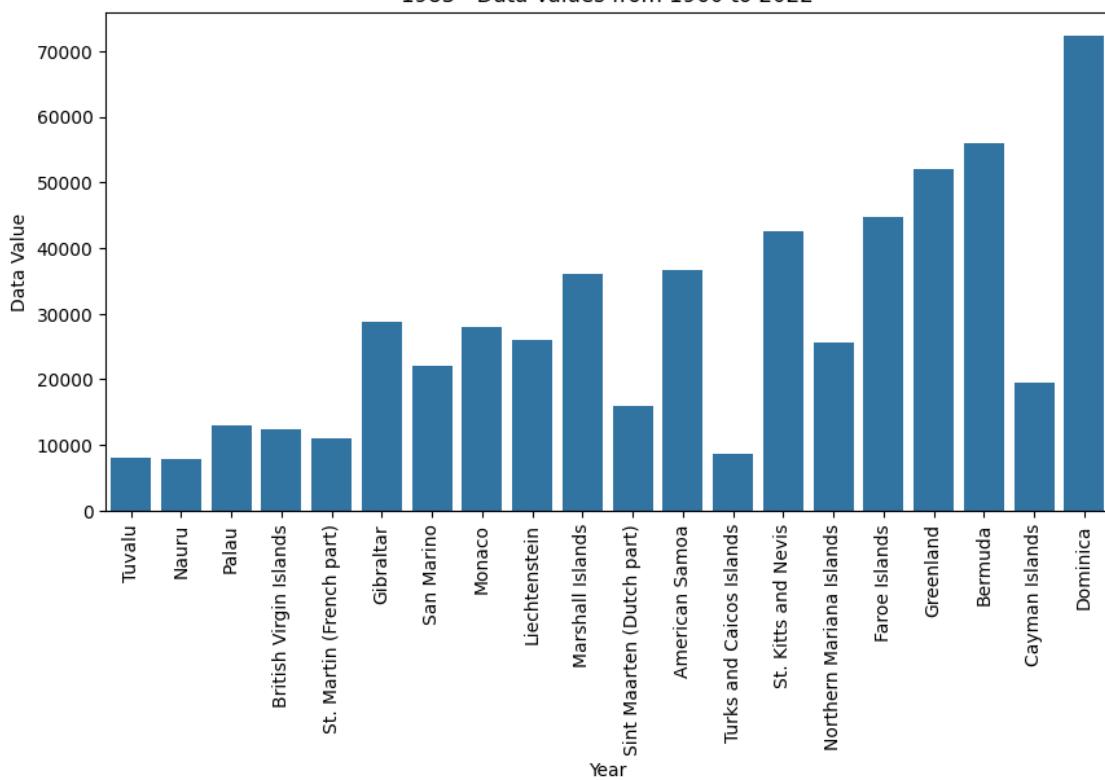
1981 - Data Values from 1960 to 2022



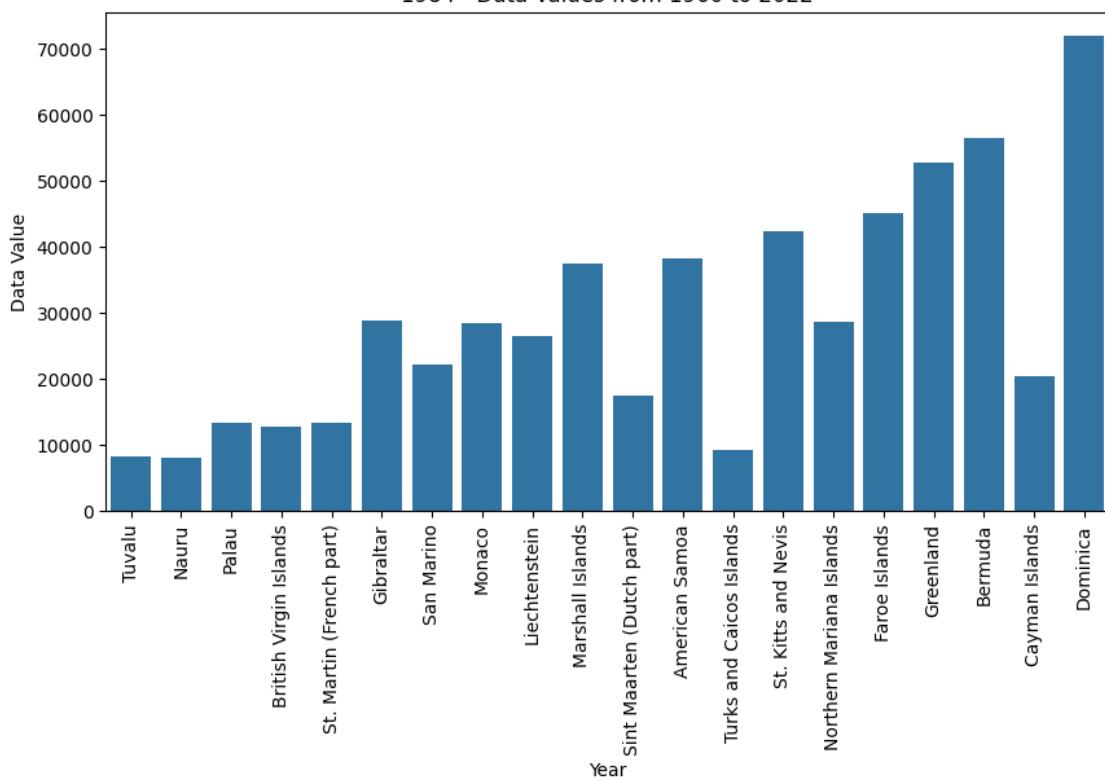
1982 - Data Values from 1960 to 2022



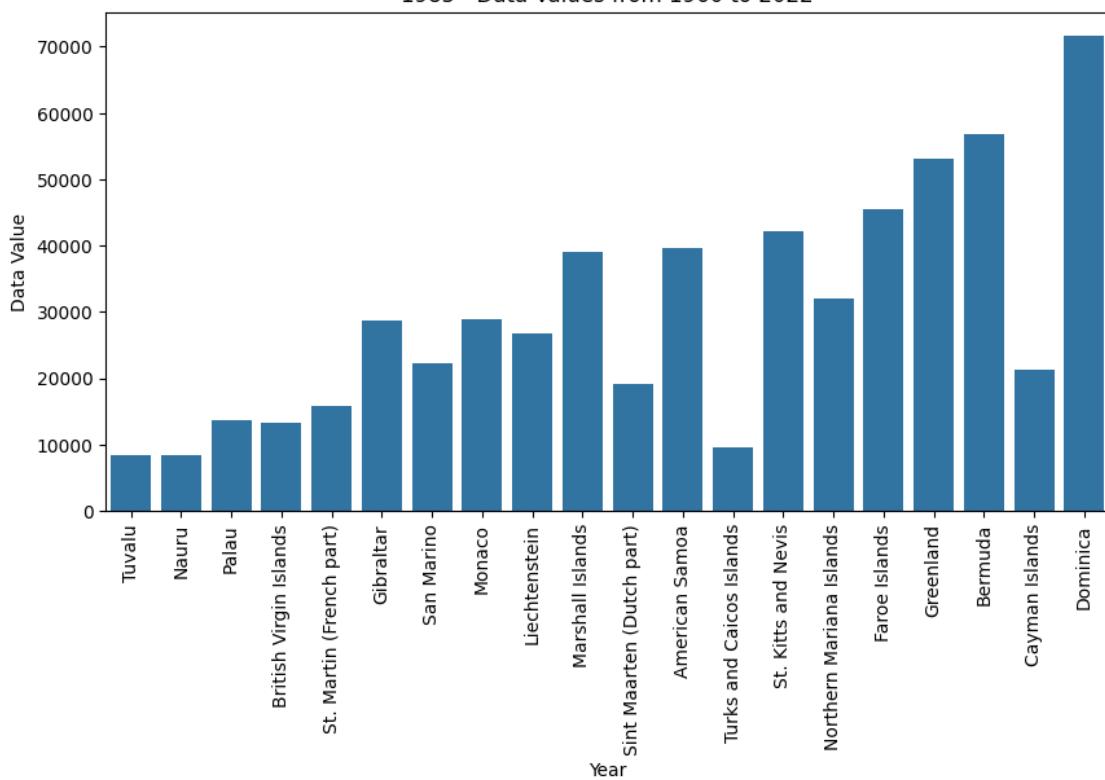
1983 - Data Values from 1960 to 2022



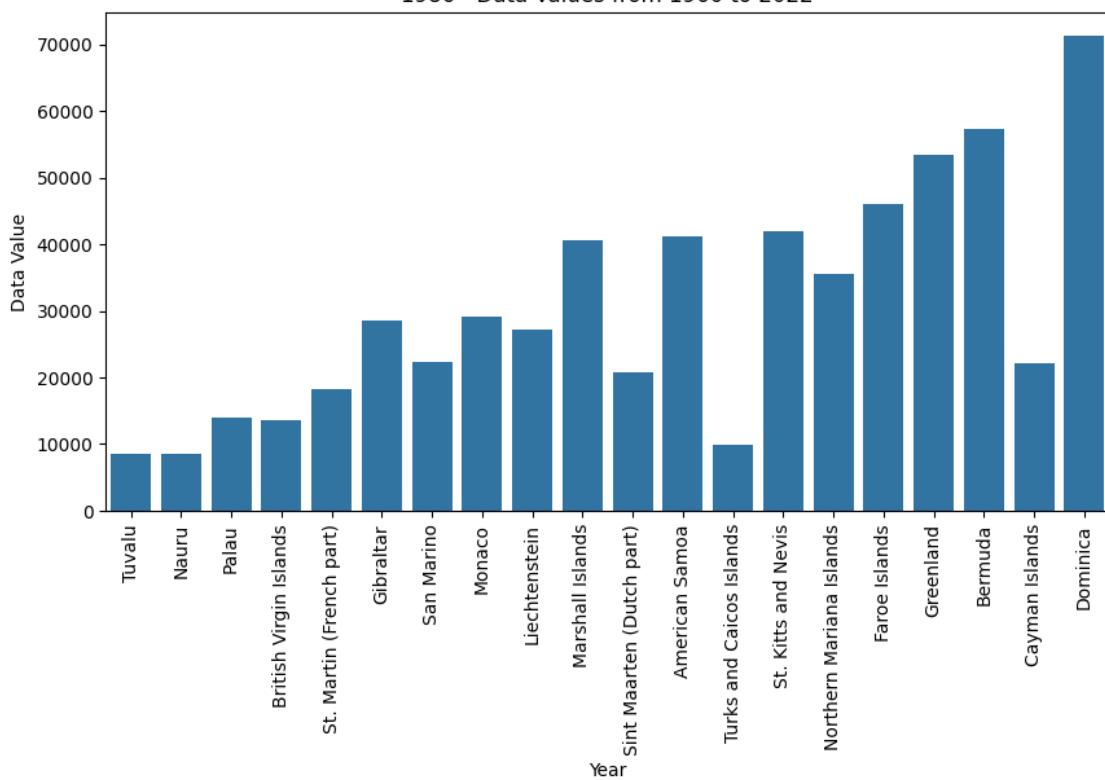
1984 - Data Values from 1960 to 2022



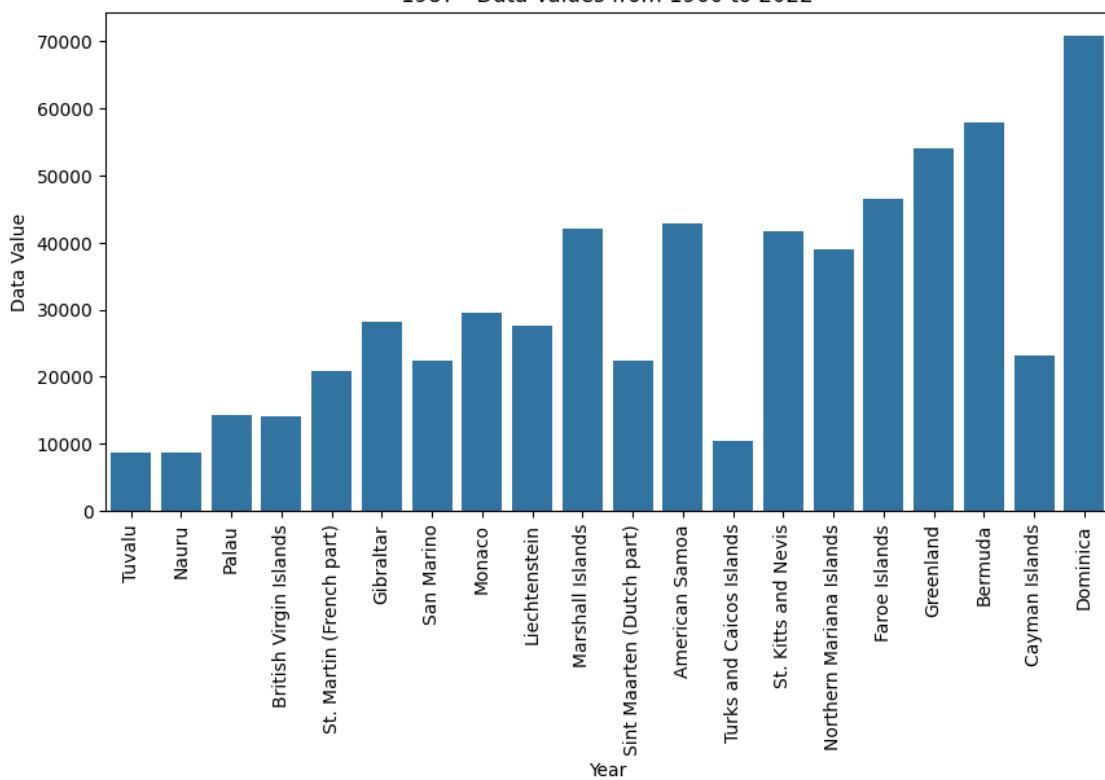
1985 - Data Values from 1960 to 2022



