In [1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
```

In [2]:

```
df = pd.read_csv("Fitness.csv")
# .dropna(axis="columns")
df
```

Out[2]:

	Row Labels	Sum of Jan	Sum of Feb	Sum of Mar	Sum of Total Sales
0	A	5.62%	7.73%	6.16%	75
1	B	4.21%	17.27%	19.21%	160
2	C	9.83%	11.60%	5.17%	101
3	D	2.81%	21.91%	7.88%	127
4	E	25.28%	10.57%	11.82%	179
5	F	8.15%	16.24%	18.47%	167
6	G	18.54%	8.76%	17.49%	171
7	H	25.56%	5.93%	13.79%	170
8	Grand Total	100.00%	100.00%	100.00%	1150

In [3]:

```
df.head()
```

Out[3]:

	Row Labels	Sum of Jan	Sum of Feb	Sum of Mar	Sum of Total Sales
0	A	5.62%	7.73%	6.16%	75
1	B	4.21%	17.27%	19.21%	160
2	C	9.83%	11.60%	5.17%	101
3	D	2.81%	21.91%	7.88%	127
4	E	25.28%	10.57%	11.82%	179

Data cleaning and pre processing

In [4]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9 entries, 0 to 8
Data columns (total 5 columns):
 #   Column              Non-Null Count  Dtype 
---  ------              --------------  ----- 
 0   Row Labels          9 non-null      object
 1   Sum of Jan          9 non-null      object
 2   Sum of Feb          9 non-null      object
 3   Sum of Mar          9 non-null      object
 4   Sum of Total Sales  9 non-null      int64 
dtypes: int64(1), object(4)
memory usage: 488.0+ bytes
```

In [5]:

```
df.describe()
```

Out[5]:

	Sum of Total Sales
count	9.000000
mean	255.555556
std	337.332963
min	75.000000
25%	127.000000
50%	167.000000
75%	171.000000
max	1150.000000

In [6]:

```
df.columns
```

Out[6]:

```
Index(['Row Labels', 'Sum of Jan', 'Sum of Feb', 'Sum of Mar',
       'Sum of Total Sales'],
      dtype='object')
```

