Introduction to categorical plots using Seaborn

WORKING WITH CATEGORICAL DATA IN PYTHON

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Our third dataset

- Name: Las Vegas TripAdvisor Reviews - `reviews`
- Rows: 504
- Columns: 20

Las Vegas reviews

```
reviews.info()
```

```
RangeIndex: 504 entries, 0 to 503
Data columns (total 20 columns):
 #   Column              Non-Null Count  Dtype
     ------              --------------  -----
 0   User country        504 non-null    object
...
 6   Traveler type       504 non-null    object
 7   Pool                504 non-null    object
 8   Gym                 504 non-null    object
 9   Tennis court        504 non-null    object
...
dtypes: int64(7), object(13)
memory usage: 78.9+ KB
```

[1] https://www.kaggle.com/crawford/las-vegas-tripadvisor-reviews

Seaborn

- Introduction to Data Visualization with Seaborn
- Intermediate Data Visualization with Seaborn

Categorical plots:

```
import seaborn as sns
import matploblib.pyplot as plt

sns.catplot(...)
```

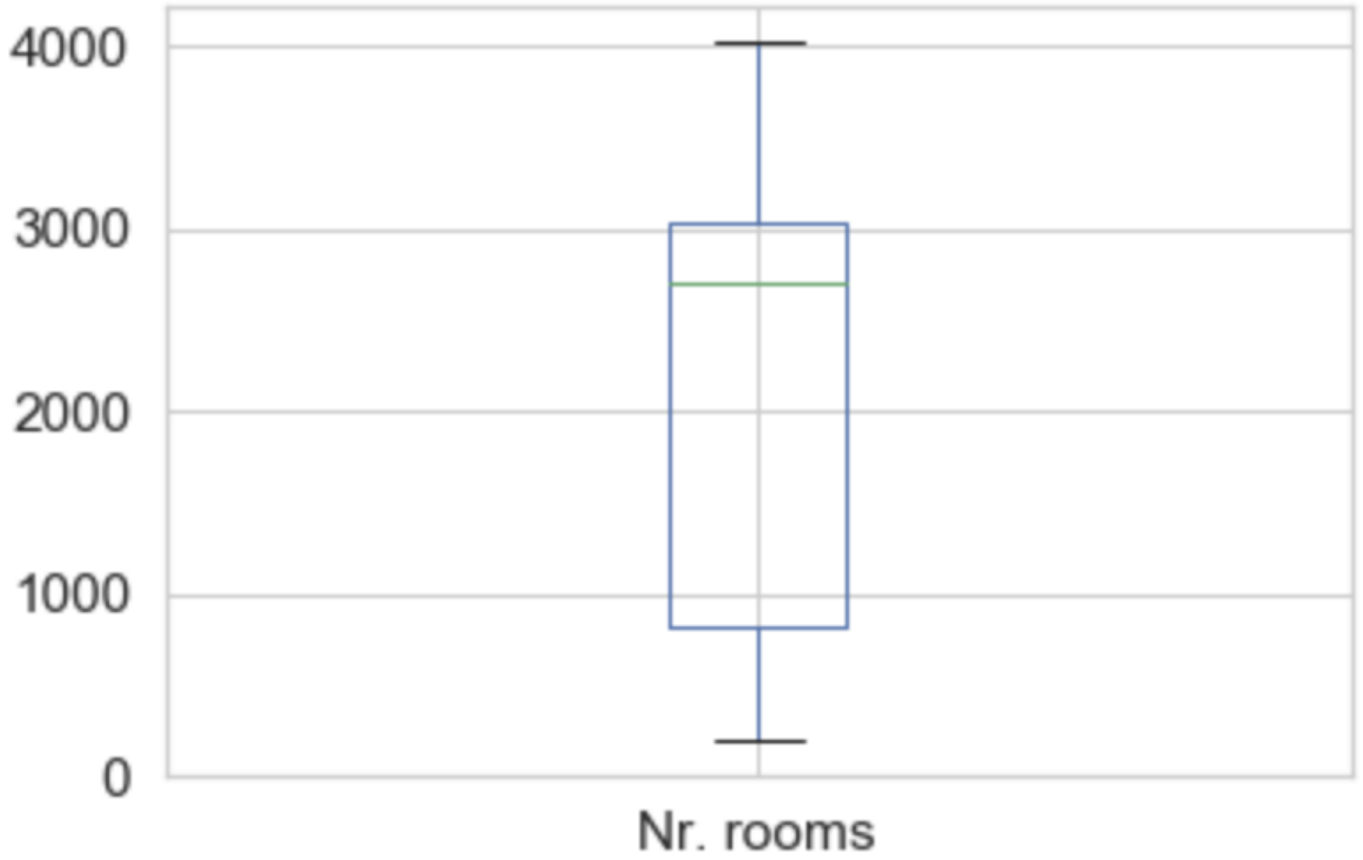
```
plt.show()
```

The catplot function

Parameters:

- `x` : name of variable in `data`
- `y` : name of variable in `data`
- `data` : a DataFrame
- `kind` : type of plot to create - one of: `"strip"` , `"swarm"` , `"box"` , `"violin"` , `"boxen"` , `"point"` , `"bar"` , or `"count"`