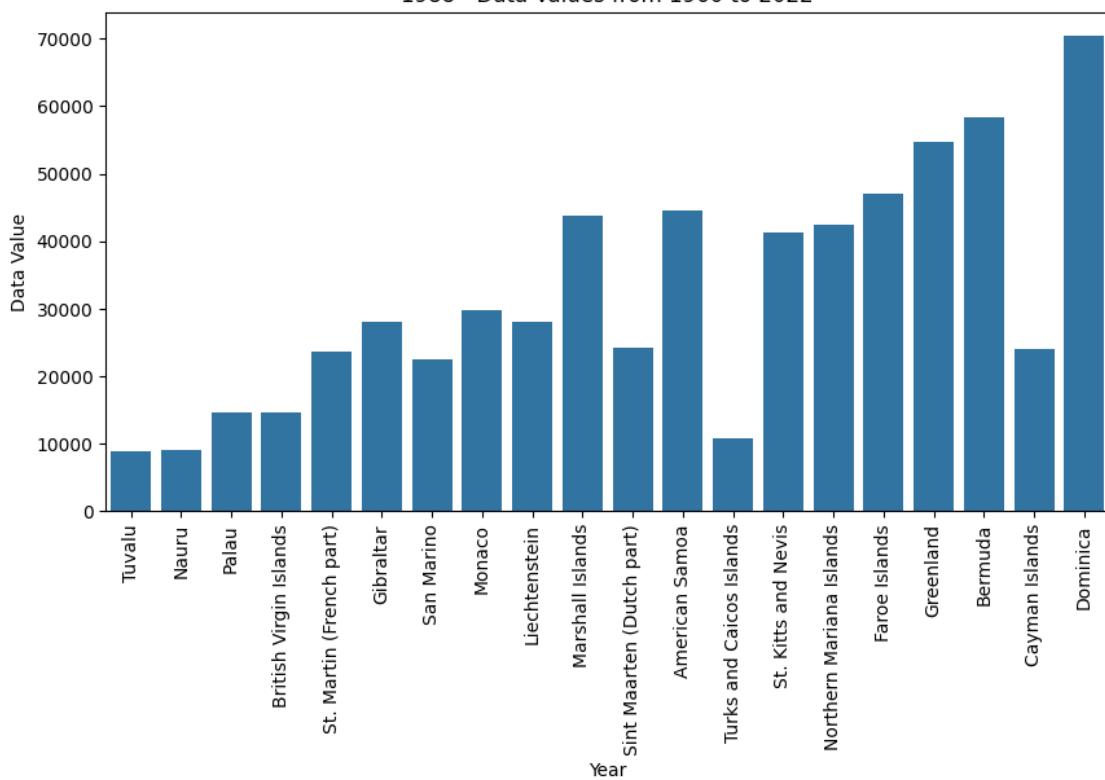
1986 - Data Values from 1960 to 2022



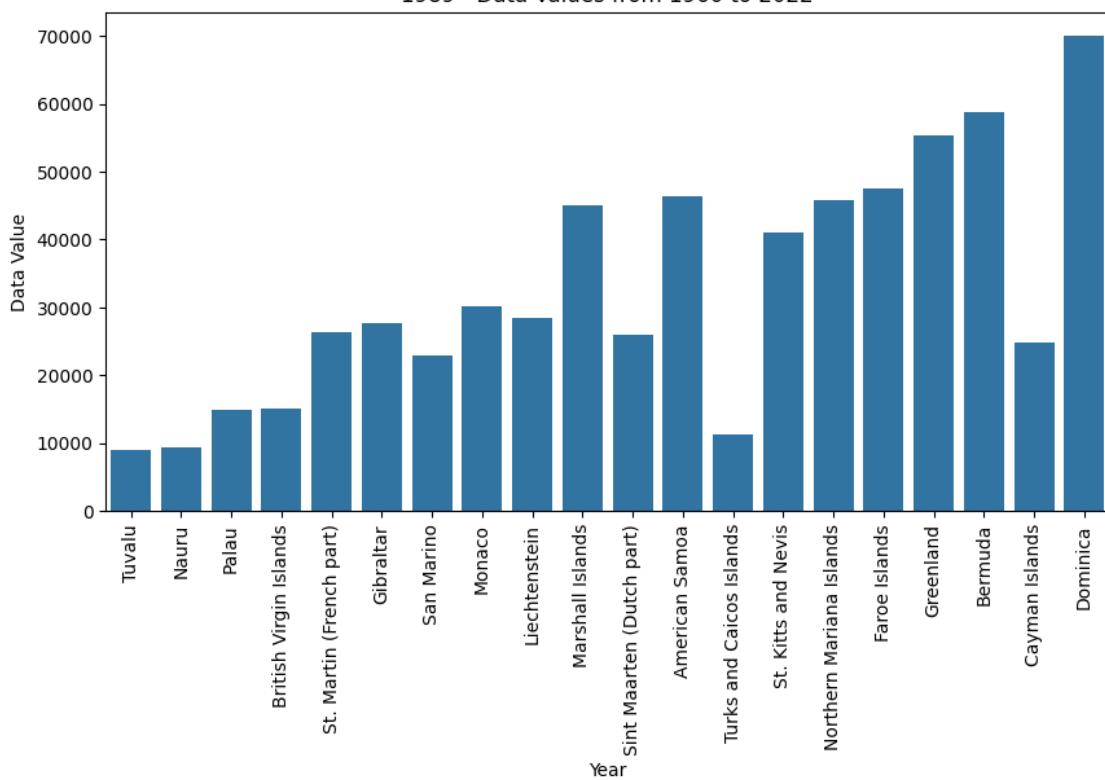
1987 - Data Values from 1960 to 2022



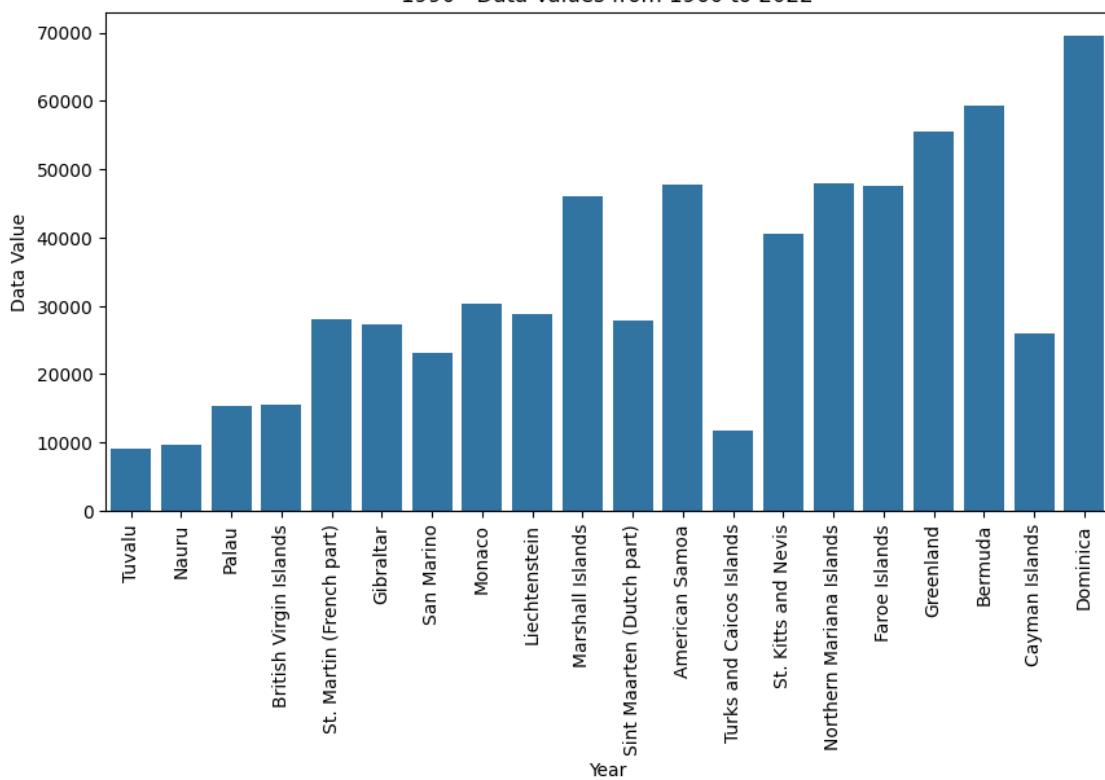
1988 - Data Values from 1960 to 2022



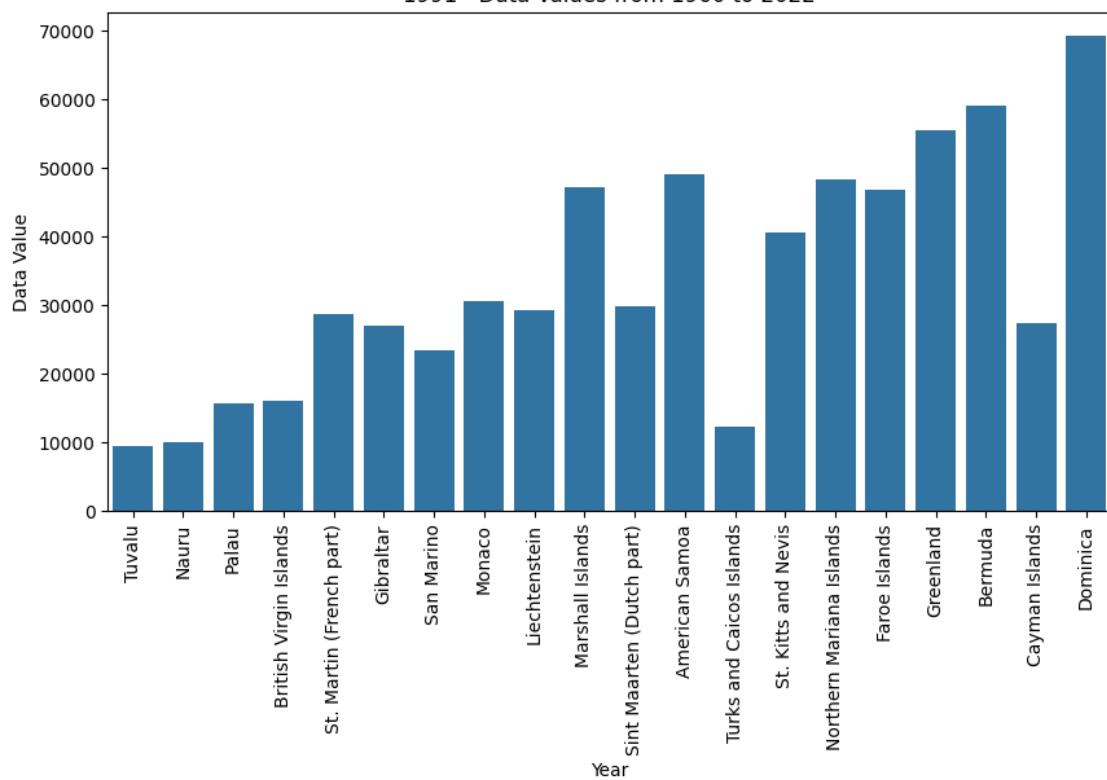
1989 - Data Values from 1960 to 2022



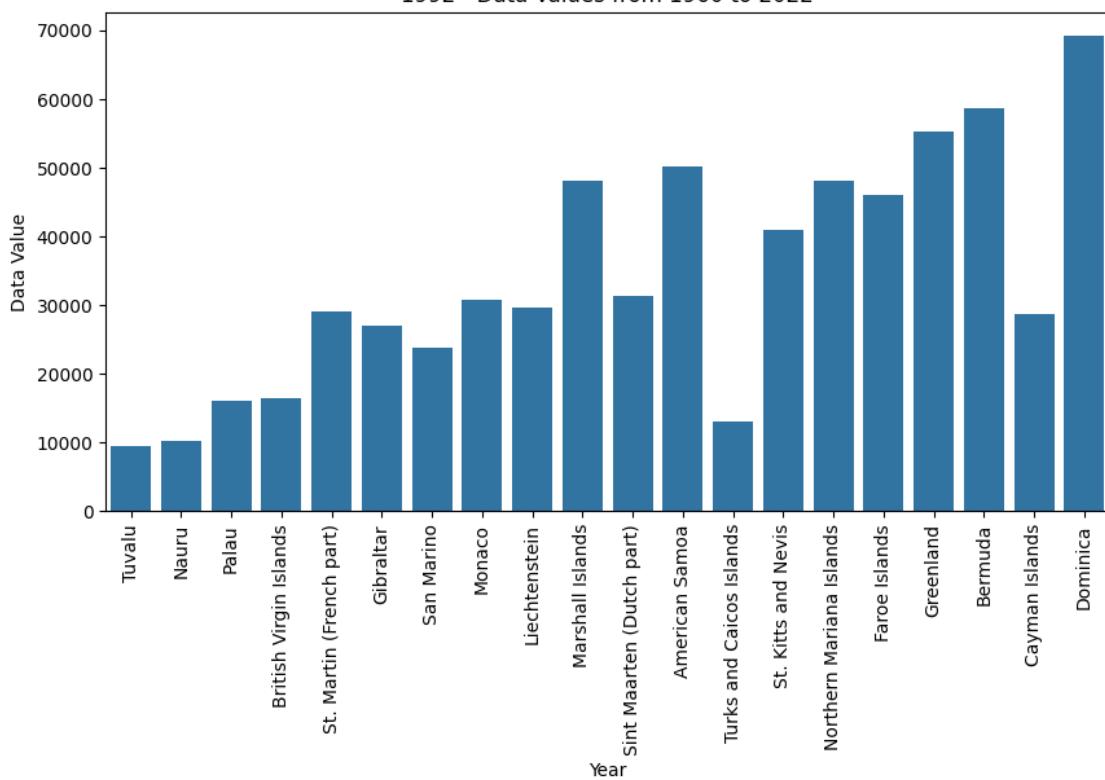
1990 - Data Values from 1960 to 2022



