clustering_hclust

June 11, 2018

```
In [1]: import pandas as pd
        import seaborn as sn
```

0.1 1. Preparing Data

Read data from a specified location

```
In [2]: from IPython.core.interactiveshell import InteractiveShell
        InteractiveShell.ast_node_interactivity = "all"
```

```
In [3]: raw_df = pd.read_csv( "/Users/Rahul/Documents/Datasets/Hclust_Beer data.csv",
                               sep = ',', na_values = ['', ' '])

        raw_df.columns = raw_df.columns.str.lower().str.replace(' ', '_')
        raw_df.head()
```

```
Out[3]:    id         beer  cal  sod  alc  cost
        0   1    Budweiser  144   15  4.7  0.43
        1   2      Schlitz  151   19  4.9  0.43
        2   3    Lowenbrau  157   15  4.9  0.48
        3   4  Kronenbourg  170    7  5.2  0.73
        4   5     Heineken  152   11  5.0  0.77
```

0.2 2. Extract Features and Standardize

Two ways to extract the features:

- use `pd.filter` and pass the list of features to extract for scaling
- Use `pd.drop` and pass the list of features which need not be extracted

The feature can also be extracted by using `dataframeName[[<name of features>]]`

```
In [4]: #feature_df = raw_df[['cal', 'sod', 'alc', 'cost']]

        feature_df = raw_df.drop({'id','beer'}, axis =1)
        col_names = feature_df.columns
        #col_names

        row_index = raw_df.iloc[:,1]
        #row_index
```

```
In [5]: from sklearn.preprocessing import StandardScaler
        scaler = StandardScaler()

        feature_scaled_df = pd.DataFrame(scaler.fit_transform( feature_df ))

        feature_scaled_df.columns = col_names
        feature_scaled_df.index = row_index
```

Use `rename` function, in case renaming of a specific column or index is required

```
In [6]: #feature_scaled_df.rename(index={'Budweiser':'Bud'}, inplace=True)
```

The referening of a row or column can be changed by using the below code chunk. Uncomment and change the values within `iloc` to understand how referencing works:

```
In [7]: #ref_row_col = raw_df.iloc[:,:]
        #ref_row_col
```

```
In [8]: feature_scaled_df
```

```
Out[8]:                      cal       sod       alc      cost
        beer
        Budweiser       0.393336  0.007795  0.351095 -0.470541
        Schlitz         0.630693  0.631369  0.621168 -0.470541
        Lowenbrau       0.834143  0.007795  0.621168 -0.114071
        Kronenbourg     1.274950 -1.239354  1.026278  1.668282
        Heineken        0.664602 -0.615780  0.756205  1.953459
        Old Mil         0.427244  1.254943  0.216058 -1.539953
        Augsburger      1.444491  1.410837  1.431387 -0.684423
        Strohs          0.562877  1.878518  0.351095 -0.541835
        Miller lite    -1.132535 -0.771673 -0.189051 -0.470541
        Bud light      -0.657820 -1.083460 -0.999270 -0.399247
        Coors           0.257703  0.475475  0.216058 -0.399247
        Coors lite     -1.030811  0.007795 -0.459124 -0.327953
        Michelob light  0.088161 -0.615780 -0.324088  0.028518
        Becks           0.596785  0.631369  0.351095  1.882165
        Kirin           0.562877 -1.395248  0.756205  2.096047
        Pabst          -2.183691  0.007795 -2.889782 -0.827012
        Hamms           0.122070  0.631369 -0.054015 -0.470541
        Heilemans       0.393336  1.410837  0.621168 -0.470541
        Olympia        -2.048058 -1.395248 -2.079563 -0.256659
        Schilitz lite  -1.200352 -1.239354 -0.324088 -0.185365
```