Box plot



Box plot wiki page

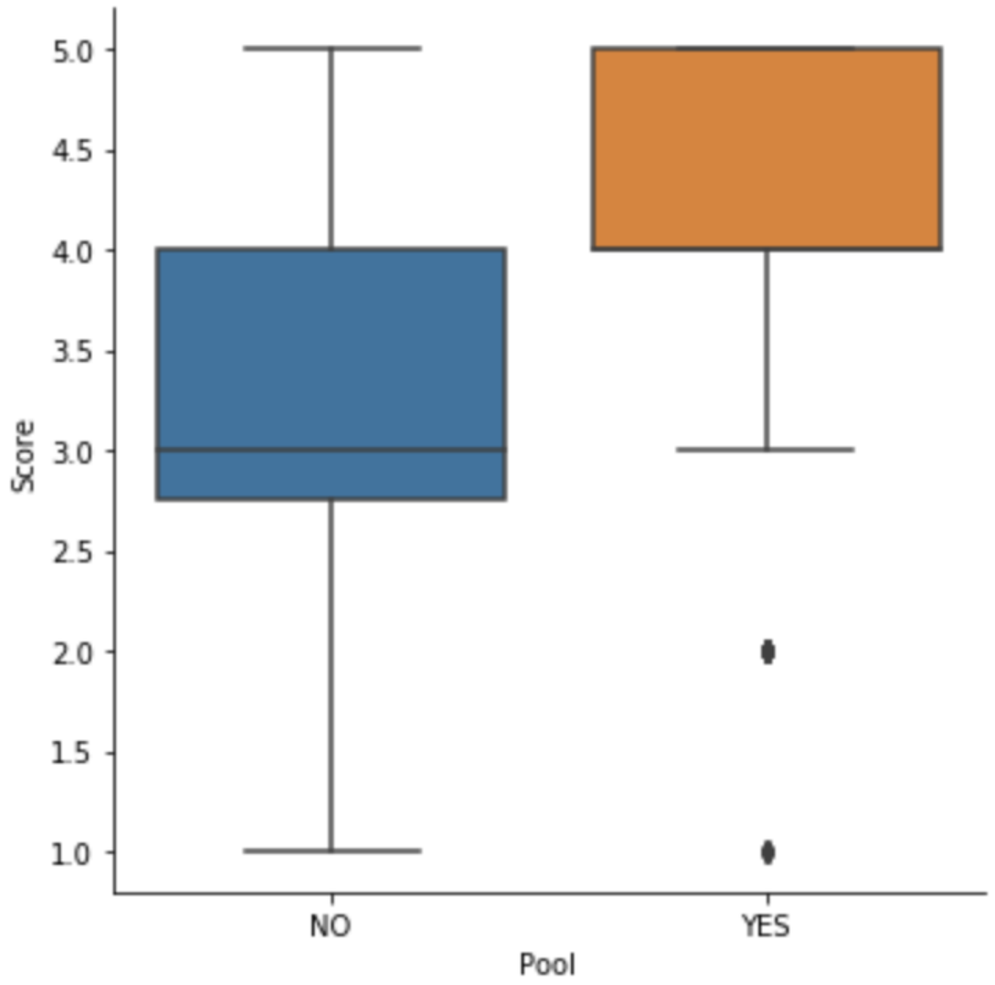
Review score

```
reviews["Score"].value_counts()
```

```
5    227
4    164
3     72
2     30
1     11
```

Box plot example

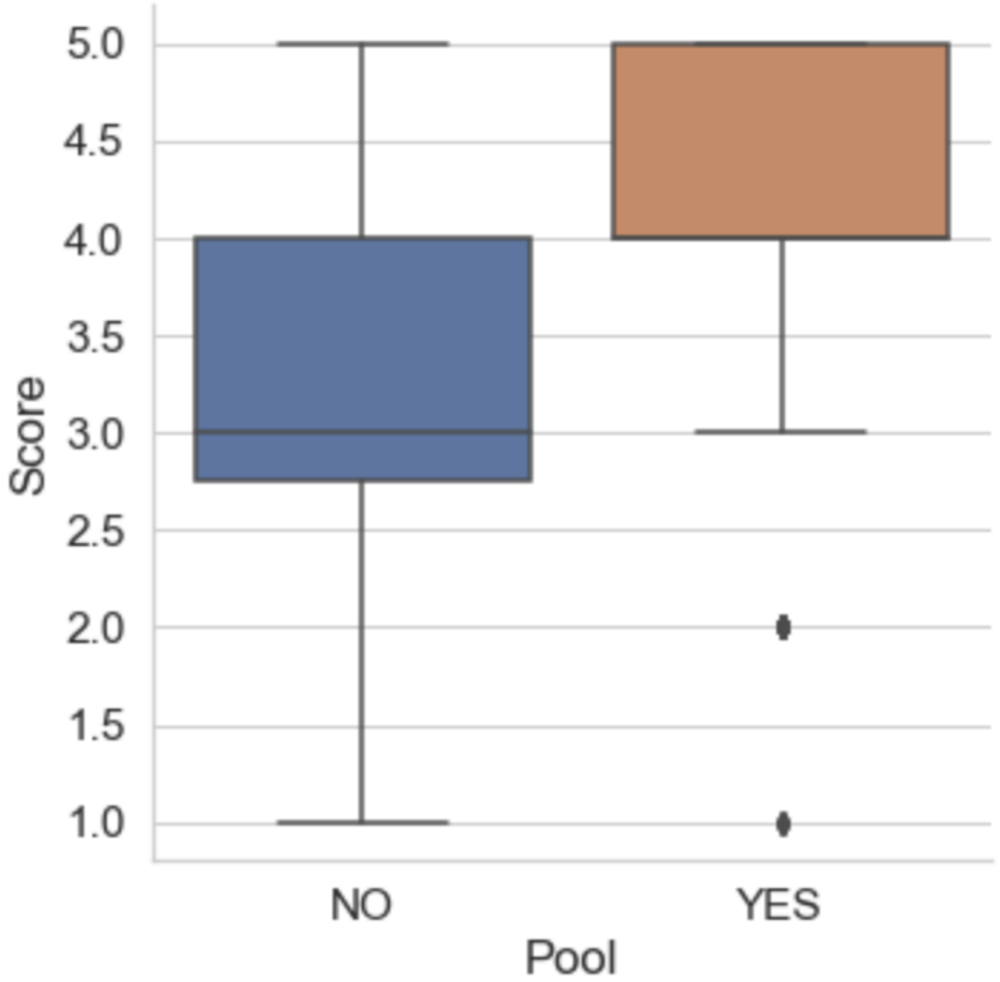
```
sns.catplot(
  x="Pool",
  y="Score",
  data=reviews,
  kind="box"
)
plt.show()
```



Two quick options

```
# Setting font size and plot background
sns.set(font_scale=1.4)
sns.set_style("whitegrid")
```

```
sns.catplot(
  x="Pool",
  y="Score",
  data=reviews,
  kind="box"
)
plt.show()
```



