Problem statement

predicting the house price in USA.To create a model to help him estimate of what the house would sell for.

In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
df=pd.read_csv("instagram csv")
```

To display top 10 rows

In [3]:

```
1 df.head(10)
```

Out[3]:

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follows	Caption	
0	3920	2586	1028	619	56	98	9	5	162	35	2	Here are some of the most important data visua...	#finance🔥#money🔥#bu
1	5394	2727	1838	1174	78	194	7	14	224	48	10	Here are some of the best data science project...	#healthcare🔥#health🔥#
2	4021	2085	1188	0	533	41	11	1	131	62	12	Learn how to train a machine learning model an...	#data🔥#datascience
3	4528	2700	621	932	73	172	10	7	213	23	8	Here🔥s how you can write a Python program to d...	#python🔥#pythonprogra
4	2518	1704	255	279	37	96	5	4	123	8	0	Plotting annotations while visualizing your da...	#datavisualization🔥#
5	3884	2046	1214	329	43	74	7	10	144	9	2	Here are some of the most important soft skill...	#data🔥#datascience
6	2621	1543	599	333	25	22	5	1	76	26	0	Learn how to analyze a candlestick chart as a ...	#stockmarket🔥#investi

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follows	Caption	
7	3541	2071	628	500	60	135	4	9	124	12	6	Here are some of the best books that you can f...	#python#pythonprogr
8	3749	2384	857	248	49	155	6	8	159	36	4	Here are some of the best data analysis projec...	#dataanalytics#data
9	4115	2609	1104	178	46	122	6	3	191	31	6	Here are two best ways to count the number of ...	#python#pythonprogr

Data Cleaning And Pre-Processing

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 119 entries, 0 to 118
Data columns (total 13 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Impressions     119 non-null    int64
 1   From Home       119 non-null    int64
 2   From Hashtags   119 non-null    int64
 3   From Explore    119 non-null    int64
 4   From Other      119 non-null    int64
 5   Saves           119 non-null    int64
 6   Comments        119 non-null    int64
 7   Shares          119 non-null    int64
 8   Likes           119 non-null    int64
 9   Profile Visits  119 non-null    int64
 10  Follows         119 non-null    int64
 11  Caption         119 non-null    object
 12  Hashtags        119 non-null    object
dtypes: int64(11), object(2)
memory usage: 12.2+ KB
```

In [5]:
```
# Display the statistical summary
df.describe()
```

Out[5]:

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profi Visi
count	119.000000	119.000000	119.000000	119.000000	119.000000	119.000000	119.000000	119.000000	119.000000	119.0000(
mean	5703.991597	2475.789916	1887.512605	1078.100840	171.092437	153.310924	6.663866	9.361345	173.781513	50.6218
std	4843.780105	1489.386348	1884.361443	2613.026132	289.431031	156.317731	3.544576	10.089205	82.378947	87.0884(
min	1941.000000	1133.000000	116.000000	0.000000	9.000000	22.000000	0.000000	0.000000	72.000000	4.0000(
25%	3467.000000	1945.000000	726.000000	157.500000	38.000000	65.000000	4.000000	3.000000	121.500000	15.0000(
50%	4289.000000	2207.000000	1278.000000	326.000000	74.000000	109.000000	6.000000	6.000000	151.000000	23.0000(
75%	6138.000000	2602.500000	2363.500000	689.500000	196.000000	169.000000	8.000000	13.500000	204.000000	42.0000(
max	36919.000000	13473.000000	11817.000000	17414.000000	2547.000000	1095.000000	19.000000	75.000000	549.000000	611.0000(

In [6]:
```
# To display the col headings
df.columns
```

Out[6]:
```
Index(['Impressions', 'From Home', 'From Hashtags', 'From Explore',
       'From Other', 'Saves', 'Comments', 'Shares', 'Likes', 'Profile Visits',
       'Follows', 'Caption', 'Hashtags'],
      dtype='object')
```

In [7]:
```
cols=df.dropna(axis=1)
```

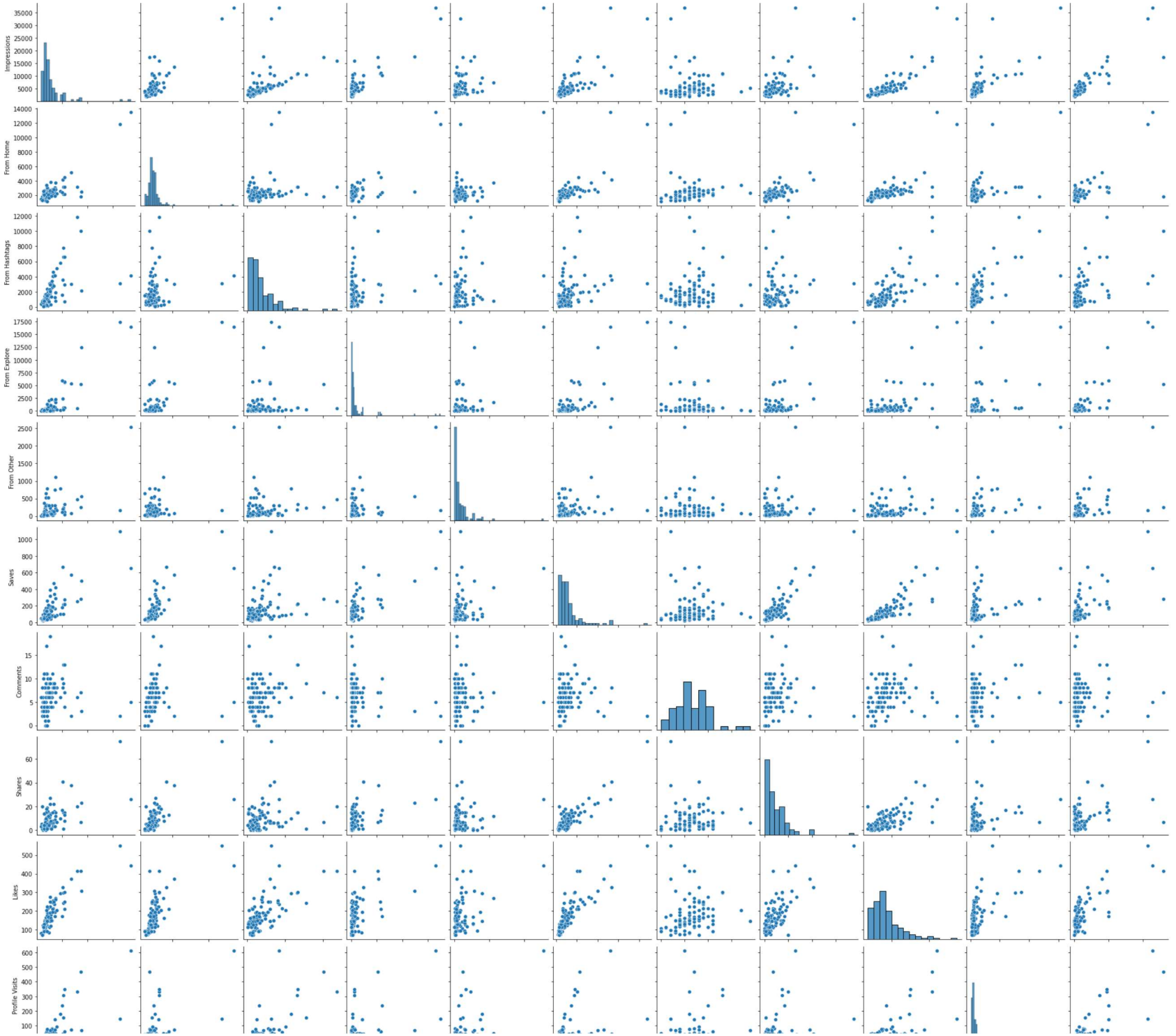
In [8]:
```
cols.columns
```

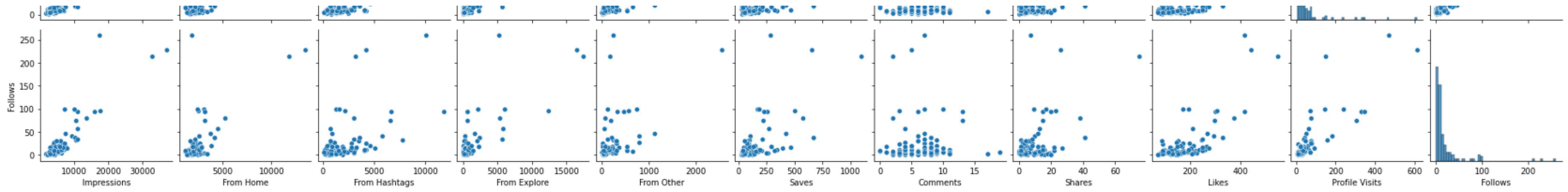
Out[8]:
```
Index(['Impressions', 'From Home', 'From Hashtags', 'From Explore',
       'From Other', 'Saves', 'Comments', 'Shares', 'Likes', 'Profile Visits',
       'Follows', 'Caption', 'Hashtags'],
      dtype='object')
```

EDA and Visualization

In [9]:
```
1 sns.pairplot(cols)
```

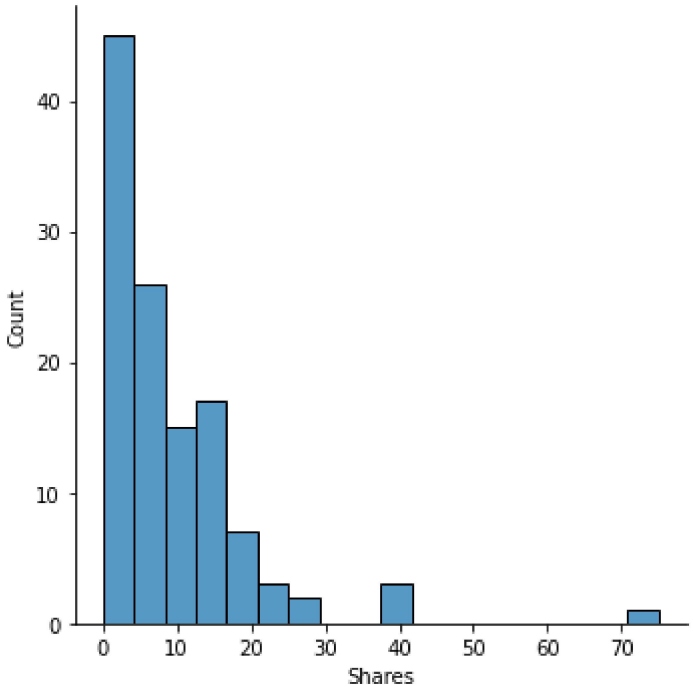
Out[9]:
```
<seaborn.axisgrid.PairGrid at 0x2009ebeb550>
```


Impressions
From Home
From Hashtags
From Explore
From Other
Saves
Comments
Shares
Likes
Profile Visits



In [10]:
```
1 sns.displot(df['Shares'])
```

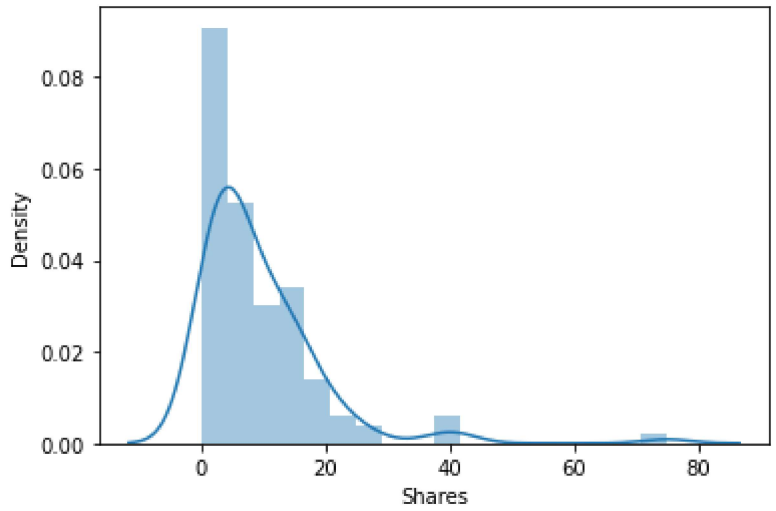
Out[10]: <seaborn.axisgrid.FacetGrid at 0x200a3335730>



In [11]:
```
# We use displot in older version we get distplot use displot
sns.distplot(df['Shares'])
```

```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: FutureWarning: `distplot` is a dep
recated function and will be removed in a future version. Please adapt your code to use either `displot` (a
figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

Out[11]: <AxesSubplot:xlabel='Shares', ylabel='Density'>



In [12]:

```
df1=cols[['Saves', 'Comments', 'Shares', 'Likes', 'Profile Visits',
       'Follows', 'Caption', 'Hashtags']]
df1
```

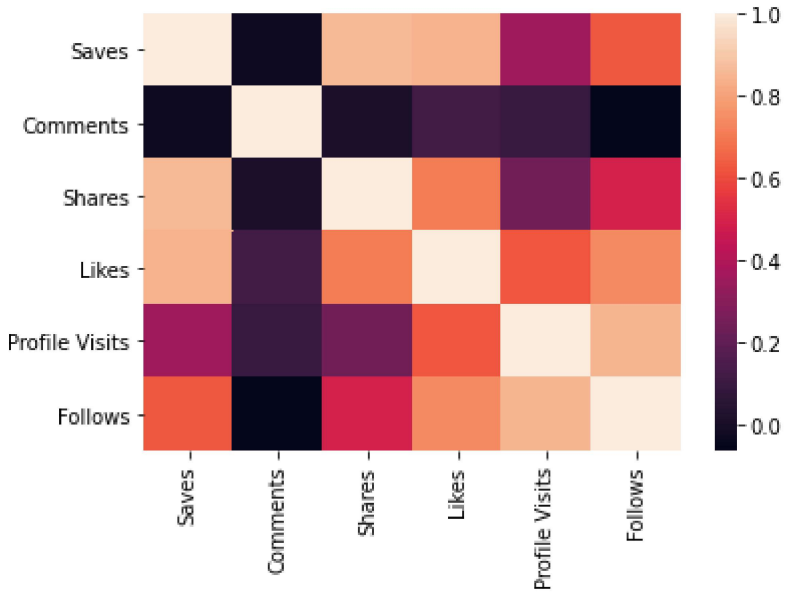
Out[12]:

	Saves	Comments	Shares	Likes	Profile Visits	Follows	Caption	Hashtags
0	98	9	5	162	35	2	Here are some of the most important data visua...	#finance🔎#money🔎#business🔎#investing🔎#investme...
1	194	7	14	224	48	10	Here are some of the best data science project...	#healthcare🔎#health🔎#covid🔎#data🔎#datascience🔎...
2	41	11	1	131	62	12	Learn how to train a machine learning model an...	#data🔎#datascience🔎#dataanalysis🔎#dataanalytic...
3	172	10	7	213	23	8	Here🔎s how you can write a Python program to d...	#python🔎#pythonprogramming🔎#pythonprojects🔎#py...
4	96	5	4	123	8	0	Plotting annotations while visualizing your da...	#datavisualization🔎#datascience🔎#data🔎#dataana...
...	...	...	...	...	...	...	...	...
114	573	2	38	373	73	80	Here are some of the best data science certifi...	#datascience🔎#datasciencejobs🔎#datasciencetrai...
115	135	4	1	148	20	18	Clustering is a machine learning technique use...	#machinelearning🔎#machinelearningalgorithms🔎#d...
116	36	0	1	92	34	10	Clustering music genres is a task of grouping ...	#machinelearning🔎#machinelearningalgorithms🔎#d...
117	1095	2	75	549	148	214	Here are some of the best data science certifi...	#datascience🔎#datasciencejobs🔎#datasciencetrai...
118	653	5	26	443	611	228	175 Python Projects with Source Code solved an...	#python🔎#pythonprogramming🔎#pythonprojects🔎#py...

119 rows × 8 columns

In [13]:
```
1 sns.heatmap(df1.corr())
```

Out[13]: <AxesSubplot:>



To train the model - MODEL BUILD

Going to train linear regression model;We split our data into 2 variables x and y where x is independent var(input) and y is dependent on x(output), we could ignore address col as it is not required for our model

In [14]:
```
1 x=df1[['Saves', 'Comments', 'Shares', 'Likes', 'Profile Visits',]]
2 y=df1[['Shares']]
```

To split the dataset into test data

In [15]:
```
# importing lib for splitting test data
from sklearn.model_selection import train_test_split
```

In [16]:
```
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.3)
```

In [17]:
```
from sklearn.linear_model import LinearRegression

lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[17]:
```
LinearRegression()
```

In [18]:
```
print(lr.intercept_)
```

```
[0.]
```

In [19]:
```
print(lr.score(x_test,y_test))
```

```
1.0
```

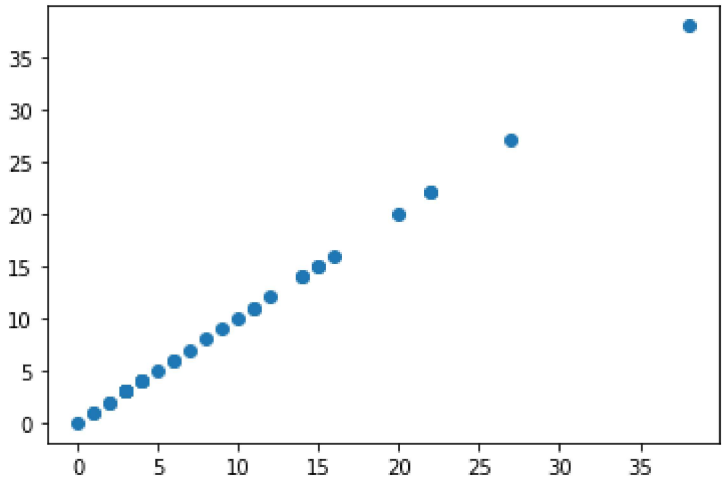
In [20]:
```
coeff=pd.DataFrame(lr.coef_)
coeff
```

Out[20]:

	0	1	2	3	4
0	1.186492e-18	-4.188671e-16	1.0	3.347315e-17	-1.199608e-16

In [21]:
```
pred = lr.predict(x_test)
plt.scatter(y_test,pred)
```

Out[21]: <matplotlib.collections.PathCollection at 0x200a54ac5b0>



In [22]:
```
from sklearn.linear_model import Ridge,Lasso
```

In [23]:
```
rr=Ridge(alpha=20)
rr.fit(x_train,y_train)
```

Out[23]: Ridge(alpha=20)

In [24]:
```
rr.score(x_test,y_test)
```

Out[24]: 0.9999394477091997

In [25]:
```
la=Lasso(alpha=20)
la.fit(x_train,y_train)
```

Out[25]: Lasso(alpha=20)

In [26]:
```
la.score(x_test,y_test)
```

Out[26]: 0.6582904888407064

ELASTIC NET

In [27]:
```
from sklearn.linear_model import ElasticNet
en=ElasticNet()
en.fit(x_train,y_train)
```

Out[27]:
```
ElasticNet()
```

In [28]:
```
print(en.coef_)
```

```
[ 2.47574074e-03  0.00000000e+00  9.57398055e-01  1.64724434e-04
 -3.68094956e-04]
```

In [29]:
```
print(en.intercept_)
```

```
[0.02140869]
```

In [30]:
```
prediction=en.predict(x_test)
prediction
```

Out[30]:
```
array([37.85570552,  3.21569465,  3.07526078, 19.27657863,  9.82476711,
        3.96476008,  3.27278448,  3.99158122, 14.60283795,  8.23722705,
        3.16975947, 26.8754339 ,  7.3254062 , 22.27747042,  0.10935121,
        1.09213219, 12.57837833,  9.03055548,  2.11568753,  2.311304  ,
       13.59704925,  3.0164361 , 10.87114104, 11.01044669,  5.88063654,
       16.21799397, 21.9034302 ,  3.99158122, 13.7463738 ,  6.2431907 ,
        4.93891646,  3.2556104 ,  4.10598836, 14.86127429,  1.33004906,
        3.27278448])
```

In [31]:
```
print(en.score(x_test,y_test))
```

```
0.999096651508552
```

EVALUATION METRICS

In [32]:
```
from sklearn import metrics
```

In [33]:
```
print("Mean Absolute Error:",metrics.mean_absolute_error(y_test,prediction))
```

```
Mean Absolute Error: 0.19670678688772242
```

In [34]:
```
print("Mean Squared Error:",metrics.mean_squared_error(y_test,prediction))
```

```
Mean Squared Error: 0.06297440289880477
```

In [35]:
```
print("Root Mean Squared Error:",np.sqrt(metrics.mean_squared_error(y_test,prediction)))
```

```
Root Mean Squared Error: 0.250947012133647
```