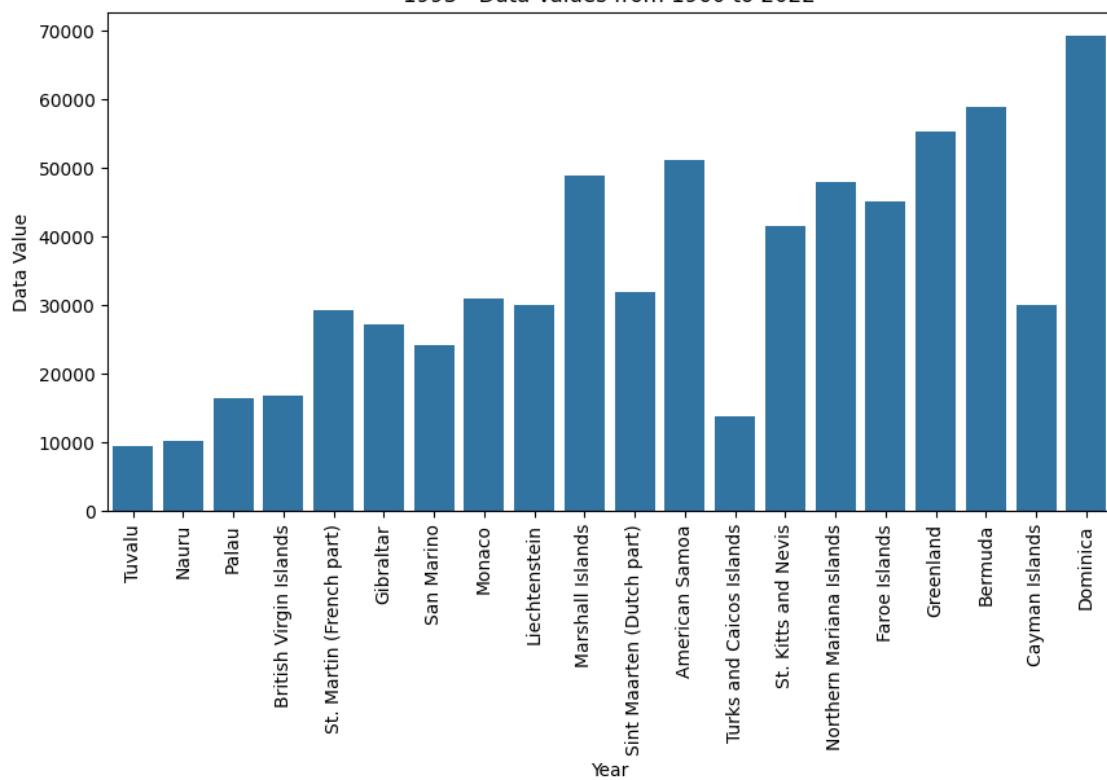
1991 - Data Values from 1960 to 2022



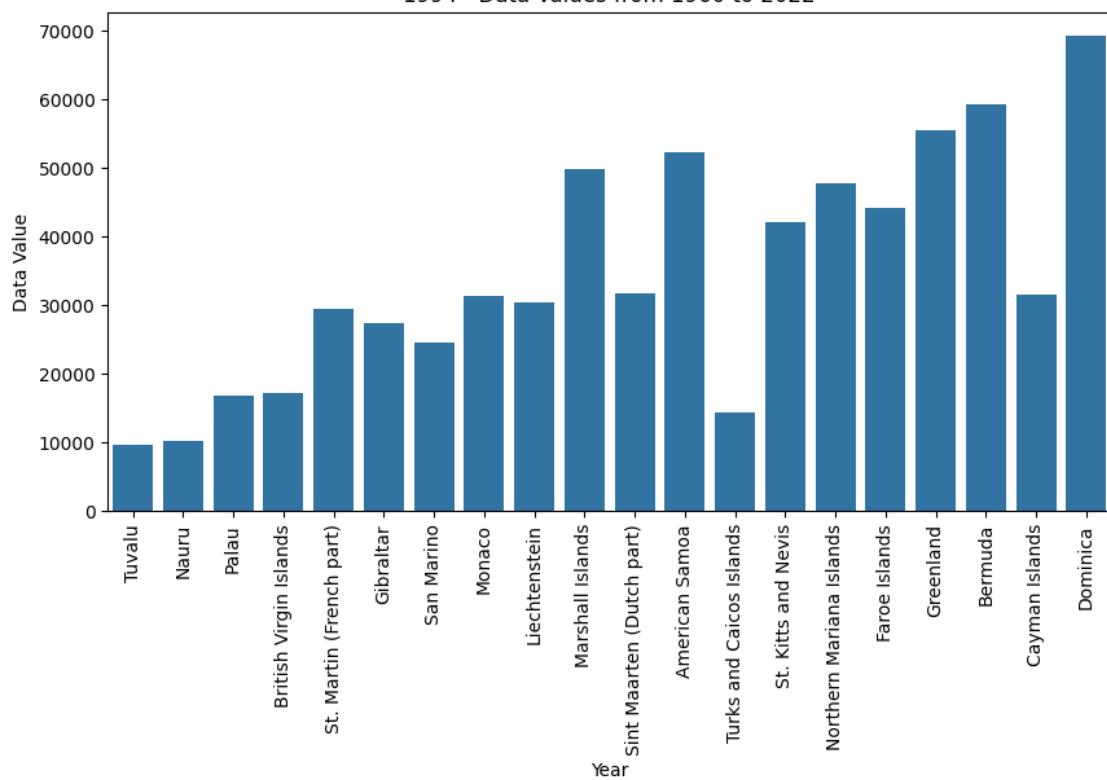
1992 - Data Values from 1960 to 2022



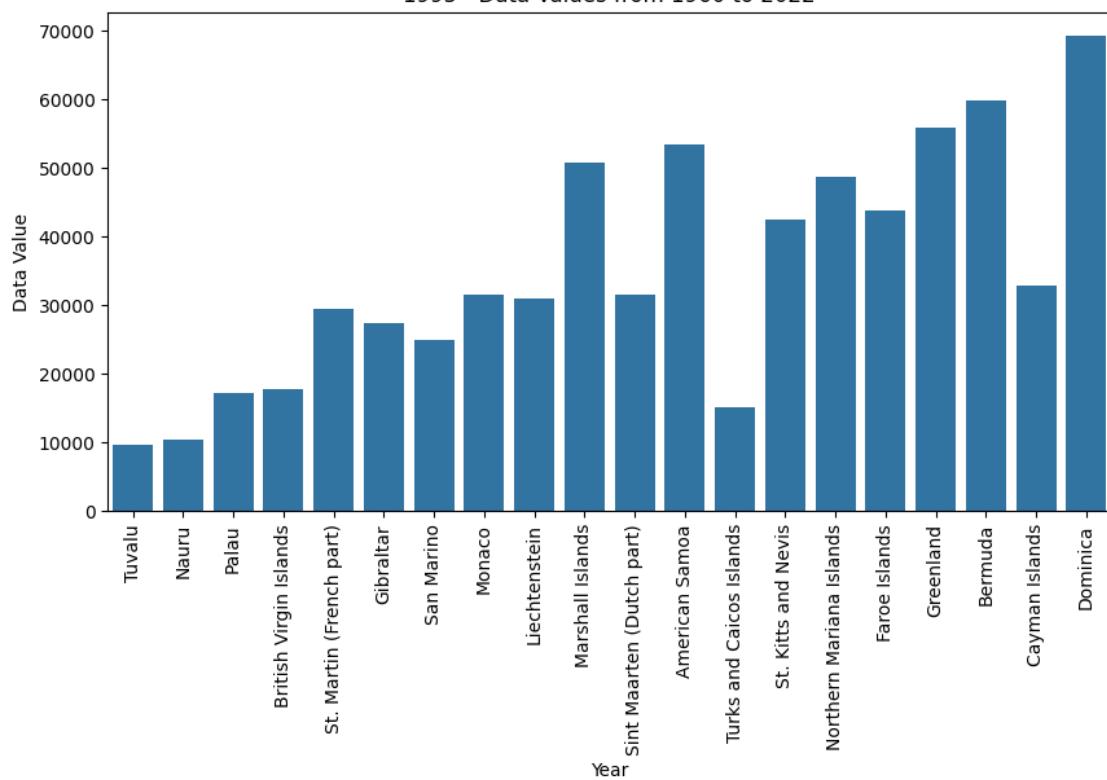
1993 - Data Values from 1960 to 2022



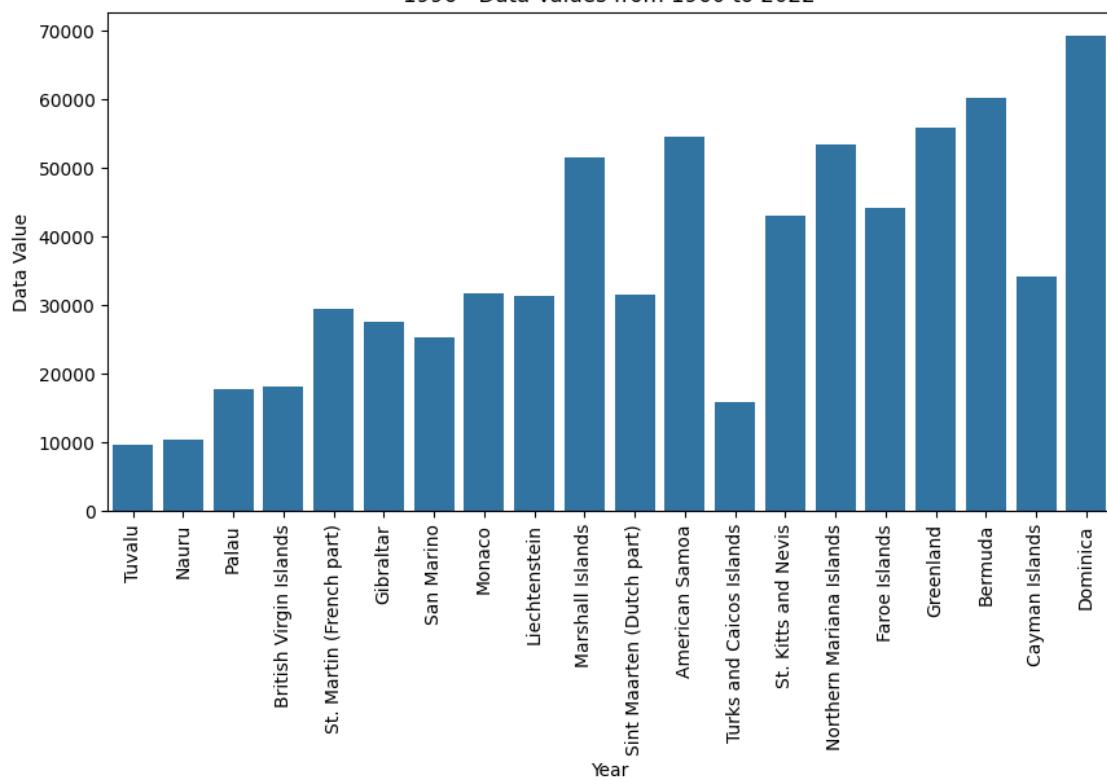
1994 - Data Values from 1960 to 2022



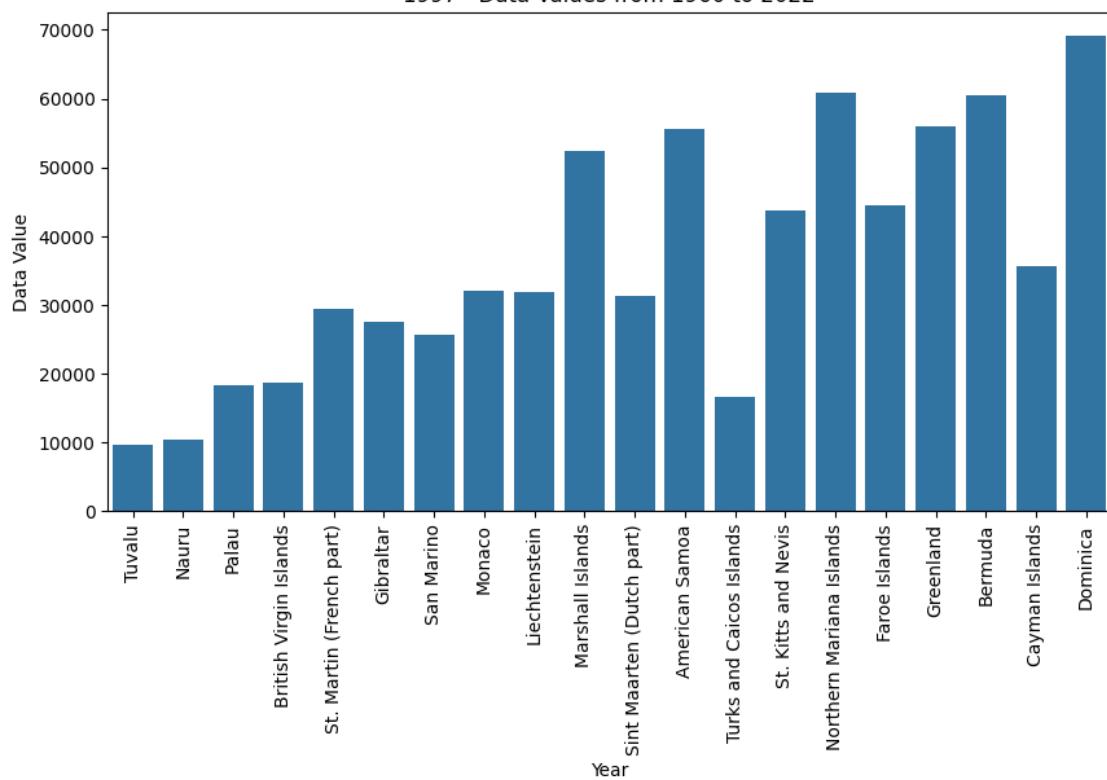
1995 - Data Values from 1960 to 2022