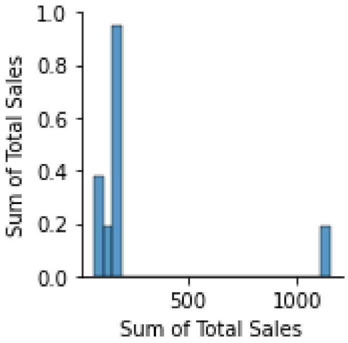
EDA and VISUALIZATION

In [7]:

```
sns.pairplot(df)
```

Out[7]:

```
<seaborn.axisgrid.PairGrid at 0x10614cc5490>
```

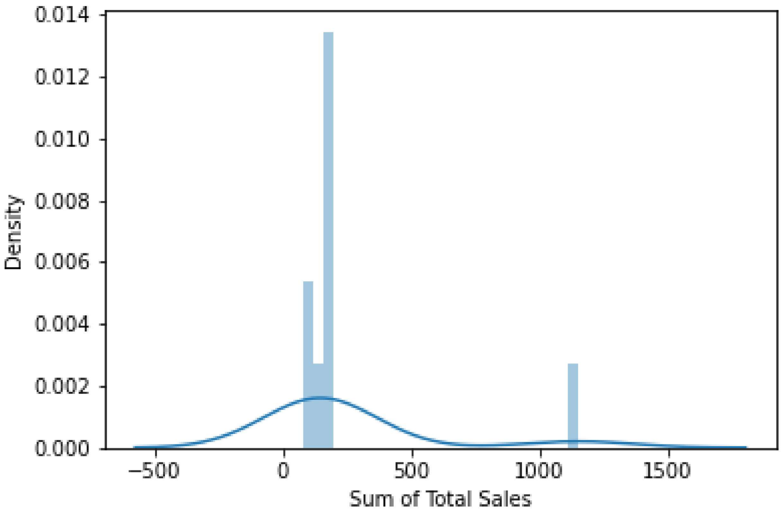


In [8]:

```
sns.distplot(df["Sum of Total Sales"])
```

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

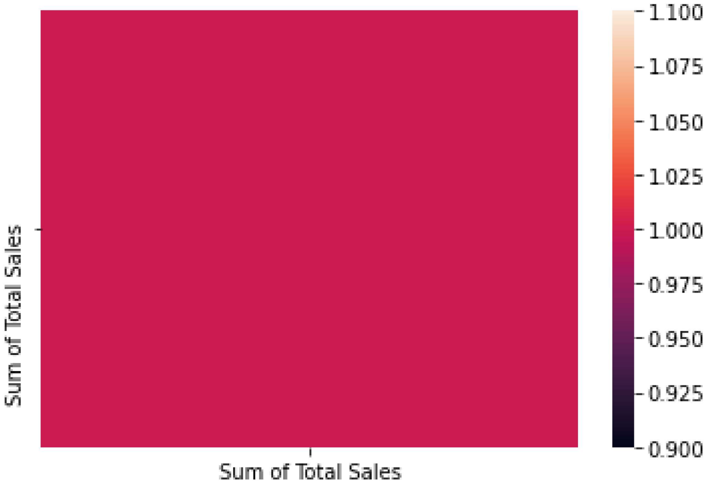
```
Out[8]: <AxesSubplot:xlabel='Sum of Total Sales', ylabel='Density'>
```



```
In [9]: df1 = df[['Row Labels', 'Sum of Jan', 'Sum of Feb', 'Sum of Mar',
               'Sum of Total Sales']]
```

```
In [10]: sns.heatmap(df1.corr())
```

```
Out[10]: <AxesSubplot:>
```



```
In [11]: x = df1[['Sum of Total Sales','Sum of Total Sales']]
         y = df1['Sum of Total Sales']
```

split the data into training and test data

```
In [12]: x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.3)
```

```
In [13]: lr = LinearRegression()
         lr.fit(x_train, y_train)
```

Out[13]:
```
LinearRegression()
```

In [14]:
```
lr.intercept_
```

Out[14]:
```
-5.684341886080802e-14
```

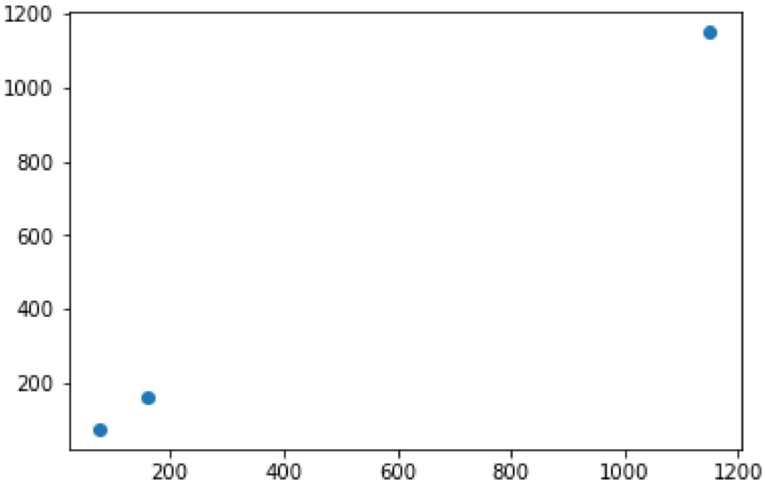
In [15]:
```
coeff = pd.DataFrame(lr.coef_, x.columns, columns =['Co-efficient'])
coeff
```

Out[15]:

	Co-efficient
Sum of Total Sales	0.5
Sum of Total Sales	0.5

In [16]:
```
prediction = lr.predict(x_test)
plt.scatter(y_test, prediction)
```

Out[16]:
```
<matplotlib.collections.PathCollection at 0x10615718580>
```



In [17]:
```
lr.score(x_test,y_test)
```

Out[17]:
```
1.0
```

ACURACY

In [18]:
```
from sklearn.linear_model import Ridge,Lasso
```

In [19]:
```
rr=Ridge(alpha=10)
rr.fit(x_train,y_train)
rr.score(x_test,y_test)
rr.score(x_train,y_train)
```

```
Out[19]: 0.9999989452496941
```

```
In [20]: rr.score(x_test,y_test)
```

```
Out[20]: 0.9999985218354555
```

```
In [21]: la = Lasso(alpha=10)
         la.fit(x_train,y_train)
```

```
Out[21]: Lasso(alpha=10)
```

```
In [22]: la.score(x_test,y_test)
```

```
Out[22]: 0.9997867064211223
```