wine_visualizations

October 23, 2017

1 Plotting with Matplotlib

Use Matplotlib to create bar charts that visualize the conclusions you made with groupby and query.

```
In [1]: # Import necessary packages and load `winequality_edited.csv`
        import pandas as pd
        import matplotlib.pyplot as plt
        import seaborn as sns
        import numpy as np
        % matplotlib inline

        df = pd.read_csv('winequality_edited.csv')
        df.head()
```

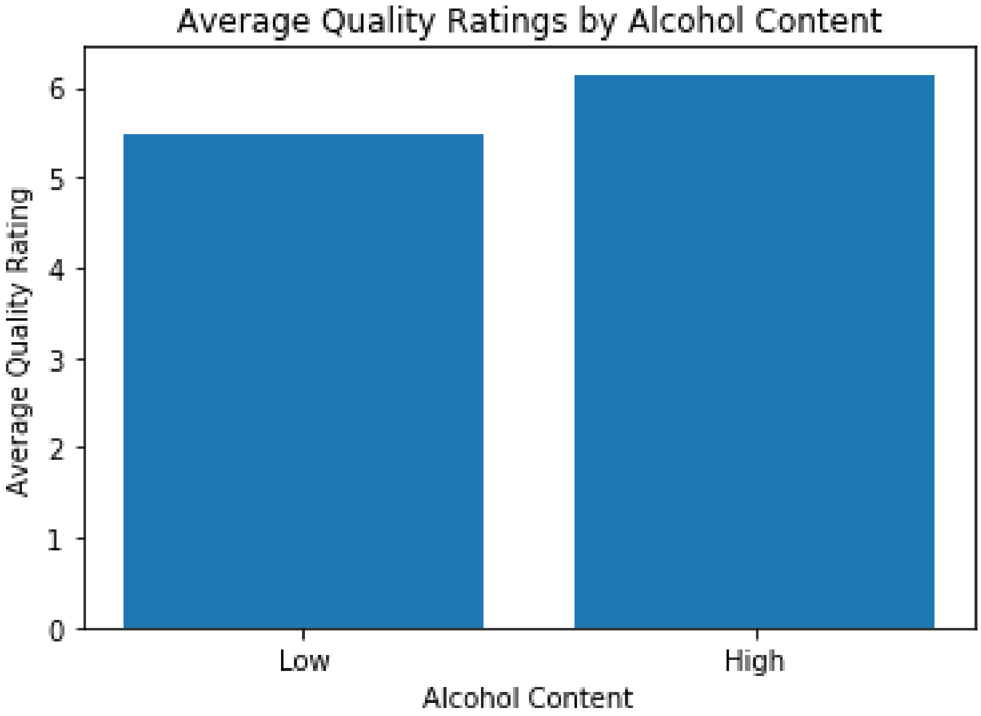
```
Out[1]:    fixed_acidity  volatile_acidity  citric_acid  residual_sugar  chloridesa \
        0            7.4              0.70         0.00             1.9      0.076
        1            7.8              0.88         0.00             2.6      0.098
        2            7.8              0.76         0.04             2.3      0.092
        3           11.2              0.28         0.56             1.9      0.075
        4            7.4              0.70         0.00             1.9      0.076

           free_sulfur_dioxide  total_sulfur_dioxide  density    pH  sulphates  \
        0                 11.0                  34.0   0.9978  3.51       0.56
        1                 25.0                  67.0   0.9968  3.20       0.68
        2                 15.0                  54.0   0.9970  3.26       0.65
        3                 17.0                  60.0   0.9980  3.16       0.58
        4                 11.0                  34.0   0.9978  3.51       0.56

           alcohol  quality color acidity_levels
        0      9.4        5   RED            low
        1      9.8        5   RED       med-high
        2      9.8        5   RED        med-low
        3      9.8        6   RED       med-high
        4      9.4        5   RED            low
```

1.0.1 #1: Do wines with higher alcoholic content receive better ratings?

Create a bar chart with one bar for low alcohol and one bar for high alcohol wine samples. This first one is filled out for you.

```
In [2]: # Use query to select each group and get its mean quality
        median = df['alcohol'].median()
        low = df.query('alcohol < {}'.format(median))
        high = df.query('alcohol >= {}'.format(median))

        mean_quality_low = low['quality'].mean()
        mean_quality_high = high['quality'].mean()
```

```
In [3]: # Create a bar chart with proper labels
        locations = [1, 2]
        heights = [mean_quality_low, mean_quality_high]
        labels = ['Low', 'High']
        plt.bar(locations, heights, tick_label=labels)
        plt.title('Average Quality Ratings by Alcohol Content')
        plt.xlabel('Alcohol Content')
        plt.ylabel('Average Quality Rating');
```



