Importing Required Library

In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import pickle
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import PowerTransformer
%matplotlib inline

import warnings
warnings.filterwarnings('ignore')
```

Reading Data

In [2]:
```
df = pd.read_csv(r"C:\Users\Kushal Arya\Desktop\Data Analysis With Python\ML File
df.head()
```

Out[2]:

	Item_Identifier	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outlet_Iden
0	FDW58	20.750	Low Fat	0.007565	Snack Foods	107.8622	OU
1	FDW14	8.300	reg	0.038428	Dairy	87.3198	OU
2	NCN55	14.600	Low Fat	0.099575	Others	241.7538	OU
3	FDQ58	7.315	Low Fat	0.015388	Snack Foods	155.0340	OU
4	FDY38	NaN	Regular	0.118599	Dairy	234.2300	OU

Check no of row and column

In [3]:
```
print('No of Rows and Columns ----->', df.shape )
```

```
No of Rows and Columns -----> (5681, 11)
```

Checking for Null values

In [4]:
```
print('----------------------\n')
print(df.isnull().sum())
print('\n----------------------')
```

```
----------------------

Item_Identifier                 0
Item_Weight                   976
Item_Fat_Content                0
Item_Visibility                 0
Item_Type                       0
Item_MRP                        0
Outlet_Identifier               0
Outlet_Establishment_Year       0
Outlet_Size                  1606
Outlet_Location_Type            0
Outlet_Type                     0
dtype: int64

----------------------
```

There is Item weight and Outlet size has Nan value

Removing Nan Value

In [5]:
```
df['Item_Weight'] = df['Item_Weight'].fillna(df['Item_Weight'].mean())
df['Outlet_Size'] = df['Outlet_Size'].fillna(df['Outlet_Size'].mode()[0])
```

We remove all nan on those features

Checking for Null values remove or not

In [6]:
```
print('----------------------\n')
print(df.isnull().sum())
print('\n----------------------')
```

```
----------------------

Item_Identifier              0
Item_Weight                  0
Item_Fat_Content             0
Item_Visibility              0
Item_Type                    0
Item_MRP                     0
Outlet_Identifier            0
Outlet_Establishment_Year    0
Outlet_Size                  0
Outlet_Location_Type         0
Outlet_Type                  0
dtype: int64

----------------------
```

In [7]:
```
print('No of Rows and Columns Left After Removing NaN ----->', df.shape )
```

```
No of Rows and Columns Left After Removing NaN -----> (5681, 11)
```

Information about dataset

In [8]:
```
print('-------------------------------------------------\n')
print(df.info())
print('\n-------------------------------------------------')
```

```
-------------------------------------------------

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5681 entries, 0 to 5680
Data columns (total 11 columns):
 #   Column                     Non-Null Count  Dtype
---  ------                     --------------  -----
 0   Item_Identifier            5681 non-null   object
 1   Item_Weight                5681 non-null   float64
 2   Item_Fat_Content           5681 non-null   object
 3   Item_Visibility            5681 non-null   float64
 4   Item_Type                  5681 non-null   object
 5   Item_MRP                   5681 non-null   float64
 6   Outlet_Identifier          5681 non-null   object
 7   Outlet_Establishment_Year  5681 non-null   int64
 8   Outlet_Size                5681 non-null   object
 9   Outlet_Location_Type       5681 non-null   object
 10  Outlet_Type                5681 non-null   object
dtypes: float64(3), int64(1), object(7)
memory usage: 488.3+ KB
None

-------------------------------------------------
```

Some features are in float and some are in object

Droping Unwanted Column

In [9]:
```
col = ['Item_Identifier','Outlet_Identifier']
```

In [10]:
```
df = df.drop(columns = col, axis = 1)
df.head()
```

Out[10]:

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outlet_Establishment_Year
0	20.750000	Low Fat	0.007565	Snack Foods	107.8622	1999
1	8.300000	reg	0.038428	Dairy	87.3198	2007
2	14.600000	Low Fat	0.099575	Others	241.7538	1998
3	7.315000	Low Fat	0.015388	Snack Foods	155.0340	2007
4	12.695633	Regular	0.118599	Dairy	234.2300	1985

In [11]:
```
print('No of Rows and Columns ----->', df.shape )
```

