

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

```
In [3]: data=pd.read_excel("data.xlsx")
data
```

Out[3]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	LocalityVerbose	Longi
0	7402935	Skye	94	Jakarta	Menara BCA, Lantai 56, Jl. MH. Thamrin, Thamri...	Grand Indonesia Mall, Thamrin	Grand Indonesia Mall, Thamrin, Jakarta	106.82
1	7410290	Satoo - Hotel Shangri-La	94	Jakarta	Hotel Shangri-La, Jl. Jend. Sudirman	Hotel Shangri-La, Sudirman	Hotel Shangri-La, Sudirman, Jakarta	106.81
2	7420899	Sushi Masa	94	Jakarta	Jl. Tuna Raya No. 5, Penjaringan	Penjaringan	Penjaringan, Jakarta	106.80
3	7421967	3 Wise Monkeys	94	Jakarta	Jl. Suryo No. 26, Senopati, Jakarta	Senopati	Senopati, Jakarta	106.81
4	7422489	Avec Moi Restaurant and Bar	94	Jakarta	Gedung PIC, Jl. Teluk Betung 43, Thamrin, Jakarta	Thamrin	Thamrin, Jakarta	106.82
...
9546	18279289	BMG - All Day Dining	1	Dehradun	140 A, Rajpur Road, Jakhan, Dehradun	Jakhan	Jakhan, Dehradun	78.06
9547	2300497	Atmosphere Grill Cafe Sheesha	1	Kanpur	8th Floor, J.S. Tower, 16/106 - Mall Road, Kan...	Mall Road	Mall Road, Kanpur	80.35
9548	18312106	UrbanCrave	1	Kanpur	14/125, The Mall, Mall Road, Colonelganj, Para...	Parade	Parade, Kanpur	80.34
9549	3900245	Deena Chat Bhandar	1	Varanasi	D-47/184, Luxa Road, Dashaswmedh Road, Varanasi	Dashaswmedh Road	Dashaswmedh Road, Varanasi	0.00
9550	18246202	VNS Live Studio	1	Varanasi	Hotel Varuna Ground Floor, 22 Gulab Bagh, Sig...	Sigra	Sigra, Varanasi	82.99

9551 rows × 19 columns

In [6]: `data.isna()`

Out[6]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisin
0	False	False	False	False	False	False	False	False	False	Fal
1	False	False	False	False	False	False	False	False	False	Fal
2	False	False	False	False	False	False	False	False	False	Fal
3	False	False	False	False	False	False	False	False	False	Fal
4	False	False	False	False	False	False	False	False	False	Fal
...
9546	False	False	False	False	False	False	False	False	False	Fal
9547	False	False	False	False	False	False	False	False	False	Fal
9548	False	False	False	False	False	False	False	False	False	Fal
9549	False	False	False	False	False	False	False	False	False	Fal
9550	False	False	False	False	False	False	False	False	False	Fal

9551 rows × 19 columns

In [8]: `data.isna().sum()`

```
Out[8]: Restaurant ID      0
        Restaurant Name    1
        Country Code       0
        City                0
        Address              0
        Locality             0
        Locality Verbose     0
        Longitude            0
        Latitude             0
        Cuisines             9
        Average Cost for two 0
        Currency             0
        Has Table booking     0
        Has Online delivery   0
        Price range           0
        Aggregate rating      0
        Rating color          0
        Rating text            0
        Votes                 0
        dtype: int64
```

In [15]: `data.isna().sum().sum()`

Out[15]: 10

In [24]: `data.columns`

```
Out[24]: Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',  
   'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',  
   'Average Cost for two', 'Currency', 'Has Table booking',  
   'Has Online delivery', 'Price range', 'Aggregate rating',  
   'Rating color', 'Rating text', 'Votes'],  
  dtype='object')
```