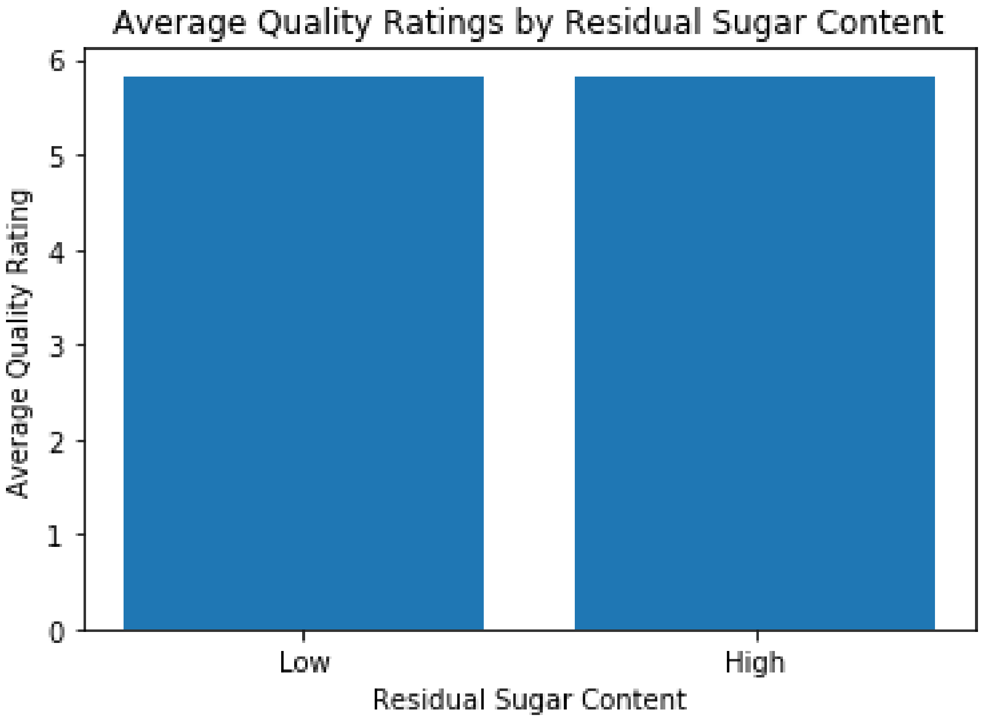
1.0.2 #2: Do sweeter wines receive higher ratings?

Create a bar chart with one bar for low residual sugar and one bar for high residual sugar wine samples.

```
In [4]: # Use query to select each group and get its mean quality
        sugar_median = df['residual_sugar'].median()
        sugar_low = df.query('residual_sugar < {}'.format(sugar_median))
        sugar_high = df.query('residual_sugar >= {}'.format(sugar_median))

        sugar_mean_quality_low = sugar_low['quality'].mean()
        sugar_mean_quality_high = sugar_high['quality'].mean()

        print('sugar low quality mean: {}'.format(sugar_mean_quality_low))
        print('sugar high quality mean: {}'.format(sugar_mean_quality_high))
```

```
sugar low quality mean: 5.808800743724822
sugar high quality mean: 5.82782874617737
```

```
In [5]: # Create a bar chart with proper labels

        #locations = [1, 2]
        sugar_heights = [sugar_mean_quality_low, sugar_mean_quality_high]
        #labels = ['Low', 'High']
        plt.bar(locations, sugar_heights, tick_label=labels)
        plt.title('Average Quality Ratings by Residual Sugar Content')
        plt.xlabel('Residual Sugar Content')
        plt.ylabel('Average Quality Rating');
```



1.0.3 #3: What level of acidity receives the highest average rating?

