import pandas as pd

import numpy as np

import seaborn as sn

import matplotlib.pyplot as plt

# Load the Titanic dataset

titanic = sn.load\_dataset('titanic')

# Check for missing values

print(titanic.isnull().sum())

# Drop NaN values in 'age' and 'embarked' columns

titanic['age'].dropna()

titanic['embarked'].dropna()

titanic['embark\_town'].dropna()

# Visualizations

sn.displot(x=titanic['age'], bins=10)

sn.jointplot(x='age', y='fare', data=titanic, kind='scatter')

sn.jointplot(x='age', y='fare', data=titanic, kind='hex')

sn.rugplot(titanic['fare'])

# Bar and count plots

# Bar plot with hue and no legend (optional)

sn.barplot(x='sex', y='age', hue='sex', data=titanic, palette={'male': 'green', 'female': 'red'}, legend=False)

# Count plot with hue and no legend (optional)

sn.countplot(x='sex', hue='sex', data=titanic, palette={'male': 'green', 'female': 'red'}, legend=False)

# Box plots

sn.boxplot(x='sex', y='age', hue='sex', data=titanic, palette={'male': 'green', 'female': 'red'})

sn.boxplot(x='sex', y='age', hue='survived', data=titanic)

# Violin plots

sn.violinplot(x='sex', y='age', data=titanic, hue='sex', palette={'male': 'green', 'female': 'red'})

plt.title("Violin Plot of Age by Sex")

sn.violinplot(x='sex', y='age', data=titanic, hue='survived', palette={0: 'red', 1: 'blue'})

plt.title("Violin Plot of Age by Sex and Survival")

# Strip and swarm plots

sn.stripplot(x='sex', y='age', data=titanic, jitter=True, hue='sex', palette={'male': 'green', 'female': 'red'})

plt.title("Strip Plot of Age by Sex")

sn.stripplot(x='sex', y='age', data=titanic, jitter=True, hue='survived')

plt.title("Strip Plot of Age by Sex and Survival Status")

sn.swarmplot(x='sex', y='age', data=titanic)

plt.title("Swarm Plot of Age by Sex")

sn.swarmplot(x='sex', y='age', data=titanic, hue='survived')

plt.title("Swarm Plot of Age by Sex and Survival Status")

# Correlation heatmap

columns\_to\_include = ['survived', 'pclass', 'age', 'fare', 'sibsp', 'parch', 'adult\_male', 'alone']

corr = titanic[columns\_to\_include].corr()

print(corr)

sn.heatmap(corr)

plt.figure(figsize=(10, 6))

sn.histplot(data=titanic, x='fare', bins=30, kde=True, color='skyblue')

plt.title('Distribution of Fare')

plt.xlabel('Fare')

plt.ylabel('Number of Passengers')

plt.grid(True)

plt.show()