

## Yelp Exploratory Data Analysis

For this project, you will analyze Yelp Dataset. The data contains 3 main tables

- `yelp_academic_dataset_business.csv` - contains information about a subset of businesses having at least one Yelp review. Every distinct business has a unique `business_id`
- `yelp_academic_dataset_review.csv` - contains a subset of Yelp reviews with a `business_id` indicating what business the review is for and a `user_id` to identify the user leaving the review
- `yelp_academic_dataset_user.csv` - contains a subset of Yelp users identified by `user_id`

## What you need to do

Goal in this notebook is to work through the problems below to perform some brief analyses of the `yelp_academic_dataset_business.csv` data.

## Configuration

```
In [2]: # Load the libraries you need...
import pandas as pd
import wordcloud
import statistics as st
import numpy as np
import matplotlib
import pprint as pp
import math as mth
import seaborn as sns
import matplotlib.pyplot as plt
import os

%matplotlib inline
```

```
In [3]: # Options to display more rows and columns
# DO NOT REMOVE
pd.set_option('display.max_rows', 500)
pd.set_option('display.max_columns', 500)
pd.set_option('display.width', 100)

fpath = 'C:/Code/Python/UND/notebooks'
```

```
In [4]: # Load the data
business_data = pd.read_csv(fpath + '/data-sets/Final/yelp_academic_dataset_business.csv')
business_data.head(3)
```

Out[4]:

	address	attributes	attributes.AcceptsInsurance	attributes.AgesAllowed	attributes.Alcohol	attributes.Ambier
0	1314 44 Avenue NE	NaN	NaN	NaN	NaN	N
1	NaN	NaN	NaN	NaN	none	N
2	1335 rue Beaubien E	NaN	NaN	NaN	beer_and_wine	{'romantic': False, 'intimate': False, 'class': 'class'}

## Task Set #1 - Explore and Clean

### Problem 1: (5 points)

The `yelp\_academic\_dataset\_business.csv` data has been loaded for you as a Pandas DataFrame called `business\_data`. Determine the number of rows and columns of the data. Is the data in a tidy format? Briefly explain your reasoning about why you think the data is/is not tidy.

```
In [5]: # Your code here
x,y = business_data.shape
f'There are {x} rows and {y} colmns in YELP Business Dataset.'
```

Out[5]: 'There are 188593 rows and 61 colmns in YELP Business Dataset.'

```
In [6]: f'The YELP business data is not tidy. For example, several variables contain a dictionary of values which can be split into multiple columns. Ex: Ambience, Business Parking, Good For Meal, Categories etc.'
```

Out[6]: 'The YELP business data is not tidy. For example, several variables contain a dictionary of values which can be split into multiple columns. Ex: Ambience, Business Parking, Good For Meal, Categories etc.'

```
In [7]: business_data.isna().sum()
```

```

Out[7]: address          7623
         attributes      188593
         attributes.AcceptsInsurance 176922
         attributes.AgesAllowed    188196
         attributes.Alcohol        140701
         attributes.Ambience      141016
         attributes.BYOB           187682
         attributes.BYOBCorkage    187184
         attributes.BestNights     181749
         attributes.BikeParking    103702
         attributes.BusinessAcceptsBitcoin 175919
         attributes.BusinessAcceptsCreditCards 48202
         attributes.BusinessParking 85169
         attributes.ByAppointmentOnly 143170
         attributes.Caters         148555
         attributes.CoatCheck      180062
         attributes.Corkage        187936
         attributes.DietaryRestrictions 188455
         attributes.DogsAllowed    174912
         attributes.DriveThru      181839
         attributes.GoodForDancing 179431
         attributes.GoodForKids    123662
         attributes.GoodForMeal    141110
         attributes.HairSpecializesIn 186712
         attributes.HappyHour      179308
         attributes.HasTV          141060
         attributes.Music          179786
         attributes.NoiseLevel     144883
         attributes.Open24Hours    188241
         attributes.OutdoorSeating 134412
         attributes.RestaurantsAttire 140411
         attributes.RestaurantsCounterService 188196
         attributes.RestaurantsDelivery 136925
         attributes.RestaurantsGoodForGroups 134754
         attributes.RestaurantsPriceRange2 81473
         attributes.RestaurantsReservations 137230
         attributes.RestaurantsTableService 145268
         attributes.RestaurantsTakeOut 127387
         attributes.Smoking        180480
         attributes.WheelchairAccessible 136570
         attributes.WiFi          139567
         business_id              0
         categories              541
         city                    10
         hours                   188593
         hours.Friday            46797
         hours.Monday            55832
         hours.Saturday          63217
         hours.Sunday            95206
         hours.Thursday          46234
         hours.Tuesday           47986
         hours.Wednesday         46750
         is_open                 0
         latitude                6
         longitude               6
         name                    0
         neighborhood            119938
         postal_code             681
         review_count            0
         stars                   0
         state                   0
         dtype: int64

```

```
In [8]: business_data = business_data.drop(columns = 'hours')
```

```
In [9]: business_data.shape
```

```
Out[9]: (188593, 60)
```

### Written Answer:

The YELP business data is not tidy. For example, several variables contain a dictionary of values which can be split into multiple columns. Ex: Ambience, Business Parking, Good For Meal, Categories etc.

### Problem 2: (5 points)

Determine the number of columns of each data type in `business\_data`: object, float64, int64.

```
In [10]: # Your code here
def df_metadata(arg_df):
    #arg_df = business_data
    l1 = pd.Series([col for col in arg_df.columns])
    l2 = pd.Series([arg_df[col].dtype for col in arg_df.columns])
    l3 = arg_df.shape[0]
    l4 = pd.Series([arg_df[col].isnull().sum() for col in arg_df.columns])
    l5 = pd.Series([round((arg_df[col].isnull().sum()*100)/l3,2) for col in arg_df.
columns])

    frame = { 'Column_Name': l1, 'Column_Datatype': l2, 'Row_Count': l3, 'Null_Count':l4, 'Null_Ratio_Pct':l5 }
    ret_df = pd.DataFrame(frame)
    return ret_df
```

```
In [11]: md_business_data = df_metadata(business_data)
md_business_data.Column_Datatype.value_counts()
```

```
Out[11]: object      53
float64      5
int64        2
Name: Column_Datatype, dtype: int64
```

### Problem 3: (5 points)

Create a Pandas Series containing the proportion of missing values in each column of `business\_data`.

```
In [12]: # Your code her
md_business_data[['Column_Name', 'Null_Ratio_Pct']]
```

Out[12]:

	Column_Name	Null_Ratio_Pct
0	address	4.04
1	attributes	100.00
2	attributes.AcceptsInsurance	93.81
3	attributes.AgesAllowed	99.79
4	attributes.Alcohol	74.61
5	attributes.Ambience	74.77
6	attributes.BYOB	99.52
7	attributes.BYOBCorkage	99.25
8	attributes.BestNights	96.37
9	attributes.BikeParking	54.99
10	attributes.BusinessAcceptsBitcoin	93.28
11	attributes.BusinessAcceptsCreditCards	25.56
12	attributes.BusinessParking	45.16
13	attributes.ByAppointmentOnly	75.91
14	attributes.Caters	78.77
15	attributes.CoatCheck	95.48
16	attributes.Corkage	99.65
17	attributes.DietaryRestrictions	99.93
18	attributes.DogsAllowed	92.75
19	attributes.DriveThru	96.42
20	attributes.GoodForDancing	95.14
21	attributes.GoodForKids	65.57
22	attributes.GoodForMeal	74.82
23	attributes.HairSpecializesIn	99.00
24	attributes.HappyHour	95.08
25	attributes.HasTV	74.80
26	attributes.Music	95.33
27	attributes.NoiseLevel	76.82
28	attributes.Open24Hours	99.81
29	attributes.OutdoorSeating	71.27
30	attributes.RestaurantsAttire	74.45
31	attributes.RestaurantsCounterService	99.79
32	attributes.RestaurantsDelivery	72.60
33	attributes.RestaurantsGoodForGroups	71.45
34	attributes.RestaurantsPriceRange2	43.20
35	attributes.RestaurantsReservations	72.77
36	attributes.RestaurantsTableService	77.03
37	attributes.RestaurantsTakeOut	67.55

	Column_Name	Null_Ratio_Pct
38	attributes.Smoking	95.70
39	attributes.WheelchairAccessible	72.42
40	attributes.WiFi	74.00
41	business_id	0.00
42	categories	0.29
43	city	0.01
44	hours.Friday	24.81
45	hours.Monday	29.60
46	hours.Saturday	33.52
47	hours.Sunday	50.48
48	hours.Thursday	24.52
49	hours.Tuesday	25.44
50	hours.Wednesday	24.79
51	is_open	0.00
52	latitude	0.00
53	longitude	0.00
54	name	0.00
55	neighborhood	63.60
56	postal_code	0.36



```
In [13]: md_business_data[['Null_Ratio_Pct']]
```

Out[13]:

	Null_Ratio_Pct
0	4.04
1	100.00
2	93.81
3	99.79
4	74.61
5	74.77
6	99.52
7	99.25
8	96.37
9	54.99
10	93.28
11	25.56
12	45.16
13	75.91
14	78.77
15	95.48
16	99.65
17	99.93
18	92.75
19	96.42
20	95.14
21	65.57
22	74.82
23	99.00
24	95.08
25	74.80
26	95.33
27	76.82
28	99.81
29	71.27
30	74.45
31	99.79
32	72.60
33	71.45
34	43.20
35	72.77
36	77.03
37	67.55
38	95.70

	Null_Ratio_Pct
39	72.42
40	74.00
41	0.00
42	0.29
43	0.01
44	24.81
45	29.60
46	33.52
47	50.48
48	24.52
49	25.44
50	24.79
51	0.00
52	0.00
53	0.00
54	0.00
55	63.60
56	0.36
57	0.00

How many variables have no missing values?

```
In [14]: # Your code here
f3 = md_business_data.Null_Ratio_Pct == 0
df1 = md_business_data[f3]
df1
```

Out[14]:

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
41	business_id	object	188593	0	0.0
51	is_open	int64	188593	0	0.0
52	latitude	float64	188593	6	0.0
53	longitude	float64	188593	6	0.0
54	name	object	188593	0	0.0
57	review_count	int64	188593	0	0.0
58	stars	float64	188593	0	0.0
59	state	object	188593	0	0.0

```
In [15]: n = len(df1)
f'There are {n} columns which have no missing values.'
```

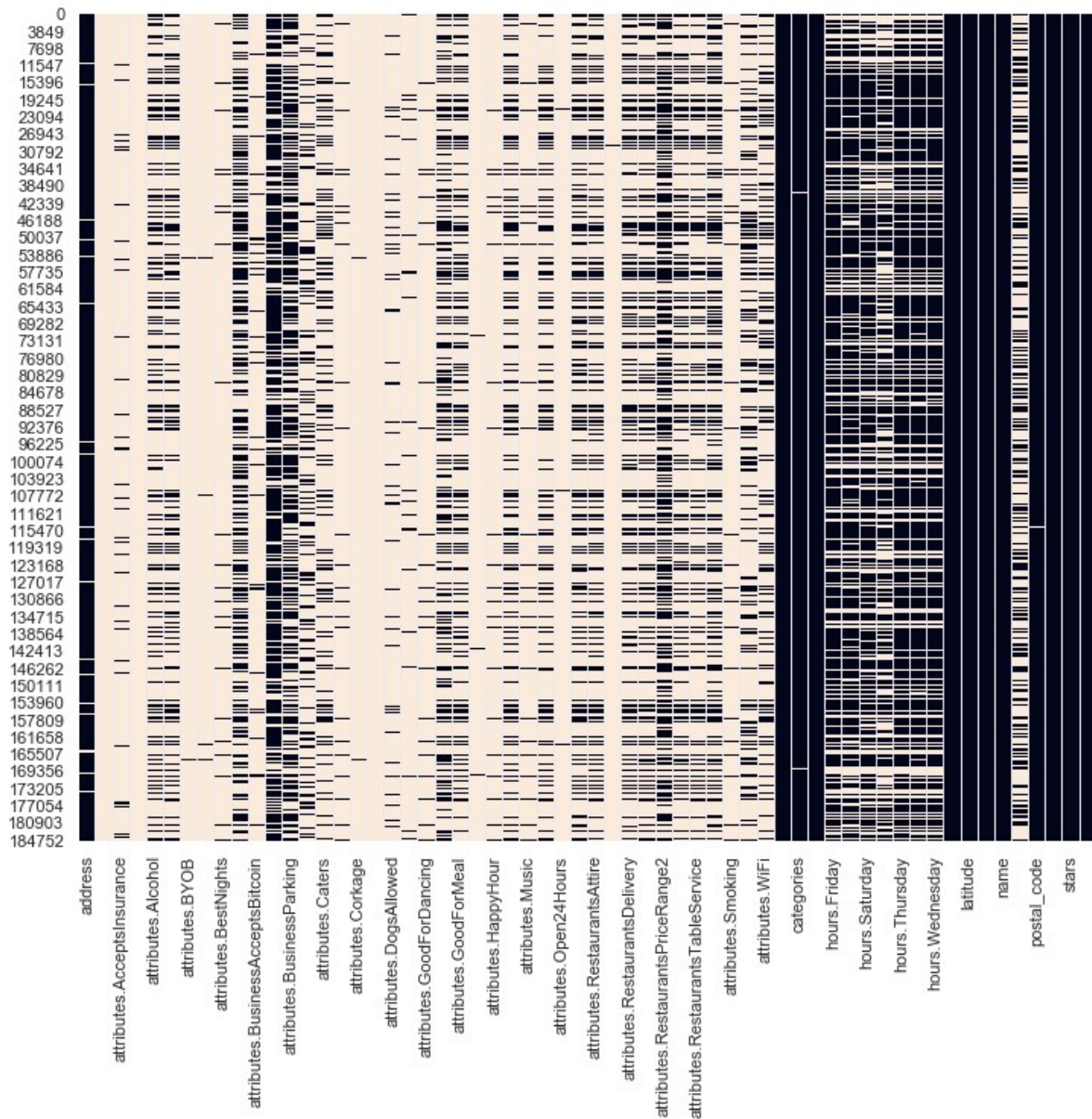
Out[15]: 'There are 8 columns which have no missing values.'

### Problem 4: (5 points)

Use an appropriate visualization technique to analyze the missingness in `business\_data`.

```
In [16]: # Use a heatmap, pointplot, or other appropriate visualization here
import seaborn as sns
sns.set(rc={'figure.figsize': (12,10)})
sns.heatmap(business_data.isnull(), cbar=False)
```

```
Out[16]: <matplotlib.axes._subplots.AxesSubplot at 0x1b400b61dd8>
```



### Problem 5: (5 points)

Drop all columns that contain \*\*only missing values\*\* from `business\_data`.

```
In [17]: # Your code here
f5 = md_business_data.Null_Ratio_Pct == 100
bad_cols = md_business_data[f5].Column_Name
business_data = business_data.drop(columns = bad_cols)
md_business_data = df_metadata(business_data)
```

```
In [18]: business_data.info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 188593 entries, 0 to 188592
Data columns (total 59 columns):
address                                180970 non-null object
attributes.AcceptsInsurance            11671 non-null object
attributes.AgesAllowed                 397 non-null object
attributes.Alcohol                    47892 non-null object
attributes.Ambience                  47577 non-null object
attributes.BYOB                       911 non-null object
attributes.BYOBCorkage                1409 non-null object
attributes.BestNights                 6844 non-null object
attributes.BikeParking                84891 non-null object
attributes.BusinessAcceptsBitcoin    12674 non-null object
attributes.BusinessAcceptsCreditCards 140391 non-null object
attributes.BusinessParking            103424 non-null object
attributes.ByAppointmentOnly          45423 non-null object
attributes.Caters                     40038 non-null object
attributes.CoatCheck                  8531 non-null object
attributes.Corkage                    657 non-null object
attributes.DietaryRestrictions        138 non-null object
attributes.DogsAllowed                13681 non-null object
attributes.DriveThru                 6754 non-null object
attributes.GoodForDancing             9162 non-null object
attributes.GoodForKids                64931 non-null object
attributes.GoodForMeal                47483 non-null object
attributes.HairSpecializesIn          1881 non-null object
attributes.HappyHour                  9285 non-null object
attributes.HasTV                      47533 non-null object
attributes.Music                      8807 non-null object
attributes.NoiseLevel                 43710 non-null object
attributes.Open24Hours                352 non-null object
attributes.OutdoorSeating             54181 non-null object
attributes.RestaurantsAttire          48182 non-null object
attributes.RestaurantsCounterService  397 non-null object
attributes.RestaurantsDelivery        51668 non-null object
attributes.RestaurantsGoodForGroups  53839 non-null object
attributes.RestaurantsPriceRange2    107120 non-null float64
attributes.RestaurantsReservations    51363 non-null object
attributes.RestaurantsTableService    43325 non-null object
attributes.RestaurantsTakeOut         61206 non-null object
attributes.Smoking                    8113 non-null object
attributes.WheelchairAccessible       52023 non-null object
attributes.WiFi                       49026 non-null object
business_id                           188593 non-null object
categories                             188052 non-null object
city                                   188583 non-null object
hours.Friday                          141796 non-null object
hours.Monday                          132761 non-null object
hours.Saturday                        125376 non-null object
hours.Sunday                          93387 non-null object
hours.Thursday                       142359 non-null object
hours.Tuesday                        140607 non-null object
hours.Wednesday                      141843 non-null object
is_open                              188593 non-null int64
latitude                             188587 non-null float64
longitude                             188587 non-null float64
name                                  188593 non-null object
neighborhood                          68655 non-null object
postal_code                           187912 non-null object
review_count                          188593 non-null int64
stars                                 188593 non-null float64
state                                 188593 non-null object
dtypes: float64(4), int64(2), object(53)

```

memory usage: 94.91 MB

### Problem 6: (5 points)

The `business\_data` is not in a form that is convenient for analysis. Let's begin by cleaning up the variable names.

Tasks:

1. Make all column names lowercase.
2. Replace all periods . with an underscore \_



```
In [19]: # Your code here
orig_col_list = md_business_data.Column_Name
new_col_list = orig_col_list.str.lower().str.replace('.', '_')

rename_dict = dict(zip(orig_col_list, new_col_list))
rename_dict

business_data.rename(columns = rename_dict, inplace = True)
md_business_data = df_metadata(business_data)

md_business_data
```

Out[19]:

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
0	address	object	188593	7623	4.04
1	attributes_acceptsinsurance	object	188593	176922	93.81
2	attributes_agesallowed	object	188593	188196	99.79
3	attributes_alcohol	object	188593	140701	74.61
4	attributes_ambience	object	188593	141016	74.77
5	attributes_byob	object	188593	187682	99.52
6	attributes_byobcorkage	object	188593	187184	99.25
7	attributes_bestnights	object	188593	181749	96.37
8	attributes_bikeparking	object	188593	103702	54.99
9	attributes_businessacceptsbitcoin	object	188593	175919	93.28
10	attributes_businessacceptscreditcards	object	188593	48202	25.56
11	attributes_businessparking	object	188593	85169	45.16
12	attributes_byappointmentonly	object	188593	143170	75.91
13	attributes_caters	object	188593	148555	78.77
14	attributes_coatcheck	object	188593	180062	95.48
15	attributes_corkage	object	188593	187936	99.65
16	attributes_dietaryrestrictions	object	188593	188455	99.93
17	attributes_dogsallowed	object	188593	174912	92.75
18	attributes_drivethru	object	188593	181839	96.42
19	attributes_goodfordancing	object	188593	179431	95.14
20	attributes_goodforkids	object	188593	123662	65.57
21	attributes_goodformeal	object	188593	141110	74.82
22	attributes_hairspecializesin	object	188593	186712	99.00
23	attributes_happyhour	object	188593	179308	95.08
24	attributes_hastv	object	188593	141060	74.80
25	attributes_music	object	188593	179786	95.33
26	attributes_noiselevel	object	188593	144883	76.82
27	attributes_open24hours	object	188593	188241	99.81
28	attributes_outdoorseating	object	188593	134412	71.27
29	attributes_restaurantsattire	object	188593	140411	74.45
30	attributes_restaurantscounterservice	object	188593	188196	99.79
31	attributes_restaurantsdelivery	object	188593	136925	72.60

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
32	attributes_restaurantsgoodforgroups	object	188593	134754	71.45
33	attributes_restaurantspricerange2	float64	188593	81473	43.20
34	attributes_restaurantsreservations	object	188593	137230	72.77
35	attributes_restaurantstableservice	object	188593	145268	77.03
36	attributes_restaurantstakeout	object	188593	127387	67.55
37	attributes_smoking	object	188593	180480	95.70
38	attributes_wheelchairaccessible	object	188593	136570	72.42
39	attributes_wifi	object	188593	139567	74.00
40	business_id	object	188593	0	0.00
41	categories	object	188593	541	0.29
42	city	object	188593	10	0.01
43	hours_friday	object	188593	46797	24.81
44	hours_monday	object	188593	55832	29.60
45	hours_saturday	object	188593	63217	33.52
46	hours_sunday	object	188593	95206	50.48
47	hours_thursday	object	188593	46234	24.52
48	hours_tuesday	object	188593	47986	25.44
49	hours_wednesday	object	188593	46750	24.79

### Problem 7: (5 points)

Let's now get rid of columns that we don't need right now. Perform the following transformation steps to the data.

1. Drop all `attribute_*` columns except for the `attributes_happyhour` column.
2. Create a new column, called `open_on_weekends`, that is a 1 if the business is open on the weekend (has a non-null value for either `hours_saturday` or `hours_sunday`) and 0 otherwise.
3. Drop all of the `hours_*` columns after creating the `open_on_weekends` column.

```
In [20]: # Drop all of the unwanted attributes columns
business_data["open_on_weekends"] = business_data.hours_saturday.notnull() | business_data.hours_sunday.notnull()

f7 = (md_business_data.Column_Name.str.contains('^attributes_', regex = True)) | (md_business_data.Column_Name.str.contains('^hours_', regex = True))

drop_list = list(md_business_data[f7].Column_Name)
drop_list.remove('attributes_happyhour')

business_data = business_data.drop(columns = drop_list)
business_data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 188593 entries, 0 to 188592
Data columns (total 15 columns):
address                180970 non-null object
attributes_happyhour    9285 non-null object
business_id            188593 non-null object
categories             188052 non-null object
city                   188583 non-null object
is_open                188593 non-null int64
latitude               188587 non-null float64
longitude              188587 non-null float64
name                   188593 non-null object
neighborhood           68655 non-null object
postal_code            187912 non-null object
review_count           188593 non-null int64
stars                  188593 non-null float64
state                  188593 non-null object
open_on_weekends       188593 non-null bool
dtypes: bool(1), float64(3), int64(2), object(9)
memory usage: 20.3+ MB
```

```
In [21]: # Create open_on_weekends
business_data = business_data[['business_id', 'name', 'address', 'neighborhood', 'city', 'state', 'postal_code', 'latitude', 'longitude', 'open_on_weekends', 'attributes_happyhour', 'review_count', 'stars', 'categories', 'is_open']]
```

```
In [22]: md_business_data = df_metadata(business_data)
md_business_data
```

Out [22]:

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
0	business_id	object	188593	0	0.00
1	name	object	188593	0	0.00
2	address	object	188593	7623	4.04
3	neighborhood	object	188593	119938	63.60
4	city	object	188593	10	0.01
5	state	object	188593	0	0.00
6	postal_code	object	188593	681	0.36
7	latitude	float64	188593	6	0.00
8	longitude	float64	188593	6	0.00
9	open_on_weekends	bool	188593	0	0.00
10	attributes_happyhour	object	188593	179308	95.08
11	review_count	int64	188593	0	0.00
12	stars	float64	188593	0	0.00
13	categories	object	188593	541	0.29
14	is_open	int64	188593	0	0.00

```
In [23]: # Remove hours.* columns
business_data.open_on_weekends.value_counts()
```

```
Out [23]: True      126044
False      62549
Name: open_on_weekends, dtype: int64
```

### Problem 8: (5 points)

Create a Pandas Series containing the proportion of business in the data by state. (For now, a *state* refers to any level of the `state` variable, not only states in the U.S.A.)

```
In [24]: # Number of businesses by state  
state_business_prop = round(business_data.state.value_counts(normalize = True),2)  
state_business_prop
```

```
Out[24]: AZ      0.30
         NV      0.19
         ON      0.17
         NC      0.08
         OH      0.07
         PA      0.06
         QC      0.05
         AB      0.04
         WI      0.03
         IL      0.01
         SC      0.00
         NYK     0.00
         NI      0.00
         IN      0.00
         OR      0.00
         BY      0.00
         ST      0.00
         CO      0.00
         C       0.00
         HE      0.00
         XGM     0.00
         NLK     0.00
         RP      0.00
         NY      0.00
         01      0.00
         CA      0.00
         VS      0.00
         NW      0.00
         O       0.00
         6       0.00
         MO      0.00
         SG      0.00
         WA      0.00
         B       0.00
         AR      0.00
         AL      0.00
         G       0.00
         M       0.00
         CMA     0.00
         VT      0.00
         RCC     0.00
         MT      0.00
         HH      0.00
         LU      0.00
         45      0.00
         PO      0.00
         XMS     0.00
         GA      0.00
         NE      0.00
         KY      0.00
         CC      0.00
         SP      0.00
         CS      0.00
         TAM     0.00
         BC      0.00
         HU      0.00
         4       0.00
         MA      0.00
         V       0.00
         CRF     0.00
         AG      0.00
         WAR     0.00
         10      0.00
```

```

11      0.00
VA      0.00
FL      0.00
MN      0.00
DE      0.00
WHT     0.00
Name: state, dtype: float64

```

```
In [25]: n = len(state_business_prop)
n
```

```
Out[25]: 69
```

How many unique states are represented in the data? Are all of them in the United States of America? Do all of the levels of `state` make sense?

#### Written Answer:

'There are 69 states present in the data. Not all of them are in USA and they dont make sense. It requires cleansing.'

#### Problem 9: (5 points)

These data are fairly large! Let's focus on the data from a few key states. The goal in this exercise is to subset `business\_data` to only contain businesses in the 5 states having the largest total number of businesses in the state. (Again, *state* does not need to correspond to a state in the U.S.A. but simply refers to a level of the `state` column.)

Tasks:

1. Extract the 5 states from `state_counts` with the largest number of businesses
2. Subset `business_data` to only contain observations from these top-5 states

```
In [26]: # Your code here
state_count = pd.DataFrame(state_business_prop).reset_index()
```

```
In [27]: rename_dict = {'index':'state_code', 'state':'business_count'}
state_count.rename(columns = rename_dict, inplace = True)
state_count.head(10)
```

```
Out[27]:
```

	state_code	business_count
0	AZ	0.30
1	NV	0.19
2	ON	0.17
3	NC	0.08
4	OH	0.07
5	PA	0.06
6	QC	0.05
7	AB	0.04
8	WI	0.03
9	IL	0.01



```
In [28]: state_count.sort_values(by = 'business_count', ascending = False)
s1 = list(state_count.head(5).state_code)

f9 = business_data.state.isin(s1)
business_data_n5 = business_data[f9]
business_data = business_data[f9]
```

```
In [29]: business_data.state.value_counts()
```

```
Out[29]: AZ      56495
NV      35688
ON      32393
NC      14359
OH      13664
Name: state, dtype: int64
```

## Problem 10: (5 points)

Import the `territory\_abbr.csv` data which contains a record for every U.S. state and territory. Use this data to **remove** businesses outside of the United States **by** performing an appropriate **merge** with `business\_data`. Assign the remaining data to a DataFrame called `business\_data\_subset`.

(Of course...you could probably figure out what state(s) need to be removed just by looking at them. The point is to demonstrate that you can use `merge()` and any necessary arguments to accomplish the task. Also...don't mess up your tidy data! Though not necessary for full credit, you may want to remove/modify columns that are not lowercase.)

```
In [30]: # Read in data
us_data = pd.read_csv(fpath + '/data-sets/territory_abbr.csv')
```

```
In [31]: # Your code here
f10 = business_data.state.isin(list(us_data.Abbreviation))
business_data_subset = business_data[f10]
```

```
In [32]: business_data_subset.shape
```

```
Out[32]: (120206, 15)
```

How many unique U.S. states are left in the data?

```
In [33]: # Your code here
n = business_data_subset.state.value_counts().count()
f'There are 27 unique states left in business_data dataframe.'
```

```
Out[33]: 'There are 27 unique states left in business_data dataframe.'
```

## Task Set #2 - Analysis

---

**Problem 11: (5 points)**

Do businesses with more reviews tend to have higher ratings?

To help answer this question, use `business_data` to create *side-by-side notched boxplots* to visualize the relationship between the number of reviews left for the business (`review_count`, y-axis) and the rating of the business (`stars`, x-axis).

**Note:** use `ax.set_yscale('log')` to set the scale of the y-axis to be logarithmic due to extreme variation in the number of reviews left for the businesses. This means you must specify a figure and axes object using `fig, ax = plt.subplots(figsize=(10, 10))`

Make sure to use appropriate axes labels and include an appropriate title. Make the figure 10 units tall and 10 units wide.

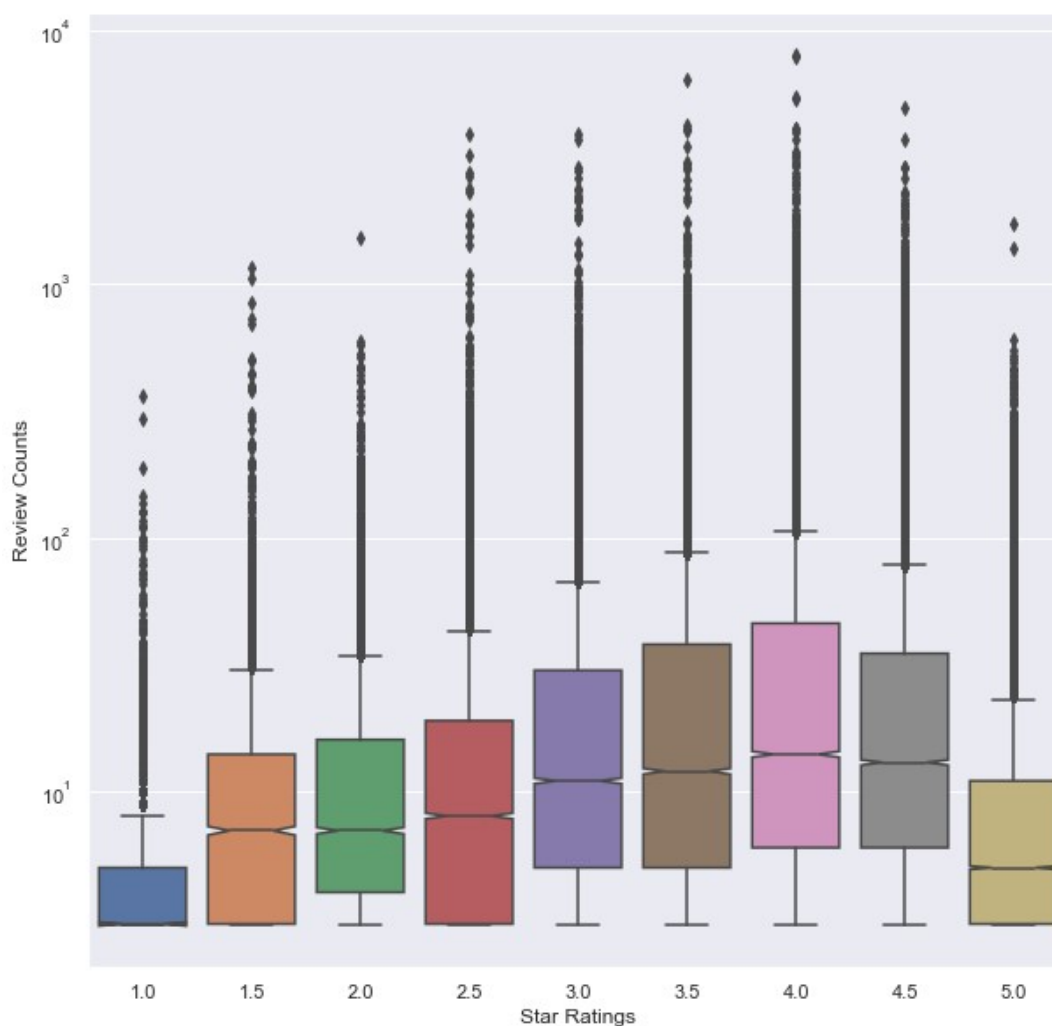
```
In [34]: # Answer
#fig, (axes_l, axes_r) = plt.subplots(1, 2, figsize=(10, 10))
fig, axes = plt.subplots(1, 1, figsize=(10, 10))
fig.suptitle('Impact of Reviews on Higher Ratings.', fontsize = 16)

sns.boxplot(y = 'review_count', x = 'stars', ax = axes, data = business_data, notch = True)

axes.set_xlabel('Star Ratings')
axes.set_ylabel('Review Counts')
axes.set_yscale('log')

#f'Between Conditions A and D, for Conditions D with higher than normal temps and r
ains, even though leaf size was bigger significantly but the nicotine content did
not grow proportionately. Between Conditions B and C, for Conditions C with higher
than normal temps and lower rains, even though leaf size was bigger significantly
but there were observations where nicotine content was same as in condition C.'
```

Impact of Reviews on Higher Ratings.



```
In [35]: f'Yes. Higher Number of reviews do seem to drive the star ratings. '
```

```
Out[35]: 'Yes. Higher Number of reviews do seem to drive the star ratings. '
```

Describe what you see in the plot and formulate a hypothesis about why the relationship between these variables looks the way it does.

**Written Answer:**

Its a cascading effect. When a restaurant is producing good food, it causes better reviews. Which pulls in more people giving high ratings based reviews and it goes on.

**Problem 12: (5 points)**

The `categories` column of `business_data_subset` contains a *comma separated* list of various keyword categories for each business. Use an appropriate Python data structure to iterate over every row of the data and determine all of the unique categories as well as the number of times each category appears, sorted from most common category to least common category.

Your result should look like the following:

Restaurants	234
Shopping	173
Home Services	132
Food	120
Health & Medical	92
.	
.	
.	

```
In [36]: business_data_subset.categories
```

```
Out[36]: 1      Chicken Wings, Burgers, Caterers, Street Vendo...
          3          Insurance, Financial Services
          5              Coffee & Tea, Food
          8              Mexican, Restaurants
          12     Bars, Sports Bars, Dive Bars, Burgers, Nightli...
          17         Shopping, Fashion, Department Stores
          18     Financial Services, Check Cashing/Pay-day Loan...
          19     American (Traditional), Food, Bakeries, Restau...
          20     Home Services, Masonry/Concrete, Professional ...
          21         Fast Food, Burgers, Restaurants
          22     Nightlife, Bars, American (Traditional), Sport...
          24         Mexican, Restaurants
          26     Home Services, Home Automation, Security Systems
          29         Pizza, Restaurants
          32         Fast Food, Restaurants, Sandwiches
          33     Beer, Wine & Spirits, Italian, Food, American ...
          34     Health & Medical, Hair Salons, Skin Care, Hair...
          35         Restaurants, Cafes
          36         Ice Cream & Frozen Yogurt, Food
          37         Seafood, Restaurants
          38     Health & Medical, Physical Therapy, Retirement...
          39         Pizza, Fast Food, Restaurants
          40     Automotive, Auto Customization, Shopping, Auto...
          44         Hair Salons, Beauty & Spas
          45     Flooring, Cabinetry, Refinishing Services, Hom...
          47     Event Planning & Services, Soup, Salad, Mexica...
          50     Thrift Stores, Shopping, Used, Vintage & Consi...
          52     Motorcycle Rental, Active Life, Motorcycle Dea...
          57         Restaurants, Pizza
          58         Home Services, Contractors
          59         Fast Food, Restaurants, Sandwiches, Food
          60     Health & Medical, Diagnostic Imaging, Diagnost...
          61         Mexican, Restaurants
          63     Waxing, Nail Salons, Eyelash Service, Beauty &...
          64     Health & Medical, Dentists, Cosmetic Dentists,...
          65         Gas Stations, Car Wash, Automotive
          66         Shopping, Pawn Shops, Jewelry
          71         Churches, Religious Organizations
          72     Venues & Event Spaces, Wedding Chapels, Photog...
          74     Waxing, Blow Dry/Out Services, Hair Salons, Ha...
          75     Home & Garden, Shopping, Mattresses, Furniture...
          76         Department Stores, Shopping, Fashion
          77         Shopping, Drugstores, Medical Supplies
          78         Urologists, Doctors, Health & Medical
          79     Fitness & Instruction, Gyms, Health & Medical,...
          81     Shopping, Mattresses, Home & Garden, Furniture...
          83         Bakeries, Food
          84     Beauty & Spas, Makeup Artists, Hair Salons, Ey...
          85         Pets, Pet Groomers, Pet Services
          86         Shopping, Tobacco Shops, Vape Shops
          90     Pet Groomers, Pet Boarding, Pets, Veterinarian...
          91         Nail Salons, Beauty & Spas
          98         Beauty & Spas, Nail Salons
          99         Financial Services, Banks & Credit Unions
         100         Auto Parts & Supplies, Automotive
         101         Beer, Wine & Spirits, Food
         102         Pet Groomers, Pets, Pet Services
         103     Periodontists, General Dentistry, Dentists, Or...
         104     Food Delivery Services, Transportation, Food, ...
         105     Appliances & Repair, IT Services & Computer Re...
         107         Fast Food, Restaurants
         108     Food, Restaurants, Italian, Bars, Wine Bars, D...
         109         Chinese, Bars, Karaoke, Nightlife, Restaurants
```

110 Restaurants, American (Traditional), Cocktail ...  
113 Jewelry, Local Services, Watch Repair, Shoppin...  
114 Sports Bars, American (Traditional), Chicken W...  
116 Restaurants, Steakhouses, Nightlife, Burgers, ...  
117 Oil Change Stations, Automotive  
118 Door Sales/Installation, Home Services, Contra...  
120 Massage Therapy, Physical Therapy, Health & Me...  
121 Keys & Locksmiths, Home Services  
122 Apartments, Home Services, Real Estate  
124 Apartments, Real Estate, Home Services  
125 Active Life, Bowling  
128 Thrift Stores, Shopping  
130 Spray Tanning, Tanning Beds, Tanning, Beauty &...  
132 Italian, Restaurants  
133 Landscaping, Home Services, Contractors  
135 Active Life, Arts & Entertainment, Horse Racin...  
136 Event Planning & Services, Caterers  
138 Discount Store, Wholesale Stores, Shopping, Ou...  
139 Doctors, Orthopedists, Health & Medical  
140 Karaoke, Country Dance Halls, Bars, Nightlife,...  
141 Chicken Wings, Restaurants, Fast Food  
142 Restaurants, American (New)  
143 Restaurants, Pizza  
144 Event Planning & Services, Hotels, Hotels & Tr...  
145 Japanese, Restaurants  
147 DUI Law, Professional Services, Lawyers, Divor...  
149 Endodontists, Health & Medical, Pediatric Dent...  
151 Arts & Entertainment, Museums  
152 Seafood, Fish & Chips, Restaurants, Fast Food  
154 Auto Repair, Automotive, Transmission Repair  
156 Auto Customization, Automotive, Furniture Reup...  
157 Flowers & Gifts, Florists, Shopping  
160 Tobacco Shops, Vape Shops, Personal Shopping, ...  
161 Party & Event Planning, Event Planning & Servi...  
163 Auto Repair, Auto Parts & Supplies, Oil Change...  
165 Doctors, Eyebrow Services, Tattoo Removal, Bea...  
166 Delis, Restaurants, Sandwiches  
167 Local Services, Printing Services, Notaries, M...  
169 Obstetricians & Gynecologists, Health & Medica...  
170 Food, Grocery  
171 Health & Medical, Physical Therapy  
172 Appliances & Repair, Local Services  
173 Arts & Entertainment, Stadiums & Arenas  
174 Restaurants, Sandwiches, Fast Food  
175 Transportation, Limos, Hotels & Travel  
176 Auto Repair, Automotive  
177 Restaurants, Hot Dogs  
180 Mexican, Restaurants  
181 Fashion, Women's Clothing, Shopping  
182 Hotels & Travel, Resorts  
185 Bars, Nightlife, Lounges, Dance Clubs  
186 Hair Salons, Hair Stylists, Beauty & Spas, Mak...  
187 American (Traditional), Comfort Food, Barbeque...  
195 Real Estate, Home Staging, Interior Design, Es...  
197 Restaurants, Salad, Fast Food, Mexican  
199 Restaurants, Seafood  
200 Carpet Cleaning, Home Services, Local Services...  
203 Southern, Chicken Wings, Fast Food, American (...  
204 Arts & Entertainment, Local Flavor, Festivals  
205 Oil Change Stations, Tires, Auto Parts & Suppl...  
208 Gardeners, Home Services, Landscape Architects...  
209 Dentists, General Dentistry, Health & Medical,...  
213 Pets, Dog Walkers, Pet Sitting, Pet Services  
216 Active Life, Fitness & Instruction, Gyms, Inte...

