KEY_Lesson19B_BarCharts_Histograms

July 18, 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* varibale 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()
```

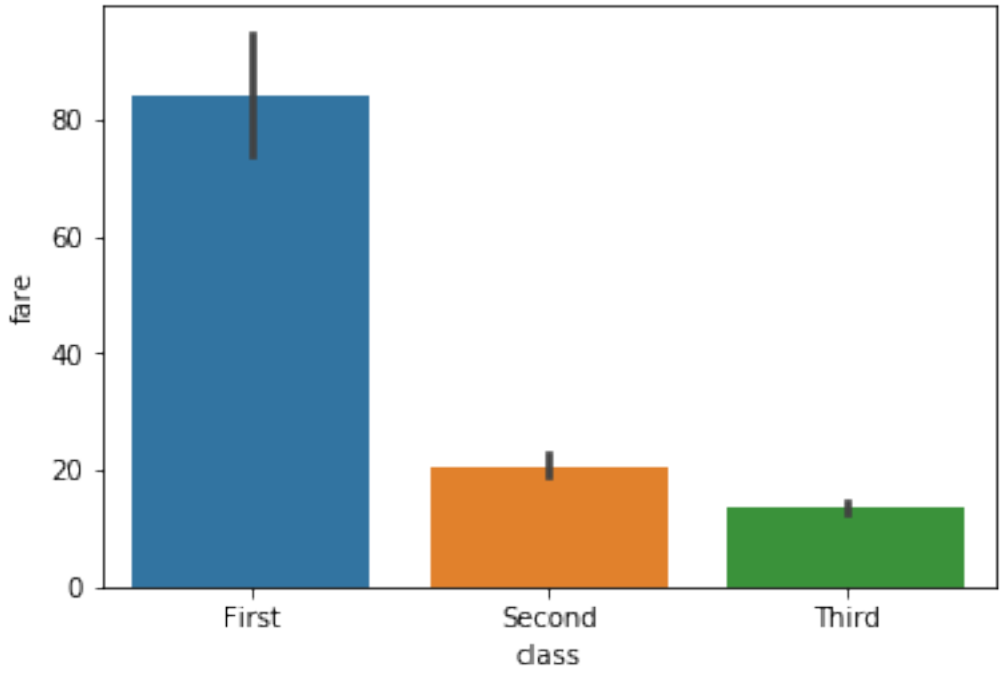
[2]:
```
   survived  pclass     sex   age  sibsp  parch     fare embarked  class  \
0         0       3    male  22.0      1      0   7.2500        S  Third
1         1       1  female  38.0      1      0  71.2833        C  First
2         1       3  female  26.0      0      0   7.9250        S  Third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

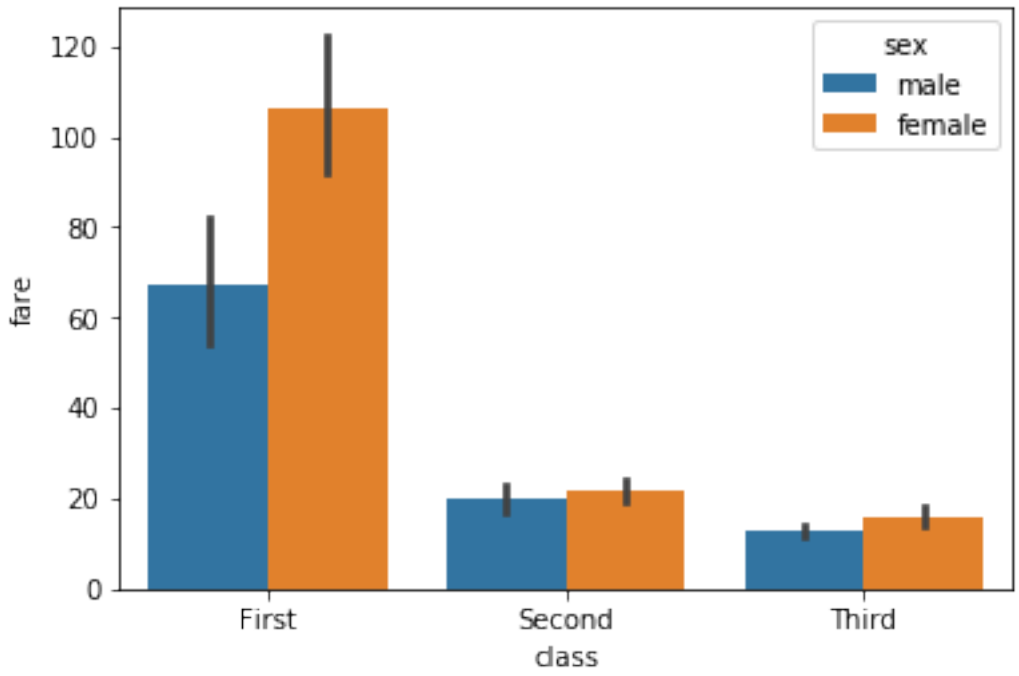


Notice how `seaborn` magically computes the mean fares and generates the plot exactly as we want without us even specifying!

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>
```



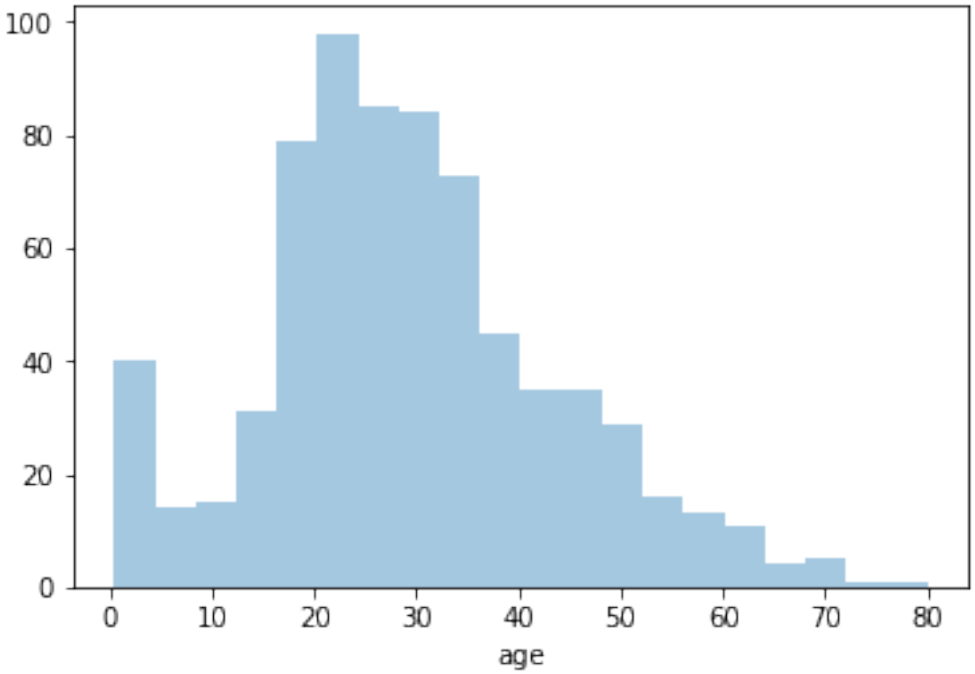
1.2 Histograms

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)
```

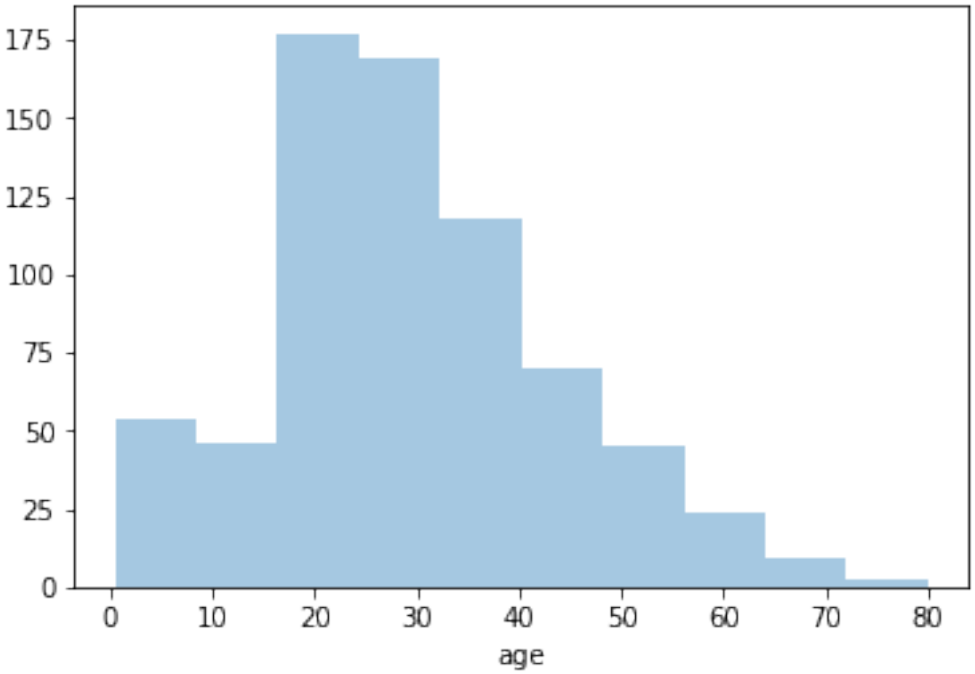
[37]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1f712e10>
```



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

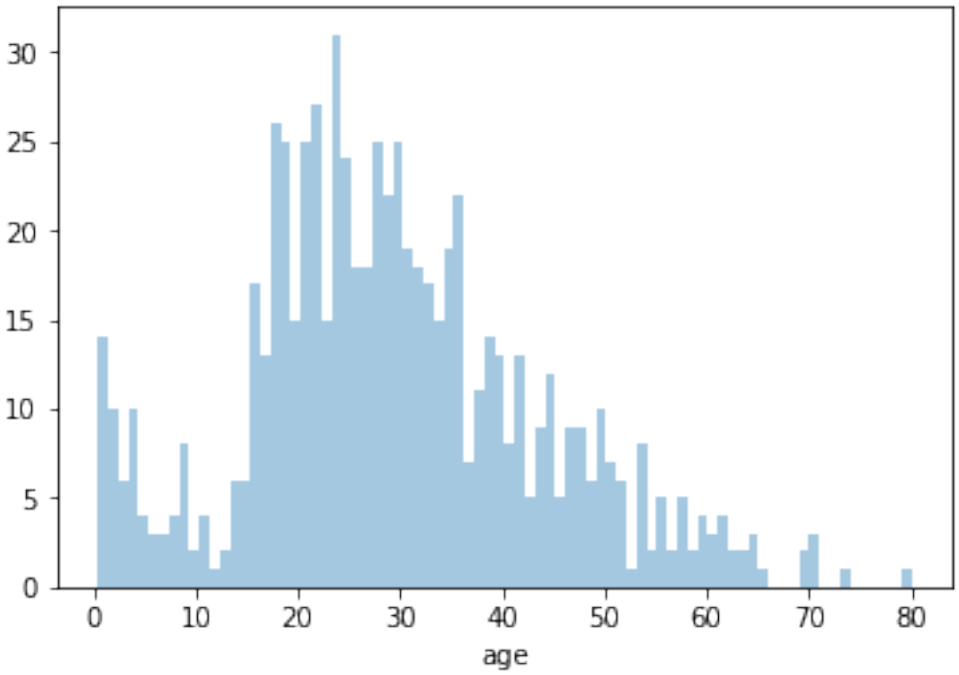
[24]:
```
# histogram of age
sns.distplot(titanic['age'].dropna(), kde=False, bins=10)
```

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



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

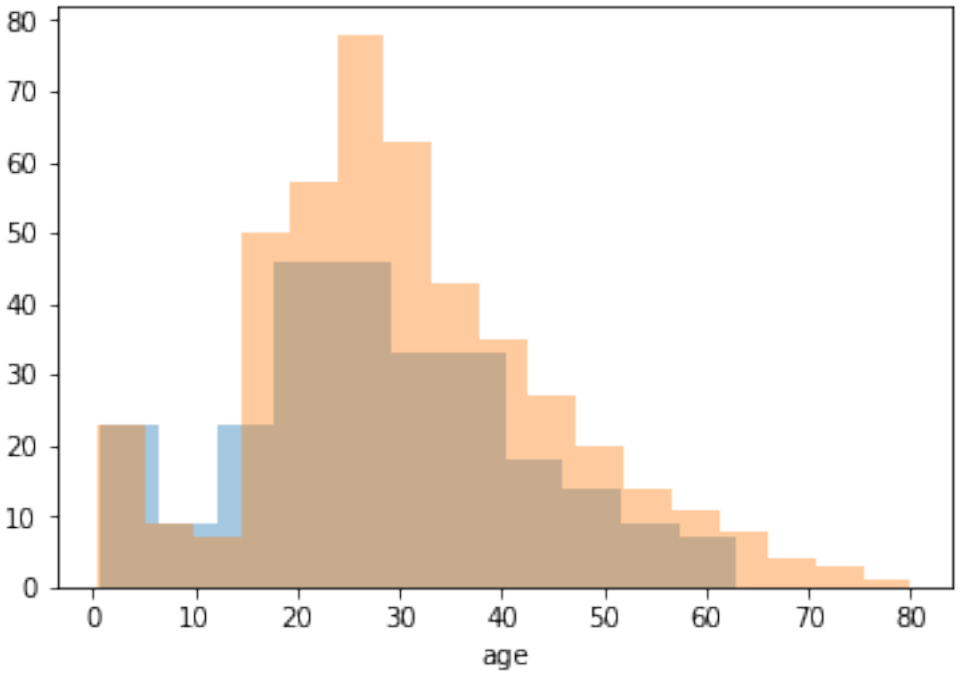
[25]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1eb7e0f0>
```



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>
```



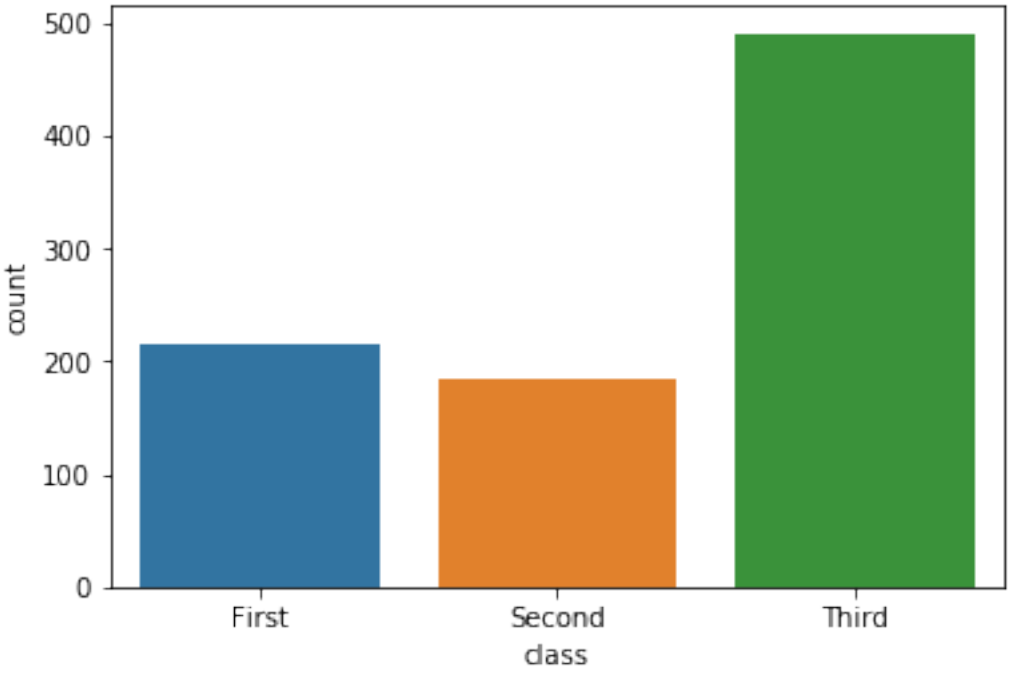
1.3 Count Plots

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)
```

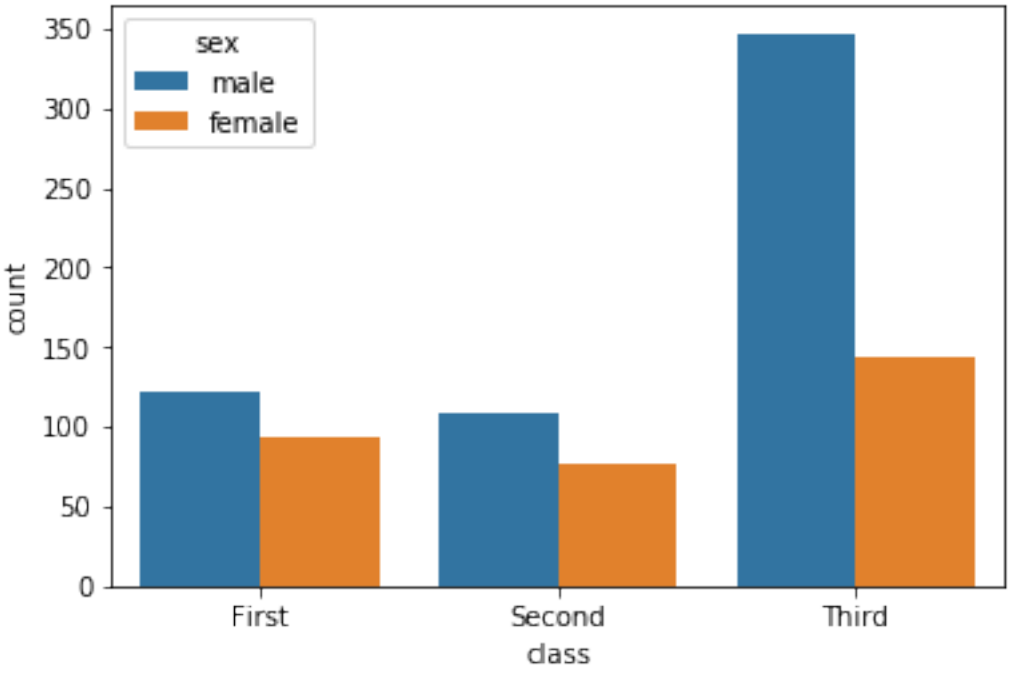
[32]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1f2d1550>
```



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)
```

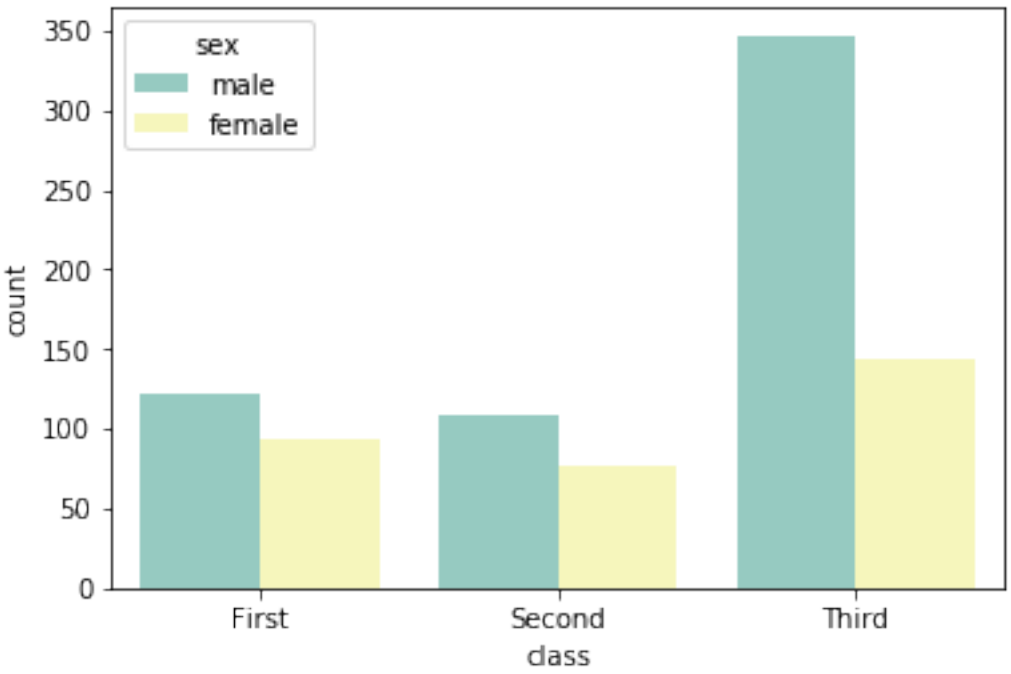
[33]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1f3a4eb8>
```



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`)