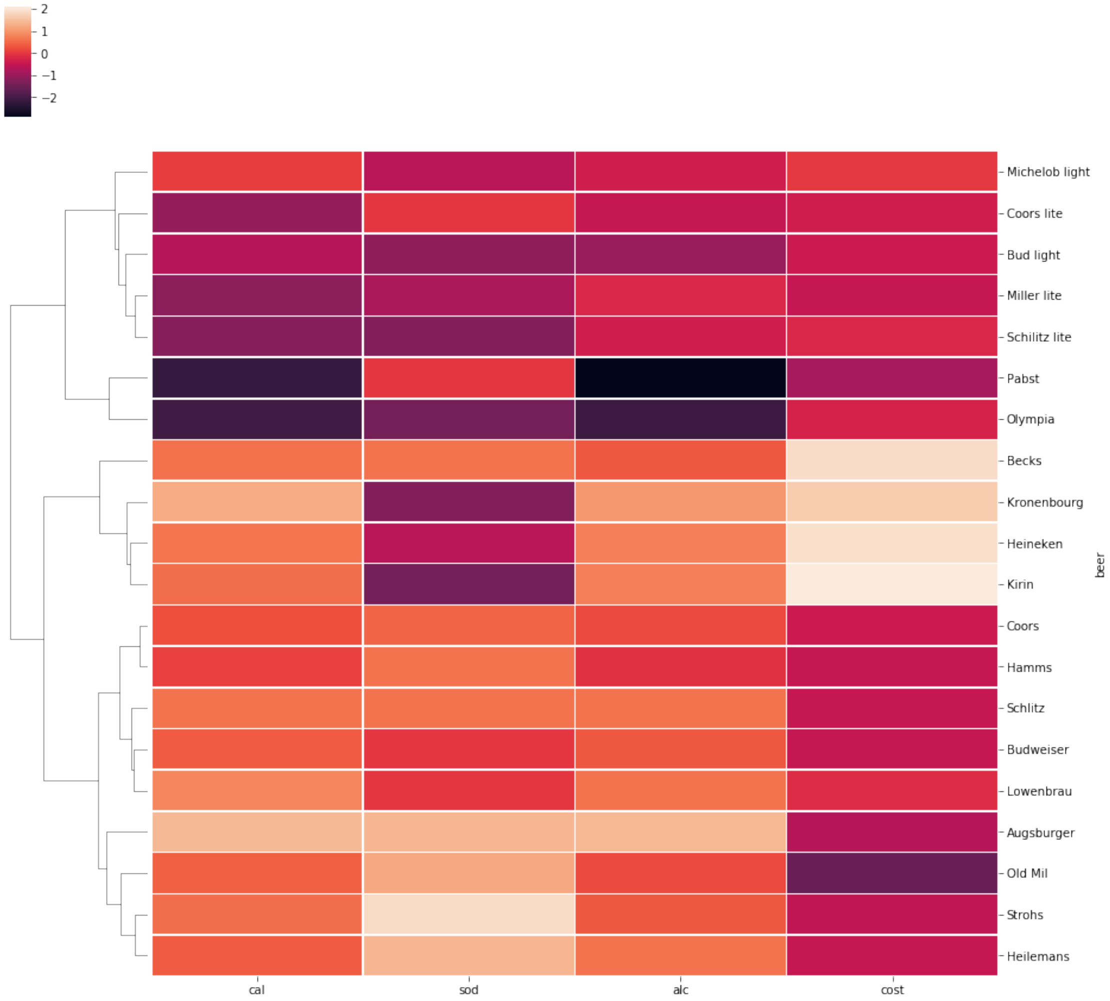
0.3 3. Cluster and Visualize

Refer to http://docs.scipy.org/doc/scipy/reference/generated/scipy.cluster.hierarchy.linkage.html for refernce to available methods, metric.

Rather than standardizing the values above We could have set `z_score` parameter inside the `clustermap` to 1 for standardizing the column values.

```
In [9]: sn.clustermap(feature_scaled_df, method = 'complete', metric = 'euclidean',
                   row_cluster=True,col_cluster = False,
                   linewidths=.5,figsize =(15,15))

Out[9]: <seaborn.matrix.ClusterGrid at 0x116372748>
```


Michelob light
Coors lite
Bud light
Miller lite
Schilitz lite
Pabst
Olympia
Becks
Kronenbourg
Heineken
Kirin
Coors
Hamms
Schlitz
Budweiser
Lowenbrau
Augsburger
Old Mil
Strohs
Heilemans
beer
cal
sod
alc
cost