Recommending Restaurants based on User Moods

Our Product is simple. User has to tell us his/her mood, we'll recommend him/her a restaurant according to the mood. The moods are stress, laziness, happy, depression, sick, cold weather, hunger, etc. The model works well for age range 15-30 due to the dataset.

About the Dataset

We are using two datasets. First is Zomato Restaurants Dataset and Second is Food Choices of College Students Dataset.

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from wordcloud import WordCloud, STOPWORDS
stopwords = set(STOPWORDS)
import seaborn as sns
from plotly.offline import init_notebook_mode, iplot
init_notebook_mode()
from collections import Counter
from nltk.corpus import stopwords
stop = set(stopwords.words('english'))
stop.update(['.', ',', '"', "'", '?', '!', ':', ';', '(', ')', '[', 
']', '{', '}',''])
from nltk.stem import WordNetLemmatizer
```

Zomato Restaurants Dataset Analysis (in New Delhi)

```
res_data = pd.read_csv('zomato.csv', encoding='latin-1')
countryCode_toName = {
    1: "India",
    14: "Australia",
    30: "Brazil",
    37: "Canada",
    94: "Indonesia",
    148: "New Zealand",
    162: "Phillipines",
    166: "Qatar",
    184: "Singapore",
    189: "South Africa",
    191: "Sri Lanka",
    208: "Turkey",
    214: "UAE",
    215: "United Kingdom",
    216: "United States",
}
res_data['Country'] = res_data['Country Code'].apply(lambda x: 
countryCode_toName[x])
```

```
res_data = res_data.loc[(res_data['Country Code'] == 1) &
(res_data['City'] == 'New Delhi'), :]
res_data = res_data.loc[res_data['Longitude'] != 0, :]
res_data = res_data.loc[res_data['Latitude'] != 0, :]
res_data = res_data.loc[res_data['Latitude'] < 29] # clearing out
invalid outlier
res_data = res_data.loc[res_data['Rating text'] != 'Not rated']
res_data['Cuisines'] = res_data['Cuisines'].astype(str)
res_data['fusion_num'] = res_data['Cuisines'].apply(lambda x:
len(x.split(',')))
res_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 3975 entries, 2561 to 8009
Data columns (total 23 columns):
Restaurant ID           3975 non-null int64
Restaurant Name         3975 non-null object
Country Code            3975 non-null int64
City                    3975 non-null object
Address                 3975 non-null object
Locality                3975 non-null object
Locality Verbose        3975 non-null object
Longitude               3975 non-null float64
Latitude                3975 non-null float64
Cuisines                3975 non-null object
Average Cost for two    3975 non-null int64
Currency                3975 non-null object
Has Table booking       3975 non-null object
Has Online delivery     3975 non-null object
Is delivering now       3975 non-null object
Switch to order menu    3975 non-null object
Price range             3975 non-null int64
Aggregate rating        3975 non-null float64
Rating color            3975 non-null object
Rating text             3975 non-null object
Votes                   3975 non-null int64
Country                 3975 non-null object
fusion_num              3975 non-null int64
dtypes: float64(3), int64(6), object(14)
memory usage: 745.3+ KB
```

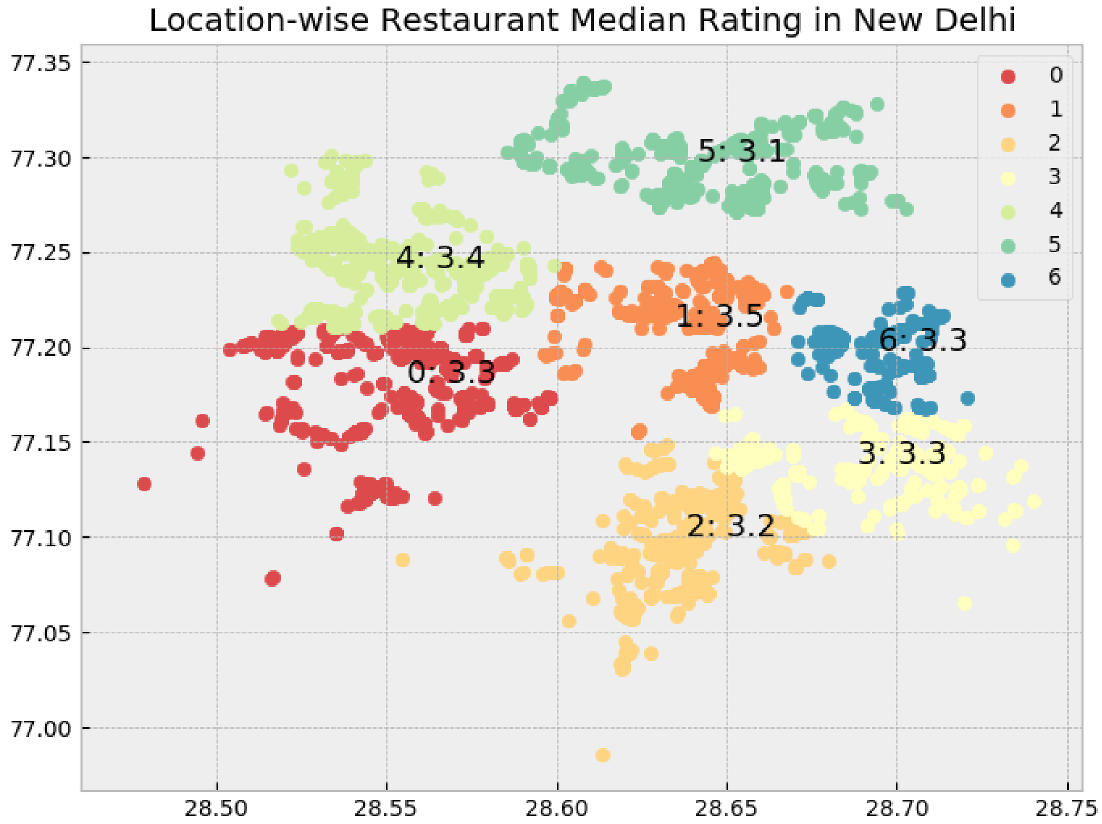
What are the most famous cuisines in New Delhi?