```
No of Rows and Columns -----> (5681, 9)
```

Analysis of data

In [12]:
```
df['Item_Fat_Content'].value_counts()
```

Out[12]:
```
Low Fat    3396
Regular    1935
LF          206
reg          78
low fat      66
Name: Item_Fat_Content, dtype: int64
```

In [13]:
```
df['Item_Type'].value_counts()
```

Out[13]:
```
Snack Foods              789
Fruits and Vegetables    781
Household                638
Frozen Foods             570
Dairy                    454
Baking Goods             438
Canned                   435
Health and Hygiene       338
Meat                     311
Soft Drinks              281
Breads                   165
Hard Drinks              148
Starchy Foods            121
Others                   111
Breakfast                 76
Seafood                   25
Name: Item_Type, dtype: int64
```

In [14]:
```
df['Outlet_Size'].value_counts()
```

Out[14]:
```
Medium    3468
Small     1592
High       621
Name: Outlet_Size, dtype: int64
```

In [15]:
```
df['Outlet_Location_Type'].value_counts()
```

Out[15]:
```
Tier 3    2233
Tier 2    1856
Tier 1    1592
Name: Outlet_Location_Type, dtype: int64
```

In [16]:
```
df['Outlet_Type'].value_counts()
```

Out[16]:
```
Supermarket Type1    3717
Grocery Store         722
Supermarket Type3     624
Supermarket Type2     618
Name: Outlet_Type, dtype: int64
```

In [17]:
```
df['Outlet_Establishment_Year'].value_counts()
```

Out[17]:
```
1985    976
1987    621
2004    620
1997    620
1999    620
2002    619
2009    618
2007    617
1998    370
Name: Outlet_Establishment_Year, dtype: int64
```

In [18]:
```
df['No_of_years_outlet_open'] = [2021] - df['Outlet_Establishment_Year']
df.head()
```

Out[18]:

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outlet_Establishment_Year
0	20.750000	Low Fat	0.007565	Snack Foods	107.8622	1999
1	8.300000	reg	0.038428	Dairy	87.3198	2007
2	14.600000	Low Fat	0.099575	Others	241.7538	1998
3	7.315000	Low Fat	0.015388	Snack Foods	155.0340	2007
4	12.695633	Regular	0.118599	Dairy	234.2300	1985

Convert Outlet establishment year into No of years outlets open because it esaier to incode

In [19]:
```
print('-------------------------------------------------\n')
print(df.info())
print('\n-------------------------------------------------')
```

```
-------------------------------------------------

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5681 entries, 0 to 5680
Data columns (total 10 columns):
 #   Column                     Non-Null Count  Dtype
---  ------                     --------------  -----
 0   Item_Weight                5681 non-null   float64
 1   Item_Fat_Content           5681 non-null   object
 2   Item_Visibility            5681 non-null   float64
 3   Item_Type                  5681 non-null   object
 4   Item_MRP                   5681 non-null   float64
 5   Outlet_Establishment_Year  5681 non-null   int64
 6   Outlet_Size                5681 non-null   object
 7   Outlet_Location_Type       5681 non-null   object
 8   Outlet_Type                5681 non-null   object
 9   No_of_years_outlet_open    5681 non-null   int64
dtypes: float64(3), int64(2), object(5)
memory usage: 444.0+ KB
None