Boxplot practice

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Seaborn bar plots

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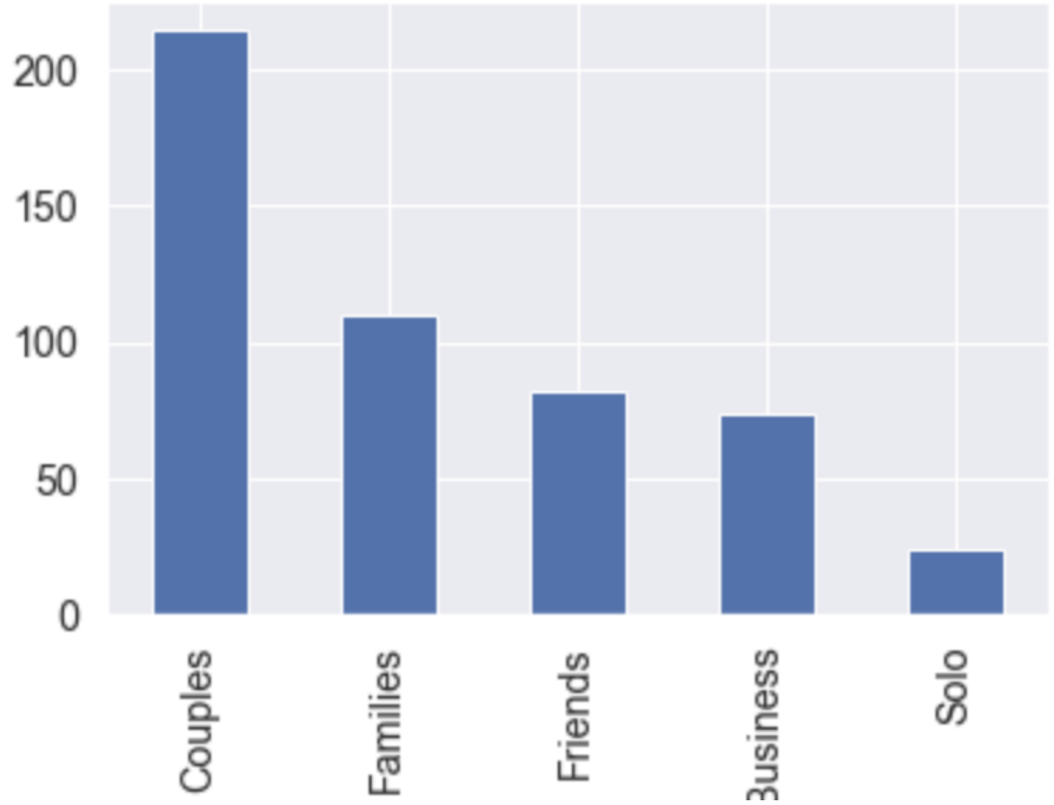
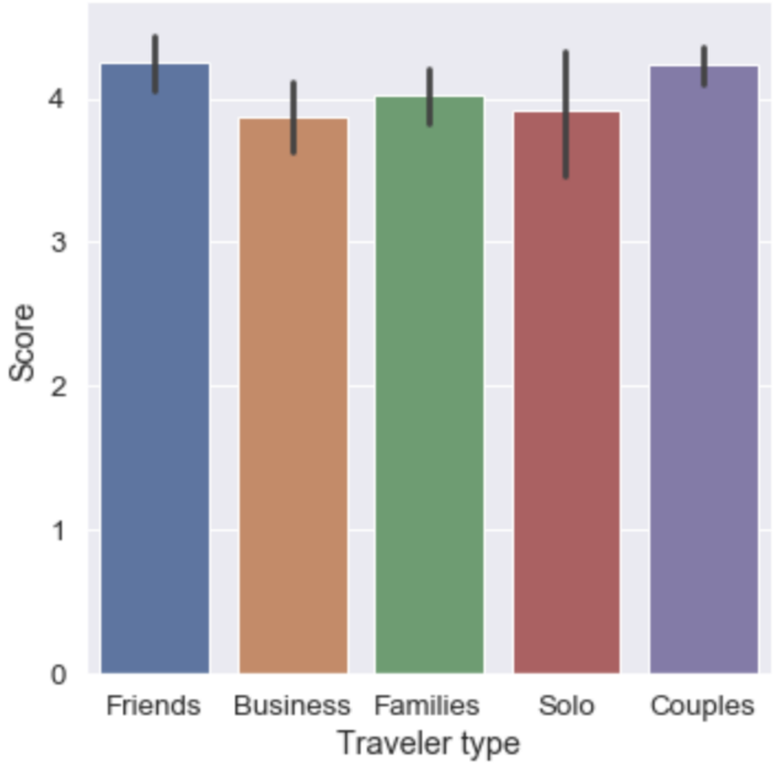
Traditional bar chart

```
# Code provided for clarity
reviews["Traveler type"].value_counts().plot.bar()
```



The syntax

```
sns.set(font_scale=1.3)
sns.set_style("darkgrid")
sns.catplot(x="Traveler type", y="Score", data=reviews, kind="bar")
```



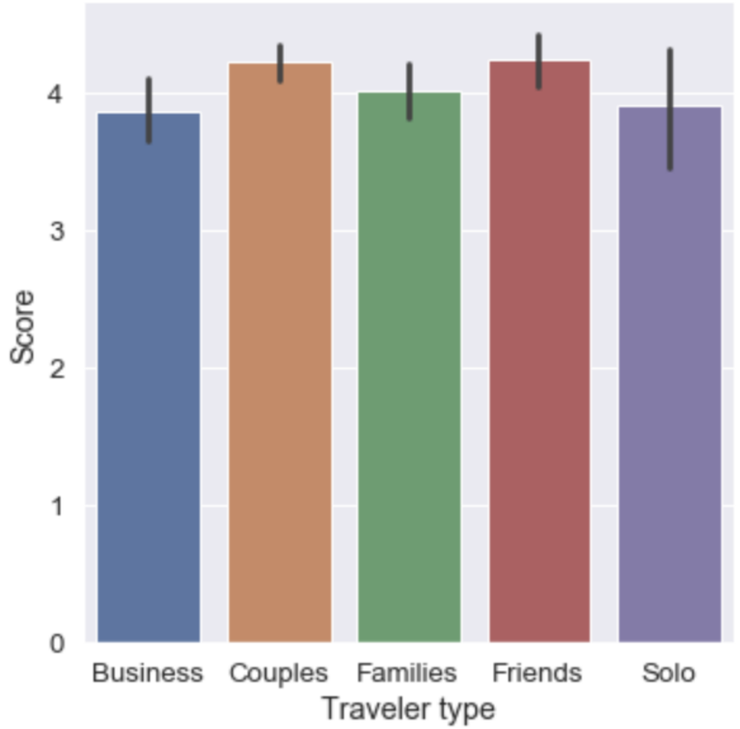
Ordering your categories

```
reviews["Traveler type"] = reviews["Traveler type"].astype("category")
reviews["Traveler type"].cat.categories
```

```
Index(['Business', 'Couples', 'Families', 'Friends', 'Solo'], dtype='object')
```

Updated visualization

```
sns.catplot(x="Traveler type", y="Score", data=reviews, kind="bar")
```