218 Event Planning & Services, Professional Servic...  
 222 Real Estate, Home Services, Property Management  
 223 Pets, Pet Services, Pet Sitting, Veterinarians  
 227 Fashion, Department Stores, Shopping  
 228 Financial Services, Professional Services, Tax...  
 229 Home Services, Local Services, Packing Supplie...  
 231 Body Shops, Auto Repair, Automotive  
 233 Restaurants, Seafood  
 235 Barbers, Beauty & Spas, Hair Stylists, Hair Sa...  
 238 Party & Event Planning, Wedding Planning, DJs,...  
 239 Auto Repair, Automotive, Car Stereo Installati...  
 242 Professional Services, Internet Service Provid...  
 243 Pets, Pet Groomers, Pet Services, Pet Training  
 245 Pediatric Dentists, Oral Surgeons, Cosmetic De...  
 246 Home Services, Real Estate Agents, Real Estate  
 247 Pawn Shops, Shopping, Jewelry, Electronics  
 249 American (New), Restaurants, Food, Breweries, ...  
 251 Playgrounds, Skate Parks, Parks, Active Life  
 252 Restaurants, Delis, Sandwiches  
 253 Auto Parts & Supplies, Automotive  
 255 Endodontists, Health & Medical, General Dentis...  
 256 Wedding Planning, Officiants, Event Planning &...  
 257 Bars, American (Traditional), Nightlife, Resta...  
 258 American (Traditional), Restaurants, Sandwiche...  
 261 Home Decor, Home Services, Appliances, Shoppin...  
 262 Massage Therapy, Reflexology, Reiki, Health & ...  
 264 Shopping, Electronics  
 265 Medical Centers, Skin Care, Health & Medical, ...  
 268 Dentists, Health & Medical, General Dentistry  
 269 Screen Printing/T-Shirt Printing, Screen Print...  
 270 Movers, Packing Services, Home Services  
 271 Food, Convenience Stores  
 272 Coffee & Tea, Automotive, Convenience Stores, ...  
 277 Handyman, Property Management, Home Services, ...  
 278 Home Services, Shopping, Electricians, Contrac...  
 279 Car Wash, Delis, Convenience Stores, Food, Res...  
 281 Active Life, Weight Loss Centers, Gyms, Health...  
 286 Active Life, Golf  
 287 Psychologists, Counseling & Mental Health, Nat...  
 289 Home Services, Heating & Air Conditioning/HVAC  
 291 Restaurants, Pizza  
 292 Real Estate, Apartments, Home Services  
 293 Restaurants, Indian  
 302 Mexican, Restaurants  
 303 Hair Stylists, Hair Removal, Beauty & Spas, Ha...  
 306 Dentists, General Dentistry, Periodontists, He...  
 307 Food, Coffee & Tea  
 311 Mexican, Breakfast & Brunch, Sandwiches, Event...  
 313 Diagnostic Services, Health & Medical  
 317 Restaurants, Food, Bakeries, Desserts, Breakfa...  
 318 Beauty & Spas, Barbers  
 323 Beauty & Spas, Hair Salons, Skin Care  
 324 Neurologist, Spine Surgeons, Cosmetic Surgeons...  
 325 Restaurants, Bars, Nightlife, Caterers, Mexica...  
 326 Doctors, Retina Specialists, Ophthalmologists,...  
 327 Home Services, Carpet Cleaning, Local Services  
 330 Accessories, Fashion, Baby Gear & Furniture, C...  
 334 Veterinarians, Pets  
 335 Beauty & Spas, Hair Salons  
 336 Emergency Rooms, Urgent Care, Health & Medical...  
 337 Automotive, Oil Change Stations, Smog Check St...  
 341 Pet Stores, Pet Services, Pets, Shopping  
 343 Local Services, Office Cleaning, Home Organiza...  
 344 Party Bus Rentals, Event Planning & Services



```

348             Italian, Restaurants
349     Sandwiches, Salad, Restaurants, Food, Juice Ba...
354             Home Services, Apartments, Real Estate
357     Steakhouses, Event Planning & Services, Food, ...
360     Fast Food, Restaurants, Sandwiches, American (...
361             Coffee & Tea, Food
363     Hotels & Travel, Active Life, Private Tutors, ...
365             Health & Medical, Neurologist, Doctors
366     Public Services & Government, Departments of M...
367     Health & Medical, Obstetricians & Gynecologist...
368             Gluten-Free, Restaurants, Vegan, American (New)
376     Hair Salons, Beauty & Spas, Cosmetics & Beauty...
377     Event Planning & Services, Arcades, Nightlife,...
378             Coffee & Tea, Food
379             Shopping, Arts & Crafts, Fabric Stores
380     Fashion, Department Stores, Automotive, Shoppi...
381     Arts & Entertainment, Coffee & Tea, Bars, Food...
382     Customized Merchandise, Shopping, Coffee Roast...
383             Shopping, Jewelry
385             Nail Salons, Beauty & Spas
387     Health & Medical, Active Life, Vitamins & Supp...
391             Pizza, Sandwiches, Restaurants, Chicken Wings
392     Auto Detailing, Automotive, Car Wash, Oil Chan...
393     Home & Garden, Home Decor, Shopping, Kitchen &...
395     Gyms, Active Life, Fitness & Instruction, Boxi...
396     Pets, Pet Stores, Pet Groomers, Pet Services, ...
397             Lounges, Nightlife, Bars
398     Pet Boarding, Pet Sitting, Pets, Pet Services,...
399             Casinos, Arts & Entertainment
400             Festivals, Arts & Entertainment, Food
402             Hair Salons, Beauty & Spas
403     Food, Desserts, Burgers, Restaurants, Ice Crea...
404             Professional Services
406             Restaurants, Pizza
407             Sandwiches, Fast Food, Restaurants
408     Shopping, Men's Clothing, Women's Clothing, Fa...
409     Doctors, Obstetricians & Gynecologists, Health...
410     Steakhouses, American (Traditional), Barbeque,...
411             Arts & Entertainment, Shopping, Art Galleries
413     Karaoke, Hotels, Nightlife, Party Equipment Re...
414     Chiropractors, Health & Medical, Physical Ther...
416             Local Services, Appliances & Repair
417     Oil Change Stations, Windshield Installation &...
420     Home Cleaning, Home Services, Home Organizatio...
421     Beauty & Spas, Eyelash Service, Waxing, Nail S...
423             Professional Services
425             Women's Clothing, Fashion, Shopping
426             Italian, Pizza, Restaurants
427             Shopping, Fashion, Accessories, Women's Clothing
428     Doctors, Ophthalmologists, Eyewear & Opticians...
429     Eyewear & Opticians, Health & Medical, Optomet...
430             Adult, Shopping, Lingerie, Fashion
434     Hotels & Travel, Asian Fusion, Day Spas, Casin...
437     Dentists, Periodontists, Cosmetic Dentists, Pr...
440             Packing Services, Movers, Home Services
441             Burgers, Fast Food, Sandwiches, Restaurants
445             Shopping, Jewelry
446     Men's Hair Salons, Barbers, Beauty & Spas, Hai...
450     Women's Clothing, Children's Clothing, Shoppin...
...
188229     Nutritionists, Massage, Health & Medical, Yoga...
188230             Automotive, Auto Repair, Car Dealers
188231     Shopping, Furniture Stores, Used, Vintage & Co...
188232     Internet Service Providers, Home Services, Pro...

```

188233 Skin Care, Beauty & Spas, Makeup Artists  
188235 Periodontists, Dentists, Health & Medical  
188238 Shopping, Antiques, Thrift Stores, Pawn Shops  
188239 Pet Sitting, Pet Transportation, Pets, Pet Ser...  
188240 Accessories, Women's Clothing, Shopping, Jewel...  
188241 Towing, Automotive  
188242 Food, Coffee & Tea  
188243 Chinese, Asian Fusion, Cantonese, Bars, Restau...  
188247 Restaurants, Sandwiches, Fast Food  
188248 Beauty & Spas, Waxing, Nail Salons, Hair Removal  
188249 Bars, Burgers, Restaurants, Nightlife, Sports ...  
188250 Apartments, Real Estate, Home Services  
188251 Home Services, Real Estate, Mortgage Brokers  
188252 Dry Cleaning & Laundry, Dry Cleaning, Local Se...  
188253 Health & Medical, Doctors, Pediatricians  
188254 Vegan, Burgers, Vegetarian, Sandwiches, Restau...  
188255 Pizza, Bars, Nightlife, Restaurants, Sports Bars  
188257 Mobile Phone Repair, Office Equipment, Printin...  
188258 Fast Food, Mexican, Tex-Mex, Restaurants  
188260 Local Services, Data Recovery, IT Services & C...  
188262 Bakeries, Candy Stores, Food, Specialty Food, ...  
188263 Food, Beer, Wine & Spirits, Restaurants, Thai,...  
188264 Restaurants, Hot Dogs  
188265 Automotive, Tires, Auto Glass Services, Auto C...  
188266 Local Services, Auto Customization, Automotive...  
188267 Professional Services  
188268 Automotive, Auto Repair, Car Dealers  
188269 Beauty & Spas, Shopping, Cosmetics & Beauty Su...  
188273 Automotive, Car Dealers, Transportation, Hotel...  
188276 Damage Restoration, Home Services, Contractors  
188277 Local Services, Financial Services, Profession...  
188278 Restaurants, Bars, Beer Bar, Vietnamese, Night...  
188279 Home Services, Plumbing  
188281 Home Cleaning, Home Services, Office Cleaning,...  
188282 Local Services, Shipping Centers, Mailbox Cent...  
188287 Medical Centers, Health & Medical  
188289 Casinos, Bingo Halls, Arts & Entertainment  
188290 Health & Medical, Bike Rentals, Motorcycle Ren...  
188291 Hotels & Travel, Tours  
188293 Food, Coffee & Tea  
188295 Packing Services, Self Storage, Movers, Local ...  
188296 Food, Ethnic Food, Imported Food, Japanese, Re...  
188299 Banks & Credit Unions, Financial Services  
188300 Session Photography, Event Planning & Services...  
188302 Food, Nightlife, Breakfast & Brunch, Juice Bar...  
188303 Real Estate, Mortgage Brokers, Banks & Credit ...  
188305 Shopping, Women's Clothing, Fashion  
188306 Laundry Services, Local Services, Dry Cleaning...  
188307 Massage, Beauty & Spas  
188309 Burgers, American (Traditional), Restaurants  
188310 Cocktail Bars, Bars, American (Traditional), N...  
188312 Fast Food, Restaurants, Mexican, Tacos  
188314 Tiling, Carpeting, Flooring, Home Services  
188315 Pizza, Restaurants  
188317 Bars, Nightlife, Cocktail Bars  
188318 Pretzels, Food  
188319 Hotels & Travel, Lounges, Restaurants, Steakho...  
188322 Beauty & Spas, Nail Salons  
188323 Pets, Veterinarians  
188324 Event Planning & Services, Caterers, Food Truc...  
188325 Beauty & Spas, Waxing, Nail Salons, Skin Care,...  
188327 Event Planning & Services, Venues & Event Spac...  
188328 Health & Medical, Occupational Therapy, Speech...  
188329 Automotive, Auto Repair

188330	Local Services, Pest Control, Home Services, L...
188331	Car Wash, Automotive, Auto Detailing
188334	Seafood, Cheesesteaks, Delis, Restaurants, San...
188335	Auto Repair, Automotive
188336	Buses, Party Bus Rentals, Hotels & Travel, Tra...
188337	Real Estate, Home Services, Apartments
188338	Fashion, Women's Clothing, Shopping, Jewelry, ...
188340	Health & Medical, Dentists, General Dentistry
188342	Real Estate, Home Services, Apartments
188344	Tapas Bars, Nightlife, Bars, Cocktail Bars, Re...
188345	Men's Clothing, Shopping, Fashion
188346	American (Traditional), Burgers, Sandwiches, R...
188347	Haunted Houses, Arts & Entertainment
188349	Japanese, Restaurants
188350	Heating & Air Conditioning/HVAC, Home Services
188351	Fast Food, Sandwiches, Restaurants
188352	Home Services, Real Estate, Apartments
188353	Session Photography, Party Equipment Rentals, ...
188355	Party & Event Planning, Event Planning & Servi...
188356	Restaurants, Salvadoran, Latin American
188357	Office Cleaning, Professional Services, Home C...
188358	Southern, Restaurants, Barbeque
188359	Salad, Nightlife, Italian, Restaurants, Bars, ...
188360	Greek, American (New), Modern European, Restau...
188361	Restaurants, Pizza
188364	Tanning, Active Life, Beauty & Spas, Trainers,...
188365	Auto Repair, Automotive
188366	Fashion, Shopping, Women's Clothing
188367	Coffee & Tea, Food
188372	Restaurants, Pizza
188374	Doctors, Health & Medical
188375	Health & Medical, Doctors, Family Practice
188377	Massage, Skin Care, Day Spas, Hair Removal, Wa...
188378	Bankruptcy Law, DUI Law, General Litigation, C...
188380	American (Traditional), Restaurants
188382	Nightlife, Restaurants, American (Traditional)...
188383	Beauty & Spas, Barbers
188384	Optometrists, Health & Medical, Medical Center...
188385	Photographers, Event Planning & Services, Even...
188386	Restaurants, Peruvian
188387	Women's Clothing, Fashion, Men's Clothing, Acc...
188388	Shopping, Tobacco Shops, Head Shops, Food, Bee...
188389	Real Estate, Home Services, Apartments
188390	Event Planning & Services, Costumes, Shopping,...
188391	Solar Installation, Home Services, Water Heate...
188392	Home Services, Real Estate Services, Real Esta...
188393	Pediatric Dentists, Oral Surgeons, Cosmetic De...
188398	Divorce & Family Law, Criminal Defense Law, La...
188399	Jewelry Repair, Jewelry, Local Services, Gold ...
188400	Beauty & Spas, Hair Salons
188401	Shopping, Eyewear & Opticians
188403	Automotive, Auto Repair
188404	Shopping, Home & Garden, Florists, Flowers & G...
188405	Shopping, Jewelry, Watch Repair, Local Service...
188406	Fast Food, Restaurants
188407	Restaurants, Greek
188409	Transmission Repair, Automotive
188412	Pet Groomers, Pets, Pet Services
188413	Apartments, Home Services, Real Estate
188415	Fashion, Shoe Stores, Shopping
188416	Doctors, Obstetricians & Gynecologists, Health...
188417	Restaurants, Fast Food
188418	Salvadoran, Food, Mexican, Burgers, Latin Amer...
188420	Restaurants, Mexican

188422 Home Decor, Home Services, Appliances, Glass &...  
188423 Cosmetics & Beauty Supply, Shopping, Makeup Ar...  
188425 Car Dealers, Auto Repair, Automotive  
188426 Door Sales/Installation, Home Services  
188428 Dentists, Pediatric Dentists, Oral Surgeons, H...  
188429 Pest Control, Local Services  
188430 Event Photography, Photographers, Session Phot...  
188431 Sporting Goods, Home Services, Movers, Pool & ...  
188434 Cosmetics & Beauty Supply, Nail Salons, Hair E...  
188436 TV Mounting, Local Services, Foundation Repair...  
188438 Hair Salons, Beauty & Spas, Hair Stylists  
188439 Pakistani, Indian, Afghan, Restaurants  
188440 Local Services, Home Services, IT Services & C...  
188441 Lounges, Nightlife, Karaoke, Bars  
188442 Home Services, Heating & Air Conditioning/HVAC  
188443 Nail Salons, Hair Removal, Waxing, Beauty & Sp...  
188445 Bakeries, Food, Restaurants, Fast Food, Pretzels  
188446 Shoe Stores, Men's Clothing, Fashion, Shopping  
188447 Beer, Wine & Spirits, Bars, Seafood, Restoran...  
188448 Steakhouses, Seafood, Nightlife, American (New...  
188449 Antiques, Shopping  
188450 Juice Bars & Smoothies, Bubble Tea, Coffee & T...  
188451 Hair Salons, Beauty & Spas  
188452 American (New), Diners, Breakfast & Brunch, Bu...  
188453 Mexican, Seafood, Restaurants, Salad  
188454 Cosmetic Surgeons, Plastic Surgeons, Health & ...  
188455 Family Practice, Doctors, Health & Medical, In...  
188456 Bagels, Food  
188458 Hair Salons, Nail Salons, Beauty & Spas  
188461 Restaurants, Fast Food, American (New), Chinese  
188462 Self Storage, Movers, Local Services, Packing ...  
188463 Real Estate, Commercial Real Estate, Home Serv...  
188464 Makeup Artists, Skin Care, Waxing, Hair Salons...  
188465 Home Services, Heating & Air Conditioning/HVAC  
188466 Tattoo, Beauty & Spas  
188467 Pizza, Restaurants, Italian  
188469 Self Storage, Local Services  
188470 Cinema, Event Planning & Services, Restaurants...  
188471 Italian, Restaurants  
188472 Yoga, Fitness & Instruction, Pilates, Boot Cam...  
188473 Active Life, Food, Playgrounds, Fitness & Inst...  
188475 Health & Medical, Medical Spas, Beauty & Spas,...  
188476 Automotive, Auto Repair, Oil Change Stations, ...  
188477 Fitness & Instruction, Yoga, Active Life  
188478 Electronics, Mobile Phones, Local Services, Sh...  
188479 Transmission Repair, Automotive, Auto Repair, ...  
188480 Gas Stations, Food, Convenience Stores, Automo...  
188482 Pets, Veterinarians  
188487 Hair Salons, Beauty & Spas  
188488 Casinos, Steakhouses, Bars, Nightlife, Restaur...  
188489 Shopping, Home Decor, Home Services, Home & Ga...  
188490 Appliances & Repair, Local Services, Fireplace...  
188491 Restaurants, Chinese  
188492 Desserts, Food  
188494 Real Estate, Apartments, Home Services  
188495 Auto Repair, Automotive, Tires  
188496 Delis, Appliances, Pasta Shops, Grocery, Soup,...  
188497 Restaurants, Thai  
188498 Hair Removal, Nail Technicians, Massage, Nail ...  
188499 Home & Garden, Golf Equipment Shops, Shopping  
188500 Costumes, Fabric Stores, Bridal, Shopping, Art...  
188502 Arts & Entertainment, Shopping, Adult Educatio...  
188503 Shopping, Electronics  
188504 Sushi Bars, Restaurants, Japanese

188506 Greek, Restaurants, Diners, Southern, Desserts...  
188507 Event Planning & Services, Swimming Pools, Hot...  
188510 Food, Juice Bars & Smoothies  
188511 Sushi Bars, Restaurants, Mexican  
188512 Local Services, Home Services, Farming Equipme...  
188513 Nightlife  
188514 Dance Clubs, Chicken Wings, Bars, Sports Bars,...  
188515 Shopping, Drugstores  
188516 Dentists, General Dentistry, Cosmetic Dentists...  
188518 Restaurants, Fast Food, Sandwiches  
188519 Restaurants, Mexican  
188520 Sandwiches, Fast Food, Restaurants  
188521 Local Services, Self Storage  
188522 Local Services, Farmers Market, Food, Health M...  
188524 Health & Medical, Family Practice, Doctors  
188525 Fashion, Men's Clothing, Shopping, Personal Sh...  
188533 Car Dealers, Automotive, Used Car Dealers, Car...  
188534 Beauty & Spas, Hair Salons, Barbers  
188539 Home Services, Property Management, Real Estat...  
188541 Motorcycle Repair, Local Services, Automotive,...  
188543 Mediterranean, Turkish, Restaurants, Kebab, Greek  
188546 Automotive, Car Wash  
188547 Food, Donuts  
188548 Home Services, IT Services & Computer Repair, ...  
188550 Session Photography, Event Photography, Arts &...  
188552 Real Estate, Mortgage Brokers, Auto Loan Provi...  
188553 Cycling Classes, Fitness & Instruction, Active...  
188554 Hair Salons, Men's Hair Salons, Beauty & Spas,...  
188555 Special Education, Vocational & Technical Scho...  
188556 Pet Sitting, Pet Stores, Pet Groomers, Pet Ser...  
188557 Arts & Entertainment, Tattoo, Beauty & Spas  
188560 Restaurants, Italian  
188561 Shopping, Flowers & Gifts, Florists  
188562 Beauty & Spas, Tanning  
188564 Nail Salons, Beauty & Spas  
188566 Eyewear & Opticians, Leather Goods, Shopping, ...  
188567 Delis, Restaurants, American (Traditional)  
188568 Self Storage, Local Services  
188569 Hair Stylists, Hair Extensions, Hair Salons, B...  
188570 Nightlife, Bars, Shopping, Tobacco Shops, Cock...  
188572 Beer Bar, Cocktail Bars, Nightlife, Bars  
188573 Performing Arts, Arts & Entertainment  
188574 Active Life, Arts & Entertainment, Nightlife, ...  
188577 American (Traditional), American (New), Restau...  
188578 Hair Removal, Eyebrow Services, Beauty & Spas,...  
188579 Banks & Credit Unions, Financial Services, Rea...  
188580 Kitchen & Bath, Building Supplies, Home Servic...  
188581 Pet Groomers, Pets, Veterinarians, Pet Sitting...  
188582 Automotive, Body Shops, Auto Repair, Oil Chang...  
188583 Beauty & Spas, Nail Salons, Active Life, Gyms,...  
188584 Beauty & Spas, Nail Salons, Hair Removal, Waxe...  
188590 Mobile Phones, Shopping, Department Stores, Fo...  
-----

```
In [37]: # Your code here
category_list = list()
business_data_subset.categories.astype('str')

for val in business_data_subset.categories.str.split(','):
    for cat_val in val:
        cat_val = cat_val.strip()
        print(cat_val)
        category_list.append(cat_val)
```

Chicken Wings  
Burgers  
Caterers  
Street Vendors  
Barbeque  
Food Trucks  
Food  
Restaurants  
Event Planning & Services  
Insurance  
Financial Services  
Coffee & Tea  
Food  
Mexican  
Restaurants  
Bars  
Sports Bars  
Dive Bars  
Burgers  
Nightlife  
Sandwiches  
Restaurants  
Shopping  
Fashion  
Department Stores  
Financial Services  
Check Cashing/Pay-day Loans  
Title Loans  
American (Traditional)  
Food  
Bakeries  
Restaurants  
Home Services  
Masonry/Concrete  
Professional Services  
Contractors  
Fast Food  
Burgers  
Restaurants  
Nightlife  
Bars  
American (Traditional)  
Sports Bars  
Restaurants  
Mexican  
Restaurants  
Home Services  
Home Automation  
Security Systems  
Pizza  
Restaurants  
Fast Food  
Restaurants  
Sandwiches  
Beer  
Wine & Spirits  
Italian  
Food  
American (Traditional)  
Breakfast & Brunch  
Restaurants  
Health & Medical  
Hair Salons

Skin Care  
Hair Extensions  
Medical Spas  
Cryotherapy  
Beauty & Spas  
Restaurants  
Cafes  
Ice Cream & Frozen Yogurt  
Food  
Seafood  
Restaurants  
Health & Medical  
Physical Therapy  
Retirement Homes  
Pizza  
Fast Food  
Restaurants  
Automotive  
Auto Customization  
Shopping  
Auto Security  
Car Stereo Installation  
Electronics  
Hair Salons  
Beauty & Spas  
Flooring  
Cabinetry  
Refinishing Services  
Home Services  
Masonry/Concrete  
Tiling  
Plumbing  
Contractors  
Event Planning & Services  
Soup  
Salad  
Mexican  
Caterers  
Restaurants  
Thrift Stores  
Shopping  
Used  
Vintage & Consignment  
Antiques  
Fashion  
Auction Houses  
Motorcycle Rental  
Active Life  
Motorcycle Dealers  
Scooter Rentals  
Automotive  
Scooter Tours  
Bike Rentals  
Car Rental  
Tours  
Hotels & Travel  
Truck Rental  
ATV Rentals/Tours  
Restaurants  
Pizza  
Home Services  
Contractors  
Fast Food  
Restaurants



Sandwiches  
Food  
Health & Medical  
Diagnostic Imaging  
Diagnostic Services  
Arts & Entertainment  
Mexican  
Restaurants  
Waxing  
Nail Salons  
Eyelash Service  
Beauty & Spas  
Hair Removal  
Health & Medical  
Dentists  
Cosmetic Dentists  
General Dentistry  
Gas Stations  
Car Wash  
Automotive  
Shopping  
Pawn Shops  
Jewelry  
Churches  
Religious Organizations  
Venues & Event Spaces  
Wedding Chapels  
Photographers  
Event Planning & Services  
Waxing  
Blow Dry/Out Services  
Hair Salons  
Hair Stylists  
Day Spas  
Massage  
Hair Removal  
Beauty & Spas  
Home & Garden  
Shopping  
Mattresses  
Furniture Stores  
Department Stores  
Shopping  
Fashion  
Shopping  
Drugstores  
Medical Supplies  
Urologists  
Doctors  
Health & Medical  
Fitness & Instruction  
Gyms  
Health & Medical  
Active Life  
Weight Loss Centers  
Trainers  
Shopping  
Mattresses  
Home & Garden  
Furniture Stores  
Bakeries  
Food  
Beauty & Spas  
Makeup Artists

Hair Salons  
Eyelash Service  
Hair Stylists  
Pets  
Pet Groomers  
Pet Services  
Shopping  
Tobacco Shops  
Vape Shops  
Pet Groomers  
Pet Boarding  
Pets  
Veterinarians  
Pet Stores  
Pet Sitting  
Pet Services  
Nail Salons  
Beauty & Spas  
Beauty & Spas  
Nail Salons  
Financial Services  
Banks & Credit Unions  
Auto Parts & Supplies  
Automotive  
Beer  
Wine & Spirits  
Food  
Pet Groomers  
Pets  
Pet Services  
Periodontists  
General Dentistry  
Dentists  
Orthodontists  
Health & Medical  
Food Delivery Services  
Transportation  
Food  
Taxis  
Hotels & Travel  
Appliances & Repair  
IT Services & Computer Repair  
Mobile Phone Repair  
Local Services  
Electronics Repair  
Professional Services  
Fast Food  
Restaurants  
Food  
Restaurants  
Italian  
Bars  
Wine Bars  
Desserts  
Nightlife  
Chinese  
Bars  
Karaoke  
Nightlife  
Restaurants  
Restaurants  
American (Traditional)  
Cocktail Bars  
Nightlife

Bars  
Jewelry  
Local Services  
Watch Repair  
Shopping  
Watches  
Sports Bars  
American (Traditional)  
Chicken Wings  
Restaurants  
Nightlife  
Bars  
Restaurants  
Steakhouses  
Nightlife  
Burgers  
American (Traditional)  
Sports Bars  
Bars  
Oil Change Stations  
Automotive  
Door Sales/Installation  
Home Services  
Contractors  
Glass & Mirrors  
Massage Therapy  
Physical Therapy  
Health & Medical  
Keys & Locksmiths  
Home Services  
Apartments  
Home Services  
Real Estate  
Apartments  
Real Estate  
Home Services  
Active Life  
Bowling  
Thrift Stores  
Shopping  
Spray Tanning  
Tanning Beds  
Tanning  
Beauty & Spas  
Italian  
Restaurants  
Landscaping  
Home Services  
Contractors  
Active Life  
Arts & Entertainment  
Horse Racing  
Casinos  
Event Planning & Services  
Caterers  
Discount Store  
Wholesale Stores  
Shopping  
Outlet Stores  
Doctors  
Orthopedists  
Health & Medical  
Karaoke  
Country Dance Halls

Bars  
Nightlife  
Restaurants  
American (New)  
American (Traditional)  
Chicken Wings  
Restaurants  
Fast Food  
Restaurants  
American (New)  
Restaurants  
Pizza  
Event Planning & Services  
Hotels  
Hotels & Travel  
Japanese  
Restaurants  
DUI Law  
Professional Services  
Lawyers  
Divorce & Family Law  
Criminal Defense Law  
Endodontists  
Health & Medical  
Pediatric Dentists  
Cosmetic Dentists  
Orthodontists  
General Dentistry  
Dentists  
Arts & Entertainment  
Museums  
Seafood  
Fish & Chips  
Restaurants  
Fast Food  
Auto Repair  
Automotive  
Transmission Repair  
Auto Customization  
Automotive  
Furniture Reupholstery  
Local Services  
Auto Upholstery  
Flowers & Gifts  
Florists  
Shopping  
Tobacco Shops  
Vape Shops  
Personal Shopping  
Shopping  
Party & Event Planning  
Event Planning & Services  
Amusement Parks  
Food  
Desserts  
Active Life  
Auto Repair  
Auto Parts & Supplies  
Oil Change Stations  
Automotive  
Tires  
Doctors  
Eyebrow Services  
Tattoo Removal

Beauty & Spas  
Health & Medical  
Delis  
Restaurants  
Sandwiches  
Local Services  
Printing Services  
Notaries  
Mailbox Centers  
Shipping Centers  
Obstetricians & Gynecologists  
Health & Medical  
Doctors  
Food  
Grocery  
Health & Medical  
Physical Therapy  
Appliances & Repair  
Local Services  
Arts & Entertainment  
Stadiums & Arenas  
Restaurants  
Sandwiches  
Fast Food  
Transportation  
Limos  
Hotels & Travel  
Auto Repair  
Automotive  
Restaurants  
Hot Dogs  
Mexican  
Restaurants  
Fashion  
Women's Clothing  
Shopping  
Hotels & Travel  
Resorts  
Bars  
Nightlife  
Lounges  
Dance Clubs  
Hair Salons  
Hair Stylists  
Beauty & Spas  
Makeup Artists  
Eyelash Service  
American (Traditional)  
Comfort Food  
Barbeque  
Restaurants  
Real Estate  
Home Staging  
Interior Design  
Estate Liquidation  
Home Organization  
Home Services  
Restaurants  
Salad  
Fast Food  
Mexican  
Restaurants  
Seafood  
Carpet Cleaning

Home Services  
Local Services  
Office Cleaning  
Home Cleaning  
Professional Services  
Southern  
Chicken Wings  
Fast Food  
American (Traditional)  
Restaurants  
Arts & Entertainment  
Local Flavor  
Festivals  
Oil Change Stations  
Tires  
Auto Parts & Supplies  
Automotive  
Gardeners  
Home Services  
Landscape Architects  
Local Services  
Landscaping  
Pest Control  
Wildlife Control  
Dentists  
General Dentistry  
Health & Medical  
Cosmetic Dentists  
Pets  
Dog Walkers  
Pet Sitting  
Pet Services  
Active Life  
Fitness & Instruction  
Gyms  
Interval Training Gyms  
Event Planning & Services  
Professional Services  
Photographers  
Real Estate  
Home Services  
Property Management  
Pets  
Pet Services  
Pet Sitting  
Veterinarians  
Fashion  
Department Stores  
Shopping  
Financial Services  
Professional Services  
Tax Services  
Accountants  
Home Services  
Local Services  
Packing Supplies  
Movers  
Self Storage  
Shopping  
Body Shops  
Auto Repair  
Automotive  
Restaurants  
Seafood

Barbers  
Beauty & Spas  
Hair Stylists  
Hair Salons  
Kids Hair Salons  
Party & Event Planning  
Wedding Planning  
DJs  
Event Planning & Services  
Auto Repair  
Automotive  
Car Stereo Installation  
Auto Customization  
Professional Services  
Internet Service Providers  
Home Services  
Mobile Phone Accessories  
Shopping  
Mobile Phones  
Electronics  
IT Services & Computer Repair  
Local Services  
Telecommunications  
Pets  
Pet Groomers  
Pet Services  
Pet Training  
Pediatric Dentists  
Oral Surgeons  
Cosmetic Dentists  
General Dentistry  
Dentists  
Health & Medical  
Home Services  
Real Estate Agents  
Real Estate  
Pawn Shops  
Shopping  
Jewelry  
Electronics  
American (New)  
Restaurants  
Food  
Breweries  
Brewpubs  
Playgrounds  
Skate Parks  
Parks  
Active Life  
Restaurants  
Delis  
Sandwiches  
Auto Parts & Supplies  
Automotive  
Endodontists  
Health & Medical  
General Dentistry  
Pediatric Dentists  
Cosmetic Dentists  
Dentists  
Wedding Planning  
Officiants  
Event Planning & Services  
Bars

American (Traditional)  
Nightlife  
Restaurants  
Tex-Mex  
American (Traditional)  
Restaurants  
Sandwiches  
Fast Food  
Home Decor  
Home Services  
Appliances  
Shopping  
Home & Garden  
Kitchen & Bath  
Building Supplies  
Massage Therapy  
Reflexology  
Reiki  
Health & Medical  
Beauty & Spas  
Massage  
Shopping  
Electronics  
Medical Centers  
Skin Care  
Health & Medical  
Medical Spas  
Dermatologists  
Doulas  
Beauty & Spas  
Doctors  
Dentists  
Health & Medical  
General Dentistry  
Screen Printing/T-Shirt Printing  
Screen Printing  
Sewing & Alterations  
Shopping  
Local Services  
Wholesale Stores  
Embroidery & Crochet  
Arts & Crafts  
Movers  
Packing Services  
Home Services  
Food  
Convenience Stores  
Coffee & Tea  
Automotive  
Convenience Stores  
Gas Stations  
Food  
Handyman  
Property Management  
Home Services  
Gay Bars  
Lawyers  
Real Estate  
Land Surveying  
Real Estate Law  
Real Estate Services  
Nightlife  
Professional Services  
Bars



Home Services  
Shopping  
Electricians  
Contractors  
Flooring  
Plumbing  
Damage Restoration  
Roofing  
Kitchen & Bath  
Home & Garden  
Car Wash  
Delis  
Convenience Stores  
Food  
Restaurants  
Automotive  
Active Life  
Weight Loss Centers  
Gyms  
Health & Medical  
Education  
Specialty Schools  
Fitness & Instruction  
Trainers  
Active Life  
Golf  
Psychologists  
Counseling & Mental Health  
Naturopathic/Holistic  
Doctors  
Acupuncture  
Family Practice  
Health & Medical  
Medical Centers  
Home Services  
Heating & Air Conditioning/HVAC  
Restaurants  
Pizza  
Real Estate  
Apartments  
Home Services  
Restaurants  
Indian  
Mexican  
Restaurants  
Hair Stylists  
Hair Removal  
Beauty & Spas  
Hair Extensions  
Waxing  
Hair Salons  
Dentists  
General Dentistry  
Periodontists  
Health & Medical  
Food  
Coffee & Tea  
Mexican  
Breakfast & Brunch  
Sandwiches  
Event Planning & Services  
Food Trucks  
Restaurants  
Food

Caterers  
Diagnostic Services  
Health & Medical  
Restaurants  
Food  
Bakeries  
Desserts  
Breakfast & Brunch  
Beauty & Spas  
Barbers  
Beauty & Spas  
Hair Salons  
Skin Care  
Neurologist  
Spine Surgeons  
Cosmetic Surgeons  
Doctors  
Health & Medical  
Restaurants  
Bars  
Nightlife  
Caterers  
Mexican  
Tex-Mex  
Event Planning & Services  
Doctors  
Retina Specialists  
Ophthalmologists  
Health & Medical  
Home Services  
Carpet Cleaning  
Local Services  
Accessories  
Fashion  
Baby Gear & Furniture  
Children's Clothing  
Shopping  
Veterinarians  
Pets  
Beauty & Spas  
Hair Salons  
Emergency Rooms  
Urgent Care  
Health & Medical  
Diagnostic Services  
Hospitals  
Diagnostic Imaging  
Automotive  
Oil Change Stations  
Smog Check Stations  
Auto Repair  
Gas Stations  
Pet Stores  
Pet Services  
Pets  
Shopping  
Local Services  
Office Cleaning  
Home Organization  
Professional Services  
Recycling Center  
Movers  
Home Services  
Junk Removal & Hauling

Party Bus Rentals  
Event Planning & Services  
Italian  
Restaurants  
Sandwiches  
Salad  
Restaurants  
Food  
Juice Bars & Smoothies  
Home Services  
Apartments  
Real Estate  
Steakhouses  
Event Planning & Services  
Food  
Brazilian  
Beer  
Wine & Spirits  
Venues & Event Spaces  
Restaurants  
Fast Food  
Restaurants  
Sandwiches  
American (New)  
Coffee & Tea  
Food  
Hotels & Travel  
Active Life  
Private Tutors  
Climbing  
Hiking  
Education  
Tours  
Walking Tours  
Health & Medical  
Neurologist  
Doctors  
Public Services & Government  
Departments of Motor Vehicles  
Automotive  
Health & Medical  
Obstetricians & Gynecologists  
Doctors  
Gluten-Free  
Restaurants  
Vegan  
American (New)  
Hair Salons  
Beauty & Spas  
Cosmetics & Beauty Supply  
Shopping  
Hair Removal  
Event Planning & Services  
Arcades  
Nightlife  
Bars  
Arts & Entertainment  
Venues & Event Spaces  
Coffee & Tea  
Food  
Shopping  
Arts & Crafts  
Fabric Stores  
Fashion

Department Stores  
Automotive  
Shopping  
Wholesale Stores  
Tires  
Arts & Entertainment  
Coffee & Tea  
Bars  
Food  
Restaurants  
Nightlife  
Music Venues  
Cafes  
Customized Merchandise  
Shopping  
Coffee Roasteries  
Food  
Coffee & Tea  
Bakeries  
Bagels  
Shopping  
Jewelry  
Nail Salons  
Beauty & Spas  
Health & Medical  
Active Life  
Vitamins & Supplements  
Nutritionists  
Food  
Trainers  
Specialty Food  
Fitness & Instruction  
Health Markets  
Shopping  
Pizza  
Sandwiches  
Restaurants  
Chicken Wings  
Auto Detailing  
Automotive  
Car Wash  
Oil Change Stations  
Home & Garden  
Home Decor  
Shopping  
Kitchen & Bath  
Home Services  
Building Supplies  
Interior Design  
Gyms  
Active Life  
Fitness & Instruction  
Boxing  
Trainers  
Pets  
Pet Stores  
Pet Groomers  
Pet Services  
Pet Adoption  
Pet Training  
Lounges  
Nightlife  
Bars  
Pet Boarding

Pet Sitting  
Pets  
Pet Services  
Pet Groomers  
Casinos  
Arts & Entertainment  
Festivals  
Arts & Entertainment  
Food  
Hair Salons  
Beauty & Spas  
Food  
Desserts  
Burgers  
Restaurants  
Ice Cream & Frozen Yogurt  
Fast Food  
Professional Services  
Restaurants  
Pizza  
Sandwiches  
Fast Food  
Restaurants  
Shopping  
Men's Clothing  
Women's Clothing  
Fashion  
Doctors  
Obstetricians & Gynecologists  
Health & Medical  
Steakhouses  
American (Traditional)  
Barbeque  
Restaurants  
Arts & Entertainment  
Shopping  
Art Galleries  
Karaoke  
Hotels  
Nightlife  
Party Equipment Rentals  
Event Planning & Services  
Party Supplies  
Hotels & Travel  
Chiropractors  
Health & Medical  
Physical Therapy  
Naturopathic/Holistic  
Doctors  
Nutritionists  
Local Services  
Appliances & Repair  
Oil Change Stations  
Windshield Installation & Repair  
Automotive  
Auto Repair  
Auto Glass Services  
Home Cleaning  
Home Services  
Home Organization  
Office Cleaning  
Professional Services  
Beauty & Spas  
Eyelash Service

Waxing  
Nail Salons  
Hair Removal  
Professional Services  
Women's Clothing  
Fashion  
Shopping  
Italian  
Pizza  
Restaurants  
Shopping  
Fashion  
Accessories  
Women's Clothing  
Doctors  
Ophthalmologists  
Eyewear & Opticians  
Health & Medical  
Optometrists  
Shopping  
Laser Eye Surgery/Lasik  
Eyewear & Opticians  
Health & Medical  
Optometrists  
Shopping  
Adult  
Shopping  
Lingerie  
Fashion  
Hotels & Travel  
Asian Fusion  
Day Spas  
Casinos  
Restaurants  
Beauty & Spas  
Arts & Entertainment  
Resorts  
Dentists  
Periodontists  
Cosmetic Dentists  
Prosthodontists  
Oral Surgeons  
Health & Medical  
Packing Services  
Movers  
Home Services  
Burgers  
Fast Food  
Sandwiches  
Restaurants  
Shopping  
Jewelry  
Men's Hair Salons  
Barbers  
Beauty & Spas  
Hair Salons  
Women's Clothing  
Children's Clothing  
Shopping  
Fashion  
Men's Clothing  
Local Services  
Mobile Phones  
IT Services & Computer Repair