-------------------------------------------------
```

In [20]:
```
df = df.drop('Outlet_Establishment_Year', axis = 1)
df.head()
```

Out[20]:

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outlet_Size	Outlet_Locatio
0	20.750000	Low Fat	0.007565	Snack Foods	107.8622	Medium	
1	8.300000	reg	0.038428	Dairy	87.3198	Medium	
2	14.600000	Low Fat	0.099575	Others	241.7538	Medium	
3	7.315000	Low Fat	0.015388	Snack Foods	155.0340	Medium	
4	12.695633	Regular	0.118599	Dairy	234.2300	Medium	

Drop Outlet establishment year

Filter Categorical features

In [21]:
```
numerics = ['int64', 'float64']
categorical_col = []
features = df.columns.values.tolist()
for col in features:
    if df[col].dtype in numerics:
        continue
    categorical_col.append(col)
```

Encoding categorical columns using get dummies

In [22]:
```
df_dummies = pd.get_dummies(df[categorical_col], drop_first = True)
df_dummies.head()
```

Out[22]:

	Item_Fat_Content_Low Fat	Item_Fat_Content_Regular	Item_Fat_Content_low fat	Item_Fat_Content_reg	It
0	1	0	0	0	
1	0	0	0	1	
2	1	0	0	0	
3	1	0	0	0	
4	0	1	0	0	

5 rows × 26 columns