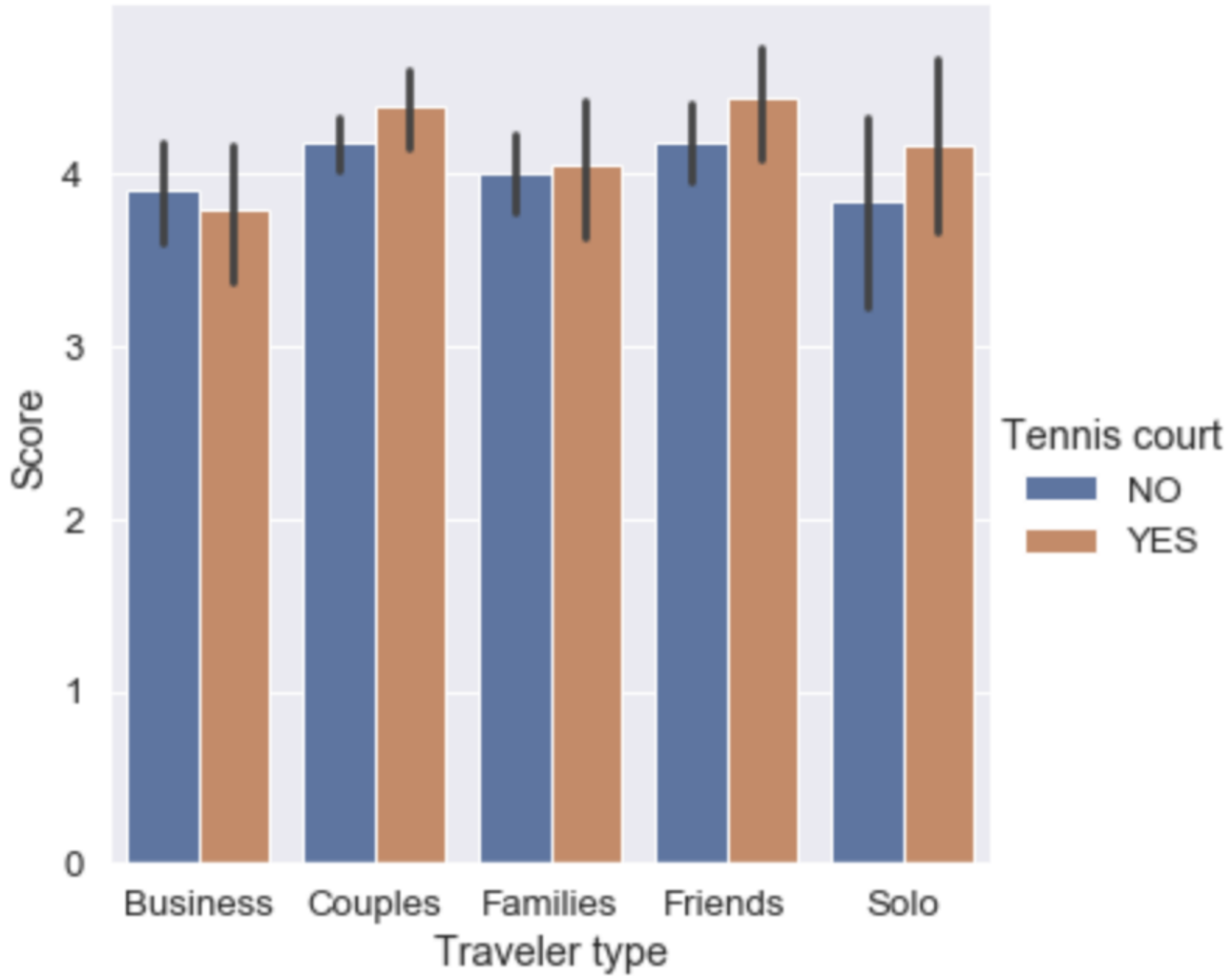
- Note: `catplot()` has an `order` parameter

The hue parameter

- `hue` :
  - name of a variable in `data`
  - used to split the data by a second category
  - also used to color the graphic

```
sns.set(font_scale=1.2)
sns.set_style("darkgrid")
sns.catplot(x="Traveler type", y="Score", data=reviews, kind="bar",
            hue="Tennis court")  # <--- new parameter
```

