```python
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
```

Line Graph

```python
from google.colab import files
uploaded = files.upload()
```

⤓ Choose Files gas_prices.csv
   • **gas_prices.csv**(text/csv) - 1092 bytes, last modified: 6/22/2025 - 100% done
   Saving gas_prices.csv to gas_prices (1).csv

```python
gas = pd.read_csv('gas_prices.csv')
print(gas)
```

```
    Year  Australia  Canada  France  Germany  Italy  Japan  Mexico  \
0   1990        NaN    1.87    3.63     2.65   4.59   3.16    1.00
1   1991       1.96    1.92    3.45     2.90   4.50   3.46    1.30
2   1992       1.89    1.73    3.56     3.27   4.53   3.58    1.50
3   1993       1.73    1.57    3.41     3.07   3.68   4.16    1.56
4   1994       1.84    1.45    3.59     3.52   3.70   4.36    1.48
5   1995       1.95    1.53    4.26     3.96   4.00   4.43    1.11
6   1996       2.12    1.61    4.41     3.94   4.39   3.64    1.25
7   1997       2.05    1.62    4.00     3.53   4.07   3.26    1.47
8   1998       1.63    1.38    3.87     3.34   3.84   2.82    1.49
9   1999       1.72    1.52    3.85     3.42   3.87   3.27    1.79
10  2000       1.94    1.86    3.80     3.45   3.77   3.65    2.01
11  2001       1.71    1.72    3.51     3.40   3.57   3.27    2.20
12  2002       1.76    1.69    3.62     3.67   3.74   3.15    2.24
13  2003       2.19    1.99    4.35     4.59   4.53   3.47    2.04
14  2004       2.72    2.37    4.99     5.24   5.29   3.93    2.03
15  2005       3.23    2.89    5.46     5.66   5.74   4.28    2.22
16  2006       3.54    3.26    5.88     6.03   6.10   4.47    2.31
17  2007       3.85    3.59    6.60     6.88   6.73   4.49    2.40
18  2008       4.45    4.08    7.51     7.75   7.63   5.74    2.45

    South Korea    UK   USA
0          2.05  2.82  1.16
1          2.49  3.01  1.14
2          2.65  3.06  1.13
3          2.88  2.84  1.11
4          2.87  2.99  1.11
5          2.94  3.21  1.15
6          3.18  3.34  1.23
7          3.34  3.83  1.23
8          3.04  4.06  1.06
9          3.80  4.29  1.17
10         4.18  4.58  1.51
11         3.76  4.13  1.46
12         3.84  4.16  1.36
13         4.11  4.70  1.59
14         4.51  5.56  1.88
15         5.28  5.97  2.30
16         5.92  6.36  2.59
17         6.21  7.13  2.80
18         5.83  7.42  3.27
```

```python
plt.title('Gas Prices Over Time in USD')
plt.xlabel('Year')
plt.ylabel('Price')
plt.plot(gas.Year,gas.USA)
plt.plot(gas.Year,gas.Canada)
plt.plot(gas.Year,gas['South Korea'])
print(gas.Year)
plt.legend(['USA','Canada','South Korea'])
plt.show()
```

```
0      1990
1      1991
2      1992
3      1993
4      1994
5      1995
6      1996
7      1997
8      1998
9      1999
10     2000
11     2001
12     2002
13     2003
14     2004
15     2005
16     2006
17     2007
18     2008
Name: Year, dtype: int64
```
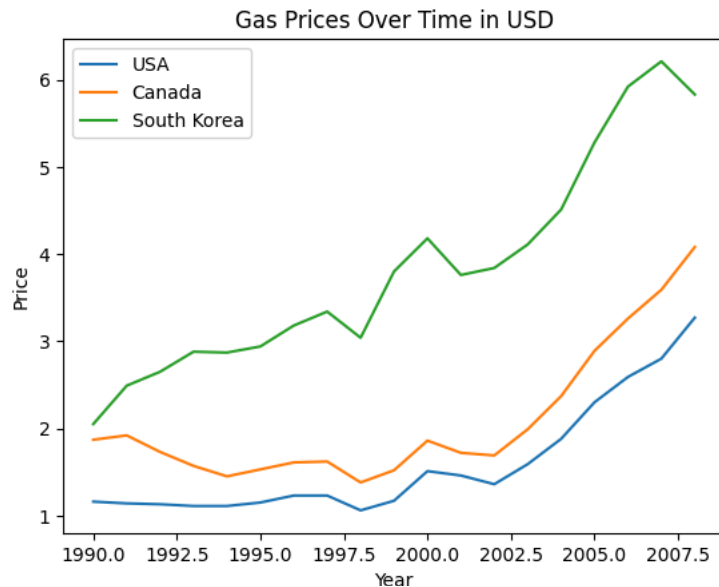

Histogram Example

Let's create a histogram showing the distribution of values for a specific year (2008):
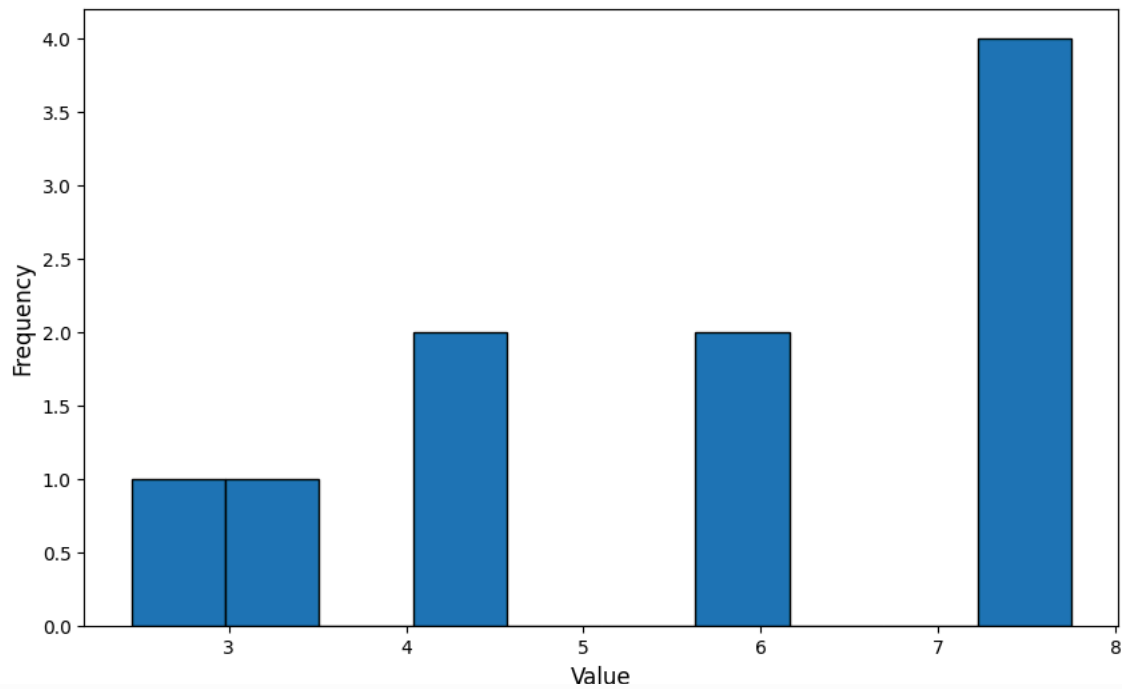
```python
plt.figure(figsize=(10, 6))
data_2008 = gas[gas['Year'] == 2008].iloc[:, 1:].values.flatten()
plt.hist(data_2008, bins=10, edgecolor='black')
plt.title('Distribution of Values Across Countries in 2008', fontsize=14)
plt.xlabel('Value', fontsize=12)
plt.ylabel('Frequency', fontsize=12)
plt.show()
```

Distribution of Values Across Countries in 2008

Pie Chart #1

Let's create a pie chart showing the proportion of values for selected countries in 2005:

```
plt.figure(figsize=(8, 8))
countries_pie = ['USA', 'UK', 'Japan', 'Germany', 'France', 'Italy']
values_2005 = gas[gas['Year'] == 2005][countries_pie].values.flatten()
plt.pie(values_2005, labels=countries_pie, autopct='%1.1f%%', startangle=90)
plt.title('Proportion of Values for Selected Countries in 2005', fontsize=14)
plt.legend(loc='upper left')
plt.show()
```


Proportion of Values for Selected Countries in 2005
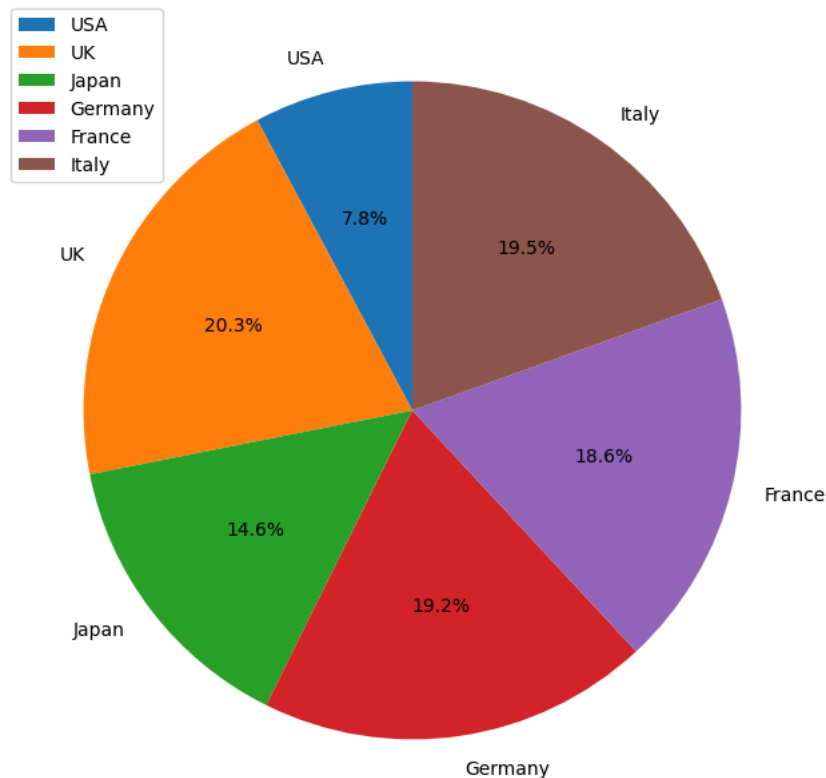
Pie Chart #2

Another pie chart showing the comparison between North American countries (USA, Canada, Mexico) in 2000:

```
plt.figure(figsize=(8, 8))
na_countries = ['USA', 'Canada', 'Mexico']
values_2000 = gas[gas['Year'] == 2000][na_countries].values.flatten()
plt.pie(values_2000, labels=na_countries, autopct='%1.1f%%',
        explode=(0.1, 0, 0), shadow=True)
plt.title('Comparison of North American Countries in 2000', fontsize=14)
plt.legend(loc='upper left')
plt.show()
```
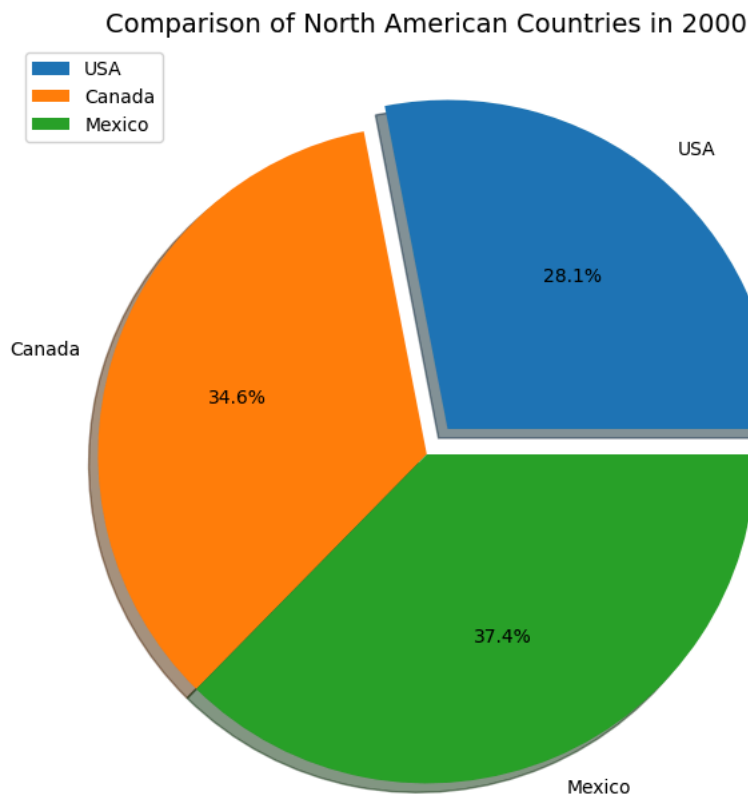

Box & Whisker Plot

Let's create a box plot showing the distribution of values across all countries for the entire period:

```
import seaborn as sns


plt.figure(figsize=(12, 6))
# Exclude Year column and melt the dataframe
melted_gas = gas.melt(id_vars=['Year'], var_name='Country', value_name='Value')
sns.boxplot(x='Country', y='Value', data=melted_gas)
plt.title('Distribution of Values Across All Countries (1990-2008)', fontsize=14)
plt.xlabel('Country', fontsize=12)
plt.ylabel('Value', fontsize=12)
plt.xticks(rotation=45)
plt.show()
```

Distribution of Values Across All Countries (1990-2008)

Heatmap

showing the correlation between countries:
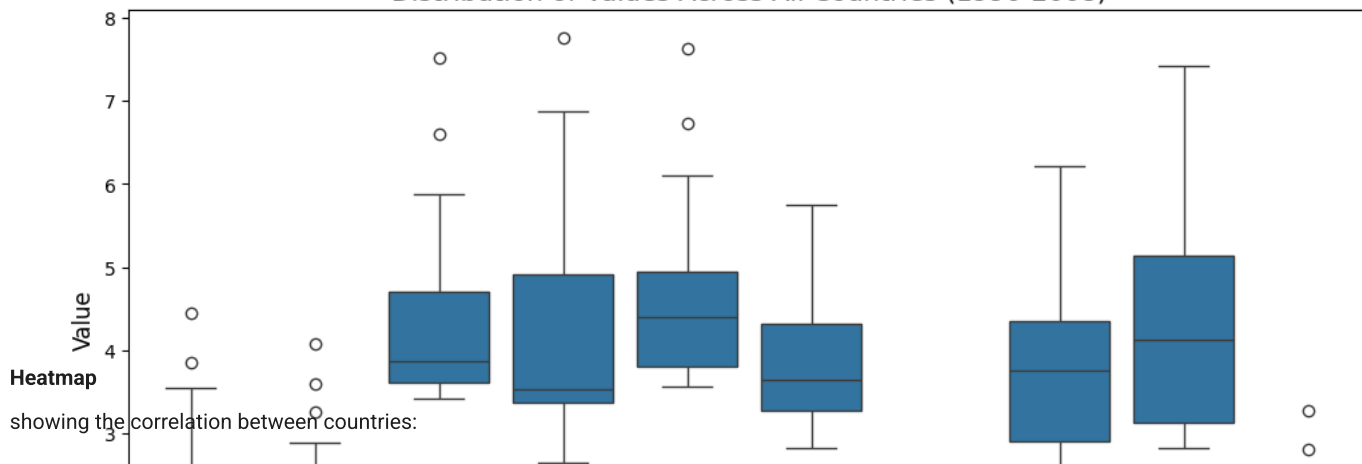
```
plt.figure(figsize=(10, 8))
correlation = gas.corr()
sns.heatmap(correlation, annot=True, cmap='coolwarm')
plt.title('Correlation Between Countries', fontsize=14)
plt.show()
```

Correlation Between Countries