```
#import library
import pandas as pd


import numpy as np


#import CSV as dataframe
df=pd.read_csv('https://raw.githubusercontent.com/YBI-Foundation/Dataset/main/Big%20Sales%


df.head()  #first five rows
```

	Item_Identifier	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Ite
0	FDT36	12.3	Low Fat	0.111448	Baking Goods	3
1	FDT36	12.3	Low Fat	0.111904	Baking Goods	3
2	FDT36	12.3	LF	0.111728	Baking Goods	3

```
df.info()  #Get info from datset
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14204 entries, 0 to 14203
Data columns (total 12 columns):
 #   Column                     Non-Null Count  Dtype  
---  ------                     --------------  -----  
 0   Item_Identifier            14204 non-null  object 
 1   Item_Weight                11815 non-null  float64
 2   Item_Fat_Content           14204 non-null  object 
 3   Item_Visibility            14204 non-null  float64
 4   Item_Type                  14204 non-null  object 
 5   Item_MRP                   14204 non-null  float64
 6   Outlet_Identifier          14204 non-null  object 
 7   Outlet_Establishment_Year  14204 non-null  int64  
 8   Outlet_Size                14204 non-null  object 
 9   Outlet_Location_Type       14204 non-null  object 
 10  Outlet_Type                14204 non-null  object 
 11  Item_Outlet_Sales          14204 non-null  float64
dtypes: float64(4), int64(1), object(7)
memory usage: 1.3+ MB
```

```
df.columns
```

```
Index(['Item_Identifier', 'Item_Weight', 'Item_Fat_Content', 'Item_Visibility',
       'Item_Type', 'Item_MRP', 'Outlet_Identifier',
       'Outlet_Establishment_Year', 'Outlet_Size', 'Outlet_Location_Type',
       'Outlet_Type', 'Item_Outlet_Sales'],
      dtype='object')
```

```
df.describe()
```

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP
count	14204.000000	14204.000000	14204.000000	14204.000000	14204.000000
mean	12.790642	0.353351	0.065953	0.208814	141.004977
std	4.251186	0.478027	0.051459	0.452384	62.086938
min	4.555000	0.000000	0.000000	0.000000	31.290000
25%	9.300000	0.000000	0.027036	0.000000	94.012000
50%	12.800000	0.000000	0.054021	0.000000	142.247000
75%	16.000000	1.000000	0.094037	0.000000	185.855600
max	30.000000	1.000000	0.328391	2.000000	266.888400

```
df['Item_Weight'].fillna(df.groupby(['Item_Type'])['Item_Weight'].transform('mean'),inplac
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14204 entries, 0 to 14203
Data columns (total 12 columns):
 #   Column                     Non-Null Count  Dtype  
---  ------                     --------------  -----  
 0   Item_Identifier            14204 non-null  object 
 1   Item_Weight                14204 non-null  float64
 2   Item_Fat_Content           14204 non-null  object 
 3   Item_Visibility            14204 non-null  float64
 4   Item_Type                  14204 non-null  object 
 5   Item_MRP                   14204 non-null  float64
 6   Outlet_Identifier          14204 non-null  object 
 7   Outlet_Establishment_Year  14204 non-null  int64  
 8   Outlet_Size                14204 non-null  object 
 9   Outlet_Location_Type       14204 non-null  object 
 10  Outlet_Type                14204 non-null  object 
 11  Item_Outlet_Sales          14204 non-null  float64
dtypes: float64(4), int64(1), object(7)
memory usage: 1.3+ MB
```

```
df.describe()
```

	Item_Weight	Item_Visibility	Item_MRP	Outlet_Establishment_Year	Ite
count	14204.000000	14204.000000	14204.000000	14204.000000	

```
df.columns #get column names
```

