Sakshi Kharat

CognifyzTechnology

Predict Restaurant Ratings

```
import pandas as pd
import numpy as np
```

Loading the Dataset

```
from google.colab import files

uploaded = files.upload()
<IPython.core.display.HTML object>
Saving Dataset.csv to Dataset.csv

df = pd.read_csv('Dataset.csv')
```

Viewing the Dataset

Restaurant ID Restaurant Name Country Code
D 6317637 Le Petit Souffle 162 Makati City
l 6304287 Izakaya Kikufuji 162
Makati City
2
3 6318506 0oma 162
Mandaluyong City
4 6314302 Sambo Kojin 162 Mandaluyong City
9546 5915730 Naml\Gurme 208
🕯stanbul 9547
©stanbul
9548 5915807 Huqqa 208
🕅 stanbul 9549
©stanbul
9550 5927402 Walter's Coffee Roastery 208

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0
      Third Floor, Century City Mall, Kalayaan Avenu...
1
      Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
      Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
2
3
      Third Floor, Mega Fashion Hall, SM Megamall, O...
4
      Third Floor, Mega Atrium, SM Megamall, Ortigas...
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      Kemanke�� Karamustafa Pa��a Mahallesi, R∖ht∖m ...
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      Ko��uyolu Mahallesi, Muhittin ��st� nda�� Cadd...
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      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
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      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
9550
      Cafea@@a Mahallesi, Bademalt \ Sokak, No 21/B, ...
                                         Locality \
0
       Century City Mall, Poblacion, Makati City
      Little Tokyo, Legaspi Village, Makati City
1
2
      Edsa Shangri-La, Ortigas, Mandaluyong City
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          SM Megamall, Ortigas, Mandaluyong City
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      Century City Mall, Poblacion, Makati City, Mak...
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      SM Megamall, Ortigas, Mandaluyong City, Mandal...
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      SM Megamall, Ortigas, Mandaluyong City, Mandal...
                                     Karak@_y, @@stanbul
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                                  Kuru@ e@@me, @@stanbul
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       Latitude
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Currency \
      14.565443
                        French, Japanese, Desserts
                                                          Botswana
Pula(P)
      14.553708
                                          Japanese
                                                          Botswana
Pula(P)
      14.581404 Seafood, Asian, Filipino, Indian
                                                          Botswana
Pula(P)
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3 Pula	14.585318		Japan	ese, Sushi		Botswana	ì
4	14.584450		Japane	se, Korean		Botswana	ì
Pula 	(P) 						
9546	41.022793			Turkish		Turkish	
Lira 9547		World Cui	.sine, Patiss	erie, Cafe		Turkish	
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Lira			1105 20	Cafe		Turkish	
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0	Has Table b	oooking Has Yes	Online deliv	ery Is del No	ivering	j now ∖ No	
1		Yes		No		No	
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3 4		No Yes		No No		No No	
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ò		No	3		4.8	Dark	Green
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2		No	4		4.4		Green
3		No	4		4.9	Dark	Green
4		No	4		4.8	Dark	Green
9546		No	3		4.1		Green
9547		No	3		4.2		Green
9548		No	4		3.7	Υ	ellow/

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9549
                        No
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                        No
     Rating text Votes
       Excellent
0
                    314
1
       Excellent
                    591
2
       Very Good
                    270
3
       Excellent
                    365
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       Excellent
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       Very Good
9546
                   788
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       Very Good
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            Good
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       Very Good
                    901
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       Very Good
                    591
[9551 rows x 21 columns]
df.info
<bound method DataFrame.info of</pre>
                                       Restaurant ID
Restaurant Name Country Code
                                             City \
            6317637 Le Petit Souffle
                                                          162
Makati City
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                              Izakaya Kikufuji
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Makati City
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                        Heat - Edsa Shangri-La
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                                                  Address \
      Third Floor, Century City Mall, Kalayaan Avenu...
      Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
1
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2
      Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
3
      Third Floor, Mega Fashion Hall, SM Megamall, O...
4
      Third Floor, Mega Atrium, SM Megamall, Ortigas...
      Kemanke�� Karamustafa Pa��a Mahallesi, R\ht\m ...
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      Ko@@uyolu Mahallesi, Muhittin @@st@ nda@@ Cadd...
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      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
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      Cafea@@a Mahallesi, Bademalt \ Sokak, No 21/B, ...
                                         Locality \
0
       Century City Mall, Poblacion, Makati City
1
      Little Tokyo, Legaspi Village, Makati City
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      Edsa Shangri-La, Ortigas, Mandaluyong City
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      Century City Mall, Poblacion, Makati City, Mak...
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Currency \
      14.565443
                        French, Japanese, Desserts
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Pula(P)
      14.553708
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Pula(P)
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                 Seafood, Asian, Filipino, Indian
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Pula(P)
      14.585318
                                   Japanese, Sushi
                                                          Botswana
Pula(P)
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                                  Japanese, Korean
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 9546 41.022793 Turkish Turkish	
Lira(TL) 9547 41.009847 World Cuisine, Patisserie, Cafe Turkish	
Lira(TL) 9548 41.055817 Italian, World Cuisine Turkish	
Lira(TL) 9549 41.057979 Restaurant Cafe Turkish	
Lira(TL) 9550 40.984776 Cafe Turkish Lira(TL)	
Has Table booking Has Online delivery Is delivering now \ O Yes No No O Yes No No No	
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4 No 4 4.8 Dark 0	Green
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9547 No 3 4.2 0	Green
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9549 No 4 4.0 C	Green
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Rating text Votes	

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0
       Excellent
                     314
       Excellent
                     591
1
2
       Very Good
                     270
       Excellent
3
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       Very Good
9546
                     788
       Very Good
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                    1034
             Good
9548
                     661
9549
       Very Good
                     901
9550
       Very Good
                     591
[9551 rows x 21 columns]>
```

Viewing the Columns

```
df.columns
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', 'Is delivering now', 'Switch to order
menu',
        'Price range', 'Aggregate rating', 'Rating color', 'Rating
text',
        'Votes'],
      dtype='object')
df.describe
<bound method NDFrame.describe of</pre>
                                             Restaurant ID
Restaurant Name Country Code
                                                City \
             6317637
                                Le Petit Souffle
                                                               162
Makati City
             6304287
                                Izakaya Kikufuji
                                                               162
Makati City
             6300002
                          Heat - Edsa Shangri-La
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Mandaluyong City
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      Third Floor, Mega Fashion Hall, SM Megamall, O...
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      Third Floor, Mega Atrium, SM Megamall, Ortigas...
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      Little Tokyo, Legaspi Village, Makati City, Ma...
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      Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...
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3
      SM Megamall, Ortigas, Mandaluyong City, Mandal...
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4
      SM Megamall, Ortigas, Mandaluyong City, Mandal...
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                                     Karakû y, ûûstanbul
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                                                            29.026016
       Latitude
                                          Cuisines
Currency \
      14.565443
                        French, Japanese, Desserts ...
                                                          Botswana
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Pula(P)					
1 14.553708 Pula(P)		Japan	ese	Botswana	
	Seafood, Asian	, Filipino, Ind	ian	Botswana	
3 14.585318 Pula(P)		Japanese, Su	shi	Botswana	
4 14.584450 Pula(P)		Japanese, Kor	ean	Botswana	
9546 41.022793		Turk	ish	Turkish	
Lira(TL) 9547 41.009847 Lira(TL)	World Cuisine	, Patisserie, C	afe	Turkish	
9548 41.055817 Lira(TL)	Ital	ian, World Cuis	ine	Turkish	
9549 41.057979 Lira(TL)		Restaurant C	afe	Turkish	
9550 40.984776 Lira(TL)		C	afe	Turkish	
, ,	hooking Uos Onli	na daliwany Ta	dolivenina	no. ()	
0 Has Table	booking Has Onli Yes	No No	detivering	No \	
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9546 9547	No No	No No		No No	
9547	No No	No No		No	
9549	No	No		No	
9550	No	No		No	
	order menu Price	range Aggrega	te rating	Rating	color
0	No	3	4.8	Dark	Green
1	No	3	4.5	Dark	Green
2	No	4	4.4		Green
3	No	4	4.9	Dark	Green
4	No	4	4.8	Dark	Green
9546	No	3	4.1		Green