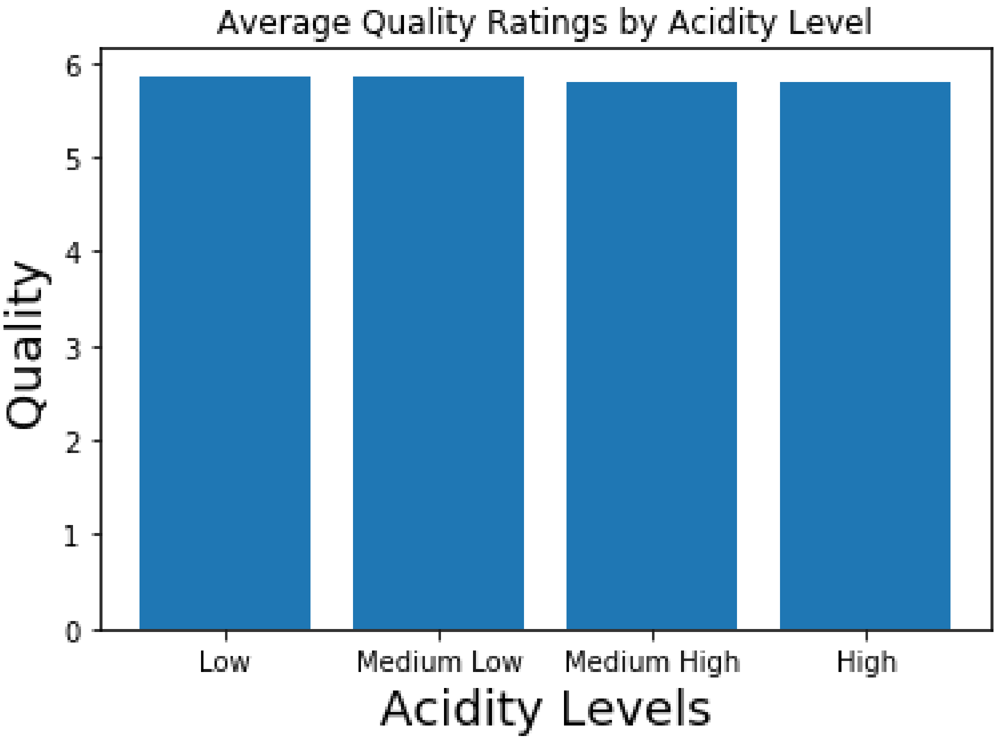
Create a bar chart with a bar for each of the four acidity levels.

```
In [6]: # Use groupby to get the mean quality for each acidity level

        quality_acid_level_means = df.groupby(['acidity_levels'])['quality'].mean()
        print(quality_acid_level_means)
```

```
acidity_levels
high        5.783343
low         5.859415
med-high    5.784540
med-low     5.850832
Name: quality, dtype: float64
```

```
In [7]: # Create a bar chart with proper labels

        # stop hardcoding the locations, we can generate them once we know how many means we
        # will plot (i.e. the number of acidity levels we grouped by)
        x_coords = list(np.arange(1, len(quality_acid_level_means) + 1))

        # reindex because the default order wasn't human-readable friendly
        quality_acid_level_means = quality_acid_level_means.reindex(['low', 'med-low', 'med-high
        #print(quality_acid_level_means)

        # labels are in same order of reindex
        acidity_labels = ['Low', 'Medium Low', 'Medium High', 'High']

        plt.bar(x_coords, quality_acid_level_means, tick_label=acidity_labels)

        plt.title('Average Quality Ratings by Acidity Level')

        plt.xlabel('Acidity Levels', fontsize=18)
        plt.ylabel('Quality', fontsize=18)
```

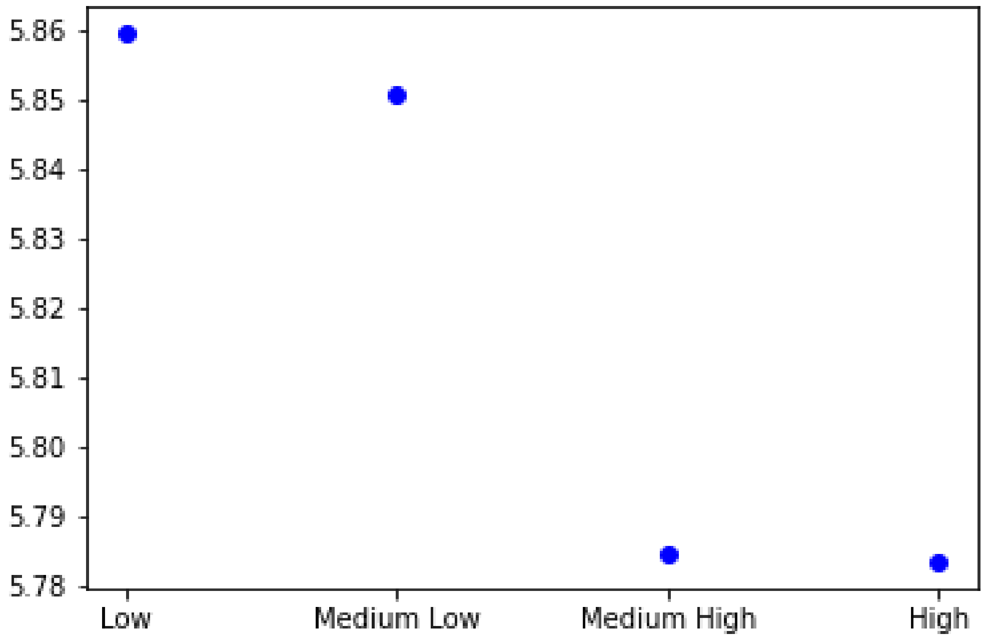
```
Out[7]: Text(0,0.5,'Quality')
```



1.0.4 Bonus: Create a line plot for the data in #3

You can use pyplot's plot function for this.

```
In [13]: # this shows the order from the re-index
         quality_acid_level_means

Out[13]: acidity_levels
         low         5.859415
         med-low     5.850832
         med-high    5.784540
         high        5.783343
         Name: quality, dtype: float64

In [17]: # need to use xticks to get the labels
         plt.plot(x_coords, quality_acid_level_means, 'bo')
         plt.xticks(x_coords, acidity_labels);
```



Compare this with the bar chart. How might showing this visual instead of the bar chart affect someone's conclusion about this data?