1) Background

There are 12 columns and 891 entries in the Titanic data set. The summary statistics showing variables and data type are shown on the right. In this analysis, the followings will be determined:

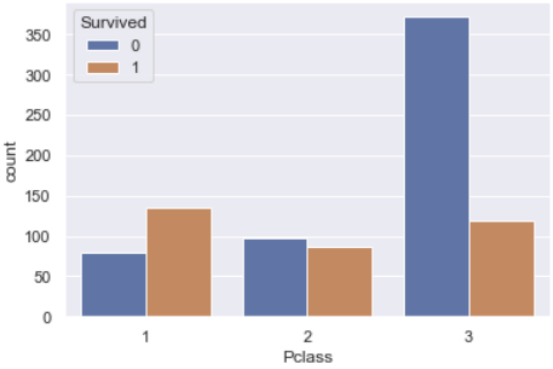
i) if the survival rate is associated to the class of passenger;
ii) if the survival rate is associated to the gender; and
iii) if the survival rate is associated to the age.

```
<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
```

In the data set, survival rate, class of passenger, gender and age are represented by variables "Survived", "Pclass", "Sex" and "Age" respectively. While there are no missing values for the first three variables as seen from the summary statistics, there are only 714 values for "Age", meaning 177 missing values are found in "Age".

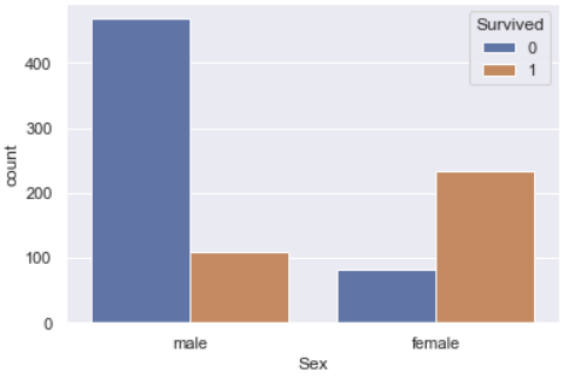
2) Analysing Association between Survival Rate and Class of Passenger

For variable "Survived", 0 means no while 1 means yes. On the other hand, 1, 2 and 3 in variable "PClass" means 1st, 2nd and 3rd class repectively. The bar chart on the right shows proportion of passengers who survived is higher in upper class than in lower class. While 62.97% passengers in 1st class survived, the survival rate drops to 47.28% for 2nd class passengers and further to 24.24% for 3rd class ones. This illustrates survival rate decreases as class of passengers goes downward.



3) Analysing Association between Survival Rate and Gender

Seeing the bar chart on the right, there are more female passengers survived than male. The percentage of survival for male and female are 18.89% and 74.20% respectively. This concludes female has a higher survival rate than male.

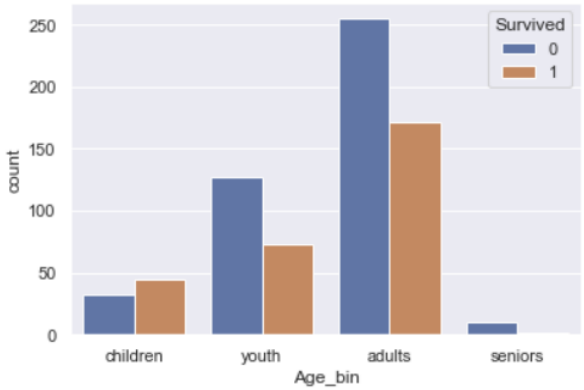


4) Analysing Association between Survival Rate and Age

There are 714 observations in total for this part after removing 177 missing values under "Age". Passengers are binned into groups based on the range as follows, and the percentages of passengers who survived in different age groups are also calculated:

Age Range	0 – 14	14 – 24	24 – 64	64 – 80
Age Group	Children	Youth	Adults	Seniors
Survival Rate	58.44%	36.5%	40.14%	9.09%

As seen from the bar chart on the right, proportion of passengers survived decreases as age increases. It is observed the survival rate is highest which is more than a half among children, then decreases to less than a half when it comes to youth and adults, and even less than one-tenth for seniors. This shows survival rate drops as age rises.



5) Summary

In conclusion, survival rate is higher when passengers are of higher class, female and younger.