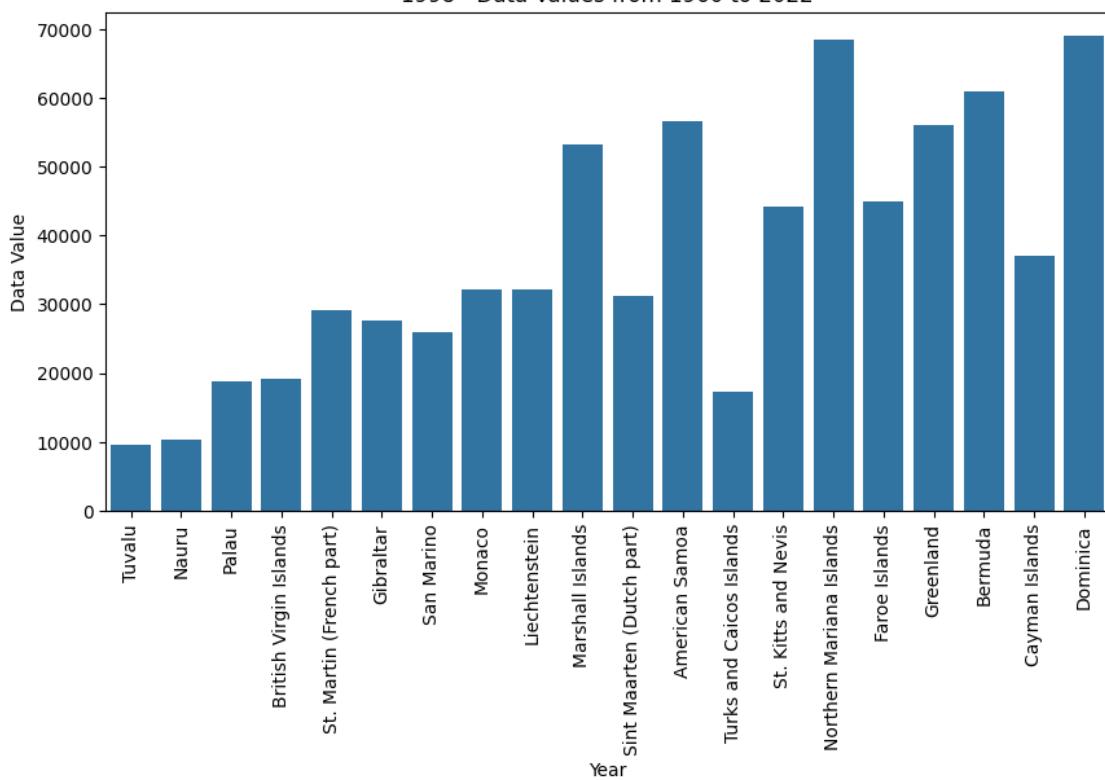
1996 - Data Values from 1960 to 2022

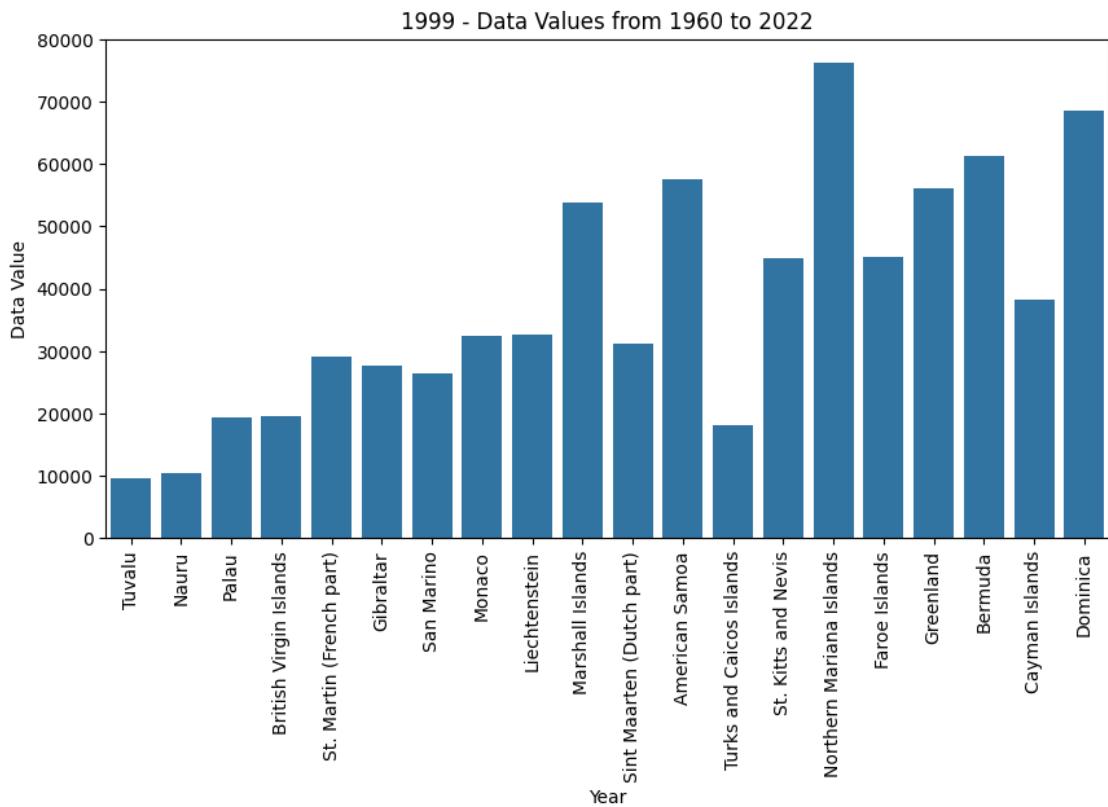


1997 - Data Values from 1960 to 2022

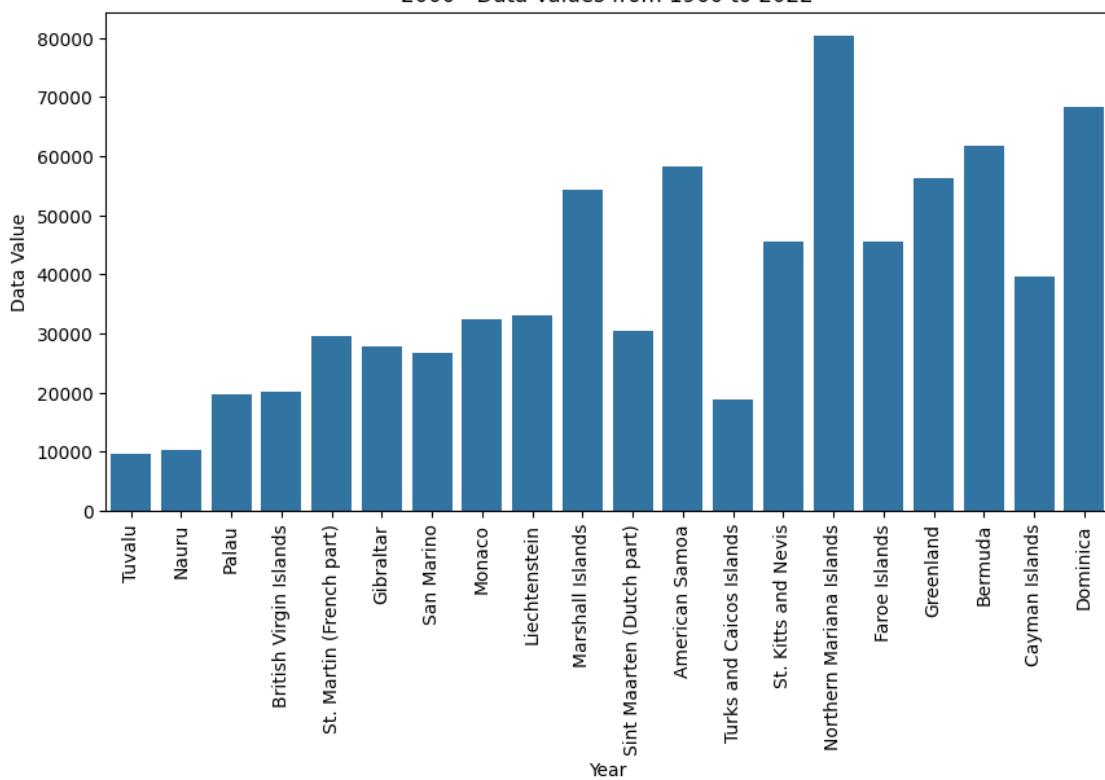


1998 - Data Values from 1960 to 2022

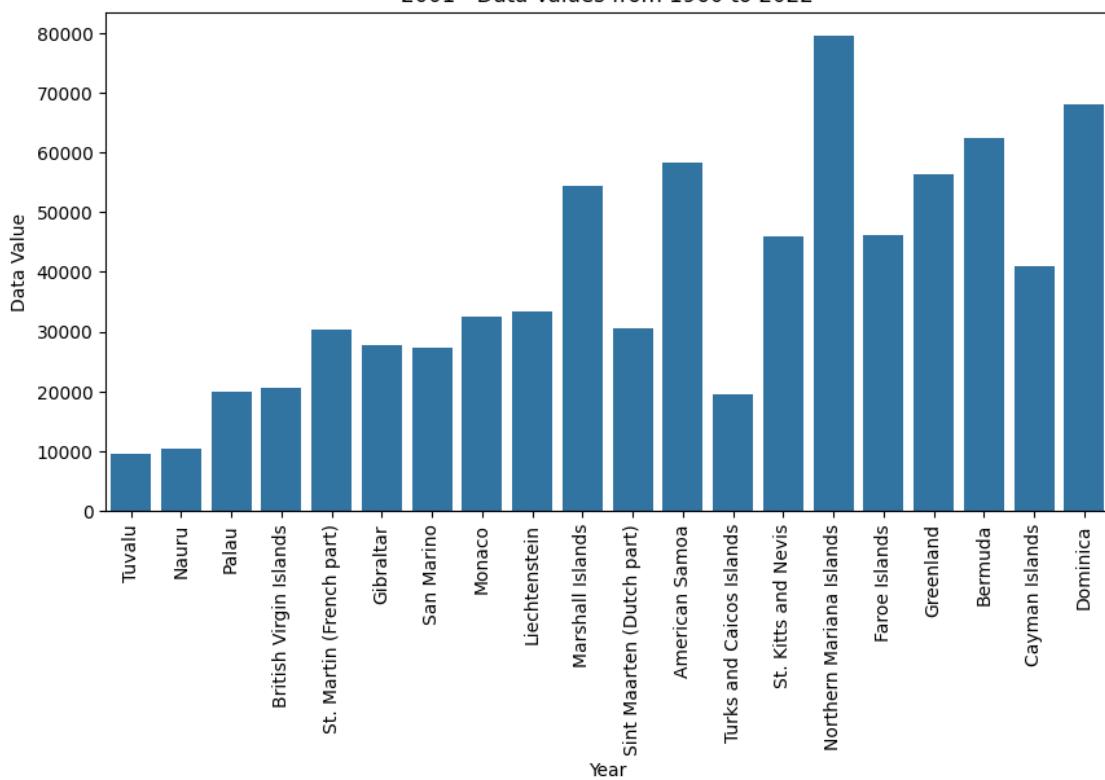


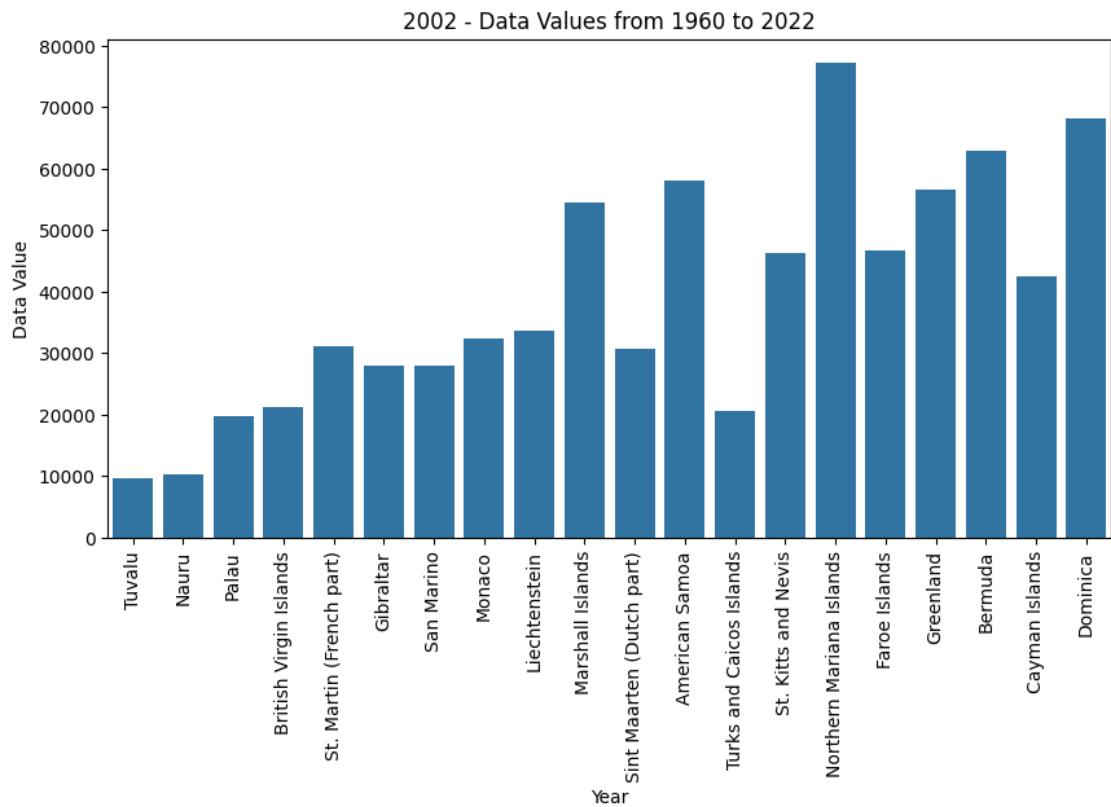


2000 - Data Values from 1960 to 2022