```
lst_cuisine = set()
Cnt_cuisine = Counter()
for cu_lst in res_data['Cuisines']:
    cu_lst = cu_lst.split(',')
    lst_cuisine.update([cu.strip() for cu in cu_lst])
    for cu in cu_lst:
        Cnt_cuisine[cu.strip()] += 1
```

```
cnt = pd.DataFrame.from_dict(Cnt_cuisine, orient = 'index')
cnt.sort_values(0, ascending = False, inplace = True)


tmp_cnt = cnt.head(10)
tmp_cnt.rename(columns = {0:'cnt'}, inplace = True)
with plt.style.context('bmh'):
    f = plt.figure(figsize = (12, 8))
    ax = plt.subplot2grid((2,2), (0,0))
    sns.barplot(x = tmp_cnt.index, y = 'cnt', data = tmp_cnt, ax = ax,
palette = sns.color_palette('Blues_d', 10))
    ax.set_title('# Cuisine')
    ax.tick_params(axis='x', rotation=70)
    ax = plt.subplot2grid((2,2), (0,1))
    sns.countplot(res_data['fusion_num'], ax=ax, palette =
sns.color_palette('Blues_d', res_data.fusion_num.nunique()))
    ax.set_title('# Cuisine Provided')
    ax.set_ylabel('')
    plt.show()
print('# Unique Cuisine: ', len(lst_cuisine))
```

K-Means Clustering - Where are high-rated restaurants located?

```
res_data['Rating category'] = res_data['Rating text'].map({'Not
rated': -1, 'Poor':0, 'Average':2, 'Good':3, 'Very Good':4,
'Excellent':5})
tmp = res_data['Aggregate rating'].map(np.round)
a = np.full(tmp.shape[0], False, dtype = bool)
((tmp - res_data['Rating category']).map(np.round)).value_counts()
sys_check = res_data[['Aggregate rating', 'Rating category',
'Votes']].copy()
sys_check['distorted'] = (res_data['Aggregate rating'] -
res_data['Rating category']).map(np.round)
sys_check['diff'] = sys_check['Aggregate rating'] - sys_check['Rating
category']
res_data = res_data.loc[sys_check['distorted'] != 2, :]
res_data['Rating category'] = res_data['Aggregate
rating'].round(0).astype(int)

from sklearn.cluster import KMeans
kmeans = KMeans(n_clusters=7,
random_state=0).fit(res_data[['Longitude', 'Latitude']])
res_data['pos'] = kmeans.labels_
pop_local = res_data.groupby('pos')['Longitude', 'Latitude',
'Aggregate rating'].agg({'Longitude':np.mean, 'Latitude':np.mean,
'Aggregate rating':np.median}).reset_index()

with plt.style.context('bmh', after_reset=True):
    pal = sns.color_palette('Spectral', 7)
    plt.figure(figsize = (8,6))
    for i in range(7):
        ix = res_data.pos == i
        plt.scatter(res_data.loc[ix, 'Latitude'], res_data.loc[ix, 
'Longitude'], color = pal[i], label = str(i))
        plt.text(pop_local.loc[i, 'Latitude'], pop_local.loc[i, 
'Longitude'], str(i) + ': '+str(pop_local.loc[i, 'Aggregate 
rating'].round(2)), fontsize = 14, color = 'black')
    plt.title('Location-wise Restaurant Median Rating in New Delhi')
    plt.legend()
    plt.show()
```



Here we can see that Central Delhi has slight better restaurants than North or South Suburb areas of Delhi.

Food Choices Dataset Analysis

```
food_data = pd.read_csv('food_choices.csv')
food_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 125 entries, 0 to 124
Data columns (total 61 columns):
GPA                                123 non-null object
Gender                             125 non-null int64
breakfast                          125 non-null int64
calories_chicken                   125 non-null int64
calories_day                       106 non-null float64
```

```
calories_scone                  124 non-null float64
coffee                          125 non-null int64
comfort_food                    124 non-null object
comfort_food_reasons            124 non-null object
comfort_food_reasons_coded      106 non-null float64
cook                            122 non-null float64
comfort_food_reasons_coded.1    125 non-null int64
cuisine                         108 non-null float64
diet_current                    124 non-null object
diet_current_coded              125 non-null int64
drink                           123 non-null float64
eating_changes                  122 non-null object
eating_changes_coded            125 non-null int64
eating_changes_coded1           125 non-null int64
eating_out                      125 non-null int64
employment                      116 non-null float64
ethnic_food                     125 non-null int64
exercise                        112 non-null float64
father_education                124 non-null float64
father_profession               122 non-null object
fav_cuisine                     123 non-null object
fav_cuisine_coded               125 non-null int64
fav_food                        123 non-null float64
food_childhood                  124 non-null object
fries                           125 non-null int64
fruit_day                       125 non-null int64
grade_level                     125 non-null int64
greek_food                      125 non-null int64
healthy_feeling                 125 non-null int64
healthy_meal                    124 non-null object
ideal_diet                      124 non-null object
ideal_diet_coded                125 non-null int64
income                          124 non-null float64
indian_food                     125 non-null int64
italian_food                    125 non-null int64
life_rewarding                  124 non-null float64
marital_status                  124 non-null float64
meals_dinner_friend             122 non-null object
mother_education                122 non-null float64
mother_profession               123 non-null object
nutritional_check               125 non-null int64
on_off_campus                   124 non-null float64
parents_cook                    125 non-null int64
pay_meal_out                    125 non-null int64
persian_food                    124 non-null float64
self_perception_weight          124 non-null float64
soup                            124 non-null float64
sports                          123 non-null float64
thai_food                       125 non-null int64
tortilla_calories               124 non-null float64
```

```
turkey_calories                 125 non-null int64
type_sports                     104 non-null object
veggies_day                     125 non-null int64
vitamins                        125 non-null int64
waffle_calories                 125 non-null int64
weight                          123 non-null object
dtypes: float64(20), int64(27), object(14)
memory usage: 59.6+ KB
```

What are some comfort food in various situations such as stress, boredom, hunger, happiness?

```
food_data[['comfort_food_reasons', 'comfort_food']]
```

```
                                  comfort_food_reasons  \
0                                 we dont have comfort
1                                 Stress, bored, anger
2                                      stress, sadness
3                                              Boredom
4                            Stress, boredom, cravings
5    None, i don't eat comfort food. I just eat whe...
6                                      stress, boredom
7    I eat comfort food when im stressed out from s...
8                                             Boredom
9                            Stress, anger and sadness
10                                            Boredom
11                       sadness, stress, cold weather
12                 Sadness, boredom, late night snack
13                 stress,  boredom, special occasions
14                    Friends, environment and boredom
15                                             boredom
16                                             Stress
17   I usually only eat comfort food when I'm bored...
18                                     Sadness, stress
19                            boredom, sadness, hungry
20                             happiness, satisfaction
21                                      Mostly boredom
22                                sadness, depression
23                                 Stress and boredom
24               A long day, not feeling well, winter
25                                             boredom
26                                  Boredom, lazyniss
27                                            Boredom
28                                     survival, bored
29                           Boredom, anger, drunkeness
..                                                 ...
95                          Boredom, hunger, snacking.
96                    Happiness, sadness, celebration.
97    Boredom, anger and just being hungry in general.
98                 Depression, comfort, accessibility
99   they are yummy, my boyfriend sometimes makes m...
```

```
100                              Sad, bored, excited
101                     boredom, stress, mood swings
102                                   Anger, sadness
103  Anxiousness, watching TV I desire "comfort food" 
104                        Boredom, sadness, anxiety
105                         Boredom, laziness, anger
106                               Stress and sadness
107  I am always stressed out, and bored when I am ...
108                         Stress, sadness, boredom
109           Stress, frustration, self-consciousness 
110                             Sadness and cravings
111                                          boredom
112                   Sadness, happiness and boredom
113                              Boredom and sadness
114                    sadness, happiness and hunger
115            Stress, boredom and physical activity
116                   loneliness, homework, boredom 
117  When i'm  eating with my close friends/ Food s...
118                              Stress and boredom 
119                 Happiness, boredom, social event
120                             boredom and sadness 
121                  Loneliness / Homesick / Sadness
122                                          sadness
123      happiness, they are some of my favorite foods
124                 hormones, Premenstrual syndrome.

                                           comfort_food
0                                              none
1                       chocolate, chips, ice cream
2                   frozen yogurt, pizza, fast food
3                  Pizza, Mac and cheese, ice cream
4                      Ice cream, chocolate, chips 
5                         Candy, brownies and soda.
6       Chocolate, ice cream, french fries, pretzels
7                  Ice cream, cheeseburgers, chips.
8                          Donuts, ice cream, chips
9             Mac and cheese, chocolate, and pasta 
10   Pasta, grandma homemade chocolate cake anythin...
11             chocolate, pasta, soup, chips, popcorn
12                      Cookies, popcorn, and chips
13                       ice cream, cake, chocolate
14     Pizza, fruit, spaghetti, chicken and Potatoes  
15                      cookies, donuts, candy bars
16                     Saltfish, Candy and Kit Kat 
17                        chips, cookies, ice cream
18                             Chocolate, ice crea 
19                            pizza, wings, Chinese
20                           Fast food, pizza, subs
21                     chocolate, sweets, ice cream
22                          burgers, chips, cookies
```

```
23                               Chilli, soup, pot pie
24                         Soup, pasta, brownies, cake
25             chocolate, ice cream/milkshake, cookies
26              Chips, ice cream, microwaveable foods 
27                             Chicken fingers, pizza 
28                  cookies, hot chocolate, beef jerky
29   Tomato soup, pizza, Fritos, Meatball sub, Dr. ...
..                                                 ...
95                  Doritos, mac and cheese, ice cream
96        Ice cream, cake, pop, pizza, and milkshakes.
97   Mac and Cheese, Pizza, Ice Cream and French Fr...
98                                   Soup, pasta, cake
99       mac & cheese, frosted brownies, chicken nuggs
100                      watermelon, grapes, ice cream
101  macaroni and cheese, stuffed peppers, hamburge...
102                  Pizza, mashed potatoes, spaghetti
103  dark chocolate, terra chips, reese's cups(dark...
104              Chips, chocolate, ,mozzarella sticks 
105                            ice cream, chips, candy
106  Pizza, soda, chocolate brownie, chicken tikka ...
107                          Chocolate, Pasta, Cookies
108                         Candy, salty snacks, toast
109           Mac in cheese, pizza, mozzarella sticks 
110                        Ice-cream, pizza, chocolate
111                                    snacks, chips, 
112                        Chocolate, Ice cream, pizza
113                    ice cream, pizza, Chinese food 
114                  Burgers, indian and korean food\r
115  chocolate bar, ice cream, pretzels, potato chi...
116              Ice cream, chocolate, pizza, cucumber 
117  Noodle ( any kinds of noodle), Tuna sandwich, ...
118                               Chinese, chips, cake
119                        chips, rice, chicken curry,
120             wine. mac and cheese, pizza, ice cream 
121                         Pizza / Wings / Cheesecake
122                         rice, potato, seaweed soup
123                       Mac n Cheese, Lasagna, Pizza
124                       Chocolates, pizza, and Ritz.

[125 rows x 2 columns]
```

```python
def search_comfort(mood):
    lemmatizer = WordNetLemmatizer()
    foodcount = {}
    for i in range(124):
        temp = [temps.strip().replace('.','').replace(',','').lower()
for temps in str(food_data["comfort_food_reasons"][i]).split(' ') if
temps.strip() not in stop ]
        if mood in temp:
            foodtemp =
[lemmatizer.lemmatize(temps.strip().replace('.','').replace(',','').lo
wer()) for temps in str(food_data["comfort_food"][i]).split(',') if
temps.strip() not in stop ]
            for a in foodtemp:
                if a not in foodcount.keys():
                    foodcount[a] = 1
                else:
                    foodcount[a] += 1
    sorted_food = []
    sorted_food = sorted(foodcount, key=foodcount.get, reverse=True)
    return sorted_food


def find_my_comfort_food(mood):
    topn = []
    topn = search_comfort(mood) #function create dictionary only for
particular mood
    print("3 Popular Comfort Foods in %s are:"%(mood))
    print(topn[0])
    print(topn[1])
    print(topn[2])
```

```
find_my_comfort_food('sad')
```

```
3 Popular Comfort Foods in sad are:
ice cream
pizza
chip
```

Main Part of our Project: Suggesting Restaurants based on User Moods

Under Following Moods

- stress
- boredom
- depression/sadness
- hunger
- laziness
- cold weather
- happiness
- watching tv

Finding Restaurants based on cuisines

```
res_data[res_data.Cuisines.str.contains('pizza',
case=False)].sort_values(by='Aggregate rating',
ascending=False).head(3)
```

```
      Restaurant ID Restaurant Name  Country Code       City  \
3658       18400736     Owl is Well             1  New Delhi
4665       18419910     Civil House             1  New Delhi
```

```
6850         313269    Tossin Pizza             1  New Delhi

                                                Address  \
3658                  Greater Kailash (GK) 1, New Delhi
4665                         26, Khan Market, New Delhi
6850  B-6/2, Safdarjung Enclave, Opposite Deer Park,...

                    Locality                   Locality Verbose
Longitude  \
3658  Greater Kailash (GK) 1  Greater Kailash (GK) 1, New Delhi
77.240703
4665             Khan Market             Khan Market, New Delhi
77.227358
6850              Safdarjung              Safdarjung, New Delhi
77.195728

       Latitude                                     Cuisines ...  \
3658  28.541636  Burger, American, Fast Food, Italian, Pizza ...
4665  28.600257                 European, Continental, Pizza ...
6850  28.559335                               Pizza, Italian ...

      Switch to order menu Price range Aggregate rating Rating
color  \
3658                    No           3              4.5   Dark Green

4665                    No           3              4.2        Green

6850                    No           2              4.1        Green


     Rating text Votes  Country  fusion_num Rating category pos
3658   Excellent   162    India           5               4   4
4665   Very Good   113    India           3               4   1
6850   Very Good   647    India           2               4   0

[3 rows x 25 columns]
```