```
# Import necessary libraries as requested [cite: 5]
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Load the Titanic dataset (built into Seaborn for easy access)
df = sns.load_dataset('titanic')

# Display the first few rows
print("First 5 rows of the dataset:")
display(df.head())
```

```
First 5 rows of the dataset:
```

| | survived | pclass | sex | age | sibsp | parch | fare | embarked | class | who | adult_male | deck | embark_town | alive | alone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | 3 | male | 22.0 | 1 | 0 | 7.2500 | S | Third | man | True | NaN | Southampton | no | False |
| **1** | 1 | 1 | female | 38.0 | 1 | 0 | 71.2833 | C | First | woman | False | C | Cherbourg | yes | False |
| **2** | 1 | 3 | female | 26.0 | 0 | 0 | 7.9250 | S | Third | woman | False | NaN | Southampton | yes | True |
| **3** | 1 | 1 | female | 35.0 | 1 | 0 | 53.1000 | S | First | woman | False | C | Southampton | yes | False |
| **4** | 0 | 3 | male | 35.0 | 0 | 0 | 8.0500 | S | Third | man | True | NaN | Southampton | no | True |

```
# 1. Check data types and missing values
print("\n--- Data Info ---")
df.info()

# 2. Statistical summary of numerical columns
print("\n--- Statistical Description ---")
display(df.describe())

# 3. Check value counts for categorical data (e.g., 'class')
print("\n--- Value Counts for Passenger Class ---")
print(df['class'].value_counts())
```

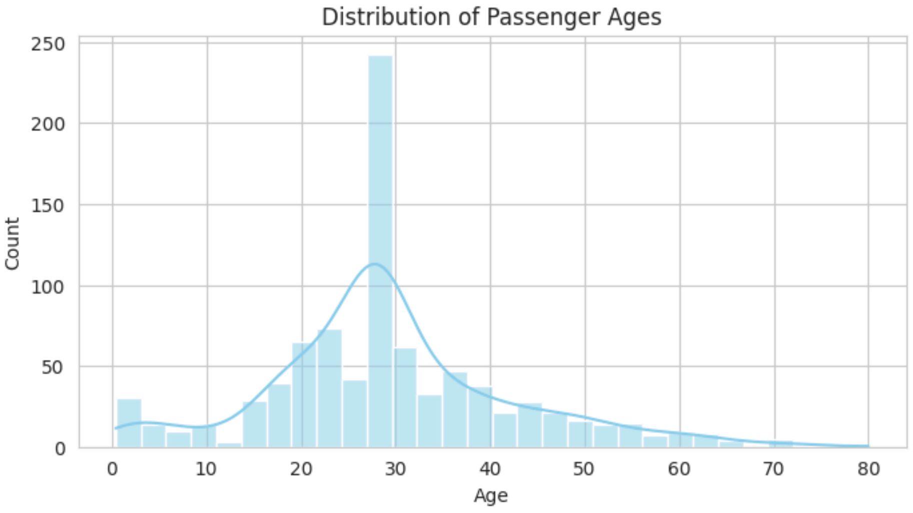
```
--- Data Info ---
```

```
# Fill missing age values with the median
df['age'].fillna(df['age'].median(), inplace=True)

# Drop columns with too many missing values (like 'deck') for cleaner analysis
df.drop(columns=['deck'], inplace=True)

print("Missing values handled.")
```

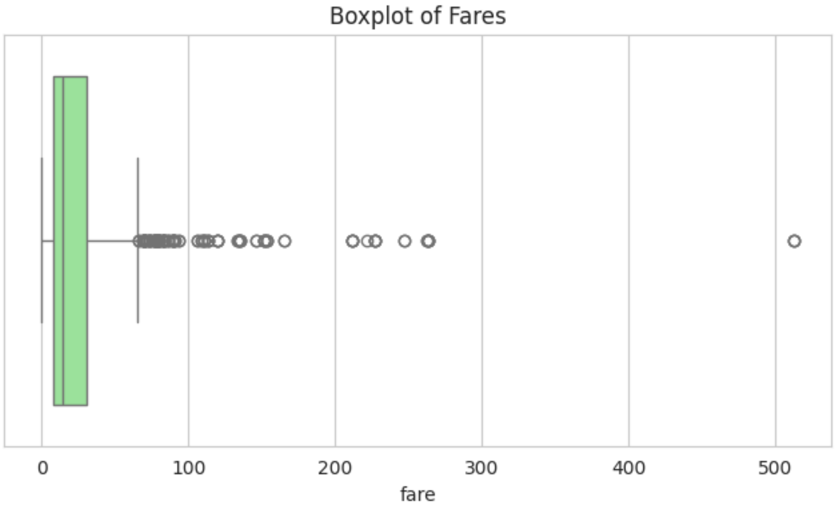
```
 3   age          714 non-null    float64
 4   sibsp        891 non-null    int64
 5   parch        891 non-null    int64
 6   fare         891 non-null    float64
 7   embarked     889 non-null    object
 8   class        891 non-null    category
 9   who          891 non-null    object
 10  adult_male   891 non-null    bool
 11  deck         203 non-null    category
 12  embark_town  889 non-null    object
 13  alive        891 non-null    object
```

```
Missing values handled.
/tmp/ipython-input-4012228794.py:2: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through ch
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are 

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col]


  df['age'].fillna(df['age'].median(), inplace=True)
```

```
# Set the visual style
sns.set_style("whitegrid")

# Histogram: Distribution of Age
plt.figure(figsize=(8, 4))
sns.histplot(df['age'], bins=30, kde=True, color='skyblue')
plt.title('Distribution of Passenger Ages')
plt.xlabel('Age')
plt.show()
print("Observation: The majority of passengers were between 20 and 40 years old.") # [cite: 12]

# Boxplot: Fare distribution
plt.figure(figsize=(8, 4))
sns.boxplot(x=df['fare'], color='lightgreen')
plt.title('Boxplot of Fares')
plt.show()
print("Observation: There are significant outliers in ticket prices (fares).")
```

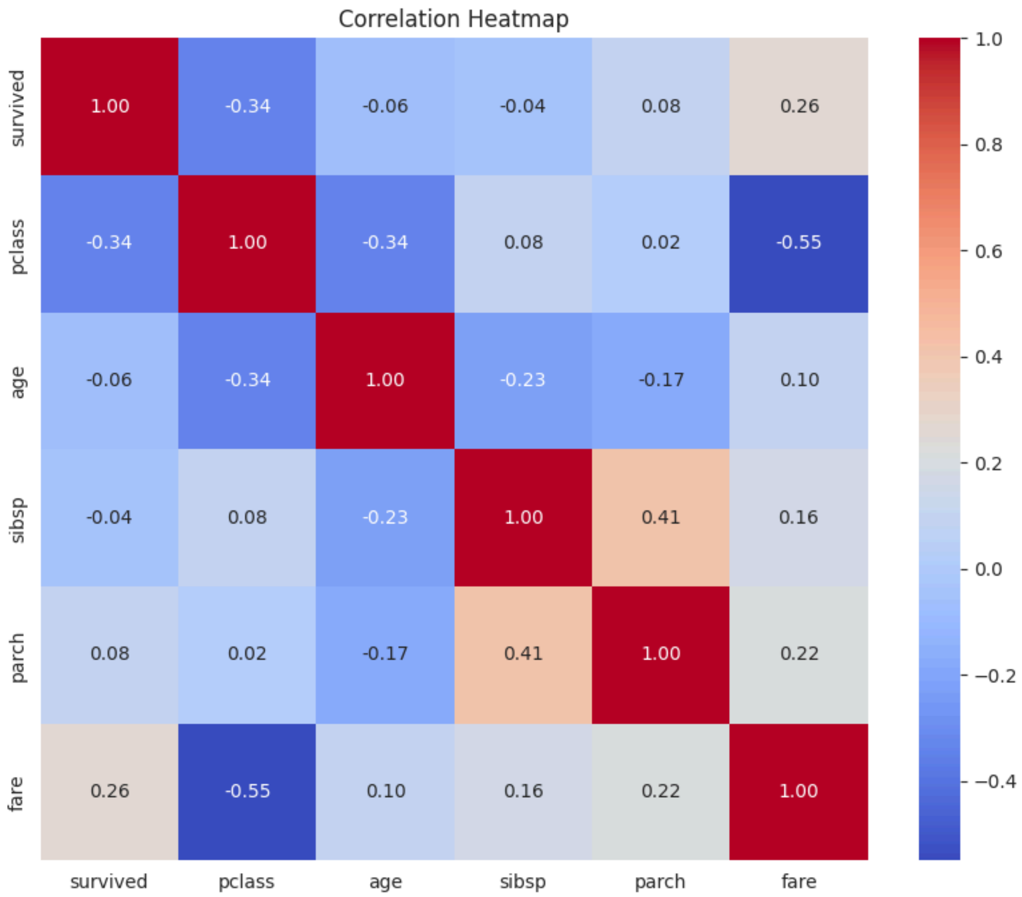


```
Observation: The majority of passengers were between 20 and 40 years old.
```

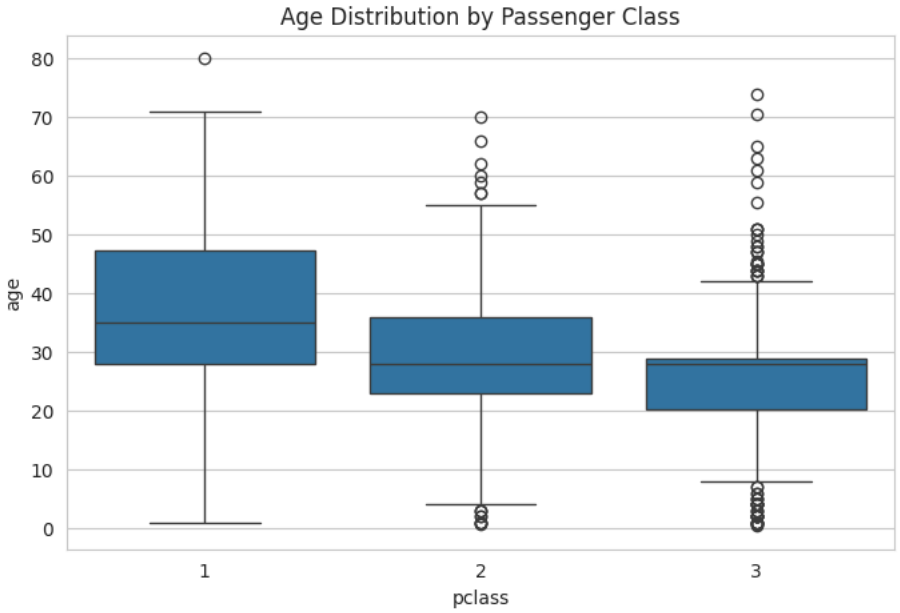


```
Observation: There are significant outliers in ticket prices (fares).
```

```
# Correlation Heatmap
plt.figure(figsize=(10, 8))
# Select only numeric columns for correlation
numeric_df = df.select_dtypes(include=['float64', 'int64'])
sns.heatmap(numeric_df.corr(), annot=True, cmap='coolwarm', fmt=".2f")
plt.title('Correlation Heatmap')
plt.show()
print("Observation: Fare and Survived have a slight positive correlation.")

# Boxplot: Age vs. Class (Relationship) [cite: 10]
plt.figure(figsize=(8, 5))
sns.boxplot(x='pclass', y='age', data=df)
plt.title('Age Distribution by Passenger Class')
plt.show()
print("Observation: 1st class passengers tend to be older on average than 3rd class.")
```

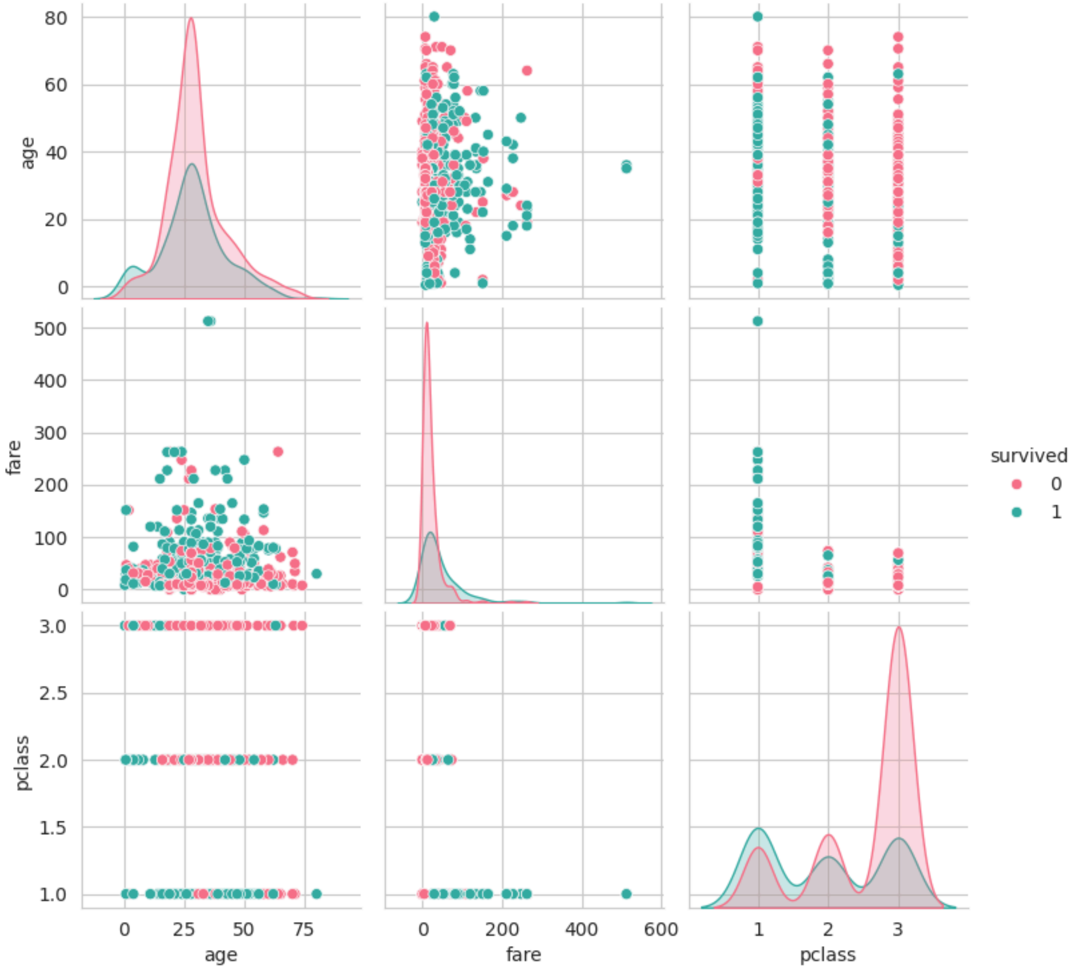


```
Observation: Fare and Survived have a slight positive correlation.
```



```
Observation: 1st class passengers tend to be older on average than 3rd class.
```

```
# Pairplot to see relationships across multiple variables
# subsetting data to make the plot readable
subset = df[['age', 'fare', 'pclass', 'survived']]
subset = df[['age', 'fare', 'pclass', 'survived']]
sns.pairplot(subset, hue='survived', palette='husl') #
plt.show()
print("Observation: Higher fares seem to correlate with higher survival rates.")
```



```
Observation: Higher fares seem to correlate with higher survival rates.
```

Start coding or generate with AI.