9547 No 3 4.2 Green 9548 No 4 3.7 Yellow 9549 No 4 4.0 Green 9550 No 2 4.0 Green 9550 No 2 4.0 Green Rating text Votes 0 Excellent 314 1 Excellent 591 2 Very Good 270 3 Excellent 365 4 Excellent 229 9546 Very Good 788 9547 Very Good 1034 9548 Good 661 9559 Very Good 591 [9551 rows x 21 columns]> df.head(10) Restaurant ID Restaurant Name Country Code O 6317637 Le Petit Souffle 162 1 G304287 Izakaya Kikufuji 162 2 G300002 Heat - Edsa Shangri-La 162 3 G318506 Ooma 162 4 G314302 Sambo Kojin 162 5 18189371 Din Tai Fung 162 6 G300781 Buffet 101 162 7 G301290 Vikings 162 8 G300010 Spiral - Sofitel Philippine Plaza Manila 162 9 G314987 Locavore							
9549 No 4 4.0 Green 9550 No 2 4.0 Green Rating text Votes 0	9547		No		3	4.2	Green
Rating text Votes 0	9548		No		4	3.7	Yellow
Rating text Votes 0	9549		No		4	4.0	Green
0	9550		No		2	4.0	Green
0							
Restaurant ID Restaurant Name Country Code \ 0	0 1 2 3 4 9546 9547 9548 9549 9550	Excellent Excellent Very Good Excellent Excellent Very Good Very Good Very Good Very Good Very Good	314 591 270 365 229 788 1034 661 901 591				
Code \ 0							
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2 6300002 Heat - Edsa Shangri-La 162 3 6318506 Ooma 162 4 6314302 Sambo Kojin 162 5 18189371 Din Tai Fung 162 6 6300781 Buffet 101 162 7 6301290 Vikings 162 8 6300010 Spiral - Sofitel Philippine Plaza Manila 162 9 6314987 Locavore	1	6304287]	Izakaya Kikufu	ji
3 6318506 0oma 162 4 6314302 Sambo Kojin 162 5 18189371 Din Tai Fung 162 6 6300781 Buffet 101 162 7 6301290 Vikings 162 8 6300010 Spiral - Sofitel Philippine Plaza Manila 162 9 6314987 Locavore	2	6300002			Heat -	Edsa Shangri-	La
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6 6300781 Buffet 101 162 7 6301290 Vikings 162 8 6300010 Spiral - Sofitel Philippine Plaza Manila 162 9 6314987 Locavore	5	18189371				Din Tai Fu	ng
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8 6300010 Spiral - Sofitel Philippine Plaza Manila 162 9 6314987 Locavore		6301290				Vikin	gs
162 9 6314987 Locavore	8		Spiral -	Sofitel	Philippi		
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City
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        Makati City Third Floor, Century City Mall, Kalayaan Avenu...
                     Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
1
        Makati City
   Mandaluyong City
                    Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
   Mandaluyong City
                    Third Floor, Mega Fashion Hall, SM Megamall, O...
   Mandaluyong City
                    Third Floor, Mega Atrium, SM Megamall, Ortigas...
   Mandaluyong City
                    Ground Floor, Mega Fashion Hall, SM Megamall, ...
         Pasay City
                    Building K, SM By The Bay, Sunset Boulevard, M...
         Pasay City
                    Building B, By The Bay, Seaside Boulevard, Mal...
8
         Pasay City
                    Plaza Level, Sofitel Philippine Plaza Manila, ...
         Pasig City Brixton Technology Center, 10 Brixton Street, ...
                                          Locality \
         Century City Mall, Poblacion, Makati City
        Little Tokyo, Legaspi Village, Makati City
1
2
        Edsa Shangri-La, Ortigas, Mandaluyong City
3
            SM Megamall, Ortigas, Mandaluyong City
4
            SM Megamall, Ortigas, Mandaluyong City
5
            SM Megamall, Ortigas, Mandaluyong City
6
   SM by the Bay, Mall of Asia Complex, Pasay City
7
   SM by the Bay, Mall of Asia Complex, Pasay City
8
       Sofitel Philippine Plaza Manila, Pasay City
9
                                         Kapitolyo
                                    Locality Verbose
                                                    Longitude
Latitude \
   Century City Mall, Poblacion, Makati City, Mak... 121.027535
14.565443
1 Little Tokyo, Legaspi Village, Makati City, Ma... 121.014101
14.553708
   Edsa Shangri-La, Ortigas, Mandaluyong City, Ma... 121.056831
14.581404
   SM Megamall, Ortigas, Mandaluyong City, Mandal... 121.056475
14.585318
   SM Megamall, Ortigas, Mandaluyong City, Mandal... 121.057508
14.584450
   SM Megamall, Ortigas, Mandaluyong City, Mandal... 121.056314
14.583764
6 SM by the Bay, Mall of Asia Complex, Pasay Cit... 120.979667
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14.531333
7 SM by the Bay, Mall of Asia Complex, Pasay Cit... 120.979333
14.540000
   Sofitel Philippine Plaza Manila, Pasay City, P... 120.980090
14.552990
                                  Kapitolyo, Pasig City 121.056532
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                               Cuisines
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                                                Botswana Pula(P)
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                                                Botswana Pula(P)
2
     Seafood, Asian, Filipino, Indian
                                                Botswana Pula(P)
3
                        Japanese, Sushi
                                          . . .
                                                Botswana Pula(P)
4
                       Japanese, Korean
                                                Botswana Pula(P)
                                          . . .
5
                                Chinese
                                          . . .
                                                Botswana Pula(P)
6
                       Asian, European
                                                Botswana Pula(P)
7
   Seafood, Filipino, Asian, European
                                                Botswana Pula(P)
                                          . . .
8
               European, Asian, Indian
                                         . . .
                                                Botswana Pula(P)
9
                               Filipino
                                         ... Botswana Pula(P)
  Has Table booking Has Online delivery Is delivering now
                                        No
0
                 Yes
                                                            No
1
                 Yes
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2
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3
                  No
                                        No
                                                            No
4
                 Yes
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                 Yes
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7
                 Yes
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8
                 Yes
                                        No
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9
                 Yes
                                        No
                                                            No
  Switch to order menu Price range
                                                           Rating color
                                       Aggregate rating
0
                     No
                                    3
                                                     4.8
                                                             Dark Green
                                    3
1
                     No
                                                     4.5
                                                             Dark Green
2
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                     No
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3
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7
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8
                     No
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                                                     4.9
                                                             Dark Green
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                                                     4.8
                                                             Dark Green
                     No
  Rating text Votes
    Excellent
                 314
0
    Excellent
                 591
1
    Very Good
2
                 270
    Excellent
3
                 365
4
    Excellent
                 229
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5
    Very Good
                336
    Very Good
6
                520
7
    Very Good
                677
    Excellent
8
                621
9
    Excellent
                532
[10 rows x 21 columns]
df.shape
(9551, 21)
print(df)
                               Restaurant Name Country Code
      Restaurant ID
City
                              Le Petit Souffle
            6317637
                                                           162
Makati City
            6304287
                              Izakaya Kikufuji
                                                           162
Makati City
            6300002
                        Heat - Edsa Shangri-La
                                                           162
Mandaluyong City
            6318506
                                           0<sub>oma</sub>
                                                           162
Mandaluyong City
            6314302
                                    Sambo Kojin
                                                           162
Mandaluyong City
. . .
                                    Naml \ Gurme
9546
            5915730
                                                           208
@stanbul
9547
            5908749
                                   Ceviz A@@ac \
                                                       208
@@stanbul
9548
            5915807
                                          Huqqa
                                                           208
@
@
g
s
t
anbul
                                    A@@k Kahve
9549
            5916112
                                                           208
@stanbul
9550
            5927402 Walter's Coffee Roastery
                                                           208
@rstanbul
                                                   Address \
      Third Floor, Century City Mall, Kalayaan Avenu...
0
      Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
1
2
      Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
      Third Floor, Mega Fashion Hall, SM Megamall, O...
3
4
      Third Floor, Mega Atrium, SM Megamall, Ortigas...
. . .
9546
      Kemanke🗘 Karamustafa Pa🗘 Mahallesi, R\ht\m ...
9547
      Ko��uyolu Mahallesi, Muhittin ��st� nda�� Cadd...
      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
9548
      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
9549
```

```
9550 Cafea@@a Mahallesi, Bademalt \ Sokak, No 21/B, ...
                                        Locality \
       Century City Mall, Poblacion, Makati City
0
1
      Little Tokyo, Legaspi Village, Makati City
2
      Edsa Shangri-La, Ortigas, Mandaluyong City
3
          SM Megamall, Ortigas, Mandaluyong City
4
          SM Megamall, Ortigas, Mandaluyong City
9546
                                        Karak 🗘 y
                                       Ko@@uyolu
9547
9548
                                     Kuru@ e@@me
9549
                                     Kuru Perme
9550
                                            Moda
                                       Locality Verbose
                                                          Longitude \
      Century City Mall, Poblacion, Makati City, Mak...
0
                                                          121.027535
1
      Little Tokyo, Legaspi Village, Makati City, Ma...
                                                          121.014101
2
      Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...
                                                          121.056831
3
      SM Megamall, Ortigas, Mandaluyong City, Mandal...
                                                          121.056475
4
      SM Megamall, Ortigas, Mandaluyong City, Mandal...
                                                          121.057508
9546
                                    Karak@ v, @@stanbul
                                                           28.977392
                                   Ko@@uvolu, @@stanbul
9547
                                                           29.041297
                                 Kuru@ e@@me, @@stanbul
9548
                                                           29.034640
                                 Kuru@ e@@me, @@stanbul
9549
                                                           29.036019
                                        Moda, 🚱 stanbul
                                                           29.026016
9550
       Latitude
                                         Cuisines ...
Currency \
      14.565443
                       French, Japanese, Desserts ... Botswana
Pula(P)
      14.553708
                                         Japanese
                                                   . . .
                                                        Botswana
Pula(P)
      14.581404 Seafood, Asian, Filipino, Indian
                                                         Botswana
Pula(P)
      14.585318
                                  Japanese, Sushi
                                                         Botswana
Pula(P)
      14.584450
                                 Japanese, Korean ...
                                                        Botswana
Pula(P)
. . .
9546 41.022793
                                          Turkish ... Turkish
Lira(TL)
9547 41.009847
                  World Cuisine, Patisserie, Cafe ...
                                                        Turkish
Lira(TL)
9548 41.055817
                           Italian, World Cuisine
                                                        Turkish
Lira(TL)
9549 41.057979
                                  Restaurant Cafe ... Turkish
```

Lira(TI)									
9550	40.984776						Cafe	·	Turkish	
Lira(
0 1 2 3 4	Has Table b	ooking Yes Yes Yes No Yes	Has	Online	e deliv	No No No No No No	Is del	ivering.	No No No No No No	
9546 9547 9548 9549 9550		No No No No No				No No No No No			No No No No No	
	Switch to c	rder me	enu F	Price r	ange	Aggr	egate	rating	Rating	color
0			No		3			4.8	Dark	Green
1			No		3			4.5	Dark	Green
2			No		4			4.4		Green
3			No		4			4.9	Dark	Green
4			No		4			4.8	Dark	Green
9546			No		3			4.1		Green
9547			No		3			4.2		Green
9548			No		4			3.7	Y	/ellow
9549			No		4			4.0		Green
9550			No		2			4.0		Green
0 1 2 3 4 9546 9547	Rating text Excellent Excellent Very Good Excellent Excellent Very Good Very Good	314 591 270 365 229 								

```
9548
            Good
                   661
9549
       Very Good
                   901
9550
       Very Good
                   591
[9551 rows x 21 columns]
df.iloc[2]
Restaurant ID
6300002
Restaurant Name
                                                    Heat - Edsa
Shangri-La
Country Code
162
City
                                                           Mandaluyong
City
Address
                        Edsa Shangri-La, 1 Garden Way, Ortigas,
Mandal...
Locality
                                Edsa Shangri-La, Ortigas, Mandaluyong
City
Locality Verbose
                        Edsa Shangri-La, Ortigas, Mandaluyong City,
Ma...
Longitude
121.056831
Latitude
14.581404
                                          Seafood, Asian, Filipino,
Cuisines
Indian
Average Cost for two
4000
Currency
                                                           Botswana
Pula(P)
Has Table booking
Yes
Has Online delivery
No
Is delivering now
No
Switch to order menu
No
Price range
Aggregate rating
4.4
Rating color
Green
Rating text
                                                                  Very
Good
Votes
```

```
270
Name: 2, dtype: object
```

Calculating the aggregate ratings

```
df["Aggregate rating"].value_counts()
0.0
       2148
3.2
        522
3.1
        519
3.4
        498
3.3
        483
3.5
        480
3.0
        468
3.6
        458
3.7
        427
3.8
        400
2.9
        381
3.9
        335
2.8
        315
4.1
        274
4.0
        266
2.7
        250
4.2
        221
2.6
        191
4.3
        174
4.4
        144
2.5
        110
4.5
         95
2.4
         87
4.6
         78
4.9
         61
2.3
         47
4.7
         42
2.2
         27
4.8
         25
2.1
         15
2.0
          7
          2
1.9
1.8
Name: Aggregate rating, dtype: int64
```

Preprocessing The Data

Calculating the missing values in the dataset

```
df.isnull()
```

	Restaurant II	D Resta	ırant Nam	e Countr	y Code	City	Address	
Locali 0	False	е	False	e	False	False	False	
False 1	False	e	Fals	e	False	False	False	
False 2			Fals		False	False		
False	False						False	
3 False	False	е	Fals	e	False	False	False	
4	False	е	Fals	e	False	False	False	
False								
	F-1-	_	F-1-		F-1	F.1	F-1	
9546 False	False	е	Fals	e	False	False	False	
9547	False	е	Fals	е	False	False	False	
False 9548	False	е	Fals	e	False	False	False	
False 9549	False	۵	Fals	۵	False	False	False	
False								
9550 False	False	е	Fals	e	False	False	False	
	1 1 ' b V 1				Contractor			
Curren	Locality Verl	oose Loi	ngitude	Latitude	Cuisin	es		
0		alse	False	False	Fal	se	False	
1	Fa	alse	False	False	Fal	se	False	
2	Fa	alse	False	False	Fal	se	False	
3	Fa	alse	False	False	Fal	se	False	
4	Fa	alse	False	False	Fal	se	False	
9546	F:	alse	False	False	Fal	se	False	
9547		alse	False	False	Fal		False	
9548	Fa	alse	False	False	Fal	se	False	
9549	F	alse	False	False	Fal	se	False	
9550	Fa	alse	False	False	Fal	se	False	
	llee Teble be	alei ma U	Onli	ماما المام	Ta de	1 4 , , a 4		
	Has Table bo	oktiig H	as untine	uetivery	rs de	civering	now \	

0 1 2 3 4 9546 9547 9548 9549 9550		F F F F F	alse alse alse alse alse alse alse alse			False		False	
color 0 False		to ord	false	Price	range False	Aggregate	rating False	Rating	
1 False			False		False		False		
2 False			False		False		False		
3 False			False		False		False		
4 False			False		False		False		
9546			False		False		False		
False 9547			False		False		False		
False 9548			False		False		False		
False 9549			False		False		False		
False 9550			False		False		False		
Palse 0 1 2 3 4 9546 9547 9548 9549 9550	F F F F F	text alse alse alse alse alse alse alse alse	Votes False						

```
[9551 rows x 21 columns]
df.isnull().sum()
Restaurant ID
                         0
Restaurant Name
                         0
                         0
Country Code
City
                         0
Address
                         0
Locality
                         0
Locality Verbose
                         0
Longitude
                         0
                         0
Latitude
                         9
Cuisines
                         0
Average Cost for two
Currency
                         0
                         0
Has Table booking
Has Online delivery
                         0
Is delivering now
                         0
Switch to order menu
                         0
Price range
                         0
                         0
Aggregate rating
Rating color
                         0
Rating text
                         0
                         0
Votes
dtype: int64
```

There are no missing values

```
df_cleaned = df.dropna()
print(df_cleaned)
      Restaurant ID
                               Restaurant Name Country Code
City \
            6317637
                              Le Petit Souffle
                                                          162
Makati City
            6304287
                              Izakaya Kikufuji
                                                          162
Makati City
                        Heat - Edsa Shangri-La
            6300002
                                                          162
Mandaluyong City
                                                          162
            6318506
                                           0oma
Mandaluyong City
            6314302
                                   Sambo Kojin
                                                          162
Mandaluyong City
. . .
. . .
9546
                                   Naml \ Gurme
                                                          208
            5915730
@stanbul
```

```
Ceviz A@@ac \
9547
            5908749
                                                     208
@ @ stanbul
9548
                                                          208
            5915807
                                         Hugga
@ @ stanbul
                                   A@@k Kahve
9549
            5916112
                                                          208
@
@
g
s
t
anbul
9550
            5927402 Walter's Coffee Roastery
                                                          208
@stanbul
                                                 Address
                                                          \
      Third Floor, Century City Mall, Kalayaan Avenu...
0
1
      Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
      Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
2
3
      Third Floor, Mega Fashion Hall, SM Megamall, O...
4
      Third Floor, Mega Atrium, SM Megamall, Ortigas...
9546
      Kemanke🗘 Karamustafa Pa🗘 Mahallesi, R\ht\m ...
9547
      Ko@@uyolu Mahallesi, Muhittin @@st@ nda@@ Cadd...
9548
      Kuru@ e@@me Mahallesi, Muallim Naci Caddesi, N...
9549
      Kuru� e��me Mahallesi, Muallim Naci Caddesi, N...
9550
      Cafea@@a Mahallesi, Bademalt \ Sokak, No 21/B, ...
                                         Locality \
0
       Century City Mall, Poblacion, Makati City
1
      Little Tokyo, Legaspi Village, Makati City
2
      Edsa Shangri-La, Ortigas, Mandaluyong City
3
          SM Megamall, Ortigas, Mandaluyong City
4
          SM Megamall, Ortigas, Mandaluyong City
9546
                                         Karak@ v
9547
                                        Ko@@uyolu
                                      Kuruû eûûme
9548
9549
                                      Kuru@ e@@me
9550
                                             Moda
                                        Locality Verbose
                                                            Longitude \
0
      Century City Mall, Poblacion, Makati City, Mak...
                                                           121.027535
1
      Little Tokyo, Legaspi Village, Makati City, Ma...
                                                           121.014101
2
      Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...
                                                           121.056831
3
      SM Megamall, Ortigas, Mandaluyong City, Mandal...
                                                           121.056475
4
      SM Megamall, Ortigas, Mandaluyong City, Mandal...
                                                           121.057508
9546
                                     Karak@_y, @@stanbul
                                                            28.977392
                                    Ko@@uyolu, @@stanbul
9547
                                                            29.041297
                                  Kuru@ e@@me, @@stanbul
9548
                                                            29.034640
9549
                                  Kuru@ e@@me, @@stanbul
                                                            29.036019
9550
                                         Moda. 🚱 stanbul
                                                            29.026016
       Latitude
                                          Cuisines
```

Cummon ou					
Currency \ 0 14.565443 Pula(P)	French, .	Japanese, Dessert	5	Botswana	1
1 14.553708 Pula(P)		Japanes	e	Botswana	ı
2 14.581404	Seafood, Asian	, Filipino, India	1	Botswana	ì
Pula(P) 3 14.585318		Japanese, Sush	i	Botswana	ı
Pula(P) 4 14.584450		Japanese, Korea	ı	Botswana	1
Pula(P)					
9546 41.022793 Lira(TL)		Turkisl	1	Turkish	
9547 41.009847 Lira(TL)	World Cuisine	, Patisserie, Caf	e	Turkish	
9548 41.055817	Ital	ian, World Cuisin	e	Turkish	
Lira(TL) 9549 41.057979		Restaurant Cafe	e	Turkish	
Lira(TL) 9550 40.984776 Lira(TL)		Cafe	e	Turkish	
Hac Table b	ooking Has Onli	ne delivery Is de	Livorino	ı nov. \	
0	Yes	No	civering	No	
i 1	Yes	No		No	
2	Yes	No		No	
3	No	No		No	
4	Yes	No		No	
		111			
9546	No	No		No	
9547	No	No		No	
9548	No	No		No	
9549	No	No		No	
9550	No	No		No	
Switch to o	rder menu Price	range Aggregate	rating	Rating	color
Ô	No	3	4.8	Dark	Green
1	No	3	4.5	Dark	Green
2	No	4	4.4		Green
3	No	4	4.9	Dark	Green
4	No	4	4.8	Dark	Green

9546	No	3	4.1	Green
9547	No	3	4.2	Green
9548	No	4	3.7	Yellow
9549	No	4	4.0	Green
9550	No	2	4.0	Green

	Rating	text	Votes
0	Exce	llent	314
1	Exce	llent	591
2	Very	Good	270
3	Exce	llent	365
4	Exce	llent	229
9546	Very	Good	788
9547	Very	Good	1034
9548		Good	661
9549	Very	Good	901
9550	Very	Good	591
	_		

[9542 rows x 21 columns]

df_cleaned.isnull().sum()

Restaurant ID Restaurant Name	0 0
Country Code	0
City	0
Address	0
Locality	0
Locality Verbose	0
Longitude	0
Latitude	0
Cuisines	0
Average Cost for two	0
Currency	0
Has Table booking	0
Has Online delivery	0
Is delivering now	0
Switch to order menu	0
	0
Price range	
Aggregate rating	0
Rating color	0
Rating text	0

Votes 0
dtype: int64

Label Encoding

Installing the Label Encoding

```
from sklearn import preprocessing
label encoder = preprocessing.LabelEncoder()
encoded data = pd.get dummies(df cleaned, columns=['Cuisines'])
df cleaned['Cuisines']=
label encoder.fit transform(df cleaned['Cuisines'])
<ipython-input-22-e27eaf236f61>:1: 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:
https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#
returning-a-view-versus-a-copy
  df cleaned['Cuisines']=
label encoder.fit transform(df cleaned['Cuisines'])
df cleaned['Cuisines'].unique()
array([ 920, 1111, 1671, ..., 319, 1824, 1110])
from sklearn import preprocessing
encoded data = pd.get dummies(df cleaned, columns=['Restaurant Name'])
df cleaned['Restaurant Name']=
label encoder.fit transform(df cleaned['Restaurant Name'])
<ipython-input-26-ff076fcd1971>:1: 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:
https://pandas.pydata.org/pandas-docs/stable/user guide/indexing.html#
returning-a-view-versus-a-copy
  df cleaned['Restaurant Name']=
label encoder.fit transform(df cleaned['Restaurant Name'])
df cleaned['Restaurant Name'].unique()
array([3742, 3167, 2892, ..., 3063, 512, 7231])
from sklearn import preprocessing
```

```
encoded_data = pd.get_dummies(df_cleaned, columns=['Address'])

df_cleaned['Address']=
label_encoder.fit_transform(df_cleaned['Address'])

<ipython-input-30-59dd0lb8c0fe>:1: 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:
https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#
returning-a-view-versus-a-copy
    df_cleaned['Address']=
label_encoder.fit_transform(df_cleaned['Address'])

df_cleaned['Address'].unique()

array([8677, 6047, 4676, ..., 5958, 5959, 4250])
categorical_vars = df.select_dtypes(include='object')
numerical_vars = df.select_dtypes(exclude='object')
```

Normalizing Numerical Features

Splitting the Training and testing the Data

```
x = normalized_df.drop('Aggregate rating', axis=1)
y = normalized_df['Aggregate rating']
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=42)
```

Training the Ligression Regression

```
from sklearn.linear_model import LinearRegression
model = LinearRegression()
model.fit(x_train, y_train)
LinearRegression()
```

Evaluating the Model

Mean Squared Error

```
from sklearn.metrics import mean_squared_error
y_pred = model.predict(x_train)
mse = mean_squared_error(y_train, y_pred)
print(f"Train Mean Squared Error: {mse}")
Train Mean Squared Error: 0.0626671037783661
y_pred = model.predict(x_test)
mse = mean_squared_error(y_pred, y_test)
print(f"Test Mean Squared Error: {mse}")
Test Mean Squared Error: 0.06563531055788792
```

R Squared

```
from sklearn.metrics import r2_score
y_pred = model.predict(x_train)
r2 = r2_score(y_train, y_pred)
print("R-squared:", r2)
R-squared: 0.3471503297302301
```

End of the code