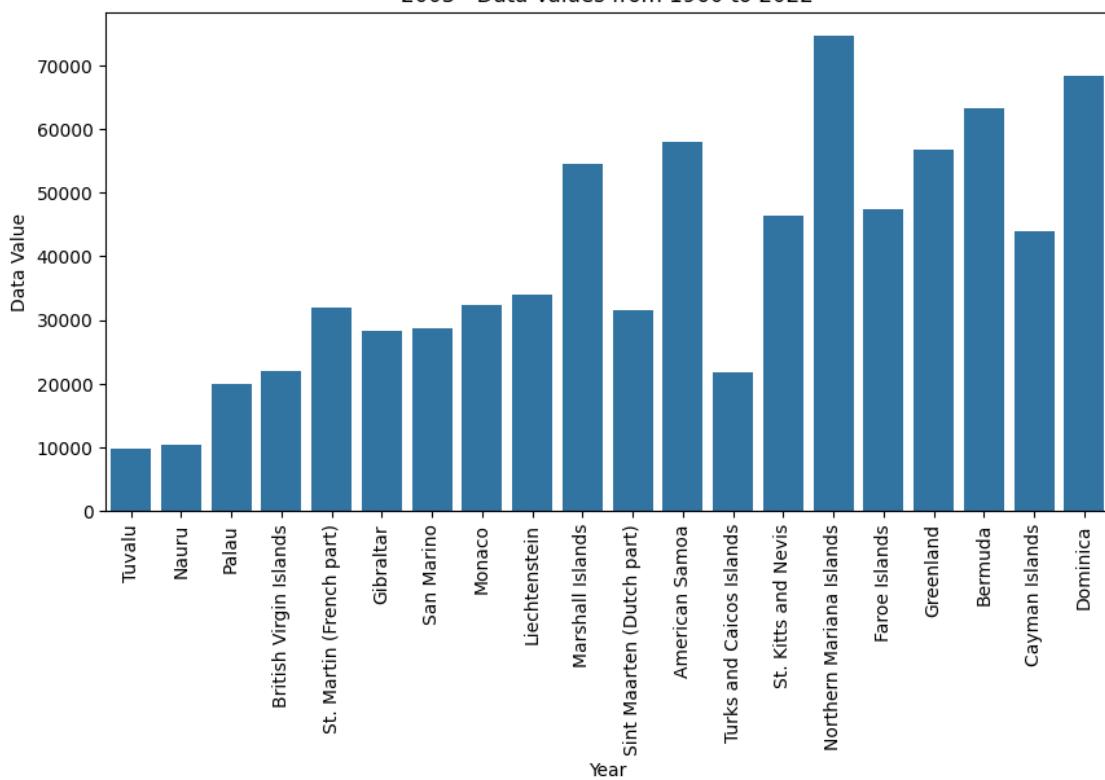


2001 - Data Values from 1960 to 2022

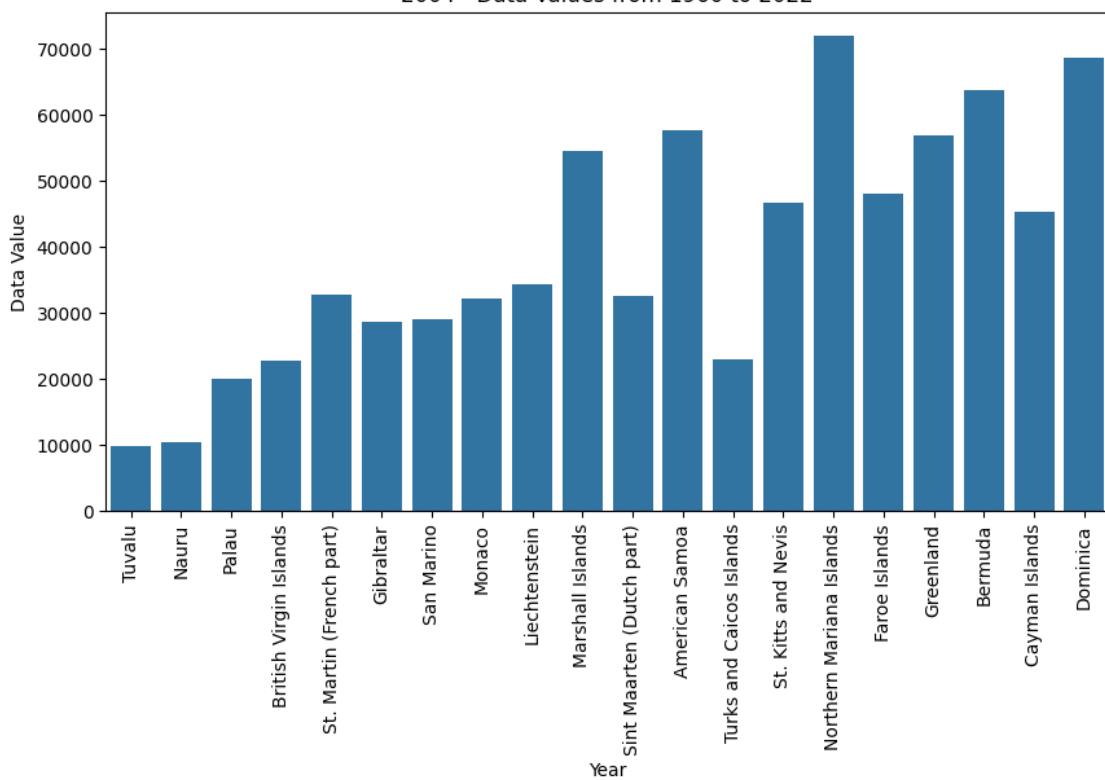




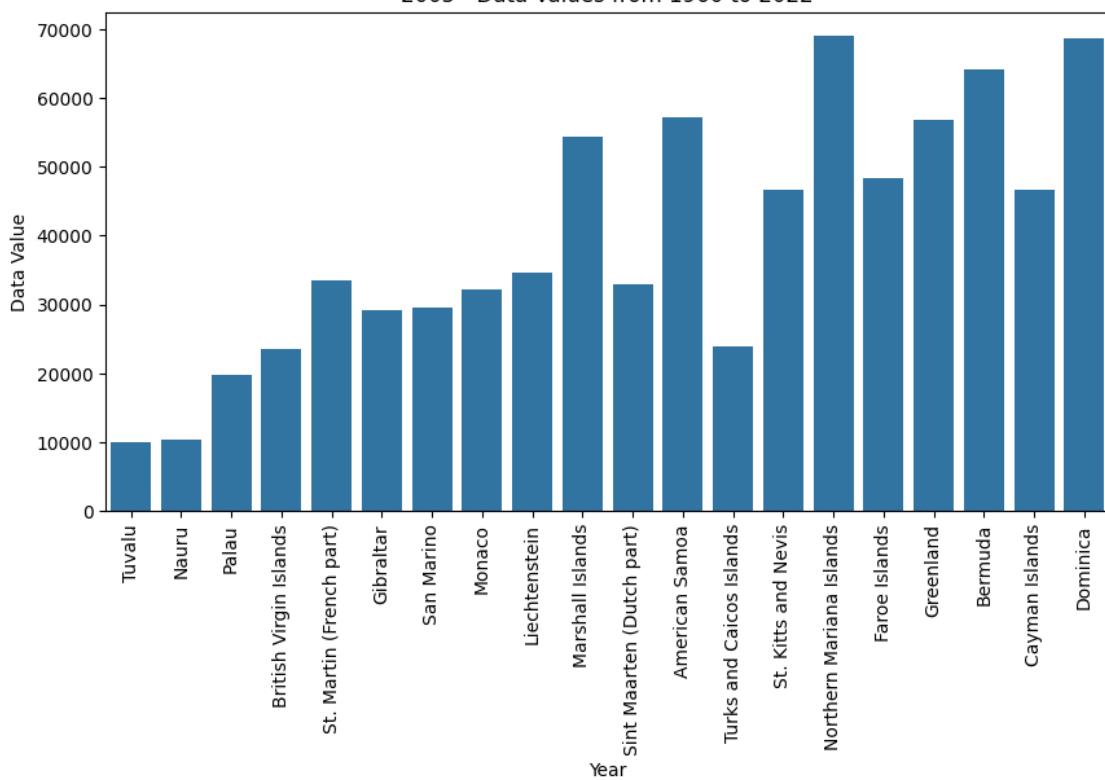
2003 - Data Values from 1960 to 2022



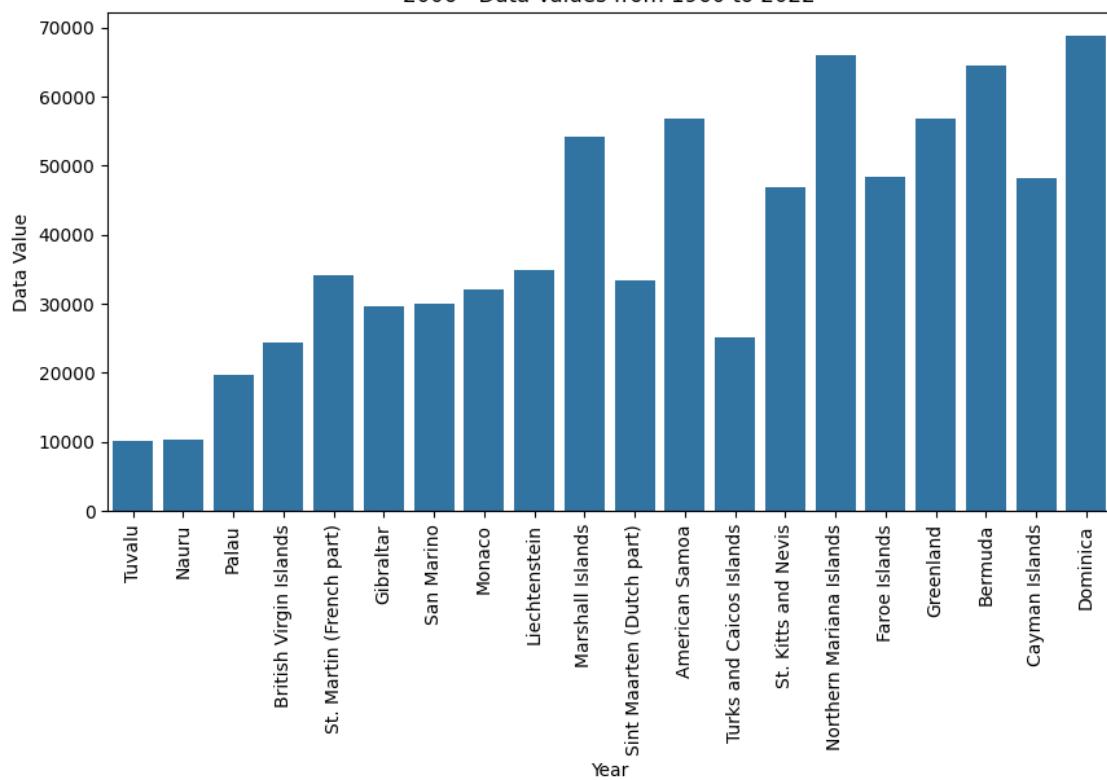
2004 - Data Values from 1960 to 2022



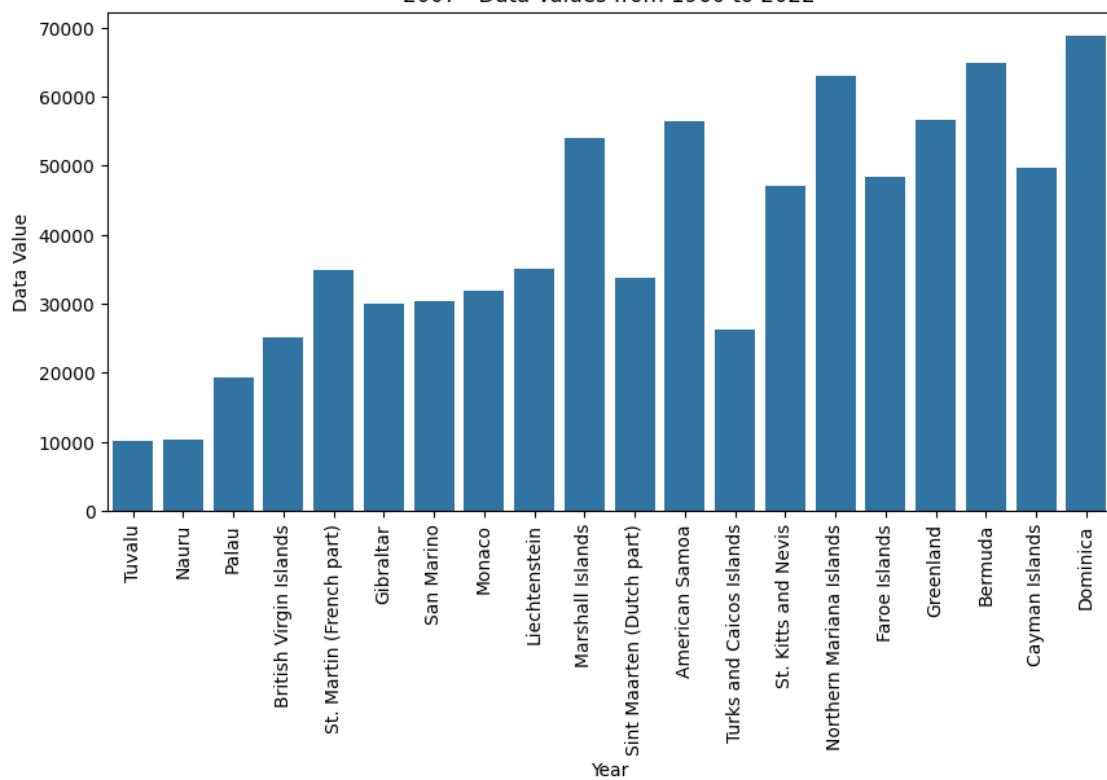
2005 - Data Values from 1960 to 2022



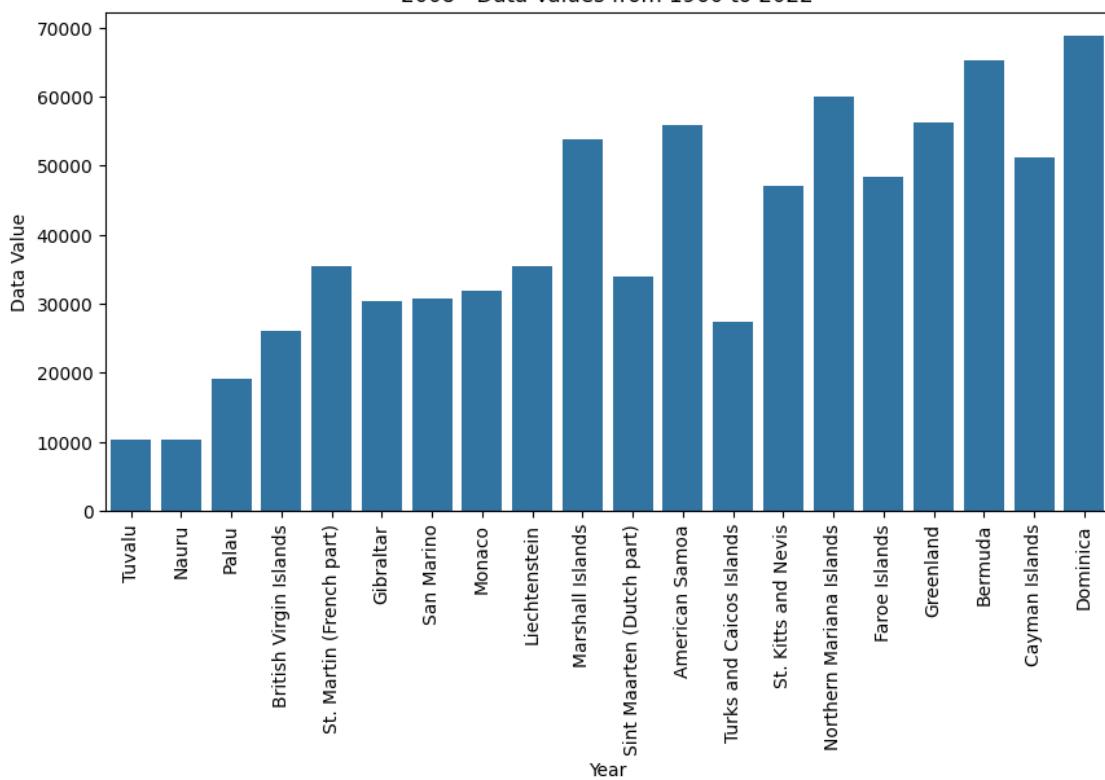
2006 - Data Values from 1960 to 2022



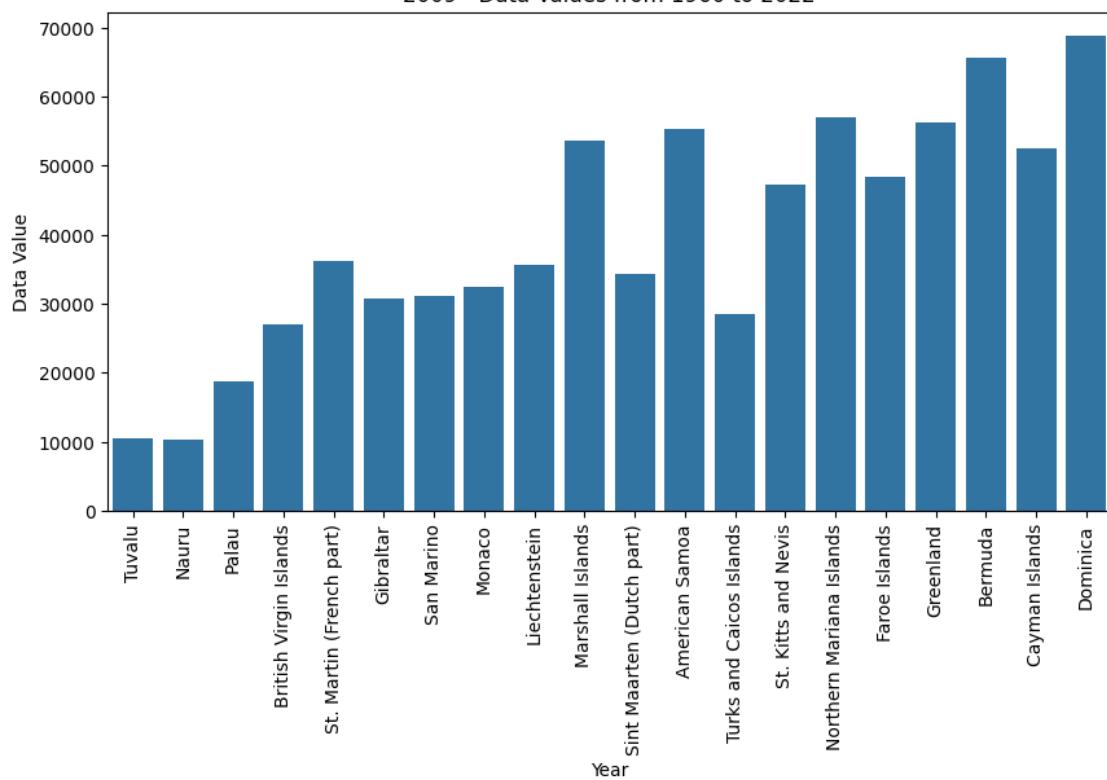
2007 - Data Values from 1960 to 2022



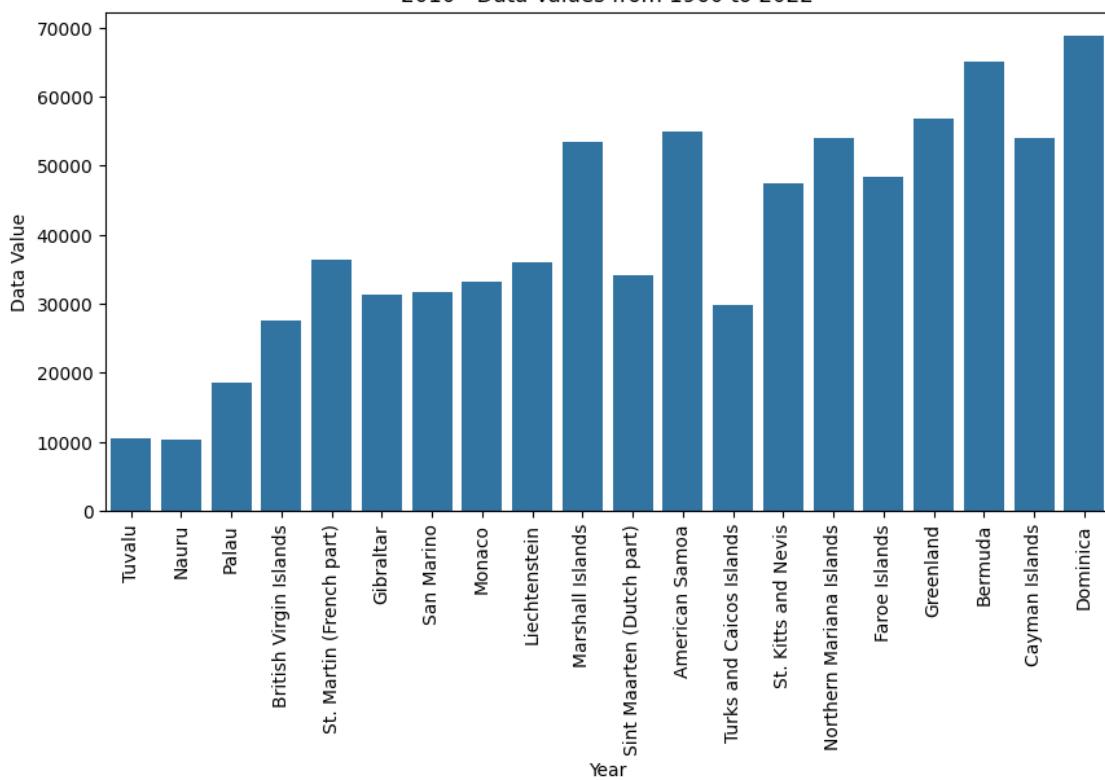
2008 - Data Values from 1960 to 2022



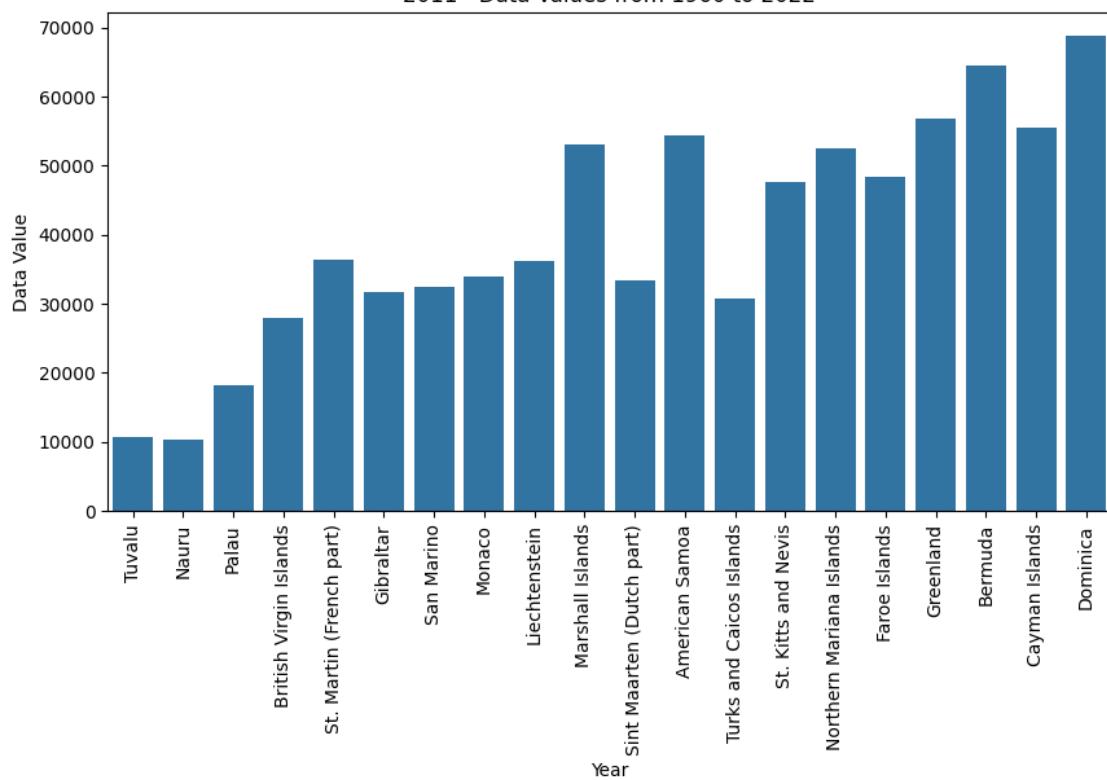
2009 - Data Values from 1960 to 2022



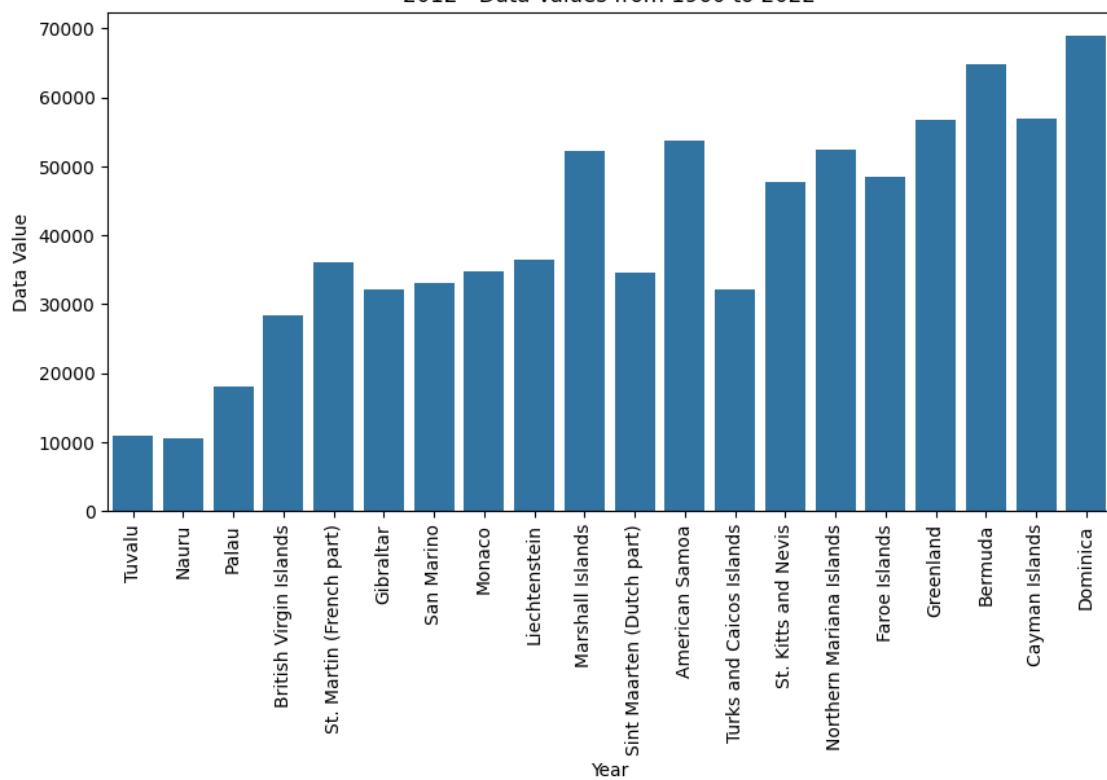
2010 - Data Values from 1960 to 2022



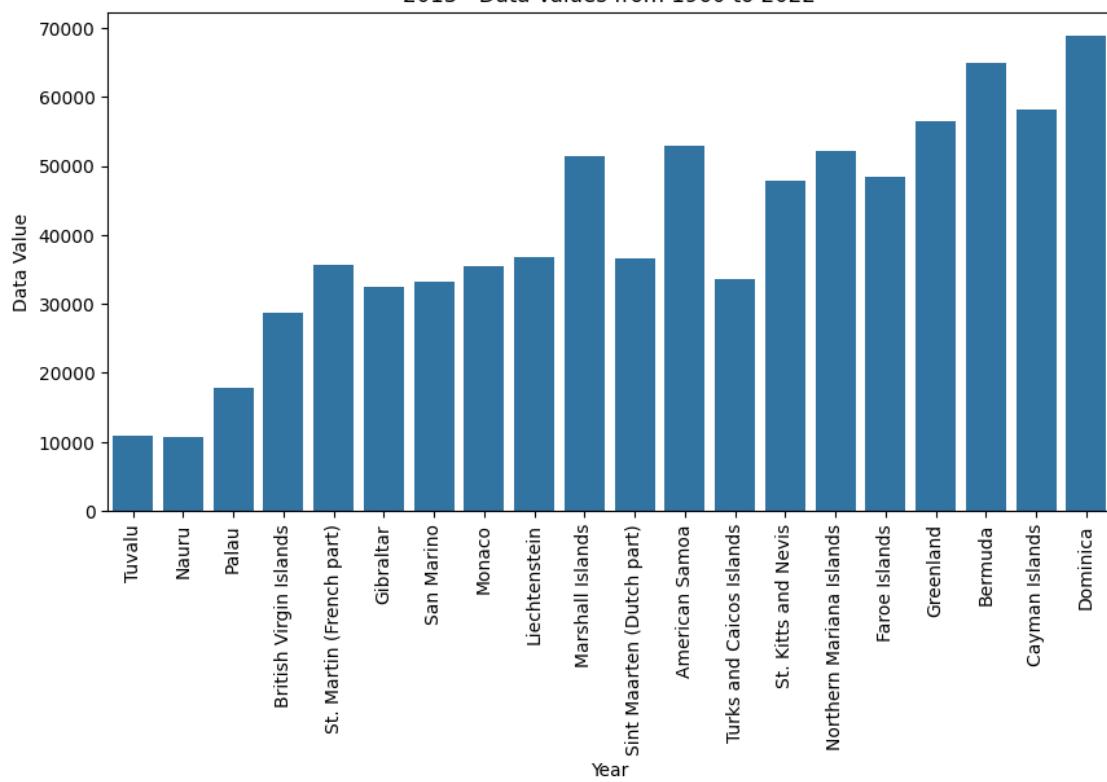
2011 - Data Values from 1960 to 2022



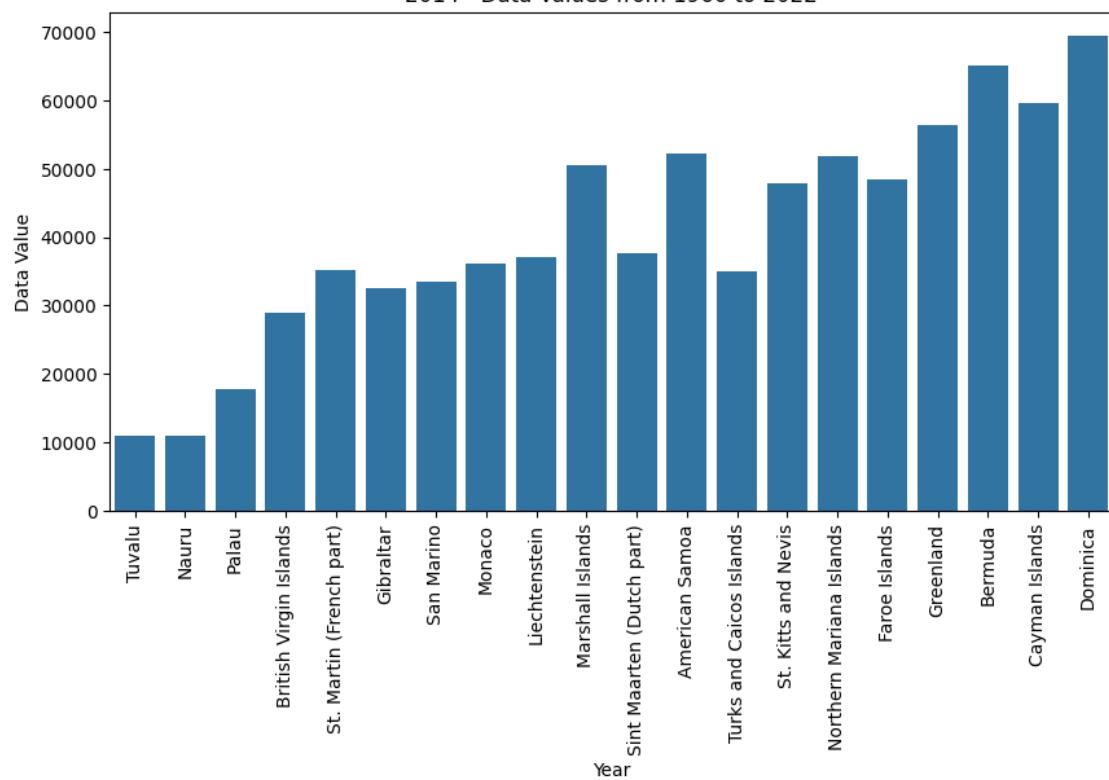
2012 - Data Values from 1960 to 2022



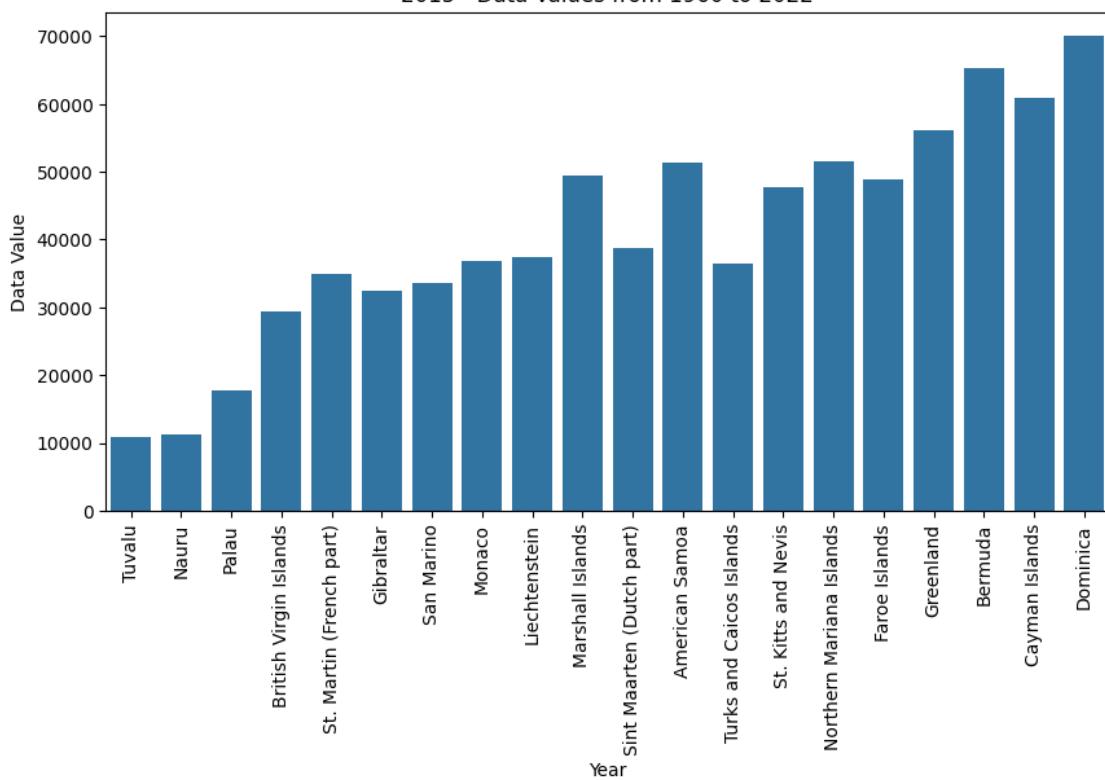
2013 - Data Values from 1960 to 2022



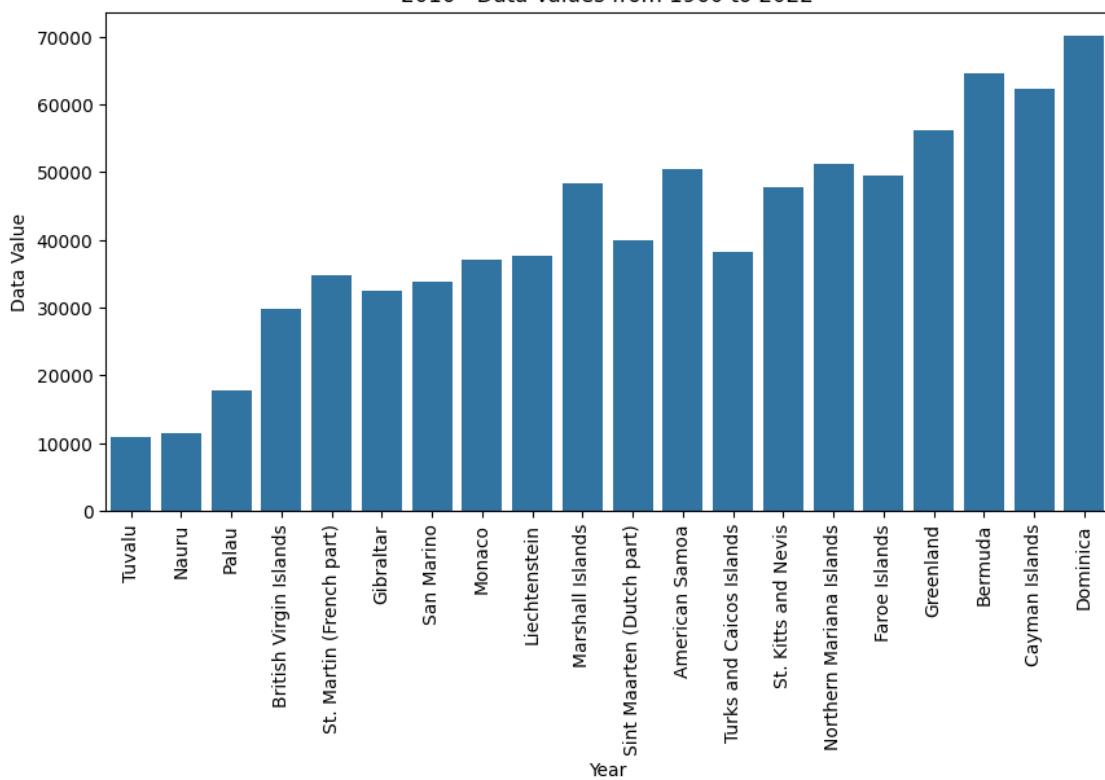
2014 - Data Values from 1960 to 2022



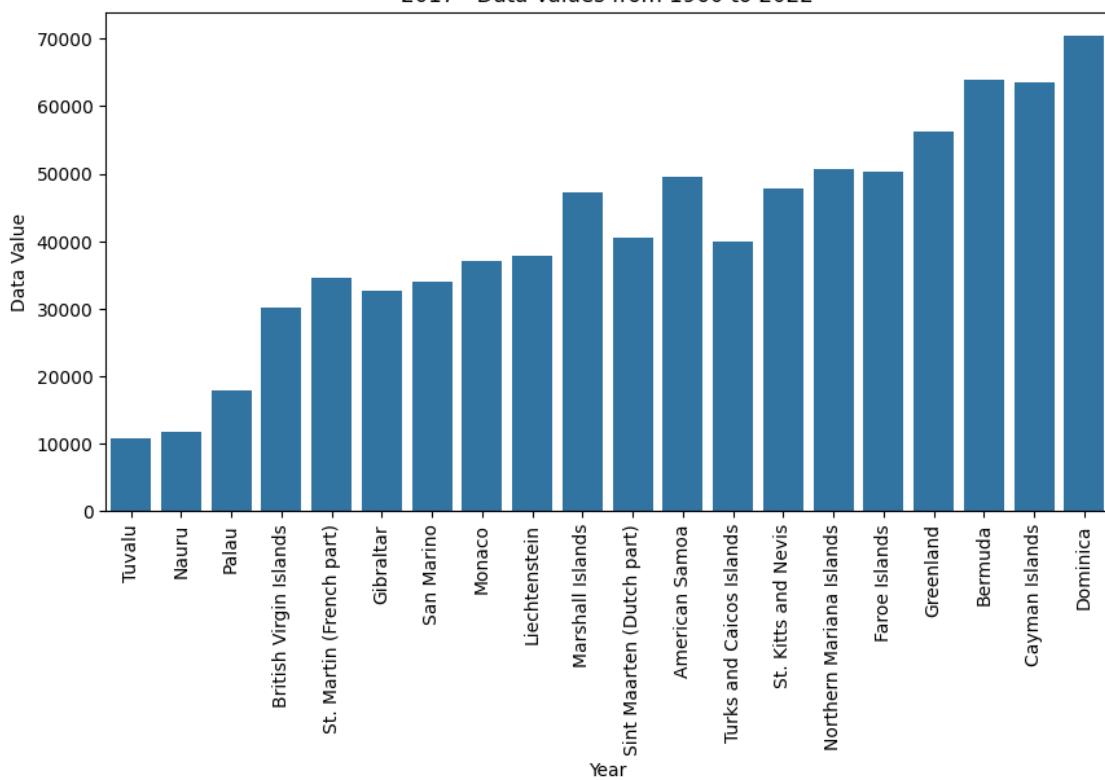
2015 - Data Values from 1960 to 2022



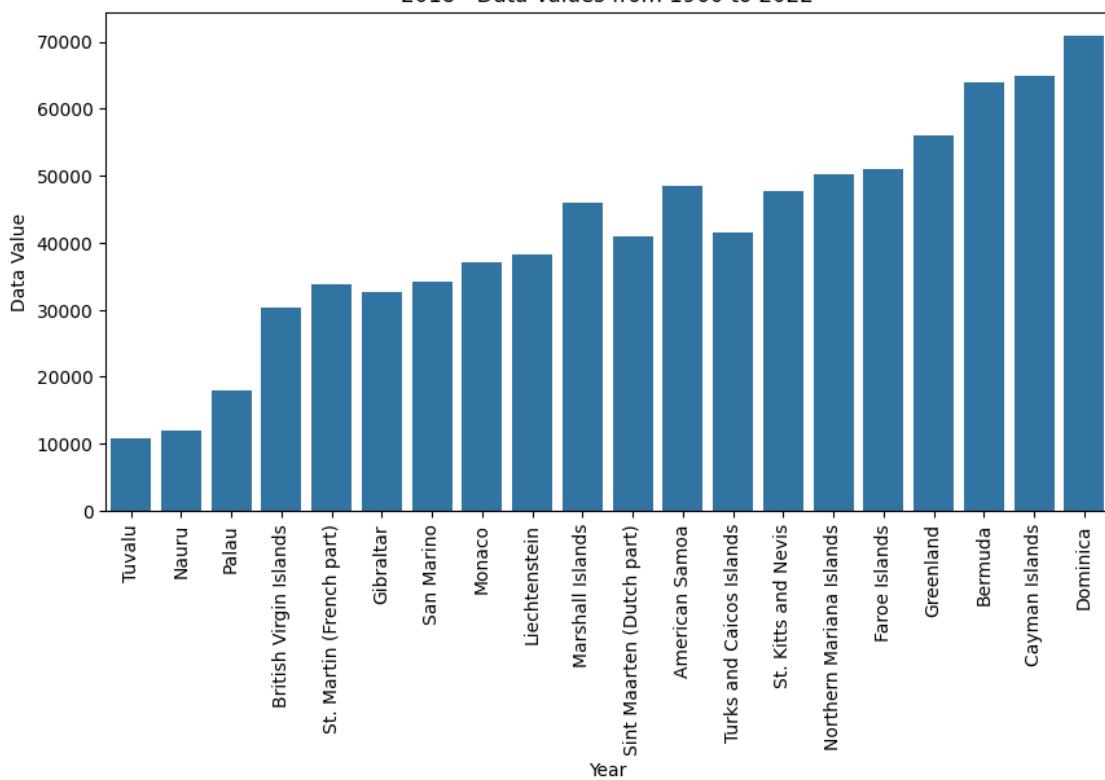