Telecommunications  
Electronics  
Shopping  
Mobile Phone Accessories  
Carpeting  
Carpet Installation  
Flooring  
Home Services  
Fitness & Instruction  
Trainers  
Active Life  
Gyms  
Restaurants  
Burgers  
Sports Bars  
Bars  
American (New)  
Nightlife  
American (Traditional)  
Barbers  
Hair Salons  
Beauty & Spas  
Local Services  
Furniture Assembly  
Furniture Repair  
Furniture Reupholstery  
Home Services  
Plumbing  
Home Services  
Apartments  
Home Services  
Real Estate  
Pool & Hot Tub Service  
Pool Cleaners  
Home Services  
Professional Services  
Contractors  
Architects  
Home Services  
Nightlife  
Sports Bars  
Bars  
Restaurants  
Karaoke  
Local Services  
Self Storage  
Beer  
Wine & Spirits  
Restaurants  
Burgers  
Pubs  
Nightlife  
Food  
Bars  
Appliances & Repair  
Local Services  
Restaurants  
Italian  
Restaurants  
Food  
American (Traditional)  
Coffee & Tea  
Breakfast & Brunch  
Real Estate

Apartments  
Home Services  
Coffee & Tea  
Food  
Restaurants  
Fast Food  
Burgers  
Burgers  
Fast Food  
Restaurants  
Food  
Coffee & Tea  
Restaurants  
Fast Food  
Shopping  
Gift Shops  
Flowers & Gifts  
Event Planning & Services  
Venues & Event Spaces  
Home Services  
Real Estate Services  
Real Estate Agents  
Real Estate  
Restaurants  
Mexican  
Skin Care  
Makeup Artists  
Tanning  
Spray Tanning  
Beauty & Spas  
Pizza  
Food  
Restaurants  
Shopping  
Active Life  
Archery  
Sporting Goods  
Eyebrow Services  
Event Planning & Services  
Threading Services  
Henna Artists  
Beauty & Spas  
Hair Salons  
Hair Removal  
Grocery  
Food  
Ethnic Food  
Specialty Food  
Imported Food  
Interior Design  
Flooring  
Contractors  
Home Services  
Landscaping  
Home Services  
Masonry/Concrete  
Landscape Architects  
Shopping Centers  
Shopping  
Sports Bars  
Nightlife  
American (Traditional)  
Restaurants  
Bars



Pet Services  
Dog Walkers  
Pets  
Pet Sitting  
Pet Training  
Automotive  
Auto Parts & Supplies  
Car Dealers  
Security Systems  
Home Theatre Installation  
Home Services  
Security Services  
Professional Services  
Home Services  
Movers  
Financial Services  
Insurance  
Indian  
Pakistani  
Restaurants  
Restaurants  
Breakfast & Brunch  
Food  
Bakeries  
Food  
Grocery  
Signmaking  
Professional Services  
Fruits & Veggies  
Bakeries  
Breakfast & Brunch  
Grocery  
Restaurants  
Specialty Food  
Food  
Mediterranean  
Middle Eastern  
Event Planning & Services  
Photographers  
Event Photography  
Session Photography  
Auto Parts & Supplies  
Auto Customization  
Auto Repair  
Automotive  
Tires  
Real Estate  
Home Services  
Mortgage Brokers  
Real Estate  
Real Estate Services  
Home Services  
Real Estate Agents  
Shopping  
Drugstores  
Shopping  
Bridal  
Home Cleaning  
Professional Services  
Home Services  
Office Cleaning  
Carpet Cleaning  
Local Services  
Local Services

Hotels & Travel  
Airports  
Beauty & Spas  
Barbers  
Kids Hair Salons  
Men's Hair Salons  
Hair Salons  
Hair Stylists  
Food Stands  
Food  
Restaurants  
Street Vendors  
Flowers & Gifts  
Books  
Mags  
Music & Video  
Arts & Entertainment  
Supernatural Readings  
Shopping  
Bookstores  
Gift Shops  
Spiritual Shop  
Pizza  
Restaurants  
Child Care & Day Care  
Education  
Local Services  
Arts & Crafts  
Nanny Services  
Shopping  
Toy Stores  
Desserts  
Specialty Food  
Chocolatiers & Shops  
Candy Stores  
Food  
Party & Event Planning  
Floral Designers  
Florists  
Flowers & Gifts  
Shopping  
Event Planning & Services  
Car Wash  
Automotive  
Sports Wear  
Shopping  
Fashion  
Sporting Goods  
Ice Cream & Frozen Yogurt  
Desserts  
Food  
Local Services  
Sewing & Alterations  
Automotive  
Windshield Installation & Repair  
Auto Glass Services  
Hostels  
Hotels & Travel  
Food  
Fast Food  
Filipino  
Ethnic Food  
Restaurants  
Specialty Food

Mortuary Services  
Local Services  
Funeral Services & Cemeteries  
Wedding Planning  
Event Planning & Services  
Shopping  
Gift Shops  
Florists  
Flowers & Gifts  
Local Services  
Beauty & Spas  
Hair Salons  
Nail Salons  
Beauty & Spas  
Barbers  
Event Planning & Services  
Women's Clothing  
Fashion  
Department Stores  
Shopping  
Home & Garden  
Arts & Crafts  
Discount Store  
Flowers & Gifts  
Accessories  
Men's Clothing  
Cards & Stationery  
Home Decor  
Photographers  
Event Photography  
Event Planning & Services  
Session Photography  
Home & Garden  
Shopping  
Electronics  
Furniture Stores  
Appliances  
Middle Schools & High Schools  
Education  
Elementary Schools  
Kids Activities  
Active Life  
Grocery  
Food  
Pet Services  
Pets  
Pet Groomers  
Restaurants  
Nightlife  
Irish Pub  
Bars  
Irish  
Optometrists  
Health & Medical  
Home Services  
Handyman  
Insurance  
Life Insurance  
Auto Insurance  
Home & Rental Insurance  
Financial Services  
IT Services & Computer Repair  
Local Services  
Mobile Phone Repair

Electronics Repair  
 Restaurants  
 Chinese  
 Hotels  
 Event Planning & Services  
 Venues & Event Spaces  
 Caterers  
 Hotels & Travel  
 Kitchen & Bath  
 Shopping  
 Home & Garden  
 Professional Services  
 Lawyers  
 DUI Law  
 Criminal Defense Law  
 Financial Services  
 Professional Services  
 Tax Services  
 Accountants  
 Auto Glass Services  
 Automotive  
 Heating & Air Conditioning/HVAC  
 Home Energy Auditors  
 Insulation Installation  
 Home Services  
 Bookstores  
 Public Services & Government  
 Education  
 Shopping  
 Books  
 Mags  
 Music & Video  
 Libraries  
 Educational Services

```

-----
TypeError                                Traceback (most recent call last)
<ipython-input-37-355b420ba040> in <module>
      4
      5 for val in business_data_subset.categories.str.split(','):
----> 6     for cat_val in val:
      7         cat_val = cat_val.strip()
      8         print(cat_val)

TypeError: 'float' object is not iterable
  
```

```

In [38]: category_series = pd.Series(category_list)
        n = len(category_series.value_counts())
  
```

How many distinct categories are in 'business\_data\_subset'?

```

In [39]: # Number of distinct categories equal to the number of rows
        f'There are {n} distinct categories in the dataset.'
  
```

```

Out[39]: 'There are 389 distinct categories in the dataset.'
  
```

### Problem 13: (5 points)

For this question, we want to see if we can use the `categories` variable from the `business\_data\_subset` table to extract the records belonging to **food establishments** - any place that someone could go to get a freshly prepared meal.

Create a copy of the Pandas DataFrame called `food\_establishments` which contains all business in `business\_data\_subset` that contain either **dining** or **restaurant** in their list of categories. (Make sure to ignore case.) How many food establishments are captured using this method?

Hint: This can be accomplished in at least two ways. No reasonable method is bad! Create a new variable and use it to filter observations or directly subset the data. Your choice!

```
In [40]: # Your code here
f13 = business_data_subset.categories.str.contains('Dining') | business_data_subset.categories.str.contains('Restaurant')
food_establishments = business_data_subset[f13]
n = len(food_establishments)
f'There are {n} establishments which provide freshly prepared meals.'
```

```
Out[40]: 'There are 27724 establishments which provide freshly prepared meals.'
```

### Problem 14: (5 points)

Using the `food\_establishments` table, create a table with `stars` as the index, `state` as the columns, and the conditional `stars` distribution of food establishments for each `state` as values.

Include the marginal `stars` distribution in your table by using the appropriate `margins` argument. Create a valid conditional `stars` distribution for each state using the `normalize = 'columns'` argument.

You can check that you have successfully create valid conditional `stars` distributions for each state by verifying each column sums to 1.

Your final table should look similar to the table below with the appropriate values imputed for `val`.

state	AZ	NV	NC	OH	All
stars					
1	val	val	val	val	val
1.5	val	val	val	val	val
2	val	val	val	val	val
2.5	val	val	val	val	val
3	val	val	val	val	val
3.5	val	val	val	val	val
4	val	val	val	val	val
4.5	val	val	val	val	val
5	val	val	val	val	val

In [41]: *# Your code here*

```
yelp_star_dist = pd.crosstab(index = food_establishments['stars'],  
                             columns = food_establishments['state'],  
                             normalize = 'columns',  
                             margins = True)  
  
yelp_star_dist
```

Out[41]:

state	AZ	NC	NV	OH	All
stars					
1.0	0.006136	0.009119	0.003765	0.012701	0.007142
1.5	0.024274	0.029998	0.022862	0.026196	0.025105
2.0	0.064248	0.062155	0.062668	0.061520	0.063014
2.5	0.107562	0.106791	0.103685	0.109149	0.106695
3.0	0.176051	0.183345	0.166218	0.167494	0.172955
3.5	0.232990	0.235661	0.237090	0.237150	0.235247
4.0	0.248150	0.234941	0.246369	0.240524	0.244301
4.5	0.114781	0.111831	0.126950	0.118674	0.118309
5.0	0.025808	0.026158	0.030393	0.026593	0.027233

### Problem 15: (5 points)

Is there a difference in the rating distribution (`stars`) of food establishments by state?

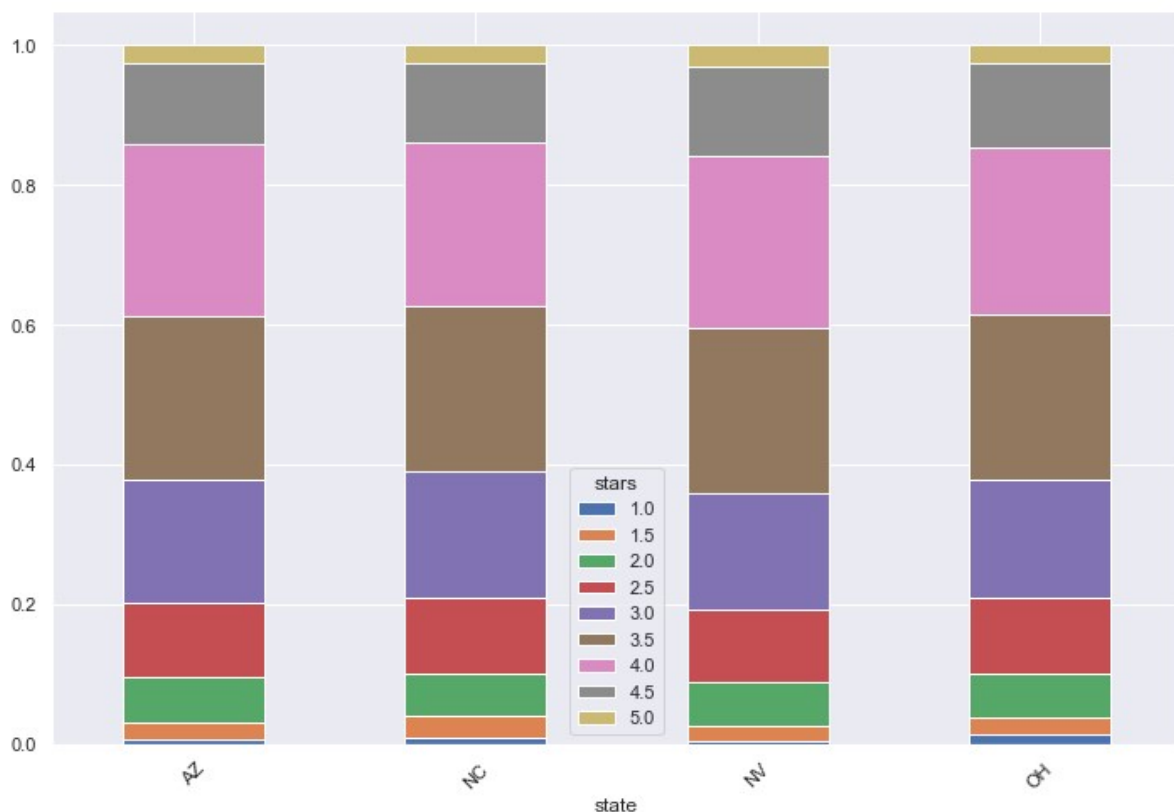
Use the table you created in the previous problem to create an appropriate visualization that helps you to answer the above question.

In [42]: `# Your code here`

`# Your code here`

```
yelp_state_dist = pd.crosstab(index = food_establishments['stars'],
                              columns = food_establishments['state'],
                              normalize = 'columns',
                              margins = False)
yelp_state_dist.T.plot(kind = 'bar', stacked=True, grid = True, rot = 45, figsize =
(12,8))
```

Out[42]: `<matplotlib.axes._subplots.AxesSubplot at 0x1b408090160>`



In [43]: `f'After looking at the normalized and conditional distribution visualization, There is insignificant difference between star distribution between these 4 states.'`

Out[43]: `'After looking at the normalized and conditional distribution visualization, There is insignificant difference between star distribution between these 4 states.'`

### Problem 16: (5 points)

Using the `'food_establishments'` data, calculate the `*median*`, `*mean*`, `*standard deviation*`, `*minimum*`, `*maximum*`, and `*number of observations*` for food establishments with/without a `*Happy Hour*` by using the `'attributes_happyhour'` variable.

```
In [44]: # Your code here
food_establishments.groupby(["attributes_happyhour"]).agg({'stars': ['count', 'min',
'max', 'mean', 'median', 'std']}).sort_index(ascending = False)
```

Out [44]:

	stars					
	count	min	max	mean	median	std
attributes_happyhour						
True	3057	1.0	5.0	3.505561	3.5	0.620838
False	435	1.5	5.0	3.678161	4.0	0.655432

Describe any differences you find for food establishments having a \*Happy Hour\* and those that do not. Do food establishments with a happy hour seem to typically be higher or lower rated than food establishments without a happy hour? Do most food establishments offer a happy hour?

**Written Answer:**

1.

### Problem 17: (5 points)

Let's investigate differences in food establishments with/without a Happy Hour using an appropriate visualization.

First, create a new variable for the `food_establishments` table called `binned_review_count` that bins the `review_count` variable as:

- '[0-10]' = having between 0 and 10 reviews inclusive
- '(10,100]' = having between 10 and 100 reviews
- '(100,1,000]' = having between 100 and 1,000 reviews
- '1,000 +' = more than one thousand reviews.

Create a side-by-side violin plot with `'binned_review_count'` on the y-axis, `'stars'` on the x-axis, and allow the rating distributions to differ for establishments **with and without a Happy Hour** by using the `'split = True'` argument. As always, provide an appropriate title and axes labels.



```
In [45]: df_metadata(food_establishments)
```

```
Out[45]:
```

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
0	business_id	object	27724	0	0.00
1	name	object	27724	0	0.00
2	address	object	27724	293	1.06
3	neighborhood	object	27724	19314	69.67
4	city	object	27724	1	0.00
5	state	object	27724	0	0.00
6	postal_code	object	27724	38	0.14
7	latitude	float64	27724	0	0.00
8	longitude	float64	27724	0	0.00
9	open_on_weekends	bool	27724	0	0.00
10	attributes_happyhour	object	27724	24232	87.40
11	review_count	int64	27724	0	0.00
12	stars	float64	27724	0	0.00
13	categories	object	27724	0	0.00
14	is_open	int64	27724	0	0.00

```
In [46]: # Your code here
bins = [0, 10, 100, 1000, 10000]
food_establishments["binned_review_count"] = pd.cut(food_establishments['review_count'], bins)
food_establishments.head(10)
```

C:\ProgramData\Anaconda3\lib\site-packages\ipykernel\_launcher.py:3: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row\_indexer,col\_indexer] = value instead

See the caveats in the documentation: <http://pandas.pydata.org/pandas-docs/stable/indexing.html#indexing-view-versus-copy>

This is separate from the ipykernel package so we can avoid doing imports until

Out[46]:

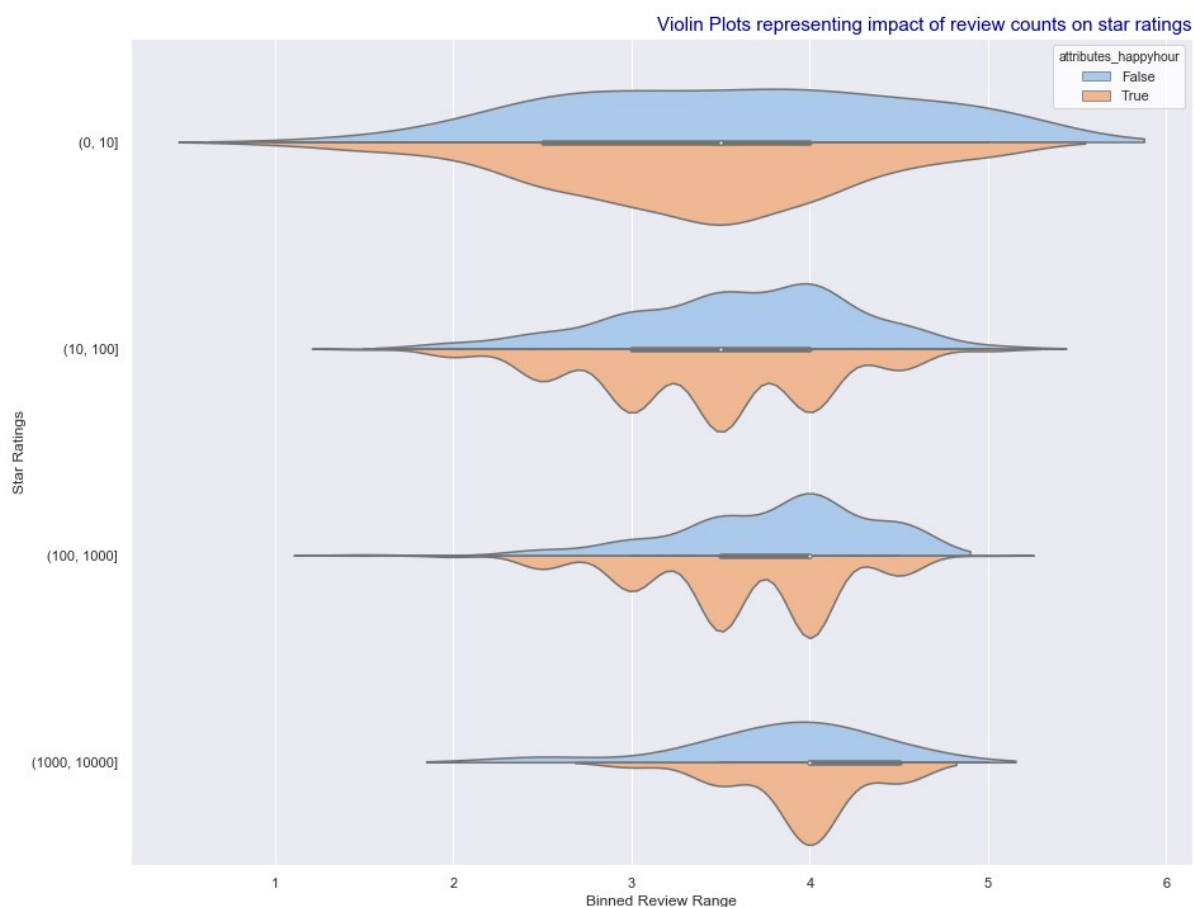
	business_id	name	address	neighborhood	city	state	postal_code	latitude
1	AjEblBw6ZFln7ePHha9PA	CK'S BBQ & Catering	NaN	NaN	Henderson	NV	89002	35.960734
8	8-NRKKPY1UiFXW20WXXiXg	Filiberto's Mexican Food	1440 N. Dysart Ave	NaN	Avondale	AZ	85323	33.448106
12	_c3ixq9jYKxhLUB0czi0ug	Original Hamburger Works	2801 N 15th Ave	NaN	Phoenix	AZ	85007	33.479807
19	vJluDBdu01vCA8y1fwR1OQ	CakesbyToi	3940 Martin Luther King Blvd, Ste 101	NaN	Las Vegas	NV	89106	36.192284
21	gJ5xSt6147gkcZ9Es0WxIA	Rally's Hamburgers	3040 Carnegie Ave	Central	Cleveland	OH	44115	41.499989
22	3ByGQOVgds2YEu6kzl-XEQ	Rib Shop	4131 N 83rd Ave	NaN	Phoenix	AZ	85033	33.495298
24	CeuTRtwsq6w5rztGOyNMPg	Salsitas	7745 W Thomas Rd	NaN	Phoenix	AZ	85033	33.479671
29	6YC6CsXRrmPv_iwfv9onA	Terasas Pizzeria	9525 State Rt 14	NaN	Streetsboro	OH	44241	41.243783
32	kgffcoxT6BQp-gJ-UQ7Czw	Subway	2255 N Rampart Blvd	Summerlin	Las Vegas	NV	89128	36.201794
33	0jtRI7hVMPQHPUVtUy4ITw	Omelet House Summerlin	2227 N Rampart Blvd	Summerlin	Las Vegas	NV	89128	36.201990

```
In [47]: # Answer
fig, ax = plt.subplots(figsize=(15, 12))
sns.set(style = "whitegrid", palette = "pastel", color_codes = True)

sns.violinplot(x = 'stars',
               y = 'binned_review_count',
               data = food_establishments,
               ax = ax,
               split = True,
               hue = 'attributes_happyhour')

ax.set_xlabel('Binned Review Range')
ax.set_ylabel('Star Ratings')
ax.set_title('Violin Plots representing impact of review counts on star ratings', loc='right', color='darkblue', fontsize = 15)
```

Out[47]: Text(1.0, 1.0, 'Violin Plots representing impact of review counts on star ratings')



Describe what you see in the plot.

### Written Answer:

'Happy Hour pulls in more people. And obviously from there its the cascading effect takes over if the food is good driving higher ratings. And whether happy hour or not ratings given are consistent.'

### Problem 18: (5 points)

Suppose you work at Yelp. You have been tasked with a new initiative to create a new award for the highest performing food establishments represented on the Yelp platform. The team at Yelp has determined that any food establishment that has both the highest `stars` rating **\*\*AND\*\*** the largest total number of reviews (`review\_count`) in their city *\*deserves\** the **\*\*Best Local Food Establishment Award\*\***. You have been tasked with writing Python code that can determine which food establishments in a data set deserve this new prestigious award.

For this exercise, create a DataFrame containing all the food establishments in the `food\_establishments` data that deserve **\*\*Best Local Food Establishment Award\*\*** for every city/state combination (to avoid issues with cities that have the same name). The final table that you are to create, called `best\_food\_establishments`, should provide the `name`, `city`, `state`, `review\_count`, and `stars` ratings of all of the food establishments that deserve the award.

Important Notes: There are some slight variations in some city names like: LasVegas, Las Vegas, las vegas. You do not need to worry about cleaning this up before performing your analysis, this is really a proof-of-concept for your team. Also, some cities will have no food establishments that deserve to receive this award as it is possible that the food establishment with the largest number of reviews **does not** have the highest rating in the city.

```
In [48]: # Your code here
best_food_establishments = food_establishments.groupby(['state', 'city', 'name', 'stars', 'binned_review_count' ]).agg({'review_count': 'sum'}).reset_index()
best_food_establishments.sort_values(by = ['state', 'city', 'name', 'stars', 'review_count'], ascending = [True, True, True, False, False])
```

Out[48]:

	state	city	name	stars	binned_review_count	review_count
0	AZ	Ahwatukee	Barro's Pizza	3.0	(10, 100]	85
1	AZ	Ahwatukee	Cupz N' Crepes	4.0	(100, 1000]	283
2	AZ	Ahwatukee	Florencia Pizza Bistro	4.0	(100, 1000]	184
3	AZ	Ahwatukee	McDonald's	1.5	(0, 10]	7
4	AZ	Ahwatukee	My Wine Cellar	4.0	(100, 1000]	202
5	AZ	Anthem	Auntie Anne's	4.5	(0, 10]	7
6	AZ	Anthem	Barro's Pizza	3.5	(10, 100]	69
7	AZ	Anthem	Cafe Affy	3.0	(0, 10]	7
8	AZ	Anthem	Cafe Provence	4.0	(10, 100]	50
9	AZ	Anthem	Haggen Food & Pharmacy	2.0	(0, 10]	7
10	AZ	Anthem	Hungry Howie's Pizza	2.5	(0, 10]	7
11	AZ	Anthem	Jack In the Box	2.5	(0, 10]	7
12	AZ	Anthem	Madelyn's	3.5	(0, 10]	4
13	AZ	Anthem	McDonald's	1.5	(10, 100]	41
14	AZ	Anthem	Native New Yorker	3.0	(0, 10]	4
15	AZ	Anthem	Pinata Nueva	2.5	(0, 10]	3
16	AZ	Anthem	Shanghai Club	3.5	(100, 1000]	105
18	AZ	Anthem	Subway	2.0	(10, 100]	11
17	AZ	Anthem	Subway	1.5	(0, 10]	5
19	AZ	Anthem	The Tennessee Grill	4.0	(100, 1000]	257
20	AZ	Anthem	Tru Burger Co.	3.5	(100, 1000]	173
21	AZ	Avondale	1 Brothers Pizza	4.0	(10, 100]	55
22	AZ	Avondale	5395 West Soul Food Place	4.0	(0, 10]	4
23	AZ	Avondale	99 Pub and Grill	3.5	(10, 100]	44
24	AZ	Avondale	AJK Chinese Cuisine	4.0	(10, 100]	82
25	AZ	Avondale	Aguila's Hidaway	3.5	(10, 100]	12
26	AZ	Avondale	Ahipoki	4.5	(10, 100]	40
27	AZ	Avondale	Ararat Mediterranean Restaurant	4.0	(0, 10]	6
29	AZ	Avondale	Arizona Frybread	3.0	(100, 1000]	106
28	AZ	Avondale	Arizona Frybread	3.0	(0, 10]	3
30	AZ	Avondale	Atlantis Mexican Restaurant	3.0	(0, 10]	8
31	AZ	Avondale	Baja Fresh Mexican Grill	4.0	(0, 10]	9
32	AZ	Avondale	Bamboo Palace Buffet	2.0	(0, 10]	3
33	AZ	Avondale	Bbb Fashion	2.5	(0, 10]	4
34	AZ	Avondale	Big Apple Bagels	4.5	(0, 10]	7
35	AZ	Avondale	Blaze Fast Fire'd Pizza	4.5	(10, 100]	67

	state	city	name	stars	binned_review_count	review_count
36	AZ	Avondale	Brew Coffee and Tea	5.0	(0, 10]	6
37	AZ	Avondale	Buffalo Wings & Rings	2.5	(0, 10]	10
39	AZ	Avondale	Burger King	2.5	(0, 10]	7
38	AZ	Avondale	Burger King	2.0	(0, 10]	9
40	AZ	Avondale	Cafe Rio Mexican Grill	3.0	(100, 1000]	134
41	AZ	Avondale	Cafe Zamora	4.0	(10, 100]	86
42	AZ	Avondale	Café Zupas	3.5	(10, 100]	100
43	AZ	Avondale	Carlos O'Brien's - Avondale	3.0	(100, 1000]	106
44	AZ	Avondale	Carolina's	2.5	(10, 100]	70
45	AZ	Avondale	Carrabba's Italian Grill	4.0	(100, 1000]	142
46	AZ	Avondale	Casa de Plata	3.5	(10, 100]	86
47	AZ	Avondale	Chick-fil-A	4.0	(10, 100]	60
48	AZ	Avondale	China City Super Buffet	2.5	(10, 100]	90
49	AZ	Avondale	Chipotle Mexican Grill	2.5	(10, 100]	73
50	AZ	Avondale	Church's Chicken	2.5	(0, 10]	5
51	AZ	Avondale	Claim Jumper	2.5	(100, 1000]	219
52	AZ	Avondale	Colados Coffee & Crepes	4.5	(100, 1000]	338
53	AZ	Avondale	Cowgirls Bar & Grill	1.5	(0, 10]	9
54	AZ	Avondale	Cowgirls Steakhouse and Saloon	3.0	(10, 100]	18
55	AZ	Avondale	Cristina's Restaurant	4.0	(10, 100]	51
56	AZ	Avondale	Cucina Tagliani	3.0	(0, 10]	3
57	AZ	Avondale	Culver's	4.0	(100, 1000]	110
58	AZ	Avondale	Daddy Duke's	3.5	(10, 100]	19
59	AZ	Avondale	Dairy Queen	2.0	(10, 100]	40
60	AZ	Avondale	Del Taco	2.5	(10, 100]	24
61	AZ	Avondale	Dickey's Barbecue Pit	3.5	(10, 100]	19
63	AZ	Avondale	Domino's Pizza	3.5	(10, 100]	15
62	AZ	Avondale	Domino's Pizza	3.0	(10, 100]	12
64	AZ	Avondale	Don Pancho Mexican Food	4.5	(100, 1000]	256
65	AZ	Avondale	Don Rafa Taqueria	4.0	(0, 10]	6
66	AZ	Avondale	Don Taco	3.5	(10, 100]	45
67	AZ	Avondale	Dragon Garden Express	3.5	(10, 100]	30
68	AZ	Avondale	Ed's Fish & Chips	3.5	(10, 100]	31
69	AZ	Avondale	Eest Asian Bistro	4.0	(100, 1000]	139
70	AZ	Avondale	El Pollo Loco	3.0	(10, 100]	13
71	AZ	Avondale	El Tataki Sushi	3.0	(100, 1000]	133
72	AZ	Avondale	Eribertos Mexican Food	4.0	(10, 100]	34
73	AZ	Avondale	Everybody's Neighborhood Grill	3.5	(10, 100]	45
74	AZ	Avondale	Fiesta Mexicana	4.0	(100, 1000]	392
76	AZ	Avondale	Filiberto's Mexican Food	3.0	(0, 10]	5
75	AZ	Avondale	Filiberto's Mexican Food	2.5	(10, 100]	40

	state	city	name	stars	binned_review_count	review_count
77	AZ	Avondale	Fired Pie	4.0	(10, 100]	56
78	AZ	Avondale	Flavors of Louisiana	4.5	(100, 1000]	668
79	AZ	Avondale	Floriberto's Mexican Food	5.0	(0, 10]	3
80	AZ	Avondale	Four Seasons Buffet	3.0	(0, 10]	6
81	AZ	Avondale	Free Agents Sports Grill	4.0	(10, 100]	11
82	AZ	Avondale	Fritzi's Heart & Soul BBQ	4.0	(10, 100]	11
83	AZ	Avondale	Game Time Sports Grill	3.5	(10, 100]	16
84	AZ	Avondale	Garden Grille & Bar	4.0	(0, 10]	5
85	AZ	Avondale	Greek Gyro Express	4.5	(100, 1000]	181
87	AZ	Avondale	Hungry Howie's Pizza	3.0	(10, 100]	28
86	AZ	Avondale	Hungry Howie's Pizza	1.5	(0, 10]	9
88	AZ	Avondale	IHOP	2.5	(10, 100]	91
89	AZ	Avondale	In-N-Out Burger	4.0	(100, 1000]	148
90	AZ	Avondale	India Garden	4.0	(100, 1000]	255
91	AZ	Avondale	International Bistro	3.0	(0, 10]	4
92	AZ	Avondale	Islands Restaurant	3.5	(100, 1000]	166
93	AZ	Avondale	JT Boba House	3.5	(100, 1000]	202
94	AZ	Avondale	Jack In the Box	2.0	(10, 100]	27
95	AZ	Avondale	Jack in the Box	2.5	(10, 100]	16
96	AZ	Avondale	Jersey Mike's Subs	3.0	(10, 100]	22
97	AZ	Avondale	Jimmy John's	3.0	(10, 100]	61
98	AZ	Avondale	Johnny Rockets	3.0	(10, 100]	20
99	AZ	Avondale	Jr. Mexican Food	3.5	(0, 10]	3
100	AZ	Avondale	KB Smokehouse & BBQ	3.5	(0, 10]	10
101	AZ	Avondale	KFC	1.0	(10, 100]	32
102	AZ	Avondale	KFC / A&W	1.5	(0, 10]	8
103	AZ	Avondale	Kneaders Bakery Cafe	3.5	(100, 1000]	143
104	AZ	Avondale	Kreative Kupcakes	3.5	(0, 10]	8
105	AZ	Avondale	LA Fiesta Market	4.5	(0, 10]	10
106	AZ	Avondale	La Salsita Taco Shop	3.5	(10, 100]	50
107	AZ	Avondale	Laura's Burgers and More	5.0	(10, 100]	89
108	AZ	Avondale	Lighthouse Sports Bar	2.0	(10, 100]	16
109	AZ	Avondale	Little Caesars Pizza	3.0	(10, 100]	18
110	AZ	Avondale	Long John Silvers	1.0	(0, 10]	3
111	AZ	Avondale	Main Event Entertainment	2.5	(100, 1000]	145
112	AZ	Avondale	Mandy's Fish & Chips	4.5	(10, 100]	55
113	AZ	Avondale	Mangiamo's Pizza	4.0	(10, 100]	21
114	AZ	Avondale	Mango Flats	3.0	(0, 10]	9
115	AZ	Avondale	Manny's Mexican Restaurant	2.5	(100, 1000]	127
116	AZ	Avondale	Mariachi's	4.5	(10, 100]	14
117	AZ	Avondale	Mariscos Las Playitas	4.0	(10, 100]	29



	state	city	name	stars	binned_review_count	review_count
119	AZ	Avondale	McDonald's	2.5	(0, 10]	5
118	AZ	Avondale	McDonald's	1.5	(10, 100]	59
120	AZ	Avondale	Mi Cocina	4.5	(10, 100]	56
121	AZ	Avondale	Mi Panaderia	3.5	(0, 10]	8
122	AZ	Avondale	Mi Vegana Madre	4.5	(0, 10]	10
123	AZ	Avondale	My Big Fat Greek Restaurant	3.5	(10, 100]	11
124	AZ	Avondale	NYPD Pizza	4.0	(100, 1000]	186
125	AZ	Avondale	Native Grill & Wings	2.5	(100, 1000]	130
126	AZ	Avondale	New Wok Chinese Food	3.0	(10, 100]	33
127	AZ	Avondale	Ono Hawaiian BBQ	3.5	(100, 1000]	121
128	AZ	Avondale	PT Noodles - Avondale	4.0	(10, 100]	34
129	AZ	Avondale	Pacific Seafood Super Buffet	2.0	(10, 100]	17
130	AZ	Avondale	Palermo's Grill	2.5	(0, 10]	4
132	AZ	Avondale	Palermos Pizza	4.0	(10, 100]	39
131	AZ	Avondale	Palermos Pizza	3.0	(0, 10]	6
133	AZ	Avondale	Panda Express	2.5	(10, 100]	52
134	AZ	Avondale	Panera Bread	2.5	(10, 100]	91
135	AZ	Avondale	Papa Murphy's	3.5	(10, 100]	12
136	AZ	Avondale	Paradise Bakery and Cafe	2.5	(10, 100]	34
137	AZ	Avondale	Pei Wei	3.0	(100, 1000]	116
139	AZ	Avondale	Peter Piper Pizza	2.5	(10, 100]	33
138	AZ	Avondale	Peter Piper Pizza	1.5	(10, 100]	20
140	AZ	Avondale	Pieology Pizzeria	4.0	(100, 1000]	132
141	AZ	Avondale	Pita Kitchen - Avondale	4.5	(100, 1000]	543
143	AZ	Avondale	Pizza Hut	3.5	(0, 10]	6
142	AZ	Avondale	Pizza Hut	1.5	(10, 100]	16
144	AZ	Avondale	Pizza Patron	4.0	(0, 10]	8
145	AZ	Avondale	Planet Smoothie	4.0	(10, 100]	13
146	AZ	Avondale	Potbelly Sandwich Shop	3.5	(10, 100]	27
147	AZ	Avondale	Raising Cane's Chicken Fingers	3.5	(100, 1000]	116
148	AZ	Avondale	Raspados Neza	3.0	(10, 100]	61
149	AZ	Avondale	Raul & Theresa's Original Restaurant	3.5	(100, 1000]	148
150	AZ	Avondale	Raul's Original	3.5	(0, 10]	3
151	AZ	Avondale	Red Dragon Buffet	4.0	(10, 100]	72
152	AZ	Avondale	Red Robin Gourmet Burgers	3.0	(100, 1000]	130
153	AZ	Avondale	Rosati's Pizza and Sports Pub	3.5	(10, 100]	69
154	AZ	Avondale	Rosendos Taco Shop	4.0	(10, 100]	12
155	AZ	Avondale	Rubio's Coastal Grill	4.0	(10, 100]	21
156	AZ	Avondale	Ruby Tuesday	3.0	(100, 1000]	133
157	AZ	Avondale	Rumbi Island Grill	4.0	(10, 100]	40
158	AZ	Avondale	Screwballs Pizza & Spirits	3.5	(0, 10]	10

	state	city	name	stars	binned_review_count	review_count
159	AZ	Avondale	Senor Taco	3.0	(0, 10]	4
160	AZ	Avondale	Smashburger	3.5	(100, 1000]	224
162	AZ	Avondale	Sonic Drive-In	2.5	(10, 100]	19
161	AZ	Avondale	Sonic Drive-In	2.0	(10, 100]	16
163	AZ	Avondale	Starlight Cuisine	4.5	(10, 100]	16
168	AZ	Avondale	Subway	3.5	(0, 10]	6
167	AZ	Avondale	Subway	3.0	(0, 10]	4
166	AZ	Avondale	Subway	2.5	(10, 100]	11
165	AZ	Avondale	Subway	2.5	(0, 10]	7
164	AZ	Avondale	Subway	1.5	(0, 10]	5
169	AZ	Avondale	Sunrise Donuts	4.5	(10, 100]	25
170	AZ	Avondale	TJ's Homestyle Restaurant	3.5	(100, 1000]	290
173	AZ	Avondale	Taco Bell	3.0	(0, 10]	8
172	AZ	Avondale	Taco Bell	2.5	(0, 10]	14
171	AZ	Avondale	Taco Bell	2.0	(10, 100]	14
174	AZ	Avondale	Taqueria La Jacky	4.0	(10, 100]	19
175	AZ	Avondale	Tastings Wine Bar and Bistro	2.0	(0, 10]	5
176	AZ	Avondale	Tep Grill To Go	4.5	(0, 10]	5
177	AZ	Avondale	Thai Gourmet	4.5	(100, 1000]	227
178	AZ	Avondale	Thai Orchid Garden Restaurant	4.0	(100, 1000]	190
179	AZ	Avondale	The AZ FRY Guy	4.5	(100, 1000]	173
180	AZ	Avondale	The Habit Burger Grill	3.0	(10, 100]	83
181	AZ	Avondale	Theresa's Hacienda	3.0	(0, 10]	4
182	AZ	Avondale	Tokyo Joe's	3.5	(10, 100]	84
183	AZ	Avondale	Tony's Cafe	4.0	(10, 100]	51
184	AZ	Avondale	Tortas Paquime	4.0	(100, 1000]	133
185	AZ	Avondale	Tortas Y Raspados La Cascada	4.5	(10, 100]	46
186	AZ	Avondale	Ubaldo's Taco Shop	4.5	(0, 10]	6
187	AZ	Avondale	Village Inn	3.0	(10, 100]	60
188	AZ	Avondale	WaBa Grill	3.5	(10, 100]	71
189	AZ	Avondale	Walt's BBQ	4.0	(0, 10]	4
190	AZ	Avondale	We Olive & Wine Bar	4.5	(10, 100]	59
191	AZ	Avondale	Wendy's	2.5	(10, 100]	24
192	AZ	Avondale	Whataburger	3.5	(10, 100]	39
193	AZ	Avondale	Yogis Grill	3.0	(10, 100]	84
194	AZ	Avondale	Yogurtland	4.0	(10, 100]	59
195	AZ	Avondale	Zaipi's Raspados & More	4.0	(10, 100]	35
196	AZ	Avondale	Zeta's Grill	4.5	(100, 1000]	262
197	AZ	Buckeye	Argentos Pizza	4.5	(100, 1000]	107
198	AZ	Buckeye	Booty's Wings Burgers & Beer	3.5	(100, 1000]	111
199	AZ	Buckeye	Burger King	2.0	(10, 100]	17

	state	city	name	stars	binned_review_count	review_count
200	AZ	Buckeye	Cafe 25:35	4.5	(100, 1000]	146
201	AZ	Buckeye	Carl's Jr	2.0	(10, 100]	27
202	AZ	Buckeye	Chipotle Mexican Grill	3.0	(10, 100]	64
203	AZ	Buckeye	Ciao Grazie Pizzeria Winebar	4.0	(100, 1000]	127
204	AZ	Buckeye	Conde's Mexican Food	3.0	(10, 100]	65
205	AZ	Buckeye	Corner Store	3.5	(10, 100]	14
206	AZ	Buckeye	Cracker Barrel Old Country Store	3.5	(100, 1000]	169
207	AZ	Buckeye	Culver's	4.0	(10, 100]	46
209	AZ	Buckeye	Denny's	3.0	(10, 100]	26
208	AZ	Buckeye	Denny's	2.0	(0, 10]	6
210	AZ	Buckeye	Domino's Pizza	3.0	(0, 10]	10
211	AZ	Buckeye	El Duende Hot Dogs	4.0	(10, 100]	12
212	AZ	Buckeye	El Pollo Loco	3.0	(10, 100]	24
213	AZ	Buckeye	Federico's Mexican Food	2.5	(10, 100]	47
214	AZ	Buckeye	Filiberto's Mexican Food	3.0	(10, 100]	76
215	AZ	Buckeye	Firehouse Subs	3.5	(10, 100]	69
216	AZ	Buckeye	Grandma Ruth's	3.5	(0, 10]	3
217	AZ	Buckeye	Ground Control At Verrado	2.0	(10, 100]	27
218	AZ	Buckeye	Halftime Sports Bar & Grill	2.0	(10, 100]	15
219	AZ	Buckeye	Harris' Smokehouse BBQ	4.5	(10, 100]	19
220	AZ	Buckeye	Hey Papirrin Mariscos Y Tacos Al Mesquite	4.0	(10, 100]	13
221	AZ	Buckeye	Hula Hawaiian Barbeque	3.0	(0, 10]	7
222	AZ	Buckeye	Indigo Grille	2.5	(10, 100]	27
223	AZ	Buckeye	Jack in the Box	2.0	(0, 10]	9
224	AZ	Buckeye	Jacky's Mexican Food	4.5	(10, 100]	68
225	AZ	Buckeye	Jimmy John's Sandwiches	5.0	(0, 10]	4
226	AZ	Buckeye	Julioberto's	3.0	(0, 10]	5
227	AZ	Buckeye	KFC	1.5	(10, 100]	25
228	AZ	Buckeye	La Fiesta	4.5	(10, 100]	33
229	AZ	Buckeye	La Placita Cafe	3.0	(10, 100]	43
230	AZ	Buckeye	Little Caesars Pizza	1.5	(0, 10]	10
232	AZ	Buckeye	McDonald's	2.0	(10, 100]	32
231	AZ	Buckeye	McDonald's	2.0	(0, 10]	8
233	AZ	Buckeye	Memphis Best BBQ	4.0	(10, 100]	19
234	AZ	Buckeye	Mikey's Restaraunt	4.0	(0, 10]	4
235	AZ	Buckeye	Millstone Cafe	4.0	(10, 100]	29
236	AZ	Buckeye	Native Grill & Wings	2.5	(10, 100]	90
238	AZ	Buckeye	Palermos Pizza	4.0	(0, 10]	5
237	AZ	Buckeye	Palermos Pizza	3.5	(10, 100]	42
239	AZ	Buckeye	Panda Express	2.0	(10, 100]	59

	state	city	name	stars	binned_review_count	review_count
240	AZ	Buckeye	Papa John's Pizza	3.0	(10, 100]	18
241	AZ	Buckeye	Peter Piper Pizza	3.0	(10, 100]	33
243	AZ	Buckeye	Pizza Factory	3.0	(10, 100]	22
242	AZ	Buckeye	Pizza Factory	2.5	(10, 100]	34
245	AZ	Buckeye	Pizza Hut	3.0	(10, 100]	13
244	AZ	Buckeye	Pizza Hut	1.5	(0, 10]	9
246	AZ	Buckeye	Ramiro's Mexican Food	4.0	(0, 10]	10
247	AZ	Buckeye	Ranchero's Rodeo Restaurant	4.0	(10, 100]	16
248	AZ	Buckeye	Salsitas	4.0	(10, 100]	20
249	AZ	Buckeye	Salsitas Mexican Food	4.5	(0, 10]	4
...	...	...	...	...	...	...
24975	OH	Westlake	Kabob Place	4.0	(10, 100]	41
24976	OH	Westlake	Karl's Corned Beef & More	4.0	(0, 10]	3
24977	OH	Westlake	La Campagna	4.0	(10, 100]	40
24978	OH	Westlake	Legacy Cafe And Lounge	5.0	(0, 10]	8
24979	OH	Westlake	Lehman's Deli	4.0	(10, 100]	44
24980	OH	Westlake	Liquid Planet	3.5	(10, 100]	48
24981	OH	Westlake	Little Budapest	3.5	(10, 100]	13
24982	OH	Westlake	Lobster Bros Seafood	4.0	(10, 100]	18
24983	OH	Westlake	Loco Leprechaun	3.0	(10, 100]	39
24984	OH	Westlake	Luca West	4.0	(10, 100]	21
24985	OH	Westlake	M Bistro	2.0	(0, 10]	3
24986	OH	Westlake	Mahle's Restaurant and Lounge	4.0	(10, 100]	30
24987	OH	Westlake	Manero's Italian Restaurant	3.0	(10, 100]	13
24988	OH	Westlake	Max & Erma's	2.5	(10, 100]	24
24990	OH	Westlake	McDonald's	2.0	(10, 100]	16
24989	OH	Westlake	McDonald's	1.5	(10, 100]	13
24991	OH	Westlake	Mezza Mediterranean Cuisine	4.0	(10, 100]	50
24992	OH	Westlake	Miami Nights Grill, Bar, & Lounge	1.5	(10, 100]	19
24993	OH	Westlake	Mikey's Pizza	4.0	(0, 10]	7
24994	OH	Westlake	Mitchell's Tavern	3.5	(10, 100]	17
24995	OH	Westlake	Moosehead Saloon	3.5	(10, 100]	68
24996	OH	Westlake	Mr. Hero	5.0	(0, 10]	3
24997	OH	Westlake	Nathans	3.0	(0, 10]	4
24998	OH	Westlake	No. 1 Chinese Restaurant	3.0	(10, 100]	16
24999	OH	Westlake	Noodlecat	2.0	(100, 1000]	112
25000	OH	Westlake	Outback Steakhouse	3.0	(10, 100]	45
25001	OH	Westlake	Panera Bread	2.5	(10, 100]	18
25003	OH	Westlake	Panini's Bar & Grill	3.0	(10, 100]	24
25002	OH	Westlake	Panini's Bar & Grill	2.5	(10, 100]	21
25004	OH	Westlake	Papa John's Pizza	3.0	(0, 10]	4

	state	city	name	stars	binned_review_count	review_count
25005	OH	Westlake	Pasta Co-Op	4.5	(10, 100]	39
25006	OH	Westlake	Pizza by Robert	3.5	(10, 100]	71
25007	OH	Westlake	Rockwest Music And Grub Pub	4.0	(0, 10]	3
25008	OH	Westlake	Romeo's Pizza	3.0	(0, 10]	8
25009	OH	Westlake	Rosewood Grill	3.0	(10, 100]	77
25010	OH	Westlake	SB Eightyone	3.0	(10, 100]	32
25011	OH	Westlake	Sangria y Tapas Bar & Restaurant	4.5	(100, 1000]	146
25012	OH	Westlake	Savannah Bar & Grill	3.5	(10, 100]	12
25013	OH	Westlake	Siam Orchid	4.0	(0, 10]	10
25014	OH	Westlake	Stella Mia Ristorante	4.0	(10, 100]	71
25015	OH	Westlake	Stonehouse Grill	3.5	(10, 100]	39
25018	OH	Westlake	Subway	4.5	(0, 10]	3
25017	OH	Westlake	Subway	2.5	(0, 10]	3
25016	OH	Westlake	Subway	1.0	(0, 10]	7
25019	OH	Westlake	Sweet Basil Neapolitan Style Pizzeria	4.0	(100, 1000]	116
25020	OH	Westlake	Sí Señor Mexican Restaurant	3.5	(10, 100]	91
25021	OH	Westlake	TGI Fridays	2.5	(10, 100]	33
25022	OH	Westlake	Taco Bell	3.5	(10, 100]	17
25023	OH	Westlake	Texas de Brazil	3.5	(10, 100]	88
25024	OH	Westlake	Thai Spice	4.0	(100, 1000]	161
25025	OH	Westlake	The Cheesecake Factory	3.0	(100, 1000]	147
25026	OH	Westlake	The Fountain Cafe & Grille	4.5	(10, 100]	52
25027	OH	Westlake	The Rusty Barrel	3.5	(10, 100]	63
25028	OH	Westlake	Time Warp Bar	4.0	(10, 100]	16
25029	OH	Westlake	Vicki's Diner & Deli	2.5	(0, 10]	9
25030	OH	Westlake	Vieng's Asian Bistro	3.0	(100, 1000]	111
25031	OH	Westlake	Viva Fernando	4.0	(10, 100]	11
25032	OH	Westlake	Wendy's	2.5	(0, 10]	7
25033	OH	Westlake	Whistlestop Restaurant	3.0	(0, 10]	8
25034	OH	Westlake	White Oaks	3.5	(100, 1000]	110
25035	OH	Westlake	Yard House	4.0	(100, 1000]	264
25036	OH	Westlake	Zoup!	3.5	(10, 100]	22
25037	OH	Westlake	the tavern of westlake	2.0	(10, 100]	15
25038	OH	Wickliffe	Bakers Square	2.0	(0, 10]	3
25039	OH	Wickliffe	Burger Nuts	3.5	(0, 10]	4
25040	OH	Wickliffe	Casa Di Vino	4.5	(0, 10]	7
25041	OH	Wickliffe	Dino's III	3.5	(10, 100]	40
25042	OH	Wickliffe	Eastside Saggy's	3.5	(0, 10]	3
25043	OH	Wickliffe	Giuseppe's Pizza & Subs	4.5	(10, 100]	33
25044	OH	Wickliffe	Heart 'n Soul Restaurant & Baked Goods	4.5	(0, 10]	6

	state	city	name	stars	binned_review_count	review_count
25045	OH	Wickliffe	Kate's Bar & Grill	4.5	(0, 10]	3
25046	OH	Wickliffe	Kickstart Grille	3.0	(0, 10]	3
25047	OH	Wickliffe	Lino's	3.5	(0, 10]	10
25048	OH	Wickliffe	Mario's Tap House	2.5	(0, 10]	8
25049	OH	Wickliffe	Normandy Catering	4.5	(0, 10]	3
25050	OH	Wickliffe	Papa Joe's Submarines	4.5	(0, 10]	10
25051	OH	Wickliffe	Petti's Pizza & Restaurant	3.5	(10, 100]	14
25052	OH	Wickliffe	Pizza Hut	2.0	(0, 10]	4
25053	OH	Wickliffe	The Greek House Grille	4.0	(10, 100]	45
25054	OH	Wickliffe	Willowick Restaurant & Lounge	4.0	(0, 10]	4
25055	OH	Willoughby	Al Dente Pizzeria	1.5	(0, 10]	3
25056	OH	Willoughby	Applebee's Grill + Bar	2.5	(10, 100]	24
25057	OH	Willoughby	Arabica	3.5	(10, 100]	37
25058	OH	Willoughby	Arby's	2.5	(0, 10]	3
25059	OH	Willoughby	BRIM Kitchen + Brewery	3.5	(100, 1000]	122
25060	OH	Willoughby	Ballantine	3.5	(10, 100]	92
25061	OH	Willoughby	Barrio	4.0	(10, 100]	38
25062	OH	Willoughby	Beal's Pickles 'n' Pints	4.0	(10, 100]	40
25063	OH	Willoughby	Best Pizza & Sandwiches	4.0	(0, 10]	6
25064	OH	Willoughby	Big Cheese Pizza	4.0	(0, 10]	8
25065	OH	Willoughby	Bob Evans	2.0	(10, 100]	27
25066	OH	Willoughby	Bottega Bistro	5.0	(0, 10]	4
25067	OH	Willoughby	Bruegger's Bagels	3.5	(0, 10]	4
25068	OH	Willoughby	Buffalo Wild Wings	3.5	(10, 100]	29
25069	OH	Willoughby	Bumpers Bar & Grill	3.5	(10, 100]	24
25071	OH	Willoughby	Burger King	2.0	(0, 10]	3
25070	OH	Willoughby	Burger King	1.0	(0, 10]	8
25072	OH	Willoughby	Burger Nuts	3.0	(10, 100]	24
25073	OH	Willoughby	Burgers Beer & Breakfast	2.0	(0, 10]	5
25074	OH	Willoughby	Burgers-N-Beer	3.0	(10, 100]	50
25075	OH	Willoughby	CJ's Cafe	4.0	(0, 10]	6
25076	OH	Willoughby	Cafe Europa and Bistro	3.5	(10, 100]	36
25077	OH	Willoughby	Cannon Deli	3.5	(0, 10]	9
25078	OH	Willoughby	Capps Pizza	3.0	(0, 10]	4
25079	OH	Willoughby	Charlotte's Ice Cream	4.0	(0, 10]	3
25080	OH	Willoughby	Chick-fil-A	4.0	(10, 100]	17
25081	OH	Willoughby	Chipotle Mexican Grill	1.5	(10, 100]	62
25082	OH	Willoughby	Coach House	2.0	(0, 10]	4
25083	OH	Willoughby	Cocos Locos	4.5	(10, 100]	78
25084	OH	Willoughby	Courtyard Cleveland Willoughby	3.0	(10, 100]	12
25085	OH	Willoughby	Cracker Barrel Old Country Store	3.0	(10, 100]	25

	state	city	name	stars	binned_review_count	review_count
25086	OH	Willoughby	Craggy Bogland's	4.0	(10, 100]	24
25087	OH	Willoughby	Crepes In the City	4.5	(10, 100]	82
25088	OH	Willoughby	Dairy Queen	3.0	(10, 100]	13
25089	OH	Willoughby	Damons Grill	2.0	(0, 10]	3
25090	OH	Willoughby	Dave's Cosmic Subs	4.0	(0, 10]	3
25091	OH	Willoughby	Denny's	3.0	(10, 100]	20
25092	OH	Willoughby	Dino's Restaurant & Banquet Center	3.0	(0, 10]	8
25093	OH	Willoughby	Domino's Pizza	3.0	(0, 10]	10
25094	OH	Willoughby	Don Tequila Mexican Restaurant	2.5	(0, 10]	9
25095	OH	Willoughby	Eat'n Park	2.5	(10, 100]	18
25096	OH	Willoughby	Erie Street Station	4.5	(0, 10]	3
25097	OH	Willoughby	Firehouse Subs	3.5	(0, 10]	3
25098	OH	Willoughby	Frank & Tony's	2.5	(10, 100]	22
25099	OH	Willoughby	Freshly's	4.0	(10, 100]	34
25100	OH	Willoughby	Gavi's Restaurant	4.0	(0, 10]	5
25101	OH	Willoughby	Hardee's	4.0	(0, 10]	4
25102	OH	Willoughby	Helen's Sunrise Cafe	3.5	(0, 10]	3
25103	OH	Willoughby	HoneyBaked Ham	4.0	(0, 10]	5
25104	OH	Willoughby	Hong To Chinese Restaurant	3.5	(10, 100]	23
25105	OH	Willoughby	Hook & Hoof	4.5	(10, 100]	64
25106	OH	Willoughby	Hot Diggity Dogs	3.0	(10, 100]	11
25108	OH	Willoughby	IHOP	2.5	(10, 100]	20
25107	OH	Willoughby	IHOP	2.0	(0, 10]	5
25109	OH	Willoughby	JT's Diner	4.5	(10, 100]	48
25110	OH	Willoughby	Jersey Mike's Subs	4.5	(10, 100]	26
25111	OH	Willoughby	Jet's Pizza	4.0	(10, 100]	14
25112	OH	Willoughby	KFC	2.5	(0, 10]	3
25113	OH	Willoughby	Kleifelds Restaurant	4.0	(10, 100]	50
25114	OH	Willoughby	Lost Nation Sports Park	3.5	(0, 10]	9
25115	OH	Willoughby	Lure Bistro	3.5	(10, 100]	98
25116	OH	Willoughby	Manhattan Deli Bar & Grille	3.5	(10, 100]	59
25117	OH	Willoughby	Marco's Pizza- Willoughby	3.5	(0, 10]	5
25118	OH	Willoughby	McDonald's	1.0	(0, 10]	4
25119	OH	Willoughby	Molta Bella Pizza	3.5	(0, 10]	8
25120	OH	Willoughby	Mr. Chicken	4.5	(0, 10]	4
25121	OH	Willoughby	Mullarkey's Irish Pub	3.0	(0, 10]	9
25122	OH	Willoughby	Nickleby's Roundbar	4.0	(10, 100]	41
25123	OH	Willoughby	Olivor Twist	3.5	(10, 100]	60
25124	OH	Willoughby	Panda Chinese Restaurant	3.5	(10, 100]	17
25125	OH	Willoughby	Panera Bread	2.0	(10, 100]	14
25126	OH	Willoughby	Panini's Bar and Grill	3.5	(10, 100]	40

	state	city	name	stars	binned_review_count	review_count
25127	OH	Willoughby	Papa John's Pizza	3.0	(0, 10]	4
25128	OH	Willoughby	Peking Chinese	3.0	(10, 100]	22
25129	OH	Willoughby	Peppino's Pizza	3.5	(0, 10]	3
25130	OH	Willoughby	Pizza Booyah	4.5	(10, 100]	13
25131	OH	Willoughby	Pizza Hut	3.5	(10, 100]	11
25132	OH	Willoughby	Pranzo!	4.0	(10, 100]	40
25133	OH	Willoughby	Pulp Juice and Smoothie Bar	4.5	(0, 10]	6
25134	OH	Willoughby	Red Robin Gourmet Burgers	3.0	(10, 100]	56
25135	OH	Willoughby	Schlotzsky's	3.5	(10, 100]	18
25136	OH	Willoughby	Shogun Japanese Steak House	4.0	(10, 100]	25
25137	OH	Willoughby	Sol	3.5	(100, 1000]	104
25138	OH	Willoughby	Spirits In Willoughby	4.0	(0, 10]	9
25139	OH	Willoughby	Steak 'n Shake	2.5	(10, 100]	41
25140	OH	Willoughby	Steak on a Stone	2.5	(10, 100]	19
25141	OH	Willoughby	Subway	3.5	(0, 10]	8
25142	OH	Willoughby	Sugar Bowl	4.5	(10, 100]	15
25143	OH	Willoughby	Taco Bell	1.5	(10, 100]	19
25144	OH	Willoughby	Taco Local	3.5	(100, 1000]	108
25145	OH	Willoughby	Texas Roadhouse	3.5	(10, 100]	76
25146	OH	Willoughby	The Brickhouse Tavern	4.0	(0, 10]	6
25147	OH	Willoughby	The Morehouse Willoughby	3.5	(10, 100]	74
25148	OH	Willoughby	The Pierogi Palace	4.5	(0, 10]	8
25149	OH	Willoughby	The Wild Goose	4.0	(10, 100]	89
25150	OH	Willoughby	Waffle House	3.0	(10, 100]	19
25151	OH	Willoughby	Wendy's	4.0	(0, 10]	7
25152	OH	Willoughby	What About Bob's Subs	3.0	(10, 100]	20
25153	OH	Willoughby	Willoughby Brewing Co.	3.5	(100, 1000]	190
25154	OH	Willoughby	Young's Sushi	4.0	(10, 100]	73
25155	OH	Willoughby	Yukiho Japanese Restaurant	3.5	(0, 10]	9
25156	OH	Willoughby	Zoup!	4.0	(0, 10]	8
25157	OH	Willoughby Hills	Becky's Bistro	3.5	(10, 100]	23
25158	OH	Willoughby Hills	Brindaliers Bar and Grill	4.0	(10, 100]	16
25159	OH	Willoughby Hills	Dynamic Duo Beverage & Deli	4.5	(10, 100]	12
25160	OH	Willoughby Hills	Firehouse Grille & Pub	3.5	(10, 100]	42
25161	OH	Willoughby Hills	Golden Mountain Restaurant	3.5	(10, 100]	20
25162	OH	Willoughby Hills	Local Tavern	4.0	(10, 100]	76
25163	OH	Willoughby Hills	Mario Fazio's Italian Restaurant	4.5	(10, 100]	95
25164	OH	Willoughby Hills	McDonald's	2.0	(0, 10]	4
25165	OH	Willoughby Hills	Mr Wonderful's Chicken & Waffles	3.5	(0, 10]	10
25166	OH	Willoughby Hills	Pub 91	3.5	(0, 10]	5
25167	OH	Willoughby Hills	Spectators Sports and Grill	3.5	(0, 10]	4



	state	city	name	stars	binned_review_count	review_count
25168	OH	Willoughby Hills	The Lobster Pot	3.5	(10, 100]	50
25169	OH	Willoughby Hills	The Pub on Six	4.0	(0, 10]	3
25170	OH	Willoughby Hills	The Wright Place	3.0	(10, 100]	23
25171	OH	Willoughby Hills	Tony's Pizza & More	3.5	(0, 10]	10
25172	OH	Willowick	Amore Ristorante & Pizzeria	4.0	(10, 100]	46
25173	OH	Willowick	Anthony's Family Restaurant	4.0	(10, 100]	34
25174	OH	Willowick	Arby's	4.0	(0, 10]	4
25175	OH	Willowick	Burger King	3.5	(0, 10]	3
25176	OH	Willowick	Burgers 2 Beer	4.0	(0, 10]	8
25177	OH	Willowick	Cala's Pizzeria	3.5	(10, 100]	23
25178	OH	Willowick	Chin's Pagoda Chinese & American Restaurant	3.0	(10, 100]	18
25179	OH	Willowick	China Mountain II	3.5	(0, 10]	8
25180	OH	Willowick	Christine's	4.0	(0, 10]	3
25181	OH	Willowick	Cleveland Burger Company	3.5	(10, 100]	20
25182	OH	Willowick	Cleveland Pizza Co	3.5	(10, 100]	41
25183	OH	Willowick	Hundred Flowers	3.0	(10, 100]	12
25184	OH	Willowick	Imperial Super Buffet	3.5	(0, 10]	9
25185	OH	Willowick	KFC	2.5	(0, 10]	3
25186	OH	Willowick	Li Garden Restaurant	4.0	(10, 100]	16
25187	OH	Willowick	Little Caesar's Pizza	4.0	(0, 10]	6
25188	OH	Willowick	Mama Primozz Pizza	3.5	(10, 100]	14
25189	OH	Willowick	McDonald's	2.0	(0, 10]	4
25190	OH	Willowick	Milano Bar and Grill	1.0	(0, 10]	3
25191	OH	Willowick	Mr Hero	3.5	(0, 10]	7
25192	OH	Willowick	Papa Joe's Subs & Pasta	3.5	(0, 10]	8
25193	OH	Willowick	Peties Family Restaurant	4.0	(10, 100]	52
25194	OH	Willowick	Revolution Pizza	4.5	(10, 100]	33
25195	OH	Willowick	Sports Fanatics	3.5	(10, 100]	11
25196	OH	Willowick	The Cabin of Willowick	4.0	(10, 100]	49
25197	OH	Willowick	The Garage Grill & Bar	1.5	(0, 10]	3
25198	OH	Willowick	Tuscan Italian Restaurant and Pizzeria	5.0	(0, 10]	6
25199	OH	Willowick	Wendy's	1.5	(0, 10]	6
25200	OH	Woodmere	B Spot	3.5	(100, 1000]	471
25201	OH	Woodmere	Bowl Of Pho	4.0	(100, 1000]	179
25202	OH	Woodmere	Bravo! Cucina Italiana	3.0	(10, 100]	77
25203	OH	Woodmere	Chipotle Mexican Grill	2.5	(0, 10]	10
25204	OH	Woodmere	Davis Bakery & Delicatessen	4.0	(10, 100]	42
25205	OH	Woodmere	DeGaetano's Village Square Pizza	3.5	(10, 100]	34
25206	OH	Woodmere	Firehouse Subs	4.0	(10, 100]	11
25207	OH	Woodmere	Fleming's Prime Steakhouse - Woodmere	3.5	(10, 100]	83

	state	city	name	stars	binned_review_count	review_count
25208	OH	Woodmere	McDonald's	2.0	(10, 100]	33

## Problem 19: (10 points)

Subsequent questions involve the `data-sets/yelp\_academic\_dataset\_review.csv` data. Let's investigate the relationship between the data for businesses remaining in `business\_data` (we subset the data in a previous problem, you can use it as is) and the `data-sets/yelp\_academic\_dataset\_review.csv` data. One thing that would interesting to know is, does it appear that we have all the reviews for each business? For example: if we see a business in `business\_data` has 14 reviews, does the review table contain all 14 of those reviews?

To determine whether this is the case:

- Import the `data-sets/yelp_academic_dataset_review.csv` data.
- Subset the reviews data to only contain records for businesses in the `business_data` table.
- Use `groupby()` to get the counts of reviews for every unique business (by `business_id`) in the reviews data.
- Perform an appropriate join to the `business_data` table to create a DataFrame containing three columns:
  1. `business_id`
  2. `number_reviews` - the number of reviews for that particular business you found in the review table,
  3. `review_count` - the number of reviews listed in the `food_establishments` table
- Create a new column `abs_diff` containing the absolute value of the difference in the number of reviews for each business in `business_data` and number of reviews from the reviews table.
- Create a plot that helps us see the extent of any disparities between the number of reviews in the review data and the number of reviews stated in the `business_id` table.
- Use the `describe()` method to numerically describe the extent of any disparities between the number of reviews in the `review_data` and the number of reviews stated in the `business_id` table in the `review_count` field. </span>

```
In [49]: # Import the review data

review_data = pd.read_csv(fpath + '/data-sets/Final/yelp_academic_dataset_review.csv', parse_dates = True)
```

```
In [50]: #Filtering out bad records with bad date values

f190 = review_data.date.str.len() == 10
review_data = review_data[f190]
```

```
In [51]: # Changig the required data types

review_data['date'] = pd.to_datetime(review_data['date'])
#review_data['funny'] = review_data['funny'].astype('int')
#review_data['useful'] = review_data['useful'].astype('int')
```

```
In [52]: #Creating additional date derived variables

review_data["review_date"] = review_data["date"]
review_data["review_weekday_name"] = review_data["date"].dt.weekday_name
review_data["review_month_name"] = review_data["date"].dt.month_name()
review_data["review_year"] = review_data["date"].dt.year
review_data["rec_count"] = 1
```

```
In [53]: #Re-ordering all variables in review data
```

```
review_data = review_data[['business_id','review_id','user_id','review_date','review_weekday_name','review_month_name','review_year','cool','funny','useful','stars','text','rec_count']]
```

```
In [54]: review_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 5996996 entries, 0 to 5996997
Data columns (total 13 columns):
business_id      object
review_id        object
user_id          object
review_date      datetime64[ns]
review_weekday_name  object
review_month_name  object
review_year      int64
cool             int64
funny            float64
useful           float64
stars            float64
text             object
rec_count        int64
dtypes: datetime64[ns](1), float64(3), int64(3), object(6)
memory usage: 640.5+ MB
```

```
In [55]: review_cnt = review_data.groupby('business_id').agg({'stars':'count'})
review_cnt = review_cnt.reset_index()
```

```
rename_dict = {'stars':'number_reviews'}
review_cnt.rename(columns = rename_dict, inplace = True)
```

```
In [56]: df19 = business_data[['business_id', 'review_count']].merge(review_cnt, how = 'inner', on = 'business_id')
df19['abs_diff'] = abs(df19.review_count - df19.number_reviews)
df19[df19.abs_diff > 0].sort_values(by = 'abs_diff', ascending = False)
```

Out [56]:

	business_id	review_count	number_reviews	abs_diff
93781	kVbRrRpjrwn6v8cj49g1-Q	61	18	43
16032	e2yH2Fcelu_bXBdTixYURA	73	54	19
45630	iK6JSnglDcToad8SBI04Fg	45	28	17
10027	t_RIEKVtzYRG9LcMhVnPPg	39	24	15
53136	dAsnC9lnN3ql_niiA6s8Tw	38	25	13
46630	l3joBBpkq0ib11dKUpKMAw	495	504	9
32860	MhtNIpw9KRA-6rn1jnMAzg	37	28	9
112326	9K9hjlIFH2yANsG7dgliu3g	15	7	8
53001	GXMHepGKq110ceePNE5zDg	9	1	8
12665	x_qKFuYPAAO28E7tQGxZaQ	42	35	7
24290	k28a4W7MX1x0rMXNu34x_A	22	15	7
96567	9zvglUorc3YOpN3SyJQKZw	39	32	7
112981	IWN2heYitkg-D4UdqfxcMA	1883	1889	6
109313	RSOinkOUpxm0mGw1IW4Xw	427	433	6
149612	RESDUcs7fliihp38-d6_6g	7866	7861	5
123822	r7fY9a3MuDemdGRKcHuG5w	162	167	5
56310	O7uA5Rlo4vIVoh7KthEEXg	405	400	5
85419	1JhZg69WZGD3yB3Mq_hH7Q	11	6	5
25470	JDZ6_yycNQFTpUZzLIKHUg	1941	1936	5
139507	W2D2eDrP9hGXWYli-4QJdg	51	55	4
46152	qj4KHGXgwyutHpvWRLI87g	5	1	4
60234	wcLX8aToZJF4AR-qkpl2Ag	505	509	4
95634	A4NuAm6le1aYOtFQc_rb0Q	162	166	4
13546	xm-LPu0bPI5cZ2PYKS9zDQ	115	111	4
57224	3l54GTr8-E3XPblxnF_sAA	1958	1955	3
109895	ByFMv3p5X1aNeZhU61rDcA	1869	1872	3
76568	48vnBJK0B95JpO0_OMrTQw	329	332	3
129454	9zqrKGYRdt1_IZZT5FWf2g	54	51	3
116454	FaHADZARwnY4yvlvpnsfGA	3481	3484	3
57670	6s2ja_EFlsu0Pa2qFe4Jeg	101	98	3
78068	U7KyjkjJzrHx4vYx7rcNeA	6	9	3
53840	TTFbaLplwrjFx7YIL2pbJA	440	437	3
146629	Vm9JL0HBKPIvBEk47IW_Xw	9	12	3
96811	k9LOFnY_Dn0ctUU0UYBNdA	160	157	3
126105	hU-l172AdpBahJqP-GTSbA	22	25	3
87075	DYAorbxOyubUB_wtQRCdug	802	805	3
116033	XXW_OFaYQkkGOGniujZFHg	3048	3045	3

	business_id	review_count	number_reviews	abs_diff
108704	9PYn-k2Tk1BV_ns8UvG7nA	118	115	3
55615	5ma1OUQWY_Ds80xUiP7JPQ	434	431	3
87768	w2gXToEf9ba78Qfmp42YRQ	132	135	3
136122	GMeJ77rluBJQRq6KTMIZMQ	70	67	3
18115	7W-7QBBU67ax2nERXrDM1Q	239	236	3
17083	6HJmFDFw775Jlbw_4wl4vg	138	141	3
121638	a2gWIG98DdT2nZBqNeYU9g	139	142	3
16874	lwyD6R_DBUrRFoggFwqESg	33	30	3
16583	_iEI9sCLsvXEFHUWPvgsAg	303	300	3
103954	7qSJAe_Z6guAGWCtOC7Yag	167	170	3
64609	4V_fxpk6DK9SNphiPsDQPw	279	276	3
61787	osJfovV0FGBDo4n7eD4-AQ	196	199	3
81176	e90bsqWf18yyz_HogGZdAg	76	79	3
131010	dXQ2zo174AZeH0tRoHwqEQ	159	162	3
35393	Lau3N654yNyWdllybea1uA	573	575	2
58675	FzzKllzJSagomPPisoKS5w	83	85	2
42782	QC_KrEEakL-baYfnTXw2FQ	144	146	2
127195	K-uQkfSUTwu5LlwPB4b_vg	1808	1806	2
41426	jmrNqcRZZp8b7onKTOSOtA	14	12	2
73369	tSwiWYoDBZajtwy3A_ooKg	125	127	2
59409	-LG_SXZrWLTnfSXPZQvzA	4	2	2
120151	u-67zd1lmTv3EEr5kldWrA	920	918	2
48499	pJ8zPg3yi6s_EaXSxvu_4w	14	16	2
22803	eEnNw3_hBvxcFHyr23kAuA	2175	2177	2
108345	ujHiaprwCQ5ewziu0Vi9rw	4091	4089	2
41564	19rzu0wtv24oe7ffxVmh_A	21	23	2
136256	0xo3bFKKQqMkjkYAJwH5g	98	96	2
28026	ypF6t8fcEV8f_B4lMfH93Q	19	21	2
120780	awl4hHMfa7H0Xf0-ChU5hg	2313	2315	2
72602	-XrG8PgkJ4XehqWOnV1-TA	231	229	2
107983	dOGLTIMqqQZn8xxBRsU6CQ	474	476	2
120897	YuiSB5tzeajHQRmTAaF7hQ	26	28	2
103284	ZOmF-3NN4Z59b2Fw6VAM7g	739	741	2
17586	0onlwbCKK8HRw1itKvbWng	138	136	2
28396	Pbh0WNaKvki7HYwQMEWpA	160	162	2
73980	ap5VGUkChf8BFAqtBYAPEw	10	12	2
64994	yNPh5SO-7wr8HPpVCDPbXQ	1814	1812	2
35344	Rud4J5Hsjn_jjU9laQ0Dpw	200	202	2
23983	eDdhZZBHEi-TRWQ2xhRI5g	449	447	2
146773	ndQTAJzhkrl1i5ToEGSZw	594	592	2
105002	h3oVNfP_zoNydnaHiHrzZA	3	5	2

	business_id	review_count	number_reviews	abs_diff
151511	CbQyKClyv_jNJ-VBprKyFg	23	25	2
24128	Xg5qEQiB-7L6kGJ5F4K3bQ	1746	1748	2
100370	S4411fmD5hqMdaMdSVUPLw	11	13	2
109252	DjrN4zIAbJZBbRQxvAUEIA	247	249	2
127881	pDcU-HEnNr631YpwxAqYsQ	180	182	2
119145	fKlr9qNoV37WQJwQ826POg	1067	1069	2
47343	HJkDo-5SwrsTszg_zfE86w	42	40	2
146187	ZU7bsnwKPTZHeMTYPv4a8w	95	97	2
127554	NY80DkkCFEI198JmwtO4pA	1541	1543	2
8203	FFVAGNz3fQ7Mdsupm5uzMw	259	257	2
135441	Aal_qHle30fu8XCQqL2V3w	95	97	2
35827	-glp6d-bORik5SODmr4ubw	8	10	2
151607	vkQrIXyeAn4GrCnrk2haRw	309	311	2
108953	13KW8P5n1jAxxHB7Bl_obg	393	395	2
47647	dGuVYsA5DMCm_TjSbX6x7g	428	426	2
74306	qL1YWY7auU6K7H68WQxNqw	10	12	2
145777	qqIgj3vpc54Bab5xWfwONA	168	166	2
18607	P-AKuEib7cHKFAtKkK2auw	128	126	2
95252	LNGBEEeIQx4zbfWnlc66cw	2155	2157	2
49968	vUgCHg2pWUrbg_xrJZz6Lg	196	194	2
136878	XwJ6fZRVbxQYRsryy4-qDw	458	456	2
52402	mRbwm1Hkg6LjkcX_P3WWZA	66	64	2
113903	L2p0vO3fsS2LC6hhQo3CzA	1698	1700	2
139031	iSQwKRrLYYi-dl2PpJmJJg	516	518	2
93714	QPCPa-LasXaj61vHyVRf5Q	37	39	2
113936	HgdFqAvK31fB9sgBdOzo9g	1135	1133	2
53630	wMOioy2KAol2AnpbqwxOg	291	289	2
105713	sxNMGQwUuaDsviR4BtuX0g	581	583	2
124101	6kkxRV8H9SQLybj0xnEbMw	833	831	2
53452	KVqWA98XZwGhJ3YbFNI0vw	349	347	2
92168	d_L-rfS1vT3JMzgCUGtiow	1552	1554	2
80470	0ldxjei8v4q95fAplei3Lg	904	902	2
109405	-z-xTLkeSN_WpRayllh_iQ	206	208	2
92440	149rGuvlq4Zm4nUylf4GZw	9	7	2
92480	BORPULADzZV6_LJZzcsywQ	832	834	2
23589	DLcgZ180-gdPsHoU78xQDw	227	225	2
125251	QXV3L_QFGj8r6nWX2kS2hA	1635	1633	2
14438	_BELd09Ppp0aMUTW-ItJfw	245	247	2
68617	X3CzpPYqS5rS-k3Gxhcs7Q	15	13	2
92816	iH6heFdMwPXk9GIO6PwUvA	363	365	2
131369	2c9Vptks_vowLgVUMnCcjjw	410	412	2

	business_id	review_count	number_reviews	abs_diff
139806	4Q-P8lbk9d5zO_ireZFRPQ	170	168	2
104176	q_-PAv21KB74TbuOQ_S37A	8	10	2
91086	lsHmnOZNlsKnEDsNmT-5_Q	355	357	2
138226	i_96cvjJo5mgcepHmGvl_A	46	44	2
103978	TBBesHTGuak9Jv09j3iDuA	80	82	2
50172	kbTdQKw__4P0oo6XQVc07A	121	123	2
66525	da17_EW7GaYZWw1Z1JKSmw	150	148	2
143052	pPI44XATcnF1bWtkQHk3SQ	10	12	2
107331	cTZmf7B-4yciMc1WKiCVOA	848	850	2
28848	HQcel0uvvg7N7KfhHJChfSQ	1024	1022	2
80079	LWgaRojEN8a-V6yxORo7yQ	199	197	2
122209	PsdWWQE_9GrfmCNfz2yW4g	112	114	2
107150	pCWg4B0R5gauQR4SJ9VDMw	235	233	2
142826	2QEFTceTxIQUeQtZ-VuJqQ	11	13	2
54527	Xe9Za61rO8QdbU1U0Mm1CA	157	159	2
99794	6Mu2xsqytDoYyRozYG_F0Q	9	11	2
94560	-ot5Brxh-QQURT4J-ntavA	7	5	2
81170	IT_4EEIbv6Ox1jBRMyE7pg	1338	1340	2
122885	nzbQXU2x7O8oucKGthUT3g	233	235	2
126266	i69tc6p5oH5dF2WZYueebQ	28	26	2
58747	kd1VNJdd92T2eQ4hqvYQ5A	250	248	2
59210	SGZdTJOu90cbC-F_hi3cdQ	20	18	2
15880	1CqDdPrb0xvQpgu7fhI5w	210	208	2
15845	i41qYGIC0t5s0TuRBQz04Q	131	133	2
118954	XWxYHSld0T2TfANwt1KmqA	292	294	2
146677	m506zjQ67j0msTfANwB6RA	329	331	2
113261	pik4ebdFa0UcUhnNkivFcg	778	776	2
148973	9gL3XDqhLwU0PKyXlcDj0w	3	5	2
5616	jLxeBgWhLRbII2ACkgH1Sg	568	570	2
60472	DHECYVi7nBWtoUOgF0hsgQ	189	187	2
110513	rOtfTlyW7sR4IYAqyUU-1g	77	75	2
148340	RzEpt3Ts0TB6q_7ix4v7cg	265	267	2
26107	LU95pQcsRJknWgOu9YZmDQ	6	8	2
110664	GZONBn0K1yp2aaD-l8debQ	491	489	2
110666	QJatAcxYgK1Zp9BRZMAx7g	2735	2737	2
150252	kXap93zCzFTkmHW3PrOIKw	266	268	2
43010	X3ec1nuK2BmOULN4Kk3Fgw	502	504	2
101818	yhgUyctWczUN13MinNgZ3w	1519	1521	2
150989	-wpNQqYtqlmQ9Rcwhgm9iw	134	136	2
19973	rbYh1ue3YpdOt1GIUs2YBg	318	320	2
3469	_u1Bq7QsgMUXSMex8QHqLQ	375	373	2



	business_id	review_count	number_reviews	abs_diff
128863	JIETwXSEGIHMNyxZVEnNKQ	785	787	2
4765	nJUaNx-LKAZ0FHGm9mnmaw	233	235	2
151355	xE9DP3UoA4BkhDpW7WH68Q	26	24	2
62327	HHu9VyoA7RB1AR2NIFiT7g	139	137	2
76796	olmCDBoMF-EhN8U2livBSg	913	911	2
149127	u_vPjx925UPEG9DFOAAvFQ	3241	3243	2
45197	u-SJ5QUwrNquL9VnXwl8cg	1219	1221	2
25906	labRbltRXwr6T0c5HHIaPA	311	309	2
20150	duw-3Aj7gAKbQG-isS5UtQ	460	462	2
76916	hihud--QRriCYZw1zZvW4g	3731	3733	2
3823	TCoBE_BkDRrK0bWrh5VueQ	1107	1105	2
111118	zrTGcb83AsfyVTMrsCa65A	510	512	2
45091	qXXVNNf8QU6UghJJGpo7uA	152	154	2
62094	8USUyleN39rurnqCn5cA0w	178	180	2
115373	W6s1BQa6N3mU6UBTv_KqSw	362	360	2
20409	gG9z6zr_49LocyCTvSFg0w	1437	1435	2
39160	q3dJQtwZQrrurNT-1bNKgQ	1247	1249	2
57103	BUdPHseUBhZ_3wGW-GX7Mg	207	205	2
79407	B3omTXI--0eiBC7nCv_WXg	173	175	2
149558	rD32POdlhGN9eR8aUxl-3A	145	143	2
46323	zU2OIDxJetn9sJlPcEQw5w	208	206	2
134773	F1CCt2GI6qpOB73mXi5anA	339	341	2
75628	C8D_GU9cDDjbOJfCaGXxDQ	1341	1343	2
6539	bpRo8L8dkhgbJhdIKa9mwA	1464	1466	2
36987	FMlwjG47DRY7vbpVW9A3uQ	111	113	2
6440	N5B7OBTyNGgwU_Y2fwNcyw	952	950	2
86023	eoyvbnRYQe-z85e8Rc6vAg	461	459	2
41135	roR1_DDIMk7mhi5_R6XVKA	398	396	2
19405	LYWMVX8lRMfliUTm4jS-pw	75	73	2
147737	NwZ39qdA06ROFIIMjAVPgW	185	187	2
128326	WbJ1LRQdOuYYIRLyTkuuxw	1294	1296	2
19314	hx-oJMNnweYqE5ybU8aiSg	84	82	2
75972	jDQIKfsfJU3M8M6n0ESKFg	171	169	2
81665	u6Eo7MaNpQgAuVAOAN2xiQ	234	232	2
41199	UV2Jt8slktGu14gLZeNCjA	1021	1019	2
100939	DsdbXQAOsEynMIVRxXYOXw	26	24	2
100953	xfWdUmrz2ha3rcigyITV0g	1398	1396	2
82995	-7Mshr3cv5kpO9RRwiATdA	21	23	2
129876	bG-JFEQjr0pAcgdz7eHkZw	99	97	2
101428	BSDKbSLFO3CP-uhfcuUCkA	426	427	1
103930	pKk7jCFIm96qDdk0IaVT2w	1135	1136	1

		business_id	review_count	number_reviews	abs_diff
101042	F65UAC9crwFePN69UqKRJw		200	201	1
104952	Cpb142L849iIMzgiSR4a0w		231	230	1
103884	1Nq7GxjvEDgAJxBeOjR_9Q		102	103	1
101596	CqsJjzullOVp29m0l__k5Q		145	144	1
101503	ygFc5TWwhYjt0-sJvu-JzA		58	57	1
100971	p744xYzmoI_KMloeGoJhZw		69	68	1
103976	fvDF6pqWKRaqIZPNYaX2TA		8	7	1
103847	nbQH8MXjxqsDzHRNTZ8esQ		288	287	1
103842	JXAMnjjxRrW-jXHGvDJzzg		100	99	1
101398	PpQNZsScx6h9EgqICcac9Q		8	9	1
103828	na4Th5DrNauOv-c43QQFvA		3030	3031	1
100509	lqtlUTDv8QWSZJn1WWnz2Q		65	64	1
104936	vsFFbN71ehRCp46KeR5RdQ		812	811	1
100276	vE_hWF21gm7CWZX7H6HXg		96	95	1
100529	lKq4Qsz13FDcAVgp49uukQ		617	616	1
99980	Vbal-AZnu2w6NttIKfdjDg		408	409	1
100655	1NZNZHnGE4-FLZmU6xp3oQ		32	33	1
104599	e5S5E2iGFs0fU1XMPmhWBw		172	171	1
104598	VbD412ssoCtz6RklpRtLug		98	99	1
101237	fS9a8AGrcwWPf_9vfn5wPQ		370	369	1
104580	lqSiTBjvEfu_f-RvCLmgMA		28	29	1
101200	3MIRTYcBs8oTVeO2If1pJw		11	10	1
101134	Q4pg6LcRCYMIml-5jg4Z5Q		306	307	1
104469	V-aCFCkkRyakP6SelfG9-A		187	188	1
104708	Qx36_IVL-nPThPRzk9VGag		175	176	1
101261	nuGAd48mGzVLIJLPkST0BA		312	311	1
104814	-wDNRL4lm1UgeFLG9KcrjQ		155	154	1
104850	YnyDTK7LzdgSZIS9rGta0A		70	71	1
101605	aCkAmpBmEJCeRBJ5_Q2D-Q		57	58	1
100671	1CR2ddUcjYYwRd5JLtiRrw		575	576	1
101107	Ger5Otp_edlIjHqILgE40Q		141	142	1
104439	O7UMzd3i-Zk8dMeyY9ZwoA		350	351	1
101309	DeT8yTpLCnqu-Ew7Lyzahg		60	59	1
104276	UN_6ebslv5cxdDmZAX3ivQ		353	354	1
101319	-RiMCNsD7rsPPnNcv0Ls0A		9	10	1
99968	Crhm6oKCj7raPlakwltbVQ		112	113	1
104127	9FYiJfDv7yonO7jjTHt0MA		3	2	1
101331	37lci93XwfQjbY24KK7IMA		14	15	1
104056	g6HKSMyz-bzmLJvsJILOJQ		127	126	1
100518	H-WYHSzXPWS9Avj0W6SRpg		356	355	1
103995	Ju6Dq1mZ6jZ7W136j1oB1w		5	6	1

	business_id	review_count	number_reviews	abs_diff
101362	Wq_BQBy777zuCtm6KyDEyw	112	113	1
103483	6tOrCPiu-ZtC2JdAy9kBhw	274	275	1
101700	XyYjj-Kb4EU5hYygpHbKrA	35	36	1
101723	dJXFp02urBN7pMd5329D_g	35	36	1
103008	N8ArHOgRDI8wOJIOZaEHyg	315	316	1
102791	MJjTgjRZJLnU0VHF1TeMGQ	34	35	1
102755	_KCvY2g9mMgcBSrVJCS0FA	58	59	1
100354	rDhYdFjECYwOrXsKQJckoQ	154	155	1
...	...	...	...	...
40166	W2Vis19kUa7kP6GkSvJ9zQ	40	41	1
40320	fThrN4tfuplGetkrz18JOg	122	121	1
40355	vNwj8u1KbnKPQFMTd3TDWw	121	122	1
40427	dJh41AATAMF8g1XT2ezxAg	21	22	1
40432	lMuab5iHgV3unEuHpVmrjQ	103	104	1
40551	XroX0F7KpBnwULEMI9ehTg	10	9	1
40586	fv6aY1YT9GJPI3WKshwaGA	31	30	1
40626	9XfA7NMNKKGbH7yXc8G75A	309	310	1
42005	dzKDFiWLkspVBjKGfT0M2g	561	562	1
42079	lsAFh6bBhpzPimD1im6ZXg	4	5	1
42173	upgjUq616Yz1lvAvysDLWA	200	199	1
43648	9AEmy0f_QMmueXQoKsQfKw	29	28	1
43133	yQab5dxZzgBLTEHCw9V7_w	1732	1731	1
43140	bXGADvexLZ7sAiAuTfhYiA	11	12	1
43179	DNfQHjQ5K6XPFXEke9Frwx	26	27	1
43184	xCL38K0oPgK3ydzg4CrvKg	295	294	1
43257	zIfAda0cl3F1zqd91qMiQg	22	23	1
43336	XZ7eQLjyGXf6y69UT4SGhg	313	312	1
43373	-yVbIN2EqKWRBE9jfjWm-A	29	28	1
43455	9aJlj4OYWa9BPA7PNYdgMQ	54	53	1
43642	NWINMG_eBlvDjCCHK46eDQ	251	250	1
43662	C2C37kwDZ332qwlx_Cg4nw	18	17	1
42882	ly_c2QkgTp7b2Jhsm5U2-A	24	23	1
43678	SUd3lyEN7n5OYEGyt_U5lg	402	401	1
43696	TD3lX1KfkJ3X-lIJ9sLunA	37	38	1
43860	OotqWluPJcRC3iXA7v5xwg	142	143	1
43880	mIHwA-JpSi7hU3xnEu7aQw	28	29	1
43923	8yb5gF97PCDE5zbK19lwpq	58	59	1
43947	kZZInTbRMDKngBAly26dhg	11	12	1
43980	G6vkzaoXXPxETLC62GQ1Fg	5	6	1
44036	mQkzRj2l0LGG6Cv4EbEjEQ	29	30	1
44038	ZKLbz2o9M9P1jXaWONEY0w	36	37	1

		business_id	review_count	number_reviews	abs_diff
43094		XiVgLfA5gdF1VklIW_YZlqw	12	13	1
42827		dOOkCBji2gSR503kp_e4-g	84	85	1
42179		RzXSaz2BjPBHeJzEIUKoQw	116	117	1
42461		onhURB5hb6tKukQNPcBADw	23	24	1
42220		Nw96innm3adw0prGQyqWmA	42	43	1
42250		lwm8h8f2ZfRfIUoSF4_ww	13	12	1
42315		XIOtdDY_7VNieWYyMyic7Q	42	43	1
42317		_DOjM_VGK-ojgjoY6esOdg	77	78	1
42323		zXvtouoaOsL0Bp0udugAjQ	190	189	1
42391		qmYPTISRWmOV6RW_QuV4yw	100	101	1
42406		Qeie5-8-S_hLPk7_ujpajw	221	220	1
42423		WszxJV-LR9GSIp06wGzZmg	32	31	1
42459		7VAcRL0y7Arthf7YkDnrDg	16	17	1
42508		vK1_qKEG7zHvjITOsN0CRg	852	851	1
42810		osu1j_Lg8R9brpuMMn3a3A	1064	1063	1
42582		oKvIZL1ETK-Zejk5u76_Hg	29	30	1
42698		ms4nFq8B56RHKfViRaAiWQ	175	176	1
42707		jjmirGh6JBd366rUACE--w	49	50	1
42759		-av1lZI1JDY_RZN2eTMnWg	855	854	1
42773		TW26bF6l2gJfKkRj0PemMg	12	13	1
42776		eigkQ_PuRON8Se265NqQDQ	71	70	1
42789		JHyv6TwbNflcpos8_espA	138	137	1
42794		QnfAHUr5-HTiaA5-va3glQ	223	224	1
42798		DqFODQFzEacXRVxk2IeG0Q	57	58	1
49780		MxZU1ww5v7gBYaCY4HHyzA	56	55	1
49810		Qze5W5OmOzZIFRK-O2G_yw	37	36	1
49851		HoKXKkW8oC9q8XnjKLulRw	499	500	1
49874		1veVZUawy7lhlc5oDpRRQA	399	400	1
56347		iJ4JaJWm_0ZH4VBiGzad1Q	80	81	1
56433		HHvO4MgBFabsmlInou6viQ	69	70	1
56516		eLFfWcdb7VkpNyTONksHiQ	1784	1785	1
56623		G4PqbK9aigbAynfrjs38Tw	37	36	1
56642		-BgJB7tjU6S2V1uu-MHrUg	10	11	1
56649		Kk6k9cs4rXfDkC9Fjv0MjQ	55	54	1
56899		8Qs6f026h6sU6MAzL7JJjg	119	120	1
56916		Lt0748v5KSK-z98Pi7rBRA	10	9	1
56939		dUffgo9Lh_Vk9TLuFR5ywg	525	524	1
57000		RwnePLERBTS_xtyV7Rx1AQ	232	231	1
57104		wrEUVqnG3-UhgqBQIEeIWA	22	21	1
57131		mcExQV14NsdC5IB9lfl-vg	6	7	1
57136		GH2y7HPcSwEWD4xd9gQSEw	57	56	1

	business_id	review_count	number_reviews	abs_diff
57215	rmRqq0CEqEeoVu3DVnibjw	298	297	1
57238	FwmfaGVvXP8EwXo2zyyhwA	36	37	1
57245	SlumMeDPSsuoakY3RP2kVA	8	9	1
57279	-gRkfQ7CGqz0V3Y1wPeB2w	6	5	1
57313	JIey8FH6123SJBoNwG235g	174	173	1
57326	PJ-VbAtlOso1dqd2frQqqg	88	87	1
57334	IJ4Xbz-LK32oW7SDtMwiQw	35	36	1
57382	dWFUKB_HPBI87AFBHEb_w	1059	1058	1
56131	LjPGiMI6NMnmbO4UY9FbwA	8	9	1
56093	xv8nVVu2KTtTnAFsxdSpqQ	126	127	1
56020	6lgkTtACpJR5Kijkc050KQ	36	37	1
55291	FD-yD1cDNANGQaPaQVNgxw	46	47	1
54835	hmltG5aNY43I0NVMGTmPHw	166	165	1
54851	KVpvE6pOPM9KMvak4HFsNg	502	503	1
54853	3jQxp12LlxMxG3H62hKsuw	20	21	1
54870	02BXFKzu1rgaYulNGYvi6g	234	235	1
54959	wuDNjKgBla-12y7nF7BXcw	56	55	1
55123	wAQr_GVUNFSvqFfr3cC9kA	66	67	1
55208	I4Oi_pyZBSZtAVjZHoTFWg	61	62	1
55246	xxGB4cW9N5WrGKc5QYgYLw	18	19	1
55274	xW2TgfNgerHmbwSluey82Q	21	22	1
55401	YF4QJ_j-PM7cMZja6K1MwQ	752	751	1
55991	ID5wWJ9C7G0hfbQilvfxA	598	597	1
55503	SbDCw4JBxkGxVbhF6vvw7A	17	16	1
55532	Z9LM42qQzrbneB8bn76Msw	37	38	1
55638	rEdep0txAwxCw4iMICWlmQ	17	16	1
55642	rXDFjyh3VrnXHHP4tUttSw	69	70	1
55664	RNdcUG1sCTLdUo8dEC9NJw	51	50	1
55666	ePkjSWKMgurJx_ld3XS10A	63	62	1
55737	qdtfcYMROGZVvYcE9F23yg	118	119	1
55838	fw88hjCFSAFJvP1472oS4g	4	3	1
55974	uMVDGJn9jvLXSbqOJwvHHw	37	38	1
57405	qDbVUkKMLtRqSDcKgLTx1A	70	69	1
57442	2P0j97A8aZsMpbPkD1tgzw	17	18	1
57466	0FUtlSqrJI7LhqDPxLumEw	1884	1885	1
59169	fFg1SoA4tWEkkqddnOjyiQ	12	13	1
58767	P3ufH0wm0jvulnrinDpaAA	260	261	1
58894	xdGCcG3CZFkEzTBMxSi5RQ	76	77	1
58903	cnfYugAYBFKgwDCTAVdViA	243	242	1
58945	awRJ5YGb102rIPVkyPA-A	106	107	1
58980	yIJuo-bYlcEvzJZUVFXblQ	20	21	1

	business_id	review_count	number_reviews	abs_diff
58981	hM3TwxTe_XWvdXZUiFkZ9g	141	140	1
59039	V7LeK0mPA_qk1I7hApgtyw	156	157	1
59064	7rhFSZcztch_3_k3RiRKQ	4	3	1
59115	WtLUaAAZyD6vyFXO3xLrsw	15	16	1
59339	MhrqAyRa9ZvDKYundBhUbA	74	75	1
58734	dtE30mN71gKEABv3Xuo5nw	5	6	1
59365	57_msr8gjNakjGO-1f6B_g	207	206	1
59402	J1RDyyPxhioqm8c_fi4P4Q	948	949	1
59867	x5hieVj5VhyFlqpUv3M92A	6	5	1
59876	cH6GzRVyFEaJQxvojJ8pbQ	20	19	1
59898	WF2DG7R_a0EfIFqWlxzUXQ	62	63	1
60101	yhYhK7tb3la5KcLIVzG5Lw	539	540	1
60268	9tLCuUmw3Tlco-tKPGkIWQ	121	120	1
60380	m4IncWtifTQkXub5jUdNzQ	96	95	1
60421	m3XOBJyAJIWEJJUpngVLLw	174	173	1
58748	wpnLPAnkMEb1NpC3xiD_qg	641	640	1
58612	orenJYBrGyfEupJI9zclkw	32	31	1
57527	w3j40hXJUht53vIO_q4vHA	115	114	1
57814	9evRrJHVVWghiv16EOUg6zA	72	71	1
57535	q1EJ1BT_xoorCoWarXiwuw	195	196	1
57602	hxUxeY8DG9lhyjCVo_s-pw	433	432	1
57640	9G0ETTCB7RUhbUZJUPm3Tg	60	59	1
57643	axX1hO_IEn9C-na3mMN4Aw	167	166	1
57687	nuNraialluYc9vDZg7XfRA	6	5	1
57692	M9fOuiesoUSaouOqNQ3U2w	149	150	1
57708	ilFcMHXGNDz8jbx_4H-xVQ	43	44	1
57752	fuW-VCynECpKukrm-9nxdg	649	650	1
57774	Qayz6avNEPNS6Q5UThYHCQ	285	286	1
57935	qty8hfjvyD_W92z-Yxe_ig	31	32	1
58563	hyzzZdFi_RKXEGogcEAakg	98	97	1
57938	ZoPMFdyhcQhPJQO-WC-_fA	13	12	1
57956	aZMUdPl420PxZA87w3U_A	25	24	1
58222	PgVITpf4u_B-JARV8-NCIA	36	37	1
58244	DfgZINgKwBvCpA_0alumXw	2130	2129	1
58386	q10IXjtZqao66bVtPExTXw	262	263	1
58400	q2ZwmOSKMojaW6VmmtuRSg	9	10	1
58446	_skmB-CPcMOJKqeuFMWrFg	29	30	1
58526	rR8V4T5Px9ICnYLEJF225A	27	28	1
58550	ZyEjstbyzJkc1bHec_4xhA	14	15	1
54834	a19a59qthJCAGBVGoZRvmw	165	166	1
54798	VaKXUpmWTTWWDKbpJ3aQdMw	357	356	1

	business_id	review_count	number_reviews	abs_diff
54721	avVDxUmOC0sM1fxVVcm_Qw	13	14	1
51492	MO-C3o6DFqLBK1Z1qA-f4g	16	17	1
51016	LnRn6ECHdqTeoFF0c8FKYw	153	152	1
51215	2xjMLX8vNpQEisRKPgbP_w	200	199	1
51223	Z9Ss9LhBN2zVNQw9DpjVbQ	66	67	1
51262	whAwdYVty-jSNRhrYT2zHA	1358	1357	1
51271	z2JTN5PXemCRGtGbKiOvZw	60	61	1
51296	QDYS5AXM5-Z2UWEJMSVx1w	64	65	1
51330	HyzHidtQXC4JIULtSbk3NA	121	120	1
51418	z2Yivr-C0K0H2sLNxvnZyg	323	324	1
51445	3BA3Ro7GcZb1N_PQW4m1dQ	87	88	1
51568	H5Y6o9H4rtxbHJFgLql6Fw	169	168	1
50950	jdWV9pjT3ErFN6PxG91gQ	42	43	1
51694	eStn1HCGNcKiLXc0pfvZxg	622	623	1
51703	5-qYtBErnLUh02n9z2Verw	114	115	1
51708	wztnDEbXD1VNvHMMPj2tMw	46	47	1
51709	emCed5sCDrXvRBKVo6tcUQ	49	48	1
51722	fCkfyCr1gFcZC816a9pOA	161	162	1
51743	7h08ecPN5bcW1Gp6UQZxNQ	301	302	1
51877	nlxHRv1zXGT0c0K51q3jDg	66	67	1
51907	TJstASXrFYFnVz5-zfSeWA	6	5	1
51953	-MKWJZnMjSit406AUKf7Pg	171	172	1
50978	pt8AjHbXuoXd1cjQO-gjPQ	10	11	1
50819	nt6lCG6H7imdDih8QGKEbQ	9	10	1
52014	3dw6xhzG08htY5HcL2OjeA	186	187	1
50428	-1mjIwXWil1uzy-8nGkdkw	13	14	1
49888	WoYyi1JBh9v2GhFRoKhSVA	6	5	1
49935	K7IWdNUhCbcnEvl0NhGewg	6446	6447	1
49947	RWwvuTbnf3DleUSiFbUscg	41	40	1
50057	7aLHARfM2X9zNTuSWZJ8Hw	15	16	1
50240	rDMptJYWtnMhpQu_rRXHng	11	12	1
50271	wHq1efQVz17338k_aUOX3w	289	290	1
50302	WqXrmUVy5Ay3Scn4GPM9Ug	46	47	1
50391	yPiGrtnJc7j-OCPwUB2cDg	69	70	1
50415	2skQeu3C36VCiB653Mlfrw	499	498	1
50432	_kCjd-nD4INXL2oGn-JhZA	80	81	1
50756	VodyCVoc3QUoEsi0rv0opg	50	49	1
50470	s73t5HCo06cZZLIRhxpp-w	20	19	1
50489	0nyM_mub7LxN6Dx7tYpMaA	342	343	1
50491	EN3j87O4VOsMHTCrcVt2pQ	60	59	1
50632	157Y-QIXWnqQra78_WfW5g	80	81	1

	business_id	review_count	number_reviews	abs_diff
50647	Yxdx_xaYUb5mWXlIbwf64A	3	4	1
50666	A5ID3y2eREchEdMcvWPXBA	194	193	1
50668	N4BbelbQNgtUEEMutu9U3w	270	269	1
50729	wSBNzVkrZTVlnR95AFvYMG	133	134	1
50750	Lq9rYrwwVW5QDBYzq7MGHQ	417	416	1
51979	vOo-CI3RvbPA-M2xaElfGg	34	33	1
52094	XmNK5-_aMbz8RiqT0FxWGW	89	88	1
54713	dQQS9BMNOZ6I0eBsP_fTiQ	7	8	1
54158	f-7sTbx8u7c9t1-r_Fdoow	234	233	1
53783	KGGiuMVEZE8Otj5qSAO45g	168	169	1
53813	FsCujpVh9Za2DI5MIYLCxA	660	661	1
53817	ZBE-H_aUlicix_9vUGQPiq	92	91	1
53818	8ChKflgrn7DpCily3o3L1Q	3	2	1
53825	d9GSAJHevoO0GODP7lpsKQ	6	5	1
53897	gE59d8Fyh8v7hoXb6KxZKq	11	10	1
54095	Wxxvi3LZbHNIDwJ-ZimtnA	3329	3330	1
54133	n-6NSy9JxV8qzNGIJ5OKYQ	71	72	1
54156	h2cPlifmtPD029q4sthRSQ	52	53	1
54416	httpsDvCvgajUbSHxaUDlg	58	57	1
53573	-F4_kxPQaDTMGIGpJqFplg	93	94	1
54469	mM3o2evEq36fJvkUCe-BWw	128	127	1
54500	e1leCaO80qurC9LqQtQ0g	15	16	1
54536	U8UZEvtllegaDkHvABuflQ	21	20	1
54601	SEjyjYIMfFFzkHaru6JadA	458	459	1
54617	S5RLqt9XkvZxoTMKXuF-MA	185	186	1
54637	LI9ad207UhzrcisJ2xmy0w	156	157	1
54651	3uLvazEZrRFoAz6YiXcQuq	36	37	1
54675	G5BQqtg1jSAgiUSAlg_5sA	3	4	1
54678	F2-BtwaEuYO2kant2cPffg	186	187	1
53734	Bjn-GQg6hoUOkew7tTPcLA	66	67	1
53542	Pfi812k1E6TMnC1NRzH3Pg	527	526	1
52096	gBfPyzPRmeOaj3Sdclj0Rw	1134	1133	1
52821	hRUICEGFdoxa65QO16lcKg	48	47	1
52122	SxvKjtbq5qRIFoXrU8Bo9Q	226	227	1
52183	fGVZqXadtkQa9CN6dR6crw	22	23	1
52252	oPcWayqZRnMb2s7C9agCpw	75	74	1
52314	vLkKorA1gPS97Zj0_WKA0Q	289	288	1
52403	CWO8uizKGwTzZnLZGQCnGQ	122	121	1
52508	uF86ZhygpBEGr3CudNemYA	291	292	1
52510	OEnBuiez0un3EqtWjnWpSg	57	58	1



```
In [57]: df19[['review_count', 'number_reviews']].describe()
```

```
Out[57]:
```

	review_count	number_reviews
count	152599.000000	152599.000000
mean	34.755372	34.756591
std	113.296344	113.296817
min	3.000000	1.000000
25%	4.000000	4.000000
50%	9.000000	9.000000
75%	26.000000	26.000000
max	7968.000000	7968.000000

```
In [58]: df19['Discrepancy_Flag'] = True
f19 = df19.abs_diff == 0
df19.loc[f19, 'Discrepancy_Flag'] = False
df19.Discrepancy_Flag.value_counts()
```

```
Out[58]: False    149400
         True      3199
         Name: Discrepancy_Flag, dtype: int64
```

```
In [59]: df191 = df19.groupby('Discrepancy_Flag').agg({'business_id': 'count'})

rename_dict = {'business_id': 'establishment_count'}
df191.rename(columns = rename_dict, inplace = True)
df191 = df191.reset_index()
```

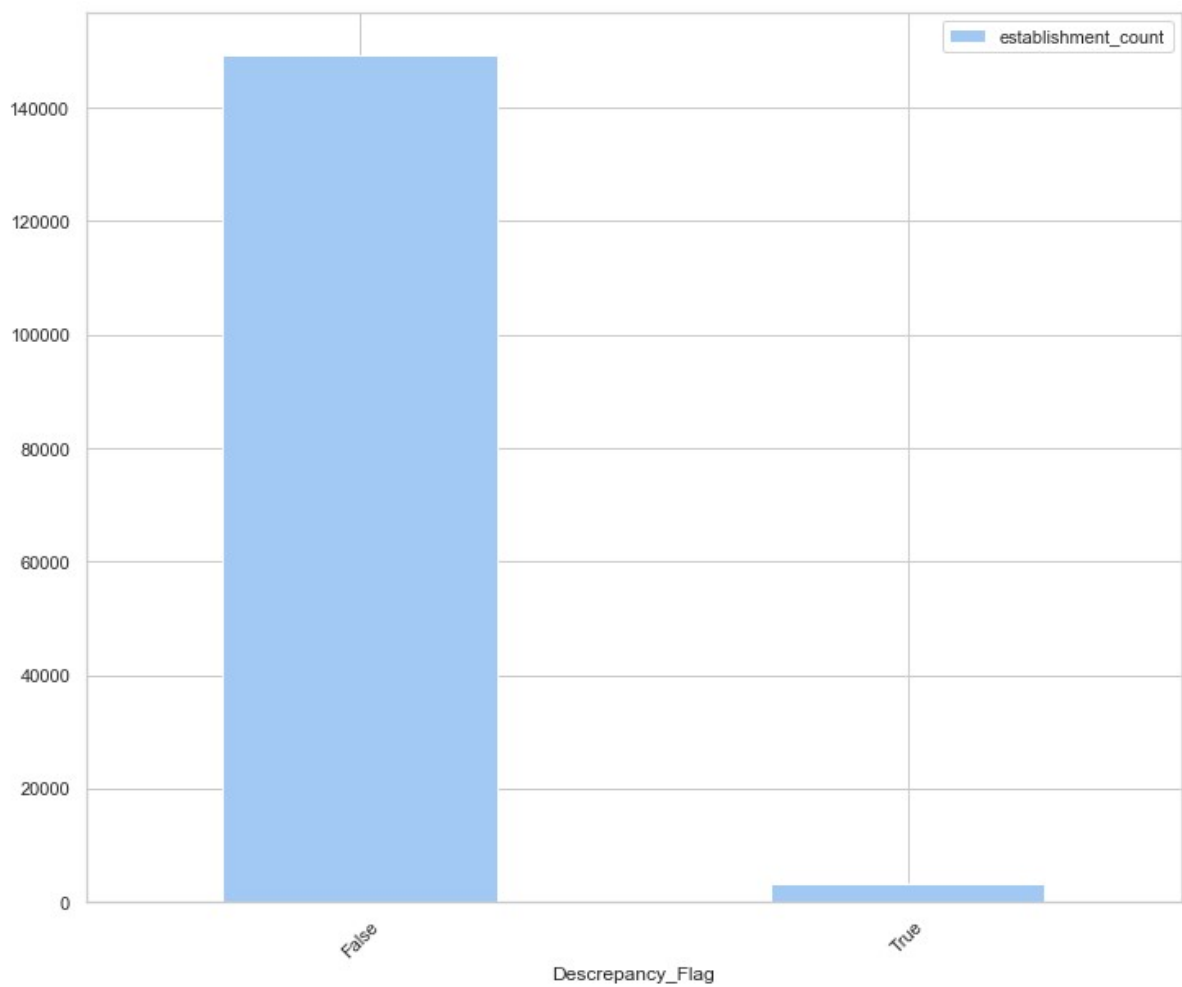
```
In [60]: df191
```

```
Out[60]:
```

	Discrepancy_Flag	establishment_count
0	False	149400
1	True	3199

```
In [61]: df191.plot(kind = 'bar', x = 'Discrepancy_Flag' ,rot = 45)
```

```
Out[61]: <matplotlib.axes._subplots.AxesSubplot at 0x1b4081c6978>
```



Describe what you see in the plot and the output from `describe()` . Does it appear that we have the all or most of the reviews for every business in the `business_data` table?

#### Written Answer:

There is insignificant discrepancy between 2 data sets for captured review counts. And Yes, we seem to have the most of the reviews captured for all businesses.

## Wrapping up

In this section of the Final Project, you will be focused on analyzing the Yelp users and the reviews they leave. Unlike the previous part, you will not be guided through each step and must decide how best to proceed.

Your analyses will involve the following 3 tables:

- `yelp_academic_dataset_review.csv` - contains a subset of Yelp reviews with a `business_id` indicating what business the review is for and a `user_id` to identify the user leaving the review.
- `yelp_academic_dataset_user.csv` - contains a subset of Yelp users identified by `user_id`
- `yelp_academic_dataset_business.csv` - contains information about a subset of businesses having at least one Yelp review and every distinct business has a unique `business_id`. This is the table that we have been analyzing in Problems 1-19.

```
In [62]: # Import the user data table
user_data = pd.read_csv(fpath + '/data-sets/Final/yelp_academic_dataset_user.csv')
user_data = user_data[['user_id', 'name', 'yelping_since', 'review_count', 'average_stars', 'compliment_cool', 'compliment_cute', 'compliment_funny', 'compliment_hot', 'compliment_list', 'compliment_more', 'compliment_note', 'compliment_photos', 'compliment_plain', 'compliment_profile', 'compliment_writer', 'cool', 'elite', 'fans', 'friends', 'funny', 'useful']]
```

```
In [63]: df_metadata(user_data)
```

```
Out [63]:
```

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
0	user_id	object	1518169	0	0.00
1	name	object	1518169	476	0.03
2	yelping_since	object	1518169	0	0.00
3	review_count	int64	1518169	0	0.00
4	average_stars	float64	1518169	0	0.00
5	compliment_cool	int64	1518169	0	0.00
6	compliment_cute	int64	1518169	0	0.00
7	compliment_funny	int64	1518169	0	0.00
8	compliment_hot	int64	1518169	0	0.00
9	compliment_list	int64	1518169	0	0.00
10	compliment_more	int64	1518169	0	0.00
11	compliment_note	int64	1518169	0	0.00
12	compliment_photos	int64	1518169	0	0.00
13	compliment_plain	int64	1518169	0	0.00
14	compliment_profile	int64	1518169	0	0.00
15	compliment_writer	int64	1518169	0	0.00
16	cool	int64	1518169	0	0.00
17	elite	object	1518169	0	0.00
18	fans	int64	1518169	0	0.00
19	friends	object	1518169	0	0.00
20	funny	int64	1518169	0	0.00
21	useful	int64	1518169	0	0.00

## Problem 20: Time Based Analysis (20 points)

The `review_data` table contains a column `date` representing the date the review was created.

Chose **ONE** of the questions below and use the `review_data` to answer.

1. Are more reviews posted during certain days of the week? What about certain months of the year? What patterns can you find about when reviews are posted? Draw a suitable plot.
2. Do reviews made on certain days of the week or certain months of the year tend to be higher/lower rated? What relationship can you find between the `stars` ratings of a review and when the reviews was posted? Draw a suitable plot.

```
In [64]: # Your code here
df_metadata(review_data)
```

Out[64]:

	Column_Name	Column_Datatype	Row_Count	Null_Count	Null_Ratio_Pct
0	business_id	object	5996996	0	0.0
1	review_id	object	5996996	0	0.0
2	user_id	object	5996996	2	0.0
3	review_date	datetime64[ns]	5996996	0	0.0
4	review_weekday_name	object	5996996	0	0.0
5	review_month_name	object	5996996	0	0.0
6	review_year	int64	5996996	0	0.0
7	cool	int64	5996996	0	0.0
8	funny	float64	5996996	0	0.0
9	useful	float64	5996996	2	0.0
10	stars	float64	5996996	0	0.0
11	text	object	5996996	1	0.0
12	rec_count	int64	5996996	0	0.0

```
In [65]: f'I will prefer to answer question 1: Are more reviews posted during certain days o
f the week? What about certain months of the year? What patterns can you find about
when reviews are posted? Draw a suitable plot '
```

Out[65]: 'I will prefer to answer question 1: Are more reviews posted during certain days  
of the week? What about certain months of the year? What patterns can you find a  
bout when reviews are posted? Draw a suitable plot '

```
In [66]: review_data.head(5)
```

```
Out [66]:
```

	business_id	review_id	user_id	review_date	review_wi
0	iCQpiavjPzJ5_3gPD5Ebg	x7mDliDB3jEiPGPHOmDzyw	msQe1u7Z_XuqjGoqhB0J5g	2011-02-25	
1	pomGBqfbxcqPv14c3XH-ZQ	dDI8zu1vWPdKGihJrwQbpw	msQe1u7Z_XuqjGoqhB0J5g	2012-11-13	
2	jtQARsP6P-LbkyjbO1qNGg	LZp4UX5zK3e-c5ZGSeo3kA	msQe1u7Z_XuqjGoqhB0J5g	2014-10-23	
3	elqbBhBfEIMNSrjFqW3now	Er4NBWCmCD4nM8_p1GRdow	msQe1u7Z_XuqjGoqhB0J5g	2011-02-25	
4	Ums3gaP2qM3W1XcA5r6SsQ	jsDu6QEJHbwP2Blom1PLCA	msQe1u7Z_XuqjGoqhB0J5g	2014-09-05	

```
In [67]: review_wkday_summ = review_data.groupby('review_weekday_name').agg({'rec_count': 'sum'})
review_wkday_summ = review_wkday_summ.reset_index()

review_wkday_summ['review_weekday_name'] = pd.Categorical(review_wkday_summ['review_weekday_name'], ['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday'])
review_wkday_summ = review_wkday_summ.sort_values(by='review_weekday_name')

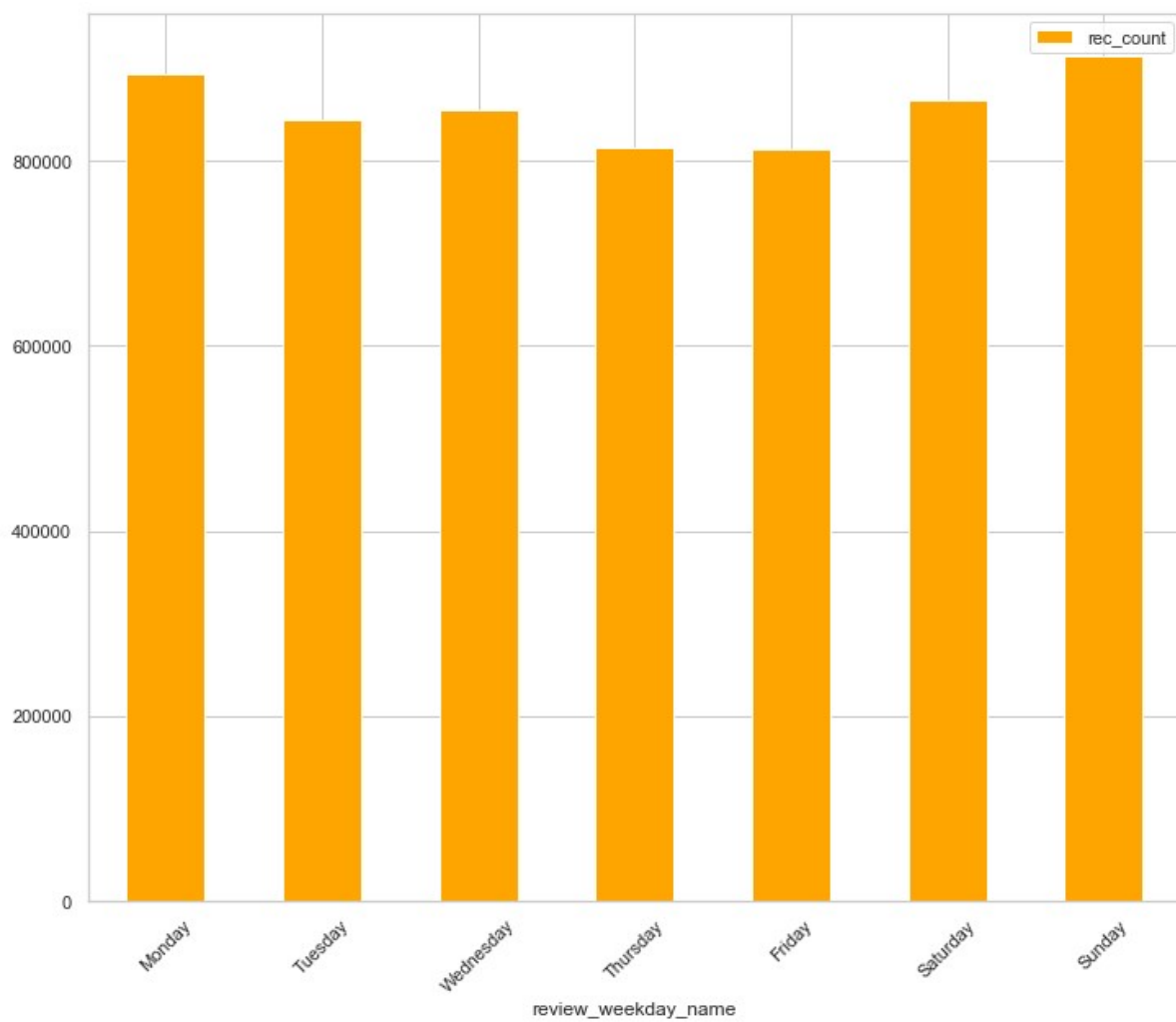
review_wkday_summ
```

```
Out [67]:
```

	review_weekday_name	rec_count
1	Monday	893652
5	Tuesday	844903
6	Wednesday	854330
4	Thursday	813336
0	Friday	811893
2	Saturday	865009
3	Sunday	913873

```
In [68]: review_wkday_summ.plot(kind = 'bar', x = 'review_weekday_name', y = 'rec_count', ro  
t = 45, color = 'orange')
```

```
Out[68]: <matplotlib.axes._subplots.AxesSubplot at 0x1b5d10806a0>
```



```
In [69]: review_month_summ = review_data.groupby('review_month_name').agg({'rec_count': 'sum'})
review_month_summ = review_month_summ.reset_index()

review_month_summ['review_month_name'] = pd.Categorical(review_month_summ['review_m
onth_name'], ['January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'Se
ptember', 'October', 'November', 'December'])
review_month_summ = review_month_summ.sort_values(by='review_month_name')

review_month_summ
```

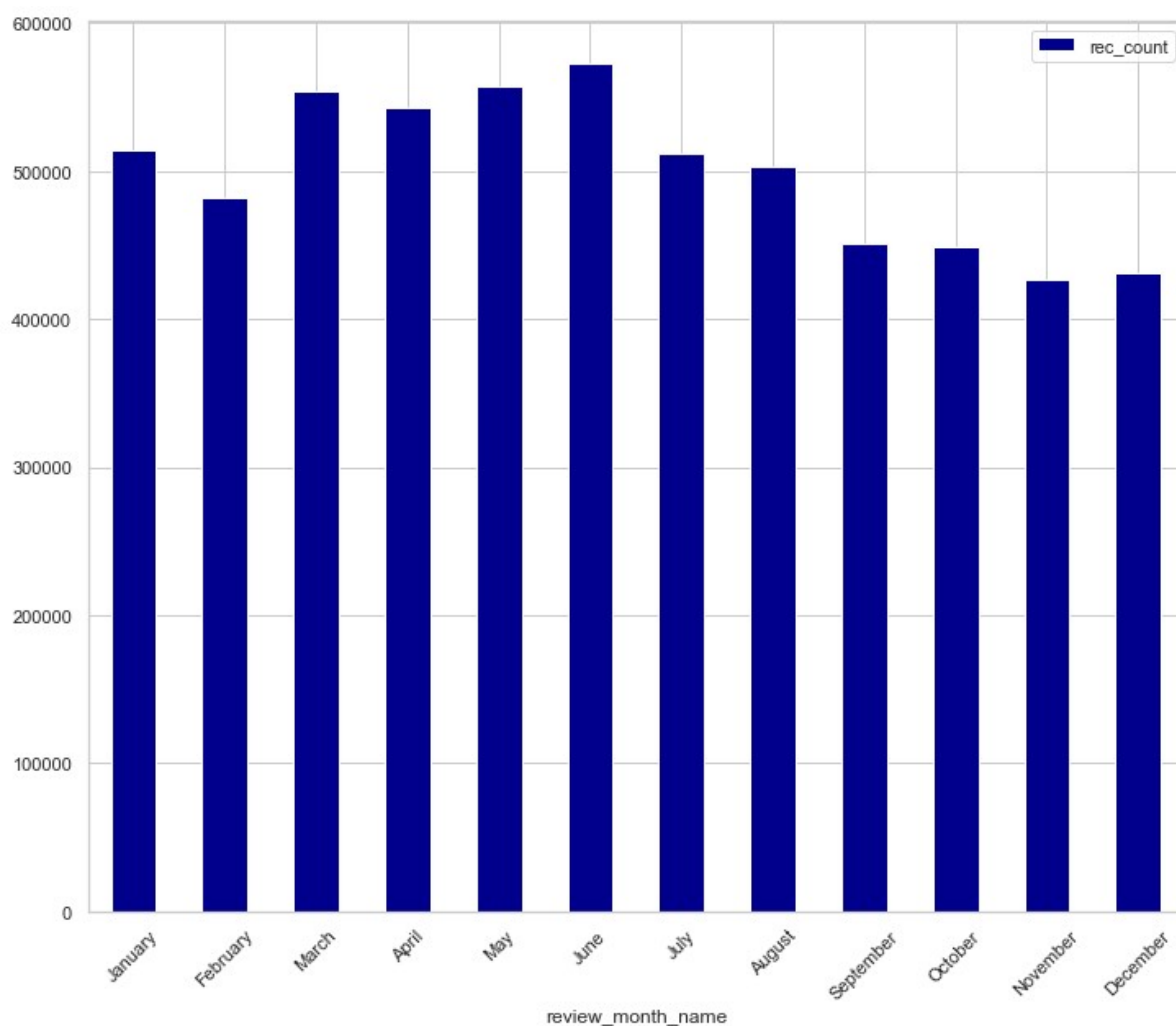
Out [69]:

	review_month_name	rec_count
4	January	513964
3	February	482581
7	March	553642
0	April	543280
8	May	556903
6	June	572744
5	July	512367
1	August	503599
11	September	450655
10	October	448738
9	November	426870
2	December	431653



```
In [70]: review_month_summ.plot(kind = 'bar', x = 'review_month_name', y = 'rec_count', color = 'darkblue', rot = 45)
```

```
Out[70]: <matplotlib.axes._subplots.AxesSubplot at 0x1b416620e10>
```



Provide a brief explanation of your conclusions.

#### Written Answer:

1. Week Day Observations: Middle of the week from Tuesday to Friday tend to get less reviews. But on week-ends and surprisingly on Mondays, reviews seem to rise.'
1. Month Observations: There is a seasonality present here. Reviews tend to rise during summer months and go down from fall season to holiday season. Come January it again goes back up with exception of February where it goes down. This is interesting observation. February needs to be investigated.

## Problem 21: Text Based Analysis (20 points)

The `review_data` table contains a column `text` containing the full text of the review. Use these data to answer one of the questions below.

Chose **ONE** of the questions below and use the `review_data` to answer.

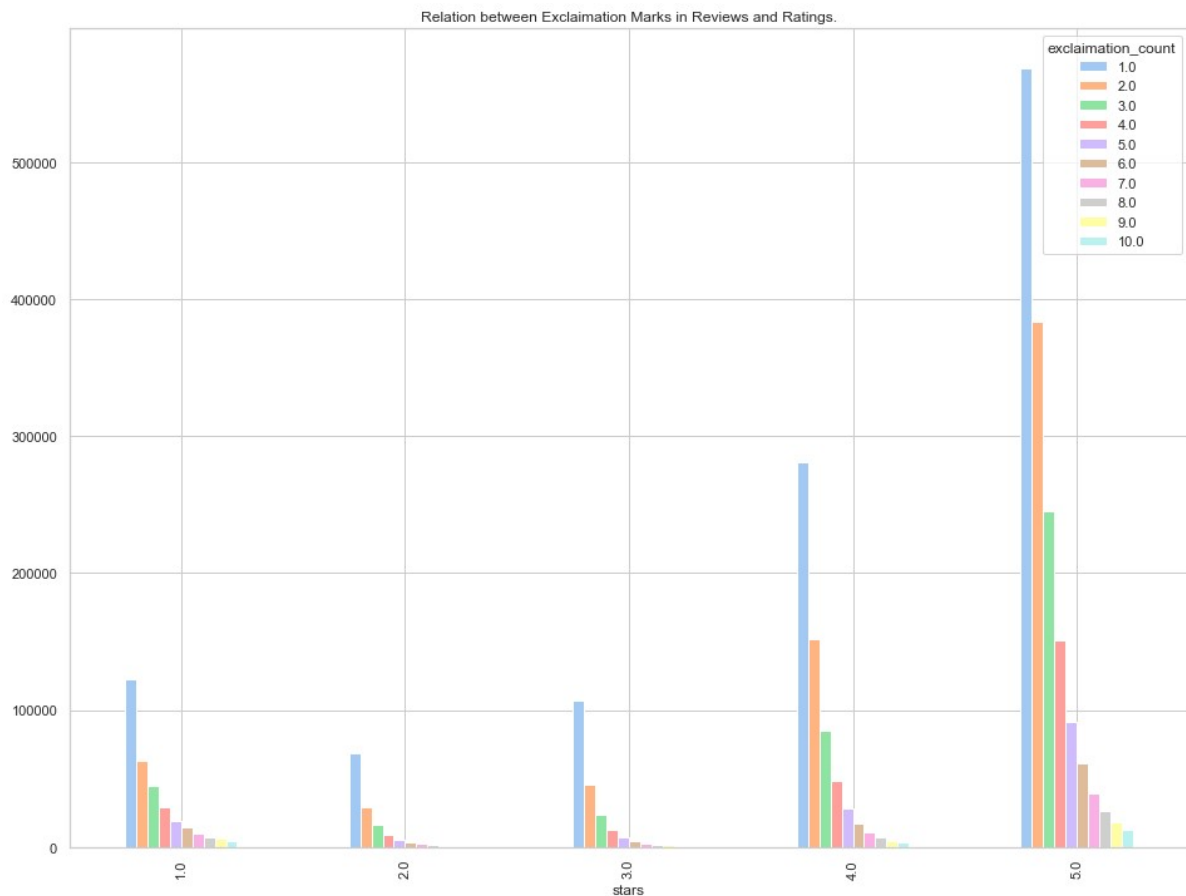
1. Can you classify a review as having a *positive* or *negative* sentiment? If so, select five particular businesses (by `business_id`) and compare the business's average `stars` rating from the `business_data` to the proportion of reviews you have identified as having `positive` or `negative` sentiment for those particular businesses. Draw a suitable plot.
2. Do reviews with exclamation points seem to be either very highly rated or very low rated? Determine the `stars` distribution as a function of the number of exclamation points used in the review. Draw a suitable plot.

```
In [106]: # Your code here
          f'My choice is to answer Question 2.'
          review_data['exclamation_count'] = review_data.text.str.count('!')
```

```
In [113]: df21 = review_data.groupby(['exclamation_count', 'stars']).agg({'rec_count': 'count'
                                '}).reset_index()
          #review_data[review_data.exclamation_count == 205].text
```

```
In [114]: df21[(df21.exclamation_count >= 1) & (df21.exclamation_count <= 10)].pivot_table(
            index = 'stars',
            columns = 'exclamation_count',
            values = 'rec_count',
            aggfunc = 'sum').plot(kind = 'bar',
                                legend = True,
                                stacked = False,
                                figsize = (16,12),
                                title = 'Relation between Exclamation Marks in Reviews and Ratings.')
            title = 'Relation between Exclamation Marks in Reviews and Ratings.'
```

Out[114]: <matplotlib.axes.\_subplots.AxesSubplot at 0x1b6517cb7f0>



Provide a brief explanation of your conclusions.

### Written Answer:

To showcase the sample relationship, I kept only that data which had 1 to 10 exclamation marks. If time allowed I would prefer to analyze reviews with 0 exclamation marks and extreme number of exclamation marks. You can see the distribution of count in data shown below.

Presence of exclamation mark does not truly affect the review ratings. It seems to be the reflection of reviewing styles of folks. Generally people consider using exclamation marks as rude so lesser the better. And the data consistently reflects that in all stars ratings.

```
In [115]: df21.sort_values(by = ['exclamation_count', 'stars', 'rec_count'], ascending = [False, False, False])
```

Out[115]:

	exclamation_count	stars	rec_count
415	426.0	1.0	1
414	349.0	1.0	1
413	296.0	1.0	1
412	272.0	5.0	1
411	265.0	1.0	1
410	227.0	1.0	1
409	213.0	1.0	1
408	208.0	1.0	1
407	205.0	1.0	1
406	171.0	1.0	1
405	165.0	1.0	1
404	161.0	4.0	1
403	154.0	1.0	1
402	153.0	5.0	1
401	151.0	1.0	1
400	150.0	1.0	1
399	148.0	1.0	2
398	146.0	5.0	1
397	143.0	1.0	1
396	142.0	5.0	1
395	137.0	1.0	1
394	130.0	1.0	1
393	129.0	1.0	1
392	126.0	1.0	1
391	125.0	5.0	1
390	125.0	1.0	1
389	124.0	5.0	1
388	119.0	1.0	2
387	118.0	1.0	1
386	115.0	5.0	1
385	115.0	4.0	1
384	115.0	1.0	1
383	113.0	5.0	1
382	113.0	2.0	1
381	113.0	1.0	1
380	112.0	5.0	1
379	111.0	5.0	1
378	111.0	1.0	1
377	110.0	3.0	1
376	109.0	1.0	1

	exclamation_count	stars	rec_count
375	106.0	5.0	1
374	105.0	5.0	1
373	104.0	5.0	1
372	103.0	1.0	1
371	102.0	1.0	2
370	101.0	5.0	1
369	101.0	1.0	2
368	100.0	1.0	1
367	98.0	5.0	2
366	97.0	5.0	2
365	97.0	1.0	4
364	96.0	1.0	2
363	95.0	2.0	1
362	95.0	1.0	3
361	94.0	5.0	1
360	94.0	1.0	1
359	93.0	5.0	1
358	93.0	2.0	1
357	92.0	1.0	1
356	91.0	1.0	1
355	89.0	5.0	1
354	88.0	1.0	1
353	87.0	5.0	1
352	87.0	1.0	2
351	86.0	5.0	1
350	86.0	1.0	1
349	85.0	5.0	1
348	85.0	4.0	1
347	85.0	1.0	3
346	84.0	5.0	3
345	84.0	1.0	5
344	83.0	1.0	3
343	82.0	5.0	1
342	82.0	3.0	1
341	81.0	5.0	2
340	81.0	3.0	1
339	81.0	1.0	1
338	79.0	5.0	3
337	79.0	1.0	1
336	78.0	5.0	1
335	78.0	2.0	2

	exclamation_count	stars	rec_count
334	78.0	1.0	4
333	77.0	5.0	2
332	77.0	1.0	2
331	76.0	1.0	3
330	75.0	5.0	2
329	75.0	1.0	2
328	74.0	5.0	4
327	74.0	1.0	4
326	73.0	5.0	2
325	72.0	5.0	3
324	72.0	4.0	2
323	72.0	3.0	1
322	72.0	1.0	3
321	71.0	5.0	2
320	71.0	1.0	6
319	70.0	5.0	3
318	70.0	4.0	1
317	70.0	1.0	6
316	69.0	5.0	3
315	69.0	2.0	2
314	69.0	1.0	5
313	68.0	5.0	2
312	68.0	4.0	1
311	68.0	1.0	4
310	67.0	5.0	2
309	67.0	4.0	4
308	67.0	2.0	1
307	67.0	1.0	2
306	66.0	5.0	2
305	66.0	4.0	1
304	66.0	1.0	3
303	65.0	5.0	4
302	65.0	4.0	1
301	65.0	1.0	6
300	64.0	5.0	3
299	64.0	3.0	1
298	64.0	1.0	8
297	63.0	5.0	5
296	63.0	4.0	3
295	63.0	1.0	7
294	62.0	5.0	2

	exclamation_count	stars	rec_count
293	62.0	4.0	1
292	62.0	1.0	5
291	61.0	5.0	3
290	61.0	4.0	1
289	61.0	1.0	6
288	60.0	5.0	6
287	60.0	4.0	2
286	60.0	2.0	1
285	60.0	1.0	8
284	59.0	5.0	12
283	59.0	3.0	1
282	59.0	2.0	1
281	59.0	1.0	6
280	58.0	5.0	6
279	58.0	4.0	3
278	58.0	2.0	1
277	58.0	1.0	11
276	57.0	5.0	4
275	57.0	2.0	1
274	57.0	1.0	6
273	56.0	5.0	3
272	56.0	4.0	1
271	56.0	2.0	1
270	56.0	1.0	12
269	55.0	5.0	12
268	55.0	4.0	1
267	55.0	1.0	16
266	54.0	5.0	7
265	54.0	4.0	1
264	54.0	3.0	1
263	54.0	2.0	2
262	54.0	1.0	8
261	53.0	5.0	7
260	53.0	4.0	2
259	53.0	2.0	1
258	53.0	1.0	8
257	52.0	5.0	10
256	52.0	4.0	1
255	52.0	2.0	2
254	52.0	1.0	12
253	51.0	5.0	8



	exclamation_count	stars	rec_count
252	51.0	4.0	3
251	51.0	3.0	1
250	51.0	2.0	1
249	51.0	1.0	16
248	50.0	5.0	11
247	50.0	4.0	2
246	50.0	2.0	1
245	50.0	1.0	18
244	49.0	5.0	12
243	49.0	4.0	4
242	49.0	3.0	1
241	49.0	2.0	2
240	49.0	1.0	22
239	48.0	5.0	12
238	48.0	4.0	5
237	48.0	3.0	2
236	48.0	1.0	25
235	47.0	5.0	12
234	47.0	4.0	3
233	47.0	3.0	1
232	47.0	1.0	26
231	46.0	5.0	17
230	46.0	4.0	2
229	46.0	3.0	1
228	46.0	1.0	29
227	45.0	5.0	21
226	45.0	4.0	2
225	45.0	3.0	1
224	45.0	2.0	3
223	45.0	1.0	22
222	44.0	5.0	19
221	44.0	4.0	2
220	44.0	3.0	1
219	44.0	2.0	4
218	44.0	1.0	30
217	43.0	5.0	29
216	43.0	4.0	4
215	43.0	3.0	3
214	43.0	1.0	35
213	42.0	5.0	19
212	42.0	4.0	6

	exclamation_count	stars	rec_count
211	42.0	3.0	2
210	42.0	1.0	34
209	41.0	5.0	33
208	41.0	4.0	8
207	41.0	3.0	2
206	41.0	2.0	4
205	41.0	1.0	35
204	40.0	5.0	29
203	40.0	4.0	5
202	40.0	3.0	1
201	40.0	2.0	3
200	40.0	1.0	44
199	39.0	5.0	41
198	39.0	4.0	8
197	39.0	3.0	3
196	39.0	2.0	4
195	39.0	1.0	60
194	38.0	5.0	28
193	38.0	4.0	5
192	38.0	3.0	2
191	38.0	2.0	6
190	38.0	1.0	71
189	37.0	5.0	49
188	37.0	4.0	13
187	37.0	3.0	1
186	37.0	2.0	4
185	37.0	1.0	58
184	36.0	5.0	47
183	36.0	4.0	10
182	36.0	3.0	3
181	36.0	2.0	6
180	36.0	1.0	68
179	35.0	5.0	55
178	35.0	4.0	10
177	35.0	3.0	4
176	35.0	2.0	4
175	35.0	1.0	82
174	34.0	5.0	67
173	34.0	4.0	13
172	34.0	3.0	5
171	34.0	2.0	8

	exclamation_count	stars	rec_count
170	34.0	1.0	86
169	33.0	5.0	85
168	33.0	4.0	16
167	33.0	3.0	10
166	33.0	2.0	8
165	33.0	1.0	106
164	32.0	5.0	106
163	32.0	4.0	24
162	32.0	3.0	8
161	32.0	2.0	6
160	32.0	1.0	97
159	31.0	5.0	92
158	31.0	4.0	26
157	31.0	3.0	4
156	31.0	2.0	14
155	31.0	1.0	120
154	30.0	5.0	146
153	30.0	4.0	21
152	30.0	3.0	7
151	30.0	2.0	15
150	30.0	1.0	118
149	29.0	5.0	163
148	29.0	4.0	29
147	29.0	3.0	5
146	29.0	2.0	25
145	29.0	1.0	150
144	28.0	5.0	186
143	28.0	4.0	34
142	28.0	3.0	14
141	28.0	2.0	13
140	28.0	1.0	174
139	27.0	5.0	218
138	27.0	4.0	56
137	27.0	3.0	15
136	27.0	2.0	26
135	27.0	1.0	210
134	26.0	5.0	281
133	26.0	4.0	63
132	26.0	3.0	16
131	26.0	2.0	25
130	26.0	1.0	235

	exclamation_count	stars	rec_count
129	25.0	5.0	277
128	25.0	4.0	67
127	25.0	3.0	13
126	25.0	2.0	24
125	25.0	1.0	274
124	24.0	5.0	382
123	24.0	4.0	78
122	24.0	3.0	22
121	24.0	2.0	39
120	24.0	1.0	294
119	23.0	5.0	445
118	23.0	4.0	97
117	23.0	3.0	33
116	23.0	2.0	39
115	23.0	1.0	373
114	22.0	5.0	581
113	22.0	4.0	131
112	22.0	3.0	32
111	22.0	2.0	47
110	22.0	1.0	450
109	21.0	5.0	682
108	21.0	4.0	154
107	21.0	3.0	56
106	21.0	2.0	58
105	21.0	1.0	490
104	20.0	5.0	875
103	20.0	4.0	197
102	20.0	3.0	71
101	20.0	2.0	42
100	20.0	1.0	513
99	19.0	5.0	1034
98	19.0	4.0	241
97	19.0	3.0	71
96	19.0	2.0	84
95	19.0	1.0	652
94	18.0	5.0	1369
93	18.0	4.0	340
92	18.0	3.0	91
91	18.0	2.0	95
90	18.0	1.0	789
89	17.0	5.0	1777

	exclamation_count	stars	rec_count
88	17.0	4.0	350
87	17.0	3.0	127
86	17.0	2.0	113
85	17.0	1.0	1005
84	16.0	5.0	2236
83	16.0	4.0	521
82	16.0	3.0	143
81	16.0	2.0	147
80	16.0	1.0	1118
79	15.0	5.0	2977
78	15.0	4.0	717
77	15.0	3.0	184
76	15.0	2.0	182
75	15.0	1.0	1428
74	14.0	5.0	3681
73	14.0	4.0	849
72	14.0	3.0	242
71	14.0	2.0	276
70	14.0	1.0	1642
69	13.0	5.0	5009
68	13.0	4.0	1246
67	13.0	3.0	328
66	13.0	2.0	302
65	13.0	1.0	2195
64	12.0	5.0	7042
63	12.0	4.0	1661
62	12.0	3.0	440
61	12.0	2.0	422
60	12.0	1.0	2816
59	11.0	5.0	9095
58	11.0	4.0	2295
57	11.0	3.0	603
56	11.0	2.0	579
55	11.0	1.0	3460
54	10.0	5.0	12954
53	10.0	4.0	3416
52	10.0	3.0	865
51	10.0	2.0	826
50	10.0	1.0	4401
49	9.0	5.0	18320
48	9.0	4.0	4775

	exclamation_count	stars	rec_count
47	9.0	3.0	1239
46	9.0	2.0	1115
45	9.0	1.0	5837
44	8.0	5.0	26588
43	8.0	4.0	7295
42	8.0	3.0	1802
41	8.0	2.0	1597
40	8.0	1.0	7578
39	7.0	5.0	39212
38	7.0	4.0	10802
37	7.0	3.0	2751
36	7.0	2.0	2209
35	7.0	1.0	10176
34	6.0	5.0	60741
33	6.0	4.0	17237
32	6.0	3.0	4443
31	6.0	2.0	3506
30	6.0	1.0	14512
29	5.0	5.0	91263
28	5.0	4.0	28022
27	5.0	3.0	7001
26	5.0	2.0	5317
25	5.0	1.0	19492
24	4.0	5.0	151022
23	4.0	4.0	48760
22	4.0	3.0	12838
21	4.0	2.0	9140
20	4.0	1.0	29579
19	3.0	5.0	245062
18	3.0	4.0	85212
17	3.0	3.0	23299
16	3.0	2.0	16081
15	3.0	1.0	44368
14	2.0	5.0	383423
13	2.0	4.0	152084
12	2.0	3.0	45192
11	2.0	2.0	28750
10	2.0	1.0	63300

## Problem 22: Analysis of Users (20 points)

Create a function that accepts at least a `user\_id` as input. This function use the `yelp\_academic\_dataset\_user.csv` data as well as the `yelp\_academic\_dataset\_review.csv` or `yelp\_academic\_dataset\_business.csv` tables as necessary.

The function should automatically process the data relevant to the `user\_id` passed and create at least one plot annotated with relevant, interesting information about the user that best answers the following questions:

**What types of businesses has the user reviewed? Summarize the users review ratings by business category.**

Tip: It is OK if the results of your function are not very interesting for users with only a small number of reviews but your function should produce something reasonable for any `user\_id` that may be passed.

```
In [72]: # Your code here
b_data = business_data[['business_id', 'name', 'categories']]
u_data = user_data[['user_id', 'name']]
r_data = review_data[['business_id', 'review_id', 'user_id', 'stars']]
```

```
In [73]: b_data.head(5)
```

Out [73]:

	business_id	name	categories
1	AjEblBw6ZFln7ePHha9PA	CK'S BBQ & Catering	Chicken Wings, Burgers, Caterers, Street Vendo...
3	bFzdJJ3wp3PZssNEsyU23g	Geico Insurance	Insurance, Financial Services
5	45bWSZtniwPRiqlivpS8Og	The Coffee Bean & Tea Leaf	Coffee & Tea, Food
6	9A2quhZLyWk0akUetBd8hQ	Bnc Cake House	Food, Bakeries
7	6OuOZAok8ikONMS_T3EzXg	Thai One On	Restaurants, Thai

```
In [74]: u_data
```



Out [74]:

	<b>user_id</b>	<b>name</b>
0	lzlZwIpuSWXEnNS91wxjHw	Susan
1	XvLBr-9smbI0m_a7dXtB7w	Daipayan
2	QPT4Ud4H5sJVr68yXhoWFW	Andy
3	i5YitlHZpf0B3R0s_8NVuw	Jonathan
4	s4FolXE_LSGviTHBe8dmcg	Shashank
5	ZcsZdHLiJGVvDhVjeTYYnQ	Stacey X Joe
6	h3p6aeVL7vrafSOM50SsCg	Lindsay
7	EbJMotYYkq-iq-v1u8wCYA	Joshua
8	nnB0AE1Cxp_0154xkhXelw	Mike
9	XoEnrhtJc2pcdlQ09d8Oug	Mitch
10	QDQTMYP2NocktWN5fHwflg	Andrea
11	Nq9WrJcCjQjHSoaUPZcPWg	F
12	SgYDjNCecPidsRB_su5-tw	Jessica
13	AUWHlxgZuL2h4svVLdUZaA	Alex
14	jlCxOfvf_Ff4YgGov8Tm1g	Kara
15	9u9a9JakFNHZksptLKPUrw	Teresa
16	NfE1uHFWzzMyXkgBeEuR1A	Danielle
17	RiBVI6UgUjfpA4EQ1SWDzA	Shawn
18	iK_Mfq3BLLxprw4Trgc4Bg	Love America
19	kPAyx-80ZIFKVy6uQ71I6Q	Matthew
20	UI_EvU0TUNeFJMNQlut--A	Kim
21	bwPVGW1Mx0qmS_qNQ7xmYg	Ying
22	vLekYe1hK12NJc8PyxRjlG	John
23	bVBLhbpER9SQW9q2X-22dQ	Kaye
24	ibLa3RJf8Ht0FKSXrw0TA	Matt
25	wplu6p4DYRx--gHjMbqPlw	Tim
26	x-IMCiS9SBrnm8mD1WleMg	Sandra
27	TpE_T9jESeq-YtqWLyACQ	Aisha
28	XZFIH0CO2Txp2OVynS0Zag	Dana
29	5_549BpxlmfCvkQa9mybBA	Teresa
30	Dmso4_w1f4LSzAiyOLk0Gw	Joe
31	-10AAuTs4nHZwXKavFPvw	Gary
32	f_Elxx59fEfpQB4MFn93Dw	Bob
33	BebqF5U9FdVShxZWPE-H-g	kerry
34	07UJ5zgua9ooAus8pWhmOA	Sarah
35	GEs3QLyGOAg3dWdntWiyLw	Rosemary
36	CIE-B2wYfJP-jFu5QO5Y3Q	Frank
37	G0VWbFLyIH2wsH_UsxY82g	Chris
38	DcBtmk6yrU37JVPGPzIHnA	Tiffany

	<b>user_id</b>	<b>name</b>
39	34dHYkTKfB4xkl6FZbny3A	Jamie
40	zuiVfy6oJy_N86nw0Wv4Zg	I Don't
41	M6cAcVnXovRrbisRPeqmiQ	Temeika
42	wEUzxhyf7ngRbxS7jleqsQ	Aja
43	UVVpMz4kCJQcLgnrOOrig	Jon
44	d1p2M9zMuFPjvOWxhtFuNg	Dellene
45	LmY9SSZ5vE-GdDA-xjpKBw	Jared
46	O3M8V0BILosInI_8Av71jw	Ronald
47	NtYXqEQzJfvwtR2YMhyfwQ	Gary
48	5ON3bSSwfWlgqxn3cvRQsQ	Brandon
49	aah4ei870eLL_IRD6r2Jxw	Zainab
50	czwv4Btham0alPTvAFoNqw	Freddie
51	iYXxZBb2trmlozioddpL5g	Amber
52	vfDj6S7vWjfy9jlkPTfeA	tim
53	9MwxXVTtRMMjg6szl4KyOA	Joanna
54	EbVuN0lr0-hfvP7c5pfc3A	Vicky
55	-hXaShW_wicEAKBTgvTn4A	RJ
56	FrLvmygqsftHGRx4-poaA	Bruce
57	LSXqKE7u1gSWeCTdRUFhnA	C
58	sGT7S3mX3xRsK3Uz7ro4ug	Almee
59	ZNESGFYfd19Wknrl63li3A	Enrique
60	bRjwncjGol0ZEdezSKeAYQ	Lex
61	xjmpdJon4hgLeU1P5Dj2Pg	Romeo
62	wBz7XZN7GeACCMnpAfgvSQ	Amanda
63	CrrG2ebNtvrj_68pltZIYw	Ron
64	JcKUiHAQ9cWGSO_qFbzIKw	Vai
65	-nnXVT844Hm9C4ENKx1N8A	Pat
66	SBjy6tJY4E8BHfAJ1PIS0w	Camam Imports
67	ZEAXQ8nctiAtj3UrD5S7qw	Laurel
68	mNzy0-YVTJTP2jqHR7zWwQ	Walter
69	D1PcuD9Owj4vwXflUnGijQ	Jorge
70	sv9iapOU9KNn0JFZcbbpUw	Curtis
71	VNw1NYRbwTvpjvLE0nEr_Q	.
72	F32weszLxep45EJFuGAOLg	Linda
73	wE7dOLiZ9pwL2MyTccey-g	Wander
74	rMkz1mjevjl8xqrypZwHzw	Daniel
75	EetIHdBj-3SngJXHnaYYkg	Jason
76	B_hSPBljhld4K7LGy7aX_A	Nancy
77	Zz18uz08eyhMAkCJOkFDJQ	Brianna
78	E2R4WD4n7V1bGXAtLe8AHQ	Tem
79	Ykbb0q-NEtJxRK8UPfSURA	George

	<b>user_id</b>	<b>name</b>
80	GkAkJLmAZn9Tad3FvMwMog	Lisa
81	AAxJbjcq94NaqUJGFE362g	K
82	pTuhStwZHOY5kDnUv_Wg	Hannah
83	B3xwUPXMICb7_5IEDIq4Uw	Yolie
84	Pc5vc0RuoCa8YU6hD-y3Ow	Anthony
85	dz1RKDdHziTy0uw7VtXeXQ	Tisharra
86	6OmHL9dw5RmKwhGFgvAA	Colleen
87	tGbVIKIZAPGr3VJTn7gRA	Aaron
88	5QGHEDr0V-3e-5NOyZU9Og	Hans
89	RyZr6SqjWbFwFuPr6XIyOA	Valery
90	2hDTGXVbYb03qN1ZPzOnpg	Sassy
91	rdHS6gsuJ4OUuriCrIhiKw	Bahar
92	4M6GVM28NHQ7BhM9wG7p0w	Kylie
93	XuhHEe8fvBERIxEPKMaIPQ	Ken
94	MeRX3U8rretG80nAOdTv-g	Deven
95	mN1eee0_-dglmm57NAf3w	j
96	GT7EWBgsoWfy6OzrzDEBfg	Cee
97	-caPDnAfiSI_2QxrXX31tQ	Michael
98	DzJvholvspOEYW6wYqOs8Q	Hala
99	3_-fbHJCdv59Bg-sidM-Tw	Vaughn
100	6DoRkChoTpUYXOeNSnyJqQ	Emili
101	ctmN5z3jzsGuE475qto3qw	Bo
102	bJPSSCDJjWA1e2mOeBPNtA	Samie
103	68qmfoSUXpPUaXz_VEyqzA	Mary
104	SMF7KR-F9TuGbLeWKHL4Yg	Roaming
105	-rP5prbJfKFIEINuvldIVw	K
106	wt86obnnh_w5wJxjErl3Kg	Laura
107	f-pgBX5PEBtG9KzsRNHEMA	Claire
108	5xK6mmJP5VQGp4C_6NIT2w	Clive
109	JpUsdHmP-viaSzcHkVRjAw	Daniel
110	7jKcsYvZPIAjPB-Srl7VZA	David
111	M8fiVDPrsDP5HKLkw1oR6Q	Michelle
112	JsQNRWZIJ7dSdveV3vANcw	Lee
113	D88RBhqHDxWVcm0UqSDJ6Q	Leah
114	vHRqK5Fi7Z-c_2sjJHtulg	Jen
115	EFCpxXKt0xi31OADlhLhAg	Kevin
116	Ietd1JFIrIHsBe2Vy-OFLw	J
117	BzghLxWwJiUwu5aAxW1eUA	Kathy
118	vOyNqYf1wile61IQNs_NPA	Rolando
119	4exKa-h8kDD9LrdXo_AeeA	Fairlight
120	ngZoUVDK7nFHB_HXBeQkiw	Isa

	<b>user_id</b>	<b>name</b>
121	vFi89PgxaZHH6RVmzq5Ecw	Lori
122	mRxqBHliQK1s480VO92-6Q	Jess Joe
123	3ns5Q8et87s_9Lg5TLc93Q	Jt
124	ZXXEFP_9tF7jMlxVWNxZAA	John
125	zRxOfT0YYGUY_kHQRKXYA	Chris
126	dGjhEfWXiDHthaLXW8Et3A	Casey
127	06yzuOJm_DD_nBkJ8UqdA	Mike
128	14_AqfABIEkf_3YwdN58Hw	Jose
129	IsD7xnhSndVh7Soujr7EeA	Ralph
130	2VMGcxW9tiX-zKwCdGH98Q	Mark
131	Mrm7E6tTuvRmz2jSjvJUEw	Zelda
132	vyeN_SffAoAaedY4KKPMow	Helen
133	WOIKidPPbpMrQe_nSY-vjw	Ilona
134	wetwn_RlcC5l2VQ0hGasdw	Diadem
135	tYTb6tBd6O46aS7ouT63lg	cathy
136	ODdom-GNplzVNpCbPFge2g	Kerri
137	BRBW3FZb2l-7AG3KZeLoZQ	Alan
138	3roaA1TggaQR1OhTjh5Q3g	Todd
139	XQcg0ut_doLfP7l91veLQ	Git
140	ww9_ybOuQ1AcKhR_q6bMzA	Teo
141	_meCwKX0cHn9cDBCnHqN2Q	Crystal
142	N2JYv9hZULO2sTe3ARcyAw	K
143	V8PxINjOO4syg9M3Gq-PHg	Brent
144	egEa0EyLeUrpflmkvN2ew	Asma
145	hftODw08Cz7tBA4vIvRpJg	R
146	em1MRZ_EVbqrM-phW0VbNg	Kple888
147	xZxzwIHWCbAkIhCN3lhMDg	Jordana
148	xsEG4i1QCjuZS9urGNLNNw	Barry
149	x4h4edZx7E8Nh2uYcBV8qQ	Jasmine
150	d7-blMfudynQ5s01Jp8fjg	Lora
151	KOxjaAfUa6MTydzAzkp5vg	Supasm
152	OemwvTqkytS7iYWMolUn1A	Megan
153	0EGGfrIsLJZLRiSscN45yw	Peter
154	_1q-xFwPBL7o7J_OCOOWfA	Andrea
155	NLGwonpcqlo7b6OB1nC4Cg	Benino
156	-sYUi6x27KX1YFaQmoXIAg	Dan
157	bb1h94CeJyHGii2eOhlx9w	Chelsea
158	8amfCfFjf9j4mSPnv5a6Uw	Sheila
159	-HOdFyXfzE845lfbQobVGQ	Cameron
160	qO63bm_qSJMIU6FS0Ow7KA	James
161	Slao2vHyX1qnMXAv43OjYQ	Jessica

	<b>user_id</b>	<b>name</b>
<b>162</b>	iQIne4dTLiUMcdGP_DpzVQ	Mack
<b>163</b>	YjjR0Rxt1RFMG4LtLEkyHA	Barron
<b>164</b>	H7mMLnfsqkpxEg1e5qdF2A	Keith
<b>165</b>	ZjpSKVKL5FXTtFjPprUbyQ	Jude
<b>166</b>	dg9FQZs84VH30iueQivLIQ	Lisa
<b>167</b>	dnDa1ozFCsFwb0NKuwxGw	Yan
<b>168</b>	e9o7CivEHWnt-Wr_wGetnw	Paul
<b>169</b>	tyFNtvPYDixKTGq595F2-g	Jun
<b>170</b>	mC3mF5XWlwZHHtiSXyzTNA	P
<b>171</b>	s6DFqgT1r1Zju8BRyHwZw	Ange
<b>172</b>	kX83T0Ov95hunujQrCEBDw	Sandee
<b>173</b>	MmBe4-OX_5azPl6CdPMBaQ	Abby
<b>174</b>	jcdlBa-vdCg02Kuh4Cu_UA	Kim
<b>175</b>	m9HSc9spXNbKseY14DO7ow	Lisa
<b>176</b>	jDD9bCWreRAukd5KMloPyA	Janna
<b>177</b>	x4ds23nzVSx0KOqqhCiafw	Jason
<b>178</b>	_dxC7Xu2E82N2hKjzitn2A	Melanie
<b>179</b>	BIKZWcqicxLp8jqMsgHKbA	A Regular
<b>180</b>	UJ9NjBeWP2fGn2Mp_9G79w	Nacho
<b>181</b>	IREd8cj4Pjkcl0mmrLzJQ	Joe
<b>182</b>	18KXCtO9FVESTggs0Si-gg	Camille
<b>183</b>	L85cv9R2kU1X6JmNVETcgA	Doug
<b>184</b>	-Sw5QUB6MHiHLr9E3NWPpw	Misc
<b>185</b>	j1mclRXvs_nRHJ4nfEeuDA	Fred
<b>186</b>	wDCWHEgg_ml5w6K3iWibNw	Katy
<b>187</b>	-O25qrW2Pi82kGHwhzAFbA	Cindy
<b>188</b>	aXzyFGHVwwe8bMHyucXXsA	Sara
<b>189</b>	s5n2QWA0dd-4RLLHMAwnPA	Louis
<b>190</b>	fde5-lpLuG40khzRV-fdtQ	Philan
<b>191</b>	DMJfDuXSswX9Gyt1UcmJpw	Leo
<b>192</b>	ei06y6sQtnT1JnXxhOmCw	Daniela
<b>193</b>	0Z12eiruN9Ue2ZK3P1g2og	Aron
<b>194</b>	3a52h20nTcXWsUWZKuojww	Matthew
<b>195</b>	ZQ8ZXepUHhT-RB-THcCzEw	M
<b>196</b>	fZvXnXrpWnZ3iZQ6-lkDCg	Rex
<b>197</b>	8Gg9EzCNO1XLGG2Qe0mdVQ	Ace
<b>198</b>	BPVVYeolcE1UMgQO14KZ_A	Chuck
<b>199</b>	vqGdBBGynOtLVa4VFyf5tw	Sara
<b>200</b>	yT8pCmxxGDL2VQliUB6r_A	Jessica
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<b>205</b>	OQSya1DStf-2a3o9dcHXug	Brittany
<b>206</b>	IHAZE_8wDBsPdB6mmT7R9Q	Adam
<b>207</b>	cN_1U2fzQhDEcqepxfwDWQ	Steven
<b>208</b>	255qTrwp8iLXSWh2HhBPww	Dean
<b>209</b>	IkNH9roJzAV9Q3lFtlRygw	Ronda
<b>210</b>	fxs5H7kv653-vZvlsC089g	Dave
<b>211</b>	2V96kGSa6f4gtc1caoPs4Q	Legal
<b>212</b>	dTQ-07-ZD19fmpc_QmyVDA	Henry
<b>213</b>	rBfycf98Bjkg8yQS1splKw	David
<b>214</b>	yM3-qDG9FtWFXmUcrjgdGA	Rachel
<b>215</b>	9FZRix5muUQRpHrzdX7_w	Deborah
<b>216</b>	liYSEwwSLyot04hVnKSASA	Saleem
<b>217</b>	se6MfGNsVZXOPr7Tsj8b3g	V.
<b>218</b>	FrMkp6CRZWlw5Z0neTINSg	Phil
<b>219</b>	XN0A-FOGAksDXh0worSw	Patrick
<b>220</b>	8QtjPtG0Kj1v0q8t5jH12A	Paul
<b>221</b>	BRddiXgP2FEpW5Rc5vYHkw	Carlo
<b>222</b>	a-A-w6y88Wi_1k_KdN-Wcw	Tony
<b>223</b>	ZVqcmgU62mbdaDB0kv4g	Brittney
<b>224</b>	DB2-nPpNPdA7sL4xkOVNZA	Lori
<b>225</b>	PAvUfCRzSSI97v5M3ddUfw	Luke
<b>226</b>	uBAG-YnpUDwtb8SXTayssA	Carol
<b>227</b>	yTEl2cJt2qDC4-9_SEoaBw	S.
<b>228</b>	8uBUldUZN5Ri75CAg5H9iA	Ryne
<b>229</b>	fwtCYTnNpEbdmW0i7GqD2g	Michael
<b>230</b>	5dPrbSDzJhnl4BUY2HWmQ	C.
<b>231</b>	8fPv0KFhZIO6kag77wU5VQ	Evelyn
<b>232</b>	nq0rKa77efHYKX5qHQHjjw	Don
<b>233</b>	E4scgBCzoXBTplO5_wKtRA	michael
<b>234</b>	8C5396Ory3qaO-5Lsix_CQ	jason
<b>235</b>	1EWtEFIEZT3Bw_TJ7O2xCA	Marnie
<b>236</b>	y4hzxKTijJm0YAaglFKzGg	Adam
<b>237</b>	veQSEPLgwW9UeAtNjY12uQ	Suzanne
<b>238</b>	AhTI6jFcW77obRFU3V7SAA	Ericka
<b>239</b>	NI0gvoYzOK0EjjoGOIYFzA	Brian
<b>240</b>	yvtY_0DntnFvPHdzhSO0Zg	Wenster
<b>241</b>	tbgJpdW8euFxFkICJc0W1A	Mandy
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<b>245</b>	SXFqW6ZMzeEzwJPYK0hlag	George
<b>246</b>	kxc4JqRlnlfFRGIYUCNZ3w	Eric
<b>247</b>	Q6LGZxXXjvoAzWDIKHh0WQ	Salem
<b>248</b>	dqWBsZ6RKXme0WYpwJgQdw	Jose
<b>249</b>	JrikvPzSxn48ivjxvVfsAQ	Bruce
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<b>1517919</b>	zMUPOT36wopK6XPW-YX54Q	Jacob
<b>1517920</b>	EimEqoWmMD-Z1s2iKF7qHg	G.
<b>1517921</b>	2_otbzm9lhaCmRpFsFcZA	Renée
<b>1517922</b>	MHYqk0O1eYI8CyzVTcZA2g	Michael-Rene
<b>1517923</b>	INCm0Yw3MZzLld8QfOfjRQ	Ryan
<b>1517924</b>	ptj0rDuXP2fTEgMjpxrFSA	Greg
<b>1517925</b>	EUbJaD7L4bFuwxFcIKJ2XA	Brandon
<b>1517926</b>	jvI9kYb_oJGpFWd19sYxZA	Latiba
<b>1517927</b>	zr9bQowld1q9lp7fRHst4g	Leanne
<b>1517928</b>	QaLwlRiJqh4nUA-safKhkw	Ann
<b>1517929</b>	CTvu7jcAGT5bA5t-Yk4rGg	John
<b>1517930</b>	ebfp-UCoSV0wpW32Mj-nKw	Patrick
<b>1517931</b>	bltz6KphfAcgn3Kah_zV1Q	Ed
<b>1517932</b>	J31n2xgETM3uTUlq62f7DQ	Ray
<b>1517933</b>	sRs3wrY23vsRIWH-5X5BFg	Joe
<b>1517934</b>	9GpBYeUS0cy25JaFPOfckQ	Darold
<b>1517935</b>	roOW9zb8vw09wY21pWrJyA	N
<b>1517936</b>	9yoWpFuy4-wnsfct98L9ng	Orlando
<b>1517937</b>	jGh7EI3ckZiK8tl3S8hgcg	Tiffany
<b>1517938</b>	05l2lgtEMQt1k-bSarHxRA	Isaac
<b>1517939</b>	5Dmuble0Ux-HBCGiqESPcQ	David
<b>1517940</b>	FLtGu4bm60o-ZEI-9zSK3g	Drew
<b>1517941</b>	NC78MfwSwv26gVGMz1ZSog	Joe
<b>1517942</b>	JQhjexJJRsb9JU9nCpyFZg	Abel
<b>1517943</b>	sRj0WvZuilxVI1IgORxhMw	Jessica
<b>1517944</b>	NbUYehMn3jd3zirLjnsHQ	Ashleigh
<b>1517945</b>	Pja67UABmUkGs71aqzN3rg	Jane
<b>1517946</b>	Mw6DbV8RRVytqPiW5nO37w	Kristi
<b>1517947</b>	IWKyDX4Om0ZOBI0bywwqFA	Natalie
<b>1517948</b>	EqMUg114JOuLe0Y-_WIIKA	Marisah
<b>1517949</b>	J4Nzl2wo6E5wTYxfA6Esmw	Brenda
<b>1517950</b>	1Nb2JIWWKClCLB0Kmh7tA	Diane
<b>1517951</b>	tNqmyuH7IC_eBZN3-tGgkQ	Brian
<b>1517952</b>	wlkgqdxQnbF3q99VubEVAg	Bob

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<b>1517955</b>	dcw3ScPctFdUDRjDm76M1A	Paula
<b>1517956</b>	pnYhMRz41GC8umORneh28Q	K
<b>1517957</b>	4oO4MsJTVgueJRTc3bVOBQ	Kim
<b>1517958</b>	MdeUMDYlrEc6Ja4ZGBdGMw	Bailey
<b>1517959</b>	bKeEgopfAb312y55XJkhEA	Dennis
<b>1517960</b>	MmwO-8ly2q4o2XZ53c-mLw	Sangeeth
<b>1517961</b>	YxB5b9VtQ34n2DAJT11ipQ	Anna
<b>1517962</b>	0x7WEf3X9TgMUaMOfRpL6A	Shawn
<b>1517963</b>	e3yfr6M3r21iNmUL-p6FRA	Mike
<b>1517964</b>	IkABAJl86bSB5IP6XwW-Ag	Butler
<b>1517965</b>	0e34Mnxt9oDbn7QPNHvcHw	Jean-René
<b>1517966</b>	Vti-7CvfB3keaHaEy3EI8g	Megan
<b>1517967</b>	1Nt-3AMVOegAIViGMW7ilQ	Elizabeth
<b>1517968</b>	dPB-U2IYEK51Ku8W_iKAmQ	Jeremy
<b>1517969</b>	NihV8W5dTGUVzGiKbLoOJQ	Terri
<b>1517970</b>	dlcwNj4UKEwUNtwFABJ2bA	Marissa
<b>1517971</b>	J1XO3fuAPbDMvUvj8abkGg	Kyle
<b>1517972</b>	7evqXwLmeeAT8AzVaBs9QQ	Paul
<b>1517973</b>	QnUcXjhFA68M2WSchB0qag	Brenda
<b>1517974</b>	YALOOcNhjPXqig71hh1hlg	Dave
<b>1517975</b>	Pc3A0MIAQUDXOHPbn1gQg	Marlina
<b>1517976</b>	Qq-wP-Dvcg332b3rnbWBjQ	Laura
<b>1517977</b>	5bjxL5ov4el7v4pkyh4S2A	Tom
<b>1517978</b>	bykrAnimFhthuLJra-0_7g	Art
<b>1517979</b>	9fm8rjzZoHtVVPgjGvcUGg	Lindsay
<b>1517980</b>	AMxZ5ljd5tmag3cSkGgGjw	Amy
<b>1517981</b>	gsNx_illfOSXZ4VC8qZw_tw	Jessica
<b>1517982</b>	RWTZTagYQm88y0Z1KeAHug	Mavis
<b>1517983</b>	NnsAZ42Mx-APUxUuWW8neQ	Eddie
<b>1517984</b>	z0JejB0AgxXKbbsZvZT1Aw	Luke
<b>1517985</b>	mB4l6bSDEQyWYi-4l3Z5aQ	Sylvia
<b>1517986</b>	1H-KzjHoKelvmAITLkGg	Rory
<b>1517987</b>	9k8Dk7bXP6ACEdlzGrt18g	Joe
<b>1517988</b>	zBnKupTKTCXsb_Hsf7wSQQ	Diane
<b>1517989</b>	6DoU5iZZW6yO8At6YMP2Kw	Karen
<b>1517990</b>	WZ89A2klJENNGZMtBAtnQA	Yessenia
<b>1517991</b>	s9cj2-YYEe9LLgBBFjPCOA	Whisky
<b>1517992</b>	ClANEvG6MnhQunY4SbWWiA	Kyle
<b>1517993</b>	BW3n-kNhyhNjbVgN1L0d8Q	Laura



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<b>1517995</b>	TUpLTp2ZbElaWVu3hPEZFg	Kase
<b>1517996</b>	TdePT849n92iVOtgiffiNA	Heather
<b>1517997</b>	Cfj1ym6qa5Y1Y46Ca0zJag	Rob
<b>1517998</b>	Cpv_sdgTCyzcyEKxgbaAJw	Calvin
<b>1517999</b>	UWMDI0XaD84O9OtpluYatg	Leonard
<b>1518000</b>	ODDdIAR030HIVyOWI7HQgQ	Lu
<b>1518001</b>	3bzBocdIKHF_AoCa2vw6zQ	Michael
<b>1518002</b>	8P5DNRdh-fkd1i8sCcNoNw	Steph
<b>1518003</b>	Jc54w6U_jM82SbwrqDs7Pg	Max
<b>1518004</b>	MAO60ZwRnS6KjLmIW_FsJA	Zayra
<b>1518005</b>	rjeQSMRSsMRqVjINAOWL-g	Suzanne
<b>1518006</b>	xYTOWlaX8L9iwJcyPuGdvw	C
<b>1518007</b>	r5JeLpkkvVuvy8x_qb9l2A	Judy
<b>1518008</b>	nWGHSukw5OFnxFmjOgBE4g	Blair
<b>1518009</b>	ssu_un4Tb6QuZT-LmWUKFA	Briln
<b>1518010</b>	mnUWQQK52D2Ok9YYoHFLgg	Matt
<b>1518011</b>	sEa0RmHyvZ9tmD2wbh2fkg	Susan
<b>1518012</b>	6k80haJKxKjwzRK-C5_Ilw	Leona
<b>1518013</b>	aTffDrYtXN-d6YUcqmsvBg	Dar
<b>1518014</b>	YsMUgw6Bcv_BpdDHxZRucQ	Aaron
<b>1518015</b>	N0_ECu2HqbBWIWwGnaUWew	Patrick
<b>1518016</b>	QWUajxk4uGKttSqxshl4nw	Rochelle
<b>1518017</b>	ydgFUB4Uh9nEQ-BEtujSmw	Lincoln
<b>1518018</b>	IOJxJ8QTJ7gE91QxMnQIFg	E
<b>1518019</b>	bujlH8QnpDNpFYB44IaHRQ	Dell
<b>1518020</b>	uSHGMr9Y9TOfHUTpotYjZQ	Sunshine
<b>1518021</b>	_S8QKjrjTK_bEtxmAOAyyQ	Steven
<b>1518022</b>	zQ2lfs77Kfsp1Z-8Zf5BCw	Gabriel
<b>1518023</b>	qbJDN9f0bxHs-l4NVgox0w	Vladi
<b>1518024</b>	0yNOrfz6p27tKVMCjZt8CQ	Lauren
<b>1518025</b>	fuhZsyKG8Wj3FyrwoQ81cg	Carol
<b>1518026</b>	wRqmS9VB1sVeo51Dk58XAA	Honest
<b>1518027</b>	0WCL8nvod47vKUHFwvaRMg	Patsy
<b>1518028</b>	yT6ui6n67wtRYsavHJLgRA	Angeline
<b>1518029</b>	An-FGyk0604ciNu9e0gfeg	Martin
<b>1518030</b>	S-_1fy7keDWZQpfu-tnPZA	Mace
<b>1518031</b>	ncpxyzJE1O9Bk6EthPqUkg	Lauren
<b>1518032</b>	x6ce4xw9v1WEvNvFQcMHZQ	Tony
<b>1518033</b>	lq2miDuqeAjVFDgwe_DvZw	Ambur
<b>1518034</b>	b9d1XWUkK-18kDpS2G-54Q	Jennifer

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<b>1518036</b>	AM-pqxtOHYyqEy4kiZlpg	Ryan
<b>1518037</b>	8kUoJrYHfzuA-dzOzeFouw	Megan
<b>1518038</b>	GKU2FbM8o9strYPJFXI9FA	Eugene
<b>1518039</b>	OYTIUrbdSgPvV1uAFyTRzg	Martha
<b>1518040</b>	QXpbyvuYxYoO42DkhhjO3A	Sebastian
<b>1518041</b>	la3R1dpgAn3W-x9VFfllhg	Griselda
<b>1518042</b>	9qSoAuNY1EaGY3YyOsacIg	Jessica
<b>1518043</b>	UFnAUBEX7yRAeFH8DQ6nWA	Adam
<b>1518044</b>	K2Wzo4XxTkDPrx8blAeFGA	Dana
<b>1518045</b>	WZXqDI0ykZKoch3bpe3nqA	Marc
<b>1518046</b>	LP2k3-3ou08EMTBMsOi2Vg	Todd
<b>1518047</b>	EEQEo2yTvZrhKKWBFVBoCQ	Morgan
<b>1518048</b>	hQ0oRGSxMS17prwqWtXluw	Tyler
<b>1518049</b>	R8eprMc9qoUAhDbYPiQXmQ	C
<b>1518050</b>	Wlna5iaq5fw5JQc3LxGptg	Brad
<b>1518051</b>	DuKJpUN9-8nrWCSlyKVMzw	Mike
<b>1518052</b>	xPDI1uuasMLBHP9nO5E8Aw	Leslie
<b>1518053</b>	1A3j5uzJdw_NH_nqGT1PBw	Kylee
<b>1518054</b>	YqNMcSyzOdRIIBa_OVDP9w	Mellissa
<b>1518055</b>	UZFMDw2GLNdTeh_Tt-FS8w	Jeremy
<b>1518056</b>	PC2uKOvGO_YR8HMSvCJpRA	Jim
<b>1518057</b>	5Km0nvseeEwuZSQ2b4niew	Diana
<b>1518058</b>	mO_Q3xphzZrMcsNyGNS7Ag	Arturo
<b>1518059</b>	XxJELp000TiKpR5uTg-kmQ	Shonda
<b>1518060</b>	E0-A-nV9uJR4DaSr253Rmw	Isabella
<b>1518061</b>	6ZDEUIhsJa3B-hvPn23ORw	Jackie
<b>1518062</b>	Mht6QDJWYVO2gE__wbRc-g	Dee
<b>1518063</b>	X_wup5ahnEhGwB6y2OmEjg	Kristine
<b>1518064</b>	vtalLUYSVhGrg9Cb0FwiBg	Michelle
<b>1518065</b>	Yw3vnKGZL_FqA5H8io978Q	Amanda
<b>1518066</b>	rLocteAqdY-plGH2retUyg	Kelly
<b>1518067</b>	VZ7h6bm8Fc9inHni7_KQLQ	Erik
<b>1518068</b>	UAz48qMQ4Vlanptj697OOw	Deb
<b>1518069</b>	Ozty823J3eZ_hWtiOKc4gg	Joe
<b>1518070</b>	GQjktuHNBmJ9UuSuVgwiaQ	James
<b>1518071</b>	v7M9I5k03CuN1C2l8QSvyQ	Nick
<b>1518072</b>	PNksW5ybtRVVHtJg3G6QKg	Joe
<b>1518073</b>	ebU9UDCVAqrBAexyUJF5kA	Lori
<b>1518074</b>	1Lh1ZVjBeliwP4E3CDb1UA	Tom
<b>1518075</b>	XTGY3lyh23lbhf1p62HfUQ	Paty

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<b>1518077</b>	0WBntcyqQVA912hSJOJtoA	Dean
<b>1518078</b>	E9RO0MJ21S1yOS_Kf7ql7g	Robert
<b>1518079</b>	ynTB0wce92HFOSMwMnBDBA	Errol
<b>1518080</b>	tXQTGAJYZVRzMypFn0hqJw	Dave
<b>1518081</b>	4pYFHindebon7OsRtsdgcw	tommy
<b>1518082</b>	xmucgQIBMR6_NwOqmSRFLA	Heather
<b>1518083</b>	HF0IRXuGf3IFxnn9VvcCwx	Robert
<b>1518084</b>	SuUJNUwQpq6COUm5Ljl_IQ	Crystal
<b>1518085</b>	rXw4In4EcysT4vSIIP4w4A	Nicole
<b>1518086</b>	bMPTcNtkSUJW7nzaElprEQ	John
<b>1518087</b>	zIRrJJ0NnCx33Yn6F9SMqQ	Diane
<b>1518088</b>	cAsJOcEvirEiPGdJPbvJBg	Jeff
<b>1518089</b>	CddVq3YPIfYm1t4m000qsg	Vince
<b>1518090</b>	4oYEAJz9_eg3Y8TiJZLc2g	C
<b>1518091</b>	K_EvgT20UD5Bnykhd4sTUw	Sean
<b>1518092</b>	LlkyXIHxKza4jsj9NWUtSg	Lani
<b>1518093</b>	U2E4aVOe0WYm-aJdT5Syyw	Baron
<b>1518094</b>	R47m9sxyhzvOqrdObiEkMQ	James
<b>1518095</b>	iW1q9DUQzEjOe6yRIKfdhA	C.
<b>1518096</b>	1ZtvAwc9i-Fr5mzQfCN_qg	blewmelon
<b>1518097</b>	QqDgcJzavTW4GZ3XZar80A	Almel
<b>1518098</b>	4xfUt9O6pASTWbhXe4uvCQ	Rachel
<b>1518099</b>	KpkOkG6RIf4Ra25Lhhxf1A	Ira
<b>1518100</b>	CLnJjLA1UUGpnalaoOTWcw	Shea
<b>1518101</b>	ng8ToWkPbYN2QQd8xVgTRg	Jeya
<b>1518102</b>	4xV4RZ5UQ2T8jhzPFxRCrw	Barron
<b>1518103</b>	KqJ0ZQRD2dJGQ9II0sTS6w	Michael
<b>1518104</b>	Y5-wycB3KvBallFYEJgigw	Jenna
<b>1518105</b>	2si9qG7D6ljJEI35UtV6Ng	Xavier
<b>1518106</b>	rpwg3VrLFayj0FAIrrId7w	J
<b>1518107</b>	k4E9KYqWD2q4hxDgyXT36w	Sandy
<b>1518108</b>	n7D7pBCoPheC73qrT6hMyQ	Sarah
<b>1518109</b>	oNdWku1aXR_AgUjOFhkFXw	Mary Lou
<b>1518110</b>	kACs834HCSGFwwcaSGNYyA	Amy
<b>1518111</b>	FMKvjyGSTf-wYrBvK3Fhxx	Jennifer
<b>1518112</b>	SjgnK3vlfO7ouDG8JRUUXQ	Kerri
<b>1518113</b>	Z1nliUnDkq8ZhV1xr57Plg	Das
<b>1518114</b>	JzEivLMH9ordTO9EI9fpUg	Kristin
<b>1518115</b>	ErtfeQhtXbV3ccFWqxGyqg	Cathy
<b>1518116</b>	m8jSfgVflpL5GUwuWIR2vg	Loni

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<b>1518117</b>	LSng4u5LnGnEgLqYp6dgnw	Nicole
<b>1518118</b>	C-uaST57XsYVIG_Y2o_w6g	Renee
<b>1518119</b>	GZbq2CuCNoVAhWzOu-shsg	Frantz
<b>1518120</b>	FSUvK5qf8NWB6DN1Gzqh6g	Frances
<b>1518121</b>	8cFWAHuBQpQlwxat4H5Mcw	Helene
<b>1518122</b>	nApACEB5z1qJa2R1f6yl1w	Stephanie
<b>1518123</b>	W1ZnrdDHd1oCF42jBd16yA	Daniel
<b>1518124</b>	qDSDgtH9Hza49zPe5SVUuQ	Bonnie
<b>1518125</b>	sb6rOYS8EX0xLIW2nYdUVg	Peter
<b>1518126</b>	yb_dY6mJPhaR2H_pTXhX_Q	Syd
<b>1518127</b>	q0tvzamw1ybExi7z_EPaiw	Elliot
<b>1518128</b>	wSQVI59NldFyQ2SDHoy7UA	Matthew
<b>1518129</b>	0uHw-AW2KIkJVwzCK7AZVg	Charles
<b>1518130</b>	5BIOXJ_vd6uKnGsYH0-oOA	Cherianne
<b>1518131</b>	mpSg9QDdVUKNeK2Sr96ylQ	Madison
<b>1518132</b>	DgxzftNcQaObBMEa4-7qYA	Diane
<b>1518133</b>	dRDn33c6xz2Yk7MqNC-6Lw	Duffy
<b>1518134</b>	0ac4LNIBxrJk-pxG0pH8uQ	Michelle
<b>1518135</b>	S_Cl1JxpvP2UErINBKotzg	Jerry
<b>1518136</b>	31wZQG1nKIVv4bxeuTJ8CA	William
<b>1518137</b>	zXjS_WshFNwu8sEns0tNdw	Tyna
<b>1518138</b>	nKNjeyc-fdF99dk6zK4zVA	Kristine
<b>1518139</b>	qGfqAyyPIWoFZ0JC6yClgw	Karen
<b>1518140</b>	kP7BZegnSiurXwfYvGGpDw	Lauren
<b>1518141</b>	_upJkCGmMlxPsEkY91BkYg	Neda
<b>1518142</b>	JDOEDdY30eMfRTjitEnMeg	Morena
<b>1518143</b>	iLfmWoSXID1t36mJOgQXHQ	Jerusha
<b>1518144</b>	60zMHHm6wpOFqCHG4OV81w	Khan
<b>1518145</b>	a8mOFGT4ycNL20TCEfkqaA	Adam
<b>1518146</b>	HLKhSv25-sJ3YE-OWL1xcQ	Helen
<b>1518147</b>	69VNRfJ47FgGnGk0Pv8rdw	Makenna
<b>1518148</b>	4fpV39jHCuVoJS4SX7q3Dg	joe
<b>1518149</b>	kwQ3BMAx-_cHmFEFH5qTfw	Jessicca
<b>1518150</b>	LHsZpDiSLX0Ru1QrR0O-vw	Bachtuyet
<b>1518151</b>	c-cVGZ2nMZYkcPlty31ACQ	Brent
<b>1518152</b>	3Aw_juO9mTtSr1rfqdA1zA	Michael
<b>1518153</b>	d2SkpTWNz5K2SW6N7edBDQ	Daniel
<b>1518154</b>	hqDoT3Px3OCzKe3EEPeeWw	Art
<b>1518155</b>	7yzcCtSezxNgniK5Z8cu6Q	Elena
<b>1518156</b>	Sj9TPijmOUwdp8CFq-vxVw	P

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In [75]: r_data
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Out [75]:

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2	jtQARsP6P-LbkyjbO1qNGg	LZp4UX5zK3e-c5ZGSeo3kA	msQe1u7Z_XuqjGoqhB0J5g	1.0	
3	elqbBhBfEIMNSrjFqW3now	Er4NBWCmCD4nM8_p1GRdow	msQe1u7Z_XuqjGoqhB0J5g	2.0	
4	Ums3gaP2qM3W1XcA5r6SsQ	jsDu6QEJHbwP2Blom1PLCA	msQe1u7Z_XuqjGoqhB0J5g	5.0	
5	vgfcTvK81oD4r50NMjU2Ag	pfavA0hr3nyqO61oupj-lA	msQe1u7Z_XuqjGoqhB0J5g	1.0	
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8	EAWh1OmG6t6p3nRaZOW_AA	wcqt0III88LEcm19lxFFyA	msQe1u7Z_XuqjGoqhB0J5g	4.0	
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15	XqNDR54eLDLrFzwo4I4dVA	5um5SX-Lbgik5dwUGe2jFw	eG6HneK9zLcuZpVuKcsCGQ	4.0	
16	0bjFYstj8USMzEV4ZQldjA	VKGvSe0SmYcFc5PqjbxLDQ	eG6HneK9zLcuZpVuKcsCGQ	5.0	
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22	VyVIneSU7XAWgMBIII6LnQ	F1UHGw4-6OYyvFFb-E4LMg	5ngpW5tf3ep680eG1HxHzA	5.0	
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28	7AIULGZl1pHt0imODsqdkg	UaHgsL0xS4UnJ_iKqeOk_w	FjH3TH8OvHGLNEbzdEYIng	5.0	
29	th4pZ5Lkollkb1Vmu_m2DA	c4zzAD1S6721Fh-acCBy-g	FjH3TH8OvHGLNEbzdEYIng	4.0	
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31	cP8ErpZfRzdVR5Fvks-pnQ	-CresnnXQShrQ85Ogm-Pqw	FjH3TH8OvHGLNEbzdEYIng	5.0	
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33	piHAFVLQHEFv67HVyndrkA	-4fp5CEEcTCB_ZsA9VZs2Q	6kEzTjPyrhAS_GLTbjnRyw	5.0	
34	LFxa9cAfKY_OIALN8sArgQ	HkSebQqJmaCpodldb_S6lQ	zx_Op2OAOM_fRic9tU-jqA	3.0	
35	SpJYus_184M2TdT7t52rIA	s9cpVj40VR_yl0IXbZQe6w	zx_Op2OAOM_fRic9tU-jqA	5.0	
36	7vxm0G4g857HzRqqpeu6bw	O-I4Y329P9FND7skkMCdDg	zx_Op2OAOM_fRic9tU-jqA	5.0	
37	RyTEGJz5tG7zC73BdXt-cQ	6IRnO0n3QdkSGIJLUQb15w	zx_Op2OAOM_fRic9tU-jqA	5.0	
38	7xA6iSP0Ndn08tpBFQtUKA	YDJDfKnx6VpMMo4EBxycGg	FCtoTo9zSH1cSAkascfEHw	1.0	
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42	awgoBwuhzILGKElverTGjQ	5bWN_IN8MQGjJ6_ZIXffDw	yyPHK6khPa4-Erv9U32x3A	5.0
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50	OX0T9dWI8b7meu-ljTo22A	oz66Z8p9Etq0WbcZVCmm7w	0pf5VuzE4_1pwj5NJHG5TQ	5.0
51	px0VdZdyTaclveb1LfV6rA	-b9UM6rX9AVj3SvshFdmiw	0pf5VuzE4_1pwj5NJHG5TQ	5.0
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76	XGLGvB8S6-Anmt7gZkPLkQ	r0dp0LMAanhzQDoSn3tleBw	0pf5VuzE4_1pwj5NJHG5TQ	1.0
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79	yz3KtngrF2PQrif8JW7gdw	SLA1YP9doUc8h-6Kd34QmA	0pf5VuzE4_1pwj5NJHG5TQ	1.0
80	ZmLYXTXXrrIA9qMx8rVsTA	gPlO1VYWzt6jp4u2mzVzsg	0pf5VuzE4_1pwj5NJHG5TQ	3.0

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87	A2pHOVp0zh7grb1bbZxoBQ	JvCsQXCKtKybpkJd8oSimw	0pf5VuzE4_1pwj5NJHG5TQ	4.0
88	gxEkxkqQrrK62DJnXxXDLg	tTc81A4aHV4DDtkFVG8RNw	0pf5VuzE4_1pwj5NJHG5TQ	3.0
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96	-ed0Yc9on37RoloG2ZgxBA	smfJ-FC5iokX7AbGbTMD4Q	Yy_iGXxLpL6tYDQoE-6XVg	3.0
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101	ixAh9crlLnJ9tM8LhWFhkw	Fv1cqZl1JShSztJWYkTcA	Yy_iGXxLpL6tYDQoE-6XVg	4.0
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104	s3i73_ttk_F33AEdqMr18g	_qlXejLYgWGYYtcGcMw1eg	Yy_iGXxLpL6tYDQoE-6XVg	3.0
105	VmspRdKauEagr8YX1oL-Q	5sXSVB7QlNix87XkhNSs01A	Yy_iGXxLpL6tYDQoE-6XVg	5.0
106	pR9HHzbUdZ0Gt80_3NmmQw	sJybnuOiOY9yb3WwdQuTTA	Yy_iGXxLpL6tYDQoE-6XVg	5.0
107	xqbvqZHNyJ2qExHdizzd0w	BC2-Mup-2YPJPcihNoa9A	Yy_iGXxLpL6tYDQoE-6XVg	5.0
108	JPfi_QJAaRzmfh5aOyFEw	mqhCY5oLA1LXP6gZ3JQDTQ	Yy_iGXxLpL6tYDQoE-6XVg	3.0
109	SmizR7MLt-558FJJQRBB0Q	2Hk7DNwu3rb2jKHaFfPyCA	YHWsLBS8jZiPjKHMFOaAA	4.0
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111	qhJ4GDULYbdb_sctDgbZgw	Vtd6Tqm7YMfRTBFLtZloOQ	YHWsLBS8jZiPjKHMFOaAA	2.0
112	gl1zQmiA8MUHmLL2wsCdVA	ZOBExhOeMnncqlJfKumRA	YHWsLBS8jZiPjKHMFOaAA	3.0
113	OR6iRk0vrMzE-1gLg-WYrw	fWdhtaQld99jXB-N9yu1tg	YHWsLBS8jZiPjKHMFOaAA	2.0
114	qAg8GkN9rforFWmGxBqVqA	t98usw-bvob9JqMJPvvnsw	YHWsLBS8jZiPjKHMFOaAA	3.0
115	VhQXJteVrG3L-wq8HIYFqw	0RqkBjJegJpH7thxPTL30NA	YHWsLBS8jZiPjKHMFOaAA	4.0
116	CN5nuUQod0f8g3oh99qq0w	TiicMquFOQFF7_-SNnyBww	YHWsLBS8jZiPjKHMFOaAA	4.0
117	yTWSFoGjkK6pl7kjm8f0Dg	OV_95Q6-zyRAN2hGDAXX3A	YHWsLBS8jZiPjKHMFOaAA	2.0
118	HOGdBz2w9VZbw2yyM-WA3g	ujMcxx-EzqTHht2ZtsiQ1w	YHWsLBS8jZiPjKHMFOaAA	5.0
119	d_Go5TsiFMIRtCE6XS8Sjw	Wcquaa90-kUULSFeV38hFQ	YHWsLBS8jZiPjKHMFOaAA	4.0
120	wVc3g-YfyDvkOLDecpr4DA	RCTkfcQKczUhtV1Hz58jA	YHWsLBS8jZiPjKHMFOaAA	5.0
121	qDguZJZSYPOzq-je_EqO3w	BP6XZmb7ugvc1De9mvoQpA	YHWsLBS8jZiPjKHMFOaAA	4.0



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171	NYpmDzwzAQyv0gQG5gBKbw	oZ5iRUKGiJ_r27Z9pJKR-w	YHWsLBS8jzZiPjKHMFOaAA	4.0
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202	idU2ytgY25a2TCVFyXZgjg	SIHJXZTUERz2vFh543KicA	OQT9DjfbBrzrwoEdVJjuYIA	4.0
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238	YE55rilHyVuC9NfkcU9eFg	4f6eWCohAq7PO6pQClogtw	OQT9DjfBrzrwOEdVJjuYIA	4.0
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240	Er1mJJbrhh885LikNsgqfA	DEsnzui_PkDmiglp3s_fYA	OQT9DjfBrzrwOEdVJjuYIA	5.0
241	IFXsOJvq8BaaLjGij639Ow	yblTpT74qBUCw1FJV3Gg5w	OQT9DjfBrzrwOEdVJjuYIA	4.0
242	yt__7tIJA3qUzwAa-okFPQ	7r2k8QHpUuJwzrS94SdZ1A	OQT9DjfBrzrwOEdVJjuYIA	5.0
243	Ex1-tKIqa74J0usZVHxYEw	0L8hqmX03h3CsNvsp4pk6w	OQT9DjfBrzrwOEdVJjuYIA	5.0
244	D2ojX9bvE0_-alj9BhdZZA	pQ5UfMv2LbPHHor687IXCA	OQT9DjfBrzrwOEdVJjuYIA	4.0

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245	ogO3Yh_PgvBFcfw5f8g-g	GNmQhwPNIdWCKHW0RaEGOg	OQT9DjfBrzrwOEdVJjuYIA	5.0
246	1FIlbmN4aNJuxsGK0shnfQ	BRUaWr8AXP2R5o06yc7ktg	OQT9DjfBrzrwOEdVJjuYIA	4.0
247	uKP1_uDGYsSMI2_5XU8fKg	AHfsjl3uEIIHr5hr1WTV6w	OQT9DjfBrzrwOEdVJjuYIA	5.0
248	VeFqptSzekFAC3FZOpi81Q	vsgYu7KdwsWnmP8kg8aBYw	OQT9DjfBrzrwOEdVJjuYIA	5.0
249	CJty_bUZVJJJaLFcTppxmzg	jQQueiU5PKrUqXD5qy4c-Ug	OQT9DjfBrzrwOEdVJjuYIA	4.0
...	...	...	...	...
5996748	bjCWqLteGWCCJvU0Y9EyzA	VXSldjXyiGKeb6DoXF7TjA	alaPtGTIMOyAx9LDLE9pzQ	1.0
5996749	JezHN-9KKLTMbojq00VP0g	uVMniKXchuxem4M0Zt_bBg	alaPtGTIMOyAx9LDLE9pzQ	2.0
5996750	VTkagyGa5G9BEVB5q9uipw	DxppM60AnOetnfKs-Hrd5A	alaPtGTIMOyAx9LDLE9pzQ	5.0
5996751	yMS8XMDf5vZLtE-rNZa63Q	e0N_UHi_cgUOXn2VfGemqA	alaPtGTIMOyAx9LDLE9pzQ	2.0
5996752	sHuBPTQuQ3tOxEcUT5JYVw	n5YpzJuL74zwYOtvd9t3dg	alaPtGTIMOyAx9LDLE9pzQ	5.0
5996753	dSkbWNYlVdrms-VZEiSbQ	c4QCeh2BCMbsQIYAuiT09A	alaPtGTIMOyAx9LDLE9pzQ	4.0
5996754	NyLYY8q1-H3hfsTwuwLPCg	8sL5HBNMt4UE2CArUo438w	alaPtGTIMOyAx9LDLE9pzQ	5.0
5996755	BQasaL9XWUhlFndmKYtMHw	VmVW3gdwQwgX4I06tZ3Q8Q	alaPtGTIMOyAx9LDLE9pzQ	1.0
5996756	RJSFI7mxGnkIIKjJCufLkg	GqV9-8GpIv_tMI8XnWQ6tw	alaPtGTIMOyAx9LDLE9pzQ	1.0
5996757	_DOjM_VGK-ojgoY6esOdg	02W7YD-Zvu_q-Ag3bL55TQ	hxxEwh5-g_Y8L_DEE12GGQ	5.0
5996758	eZDXz_RylvdD0tHEA8I0NA	viZh2wAi9Q32jXsnjmNGog	hxxEwh5-g_Y8L_DEE12GGQ	5.0
5996759	odtLH4HI7i0TSbyja6qrQ	H07pm_lyk3X60As5a0btbQ	hxxEwh5-g_Y8L_DEE12GGQ	5.0
5996760	eN91Kgveinly7NQ0rJZgzg	-Vohxll-GcGqPif5Sc8dfg	pMklRHD4FVOMRfHvk1xrqw	5.0
5996761	qHmxBsrtA3YJ8-ET1TSsPQ	0DiS7CsOYVs2oe6eK14ctw	mw4DL43zEdwfgk-iBSSNBQ	5.0
5996762	Zq1yNHUirFTZdVWf4YQCWh	GpxXeM6gT3T1zG_vMEXQ_Q	mw4DL43zEdwfgk-iBSSNBQ	3.0
5996763	0rNtenZamAH-1q-2qO9xLg	R0xrsWpOiRmThT3m6HOACw	mw4DL43zEdwfgk-iBSSNBQ	5.0
5996764	zFTMtaxUuMwmNzbrk8j0tg	2hmSaQIsjGDx5X8agXp3gg	mw4DL43zEdwfgk-iBSSNBQ	5.0
5996765	6sKaAF8WhWyyCjfZr2Rfsg	xxPgcf76P-ijlu0CR56WrQ	mw4DL43zEdwfgk-iBSSNBQ	1.0
5996766	v49C3TRAeRecPjc8u1fiPA	_ICVBsxyy3K4SF3nYlXNKg	pxKzTNdLC4tM-gB5uppSNQ	5.0
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5996768	rgZjPYSDzTS4xSTrx45PLQ	vCdD9SGio4jK7VwB_k19AQ	pxKzTNdLC4tM-gB5uppSNQ	5.0
5996769	E-HDevNTu_UIKlx8MA_RMA	HZxq0w7BUyBMA58I31uJ9A	NVuTwmNIffKS98BJmfpkaw	4.0
5996770	uE6hI5_i4QVq12xU99xtqA	TpP0IHrwe91VBykf0-Po1g	HKxaki-PQBIQRHzOdEqE0w	1.0
5996771	oaNml4cV5D_MHMOVjNS-Bg	HvqdhYn-7Sj2yLQA1jbWHg	ZvzEjbEOBoWeNKeurEk4Hg	5.0
5996772	qb_NiLFUCw_XA3cPNrQwAg	mHZpKIZ52zakuwi-YNqFCA	ZvzEjbEOBoWeNKeurEk4Hg	5.0
5996773	0rjU_WK5HxoH1fluEpTpcg	P2pTbmC4Gx6j1YdpLEj6Bw	ZvzEjbEOBoWeNKeurEk4Hg	5.0
5996774	bupMXFUaZfranBLdaVcRww	DzbTDJHwTVuNqKEXcgjQQg	jPsbUXJbrbbIGostbJt6sQ	5.0
5996775	OA5Li3ySzhrbG_WvD_QGYA	JdRDVcHVAUWYJ57igLhMQA	jPsbUXJbrbbIGostbJt6sQ	4.0
5996776	DN6pcgt3sHzz8qo67MRLKA	TR4I5G9cV7nooPsGoh_5vQ	jPsbUXJbrbbIGostbJt6sQ	1.0
5996777	fBtBizbJDIcXfAOB8GmFsg	dch2ojv1TVpZBI2q2hxsxg	q4Mmo7rW-o4KqyBTUpvuog	1.0
5996778	rCMoaqUgt-ADv-jCsfo2mA	0co6symNt84aGwDZPULvtw	Alf3fEaBWKNkcTXkvbm-Bg	5.0
5996779	iH3ml3QpCX_-QylL4dVKlg	m8IhmFbWIEZBILxRmXztcg	Alf3fEaBWKNkcTXkvbm-Bg	5.0
5996780	bl9_dtXS9qN0Gmi7YbRm5g	pLb9vRUKUWju1eU0_aB3tQ	Alf3fEaBWKNkcTXkvbm-Bg	5.0
5996781	DF_nCyzopDMQY1d-V2fv5Q	h2He1pNwUBeO5MeCRWpCPQ	roKgLNyvP4IUTXy4_Icjlw	5.0
5996782	OD09pm-MzyinigAvD5KoGPA	JdN6mR3tWaRg7UPs7XA-xw	nhLxTCsBrxmvhzew8NcPvQ	5.0