In []:

```
In [19]: data[data['Cuisines'].isna() == True]
```

Out[19]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude
9083	17374552	Corkscrew Cafe	216	Gainesville	51 W Main St, Dahlonega, GA 30533	Dahlonega	Dahlonega, Gainesville	-83.985800	32.500000
9086	17501439	Dovetail	216	Macon	543 Cherry St, Macon, GA 31201	Macon	Macon, Macon	-83.627979	32.366667
9094	17059060	Hillstone	216	Orlando	215 South Orlando Avenue, Winter Park, FL 32789	Winter Park	Winter Park, Orlando	-81.365260	28.500000
9406	17284158	Jimmie's Hot Dogs	216	Albany	204 S Jackson St, Albany, GA 31701	Albany	Albany, Albany	-84.153400	31.433333
9494	17142698	Leonard's Bakery	216	Rest of Hawaii	933 Kapahulu Ave, Honolulu, HI 96816	Kaimuki	Kaimuki, Rest of Hawaii	-157.813432	21.000000
9504	17616465	Tybee Island Social Club	216	Savannah	1311 Butler Ave, Tybee Island, GA 31328	Tybee Island	Tybee Island, Savannah	-80.848297	31.433333
9533	17284105	Cookie Shoppe	216	Albany	115 N Jackson St, Albany, GA 31701	Albany	Albany, Albany	-84.154000	31.433333
9535	17284211	Pearly's Famous Country Cookng	216	Albany	814 N Slaphey Blvd, Albany, GA 31701	Albany	Albany, Albany	-84.175900	31.433333
9539	17606621	Hi Lite Bar & Lounge	216	Miller	109 N Broadway Ave, Miller, SD 57362	Miller	Miller, Miller	-98.989100	42.000000

In [32]: `data.duplicated()`

```
Out[32]: 0      False
         1      False
         2      False
         3      False
         4      False
        ...
9546    False
9547    False
9548    False
9549    False
9550    False
Length: 9551, dtype: bool
```

```
In [33]: data.duplicated().sum()
```

```
Out[33]: 0
```

```
In [34]: data['City'].unique()
```

```
Out[34]: array(['Jakarta', 'Tangerang', 'Bogor', 'Bandung', 'New Delhi',
       'Pasay City', 'Gurgaon', 'Colombo', 'Mandaluyong City', 'Agra',
       'Noida', 'Pretoria', 'Taguig City', 'Kanpur', 'Ghaziabad',
       'Jaipur', 'Bangalore', 'Chandigarh', 'Pune', 'Chennai', 'Goa',
       'Hyderabad', 'Indore', 'Lucknow', 'Ludhiana', 'Panchkula',
       'Ranchi', 'Faridabad', 'Kolkata', 'Ahmedabad', 'Aurangabad',
       'Bhopal', 'Mysore', 'Vizag', 'Guwahati', 'Dehradun', 'Mangalore',
       'Nagpur', 'Patna', 'Inner City', 'Bhubaneshwar', 'Coimbatore',
       'Kochi', 'Mumbai', 'Nashik', 'Puducherry', 'Surat', 'Vadodara',
       'Makati City', 'Tagaytay City', 'Amritsar', 'Pasig City',
       'Varanasi', 'San Juan City', 'Allahabad', 'Johannesburg',
       'Santa Rosa', 'Secunderabad', 'Quezon City', 'Cape Town', 'Mohali',
       'Doha', 'Sandton', 'Singapore', 'Abu Dhabi', 'Dubai', 'São Paulo',
       'Ankara', 'Brasília', 'Rio de Janeiro', 'Sharjah', 'London',
       'Wellington City', 'Randburg', 'Auckland', 'İstanbul',
       'Manchester', 'Paynesville', 'Birmingham', 'Orlando', 'Edinburgh',
       'Albany', 'Boise', 'Davenport', 'Des Moines', 'Dubuque', 'Macon',
       'Princeton', 'Rest of Hawaii', 'Savannah', 'Sioux City',
       'Tampa Bay', 'Valdosta', 'Vineland Station', 'Pocatello', 'Athens',
       'Augusta', 'Cedar Rapids/Iowa City', 'Columbus', 'Dalton',
       'Gainesville', 'Ojo Caliente', 'Pensacola', 'Waterloo', 'Flaxton',
       'Middleton Beach', 'Montville', 'Palm Cove', 'Tanunda',
       'Chatham-Kent', 'Cochrane', 'Consort', 'Lincoln', 'Monroe',
       'Potrero', 'Weirton', 'Winchester Bay', 'Yorkton', 'Armidale',
       'Balingup', 'Beechworth', 'East Ballina', 'Forrest',
       'Hepburn Springs', 'Huskisson', 'Lorn', 'Macedon', 'Mayfield',
       'Penola', 'Phillip Island', 'Trentham East', 'Victor Harbor',
       'Clatskanie', 'Fernley', 'Lakeview', 'Mc Millan', 'Vernonia',
       'Dicky Beach', 'Inverloch', 'Lakes Entrance', 'Miller'],
      dtype=object)
```

```
In [36]: data.City.nunique()
```

```
Out[36]: 141
```

```
In [38]: data.columns
```

```
Out[38]: Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
   'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
   'Average Cost for two', 'Currency', 'Has Table booking',
   'Has Online delivery', 'Price range', 'Aggregate rating',
   'Rating color', 'Rating text', 'Votes'],
  dtype='object')
```

```
In [42]: data[['Restaurant ID','City']].groupby('City').nunique().sort_values('Restaurant ID')
```