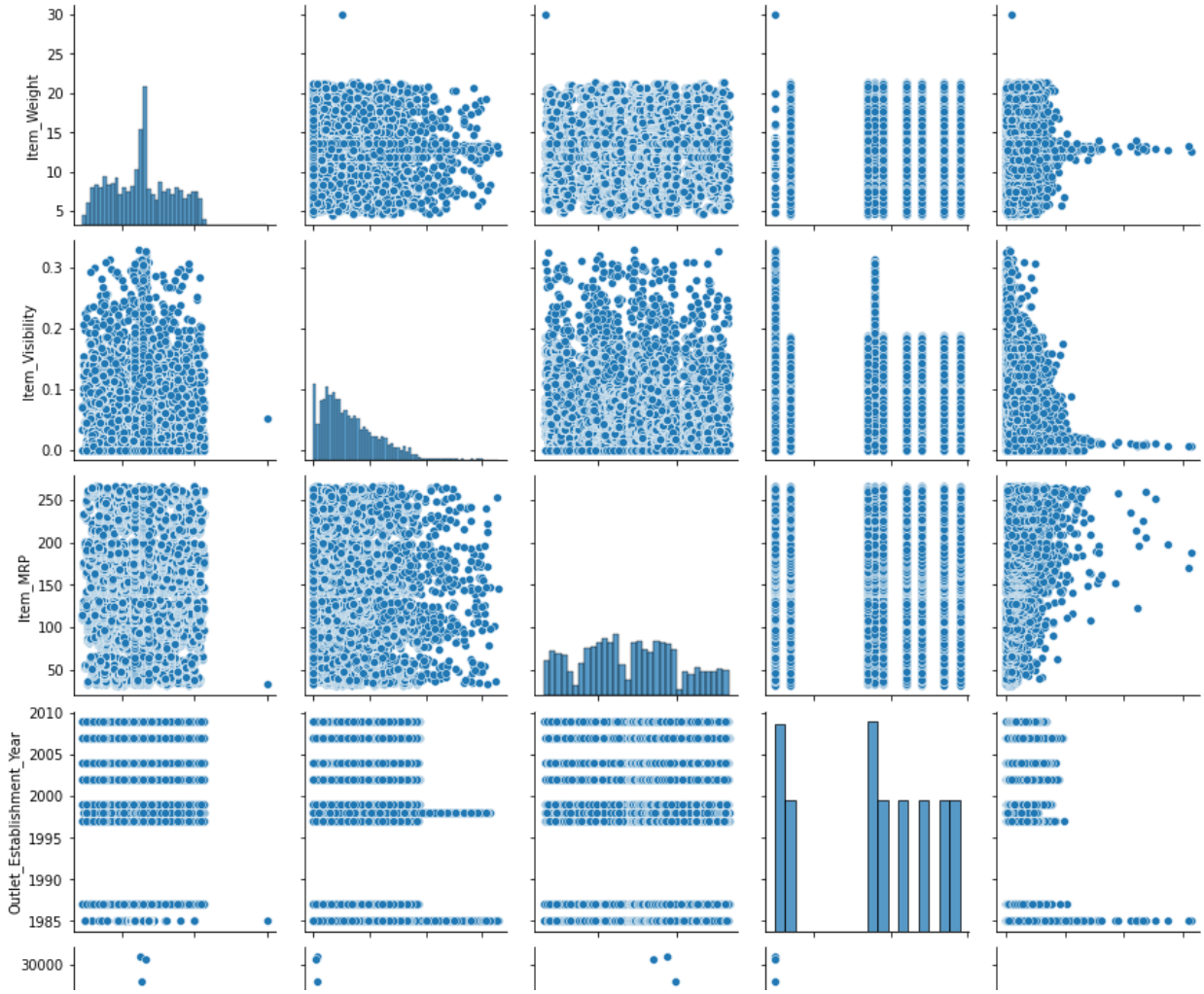
```
Index(['Item_Identifier', 'Item_Weight', 'Item_Fat_Content', 'Item_Visibility',
       'Item_Type', 'Item_MRP', 'Outlet_Identifier',
       'Outlet_Establishment_Year', 'Outlet_Size', 'Outlet_Location_Type',
       'Outlet_Type', 'Item_Outlet_Sales'],
      dtype='object')
```

```
df.describe() #Get summary statistics
```

	Item_Weight	Item_Visibility	Item_MRP	Outlet_Establishment_Year	Ite
count	14204.000000	14204.000000	14204.000000	14204.000000	
mean	12.790642	0.065953	141.004977	1997.830681	
std	4.251186	0.051459	62.086938	8.371664	
min	4.555000	0.000000	31.290000	1985.000000	
25%	9.300000	0.027036	94.012000	1987.000000	
50%	12.800000	0.054021	142.247000	1999.000000	
75%	16.000000	0.094037	185.855600	2004.000000	
max	30.000000	0.328391	266.888400	2009.000000	

```
import seaborn as sns
sns.pairplot(df)
```

```
<seaborn.axisgrid.PairGrid at 0x7f70057a8dd0>
```




```
#get categories and counts of categorical variables
df[['Item_Identifier']].value_counts()
```

```
Item_Identifier
FDQ08              10
FDO24              10
FDQ19              10
FDQ28              10
FDQ31              10
                   ..
FDM52               7
FDM50               7
FDL50               7
FDM10               7
FDR51               7
Length: 1559, dtype: int64
```

```
df[['Item_Fat_Content']].value_counts()
```

```
Item_Fat_Content
Low Fat             8485
Regular             4824
LF                   522
reg                  195
low fat              178
dtype: int64
```

```
df.replace({'Item_Fat_Content':{'LF':'Low Fat','reg':'Regular','low fat':'Low Fat'}},inpla
```

```
df[['Item_Fat_Content']].value_counts()
```

```
Item_Fat_Content
Low Fat             9185
Regular             5019
dtype: int64
```

```
df.replace({'Item_Fat_Content':{'Low Fat':0,'Regular':1}},inplace=True)
```

```
df[['Item_Type']].value_counts()
```

```
Item_Type
Fruits and Vegetables    2013
Snack Foods              1989
Household                1548
Frozen Foods             1426
Dairy                    1136
Baking Goods             1086
Canned                   1084
Health and Hygiene        858
Meat                      736
Soft Drinks               726
Breads                    416
Hard Drinks               362
Others                    280
Starchy Foods             269
Breakfast                 186
Seafood                    89
dtype: int64
```

```
df.replace({'Item_Type':{'Fruits and Vegetables':0,'Snack Foods':0,'Household':1,'Frozen F
                         'Canned':0,'Health and Hygiene':1,'Meat':0,'Soft Drinks':0,'Bread
                         'Others':2,'Starchy Foods':0,'Breakfast':0,'Seafood':0}},inplace=
```

```
df[['Item_Type']].value_counts()
```

```
Item_Type
0            11518
1             2406
2              280
dtype: int64
```

```
df[['Outlet_Identifier']].value_counts()
```

```
Outlet_Identifier
OUT027               1559
OUT013               1553
OUT035               1550
OUT046               1550
```

```
OUT049              1550
OUT045              1548
OUT018              1546
OUT017              1543
OUT010               925
OUT019               880
dtype: int64
```

```
df.replace({'Outlet_Identifier':{'OUT027':0,'OUT013':1,
                                 'OUT049':2,'OUT046':3,'OUT035':4,
                                 'OUT045':5,'OUT018':6,
                                 'OUT017':7,'OUT010':8,'OUT019':9,
                                 }},inplace=True)
```

```
df[['Outlet_Identifier']].value_counts()
```

```
Outlet_Identifier
0                   1559
1                   1553
2                   1550
3                   1550
4                   1550
5                   1548
6                   1546
7                   1543
8                    925
9                    880
dtype: int64
```

```
df[['Outlet_Size']].value_counts()
```

```
Outlet_Size
1              7122
0              5529
2              1553
dtype: int64
```

```
df.replace({'Outlet_Size':{'Small':0,'Medium':1,'High':2}},inplace=True)
```

```
df[['Outlet_Size']].value_counts()
```

```
Outlet_Size
1              7122
0              5529
2              1553
dtype: int64
```

```
df[['Outlet_Location_Type']].value_counts()
```

```
Outlet_Location_Type
Tier 3                 5583
Tier 2                 4641
Tier 1                 3980
dtype: int64
```

```
df.replace({'Outlet_Location_Type':{'Tier 1':0,'Tier 2':1,'Tier 3':2}},inplace=True)
```

```
df[['Outlet_Location_Type']].value_counts()
```

```
Outlet_Location_Type
2                      5583
1                      4641
0                      3980
dtype: int64
```

```
df.replace({'Outlet_Type':{'Grocery Store':0,'Supermarket Type1':1,'Supermarket Type2':2,'
```

```
df[['Outlet_Type']].value_counts()
```

```
Outlet_Type
1              9294
0              1805
3              1559
2              1546
dtype: int64
```

```
df.head()
```

