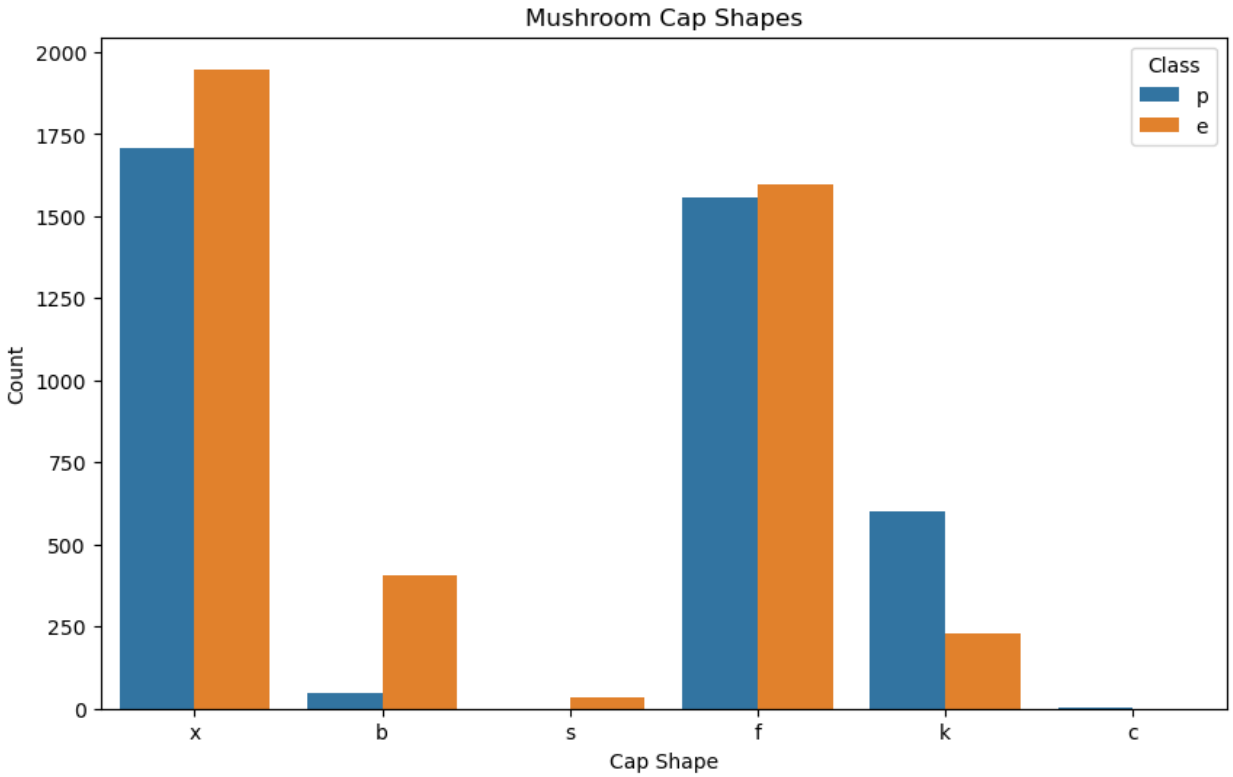
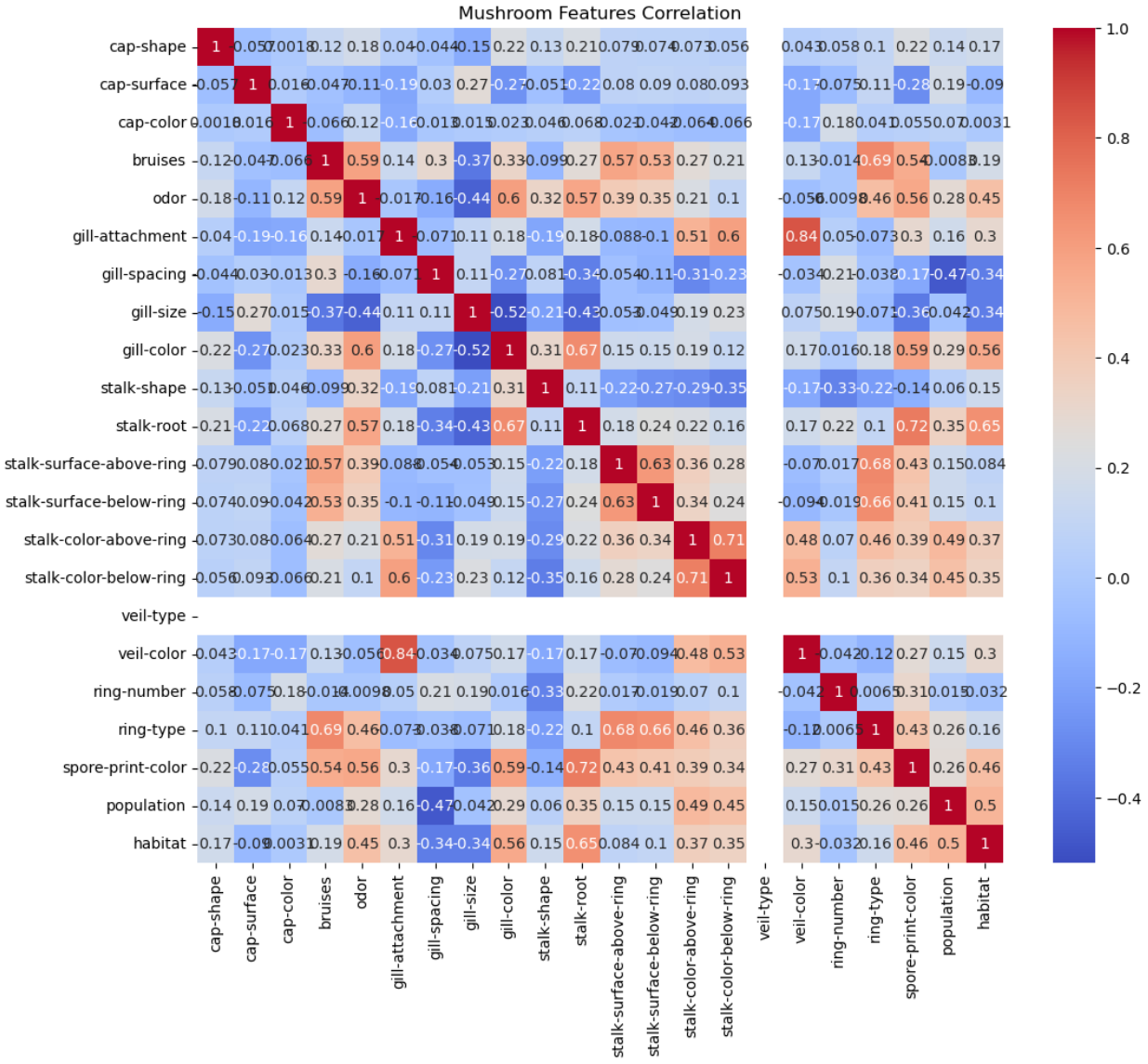
In [1]:

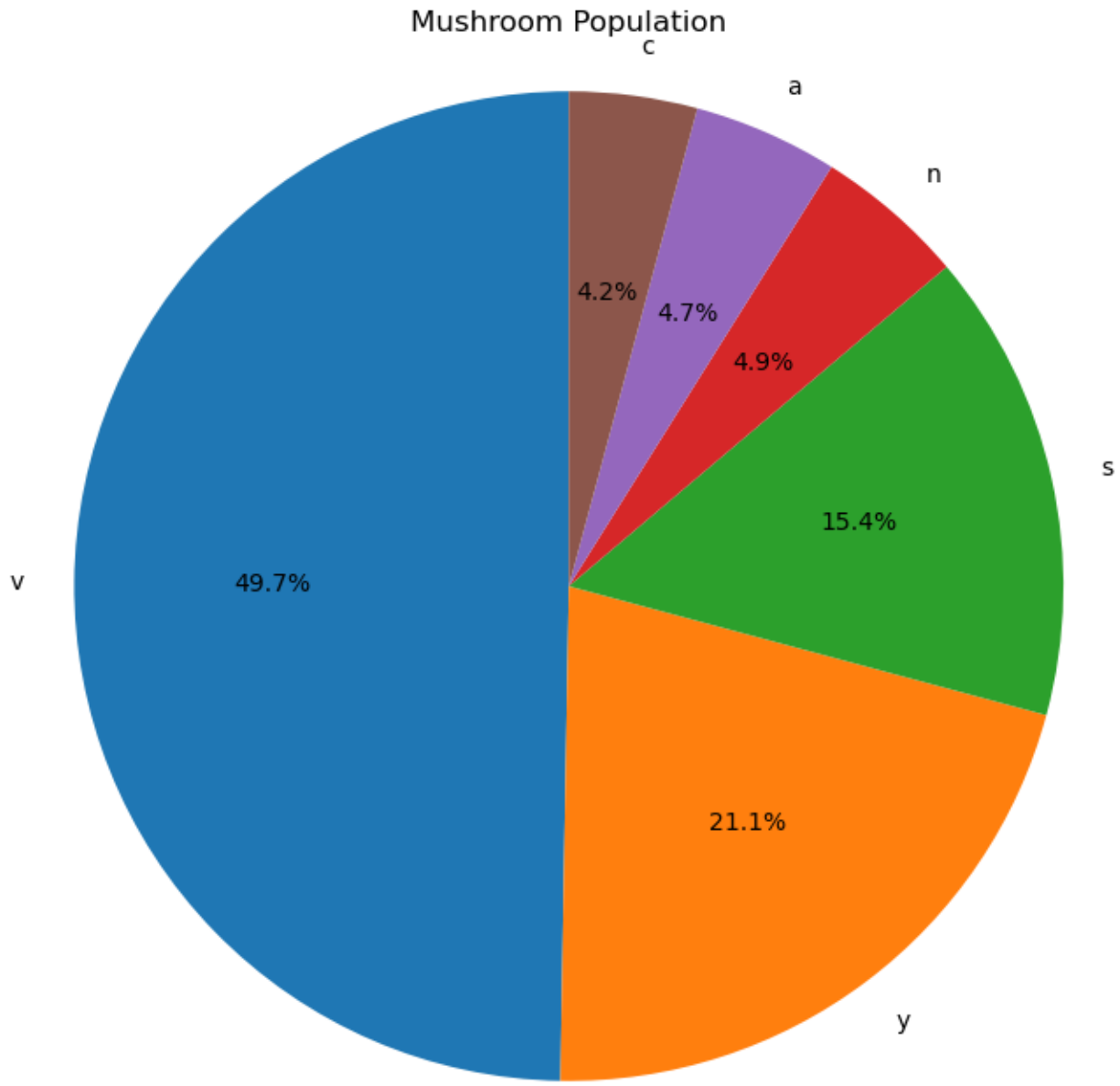
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Load the dataset into a Pandas DataFrame
url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/mushroom/agaricus-lepiota.data'
column_names = [
    'class', 'cap-shape', 'cap-surface', 'cap-color', 'bruises', 'odor',
    'gill-attachment', 'gill-spacing', 'gill-size', 'gill-color', 'stalk-shape',
    'stalk-root', 'stalk-surface-above-ring', 'stalk-surface-below-ring',
    'stalk-color-above-ring', 'stalk-color-below-ring', 'veil-type', 'veil-color',
    'ring-number', 'ring-type', 'spore-print-color', 'population', 'habitat'
]
df = pd.read_csv(url, names=column_names)
# Data visualization using Matplotlib and Seaborn
# 1. Countplot of Mushroom Classes
plt.figure(figsize=(8, 6))
sns.countplot(x='class', data=df)
plt.title("Mushroom Classes")
plt.xlabel("Class")
plt.ylabel("Count")
plt.show()
# 2. Barplot of Mushroom Cap Shapes
plt.figure(figsize=(10, 6))
sns.countplot(x='cap-shape', hue='class', data=df)
plt.title("Mushroom Cap Shapes")
plt.xlabel("Cap Shape")
plt.ylabel("Count")
plt.legend(title="Class")
plt.show()
# 3. Heatmap of Mushroom Features Correlation
plt.figure(figsize=(12, 10))
corr_matrix = df.drop('class', axis=1).apply(lambda x: pd.factorize(x)[0])
sns.heatmap(corr_matrix.corr(), annot=True, cmap='coolwarm')
plt.title("Mushroom Features Correlation")
plt.show()
# 4. Pie Chart of Mushroom Population
plt.figure(figsize=(8, 8))
population_counts = df['population'].value_counts()
labels = population_counts.index
sizes = population_counts.values
plt.pie(sizes, labels=labels, autopct='%1.1f%%', startangle=90)
plt.title("Mushroom Population")
plt.axis('equal')
plt.show()
# 5. Violin Plot of Mushroom Spore Print Color by Class
plt.figure(figsize=(10, 6))
sns.violinplot(x='class', y='spore-print-color', data=df)
plt.title("Mushroom Spore Print Color by Class")
plt.xlabel("Class")
plt.ylabel("Spore Print Color")
plt.show()
```


Mushroom Classes
Count
4000
3500
3000
2500
2000
1500
1000
500
0
p
e
Class


Mushroom Cap Shapes
Class
p
e
Count
2000
1750
1500
1250
1000
750
500
250
0
x
b
s
f
k
c
Cap Shape


Mushroom Features Correlation
cap-shape
cap-surface
cap-color
bruises
odor
gill-attachment
gill-spacing
gill-size
gill-color
stalk-shape
stalk-root
stalk-surface-above-ring
stalk-surface-below-ring
stalk-color-above-ring
stalk-color-below-ring
veil-type
veil-color
ring-number
ring-type
spore-print-color
population
habitat
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4


Mushroom Population
c
a
n
s
y
v
4.2%
4.7%
4.9%
15.4%
21.1%
49.7%