In [24]:
```
df_dummies.shape
```

Out[24]:
```
(5681, 26)
```

In [26]:
```
df = df.join(df_dummies)
```

In [27]:
```
df.head()
```

Out[27]:

	Item_Weight	Item_Fat_Content	Item_Visibility	Item_Type	Item_MRP	Outlet_Size	Outlet_Locatio
0	20.750000	Low Fat	0.007565	Snack Foods	107.8622	Medium	
1	8.300000	reg	0.038428	Dairy	87.3198	Medium	
2	14.600000	Low Fat	0.099575	Others	241.7538	Medium	
3	7.315000	Low Fat	0.015388	Snack Foods	155.0340	Medium	
4	12.695633	Regular	0.118599	Dairy	234.2300	Medium	

5 rows × 35 columns

In [28]:
```
df.drop(columns = categorical_col, axis = 1, inplace = True)
```

In [29]:
```
df.head()
```

Out[29]:

	Item_Weight	Item_Visibility	Item_MRP	No_of_years_outlet_open	Item_Fat_Content_Low Fat	Item_Fa
0	20.750000	0.007565	107.8622	22	1	
1	8.300000	0.038428	87.3198	14	0	
2	14.600000	0.099575	241.7538	23	1	
3	7.315000	0.015388	155.0340	14	1	
4	12.695633	0.118599	234.2300	36	0	

5 rows × 30 columns

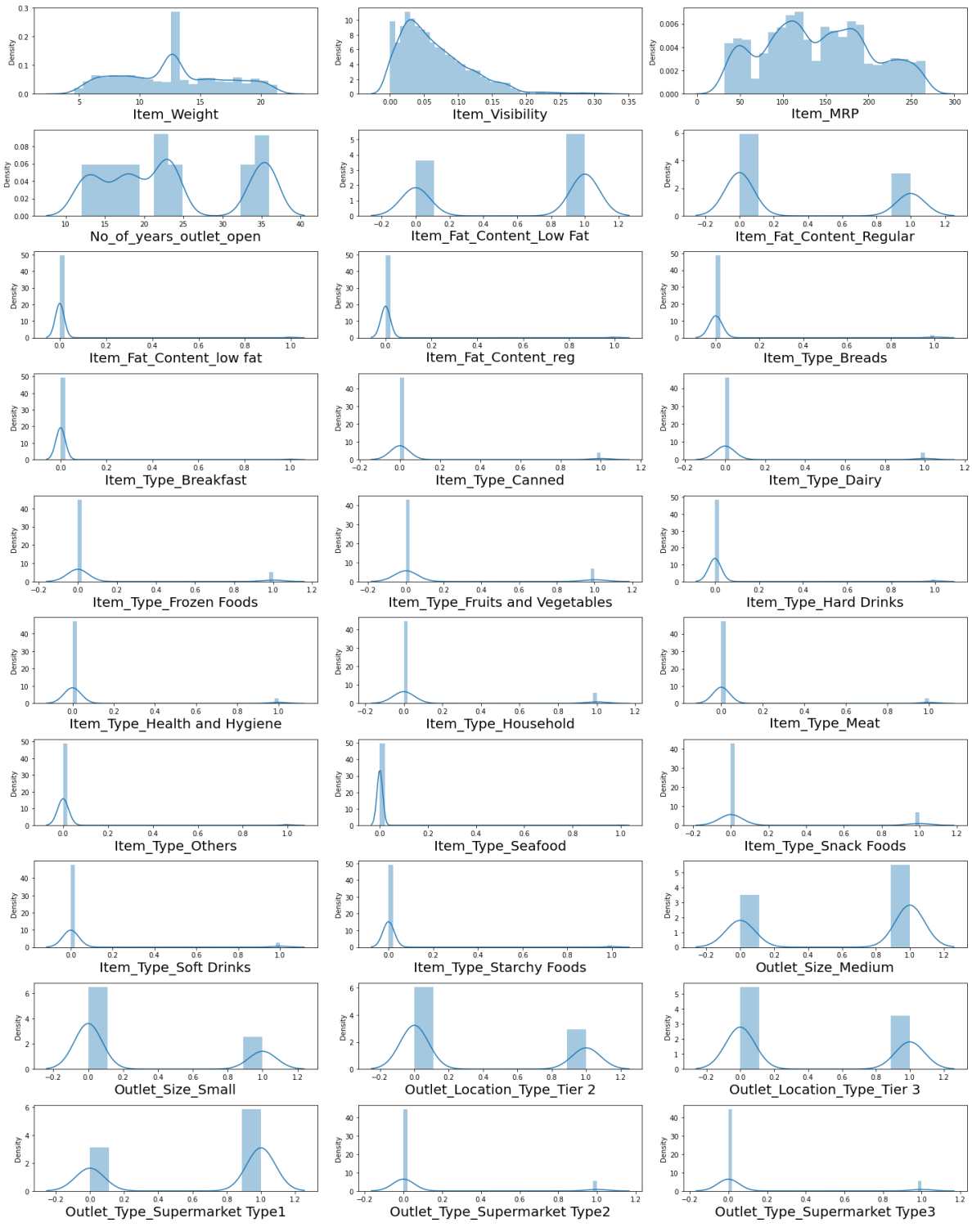
Checking Outliers

In [30]:
```
print('----------------------')
print('Distribution Plot :- ')
print('----------------------')

