

# KEY\_Lesson19B\_BarCharts\_Histograms

August 20, 2019

## 1 Bar Charts and Histograms

### 1.1 Bar Charts

Bar charts are used to display how a *categorical* variable relates to a *continuous* variable. In bar charts the *categorical* variable is displayed on the x-axis and the *continuous* variable is displayed on the y-axis.

```
[1]: # import seaborn
import seaborn as sns
```

We will be using the titanic dataset in this example. Let's load and preview it.

```
[2]: # read in titanic data
titanic = sns.load_dataset("titanic")
# preview data
titanic.head()
```

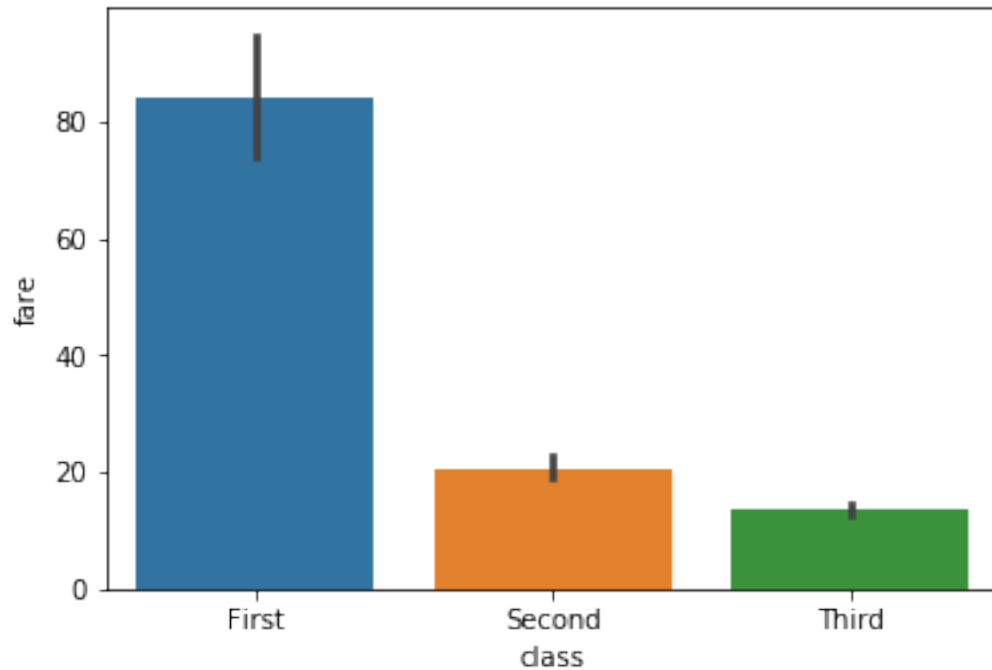
```
[2]:   survived  pclass    sex  age  sibsp  parch   fare embarked  class \
0         0        3   male  22.0     1     0   7.2500         S  Third
1         1        1  female  38.0     1     0  71.2833         C  First
2         1        3  female  26.0     0     0   7.9250         S  Third
3         1        1  female  35.0     1     0  53.1000         S  First
4         0        3   male  35.0     0     0   8.0500         S  Third
```

```
   who  adult_male deck  embark_town  alive  alone
0  man          True  NaN  Southampton    no  False
1 woman         False   C   Cherbourg   yes  False
2 woman         False  NaN  Southampton   yes  True
3 woman         False   C   Southampton   yes  False
4  man          True  NaN  Southampton    no  True
```

Let's say we want to compare the mean fare price across the three classes of tickets for all passengers.

```
[3]: # barplot of class vs fare
sns.barplot(x="class", y = 'fare', data=titanic)
```

```
[3]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1d35a470>
```

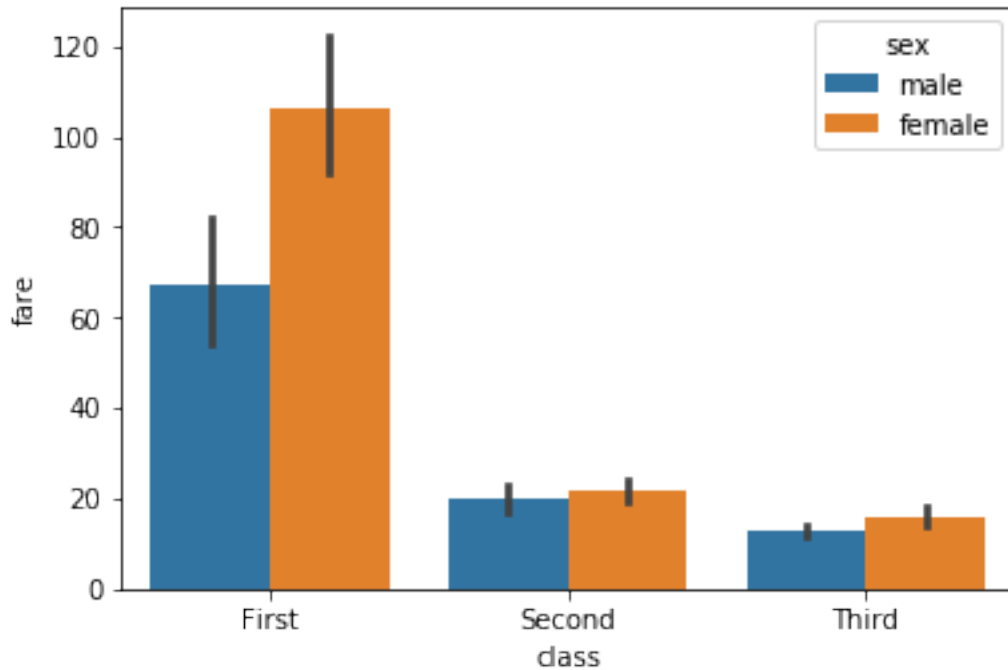


Notice how **seaborn** magically computes the mean fares and generates the plot exactly as we want without us even specifying!

What if we wanted to look at the data more granularly and further *stratify* each **class** bar by the **sex** variable? Based on what you know about **seaborn** so far, how do you think we can do that?

```
[4]: # barplot of class vs fare stratified by sex
sns.barplot(x="class", y = 'fare', hue = "sex", data=titanic)
```

```
[4]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1d63fa58>
```



## 1.2 Histograms

Histograms are used to visualize the *distribution* of a *continuous* variable.

Let's say we wanted to see how the **fare** price was distributed across all passengers in our dataset. We can use the `distplot` function to generate our histogram.

```
[37]: # histogram of age
sns.distplot(titanic['age'].dropna(), kde=False)
```

```
[37]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1f712e10>
```



We can change the number of bins used to plot our histogram to change the *granularity* of our distribution plot.

```
[24]: # histogram of age
sns.distplot(titanic['age'].dropna(), kde=False, bins=10)
```

```
[24]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1ea9d358>
```



```
[25]: # histogram of age
sns.distplot(titanic['age'].dropna(), kde=False, bins=80)
```

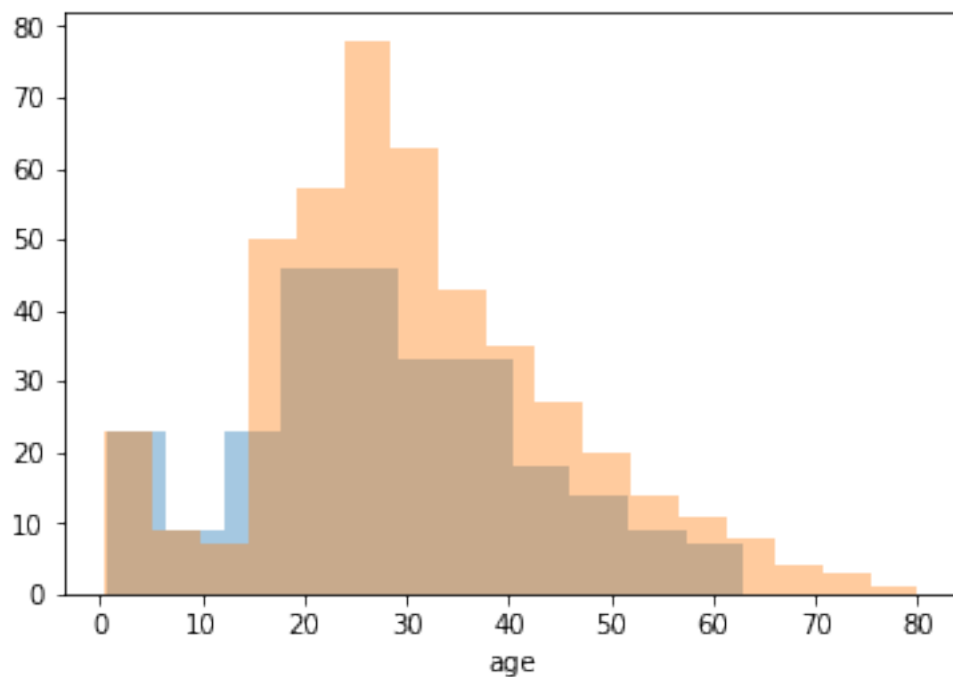
```
[25]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1eb7e0f0>
```



Unfortunately we can't color our histograms by another variable, but we can compare the distributions of certain variables between *subsets* of our DataFrame by *layering* them.

```
[31]: # histogram of age for females
sns.distplot(titanic.query('sex == "female"')['age'].dropna(), kde=False,
             label="F")
sns.distplot(titanic.query('sex == "male"')['age'].dropna(), kde=False,
             label="M")
```

```
[31]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1f1cbc50>
```



### 1.3 Count Plots

Count plots can be thought of as histograms for categorical variables.

Let's say we wanted to visualize how many passengers there were in each `class`.

```
[32]: # count plot of class
sns.countplot(x="class", data=titanic)
```

```
[32]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1f2d1550>
```



Now, let's stratify each class by the `sex` variable using color. By now you're an expert in this!

```
[33]: sns.countplot(x="class", hue = "sex", data=titanic)
```

```
[33]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1f3a4eb8>
```

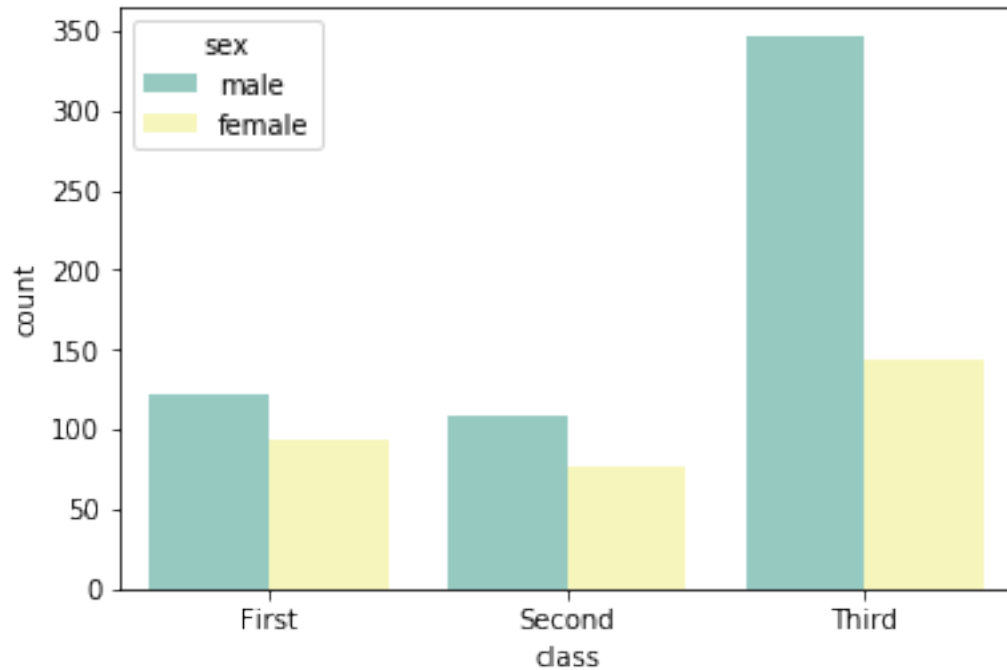


As always we can change the color palette:

```
[40]: sns.countplot(x="class", hue = "sex", palette = "Set3", data=titanic)
```

```
[40]: <matplotlib.axes._subplots.AxesSubplot at 0x1a1f98a780>
```





In this lesson you learned: \* How to create barplots in seaborn \* How to stratify barplots by another variable using color (**hue**) \* How to create histograms in seaborn \* Changing the granularity of the histograms (**bins**) \* How to create count plots in seaborn \* How to stratify count plots by another variable using color (**hue**)