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5996783	eDlgbI0Qg_mml-Osvci0gw	LKm8d7pyE_cJs5P9mU_9NQ	nhLxTCsBrxmvhzew8NcPvQ	3.0
5996784	UDs3bbFKFA5TfeFXJuPXxA	P_c0hUd2_9YhIxGATwJGzA	BILLiMcjsl9G0SaLwzT_vw	1.0
5996785	TQFeyV5LI449uQd3JprHcg	21TDIKB4Olal9PyQrpa5Vw	BILLiMcjsl9G0SaLwzT_vw	1.0
5996786	otfjSc1SWe5L28VRTkuEFw	bMHJSe6KXOdZEGz-BOYofg	BILLiMcjsl9G0SaLwzT_vw	2.0
5996787	wZXWWB_XBYfEV3D72m7lpA	a5VVCYDdTWKmjswl_yxB7w	BILLiMcjsl9G0SaLwzT_vw	5.0
5996788	hCfp6jF1yisOfwYO-88e_g	Rf21d4psMvdqZ4QtdRGdvQ	JAILhqH3x4kEhiHk_QimnQ	5.0
5996789	eWX0XKkick8Z44QGIsO4Lw	O2qHGgkYPfoIKuHFILmauQ	JAILhqH3x4kEhiHk_QimnQ	5.0
5996790	bmxloH_SxKJbG64ROSZtbw	1tms-ldFJSIfklv0Q1H1sg	JAILhqH3x4kEhiHk_QimnQ	5.0
5996791	4zI9OsL8hY1FqVKRIU2bgA	BtpZZGUW7kQ6nbU058-uRQ	i1J0is5AZOL35f7JMCBMDA	5.0
5996792	z7GAft_JrFNmAH5xbVeYSA	Walqzjh5Fj7rbk8cVxOKeg	fRDm9SfyEQ0g5uhMnPuuw	1.0
5996793	zBNlwx12UCQvR067HnSZDQ	qqeaA-Yoilr-S2MRecfI4A	pCrd0QDPKBQ85z2FKJ9GjA	5.0
5996794	Ger5Otp_edlljHqILgE40Q	dlk_NWv7pcwRKnCsq-EXrg	CxIPb7Lv0p-R3Kr54cczww	5.0
5996795	m9K1lO9OjoSApYqQ8uaxw	m-5y3fDmOXbXDWUGa8XVWw	CxIPb7Lv0p-R3Kr54cczww	4.0
5996796	zP4AIAAtAXfl0YK8TJmIIlRQ	M6e74nb_Dow_plIG0Dv8TkW	CxIPb7Lv0p-R3Kr54cczww	4.0
5996797	lpD3xIYuVaQA8xRSIKwn-Q	NEuH2-5F3fXxlkjHVprM6g	CxIPb7Lv0p-R3Kr54cczww	4.0
5996798	gV63aLTQ06Nff0GzJ0tcUA	ZTZtr_oL43tNxh76N9yi4g	zrW6BN3MWBBD-VIYBTqsZSg	2.0
5996799	0W4lkclzZThpx3V65bVgig	z83X78FAurlJi3KrPD9SEg	lhvhRilxEgK6VcygxtKQ8Q	3.0
5996800	iCQpiavjjPzJ5_3gPD5Ebg	HibiYgdElligW6XXLxxvog	SqeBzCpSehkkI_UbrMmktw	5.0
5996801	pfmr8R3WH8RXqW0W6D8ffQ	Uqfi5-qNx7xNxjv6B5nzTA	SqeBzCpSehkkI_UbrMmktw	4.0
5996802	vnvQ0ID9MDje2DFde9PKQA	VBVErA6lPjbmA4eYtAjQFA	SqeBzCpSehkkI_UbrMmktw	5.0
5996803	nVAJZ6BJ9PPixDXn976R6A	0lx9yMU1F_MTXTj79sTflA	SqeBzCpSehkkI_UbrMmktw	5.0
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5996805	11eJ14AaUcUVdAa8LXYoDw	OTNq1C7aKDFtEQEdHblkAw	V2LfRoD_Ws-qAxr2Kria-w	4.0
5996806	b9b58YAzTzgOZDREH_cDfw	pFquEMLXpl5FqcqN9X4jQg	V2LfRoD_Ws-qAxr2Kria-w	2.0
5996807	NqCHqgF_FY0Aw9gD-Z3ABQ	8vgalRlFwC68nlqyvcXrQ	V2LfRoD_Ws-qAxr2Kria-w	1.0
5996808	inXu0sfSxf7PF4GvWTfbEg	th7Zb3RnFnPtcim-oQP9Q	V2LfRoD_Ws-qAxr2Kria-w	5.0
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5996810	iSRXy3SVAAoixg6aXPhYyg	6zdl_7i5fQRYI58J1eDxew	V2LfRoD_Ws-qAxr2Kria-w	1.0
5996811	wJ-961JWdVhJXhWQf4Jlcw	ihdwO7CVU0s-jrjCpl039w	V2LfRoD_Ws-qAxr2Kria-w	1.0
5996812	NaZVUOzqk5b-l0mlki-9Og	3KhtGDymxq7PyMapAqD8qQ	V2LfRoD_Ws-qAxr2Kria-w	3.0
5996813	99kGGQoig4YaRi-52VtqMA	TdIDu9W4wrcDnP6ufURcCw	V2LfRoD_Ws-qAxr2Kria-w	2.0
5996814	U7xPpLlet56Zhi5GDZNIImoA	bWzcuWW5lMgsS1T-fF5P8Q	V2LfRoD_Ws-qAxr2Kria-w	4.0
5996815	L_ZLtfHvfzfoNVQ0-okTXg	xzUWBj8QJ7bd-j2uNw_Jgw	UwQVU5W40yIf_rPmRqzJ1g	1.0
5996816	dJWWqmoqZapsKftvExjwXg	uLVvPOUiqK3PRGd6o4lrlg	UwQVU5W40yIf_rPmRqzJ1g	5.0
5996817	aET2kncA1LUKSL3OtKixFw	_5-hLx7PqyTr3TLXYmVbKQ	-uT2ah3HQmxs74qnnnE5_g	2.0
5996818	GNa1y5-b7u_5ary42o8-LQ	4hib-WQWG0zbwa3NxPAdnQ	x5GG_pGk5kPGgQBallt7vg	5.0
5996819	QtyvwZi6JiloDNEEH_ZxLQ	7yGa__qi_RknZG-W8Wki0Q	x5GG_pGk5kPGgQBallt7vg	5.0
5996820	2wCzZUwcqRRBrAtBBYxnog	mq22VPmjbJSIOIVX8ZTsra	x5GG_pGk5kPGgQBallt7vg	5.0
5996821	_W_hRQRDEqVdO1WKGa-DQ	qpDIOL8N2Wd5jQlBuPWAlA	x5GG_pGk5kPGgQBallt7vg	5.0
5996822	nmBU1vK_3pkF08guLEoUjA	-74eGvURCaWHcrV3e7Fj3A	x5GG_pGk5kPGgQBallt7vg	4.0
5996823	im2J4GZZdEI7s4o21D7rgw	xLkRpcz6lR3A0QBIYnmguA	x5GG_pGk5kPGgQBallt7vg	5.0

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5996824	k6EQhoIZjA03b-O6foAPCA	cGHkyE3vbpdrd5X1PPR-SsQ	x5GG_pGk5kPGgQBallt7vg	5.0
5996825	Bj8SZok_fBDxzHYE4Z_0kA	Q4hYzyXcb9glF01GK5zfMg	x5GG_pGk5kPGgQBallt7vg	4.0
5996826	RBiJRcNC7NoDf-XYMFrCBg	1LU_OFIKTkJa05QE8fv6iA	x5GG_pGk5kPGgQBallt7vg	5.0
5996827	6b5RLz7szHcSTGKjvKWR_w	_50ZKFRJXMRDRdwgPDcm4g	x5GG_pGk5kPGgQBallt7vg	5.0
5996828	oopfFjmzxgkDB0tt160nkg	2mRRhyddcLdR0yj3NRAZ-Q	x5GG_pGk5kPGgQBallt7vg	1.0
5996829	oaTbZh8B-IVFEwbzJcIOBg	RnkHxC25SdZIFdGDFLJ0uA	x5GG_pGk5kPGgQBallt7vg	3.0
5996830	92KZBnzEki_70Dh_IB_Vkg	Tnl8qsuf_ajmo-Fzkma8-A	x5GG_pGk5kPGgQBallt7vg	5.0
5996831	P4w7kxvrr4odvXdyQzXlvw	nww9JbZyCe-aX2znI-vPLA	x5GG_pGk5kPGgQBallt7vg	5.0
5996832	2jqUYcKMYZXnpxNTkORJgQ	i42Xg4QJFW7fEICjiEcPIA	x5GG_pGk5kPGgQBallt7vg	5.0
5996833	ebgCzdUOEINJirj6eFuXiw	Xla7GCuLE9_sFmUMDgjiMkQ	x5GG_pGk5kPGgQBallt7vg	5.0
5996834	kafUXRnfmQm3e_U14S2WbmA	H-HoCDau7t7sNmDBIce0zQ	eHnfjZsS3VhD4qX1NRadtg	5.0
5996835	PXShA3JZMXr2mEH3on5clw	QW3JOmN-QclvpDONv5oqrQ	eHnfjZsS3VhD4qX1NRadtg	3.0
5996836	fL-b760btOaGa85OJ9ut3w	FDgzcLEKb4XG4oF8EhTBHw	eHnfjZsS3VhD4qX1NRadtg	4.0
5996837	K0FtmxCgqJEBDNCyXyMX_w	EaWbNCUFtHbNoa7qpJv0dA	pS8Jxz0UBowp0feoSqeqlg	4.0
5996838	FLvAk3LSz57-jqzCFwxh3g	MJsZ-DkkDAg4Ow42Efc-CQ	pS8Jxz0UBowp0feoSqeqlg	4.0
5996839	TX6BBY9rXOrNIHZdGmbrlQ	RtEpoagMc279mwWICyd5Fg	pS8Jxz0UBowp0feoSqeqlg	4.0
5996840	3T0Erqk1MKtN58764yZMfw	Sd16pKZ7oXsTICfZzzAJyQ	pS8Jxz0UBowp0feoSqeqlg	3.0
5996841	59YbAeuz0isJtRNKATTkw	oV3Z-YqUYX5zLV5Mg9bT6g	VKkW2LzXSHNGyOR7BHnMoQ	3.0
5996842	qgAZPDQStZP_Y5XTiQ6UqA	3M_XPJfpA3cacVHpiJ7-g	U2CeQTrvsYdhSTghKNFHlw	5.0
5996843	CMbFXgYtrmsY4OAJkX-mHQ	rtAPZcZLm3N8h3p4BW8hbA	U2CeQTrvsYdhSTghKNFHlw	4.0
5996844	8nP8ghEpT6WFcM6tfqAaGA	OeXX2FYxMMiwlafJAY28EA	U2CeQTrvsYdhSTghKNFHlw	3.0
5996845	l8uMpQS8mxdayLkdbBG6kw	5ObteOTNCqR6lheiL7d7_Q	PCd2GB6DtgSARKAhXqrow	5.0
5996846	IGFTH0RfiY1uqK1eXoC6zg	xbQeUnmCvRPspxDuflr2Vg	PCd2GB6DtgSARKAhXqrow	5.0
5996847	pApEPv1-ApXee4GYymb5AQ	bF4i81-h_v-RmdrEOm8c-Q	PCd2GB6DtgSARKAhXqrow	2.0
5996848	ad0LjmuXhUGBxTSkve5LZA	7sKaReon_WIN5EVMC52nDA	PCd2GB6DtgSARKAhXqrow	5.0
5996849	YtUaJkgKc1pucwdSq_DQeQ	9-2_6OlvpPPmVD_hmswYA	PCd2GB6DtgSARKAhXqrow	4.0
5996850	vE_hWF21gmg7CWZX7H6HXg	xxXxSsaLlkGAIfh8bmUv_sg	FQrFhgbCOKc-hSR6r0ZxNg	4.0
5996851	1iL0ZmCINct2yORMvM1e0A	0Sv2rLaxUcdl5xrVWZZ6gA	-2Ztz2kuCx1jHPCTuhqGzw	5.0
5996852	xMR7KXEu_neOpqCL84v8lw	hglOoxiZ_myAbwQmrYJ8RQ	-2Ztz2kuCx1jHPCTuhqGzw	5.0
5996853	xGzKRiUAuqDrT9eYthGqKw	G9_8OTJUP2C56Snb8rP4JA	JE2-SsoGJXuJmJEWdbUGrA	2.0
5996854	hL4zk44cGQP8ixi4sMLbVg	NH2aKM7yCj4vZdH80CF8QQ	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996855	N5mcKKKdcmwirw1bFhE80Sw	1X4QTX3WkE_YwMWtrHkjGQ	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996856	QUQAxpzjx0A7_aMpwElidpg	4mdbp90D1OrKrHVv7xG1LA	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996857	3CBLxydJU6CFRMGhu9b-sw	Bs-LJS1afhHk0tEY96eCkA	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996858	XPLSNGSCIW8gR5BTcvyOhQ	fSEbBtk3nMBcfS6Ra3634w	JE2-SsoGJXuJmJEWdbUGrA	2.0
5996859	IEtpTFWetCf6xnzelmLiHg	bZufBID6EWygN4ByNixvzA	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996860	6We2O5X62J_gduXU7jvf8w	HKiBAPHHpfqiXe0JM68lnQ	JE2-SsoGJXuJmJEWdbUGrA	4.0
5996861	GU_bZ2qgcxVsj7f98z-1YQ	39e1vPurMzZB1daJQqN2-Q	JE2-SsoGJXuJmJEWdbUGrA	1.0
5996862	UdEmYONk2iJDY9lpEPAIJQ	YXyoZ5AO5DS3tAbyFjznWQ	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996863	3X-jhrbCSMv5hfUS02xdHA	fA9hcTQu0XsehBEs7eTGmw	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996864	vX5ma5Nwrzqwdz949AmVVg	FoL_OtYiXJD2X8Zzv7olyg	JE2-SsoGJXuJmJEWdbUGrA	3.0

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5996865	AnOb3EDRIwfVayPWddr78g	HKo4E7InyqwruzNQleOSqw	JE2-SsoGJXuJmJEWdbUGrA	5.0
5996866	-rCllox7pqN3xY7E3-v56Q	6R-sAFzQ-OJDw92pfKWNng	JE2-SsoGJXuJmJEWdbUGrA	1.0
5996867	JRo3APL5f4-TEkul-SoDcA	vwBVaKEKB6ozWc1q5fUQeQ	JE2-SsoGJXuJmJEWdbUGrA	3.0
5996868	oh80akfAAu0DPP1x18y2Jw	WXtjyTzTnFTTLrz23Qgedw	Fj7PELxHYa5crhHMEUTsig	5.0
5996869	qFAw6wHMMcr4ctF-ZdGhEA	81sRqQd1qnZMyLDMkbX4jQ	Fj7PELxHYa5crhHMEUTsig	4.0
5996870	SMPbvZLSMMb7KU76YNYMGg	nq7tGWen4AUTULenTDF9pA	Fj7PELxHYa5crhHMEUTsig	5.0
5996871	CymM3BP68hGigBK_5ap58A	n1DA6TobVS8AWSy4gfYFnQ	Fj7PELxHYa5crhHMEUTsig	5.0
5996872	LrBCULmDal38G7-UdGM7zA	P7kC9Z0N34W3sAzGw2ud5A	ER_ZPy4QoitJK9F0qUY0Bw	2.0
5996873	uUq0bMEjt202bMbRHkicNA	U8Bqp8f382p8d78IMDOAMA	_5FlmOonGUmbmgT61hGJgA	1.0
5996874	ePt0qmZgU-fjqMoM1M2U3Q	lyVx30vOvmCxOagDU_U_yA	IEkC8dYPIOzGDUBBL2KQqg	2.0
5996875	CRLvROAfgX-aKI7VlfPLfg	ShGdSdrfrJExgBmNmWoAkg	IEkC8dYPIOzGDUBBL2KQqg	1.0
5996876	LPnGdeEJyMMO02e02PqZBA	PSAXB8jU19xh4SA3BTIgRQ	6NXtVSpWnu8O-Niww58gFg	5.0
5996877	uGupeWqih0ylcCg8anM1PA	jmPdA6KeKCWWV6ukn0nnWA	6NXtVSpWnu8O-Niww58gFg	4.0
5996878	mG71gQ5HWI7ut9OCN6NJKA	cbOgU66-nb-75gT7pub28w	6NXtVSpWnu8O-Niww58gFg	4.0
5996879	Wxxvi3LZbHNIDwJ-ZimtnA	_q7Yp8Wzq3MigN_g2MJf1w	6NXtVSpWnu8O-Niww58gFg	5.0
5996880	g3t2AQQVT2tWD64Huu7xVA	Z2Amy721HzlB2GefuB-eXw	6NXtVSpWnu8O-Niww58gFg	4.0
5996881	VOAO6ip7GwK4McQZbRa60g	mZ4NOc8ktctY5GS48AtB5Q	nyrKpx9xOwEcCi_fLO3kVw	3.0
5996882	avkOlpsiBUFZMQhELpl3JQ	nTOVaiioKG9aQ5ub_zTWOw	nyrKpx9xOwEcCi_fLO3kVw	1.0
5996883	uLL2uKqYnPAFwBw11LzDUQ	qcrjHOrYncli0KMYAbE_Zw	nyrKpx9xOwEcCi_fLO3kVw	1.0
5996884	vyQD-pu9jFKRXWI9tt16_Q	rdE4eqjfnPc6KNml2gK0MA	nyrKpx9xOwEcCi_fLO3kVw	2.0
5996885	gx2yPrOJSwF1ApJYdGBWlw	lhpP9E74_GCB_SKp_PJGDg	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996886	0w3BdEOxvwKTPypwbN5kiQ	kzbK_93AWA8w_lo1W3-yGQ	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996887	Vh3i65akhsrrpPLnYB8A5w	mRPnNyAdiz-vYadDyrVCfA	nyrKpx9xOwEcCi_fLO3kVw	4.0
5996888	qmiHO-6T_KEfPC9jyGDamQ	aEAoxZn2h21E_OFjqQcm8g	nyrKpx9xOwEcCi_fLO3kVw	3.0
5996889	k8BqCejnaMlw7aoVthvqyw	43yVsgqs-wBac32ILQABlg	nyrKpx9xOwEcCi_fLO3kVw	1.0
5996890	YPK024huhY2np5hJ_5qWCw	RdtBCUx77wwZ0rensTdMoA	nyrKpx9xOwEcCi_fLO3kVw	1.0
5996891	_wnAPT7ehpybzQptYKNHxQ	3cpJ9HfPh6v-oLtAlpGv1w	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996892	u3nwislXMKKwkpHAXAarbQ	OK-XVi6mcuhQ5A7ColBsXQ	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996893	fcWkZgmzRsm3H4egzSrV_A	GSj0JWUIJbs8CAonUUavnQ	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996894	Cr4ipI-tr-R8Q0NilkWnKA	lvBJEJ6zClib9fjnYZ9YHg	nyrKpx9xOwEcCi_fLO3kVw	2.0
5996895	5CJL_2-XwCGBmOav4mFdYg	B5YpeY_SHetMyqKG92Lqsw	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996896	SAIrNOB4PtDA4gziNCucwg	Nn1RzyhMTzE9mwm-pQxeWw	nyrKpx9xOwEcCi_fLO3kVw	5.0
5996897	Lq9rYrwwVW5QDBYzq7MGHQ	QDtUpAkDhQdVNV3S1TIAvw	nyrKpx9xOwEcCi_fLO3kVw	4.0
5996898	yfxDa8RFOvJPQh0rNtakHA	Z_-1-2c17hCxQjU_HFYQdg	nyrKpx9xOwEcCi_fLO3kVw	2.0
5996899	osu1j_Lg8R9brpuMMn3a3A	VBLEilvYVRvCP6BWxoPkXQQ	0LJXM7Xi1tevvY68V9h_cw	4.0
5996900	F-NJWGBEGj_a-o_ifGACcw	TT4QNOMCYki1mvNmnpvnTg	RtTC5pKxiTkByTe_8LNUDA	5.0
5996901	KfaeDC-oPE6GTfBvdF9x7Q	UMWid0pKSaRo7iY2FuKKLw	VKnOOOnj7VrbbZKPsUnDx5w	4.0
5996902	VjaHHmV-rSkFaOAnU3faxg	1-0FOkIq_06vxJkL1LQzBg	VKnOOOnj7VrbbZKPsUnDx5w	5.0
5996903	wWpw4gbA9B6VWt85351TvA	ZSolri6iueMmj5LXpwwfA	VKnOOOnj7VrbbZKPsUnDx5w	5.0
5996904	yvqMh9kTv3Kx-tocc0DFBQ	YHVzcl_J262G1n9C78053A	VKnOOOnj7VrbbZKPsUnDx5w	5.0
5996905	CDLyT9EeaD4IIZmCCtTgHg	NYKyM4ZqZRlszZPJUq5_eQ	whGQN8LVi6pQqkuCioOXKw	5.0

	business_id	review_id	user_id	stars
5996906	6ifzvHFI3Lgv3CNeHV2hsA	U3GhD9DBRg3eSXk52aQ7qw	KjKat8hKE6dthzHGLNn0vg	1.0
5996907	QfG4JZvFoFpRbAxU2Fn-UQ	JweKqU5iyhXVxMNGYrDTdw	KjKat8hKE6dthzHGLNn0vg	1.0
5996908	53BSdnhzcCBfBH_6TgX63Q	wUtk6gmMcH63J2QsF4ou2w	KjKat8hKE6dthzHGLNn0vg	3.0
5996909	ajoeQHnCZTD8-8GqGLq9-Q	PHCrDPUPXMD3oUunQtbrKQ	UyDpNcErsWIk8ATEXL23Dg	1.0
5996910	IMvPJEEzcPoHdeQLu6_LHKw	2_leaZjwuZ3da2327R1VoA	MmvExV_0QeUQg1Ui0YG52Q	1.0
5996911	prcrTVScKNTfSu0wcle0DA	yYYUcrlJbXrPMkjmqmX5u9g	MmvExV_0QeUQg1Ui0YG52Q	4.0
5996912	wKA2y-F_fPcBDOkpbDB9eQ	oGicKvhvFOmnUUDd27L9hQ	OzZ7FWocL6XTozj4Ok4yg	5.0
5996913	YPavuOh2XsnRbLf0DH2IQ	21YHXT8DBaaieUGUKq5Vjg	QPUtjpbE9O_BbFe27YmtLA	5.0
5996914	1WD2WT0klJT7t-zL5ZmfUw	JdHhWto3mwQlHePpDnzkkA	QPUtjpbE9O_BbFe27YmtLA	5.0
5996915	VuCrxl61nT30OndMcrPgkA	ffDuau-kYvTZtYE_krOhmw	iWb-6tFQqn1eILNkhKjnHQ	3.0
5996916	DmA7Kr-tHvxl4Ci2ygiG4w	oiD_g7ufbibWh7IoSiduSg	iWb-6tFQqn1eILNkhKjnHQ	5.0
5996917	SOhDXouPwa6C5cf-3hcl2Q	vkEtjDaQrItD7J2x94K4_g	MlvIhVuXb-mLCGEE42xBEg	5.0
5996918	prh-RlduJU3z3ynA5IU3Wg	GL5B6eQ4MiX6pORFYioOyw	MlvIhVuXb-mLCGEE42xBEg	2.0
5996919	ecM2ISLuZhXZKQdGZWMOFg	vLgAjx-RSEPED6jyT1gPBw	3LC2sKfvz_nWuJquUDsNnw	3.0
5996920	da3c-sAS3KM08YVnSOOBAQ	sglir75ftkvgy7tLIR8-_A	3LC2sKfvz_nWuJquUDsNnw	4.0
5996921	Ool3WUe4XI86d53avy3oVA	42q3AKJtQClvAyMPAS3gRw	3LC2sKfvz_nWuJquUDsNnw	4.0
5996922	eFF000MRzjxMNVlUJkRogA	3xfcsjkdxASAObdCHpBjQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996923	wEisic-u9Yj543iYzfpAhw	jk8DUTd57B89eExy4psz0Q	3LC2sKfvz_nWuJquUDsNnw	4.0
5996924	VjaHHmV-rSkFaOAnU3faxg	xdM1wqaTwEP8XDzmtc308w	3LC2sKfvz_nWuJquUDsNnw	5.0
5996925	wX8btbqgyFh0yHgmyR8ovA	WezFip6qm3Ry4LXE0icWSw	3LC2sKfvz_nWuJquUDsNnw	5.0
5996926	ZliwQrjUnAosBLM8W_bsGQ	s7ZVVjMGccOO_zX9b9e3Aw	3LC2sKfvz_nWuJquUDsNnw	5.0
5996927	BwOo1dxSxGRCa_HaZZSLrQ	laB-jYvYmnmvzNlkdTRNFbA	3LC2sKfvz_nWuJquUDsNnw	4.0
5996928	58c9tCvjKDRONJq8h6NLzg	jlW5x4E_8phudfdo5O-Mw	3LC2sKfvz_nWuJquUDsNnw	4.0
5996929	LDxapKCcuUbH-G24O4vjD7g	f4UlfXzYoWt1QNN3q5x2YA	3LC2sKfvz_nWuJquUDsNnw	4.0
5996930	Jml9nslLD7KZqRr__Bg6NQ	C5Qq0xJhpbx1Jj02IIVthA	3LC2sKfvz_nWuJquUDsNnw	2.0
5996931	ny0AwrA3vjo3ZpYeRLJfqg	EjbCHA_C5MwpGjaeUP5oDQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996932	keQIXWfz2K7GukqaReVyow	B2yM14A--9zW8_a6_a-7Sw	3LC2sKfvz_nWuJquUDsNnw	5.0
5996933	Xl6l0-JmFE_6w28bku2idQ	VPDzGuUVA-hEyRBSB21_sQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996934	QylMuwQjVHo5ElzNLw9gpg	-LsA12hyH6hvs_QxTaM24A	3LC2sKfvz_nWuJquUDsNnw	1.0
5996935	Cb-Xl9s4AboAeOO_T9LdnA	593BaCGHPfnQBwSnOrNVIQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996936	_Dp6Wfqqt4J0D5rHij-WqQ	XwPj_2GPjVZOJQAq-RS5OQ	3LC2sKfvz_nWuJquUDsNnw	5.0
5996937	3uFye5VIDqtBU5_TzSulyA	HOiBITzvr1w_aL6lnD_Ocg	3LC2sKfvz_nWuJquUDsNnw	3.0
5996938	b8u5AasAkEcqTwKISjcHlw	SLa353i5N3p7Cc2ZS09lzg	3LC2sKfvz_nWuJquUDsNnw	5.0
5996939	NsEAgJ3Tf8PzW-8Pk8gyhQ	Q9j8UGILeEfv76WC36SjBA	3LC2sKfvz_nWuJquUDsNnw	4.0
5996940	Eydky7VuIZijOJ37yl8IGQ	8PJXiNbcBN_ol0Z4IT7vUg	3LC2sKfvz_nWuJquUDsNnw	4.0
5996941	YLqO9xm5s0KJ9JzWukAk8Q	bp8k5LJJ2ga1tJk2e_M2sw	3LC2sKfvz_nWuJquUDsNnw	4.0
5996942	FoU5sNX7QPKahchxd0gHkQ	AoSijWBh92XidYtFJ9JoYA	3LC2sKfvz_nWuJquUDsNnw	5.0
5996943	KU_FnvsvvhVT7aOzIErPIQ	Kr0KmY8miHCvuJ448tgFsw	3LC2sKfvz_nWuJquUDsNnw	4.0
5996944	S3-JpB5dBhMXmauMqeoN-g	fRkG9kWGQE9CrfmUAYk7-A	3LC2sKfvz_nWuJquUDsNnw	4.0
5996945	UyTYTtyZWym-7u84XMgSOQ	GfpQ1VWLVJw3RxitpNua_w	3LC2sKfvz_nWuJquUDsNnw	4.0
5996946	Y2Z1lg5lE3PSU_GQQUW9Q	vu_TetuHr9U9gGNI0Zr7ow	3LC2sKfvz_nWuJquUDsNnw	4.0



	business_id	review_id	user_id	stars
5996947	NiBzh0kHusvH5rdnpm7yVw	-lFj1ETh0dMIRt2CHIVhgg	3LC2sKfvz_nWuJquUDsNnw	5.0
5996948	zINKP9rtvo2lUKTZoYJUvQ	YlwO7sm6WvyZZtOlz6AISQ	3LC2sKfvz_nWuJquUDsNnw	5.0
5996949	5uMflYovqfgk41abdfFegw	1VxFnEq_zEtAKvpMvNUMzQ	3LC2sKfvz_nWuJquUDsNnw	5.0
5996950	hOxNKZJ8wWg8Q165U7CCqg	pN0Efzl0UsvUmTm136MERQ	3LC2sKfvz_nWuJquUDsNnw	5.0
5996951	Ty2BpVQNekxWC47yTD9Tpg	FssbmZ5eD-jc2gy_INAbEA	3LC2sKfvz_nWuJquUDsNnw	4.0
5996952	kOUnmvGamiw90BfmthoQGg	UkBlnRHZ3Z4kNs181FdPvw	3LC2sKfvz_nWuJquUDsNnw	4.0
5996953	PLiVD2blqBDRzAAAd1_RxxQ	EHZpTqoWiflJabCGX3MrSQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996954	RMEzXHypnEsWlfozit_xw	7UbZhPGBrQybhyO71cU_Ow	3LC2sKfvz_nWuJquUDsNnw	4.0
5996955	O-GefJqucTHDIYJSxVhEyA	d5VVGIfSR4Vg4OIEW7INsg	3LC2sKfvz_nWuJquUDsNnw	4.0
5996956	aRbUf7je5wv5ihTrB4vDhA	FKqNm6abpz8OFkdK_yHn-w	3LC2sKfvz_nWuJquUDsNnw	4.0
5996957	eJYvivWUp4Hdc9Tc8SaZPA	b2h52kc6MATq9XxqrtyhkQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996958	yPgUkQxj8CYPKF89HV65kg	ilWp9Wjiunc0Odwwqj4tdbQ	3LC2sKfvz_nWuJquUDsNnw	4.0
5996959	GnODIDJz09LecpudDoynCg	25lPbi1X3PcmhAlQM7Js9A	3LC2sKfvz_nWuJquUDsNnw	4.0
5996960	G65yipCa-UKCcZTH135IAw	c4Yqc0RAeEj_hHjxwic20g	3LC2sKfvz_nWuJquUDsNnw	4.0
5996961	QlAPX3c0Vm2dU_w3pulAlw	spW-33DkohXQWZWnFAbomA	3LC2sKfvz_nWuJquUDsNnw	5.0
5996962	uqnFLc-1MxWw5f4SlyEf4Q	hsF8hi6ZUPRKMIthRQIL3Q	3LC2sKfvz_nWuJquUDsNnw	5.0
5996963	Xc3Y8_cWBnMVXvoJmGCh4g	rBO_PjDHriaHy970x_HBXg	3LC2sKfvz_nWuJquUDsNnw	2.0
5996964	rWTC3Hg5DKoQ_dTrcuSJgw	9lyMT8Or19Zc_fuvTpXXbA	3LC2sKfvz_nWuJquUDsNnw	5.0
5996965	t67GMPZ0cv_ltkIID-JFiQ	ysQ3Qx_f04FohSjz9t3OtA	3LC2sKfvz_nWuJquUDsNnw	5.0
5996966	Trs4cEYdP6AX_KihTk9kWQ	Hb3oB54DF_IQ5qKdbFOPEA	3LC2sKfvz_nWuJquUDsNnw	4.0
5996967	G099MT9cwtwgdsR71JLp6w	cb78W5sXIK7XeylBam50Ww	3LC2sKfvz_nWuJquUDsNnw	5.0
5996968	wsmVIHJEi9J_38dXx2qLKA	qyqGOVBjUBrPGH5-esjDmQ	3LC2sKfvz_nWuJquUDsNnw	3.0
5996969	j1i7s55PmOFzJC3l6O8PiA	kfvdtl60V5bi1eBS7yMUZg	3LC2sKfvz_nWuJquUDsNnw	4.0
5996970	zjwdU1OdlbKTGjm-lfD4TQ	GAuxhKaWFOpV0oW1WgecZA	3LC2sKfvz_nWuJquUDsNnw	3.0
5996971	ceuvH6NpDhpT1p4q1w93pA	x6F0rFxDX-wsjsH42h-MjA	3LC2sKfvz_nWuJquUDsNnw	4.0
5996972	HHcN1akqlpl_BhdcJoYPbw	1odUI7uijuOhj6X01xCm2w	3LC2sKfvz_nWuJquUDsNnw	4.0
5996973	vzqzoa-plufwTsQUuWw_s6Q	gHYyDw64i9l_71n_ITOdWw	3LC2sKfvz_nWuJquUDsNnw	4.0
5996974	7mjflQcubrHXWMSxGszQIQ	Qk5hVZ0Sccl4LoUrh7mdg	3LC2sKfvz_nWuJquUDsNnw	4.0
5996975	3-HFGxmbzSax-NySJ_LzDg	CdVHI2JobRdpp5S61Jj-1Q	3LC2sKfvz_nWuJquUDsNnw	5.0
5996976	ogllZt5mg2nErhpTH_AakQ	6CrJ25LHrF4bDuW1U-oGg	3LC2sKfvz_nWuJquUDsNnw	4.0
5996977	OPSNdO3LNPMt7qz1MNb42g	UwdDj23NbmBMRktWQ4nWVQ	IDh4clMpgeeVVTEx2utfsQ	5.0
5996978	CA4qhLICQWX0H_bf9iGw0Q	abRHj_fLXNgjDOCgHQYG0A	QfgwyTHxqs6pr0BLI2HaUg	1.0
5996979	oJPInRXXLwG_89l-5cliQ	gUe27XrPVVf2gdst_vWI2A	QfgwyTHxqs6pr0BLI2HaUg	5.0
5996980	JcMx_Ply0ROlIJWens4TAQ	PIF-NeBZI52xA9QmkF3y7A	QfgwyTHxqs6pr0BLI2HaUg	5.0
5996981	gRMYm-CeEdjXtaQcVo8vsw	EHGBEGkb4R0uswU2uK1Zrw	QfgwyTHxqs6pr0BLI2HaUg	1.0
5996982	WbS58nfQQZaxWk1BUPBuJQ	9YrHtJcAhC6ZNuzp6SGc9w	uDGQYAIUSne3LKKhTAvKLg	4.0
5996983	hGBdtLUHanbw6rMRoMxUSQ	jQ0UKnDQUYpRQoJRzo5Mw	uDGQYAIUSne3LKKhTAvKLg	5.0
5996984	XF7cEaCGuPkt1yuz77jeTQ	Rw1bWfW2UQ3hXQjWY5TKgQ	uDGQYAIUSne3LKKhTAvKLg	5.0
5996985	aLcFhMe6DDJ430zeICpd2A	tq2d5d78ig42XH8CFLKULQ	uDGQYAIUSne3LKKhTAvKLg	4.0
5996986	R_fQGSUQv0L_fRiuaa47dw	zhYk0aPITQFNUbPYg1qt_Q	hDamkEc4NvaXDMD1CMtG2A	5.0

```
In [76]: def df_user_reviews(arg_user_id):

    df22 = u_data[u_data.user_id == arg_user_id]

    df22 = df22.merge(r_data, how = 'inner', on = 'user_id')
    df22 = df22.merge(b_data, how = 'inner', on = 'business_id')

    rename_dict = {'name_x': 'user_name', 'name_y': 'business_name'}
    df22.rename(columns = rename_dict, inplace = True)

    df22.categories = df22.categories.str.split(',')
    df22 = df22[['user_id', 'user_name', 'business_id', 'business_name', 'categories', 'review_id', 'stars']]

    result_list = list()
    for index, row in df22.iterrows():
        for val in row['categories']:
            val = val.strip()
            t1 = (row['user_id'], row['user_name'], row['business_id'], row['business_name'], val, row['review_id'], row['stars'])
            result_list.append(t1)

    result_df = pd.DataFrame(result_list, columns = ['user_id', 'user_name', 'business_id', 'business_name', 'category', 'review_id', 'stars'])
    result_df['rec_count'] = 1
    return result_df
```

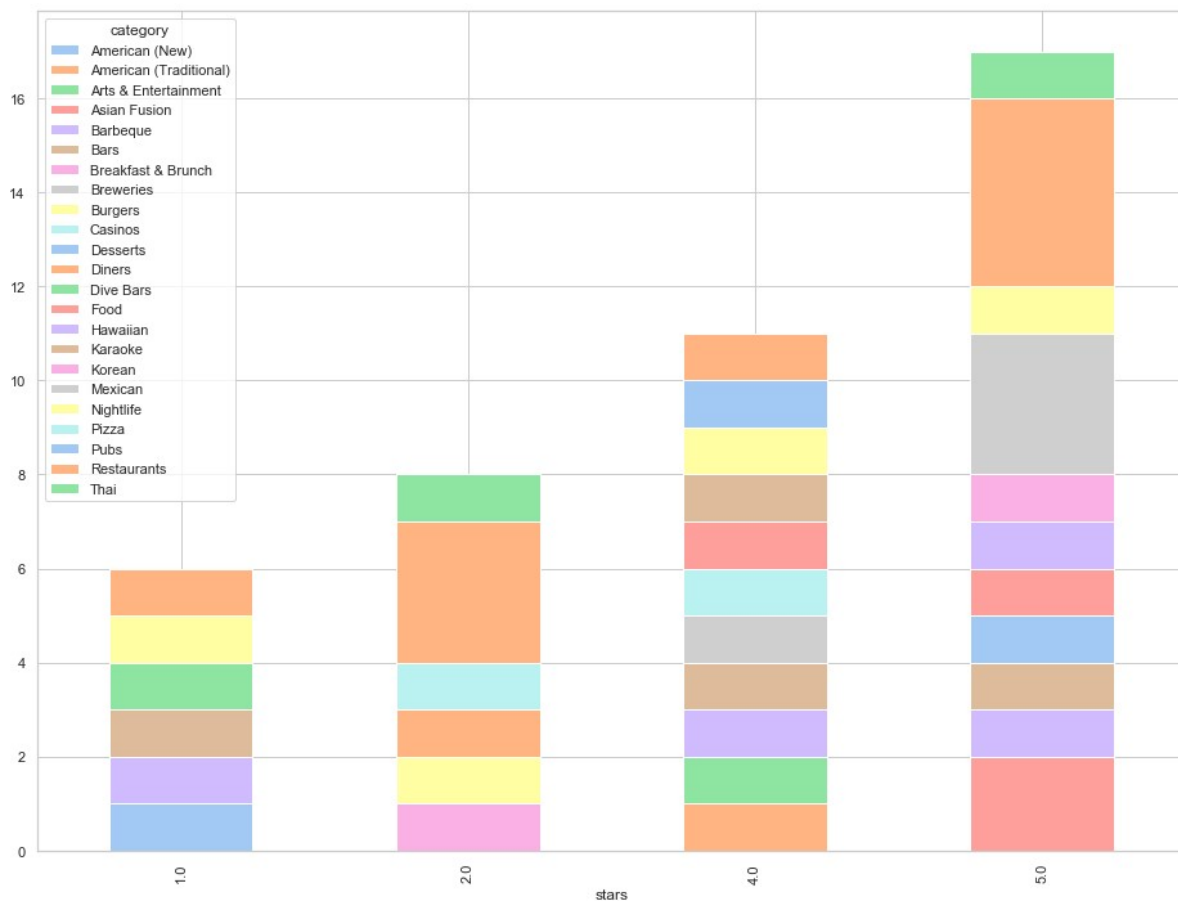
```
In [77]: final_df = df_user_reviews('msQelu7Z_XuqjGoqhB0J5g')
user_review_summary = final_df.groupby(['stars', 'category']).agg({'rec_count': 'sum'})
user_review_summary = user_review_summary.sort_values(by = ['stars', 'rec_count', 'category'], ascending = [False, False, True])
user_review_summary
```

Out [77]:

	stars	category	rec_count
32	5.0	Restaurants	4
30	5.0	Mexican	3
23	5.0	Asian Fusion	2
24	5.0	Barbeque	1
25	5.0	Bars	1
26	5.0	Desserts	1
27	5.0	Food	1
28	5.0	Hawaiian	1
29	5.0	Korean	1
31	5.0	Nightlife	1
33	5.0	Thai	1
12	4.0	American (Traditional)	1
13	4.0	Arts & Entertainment	1
14	4.0	Barbeque	1
15	4.0	Bars	1
16	4.0	Breweries	1
17	4.0	Casinos	1
18	4.0	Food	1
19	4.0	Karaoke	1
20	4.0	Nightlife	1
21	4.0	Pubs	1
22	4.0	Restaurants	1
10	2.0	Restaurants	3
6	2.0	Breakfast & Brunch	1
7	2.0	Burgers	1
8	2.0	Diners	1
9	2.0	Pizza	1
11	2.0	Thai	1
0	1.0	American (New)	1
1	1.0	Barbeque	1
2	1.0	Bars	1
3	1.0	Dive Bars	1
4	1.0	Nightlife	1
5	1.0	Restaurants	1

```
In [78]: user_review_summary.pivot_table(index = 'stars',
      columns = 'category',
      values = 'rec_count',
      aggfunc = 'sum').plot(kind = 'bar',
                           legend = True,
                           stacked = True,
                           figsize = (16,12))
```

Out[78]: <matplotlib.axes.\_subplots.AxesSubplot at 0x1b4164002e8>



```
In [79]: f'This visualization is flawed as every business has multiple bussiness categories
associated with it with there are no primary business category identified. So numbe
r of observations multiply duing tidying up exercise.'
```

Out[79]: 'This visualization is flawed as every business has multiple bussiness categorie  
s associated with it with there are no primary business category identified. So  
number of observations multiply duing tidying up exercise.'