Out[42]:

Restaurant ID	
City	
Ojo Caliente	1
Clatskanie	1
Cochrane	1
Phillip Island	1
Potrero	1
...	...
Ghaziabad	25
Faridabad	251
Noida	1080
Gurgaon	1118
New Delhi	5473

141 rows × 1 columns

```
In [43]: data['Restaurant Name'].value_counts()
```

```
Out[43]: Cafe Coffee Day           83
Domino's Pizza                   79
Subway                           63
Green Chick Chop                 51
McDonald's                        48
                               ..
The Chickmunks Cafè@            1
Punjabi Chaska                   1
Amrit's Agni Multi Cuisine Restaurant 1
Quick Grabs                       1
VNS Live Studio                  1
Name: Restaurant Name, Length: 7445, dtype: int64
```

```
In [45]: data[['Restaurant Name','Country Code']].groupby('Restaurant Name').nunique().sort_val
```

Out[45]:

Country Code	
Restaurant Name	
12212	1
Pizza Junction	1
Pizza Hut Delivery	1
Pizza Hub	1
Pizza Hot	1
...	...
Punjab Grill	2
The Cafe	2
SpiceKlub	2
Barbeque Nation	2
Hard Rock Cafe	3

7445 rows × 1 columns

In [46]: `data['Has Table booking'].value_counts()`Out[46]:
No 8393
Yes 1158
Name: Has Table booking, dtype: int64In [49]: `data['Has Table booking'].value_counts(normalize=True)*100`Out[49]:
No 87.875615
Yes 12.124385
Name: Has Table booking, dtype: float64In [54]: `data[['Has Online delivery', 'Votes']].groupby('Has Online delivery').sum()`Out[54]:

Has Online delivery	Votes
No	980731
Yes	517914

In [56]: `CityWise_Restaurant = data[['Restaurant ID', 'City']].groupby('City').nunique().sort_values(ascending=False)`
CityWise_Restaurant

Out[56]:

Restaurant ID

City	Restaurant ID
Ojo Caliente	1
Clatskanie	1
Cochrane	1
Phillip Island	1
Potrero	1
...	...
Ghaziabad	25
Faridabad	251
Noida	1080
Gurgaon	1118
New Delhi	5473

141 rows × 1 columns

In []:

In []:

In []:

In [74]: City_Cuisines_1= data[['Restaurant ID', 'Restaurant Name', 'City','Cuisines']].copy()
City_Cuisines_1

Out[74]:

	Restaurant ID	Restaurant Name	City	Cuisines
0	7402935	Skye	Jakarta	Italian, Continental
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Asian, Indonesian, Western
2	7420899	Sushi Masa	Jakarta	Sushi, Japanese
3	7421967	3 Wise Monkeys	Jakarta	Japanese
4	7422489	Avec Moi Restaurant and Bar	Jakarta	French, Western
...
9546	18279289	BMG - All Day Dining	Dehradun	Chinese, North Indian, Fast Food
9547	2300497	Atmosphere Grill Cafe Sheesha	Kanpur	Indian, Chinese, Continental
9548	18312106	UrbanCrave	Kanpur	Cafe, Continental, Desserts, Ice Cream, Italia...
9549	3900245	Deena Chat Bhandar	Varanasi	Street Food
9550	18246202	VNS Live Studio	Varanasi	Chinese, North Indian

9551 rows × 4 columns

In [75]: `City_Cuisines_2 = data[['Restaurant ID', 'Restaurant Name', 'City', 'Cuisines']].dropna()`
City_Cuisines_2

Out[75]:

	Restaurant ID	Restaurant Name	City	Cuisines
0	7402935	Skye	Jakarta	Italian, Continental
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Asian, Indonesian, Western
2	7420899	Sushi Masa	Jakarta	Sushi, Japanese
3	7421967	3 Wise Monkeys	Jakarta	Japanese
4	7422489	Avec Moi Restaurant and Bar	Jakarta	French, Western
...
9546	18279289	BMG - All Day Dining	Dehradun	Chinese, North Indian, Fast Food
9547	2300497	Atmosphere Grill Cafe Sheesha	Kanpur	Indian, Chinese, Continental
9548	18312106	UrbanCrave	Kanpur	Cafe, Continental, Desserts, Ice Cream, Italia...
9549	3900245	Deena Chat Bhandar	Varanasi	Street Food
9550	18246202	VNS Live Studio	Varanasi	Chinese, North Indian

9541 rows × 4 columns

In [76]: `City_Cuisines_2['Cuisines'] = City_Cuisines_2['Cuisines'].apply(lambda x : x.split(','))`

In [77]: `City_Cuisines_2`

Out[77]:

	Restaurant ID	Restaurant Name	City	Cuisines
0	7402935	Skye	Jakarta	[Italian, Continental]
1	7410290	Satoo - Hotel Shangri-La	Jakarta	[Asian, Indonesian, Western]
2	7420899	Sushi Masa	Jakarta	[Sushi, Japanese]
3	7421967	3 Wise Monkeys	Jakarta	[Japanese]
4	7422489	Avec Moi Restaurant and Bar	Jakarta	[French, Western]
...
9546	18279289	BMG - All Day Dining	Dehradun	[Chinese, North Indian, Fast Food]
9547	2300497	Atmosphere Grill Cafe Sheesha	Kanpur	[Indian, Chinese, Continental]
9548	18312106	UrbanCrave	Kanpur	[Cafe, Continental, Desserts, Ice Cream, ...]
9549	3900245	Deena Chat Bhandar	Varanasi	[Street Food]
9550	18246202	VNS Live Studio	Varanasi	[Chinese, North Indian]

9541 rows × 4 columns

In [104...]: `City_Cuisines_2['Number of Cuisines'] = City_Cuisines_2['Cuisines'].apply(lambda x : len(x))`
`City_Cuisines_2`

Out[104]:

	Restaurant ID	Restaurant Name	City	Cuisines	Number of Cuisines
0	7402935	Skye	Jakarta	[Italian, Continental]	2
1	7410290	Satoo - Hotel Shangri-La	Jakarta	[Asian, Indonesian, Western]	3
2	7420899	Sushi Masa	Jakarta	[Sushi, Japanese]	2
3	7421967	3 Wise Monkeys	Jakarta	[Japanese]	1
4	7422489	Avec Moi Restaurant and Bar	Jakarta	[French, Western]	2
...
9546	18279289	BMG - All Day Dining	Dehradun	[Chinese, North Indian, Fast Food]	3
9547	2300497	Atmosphere Grill Cafe Sheesha	Kanpur	[Indian, Chinese, Continental]	3
9548	18312106	UrbanCrave	Kanpur	[Cafe, Continental, Desserts, Ice Cream, I...]	6
9549	3900245	Deena Chat Bhandar	Varanasi	[Street Food]	1
9550	18246202	VNS Live Studio	Varanasi	[Chinese, North Indian]	2

9541 rows × 5 columns

In [105...]

`City_Cuisines_2.sort_values('Number of Cuisines')`

Out[105]:

Restaurant ID	Restaurant Name	City	Cuisines	Number of Cuisines	
7122	2012	Bobby Tikki Wala	New Delhi	[Street Food]	1
2973	18365894	Behrouz Biryani	New Delhi	[Biryani]	1
6703	18361770	Dosa Junction	New Delhi	[South Indian]	1
6702	18454520	Choc-oholic	New Delhi	[Desserts]	1
6701	18361764	Aunty Chings Fast Food	New Delhi	[Chinese]	1
...	
3271	18279982	Indian Summer Cafe	Patna	[Continental, Cafe, Italian, Pizza, North ...]	8
3406	492	Bikanervala	New Delhi	[North Indian, South Indian, Fast Food, Str...]	8
3451	307566	Bikanervala	Noida	[North Indian, South Indian, Fast Food, Str...]	8
3442	18446491	Bikanervala	New Delhi	[North Indian, South Indian, Fast Food, Str...]	8
3425	497	Bikanervala	New Delhi	[North Indian, South Indian, Fast Food, Str...]	8

9541 rows × 5 columns

In [80]: `City_Cuisines_2.explode('Cuisines')`

Out[80]:

	Restaurant ID	Restaurant Name	City	Cuisines
0	7402935	Skye	Jakarta	Italian
0	7402935	Skye	Jakarta	Continental
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Asian
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Indonesian
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Western
...
9548	18312106	UrbanCrave	Kanpur	Italian
9548	18312106	UrbanCrave	Kanpur	Beverages
9549	3900245	Deena Chat Bhandar	Varanasi	Street Food
9550	18246202	VNS Live Studio	Varanasi	Chinese
9550	18246202	VNS Live Studio	Varanasi	North Indian

19706 rows × 4 columns

In [81]:

City_Cuisines_2.explode('Cuisines').head(20)

Out[81]:

	Restaurant ID	Restaurant Name	City	Cuisines
0	7402935	Skye	Jakarta	Italian
0	7402935	Skye	Jakarta	Continental
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Asian
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Indonesian
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Western
2	7420899	Sushi Masa	Jakarta	Sushi
2	7420899	Sushi Masa	Jakarta	Japanese
3	7421967	3 Wise Monkeys	Jakarta	Japanese
4	7422489	Avec Moi Restaurant and Bar	Jakarta	French
4	7422489	Avec Moi Restaurant and Bar	Jakarta	Western
5	18352452	Lucky Cat Coffee & Kitchen	Jakarta	Cafe
5	18352452	Lucky Cat Coffee & Kitchen	Jakarta	Western
6	18386856	Onokabe	Tangerang	Indonesian
7	7423482	Lemongrass	Bogor	Peranakan
7	7423482	Lemongrass	Bogor	Indonesian
8	18391256	MONKS	Jakarta	Western
8	18391256	MONKS	Jakarta	Asian
8	18391256	MONKS	Jakarta	Cafe
9	7422633	Talaga Sampireun	Jakarta	Sunda
9	7422633	Talaga Sampireun	Jakarta	Indonesian

In [83]:

```
City_Cuisines_Expanded =City_Cuisines_2.explode('Cuisines')
City_Cuisines_Expanded
```

Out[83]:

	Restaurant ID	Restaurant Name	City	Cuisines
0	7402935	Skye	Jakarta	Italian
0	7402935	Skye	Jakarta	Continental
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Asian
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Indonesian
1	7410290	Satoo - Hotel Shangri-La	Jakarta	Western
...
9548	18312106	UrbanCrave	Kanpur	Italian
9548	18312106	UrbanCrave	Kanpur	Beverages
9549	3900245	Deena Chat Bhandar	Varanasi	Street Food
9550	18246202	VNS Live Studio	Varanasi	Chinese
9550	18246202	VNS Live Studio	Varanasi	North Indian

19706 rows × 4 columns

In [91]: `City_Cuisines_Expanded.sort_values(['City', 'Cuisines'])`

Out[91]:

	Restaurant ID	Restaurant Name	City	Cuisines
8982	5704118	Tikka Tonight	Abu Dhabi	Afghani
8931	5701729	Sofra Istanbul	Abu Dhabi	Arabian
8932	5701548	Bait El Khetyar	Abu Dhabi	Arabian
8525	5704202	Hot Palayok	Abu Dhabi	Asian
8498	5702418	Gazebo	Abu Dhabi	Biryani
...
8902	5902117	Valonia	İstanbul	Restaurant Cafe
8903	5926979	Leman Kì_Itì_r	İstanbul	Restaurant Cafe
8907	5905215	Emirgan SÌ_tiÀÙ	İstanbul	Restaurant Cafe
8904	5915730	Naml€± Gurme	İstanbul	Turkish
8514	5908749	Ceviz A€Ùac€±	İstanbul	World Cuisine

19706 rows × 4 columns

In [85]: `City_Cuisines_Expanded.groupby(['City', 'Cuisines']).count()`

Out[85]:

		Restaurant ID	Restaurant Name
City	Cuisines		
Abu Dhabi	Afghani	1	1
	Arabian	2	2
	Asian	1	1
	Biryani	1	1
	Burger	1	1
...
€stanbul	Desserts	2	2
	Italian	1	1
	Restaurant Cafe	4	4
	Turkish	1	1
	World Cuisine	1	1

2400 rows × 2 columns

In [93]: `City_Cuisines_Expanded_1 = City_Cuisines_Expanded.groupby(['City','Cuisines']).count()`In [98]: `City_Cuisines_Expanded_1[['Restaurant ID']]`

Out[98]:

		Restaurant ID
City	Cuisines	
Abu Dhabi	Afghani	1
	Arabian	2
	Asian	1
	Biryani	1
	Burger	1
...
€stanbul	Desserts	2
	Italian	1
	Restaurant Cafe	4
	Turkish	1
	World Cuisine	1

2400 rows × 1 columns

In [98]: `City_Cuisines_Expanded_1[['Restaurant ID']]`

Out[98]:

Restaurant ID		
City	Cuisines	
Abu Dhabi	Afghani	1
	Arabian	2
	Asian	1
	Biryani	1
	Burger	1
...
€stanbul	Desserts	2
	Italian	1
	Restaurant Cafe	4
	Turkish	1
	World Cuisine	1

2400 rows × 1 columns

In [99]: `data['Price range'].value_counts()`

Out[99]:

In [101...]: `data['Price range'].value_counts(normalize=True)*100`

Out[101]:

In [109...]: `City_Cuisines_Expanded.groupby(['City', 'Cuisines']).count()[['Restaurant ID']] .reset_i`

Out[109]:

	City	Cuisines	Restaurant ID
24	Abu Dhabi	Indian	6
19	Abu Dhabi	American	4
14	Abu Dhabi	North Indian	3
1	Abu Dhabi	Arabian	2
5	Abu Dhabi	Chinese	2
...
2392	€jstanbul	Bar Food	1
2393	€jstanbul	Burger	1
2396	€jstanbul	Italian	1
2398	€jstanbul	Turkish	1
2399	€jstanbul	World Cuisine	1

2400 rows × 3 columns

In []: