EDA on Sustainable Companies Driving Green Initiatives

In [1]:

```python
import pandas as pd
import numpy as np

import seaborn as sns
import matplotlib.pyplot as plt

import matplotlib.cm as cm
import matplotlib.colors as mcolors
```

In [2]:

```python
df = pd.read_csv("most sustainable corporations.csv", encoding='ISO-8859-1')
```

In [3]:

```python
df.head()
```

Out[3]:

	Rank	Previous Rank	Company	Location	Industry	Revenue	Profit %	CEO Pay Ratio	Women on Board %	Women in Leadership %	Women i Workforc %
0	1	14	Sims Ltd	Mascot, Australia	Waste management	$ 38,525	16%	36:1	38%	100%	100%
1	2	3	Brambles Ltd	Sydney, Australia	Furniture and general manufacturing	$ 123,791	12%	61:1	36%	100%	100%
2	3	2	Vestas Wind Systems A/S	Aarhus, Denmark	Machinery manufacturing	$ 141,969	19%	70:1	42%	100%	100%
3	4	9	Taiwan High Speed Rail Corp	Taipei, Taiwan	Transit and ground transportation	$ 7,698	0%	11:1	15%	100%	100%
4	5	NaN	Nordex SE	Hamburg, Germany	Machinery manufacturing	$ 160,887	73%	82:1	33%	100%	100%

In [4]:

```python
df.columns
```

Out[4]:

```
Index(['Rank', 'Previous Rank', 'Company', 'Location', 'Industry', 'Revenue',
       'Profit %', 'CEO Pay Ratio', 'Women on Board %',
       'Women in Leadership %', 'Women in Workforce %', 'Climate Grade',
       'Sustainability Initiatives'],
      dtype='object')
```

In [5]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 13 columns):
 #   Column                      Non-Null Count  Dtype 
---  ------                      --------------  ----- 
 0   Rank                        100 non-null    int64 
 1   Previous Rank               68 non-null     object
 2   Company                     100 non-null    object
 3   Location                    100 non-null    object
 4   Industry                    100 non-null    object
 5   Revenue                     96 non-null     object
 6   Profit %                    100 non-null    object
 7   CEO Pay Ratio               82 non-null     object
 8   Women on Board %            100 non-null    object
 9   Women in Leadership %       100 non-null    object
 10  Women in Workforce %        100 non-null    object
 11  Climate Grade               99 non-null     object
 12  Sustainability Initiatives  73 non-null     object
dtypes: int64(1), object(12)
memory usage: 10.3+ KB
```

In [6]:

```python
# Converting Revenue to numeric
df['Revenue'] = df['Revenue'].replace('[\$,]', '', regex=True).astype(float)

# Converting Profit % to numeric
df['Profit %'] = df['Profit %'].replace('%', '', regex=True).astype(float)

# Converting percentage columns to numeric
df['Women on Board %'] = df['Women on Board %'].replace('%', '', regex=True).astype(floa
t)
df['Women in Leadership %'] = df['Women in Leadership %'].replace('%', '', regex=True).a
stype(float)
df['Women in Workforce %'] = df['Women in Workforce %'].replace('%', '', regex=True).ast
ype(float)

# Converting Previous Rank to numeric
df['Previous Rank'] = pd.to_numeric(df['Previous Rank'], errors='coerce')

df.head()
```

Out[6]:

	Rank	Previous Rank	Company	Location	Industry	Revenue	Profit %	CEO Pay Ratio	Women on Board %	Women in Leadership %	Women i Workforc %
0	1	14.0	Sims Ltd	Mascot, Australia	Waste management	38525.0	16.0	36:1	38.0	100.0	100.
1	2	3.0	Brambles Ltd	Sydney, Australia	Furniture and general manufacturing	123791.0	12.0	61:1	36.0	100.0	100.
2	3	2.0	Vestas Wind Systems A/S	Aarhus, Denmark	Machinery manufacturing	141969.0	19.0	70:1	42.0	100.0	100.
3	4	9.0	Taiwan High Speed Rail Corp	Taipei, Taiwan	Transit and ground transportation	7698.0	0.0	11:1	15.0	100.0	100.
4	5	NaN	Nordex SE	Hamburg, Germany	Machinery manufacturing	160887.0	73.0	82:1	33.0	100.0	100.

In [7]:

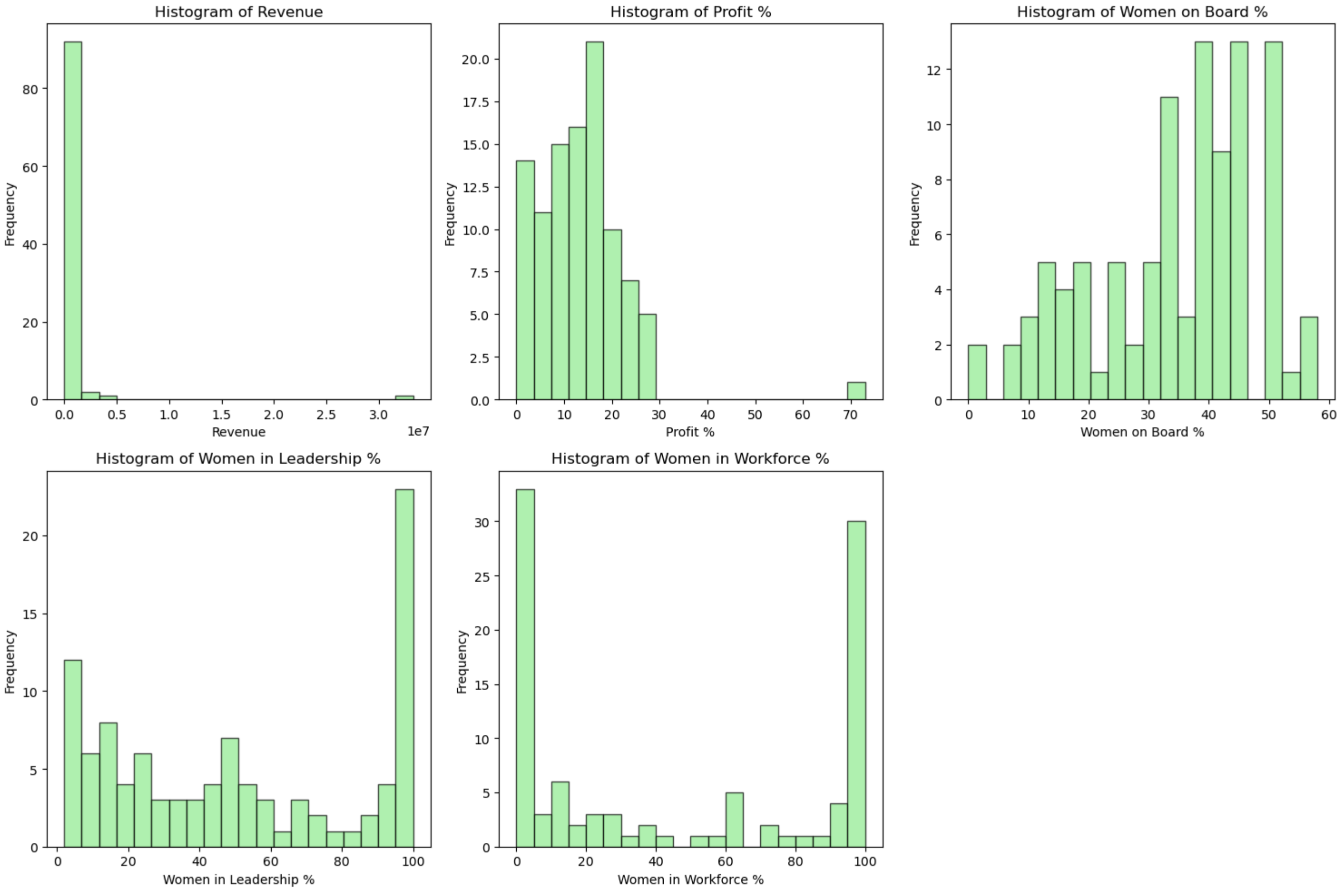
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 13 columns):
 #   Column                      Non-Null Count  Dtype  
---  ------                      --------------  -----  
 0   Rank                        100 non-null    int64  
 1   Previous Rank               67 non-null     float64
 2   Company                     100 non-null    object 
 3   Location                    100 non-null    object 
 4   Industry                    100 non-null    object 
 5   Revenue                     96 non-null     float64
 6   Profit %                    100 non-null    float64
 7   CEO Pay Ratio               82 non-null     object 
 8   Women on Board %            100 non-null    float64
 9   Women in Leadership %       100 non-null    float64
 10  Women in Workforce %        100 non-null    float64
 11  Climate Grade               99 non-null     object 
 12  Sustainability Initiatives  73 non-null     object 
dtypes: float64(6), int64(1), object(6)
memory usage: 10.3+ KB
```

EDA Begins

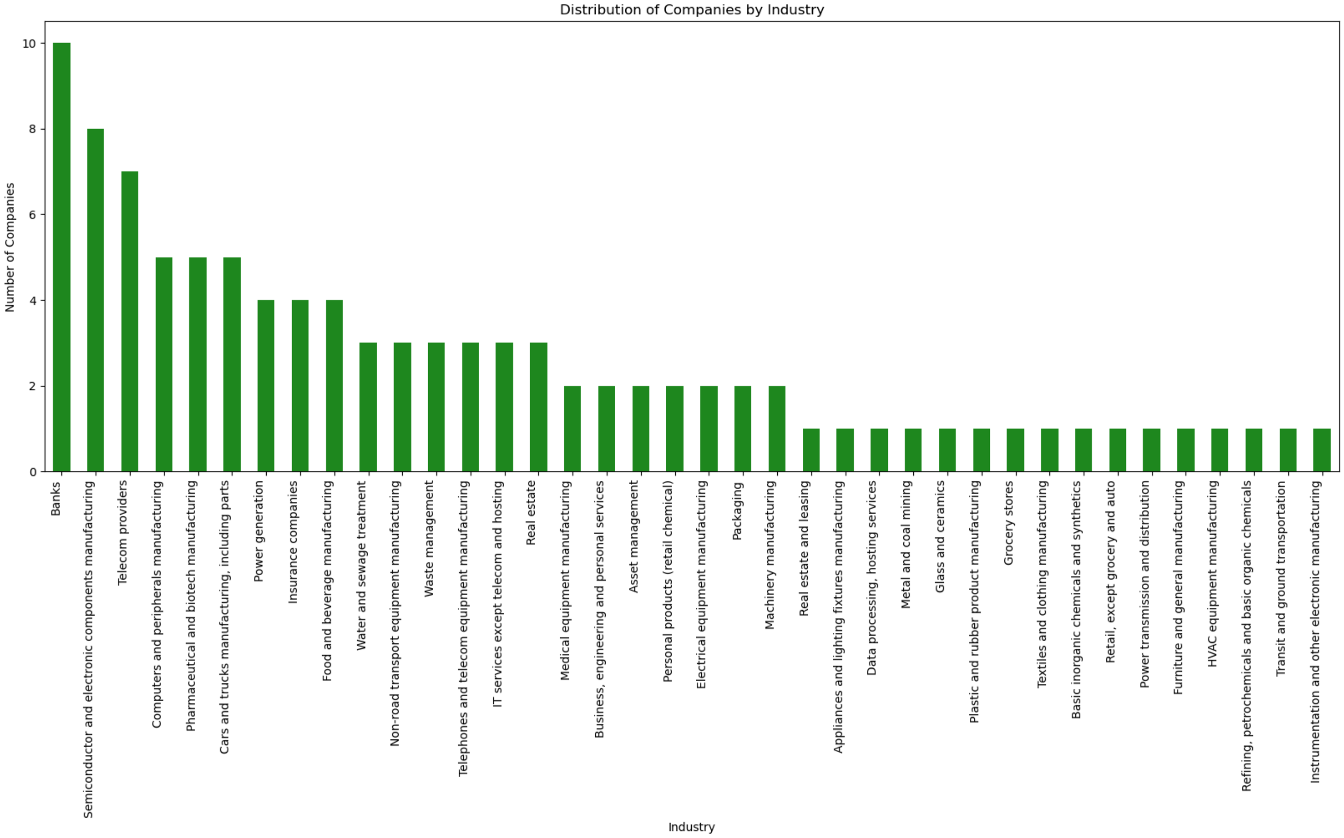
In [8]:

```
numerical_columns = ['Revenue', 'Profit %', 'Women on Board %', 'Women in Leadership %',
'Women in Workforce %']

plt.figure(figsize=(15, 10))
for i, col in enumerate(numerical_columns):
    plt.subplot(2, 3, i + 1)
    plt.hist(df[col].dropna(), bins=20, edgecolor='k', alpha=0.7, color = "lightgreen")
    plt.title(f'Histogram of {col}')
    plt.xlabel(col)
    plt.ylabel('Frequency')

plt.tight_layout()
plt.show()
```



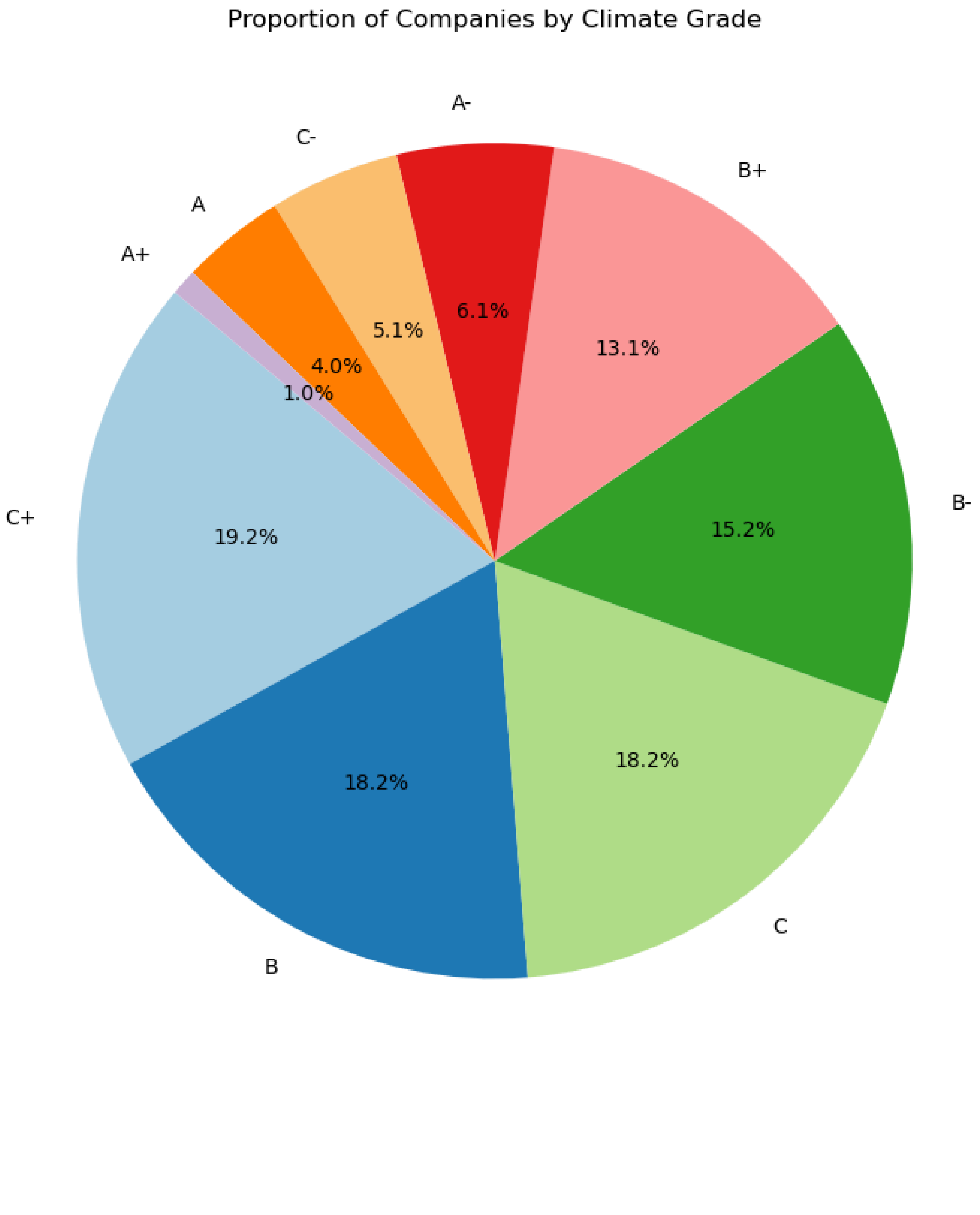
In [23]:

```
# Bar chart for Industry distribution
plt.figure(figsize=(20, 7))
df['Industry'].value_counts().plot(kind='bar', color='forestgreen')
plt.title('Distribution of Companies by Industry')
plt.xlabel('Industry')
plt.ylabel('Number of Companies')
plt.xticks(rotation=90, ha='right')
plt.show()
```



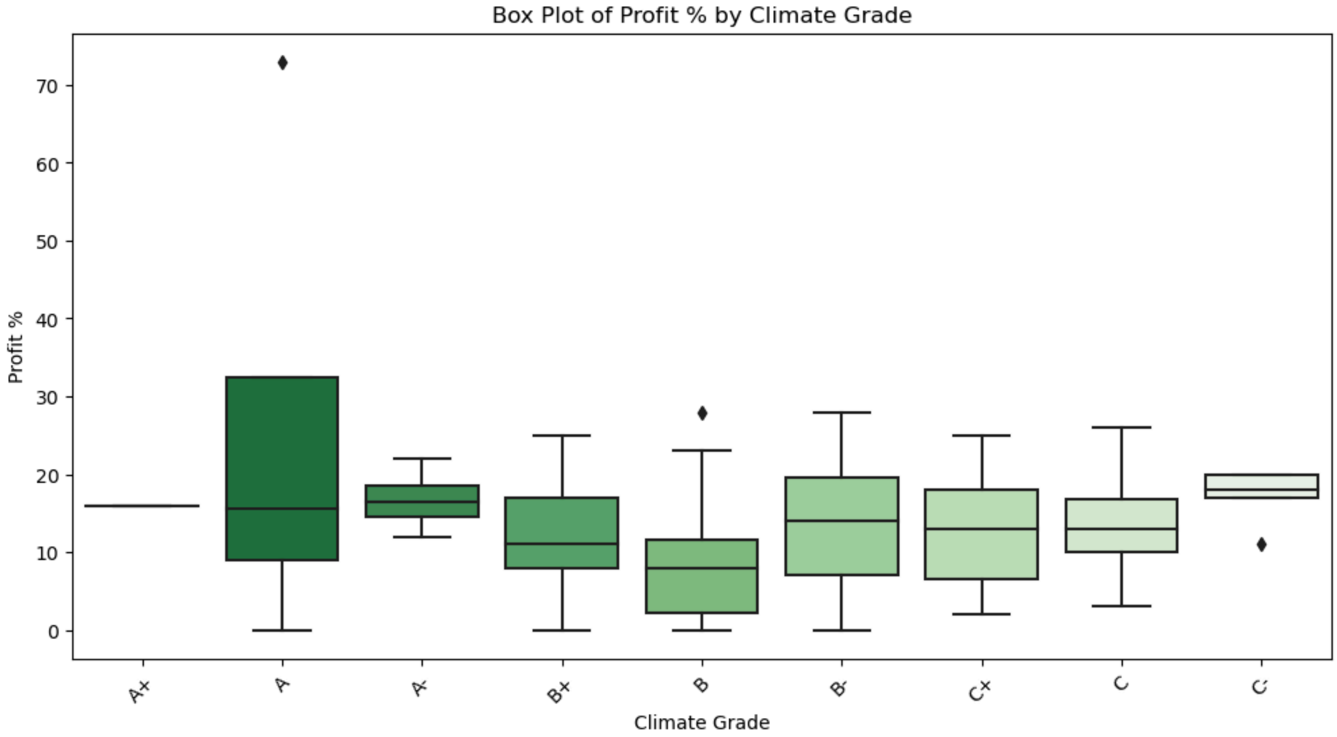
In [10]:

```
# Pie chart for Climate Grade distribution
plt.figure(figsize=(9, 16))
df['Climate Grade'].value_counts().plot(kind='pie', autopct='%1.1f%%', colors=plt.cm.Paired.colors, startangle=140)
plt.title('Proportion of Companies by Climate Grade')
plt.ylabel('')
plt.show()
```

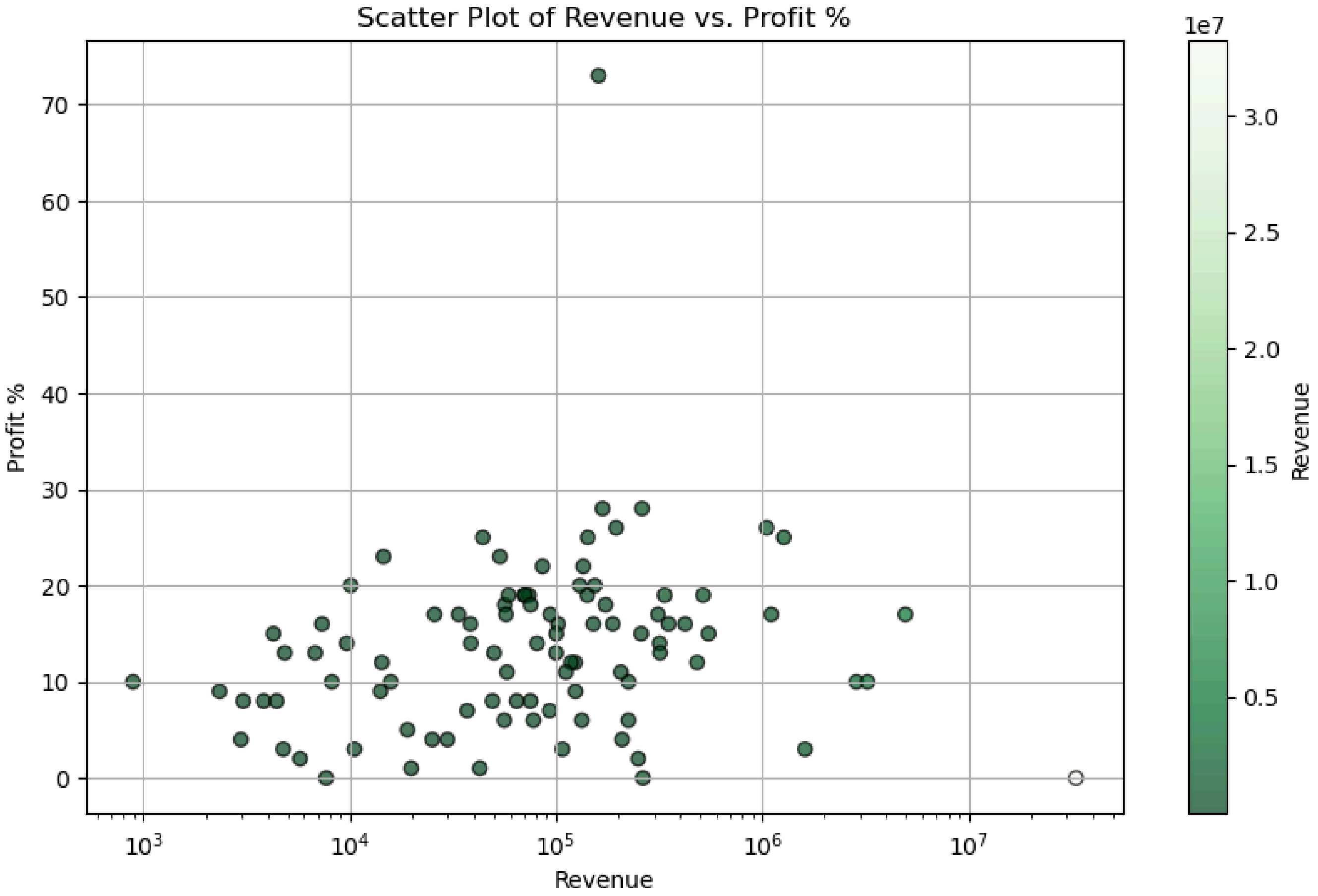


In [11]:

```
# Box plot for Profit % by Climate Grade
plt.figure(figsize=(12, 6))
sns.boxplot(x='Climate Grade', y='Profit %', data=df, palette='Greens_r')
plt.title('Box Plot of Profit % by Climate Grade')
plt.xlabel('Climate Grade')
plt.ylabel('Profit %')
plt.xticks(rotation=45)
plt.show()
```

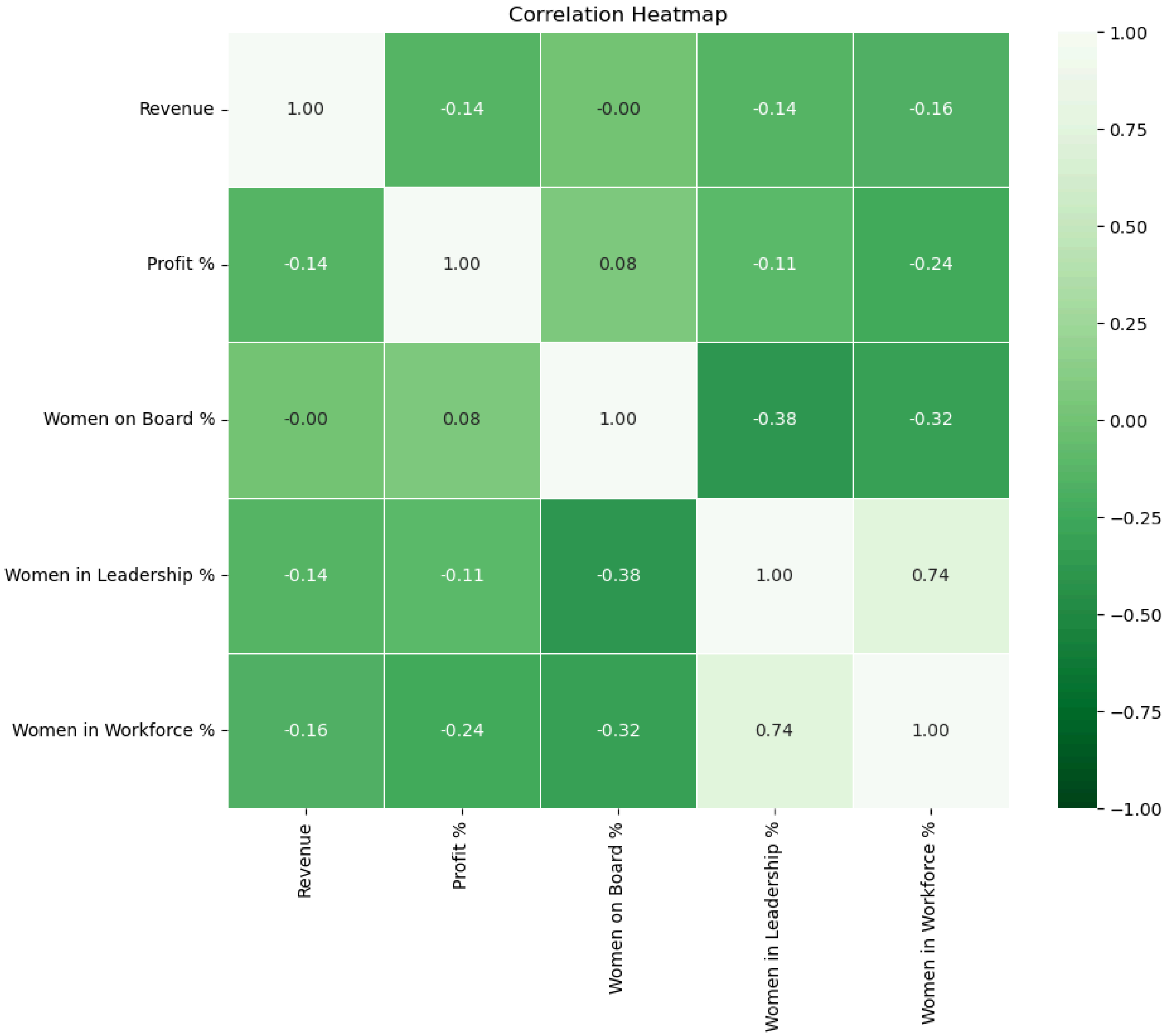


```
In [12]: # Normalizing values for color mapping
         norm_revenue = mcolors.Normalize(vmin=df['Revenue'].min(), vmax=df['Revenue'].max())
         norm_profit = mcolors.Normalize(vmin=df['Profit %'].min(), vmax=df['Profit %'].max())

         # colormap
         cmap_revenue = cm.ScalarMappable(norm=norm_revenue, cmap='viridis')
         cmap_profit = cm.ScalarMappable(norm=norm_profit, cmap='plasma')

         plt.figure(figsize=(10, 6))
         sc = plt.scatter(df['Revenue'], df['Profit %'], c=df['Revenue'], cmap='Greens_r', edgeco
         lors='k', alpha=0.7, norm=norm_revenue)
         plt.colorbar(sc, label='Revenue')
         plt.title('Scatter Plot of Revenue vs. Profit %')
         plt.xlabel('Revenue')
         plt.ylabel('Profit %')
         plt.xscale('log')
         plt.yscale('linear')
         plt.grid(True)
         plt.show()
```



In [13]:

```
# Correlation matrix
correlation_matrix = df[numerical_columns].corr()

# heatmap
plt.figure(figsize=(10, 8))
sns.heatmap(correlation_matrix, annot=True, cmap='Greens_r', vmin=-1, vmax=1, center=0,
fmt='.2f', linewidths=0.5)
plt.title('Correlation Heatmap')
plt.show()
```



In [14]:

```
df_revenue = df.dropna(subset=['Revenue'])

# Sorting by Revenue to get top 10
top_10_revenue = df_revenue.nlargest(10, 'Revenue')

print("Top 10 Companies by Revenue:")
top_10_revenue[['Company', 'Revenue']]
```

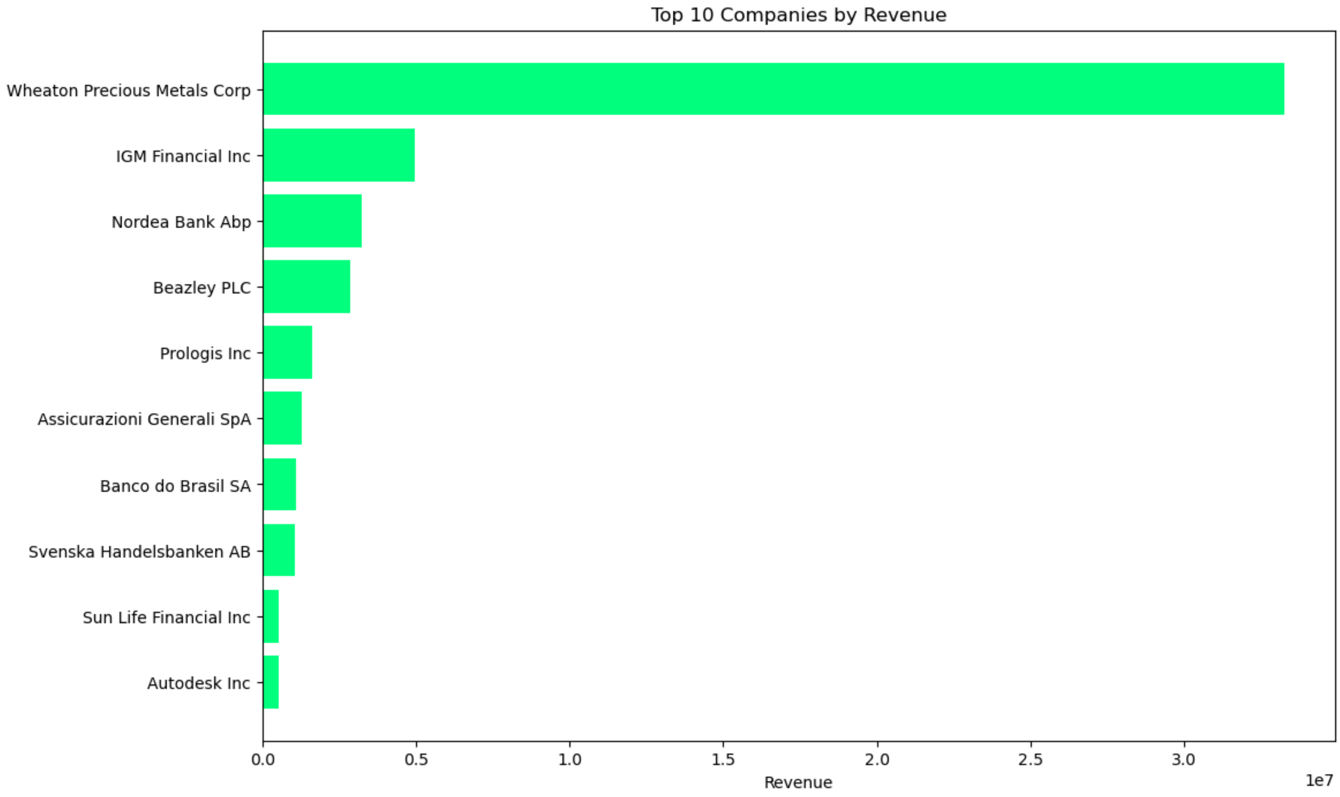
```
Top 10 Companies by Revenue:
```

Out[14]:

	Company	Revenue
25	Wheaton Precious Metals Corp	33251733.0
95	IGM Financial Inc	4947231.0
82	Nordea Bank Abp	3242058.0
36	Beazley PLC	2864982.0
86	Prologis Inc	1614690.0
90	Assicurazioni Generali SpA	1273258.0
5	Banco do Brasil SA	1106800.0
81	Svenska Handelsbanken AB	1052698.0
78	Sun Life Financial Inc	549255.0
10	Autodesk Inc	517478.0

In [15]:

```
plt.figure(figsize=(12, 8))
plt.barh(top_10_revenue['Company'], top_10_revenue['Revenue'], color='springgreen')
plt.xlabel('Revenue')
plt.title('Top 10 Companies by Revenue')
plt.gca().invert_yaxis()
plt.show()
```



In [16]:

```python
df_profit = df.dropna(subset=['Profit %'])

# Sorting by Profit % and to get top 10
top_10_profit = df_profit.nlargest(10, 'Profit %')

print("Top 10 Companies by Profit %:")
top_10_profit[['Company', 'Profit %']]
```

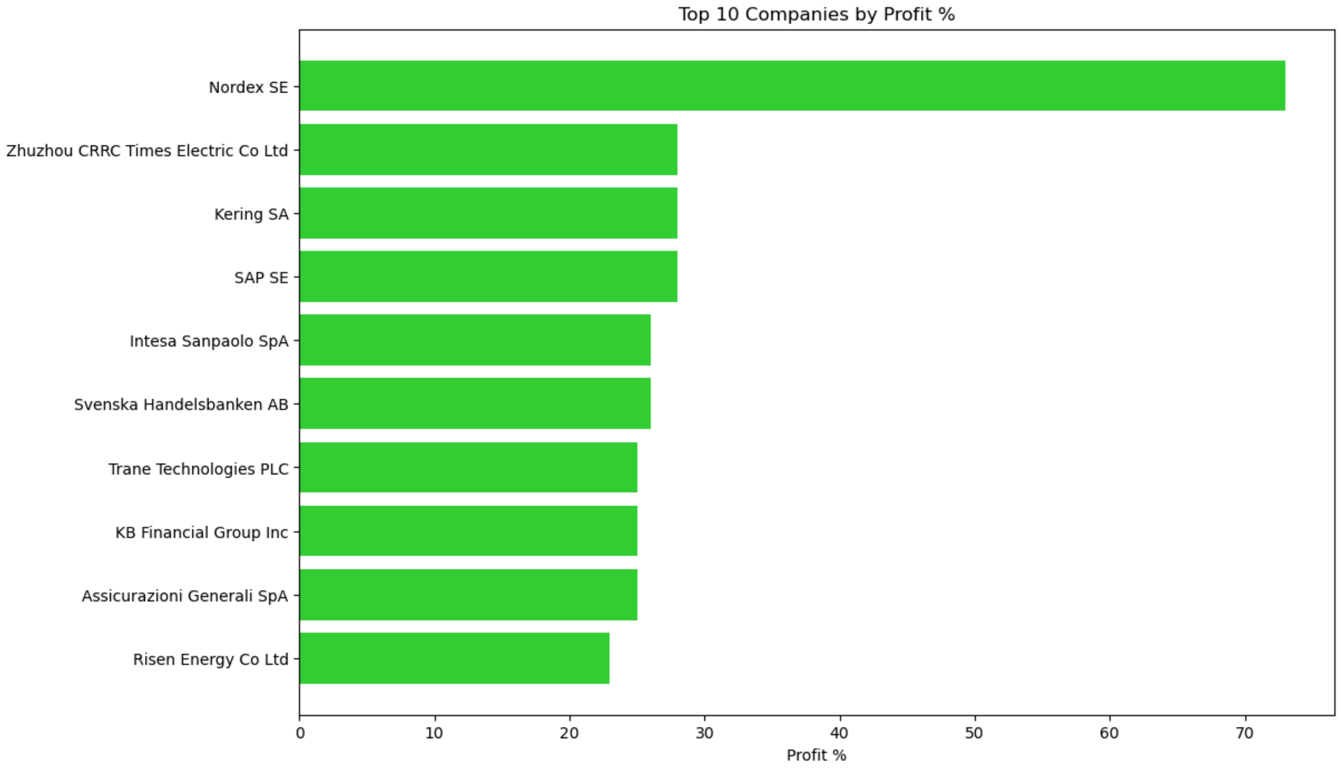
```
Top 10 Companies by Profit %:
```

Out[16]:

	Company	Profit %
4	Nordex SE	73.0
32	Zhuzhou CRRC Times Electric Co Ltd	28.0
44	Kering SA	28.0
47	SAP SE	28.0
56	Intesa Sanpaolo SpA	26.0
81	Svenska Handelsbanken AB	26.0
22	Trane Technologies PLC	25.0
64	KB Financial Group Inc	25.0
90	Assicurazioni Generali SpA	25.0
29	Risen Energy Co Ltd	23.0

In [17]:

```python
plt.figure(figsize=(12, 8))
plt.barh(top_10_profit['Company'], top_10_profit['Profit %'], color='limegreen')
plt.xlabel('Profit %')
plt.title('Top 10 Companies by Profit %')
plt.gca().invert_yaxis()
plt.show()
```



In [18]:

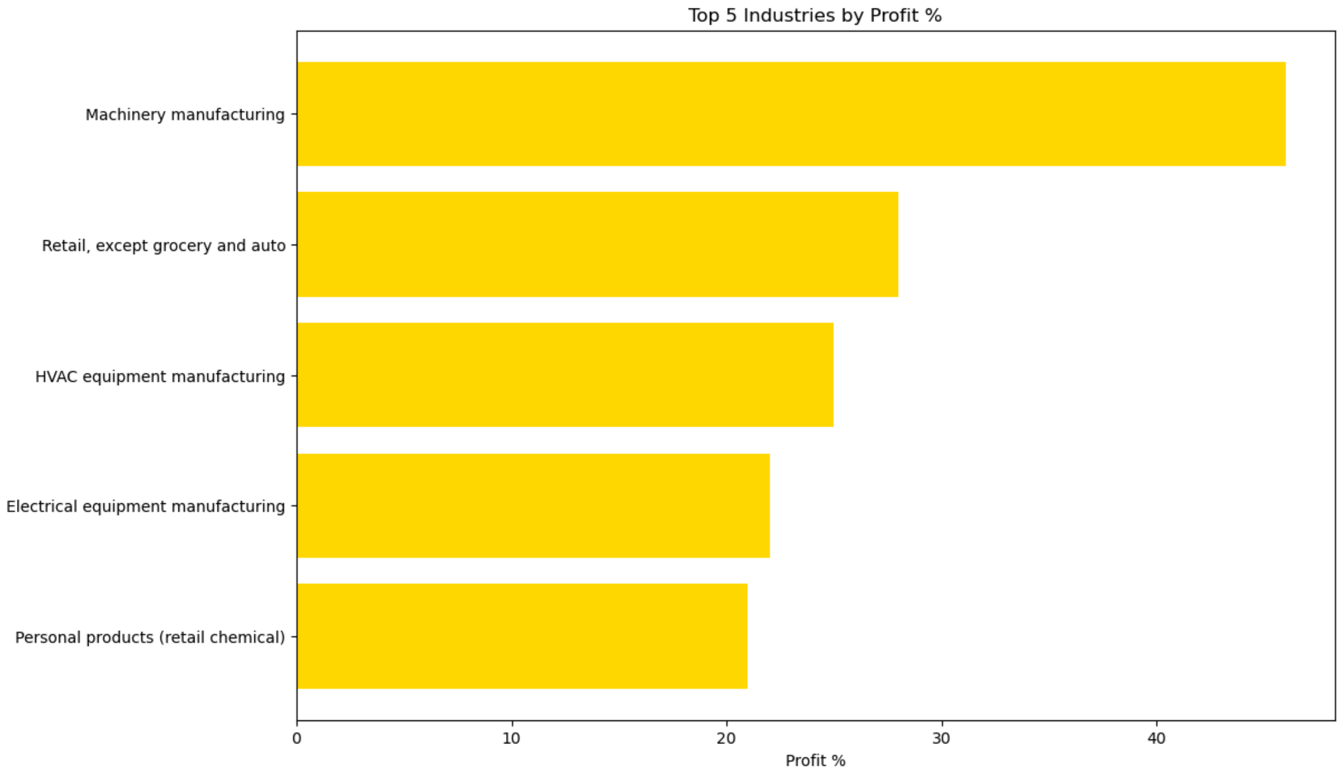
```
df_profit = df.dropna(subset=['Profit %'])

# Grouping by Industry and calculating the mean Profit %
industry_profit = df_profit.groupby('Industry')['Profit %'].mean().sort_values(ascending
=False)

# top 5 industries
top_5_industry_profit = industry_profit.head(5)

top_5_industry_profit
```