Bar plot across two variables



Bar plot practice

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Point and count plots

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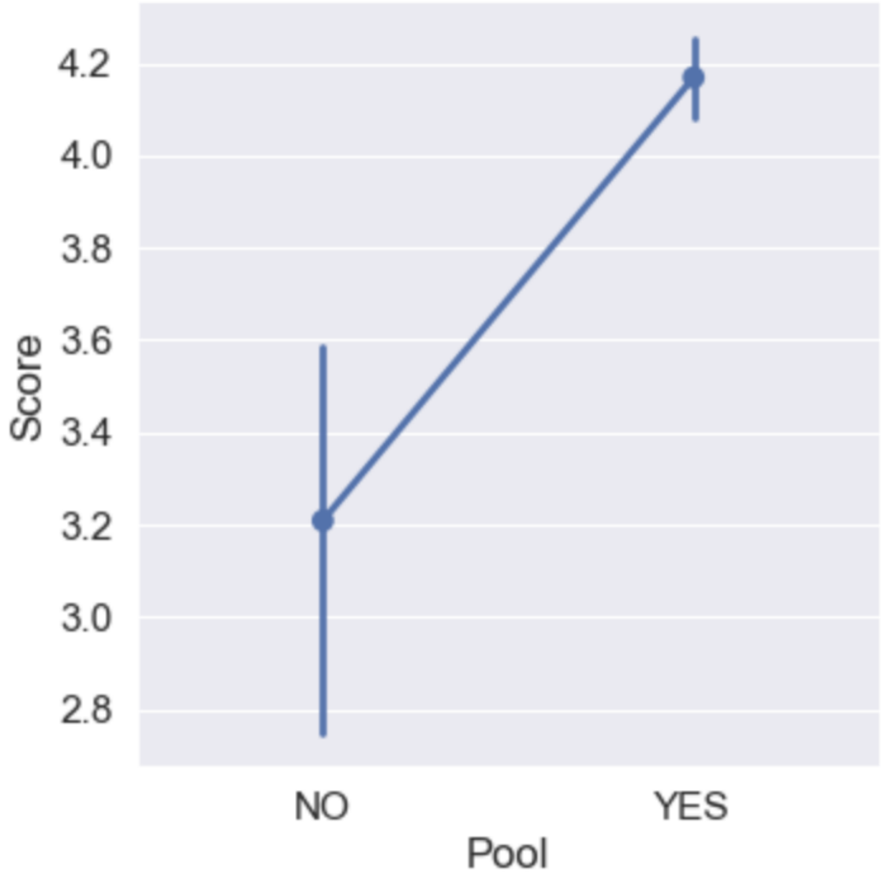
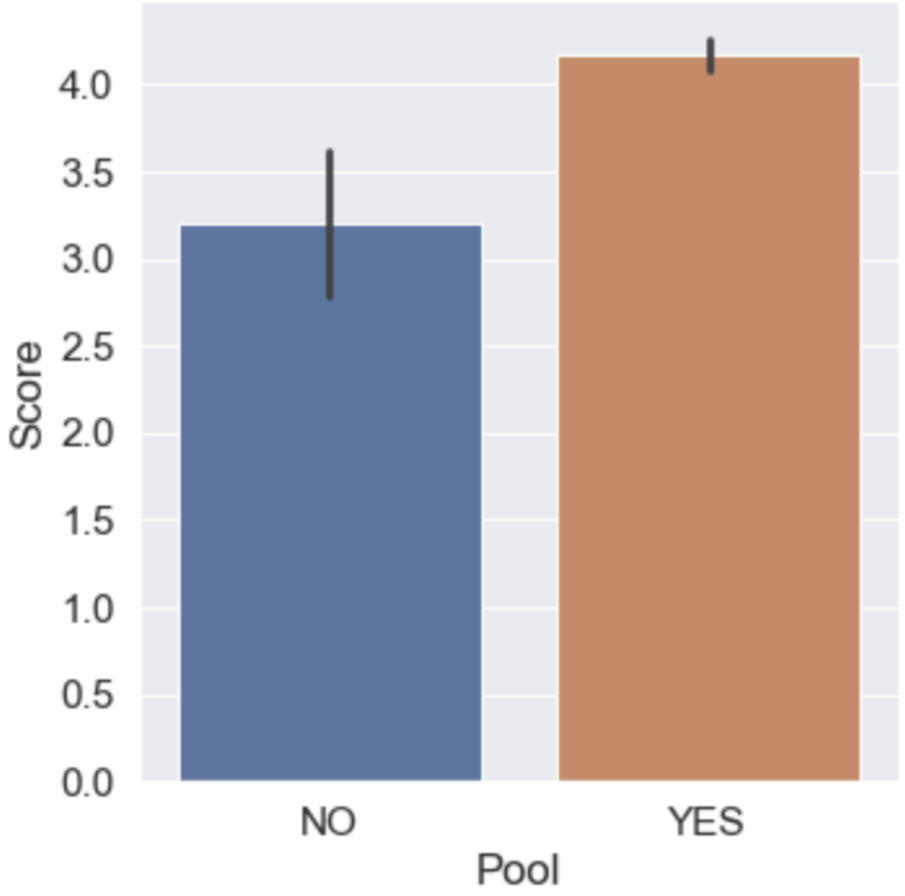
Point plot example

```
sns.catplot(x="Pool", y="Score", data=reviews, kind="point") # <--- updated
```

