```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import missingno as msno
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder, StandardScaler
from sklearn.linear_model import LinearRegression
from sklearn.tree import DecisionTreeRegressor
from sklearn.metrics import mean_squared_error, r2_score
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, precision_score, recall_score, classification_report
from sklearn.neighbors import NearestNeighbors
import folium
```

```python
df=pd.read_csv('/content/Dataset .csv')
```

```python
print(df)
```

```
⇄     9547                       Ko��uyolu, ��stanbul   29.041297
      9548                       Kuru�_e��me, ��stanbul   29.034640
      9549                       Kuru�_e��me, ��stanbul   29.036019
      9550                              Moda, ��stanbul   29.026016

            Latitude                      Cuisines  ...          Currency  \
      0     14.565443      French, Japanese, Desserts  ...  Botswana Pula(P)
      1     14.553708                        Japanese  ...  Botswana Pula(P)
      2     14.581404  Seafood, Asian, Filipino, Indian  ...  Botswana Pula(P)
      3     14.585318                  Japanese, Sushi  ...  Botswana Pula(P)
      4     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(TL)
      9550  40.984776                            Cafe  ...  Turkish Lira(TL)

            Has Table booking Has Online delivery Is delivering now  \
      0                   Yes                  No                No
      1                   Yes                  No                No
      2                   Yes                  No                No
      3                    No                  No                No
      4                   Yes                  No                No
      ...                 ...                 ...               ...
      9546                 No                  No                No
      9547                 No                  No                No
      9548                 No                  No                No
      9549                 No                  No                No
      9550                 No                  No                No

            Switch to order menu Price range  Aggregate 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

            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
      9549    Very Good   901
      9550    Very Good   591

      [9551 rows x 21 columns]
```

```
print(df.head())
```

```
   Restaurant ID         Restaurant Name  Country Code              City  \
0       6317637           Le Petit Souffle           162        Makati City
1       6304287           Izakaya Kikufuji           162        Makati City
2       6300002  Heat - Edsa Shangri-La           162  Mandaluyong City
3       6318506                      Ooma           162  Mandaluyong City
4       6314302               Sambo Kojin           162  Mandaluyong City

                                             Address  \
0  Third Floor, Century City Mall, Kalayaan Avenu...
1  Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
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...

                                       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

                                  Locality Verbose   Longitude   Latitude  \
0  Century City Mall, Poblacion, Makati City, Mak...  121.027535  14.565443
1  Little Tokyo, Legaspi Village, Makati City, Ma...  121.014101  14.553708
2  Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...  121.056831  14.581404
3  SM Megamall, Ortigas, Mandaluyong City, Mandal...  121.056475  14.585318
4  SM Megamall, Ortigas, Mandaluyong City, Mandal...  121.057508  14.584450

                           Cuisines  ...        Currency Has Table booking  \
0         French, Japanese, Desserts  ...  Botswana Pula(P)               Yes
1                           Japanese  ...  Botswana Pula(P)               Yes
2  Seafood, Asian, Filipino, Indian  ...  Botswana Pula(P)               Yes
3                   Japanese, Sushi  ...  Botswana Pula(P)                No
4                  Japanese, Korean  ...  Botswana Pula(P)               Yes

  Has Online delivery Is delivering now Switch to order menu Price range  \
0                  No                No                   No           3
1                  No                No                   No           3
2                  No                No                   No           4
3                  No                No                   No           4
4                  No                No                   No           4

   Aggregate rating  Rating color Rating text Votes
0               4.8    Dark Green   Excellent   314
1               4.5    Dark Green   Excellent   591
2               4.4         Green   Very Good   270
3               4.9    Dark Green   Excellent   365
4               4.8    Dark Green   Excellent   229

[5 rows x 21 columns]
```

```
print(df.tail())
```

```
      Restaurant ID         Restaurant Name  Country Code       City  \
9546        5915730             Naml` Gurme           208    ��stanbul
9547        5908749             Ceviz A��ac`           208    ��stanbul
9548        5915807                    Huqqa           208    ��stanbul
9549        5916112               A���k Kahve           208    ��stanbul
9550        5927402  Walter's Coffee Roastery           208    ��stanbul

                                             Address          Locality  \
9546  Kemanke�� Karamustafa Pa��a Mahallesi, R`ht`m ...      Karak�_y
9547  Ko��uyolu Mahallesi, Muhittin ��st�_nda�� Cadd...     Ko��uyolu
9548  Kuru�_e���me Mahallesi, Muallim Naci Caddesi, N...  Kuru�_e���me
9549  Kuru�_e���me Mahallesi, Muallim Naci Caddesi, N...  Kuru�_e���me
9550  Cafea��a Mahallesi, Bademalt` Sokak, No 21/B, ...          Moda

             Locality Verbose   Longitude   Latitude  \
9546      Karak�_y, ��stanbul  28.977392  41.022793
9547     Ko��uyolu, ��stanbul  29.041297  41.009847
9548  Kuru�_e���me, ��stanbul  29.034640  41.055817
9549  Kuru�_e���me, ��stanbul  29.036019  41.057979
9550          Moda, ��stanbul  29.026016  40.984776

                              Cuisines  ...        Currency  \
9546                           Turkish  ...  Turkish Lira(TL)
9547  World Cuisine, Patisserie, Cafe  ...  Turkish Lira(TL)
9548          Italian, World Cuisine  ...  Turkish Lira(TL)
9549                 Restaurant Cafe  ...  Turkish Lira(TL)
9550                            Cafe  ...  Turkish Lira(TL)
```

```
      Has Table booking Has Online delivery Is delivering now  \
9546                 No                  No                No
9547                 No                  No                No
9548                 No                  No                No
9549                 No                  No                No
9550                 No                  No                No

      Switch to order menu Price range  Aggregate rating  Rating color  \
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
9546    Very Good    788
9547    Very Good   1034
9548         Good    661
9549    Very Good    901
9550    Very Good    591

[5 rows x 21 columns]
```

```python
print(df.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9551 entries, 0 to 9550
Data columns (total 21 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   Restaurant ID         9551 non-null   int64
 1   Restaurant Name       9551 non-null   object
 2   Country Code          9551 non-null   int64
 3   City                  9551 non-null   object
 4   Address               9551 non-null   object
 5   Locality              9551 non-null   object
 6   Locality Verbose      9551 non-null   object
 7   Longitude             9551 non-null   float64
 8   Latitude              9551 non-null   float64
 9   Cuisines              9542 non-null   object
 10  Average Cost for two  9551 non-null   int64
 11  Currency              9551 non-null   object
 12  Has Table booking     9551 non-null   object
 13  Has Online delivery   9551 non-null   object
 14  Is delivering now     9551 non-null   object
 15  Switch to order menu  9551 non-null   object
 16  Price range           9551 non-null   int64
 17  Aggregate rating      9551 non-null   float64
 18  Rating color          9551 non-null   object
 19  Rating text           9551 non-null   object
 20  Votes                 9551 non-null   int64
dtypes: float64(3), int64(5), object(13)
memory usage: 1.5+ MB
None
```

```python
print(df.dropna())
```

```
       ...                 ...             ...             ...
      9546                  No              No              No
      9547                  No              No              No
      9548                  No              No              No
      9549                  No              No              No
      9550                  No              No              No

           Switch to order menu Price range  Aggregate rating  Rating color  \
      0                      No         3.0               4.8    Dark Green
      1                      No         3.0               4.5    Dark Green
      2                      No         4.0               4.4         Green
      3                      No         4.0               4.9    Dark Green
      4                      No         4.0               4.8    Dark Green
      ...                   ...         ...               ...           ...
      9546                   No         3.0               4.1         Green
      9547                   No         3.0               4.2         Green
      9548                   No         4.0               3.7        Yellow
      9549                   No         4.0               4.0         Green
      9550                   No         2.0               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
      9549   Very Good    901
      9550   Very Good    591

      [9542 rows x 21 columns]
```

```python
from sklearn.feature_extraction.text import TfidfVectorizer
from scipy.sparse import hstack

# Handling missing values
df.dropna(subset=['Cuisines', 'Price range'], inplace=True)

# Convert 'Price range' to numerical if it's categorical
df['Price range'] = df['Price range'].astype(float)

# Vectorizing the 'Cuisines' column using TF-IDF
vectorizer = TfidfVectorizer()
cuisine_matrix = vectorizer.fit_transform(df['Cuisines'])

# Combine cuisine vectors with 'Price range'
X = hstack((cuisine_matrix, df[['Price range']].values)).tocsr()  # Convert to compressed sparse row format

# Model training
nn = NearestNeighbors(n_neighbors=5, metric='cosine')
nn.fit(X)

# Recommendation function
def recommend_restaurant(index):
    distances, indices = nn.kneighbors(X[index].toarray())  # Convert sparse row to dense array
    print("Recommended Restaurants:")
    for i in indices[0]:
        print(df.iloc[i]['Restaurant Name'])  # Replace with actual column name

recommend_restaurant(10)  # Example index
```

```
Recommended Restaurants:
Silantro Fil-Mex
Silantro Fil-Mex
Locavore
Guevarra's
Balay Dako
```

```python
print(X)
```

```
  (0, 45)       0.3949328312995939
  (0, 57)       0.7256384522187065
  (0, 76)       0.5634508811097259
  (0, 150)      3.0
  (1, 76)       1.0
```

```
(1, 150)        3.0
(2, 10)         0.4471179676485894
(2, 53)         0.7381348081610657
(2, 69)         0.17171338550659074
(2, 124)        0.4751389704335845
(2, 150)        4.0
(3, 76)         0.6690605668710697
(3, 136)        0.7432078833396232
(3, 150)        4.0
(4, 76)         0.5961071302858968
(4, 82)         0.8029049067120668
(4, 150)        4.0
(5, 35)         1.0
(5, 150)        3.0
(6, 10)         0.6737242242807269
(6, 51)         0.7389828615180007
(6, 150)        4.0
(7, 10)         0.4062974671822443
(7, 51)         0.44565247041012473
(7, 53)         0.6707453618383769
  :       :
(9533, 150)     3.0
(9534, 28)      1.0
(9534, 150)     2.0
(9535, 1)       0.9320872231909288
(9535, 45)      0.3622339138791721
(9535, 150)     2.0
(9536, 26)      0.4551840289506141
(9536, 75)      0.8903973830758302
(9536, 150)     3.0
(9537, 144)     1.0
(9537, 150)     3.0
(9538, 28)      0.2377604261434737
(9538, 42)      0.5527402926774335
(9538, 110)     0.5647778982090831
(9538, 149)     0.5647778982090831
(9538, 150)     3.0
(9539, 42)      0.6709767430317639
(9539, 74)      0.28241372359431877
(9539, 149)     0.68558893078484218
(9539, 150)     4.0
(9540, 28)      0.38800045241797815
(9540, 120)     0.9216591826285053
(9540, 150)     4.0
(9541, 28)      1.0
(9541, 150)     2.0
```

```
print(nn)
```

```
NearestNeighbors(metric='cosine')
```

```
print(recommend_restaurant(10))
```

```
Recommended Restaurants:
Silantro Fil-Mex
Silantro Fil-Mex
Locavore
Guevarra's
Balay Dako
None
```

Start coding or generate with AI.

+ Code   + Text