In [1]:
```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
import plotly.express as px
from IPython.display import display
```

In [2]:
```
df = pd.read_excel("Random Price Dataset Trial Assignment.xlsx")
df.head()
```

Out[2]:

	Date	Domestic Market (Contract) Blow Molding, Low	Spot/Export Blow Molding	Spot, Domestic	WTISPLC	MCOILBRENTEU	GASREGM	IMPCH	EXPCH	PRUBBUSDM	...	Russia_import	South_Africa_import	Tu
0	2000-01-01	41.0	NaN	NaN	27.18	25.51	1.289	6902.1	863.1	29.207387	...	NaN	NaN	
1	2000-02-01	41.0	NaN	NaN	29.35	27.78	1.377	6584.4	972.7	33.391099	...	NaN	NaN	
2	2000-03-01	45.0	NaN	NaN	29.89	27.49	1.516	6424.1	1330.5	30.941913	...	NaN	NaN	
3	2000-04-01	47.0	NaN	NaN	25.74	22.76	1.465	7070.5	1227.5	31.930148	...	NaN	NaN	
4	2000-05-01	47.0	NaN	NaN	28.78	27.74	1.487	7850.2	1526.3	31.201702	...	NaN	NaN	

5 rows × 50 columns

```
In [3]: df.isnull().sum()
```

Out[3]:

```
Date
0
Domestic Market (Contract) Blow Molding, Low
0
Spot/Export Blow Molding
91
Spot, Domestic                                                                                                                1
51
WTISPLC
0
MCOILBRENTEU
0
GASREGM
0
IMPCH
1
EXPCH
1
PRUBBUSDM
1
WPUFD4111
1
PCU325211325211
1
PCU32611332611301
1
WPU0915021625                                                                                                                 1
44
PCU3252132521
48
MHHNGSP
0
WPU072205011                                                                                                                  1
61
PCU32611132611115                                                                                                             1
61
PCU32611332611301.1
72
PCU32611132611112                                                                                                             1
61
WPU0915021622                                                                                                                 1
43
Producer Price Index by Industry: Plastics Material and Resins Manufacturing: Thermoplastic Resins and Plastics Materials
0
Australia _export                                                                                                             2
38
Canada_export                                                                                                                 1
22
Saudi_export                                                                                                                  2
43
Usa_export                                                                                                                    1
22
India_export                                                                                                                  1
34
Russia_export                                                                                                                 1
68
South_Africa_export                                                                                                           1
22
Turkey
4
Brazil
1
France_export
36
Germeny_export
98
United Kingdome_export                                                                                                        1
23
China_export                                                                                                                  1
68
Australia _import                                                                                                             1
67
Canada_import                                                                                                                 1
22
Saudi_import                                                                                                                  2
43
Usa_import                                                                                                                    1
22
India_import                                                                                                                  1
34
Russia_import                                                                                                                 1
68
South_Africa_import                                                                                                           1
22
Turkey_import                                                                                                                 1
08
```

```
Brazil_import                                                                                 1
08
France_import
36
Germeny_import
98
United Kingdome_import                                                                        1
22
China_import                                                                                  1
68
Japan_import                                                                                  1
23
South_korea_import                                                                            2
76
dtype: int64
```

In [4]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 276 entries, 0 to 275
Data columns (total 50 columns):
 #   Column
Non-Null Count  Dtype
---  ------
--------------  -----
 0   Date
276 non-null    datetime64[ns]
 1   Domestic Market (Contract) Blow Molding, Low
276 non-null    float64
 2   Spot/Export Blow Molding
185 non-null    float64
 3   Spot, Domestic
125 non-null    float64
 4   WTISPLC
276 non-null    float64
 5   MCOILBRENTEU
276 non-null    float64
```

In [ ]:
```
###df = df.drop(['Date'], axis = 1)
```

In [5]:
```
df['Date']=pd.to_datetime(df['Date'])
```

In [6]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 276 entries, 0 to 275
Data columns (total 50 columns):
 #   Column
Non-Null Count  Dtype
---  ------
--------------  -----
 0   Date
276 non-null    datetime64[ns]
 1   Domestic Market (Contract) Blow Molding, Low
276 non-null    float64
 2   Spot/Export Blow Molding
185 non-null    float64
 3   Spot, Domestic
125 non-null    float64
 4   WTISPLC
276 non-null    float64
 5   MCOILBRENTEU
276 non-null    float64
```

In [7]:
```
df = df.fillna(df.mean())
```

```
C:\Users\DELL\AppData\Local\Temp/ipykernel_10752/114435927.py:1: FutureWarning: DataFrame.mean and DataFrame.median with numeri
c_only=None will include datetime64 and datetime64tz columns in a future version.
  df = df.fillna(df.mean())
C:\Users\DELL\AppData\Local\Temp/ipykernel_10752/114435927.py:1: FutureWarning: Dropping of nuisance columns in DataFrame reduc
tions (with 'numeric_only=None') is deprecated; in a future version this will raise TypeError.  Select only valid columns befor
e calling the reduction.
  df = df.fillna(df.mean())
```

In [8]:

```
df.isnull().sum()
```

```
Out[8]: Date
        0
        Domestic Market (Contract) Blow Molding, Low
        0
        Spot/Export Blow Molding
        0
        Spot, Domestic
        0
        WTISPLC
        0
        MCOILBRENTEU
        0
        GASREGM
        0
        IMPCH
        0
        EXPCH
        0
        PRUBBUSDM
        0
        WPUFD4111
        0
        PCU325211325211
        0
        PCU32611332611301
        0
        WPU0915021625
        0
        PCU3252132521
        0
        MHHNGSP
        0
        WPU072205011
        0
        PCU32611132611115
        0
        PCU32611332611301.1
        0
        PCU32611132611112
        0
        WPU0915021622
        0
        Producer Price Index by Industry: Plastics Material and Resins Manufacturing: Thermoplastic Resins and Plastics Materials
        0
        Australia _export                                                                                                             2
        38
        Canada_export
        0
        Saudi_export                                                                                                                  2
        43
        Usa_export
        0
        India_export
        0
        Russia_export
        0
        South_Africa_export
        0
        Turkey
        0
        Brazil
        0
        France_export
        0
        Germeny_export
        0
        United Kingdome_export
        0
        China_export
        0
        Australia _import
        0
        Canada_import
        0
        Saudi_import
        0
        Usa_import
        0
        India_import
        0
        Russia_import
        0
        South_Africa_import
        0
        Turkey_import
        0
```

```
Brazil_import
0
France_import
0
Germeny_import
0
United Kingdome_import
0
China_import
0
Japan_import
0
South_korea_import                                                                                                             2
76
dtype: int64
```

In [9]:

```
df = df.drop(['Australia _export', 'Saudi_export','South_korea_import'], axis=1)
```

In [10]:

```
df.isnull().sum()
```

Out[10]:

```
Date                                                                                                                           0
Domestic Market (Contract) Blow Molding, Low                                                                                   0
Spot/Export Blow Molding                                                                                                       0
Spot, Domestic                                                                                                                 0
WTISPLC                                                                                                                        0
MCOILBRENTEU                                                                                                                   0
GASREGM                                                                                                                        0
IMPCH                                                                                                                          0
EXPCH                                                                                                                          0
PRUBBUSDM                                                                                                                      0
WPUFD4111                                                                                                                      0
PCU325211325211                                                                                                                0
PCU32611332611301                                                                                                              0
WPU0915021625                                                                                                                  0
PCU3252132521                                                                                                                  0
MHHNGSP                                                                                                                        0
WPU072205011                                                                                                                   0
PCU32611132611115                                                                                                              0
PCU32611332611301.1                                                                                                            0
PCU32611132611112                                                                                                              0
WPU0915021622                                                                                                                  0
Producer Price Index by Industry: Plastics Material and Resins Manufacturing: Thermoplastic Resins and Plastics Materials      0
Canada_export                                                                                                                  0
Usa_export                                                                                                                     0
India_export                                                                                                                   0
Russia_export                                                                                                                  0
South_Africa_export                                                                                                            0
Turkey                                                                                                                         0
Brazil                                                                                                                         0
France_export                                                                                                                  0
Germeny_export                                                                                                                 0
United Kingdome_export                                                                                                         0
China_export                                                                                                                   0
Australia _import                                                                                                              0
Canada_import                                                                                                                  0
Saudi_import                                                                                                                   0
Usa_import                                                                                                                     0
India_import                                                                                                                   0
Russia_import                                                                                                                  0
South_Africa_import                                                                                                            0
Turkey_import                                                                                                                  0
Brazil_import                                                                                                                  0
France_import                                                                                                                  0
Germeny_import                                                                                                                 0
United Kingdome_import                                                                                                         0
China_import                                                                                                                   0
Japan_import                                                                                                                   0
dtype: int64
```

In [11]:

```
from sklearn import preprocessing
```

In [12]:

```
Standardisation = preprocessing.StandardScaler()
```

In [13]:

```
import lazypredict
from sklearn.model_selection import train_test_split
from lazypredict.Supervised import LazyRegressor
```

In [14]:

```
X = df .drop(["Domestic Market (Contract) Blow Molding, Low"], axis=1)
Y = df ["Domestic Market (Contract) Blow Molding, Low"]
X_train, X_test, y_train, y_test = train_test_split(X, Y, test_size = 0.2, random_state = 64)
reg = LazyRegressor(verbose=0, ignore_warnings=False, custom_metric=None)
models,pred = reg.fit(X_train, X_test, y_train, y_test)
models
```

```
100%|██████████| 42/42 [00:06<00:00,  6.63it/s]
```

Out[14]:

	Adjusted R-Squared	R-Squared	RMSE	Time Taken
Model				
ExtraTreesRegressor	0.87	0.98	2.89	0.42
TransformedTargetRegressor	0.84	0.97	3.22	0.01
LinearRegression	0.84	0.97	3.22	0.02
HistGradientBoostingRegressor	0.83	0.97	3.28	0.53
LassoCV	0.82	0.97	3.43	0.27
LassoLarsCV	0.82	0.97	3.43	0.13
LassoLarsIC	0.82	0.97	3.43	0.05
Ridge	0.82	0.97	3.45	0.03
HuberRegressor	0.81	0.97	3.47	0.09
RandomForestRegressor	0.81	0.97	3.50	1.00
GradientBoostingRegressor	0.80	0.97	3.58	0.64
ElasticNetCV	0.79	0.97	3.64	0.33
BayesianRidge	0.79	0.97	3.66	0.05
LGBMRegressor	0.79	0.96	3.71	0.10
PoissonRegressor	0.78	0.96	3.74	0.08
RidgeCV	0.78	0.96	3.76	0.02
SGDRegressor	0.78	0.96	3.80	0.02
AdaBoostRegressor	0.76	0.96	3.90	0.26
BaggingRegressor	0.72	0.95	4.26	0.11
LinearSVR	0.70	0.95	4.38	0.02
Lasso	0.68	0.95	4.51	0.03
LassoLars	0.68	0.95	4.51	0.03
XGBRegressor	0.65	0.94	4.76	0.22
KNeighborsRegressor	0.60	0.93	5.09	0.15
ElasticNet	0.58	0.93	5.22	0.02
TweedieRegressor	0.53	0.92	5.51	0.04
GammaRegressor	0.50	0.92	5.65	0.05
ExtraTreeRegressor	0.50	0.92	5.65	0.02
PassiveAggressiveRegressor	0.42	0.90	6.12	0.02
OrthogonalMatchingPursuitCV	0.42	0.90	6.13	0.03
DecisionTreeRegressor	0.39	0.90	6.26	0.02
OrthogonalMatchingPursuit	0.37	0.90	6.35	0.02
RANSACRegressor	0.14	0.86	7.42	0.29
SVR	-0.16	0.81	8.64	0.02
NuSVR	-0.47	0.76	9.73	0.03
LarsCV	-0.93	0.68	11.14	0.08
MLPRegressor	-3.84	0.21	17.66	0.49
DummyRegressor	-5.13	-0.00	19.87	0.01
QuantileRegressor	-5.14	-0.01	19.89	0.48
GaussianProcessRegressor	-59.39	-8.88	62.38	0.04
KernelRidge	-80.13	-12.28	72.30	0.02
Lars	-302060.26	-49427.21	4411.64	0.02

In [ ]: