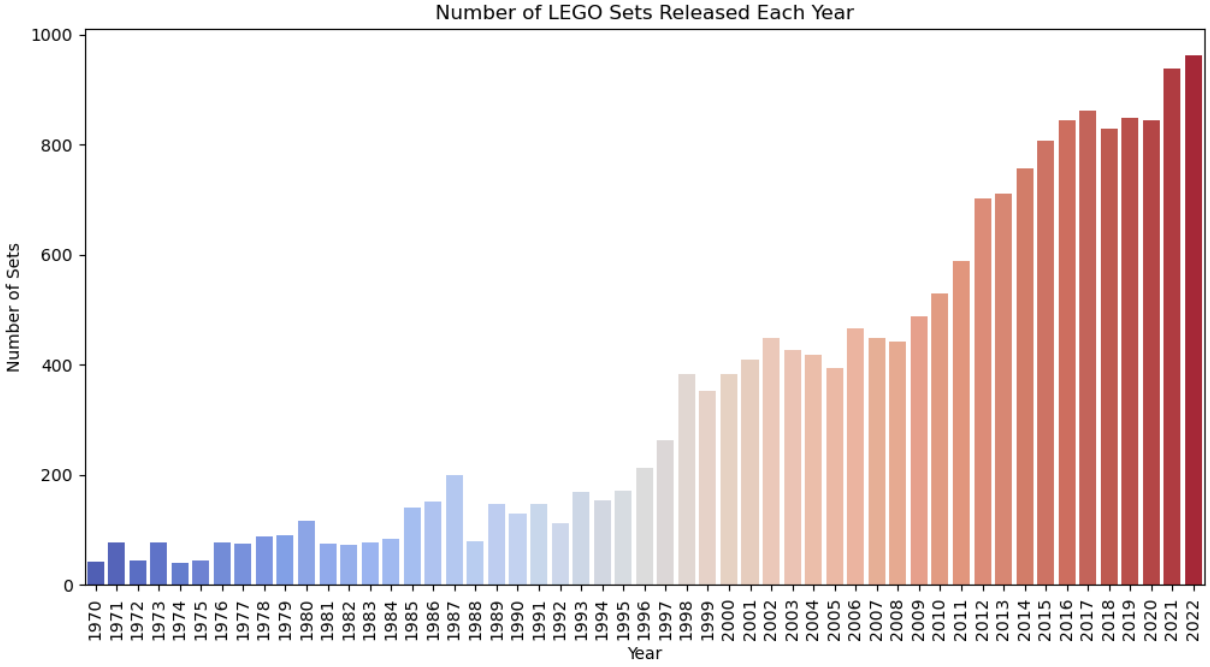
In [1]:

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

# loading dataset
file_path = "/Users/maazhussain/Downloads/LEGO+Sets/lego_sets.csv"
lego_df = pd.read_csv(file_path)

# renaming columns for consistency
lego_df.rename(columns={"US_retailPrice": "price"}, inplace=True)

# Data Cleaning & Normalization
lego_df.fillna({
    'price': lego_df['price'].median(),  # Fill missing prices with median v
    'pieces': lego_df['pieces'].median(),  # Fill missing pieces with mediar
    'theme': 'Unknown',  # Assign 'Unknown' to missing themes
}, inplace=True)

# converting data types
lego_df['year'] = pd.to_numeric(lego_df['year'], errors='coerce').fillna(0).
lego_df['price'] = pd.to_numeric(lego_df['price'], errors='coerce').fillna(0
lego_df['pieces'] = pd.to_numeric(lego_df['pieces'], errors='coerce').fillna

# removing potential outliers
lego_df = lego_df[(lego_df['price'] >= 0) & (lego_df['price'] <= 1000)]  # L
lego_df = lego_df[(lego_df['pieces'] >= 1) & (lego_df['pieces'] <= 10000)]

# summary statistics
summary_stats = lego_df.describe()
print("Summary Statistics:")
print(summary_stats)

# Yearly LEGO Set Releases
plt.figure(figsize=(12, 6))
sns.countplot(x=lego_df['year'], order=sorted(lego_df['year'].unique()), pal
plt.xticks(rotation=90)
plt.title("Number of LEGO Sets Released Each Year")
plt.xlabel("Year")
plt.ylabel("Number of Sets")
plt.savefig("yearly_lego_releases.png")
plt.show()

# Top 10 LEGO Themes
top_themes = lego_df['theme'].value_counts().nlargest(10)
plt.figure(figsize=(10, 5))
sns.barplot(x=top_themes.values, y=top_themes.index, palette="viridis")
plt.title("Top 10 Most Popular LEGO Themes")
plt.xlabel("Number of Sets")
plt.ylabel("Theme")
plt.savefig("top_lego_themes.png")
plt.show()