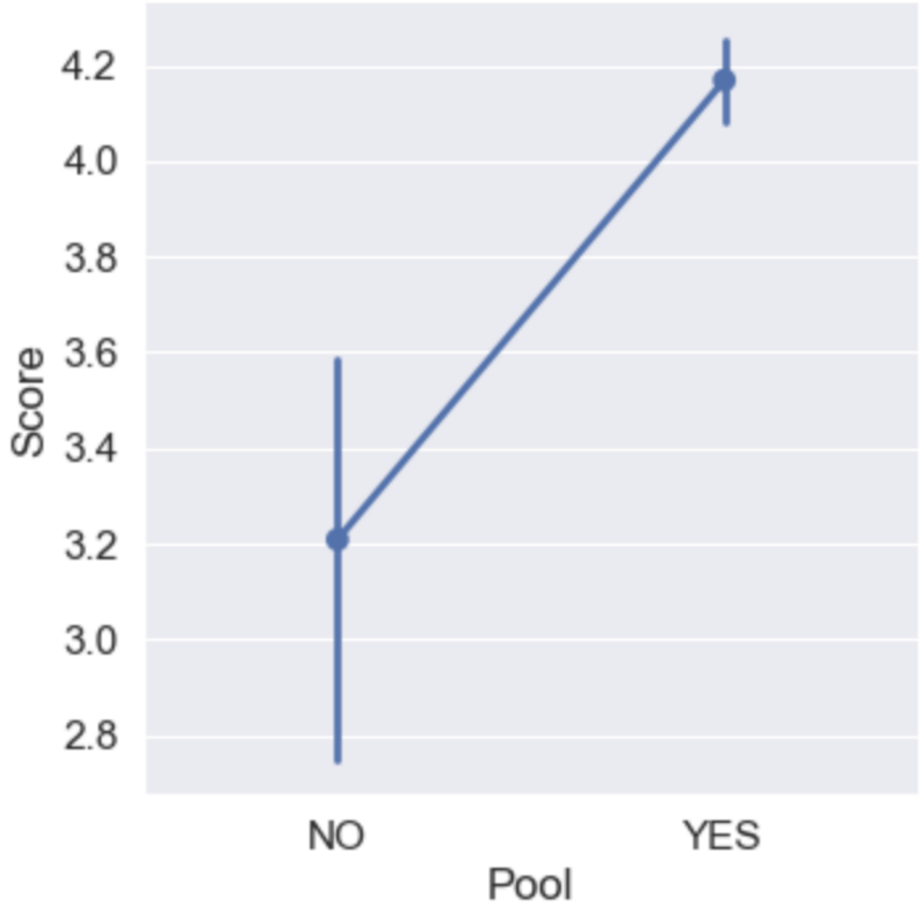


Bar plot vs. point plot

Bar plot

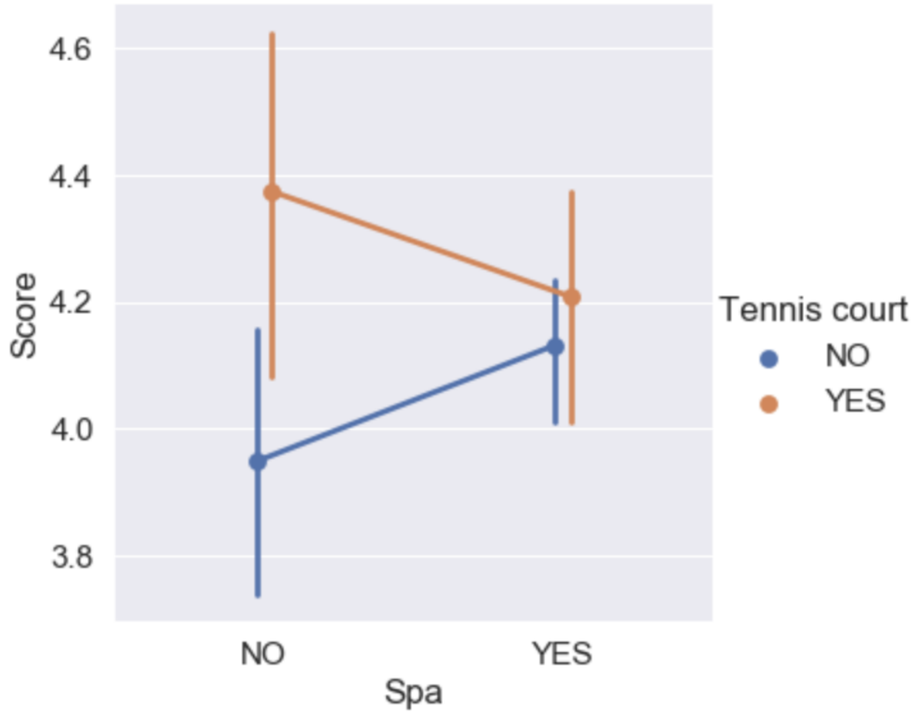


Point plot



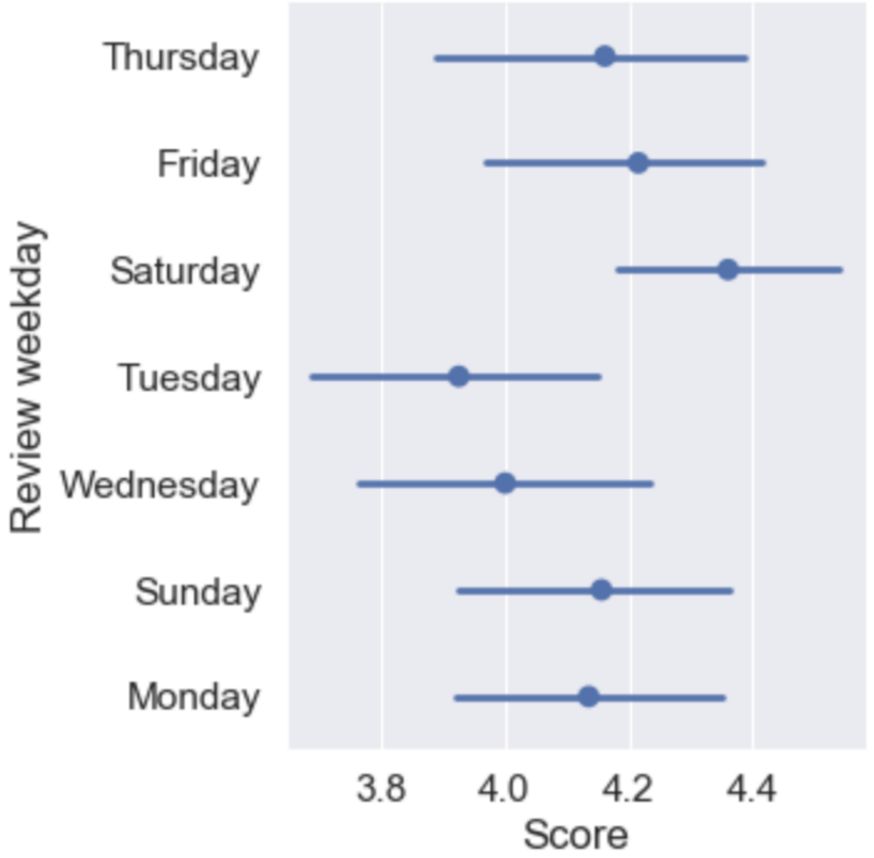
Point plot with hue

```
sns.catplot(x="Spa", y="Score", data=reviews, kind="point",
            hue="Tennis court", dodge=True  # < --- New Parameter!
)
```



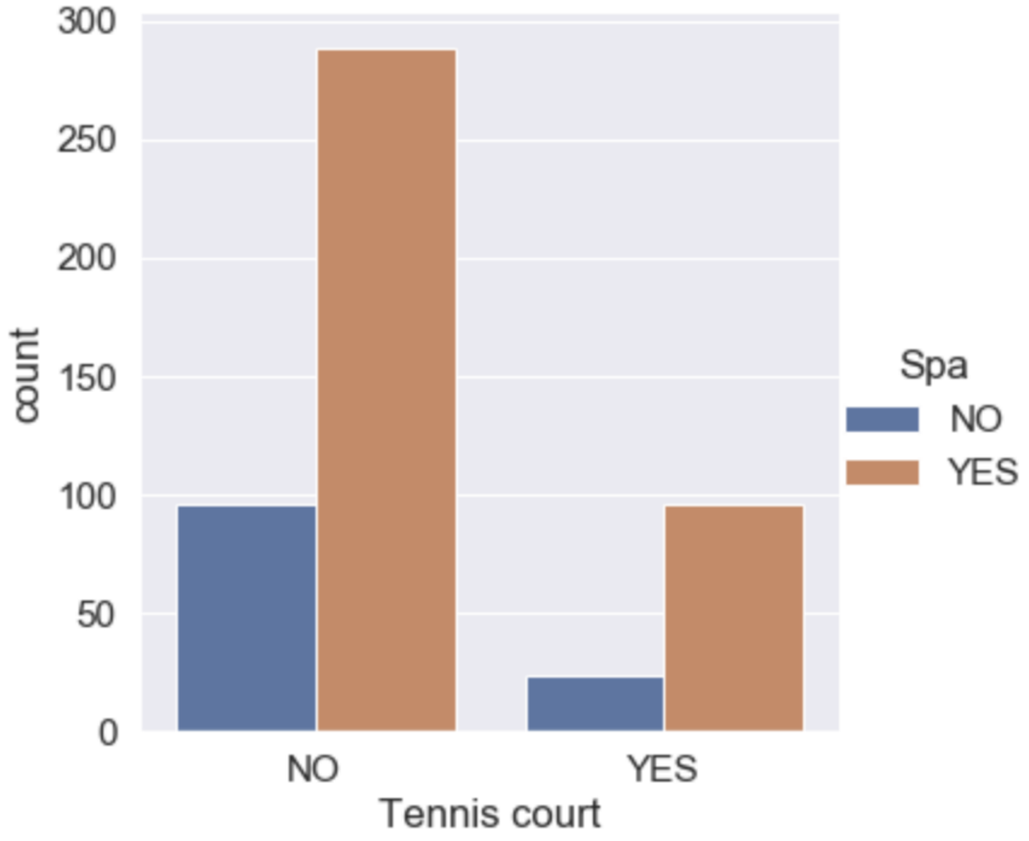
Using the join parameter

```
sns.catplot(x="Score",
            y="Review weekday",
            data=reviews,
            kind="point",
            join=False # < --- New!
)
```



One last catplot type

```
sns.catplot(x="Tennis court", data=reviews, kind="count", hue="Spa")
```



Time to practice!

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Additional catplot() options

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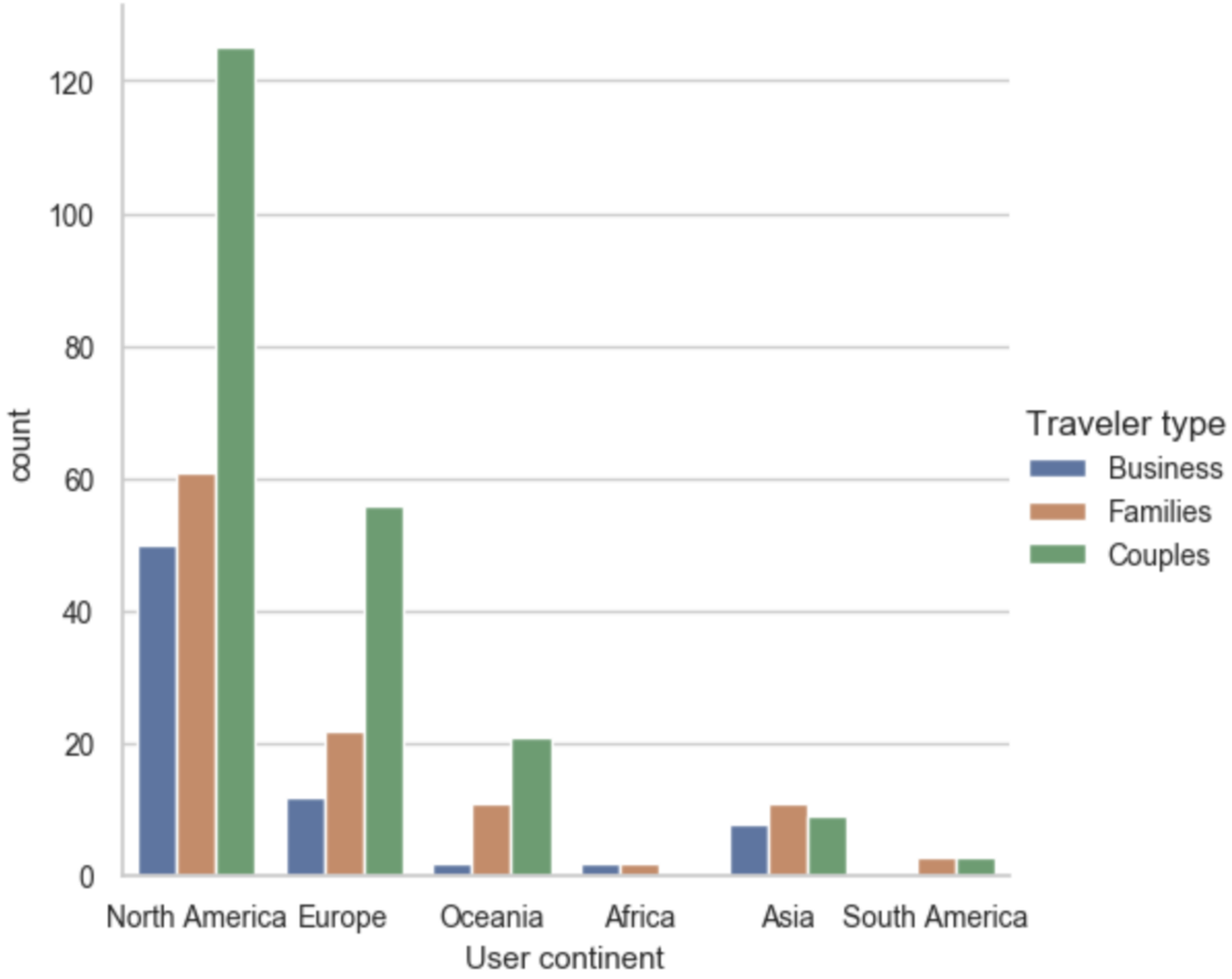
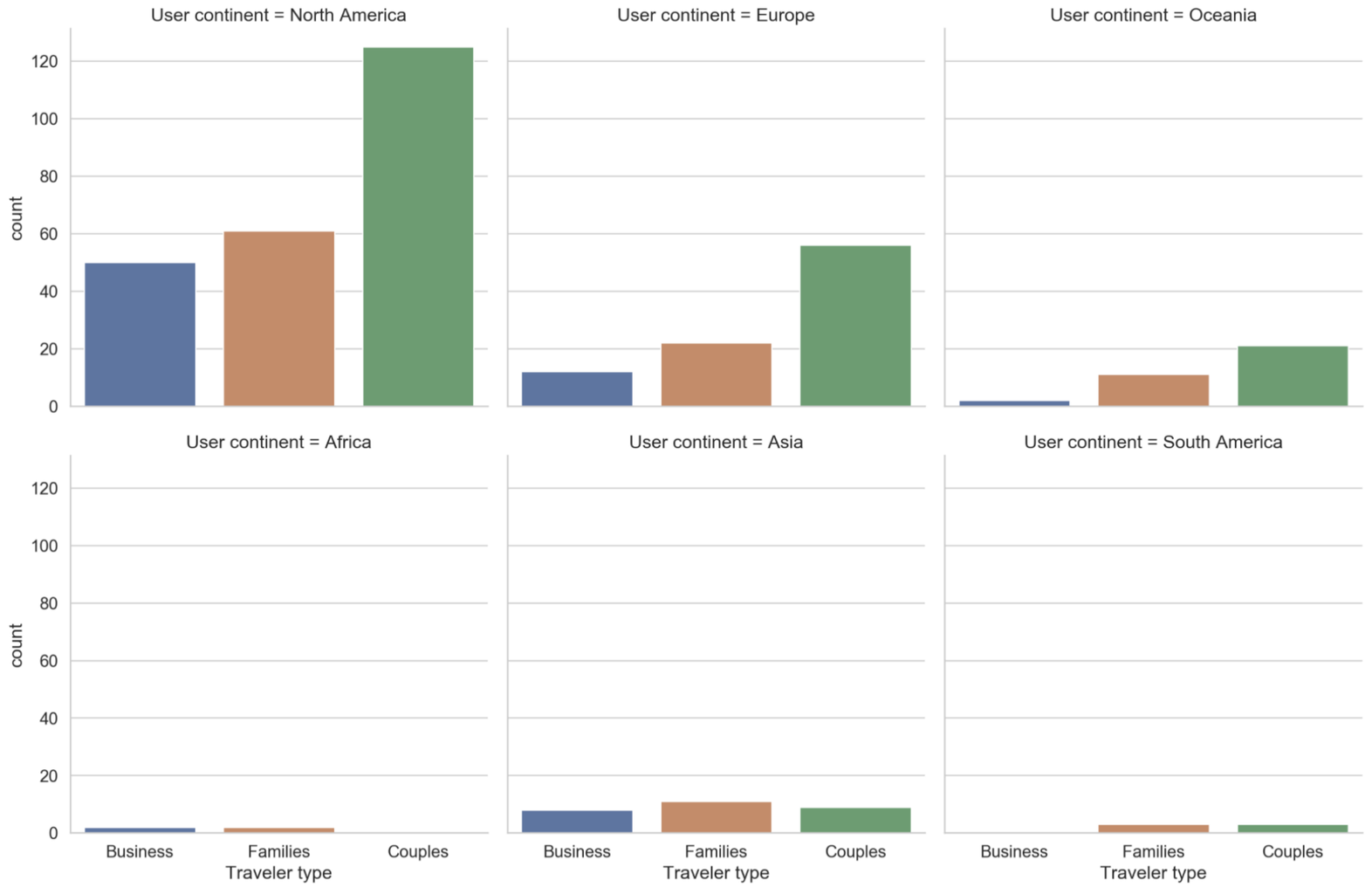
Difficulties with categorical plots



Using the catplot() facetgrid



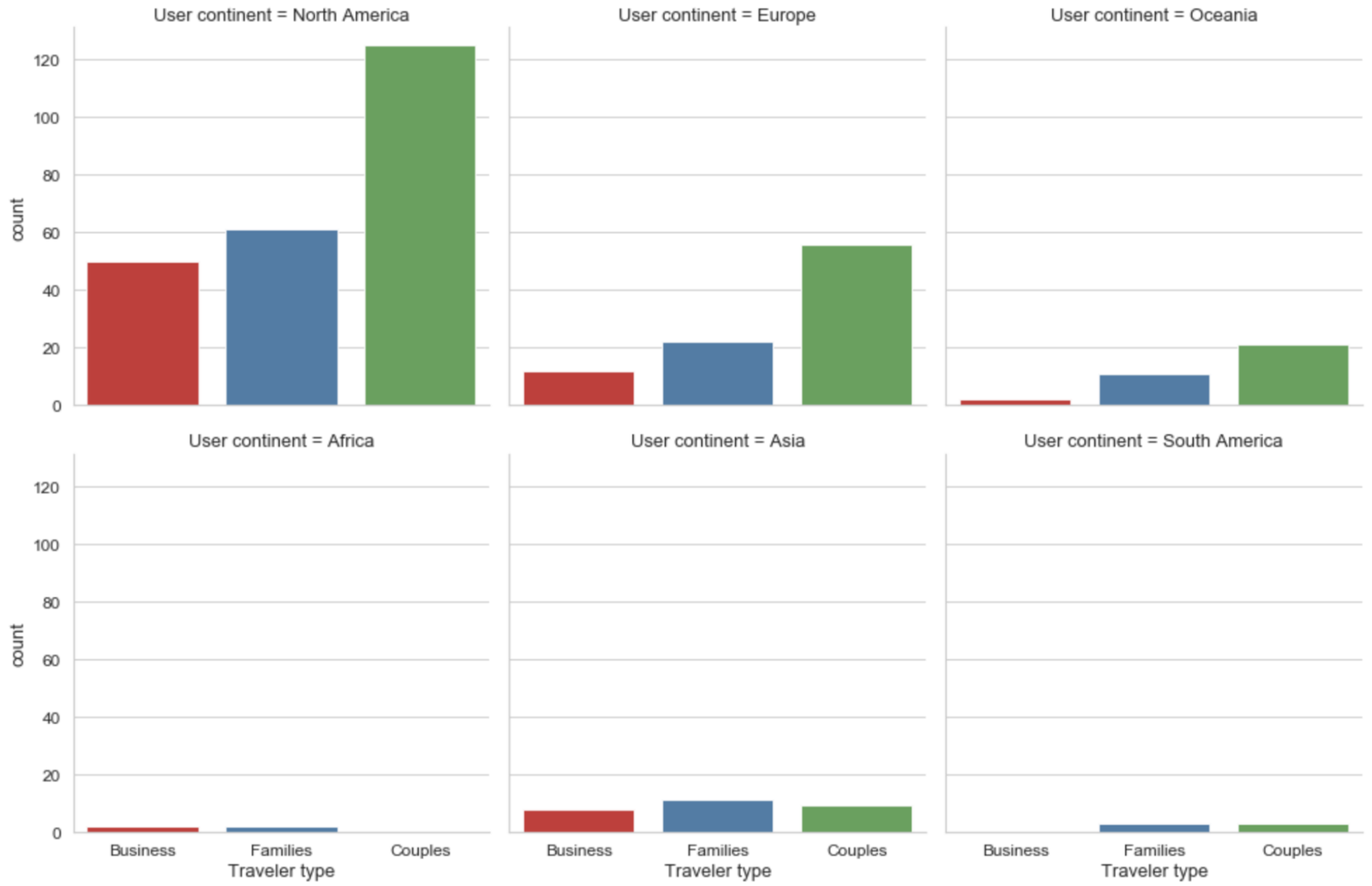
Using different arguments

```
sns.catplot(x="Traveler type", kind="count",
    col="User continent",
    col_wrap=3,
    palette=sns.color_palette("Set1"), data=reviews)
```

- `x` : `"Traveler type"`
- `kind` : `"count"`
- `col` : `"User continent"`
- `col_wrap` : `3`
- `palette` : `sns.color_palette("Set1")`
- Common colors: `"Set"` , `"Set2"` , `"Tab10"` , `"Paired"`

[1] http://seaborn.pydata.org/tutorial/color_palettes.html

One more look



Updating plots

- Setup: save your graphic as an object: `ax`
- Plot title: `ax.fig.suptitle("My title")`
- Axis labels: `ax.set_axis_labels("x-axis-label", "y-axis-label")`
- Title height: `plt.subplots_adjust(top=.9)`

```
ax = sns.catplot(x="Traveler type", col="User continent", col_wrap=3,
    kind="count", palette=sns.color_palette("Set1"), data=reviews)
ax.fig.suptitle("Hotel Score by Traveler Type & User Continent")
ax.set_axis_labels("Traveler Type", "Number of Reviews")
plt.subplots_adjust(top=.9)
plt.show()
```

Finished product

catplot() practice

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