plt.figure(figsize = (20,25))
plotnumber = 1

for column in df:
    if plotnumber <=30:
        ax = plt.subplot(10,3, plotnumber)
        sns.distplot(df[column])
        plt.xlabel(column, fontsize = 20)
    plotnumber +=1
plt.tight_layout()
```

```
----------------------
Distribution Plot :-
----------------------
```



Some outliers present in columns

Power Transformer to remove outliers

In [32]:
```
scaler = PowerTransformer(method = 'yeo-johnson')
x_scaled = scaler.fit_transform(df)
x_scaled
```

Out[32]:
```
array([[ 1.77007392, -1.46206861, -0.47201654, ...,  0.72689965,
        -0.34937375, -0.35127385],
       [-1.03619283, -0.44801894, -0.83599752, ...,  0.72689965,
        -0.34937375, -0.35127385],
       [ 0.49167513,  0.87134242,  1.52537499, ..., -1.37570571,
        -0.34937375, -0.35127385],
       ...,
       [-0.59355557,  0.39786781, -0.288074  , ...,  0.72689965,
        -0.34937375, -0.35127385],
       [ 0.64562931, -1.76023409,  1.15680222, ...,  0.72689965,
        -0.34937375, -0.35127385],
       [-0.72091914,  0.9524881 , -0.97581463, ...,  0.72689965,
        -0.34937375, -0.35127385]])
```

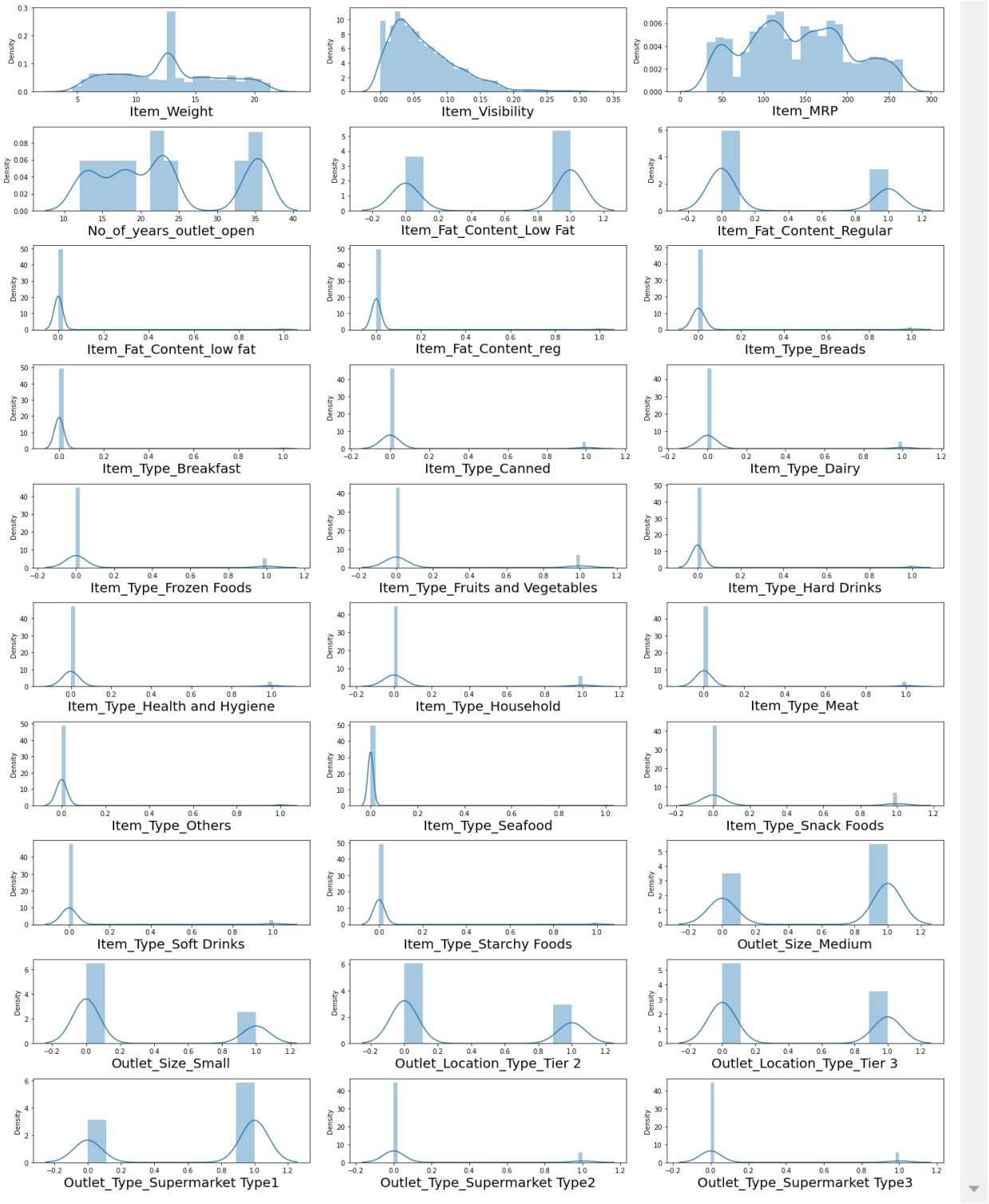
Checking Outlier remove or not

In [33]:
```
print('----------------------')
print('Distribution Plot :- ')
print('----------------------')

plt.figure(figsize = (20,25))
plotnumber = 1

for column in df:
    if plotnumber <=30:
        ax = plt.subplot(10,3, plotnumber)
        sns.distplot(df[column])
        plt.xlabel(column, fontsize = 20)
    plotnumber +=1
plt.tight_layout()
```

```
----------------------
Distribution Plot :-
----------------------
```



Outliers are removed

Load Pickle File

In [40]:
```
model = pickle.load(open('Big Data Mart Sales Train.pickle', 'rb'))
```

In [44]:
```
a = model.predict(df)
a
```

Out[44]:
```
array([1793.58824495, 1413.1182747 , 1928.6508598 , ..., 1881.885621  ,
       3653.25026613, 1359.89941381])
```

In [45]:
```
pred = pd.DataFrame(a)
```

In [46]:
```
pred.to_csv('Test Predict.csv', index = False)
```

In [ ]:
```

```