	Item_Identifier	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Ite
0	FDT36	12.3	0	0.111448	0	3
1	FDT36	12.3	0	0.111904	0	3
2	FDT36	12.3	0	0.111728	0	3
3	FDT36	12.3	0	0.000000	0	3
4	FDP12	9.8	1	0.045523	0	3

```
df.head()
```

	Item_Identifier	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Ite
0	FDT36	12.3	0	0.111448	0	3

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14204 entries, 0 to 14203
Data columns (total 12 columns):
 #   Column                     Non-Null Count  Dtype  
---  ------                     --------------  -----  
 0   Item_Identifier            14204 non-null  object 
 1   Item_Weight                14204 non-null  float64
 2   Item_Fat_Content           14204 non-null  int64  
 3   Item_Visibility            14204 non-null  float64
 4   Item_Type                  14204 non-null  int64  
 5   Item_MRP                   14204 non-null  float64
 6   Outlet_Identifier          14204 non-null  int64  
 7   Outlet_Establishment_Year  14204 non-null  int64  
 8   Outlet_Size                14204 non-null  int64  
 9   Outlet_Location_Type       14204 non-null  int64  
 10  Outlet_Type                14204 non-null  int64  
 11  Item_Outlet_Sales          14204 non-null  float64
dtypes: float64(4), int64(7), object(1)
memory usage: 1.3+ MB
```

```
df.shape #get shape of datframe
```

```
(14204, 12)
```

```
y=df['Item_Outlet_Sales']
```

```
y.shape
```

```
(14204,)
```

```
y
```

```
0         436.608721
1         443.127721
2         564.598400
3        1719.370000
4         352.874000
             ...     
14199    4984.178800
14200    2885.577200
14201    2885.577200
14202    3803.676434
14203    3644.354765
Name: Item_Outlet_Sales, Length: 14204, dtype: float64
```

```
X=df[['Item_Weight', 'Item_Fat_Content', 'Item_Visibility',
       'Item_Type', 'Item_MRP', 'Outlet_Identifier',
```

```
       'Outlet_Establishment_Year', 'Outlet_Size', 'Outlet_Location_Type',
       'Outlet_Type']]
```

```
X=df.drop(['Item_Identifier','Item_Outlet_Sales'],axis=1)
```

```
X.shape
```

```
(14204, 10)
```

```
X
```

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outlet
0	12.300000	0	0.111448	0	33.4874	
1	12.300000	0	0.111904	0	33.9874	
2	12.300000	0	0.111728	0	33.9874	
3	12.300000	0	0.000000	0	34.3874	
4	9.800000	1	0.045523	0	35.0874	
...	...	...	...	...	...	
14199	12.800000	0	0.069606	0	261.9252	
14200	12.800000	0	0.070013	0	262.8252	
14201	12.800000	0	0.069561	0	263.0252	
14202	13.659758	0	0.069282	0	263.5252	
14203	12.800000	0	0.069727	0	263.6252	

14204 rows × 10 columns

```
from sklearn.preprocessing import StandardScaler
```

```
sc=StandardScaler()
```

```
X_std=df[['Item_Weight','Item_Visibility','Item_MRP','Outlet_Establishment_Year']]
```

```
X_std=sc.fit_transform(X_std)
```

```
X_std
```

```
array([[-0.11541705,  0.88413635, -1.73178716,  0.13968068],
       [-0.11541705,  0.89300616, -1.72373366,  1.09531886],
       [-0.11541705,  0.88958331, -1.72373366,  1.3342284 ],
       ...,
       [ 0.00220132,  0.07011952,  1.96538148, -1.29377659],
       [ 0.20444792,  0.06469366,  1.97343499, -1.53268614],
       [ 0.00220132,  0.07334891,  1.97504569,  0.13968068]])
```

```
X[['Item_Weight','Item_Visibility','Item_MRP','Outlet_Establishment_Year']]=pd.DataFrame(X
```

```
X
```

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outle
0	-0.115417	0	0.884136	0	-1.731787	
1	-0.115417	0	0.893006	0	-1.723734	
2	-0.115417	0	0.889583	0	-1.723734	
3	-0.115417	0	-1.281712	0	-1.717291	
4	-0.703509	1	-0.397031	0	-1.706016	
...	...	...	...	...	...	
14199	0.002201	0	0.070990	0	1.947664	
14200	0.002201	0	0.078898	0	1.962160	
14201	0.002201	0	0.070120	0	1.965381	
14202	0.204448	0	0.064694	0	1.973435	
14203	0.002201	0	0.073349	0	1.975046	

14204 rows × 10 columns

```
from sklearn.model_selection import train_test_split #Get train test split
```

```
X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.1,random_state=2529)
```

```
X_train.shape,X_test.shape,y_train.shape,y_test.shape
```

```
((12783, 10), (1421, 10), (12783,), (1421,))
```

```
from sklearn.ensemble import RandomForestRegressor
```

```
rfr=RandomForestRegressor(random_state=2529)
```

```
rfr.fit(X_train,y_train)
```

```
RandomForestRegressor(random_state=2529)
```

```
y_pred=rfr.predict(X_test)  #Get Model Prediction
```

```
y_pred.shape
```

```
(1421,)
```

```
y_pred
```

```
array([1445.29507934,  669.51312572, 1883.54185796, ..., 2228.46101734,
       3251.93307564,  460.5156873 ])
```

```
from sklearn.metrics import mean_squared_error,mean_absolute_error,r2_score #Get Model Eva
```

```
mean_squared_error(y_test,y_pred)
```

```
1611177.5560500463
```

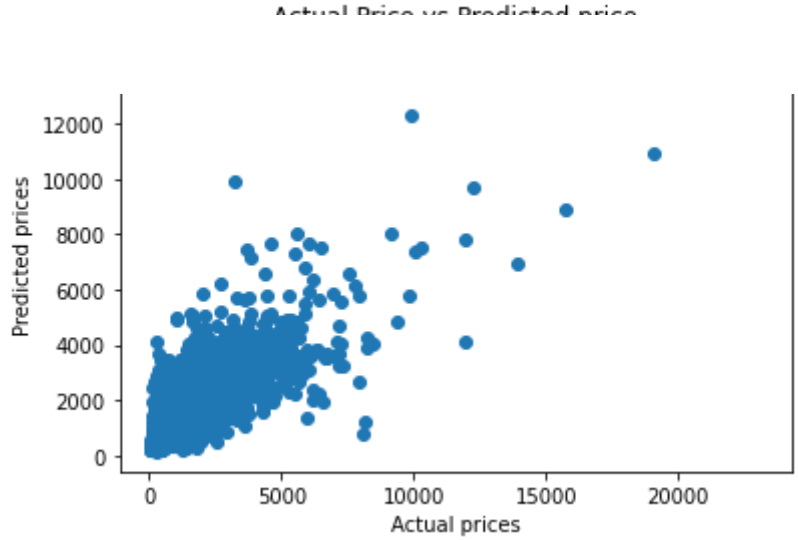
```
mean_absolute_error(y_test,y_pred)
```

```
828.3494726840753
```

```
r2_score(y_test,y_pred)
```

```
0.5806344037136959
```

```
import matplotlib.pyplot as plt  #get Visualization of actual vs predicted result
plt.scatter(y_test,y_pred)
plt.xlabel('Actual prices')
plt.ylabel('Predicted prices')
plt.title('Actual Price vs Predicted price')
plt.show()
```



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