2016 - Data Values from 1960 to 2022



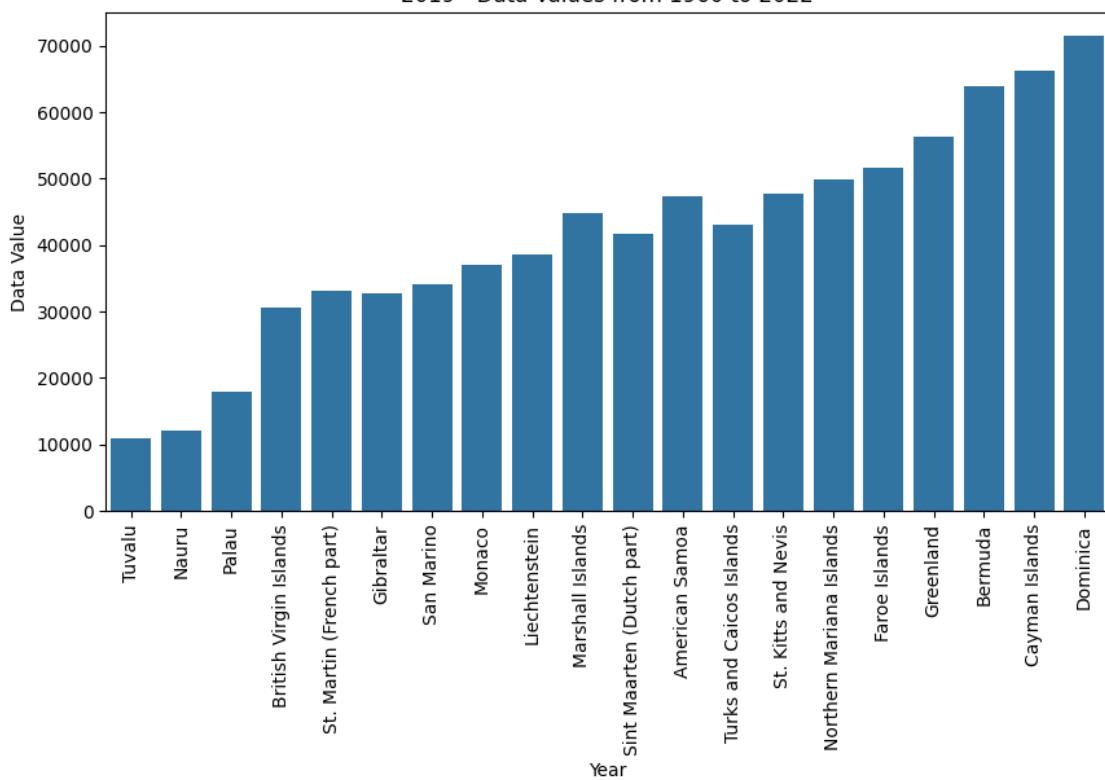
2017 - Data Values from 1960 to 2022



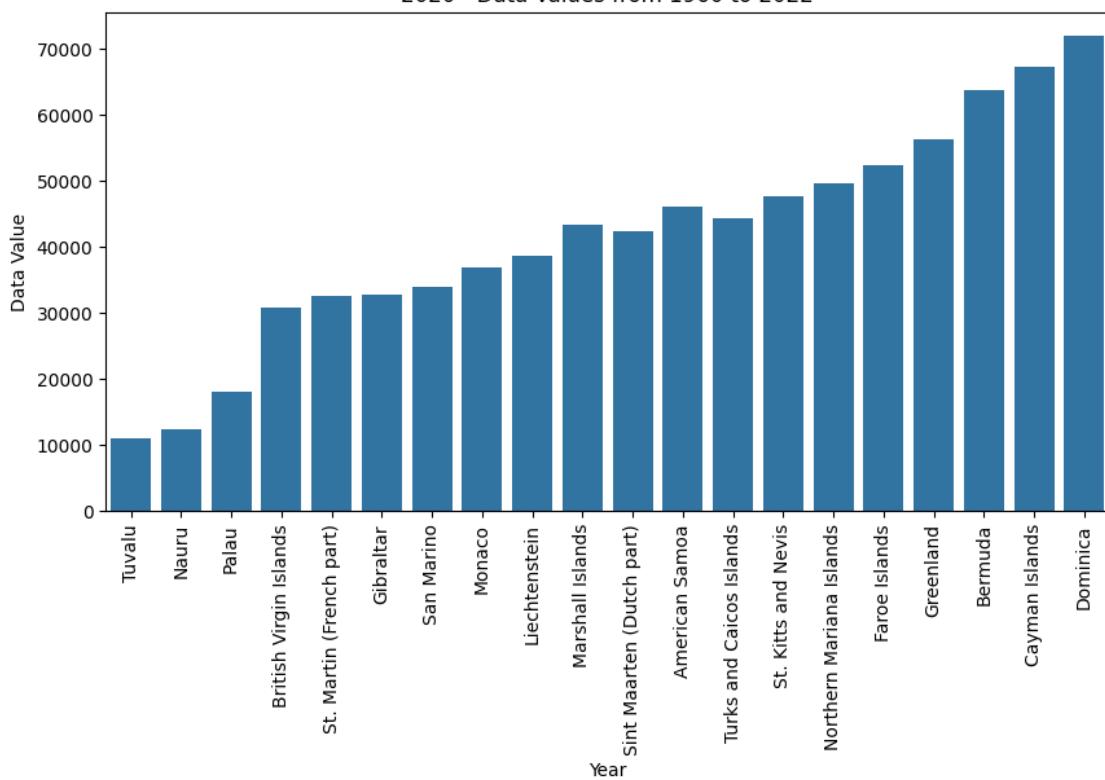
2018 - Data Values from 1960 to 2022



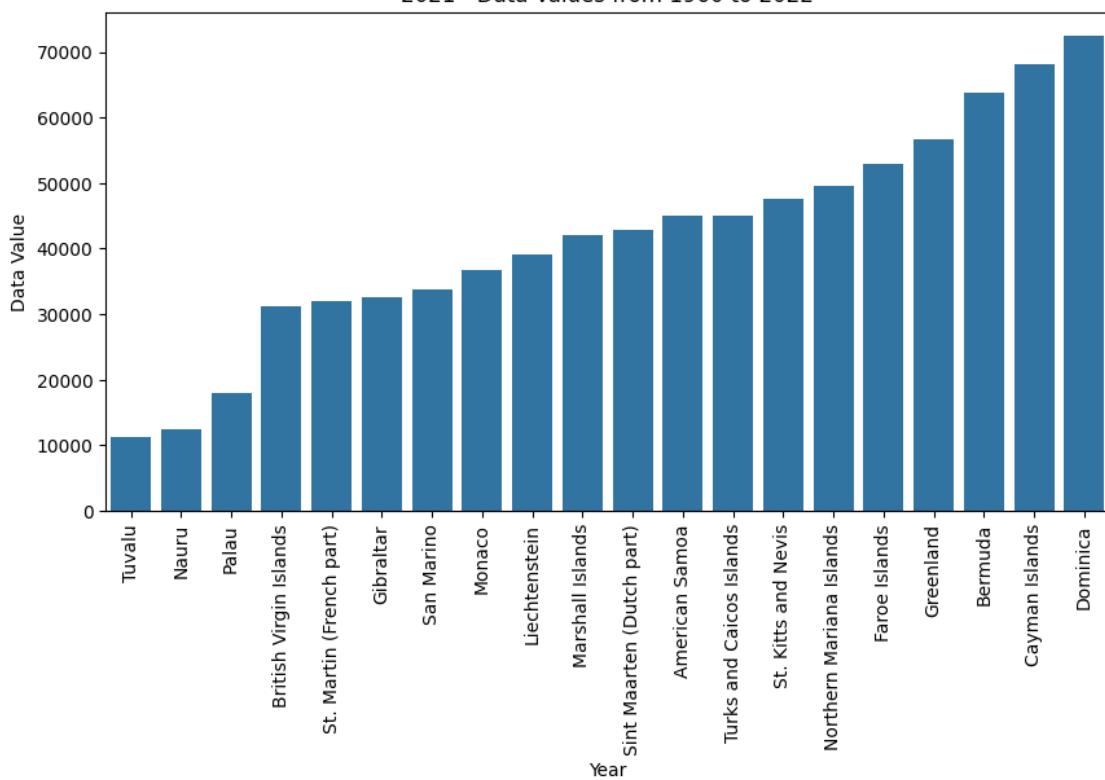
2019 - Data Values from 1960 to 2022



2020 - Data Values from 1960 to 2022



2021 - Data Values from 1960 to 2022



2022 - Data Values from 1960 to 2022