Out[18]:

```
Industry
Machinery manufacturing                  46.0
Retail, except grocery and auto          28.0
HVAC equipment manufacturing             25.0
Electrical equipment manufacturing       22.0
Personal products (retail chemical)      21.0
Name: Profit %, dtype: float64
```

In [19]:

```
plt.figure(figsize=(12, 8))
plt.barh(top_5_industry_profit.index, top_5_industry_profit.values, color='gold')
plt.xlabel('Profit %')
plt.title('Top 5 Industries by Profit %')
plt.gca().invert_yaxis()
plt.show()
```



In [20]:

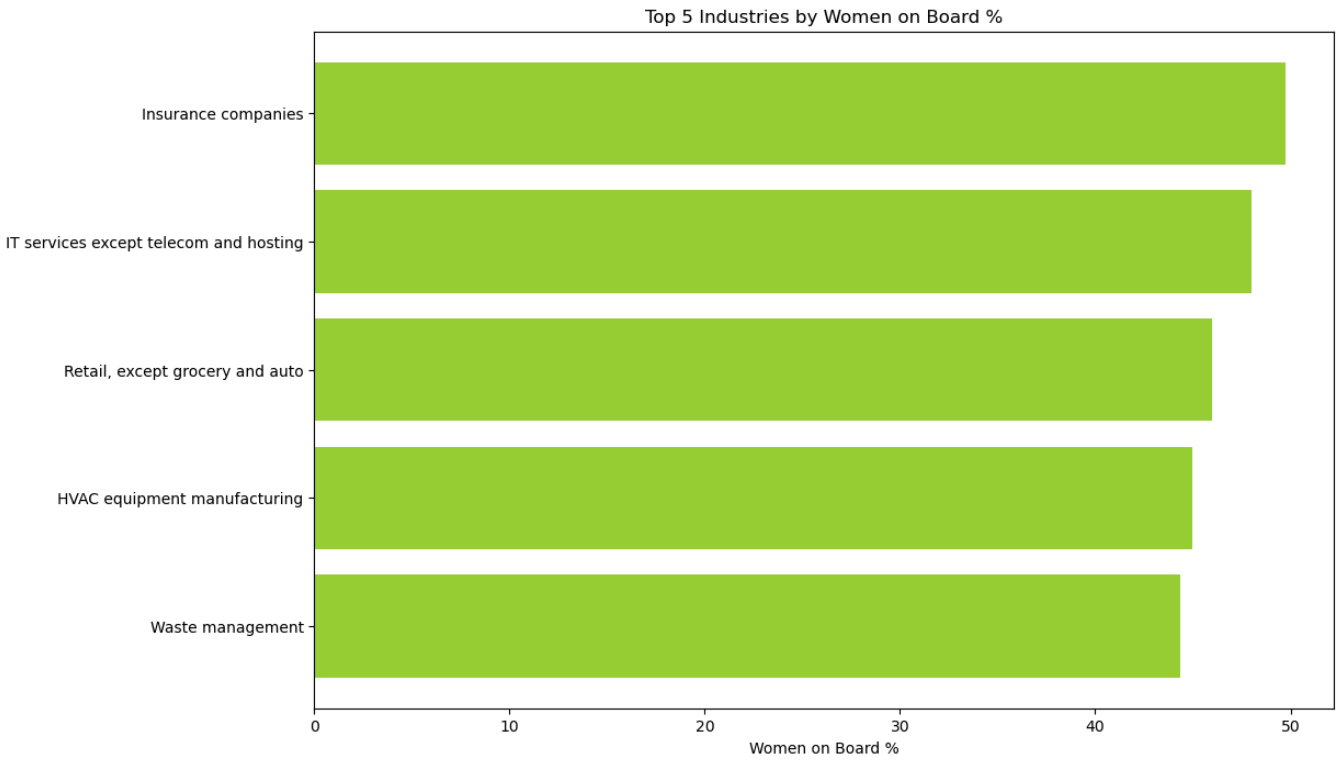
```
df_women_on_board = df.dropna(subset=['Women on Board %'])

# Grouping by Industry and calculating the mean Women on Board %
industry_women_on_board = df_women_on_board.groupby('Industry')['Women on Board %'].mean
().sort_values(ascending=False)

top_5_industry_women_on_board = industry_women_on_board.head(5)

top_5_industry_women_on_board
```

Out[20]:

```
Industry
Insurance companies                          49.750000
IT services except telecom and hosting       48.000000
Retail, except grocery and auto              46.000000
HVAC equipment manufacturing                 45.000000
Waste management                             44.333333
Name: Women on Board %, dtype: float64
```

In [21]:

```
plt.figure(figsize=(12, 8))
plt.barh(top_5_industry_women_on_board.index, top_5_industry_women_on_board.values, colo
r='yellowgreen')
plt.xlabel('Women on Board %')
plt.title('Top 5 Industries by Women on Board %')
plt.gca().invert_yaxis()
plt.show()
```



Thank You!

Thank you for going through this notebook. I hope you found the Exploratory Data Analysis insightful and helpful.