[1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")
%matplotlib inline
```

1 Load data and basic stats

[2]:
```
df = pd.read_csv("train.csv")
```

[3]:
```
df.shape
```

[3]:
```
(891, 12)
```

[4]:
```
df.head()
```

[4]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th…	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0				

```
4      0            373450   8.0500   NaN        S
```

[5]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    object
 5   Age          714 non-null    float64
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Cabin        204 non-null    object
 11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

[6]:
```
df.describe()
```

[6]:
```
       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  714.000000  891.000000
mean    446.000000    0.383838    2.308642   29.699118    0.523008
std     257.353842    0.486592    0.836071   14.526497    1.102743
min       1.000000    0.000000    1.000000    0.420000    0.000000
25%     223.500000    0.000000    2.000000   20.125000    0.000000
50%     446.000000    0.000000    3.000000   28.000000    0.000000
75%     668.500000    1.000000    3.000000   38.000000    1.000000
max     891.000000    1.000000    3.000000   80.000000    8.000000

            Parch        Fare
count  891.000000  891.000000
mean     0.381594   32.204208
std      0.806057   49.693429
min      0.000000    0.000000
25%      0.000000    7.910400
50%      0.000000   14.454200
75%      0.000000   31.000000
max      6.000000  512.329200
```

[13]:
```
df.isna().sum()
```

[13]:
```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

[15]:
```
df["Age"] = df["Age"].fillna(df["Age"].mean())
```

[16]:
```
df.isna().sum()
```

[16]:
```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age              0
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

2 Visualization

[7]:
```
df["Name"]
```

[7]:
```
0                                Braund, Mr. Owen Harris
1      Cumings, Mrs. John Bradley (Florence Briggs Th…
2                                 Heikkinen, Miss. Laina
3           Futrelle, Mrs. Jacques Heath (Lily May Peel)
4                               Allen, Mr. William Henry
                              …
886                                Montvila, Rev. Juozas
887                         Graham, Miss. Margaret Edith
888             Johnston, Miss. Catherine Helen "Carrie"
889                                Behr, Mr. Karl Howell
```

```
890                                  Dooley, Mr. Patrick
Name: Name, Length: 891, dtype: object
```

[9]:
```
df["Sex"].value_counts()
```

[9]:
```
male      577
female    314
Name: Sex, dtype: int64
```

[10]:
```
df["Ticket"].value_counts()
```

[10]:
```
347082      7
CA. 2343    7
1601        7
3101295     6
CA 2144     6
           ..
9234        1
19988       1
2693        1
PC 17612    1
370376      1
Name: Ticket, Length: 681, dtype: int64
```

[11]:
```
df["Cabin"].value_counts()
```

[11]:
```
B96 B98        4
G6             4
C23 C25 C27    4
C22 C26        3
F33            3
              ..
E34            1
C7             1
C54            1
E36            1
C148           1
Name: Cabin, Length: 147, dtype: int64
```

[12]:
```
df["Embarked"].value_counts()
```

[12]:
```
S    644
C    168
Q     77
Name: Embarked, dtype: int64
```

[17]:
```
def fun1(value):
    if (value == "male"):
        return 1
    else:
        return 0
```

[18]:
```
def fun2(value):
    if (value == 'S'):
        return 0
    elif (value == 'C'):
        return 1
    elif (value == 'Q'):
        return 2
    else:
        return 0
```

[19]:
```
df["Sex"] = df["Sex"].apply(fun1)
```

[20]:
```
df["Embarked"] = df["Embarked"].apply(fun2)
```

[21]:
```
df.isna().sum()
```

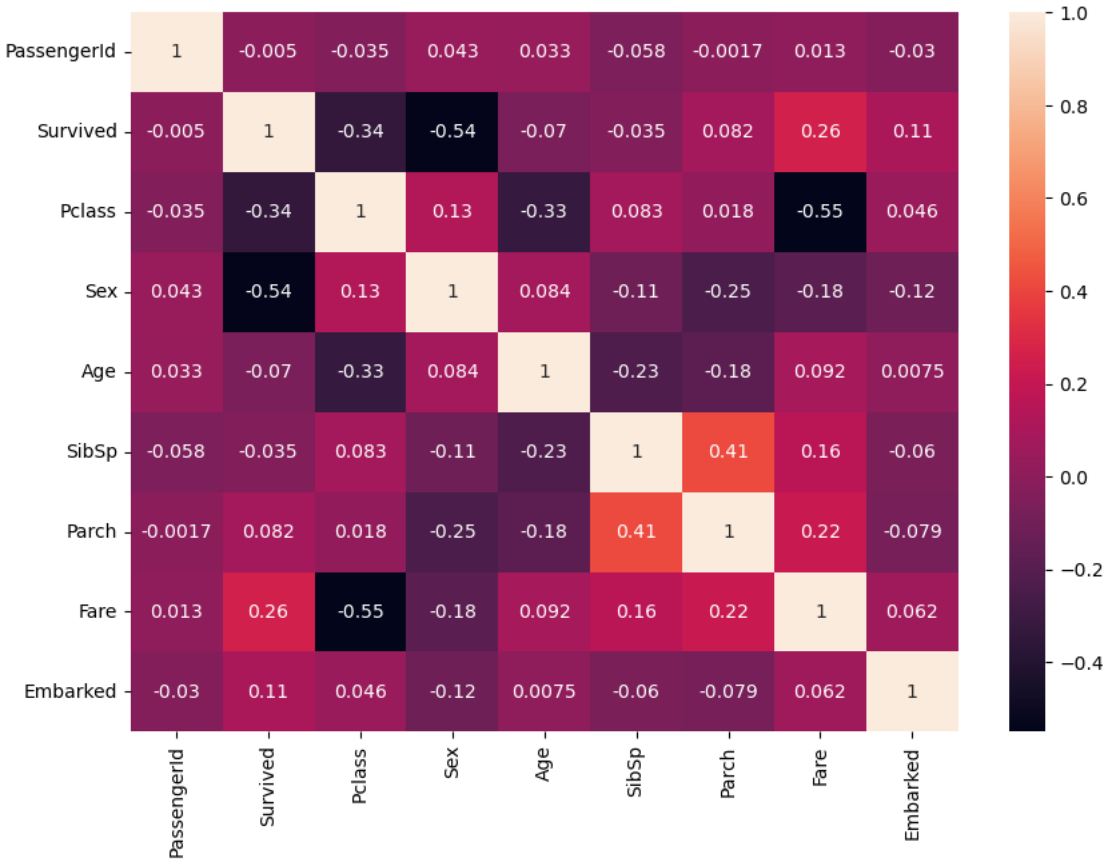
[21]:
```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age              0
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         0
dtype: int64
```

[22]:
```
df = df.drop("Cabin", axis=1)
```

[23]:
```
df.shape
```

[23]:
```
(891, 11)
```

[25]:
```
plt.figure(figsize=(10,7))
sns.heatmap(df.corr(), annot=True)
plt.show()
```

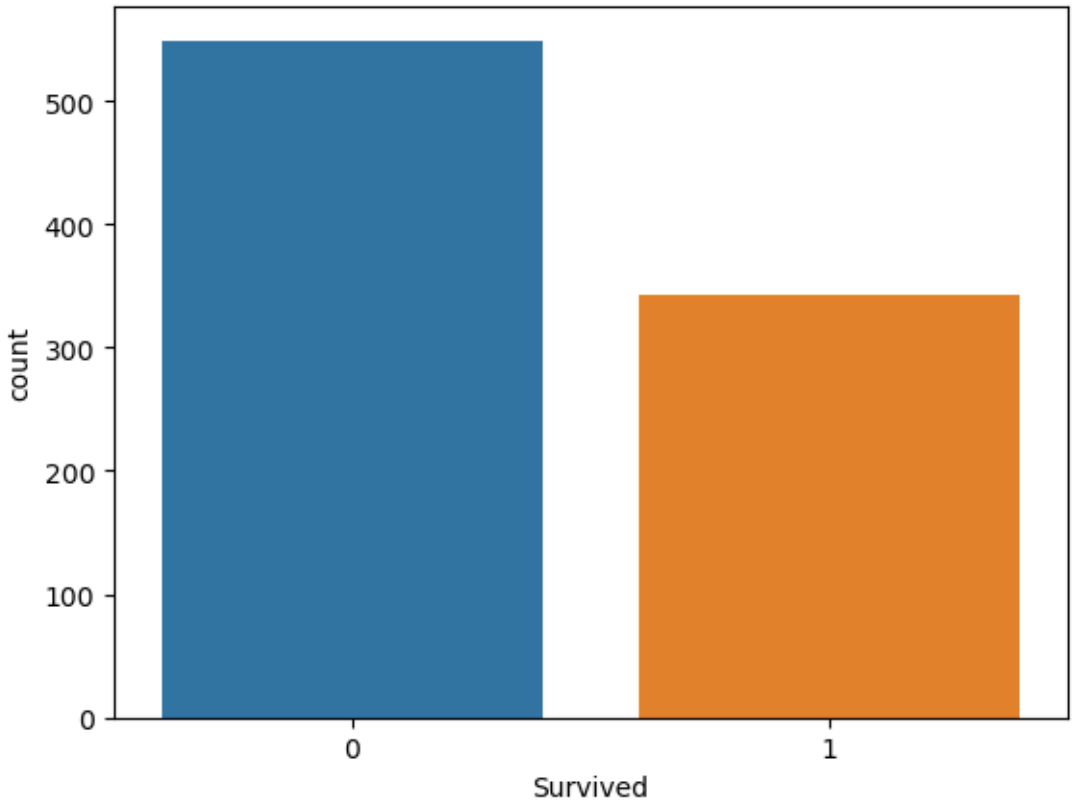


[26]:
```
df.info()
```

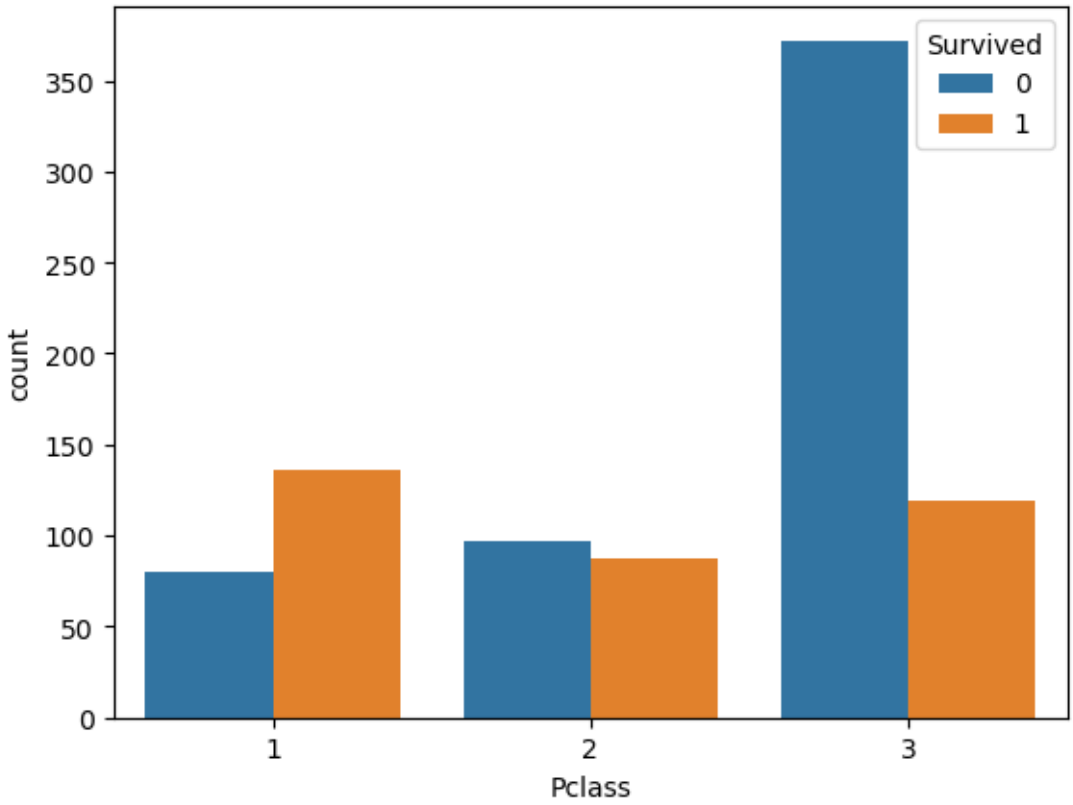
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 11 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    int64
 5   Age          891 non-null    float64
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Embarked     891 non-null    int64
dtypes: float64(2), int64(7), object(2)
memory usage: 76.7+ KB
```

3 “Survived” is the label

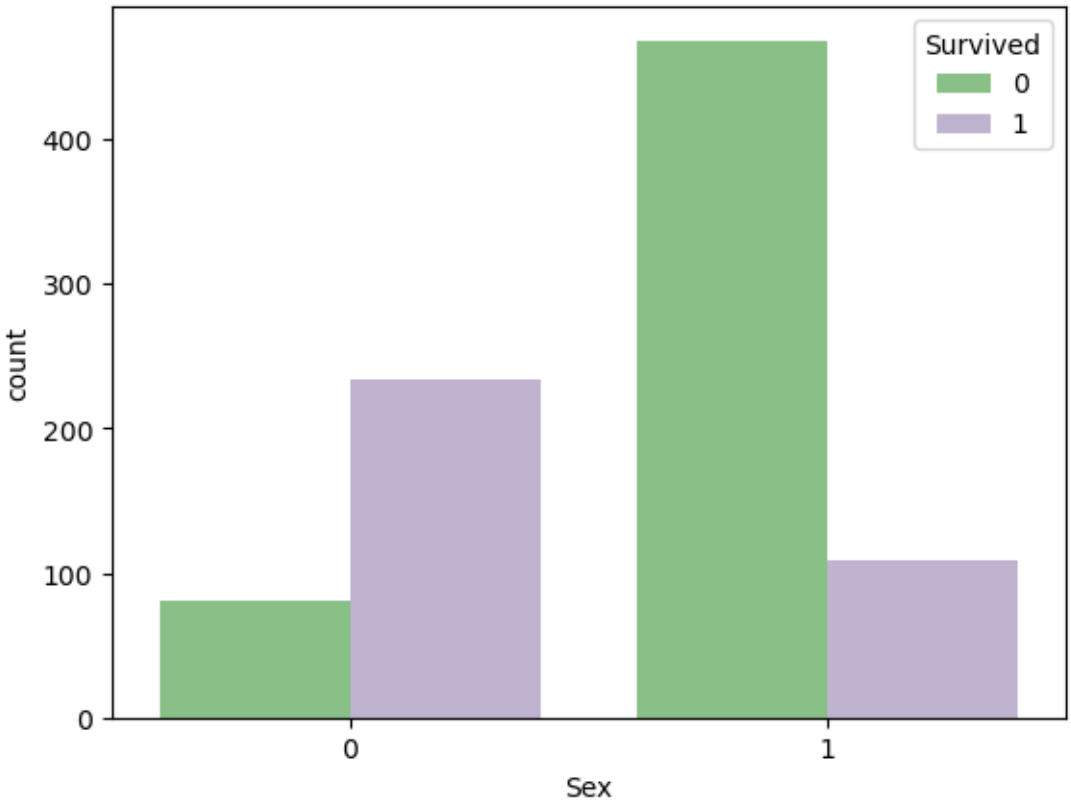
[29]:
```
sns.countplot(df["Survived"])
plt.show()
```



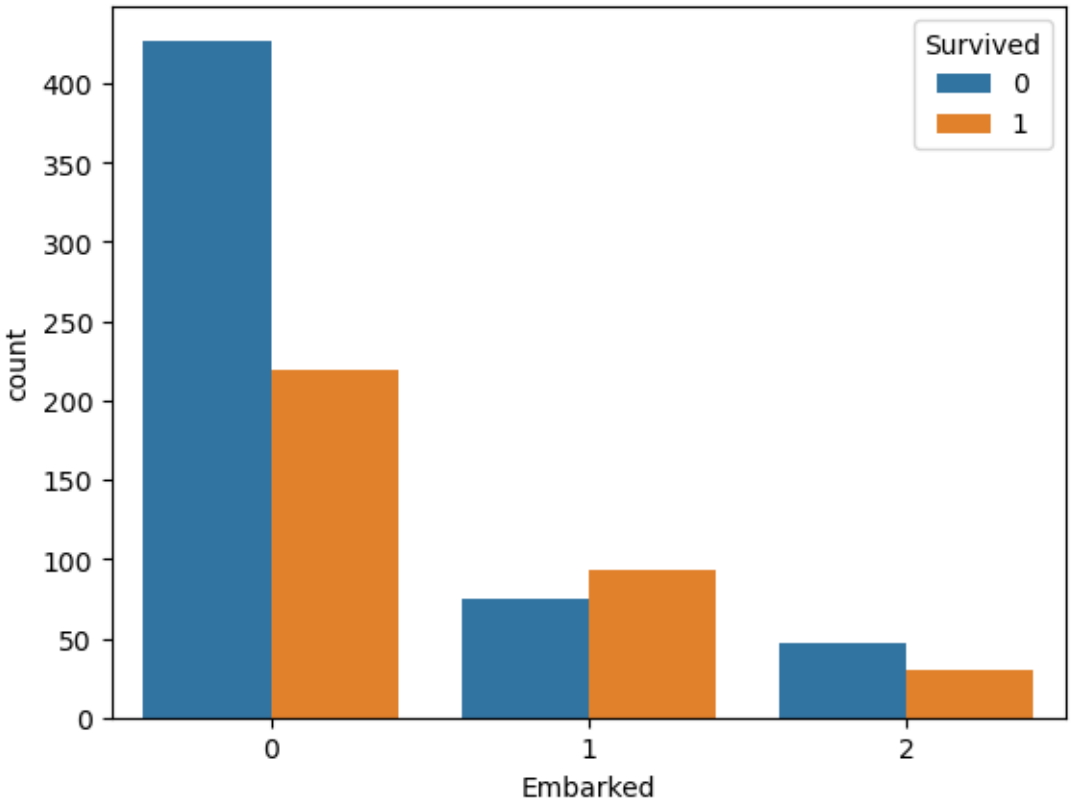
[31]:
```
sns.countplot(df["Pclass"], hue=df["Survived"])
plt.show()
```



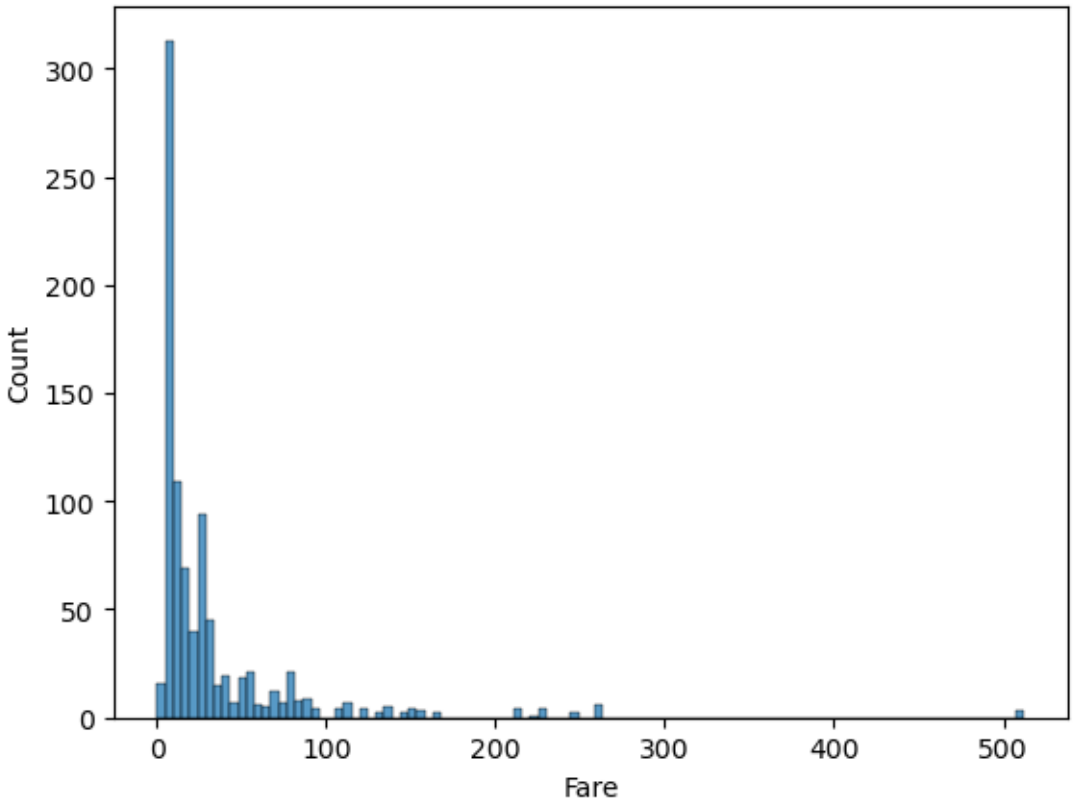
[41]:
```
sns.countplot(df["Sex"], hue=df["Survived"], palette="Accent")
plt.show()
```



[42]:
```
sns.countplot(df["Embarked"], hue=df["Survived"])
plt.show()
```



[52]:
```
sns.histplot(df["Fare"])
plt.show()
```


300
250
200
150
100
50
0
Count
0
100
200
300
400
500
Fare