# Price vs Pieces Scatter Plot
```

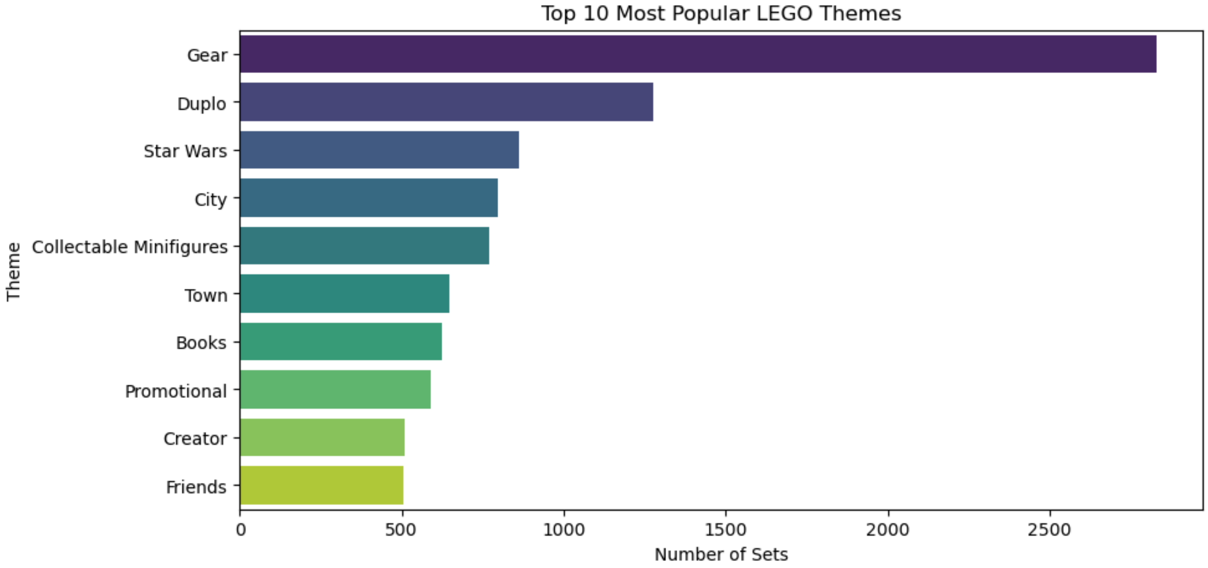
```python
plt.figure(figsize=(10, 6))
sns.scatterplot(data=lego_df, x='pieces', y='price', alpha=0.5)
plt.title("LEGO Set Price vs. Number of Pieces")
plt.xlabel("Number of Pieces")
plt.ylabel("Price ($)")
plt.xlim(0, 5000)  # Limit x-axis to focus on standard sets
plt.ylim(0, 500)  # Limit y-axis to remove extreme prices
plt.savefig("lego_price_vs_pieces.png")
plt.show()

# Saving Analysis Outputs
lego_df.to_csv("cleaned_lego_data.csv", index=False)  # Save cleaned dataset
summary_stats.to_csv("summary_statistics.csv")  # Save statistics as CSV

print(" Traditional Analysis Complete!")
```

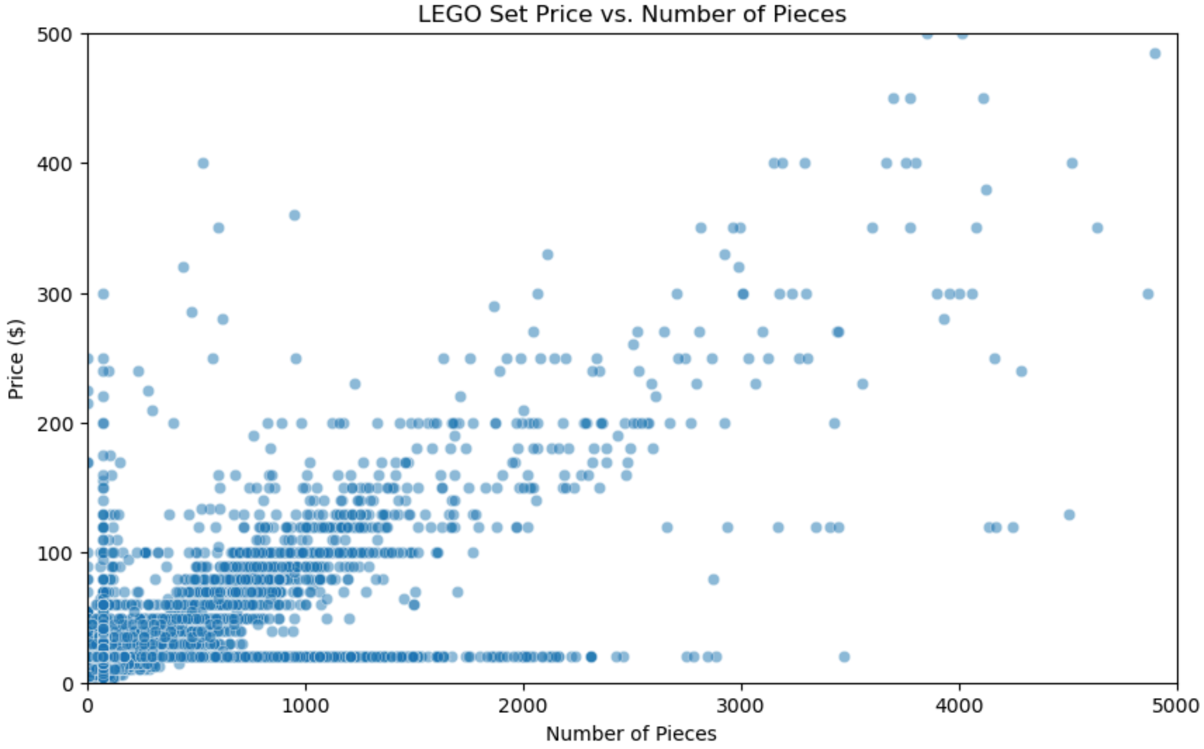
```
Summary Statistics:
               year        pieces     minifigs  agerange_min         price
count  18438.000000  18438.000000  8391.000000   6777.000000  18438.000000
mean    2007.949886    191.686897     2.659874      6.635089     26.587950
std       11.948579    400.699038     2.894145      2.774818     34.202086
min     1970.000000      1.000000     1.000000      1.000000      1.490000
25%     2001.000000     32.000000     1.000000      5.000000     19.990000
50%     2011.000000     70.000000     2.000000      6.000000     19.990000
75%     2017.000000    174.000000     3.000000      8.000000     19.990000
max     2022.000000   9090.000000    80.000000     18.000000    849.990000
```

```
/var/folders/mf/pjg0mk757xj_7wrzg8xb_7tr0000gn/T/ipykernel_59168/2675365654.
py:36: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed
in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the
same effect.

  sns.countplot(x=lego_df['year'], order=sorted(lego_df['year'].unique()), p
alette="coolwarm")
```



```
/var/folders/mf/pjg0mk757xj_7wrzg8xb_7tr0000gn/T/ipykernel_59168/2675365654.
py:47: FutureWarning: 

Passing `palette` without assigning `hue` is deprecated and will be removed
in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the
same effect.

  sns.barplot(x=top_themes.values, y=top_themes.index, palette="viridis")
```





```
Traditional Analysis Complete!
```

In [9]:
```
import os

# List all files in the current directory
print(os.listdir())

# Check specific files
```

```
files_to_check = [
    "cleaned_lego_data.csv",
    "summary_statistics.csv",
    "yearly_lego_releases.png",
    "top_lego_themes.png",
    "lego_price_vs_pieces.png"
]

for file in files_to_check:
    print(f"{file} exists: {os.path.exists(file)}")
```

```
['.config', 'Music', 'ParkType_Frequency.png', 'Untitled4.py', 'top_lego_the
mes.png', '.condarc', 'Untitled5.ipynb', 'Untitled1.ipynb', '.DS_Store', 'Do
wnloads\\filtered_dob_employed_data.csv', 'nltk_data', '.CFUserTextEncodin
g', '.xonshrc', 'EU_OCC_processed.csv', 'Untitled3.ipynb', 'Untitled.ipynb',
'.zshrc', 'Creative Cloud Files Company Account SENECA POLYTECHNIC STUDENT C
ONSOLE mhussain90@myseneca.ca 182D1E88661163CA0A495C91@17621e5d66115f3b495cf
b.e', 'Untitled4.ipynb', '.streamlit', 'Untitled6.ipynb', 'Pictures', 'Downl
oads\\np_summary_processed.csv', 'yearly_lego_releases.png', '.zsh_history',
'Untitled2.ipynb', '.ipython', 'Desktop', 'Library', '.matplotlib', 'lego_pr
ice_vs_pieces.png', 'lego_analysis.png', 'GlobalProtectLogs.tgz', 'Downloads
\\filtered_credit_data.csv', 'Public', 'cleaned_lego_data.csv', '.tcshrc',
'np_summary_processed.csv', '.anaconda', 'Movies', 'Query1_Results.csv', 'ap
p.py', '.Trash', '.ipynb_checkpoints', '.jupyter', 'Query2_Results.csv', 'Do
cuments', 'summary_statistics.csv', '.bash_profile', 'Downloads', 'comparati
ve_dashboard.py', '.continuum', 'filtered_eu_occ.csv', 'untitled.py', '.zsh_
sessions', 'Downloads\\customer_transformed.csv', '.conda']
cleaned_lego_data.csv exists: True
summary_statistics.csv exists: True
yearly_lego_releases.png exists: True
top_lego_themes.png exists: True
lego_price_vs_pieces.png exists: True
```

In [13]:

```
import shutil

destination_folder = "/Users/maazhussain/Downloads/"

# Move files to Downloads
for file in files_to_check:
    if os.path.exists(file):
        shutil.move(file, destination_folder)
        print(f" Moved {file} to {destination_folder}")
    else:
        print(f" {file} not found.")
```

```
 Moved cleaned_lego_data.csv to /Users/maazhussain/Downloads/
 Moved summary_statistics.csv to /Users/maazhussain/Downloads/
 Moved yearly_lego_releases.png to /Users/maazhussain/Downloads/
 Moved top_lego_themes.png to /Users/maazhussain/Downloads/
 Moved lego_price_vs_pieces.png to /Users/maazhussain/Downloads/
```

In [ ]: