Problem Statement

Linear Regression

Import Libraries

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

In [2]:
```
a=pd.read_csv("insta.csv")
a
```

Out[2]:

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follo
0	3920	2586	1028	619	56	98	9	5	162	35	
1	5394	2727	1838	1174	78	194	7	14	224	48	
2	4021	2085	1188	0	533	41	11	1	131	62	
3	4528	2700	621	932	73	172	10	7	213	23	
4	2518	1704	255	279	37	96	5	4	123	8	
...	...	...	...	...	...	...	...	...	...	...	
114	13700	5185	3041	5352	77	573	2	38	373	73	

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follo
115	5731	1923	1368	2266	65	135	4	1	148	20	
116	4139	1133	1538	1367	33	36	0	1	92	34	
117	32695	11815	3147	17414	170	1095	2	75	549	148	2
118	36919	13473	4176	16444	2547	653	5	26	443	611	2

119 rows × 13 columns

To display top 10 rows

In [3]:
```
c=a.head(15)
c
```

Out[3]:

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follow
0	3920	2586	1028	619	56	98	9	5	162	35	
1	5394	2727	1838	1174	78	194	7	14	224	48	1
2	4021	2085	1188	0	533	41	11	1	131	62	1
3	4528	2700	621	932	73	172	10	7	213	23	
4	2518	1704	255	279	37	96	5	4	123	8	

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follow
5	3884	2046	1214	329	43	74	7	10	144	9	
6	2621	1543	599	333	25	22	5	1	76	26	
7	3541	2071	628	500	60	135	4	9	124	12	
8	3749	2384	857	248	49	155	6	8	159	36	
9	4115	2609	1104	178	46	122	6	3	191	31	
10	2218	1597	411	162	15	28	6	3	81	29	
11	3234	2414	476	185	75	122	8	14	151	15	
12	4344	2168	1274	673	40	119	7	11	162	8	
13	3216	2524	212	201	223	121	5	5	142	20	
14	9453	2525	5799	208	794	100	6	10	294	181	4

To find Missing values

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 15 entries, 0 to 14
Data columns (total 13 columns):
```

```
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Impressions     15 non-null     int64
 1   From Home       15 non-null     int64
 2   From Hashtags   15 non-null     int64
 3   From Explore    15 non-null     int64
 4   From Other      15 non-null     int64
 5   Saves           15 non-null     int64
 6   Comments        15 non-null     int64
 7   Shares          15 non-null     int64
 8   Likes           15 non-null     int64
 9   Profile Visits  15 non-null     int64
 10  Follows         15 non-null     int64
 11  Caption         15 non-null     object
 12  Hashtags        15 non-null     object
dtypes: int64(11), object(2)
memory usage: 1.6+ KB
```

To display summary of statistics

In [5]:
```
a.describe()
```

Out[5]:

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments
count	119.000000	119.000000	119.000000	119.000000	119.000000	119.000000	119.000000
mean	5703.991597	2475.789916	1887.512605	1078.100840	171.092437	153.310924	6.663866
std	4843.780105	1489.386348	1884.361443	2613.026132	289.431031	156.317731	3.544576
min	1941.000000	1133.000000	116.000000	0.000000	9.000000	22.000000	0.000000
25%	3467.000000	1945.000000	726.000000	157.500000	38.000000	65.000000	4.000000
50%	4289.000000	2207.000000	1278.000000	326.000000	74.000000	109.000000	6.000000
75%	6138.000000	2602.500000	2363.500000	689.500000	196.000000	169.000000	8.000000
max	36919.000000	13473.000000	11817.000000	17414.000000	2547.000000	1095.000000	19.000000

To display column heading

In [6]:
```
a.columns
```

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

Pairplot

In [7]:
```
s=a.dropna(axis=1)
s
```

Out[7]:

	Impressions	From Home	From Hashtags	From Explore	From Other	Saves	Comments	Shares	Likes	Profile Visits	Follo
0	3920	2586	1028	619	56	98	9	5	162	35	
1	5394	2727	1838	1174	78	194	7	14	224	48	
2	4021	2085	1188	0	533	41	11	1	131	62	
3	4528	2700	621	932	73	172	10	7	213	23	
4	2518	1704	255	279	37	96	5	4	123	8	
...	...	...	...	...	...	...	...	...	...	...	
114	13700	5185	3041	5352	77	573	2	38	373	73	
115	5731	1923	1368	2266	65	135	4	1	148	20	
116	4139	1133	1538	1367	33	36	0	1	92	34	
117	32695	11815	3147	17414	170	1095	2	75	549	148	2
118	36919	13473	4176	16444	2547	653	5	26	443	611	2

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

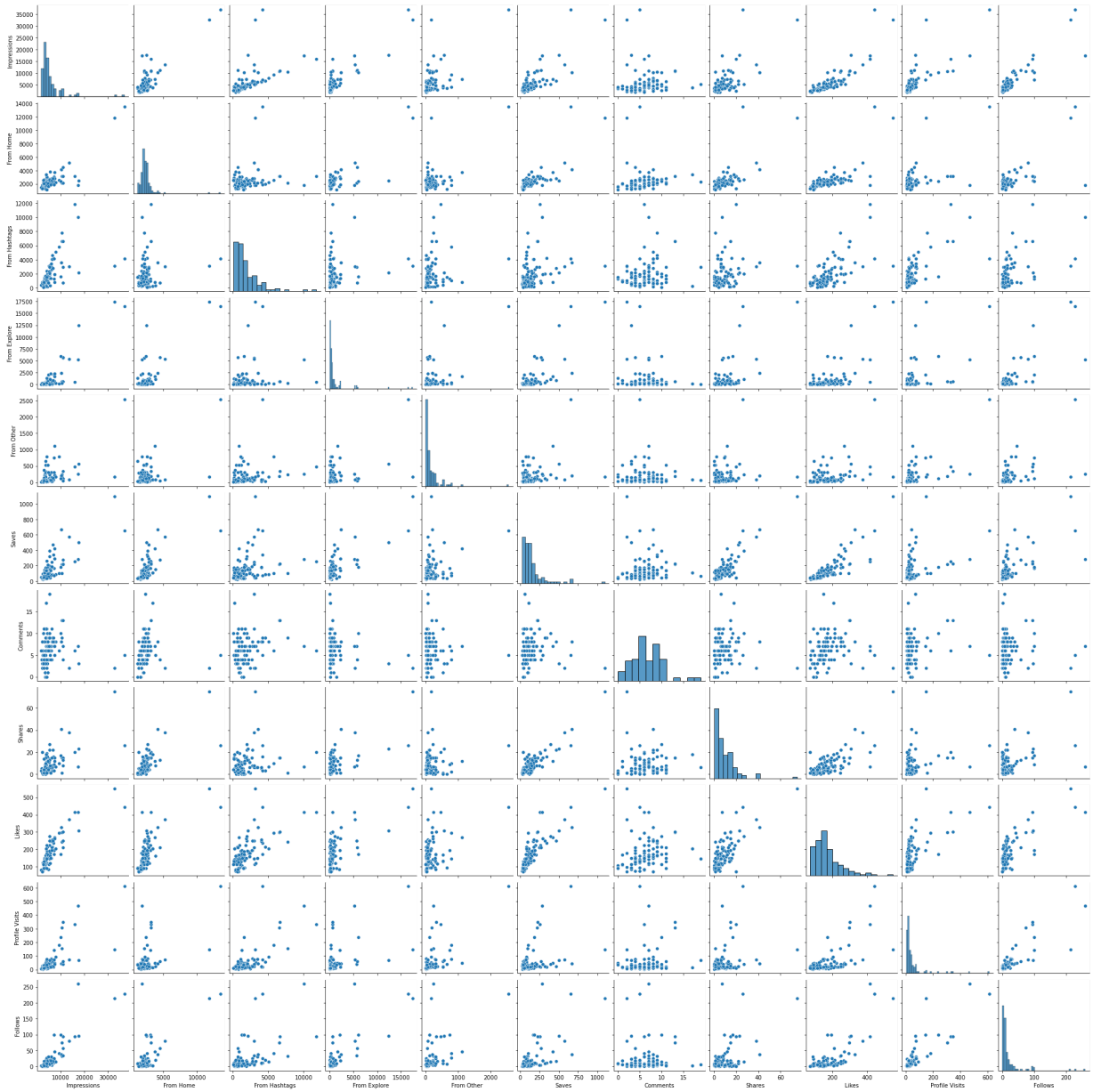
119 rows × 13 columns

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

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

In [10]:
```
sns.pairplot(a)
```

Out[10]:
```
<seaborn.axisgrid.PairGrid at 0x28dbf240970>
```

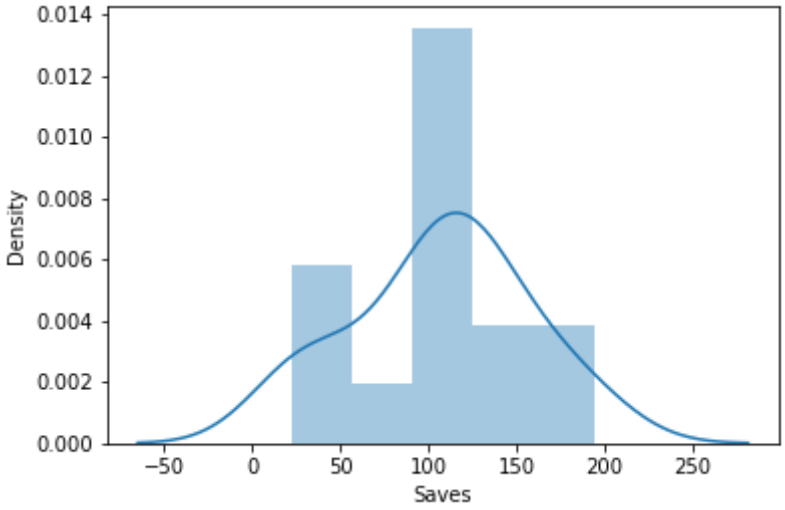


Distribution Plot

In [11]:
```
sns.distplot(c['Saves'])
```

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

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

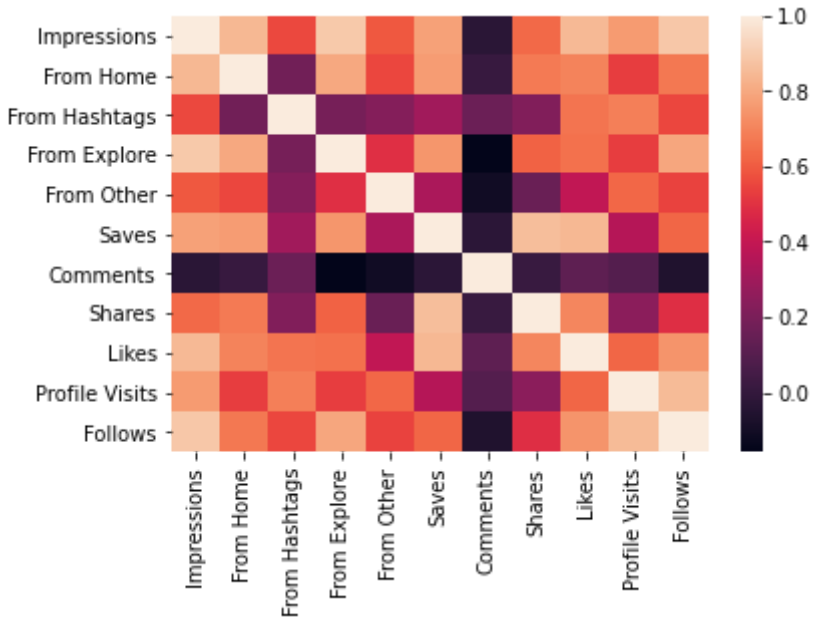


Correlation

Train the model - Model Building

In [12]:
```
b=a[['Impressions', 'From Home', 'From Hashtags', 'From Explore',
       'From Other', 'Saves', 'Comments', 'Shares', 'Likes', 'Profile Visits',
       'Follows', 'Caption', 'Hashtags']]
sns.heatmap(b.corr())
```

Out[12]: <AxesSubplot:>



In [13]:
```
g=c[['Comments', 'Shares', 'Likes', 'Profile Visits',
       'Follows']]
h=c['Saves']
```

To split dataset into training end test

In [14]:
```
from sklearn.model_selection import train_test_split
g_train,g_test,h_train,h_test=train_test_split(g,h,test_size=0.6)
```

To run the model

In [15]:
```
from sklearn.linear_model import LinearRegression
```

In [16]:
```
lr=LinearRegression()
lr.fit(g_train,h_train)
```

Out[16]:
```
LinearRegression()
```

In [17]:
```
print(lr.intercept_)
```

```
119.61121642969985
```

Coeffecient

In [18]:
```
coeff=pd.DataFrame(lr.coef_,g.columns,columns=['Co-effecient'])
coeff
```

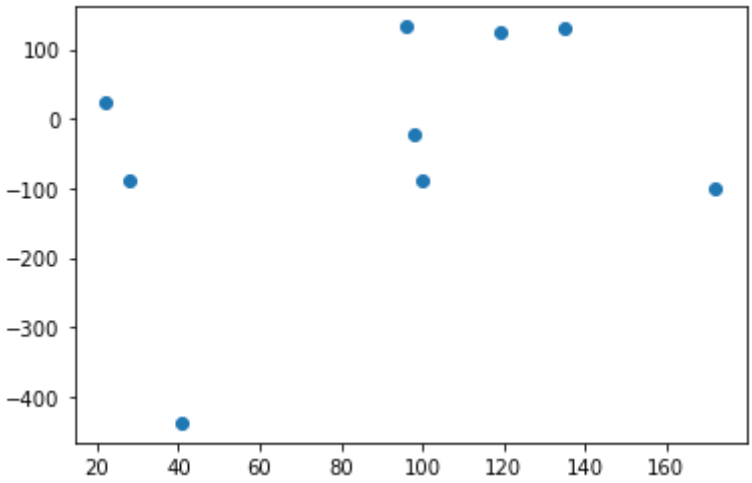
Out[18]:

	Co-effecient
Comments	-64.937599
Shares	10.805055
Likes	2.282306
Profile Visits	1.732701
Follows	-21.672512

Best Fit line

In [19]:
```
prediction=lr.predict(g_test)
plt.scatter(h_test,prediction)
```

Out[19]:
```
<matplotlib.collections.PathCollection at 0x28dc3853ac0>
```



To find score

In [20]:
```
print(lr.score(g_test,h_test))
```

```
-16.860590459023072
```

Import Lasso and ridge

In [21]:
```
from sklearn.linear_model import Ridge,Lasso
```

Ridge

In [22]:
```
ri=Ridge(alpha=5)
ri.fit(g_train,h_train)
```

Out[22]:
```
Ridge(alpha=5)
```

In [23]:
```
ri.score(g_test,h_test)
```

Out[23]:
```
-13.134025680517993
```

In [24]:
```
ri.score(g_train,h_train)
```

Out[24]:
```
0.94954784619308
```

Lasso

In [25]:
```
l=Lasso(alpha=6)
l.fit(g_train,h_train)
```

Out[25]:
```
Lasso(alpha=6)
```

In [26]:
```
l.score(g_test,h_test)
```

Out[26]:
```
-12.980287087281416
```

In [27]:
```
ri.score(g_train,h_train)
```

Out[27]:
```
0.94954784619308
```

In [ ]:
```

```