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

In [3]:
```
d=pd.read_csv(r"C:\Users\user\Downloads\Fitness.csv")
d
```

Out[3]:

| | SALESMAN | JAN | FEB | MAR | APR | MAY | JUN | TOTAL SALES | Unnamed: 8 | Unnamed: 9 | Unnamed: 10 | Unn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | ANU | 70.0 | 80.0 | 75.0 | 60.0 | 72.0 | 55.0 | 412.0 | NaN | NaN | NaN | |
| **1** | BABU | 30.0 | 48.0 | 35.0 | 45.0 | 25.0 | 37.0 | 220.0 | NaN | NaN | NaN | Ind Sales |
| **2** | CHANDRU | 65.0 | 54.0 | 49.0 | 54.0 | 35.0 | 65.0 | 322.0 | NaN | NaN | NaN | 2. Fi p cond |
| **3** | DAVID | 85.0 | 71.0 | 68.0 | 77.0 | 88.0 | 73.0 | 462.0 | NaN | NaN | NaN | 3. A usin ta c perce |
| **4** | EINSTEIN | 55.0 | 25.0 | 45.0 | 50.0 | 53.0 | 30.0 | 258.0 | NaN | NaN | NaN | 4. |
| **5** | FAROOK | 35.0 | 45.0 | 15.0 | 45.0 | 45.0 | 25.0 | 210.0 | NaN | NaN | NaN | 5. R retu ra v |
| **6** | GOWTHAM | 75.0 | 66.0 | 59.0 | 65.0 | 56.0 | 30.0 | 351.0 | NaN | NaN | NaN | |
| **7** | HARSHITH | 29.0 | 35.0 | 49.0 | 48.0 | 35.0 | 55.0 | 247.0 | NaN | NaN | NaN | |
| **8** | INIYAN | 35.0 | 35.0 | 50.0 | 59.0 | 67.0 | 73.0 | 319.0 | NaN | NaN | NaN | |
| **9** | JOHN | 77.0 | 85.0 | 77.0 | 68.0 | 56.0 | 25.0 | 388.0 | NaN | NaN | NaN | |
| **10** | MONTHLY SALES | 556.0 | 544.0 | 522.0 | 571.0 | 532.0 | 468.0 | NaN | 3193.0 | NaN | NaN | |
| **11** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | 3189.0 | NaN | NaN | NaN | |

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 12 entries, 0 to 11
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   SALESMAN     11 non-null     object
 1   JAN          11 non-null     float64
 2   FEB          11 non-null     float64
 3   MAR          11 non-null     float64
 4   APR          11 non-null     float64
 5   MAY          11 non-null     float64
 6   JUN          11 non-null     float64
 7   TOTAL SALES  11 non-null     float64
 8   Unnamed: 8   1 non-null      float64
 9   Unnamed: 9   0 non-null      float64
 10  Unnamed: 10  0 non-null      float64
 11  Unnamed: 11  6 non-null      object
dtypes: float64(10), object(2)
memory usage: 1.2+ KB
```

In [5]:
```
d.isna()
```

Out[5]:

| | SALESMAN | JAN | FEB | MAR | APR | MAY | JUN | TOTAL SALES | Unnamed: 8 | Unnamed: 9 | Unnamed: 10 | Unnam |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | False | False | False | False | False | False | False | False | True | True | True | T |
| **1** | False | False | False | False | False | False | False | False | True | True | True | Fa |
| **2** | False | False | False | False | False | False | False | False | True | True | True | Fa |
| **3** | False | False | False | False | False | False | False | False | True | True | True | Fa |
| **4** | False | False | False | False | False | False | False | False | True | True | True | Fa |
| **5** | False | False | False | False | False | False | False | False | True | True | True | Fa |
| **6** | False | False | False | False | False | False | False | False | True | True | True | T |
| **7** | False | False | False | False | False | False | False | False | True | True | True | Fa |
| **8** | False | False | False | False | False | False | False | False | True | True | True | T |
| **9** | False | False | False | False | False | False | False | False | True | True | True | T |
| **10** | False | False | False | False | False | False | False | True | False | True | True | T |
| **11** | True | True | True | True | True | True | True | False | True | True | True | T |

In [10]:
```
d.fillna(value=0)
```

Out[10]:

| | SALESMAN | JAN | FEB | MAR | APR | MAY | JUN | TOTAL SALES | Unnamed: 8 | Unnamed: 9 | Unnamed: 10 | Unn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | ANU | 70.0 | 80.0 | 75.0 | 60.0 | 72.0 | 55.0 | 412.0 | 0.0 | 0.0 | 0.0 | |
| **1** | BABU | 30.0 | 48.0 | 35.0 | 45.0 | 25.0 | 37.0 | 220.0 | 0.0 | 0.0 | 0.0 | Ind Sales |

| | SALESMAN | JAN | FEB | MAR | APR | MAY | JUN | TOTAL SALES | Unnamed: 8 | Unnamed: 9 | Unnamed: 10 | Unn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2** | CHANDRU | 65.0 | 54.0 | 49.0 | 54.0 | 35.0 | 65.0 | 322.0 | 0.0 | 0.0 | 0.0 | 2. Fi<br>F<br><br>cond |
| **3** | DAVID | 85.0 | 71.0 | 68.0 | 77.0 | 88.0 | 73.0 | 462.0 | 0.0 | 0.0 | 0.0 | 3. A<br>usin<br>ta<br>c<br>perce |
| **4** | EINSTEIN | 55.0 | 25.0 | 45.0 | 50.0 | 53.0 | 30.0 | 258.0 | 0.0 | 0.0 | 0.0 | 4. |
| **5** | FAROOK | 35.0 | 45.0 | 15.0 | 45.0 | 45.0 | 25.0 | 210.0 | 0.0 | 0.0 | 0.0 | 5. R<br>retu<br>ra<br><br>v |
| **6** | GOWTHAM | 75.0 | 66.0 | 59.0 | 65.0 | 56.0 | 30.0 | 351.0 | 0.0 | 0.0 | 0.0 | |
| **7** | HARSHITH | 29.0 | 35.0 | 49.0 | 48.0 | 35.0 | 55.0 | 247.0 | 0.0 | 0.0 | 0.0 | |
| **8** | INIYAN | 35.0 | 35.0 | 50.0 | 59.0 | 67.0 | 73.0 | 319.0 | 0.0 | 0.0 | 0.0 | |
| **9** | JOHN | 77.0 | 85.0 | 77.0 | 68.0 | 56.0 | 25.0 | 388.0 | 0.0 | 0.0 | 0.0 | |
| **10** | MONTHLY SALES | 556.0 | 544.0 | 522.0 | 571.0 | 532.0 | 468.0 | 0.0 | 3193.0 | 0.0 | 0.0 | |
| **11** | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3189.0 | 0.0 | 0.0 | 0.0 | |

In [11]:
```
d.describe()
```

Out[11]:

| | JAN | FEB | MAR | APR | MAY | JUN | TOTAL SALES | Unnamed: 8 |
|---|---|---|---|---|---|---|---|---|
| **count** | 11.000000 | 11.000000 | 11.000000 | 11.000000 | 11.000000 | 11.000000 | 11.000000 | 1.0 |
| **mean** | 101.090909 | 98.909091 | 94.909091 | 103.818182 | 96.727273 | 85.090909 | 579.818182 | 3193.0 |
| **std** | 152.263886 | 148.884153 | 142.770763 | 155.277054 | 145.500578 | 128.347540 | 869.142775 | NaN |
| **min** | 29.000000 | 25.000000 | 15.000000 | 45.000000 | 25.000000 | 25.000000 | 210.000000 | 3193.0 |
| **25%** | 35.000000 | 40.000000 | 47.000000 | 49.000000 | 40.000000 | 30.000000 | 252.500000 | 3193.0 |
| **50%** | 65.000000 | 54.000000 | 50.000000 | 59.000000 | 56.000000 | 55.000000 | 322.000000 | 3193.0 |
| **75%** | 76.000000 | 75.500000 | 71.500000 | 66.500000 | 69.500000 | 69.000000 | 400.000000 | 3193.0 |
| **max** | 556.000000 | 544.000000 | 522.000000 | 571.000000 | 532.000000 | 468.000000 | 3189.000000 | 3193.0 |

In [12]:
```
d.columns
```

Out[12]:
```
Index(['SALESMAN', 'JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN', 'TOTAL SALES',
       'Unnamed: 8', 'Unnamed: 9', 'Unnamed: 10', 'Unnamed: 11'],
      dtype='object')
```

In [13]:
```
d.index
```

Out[13]:
```
RangeIndex(start=0, stop=12, step=1)
```

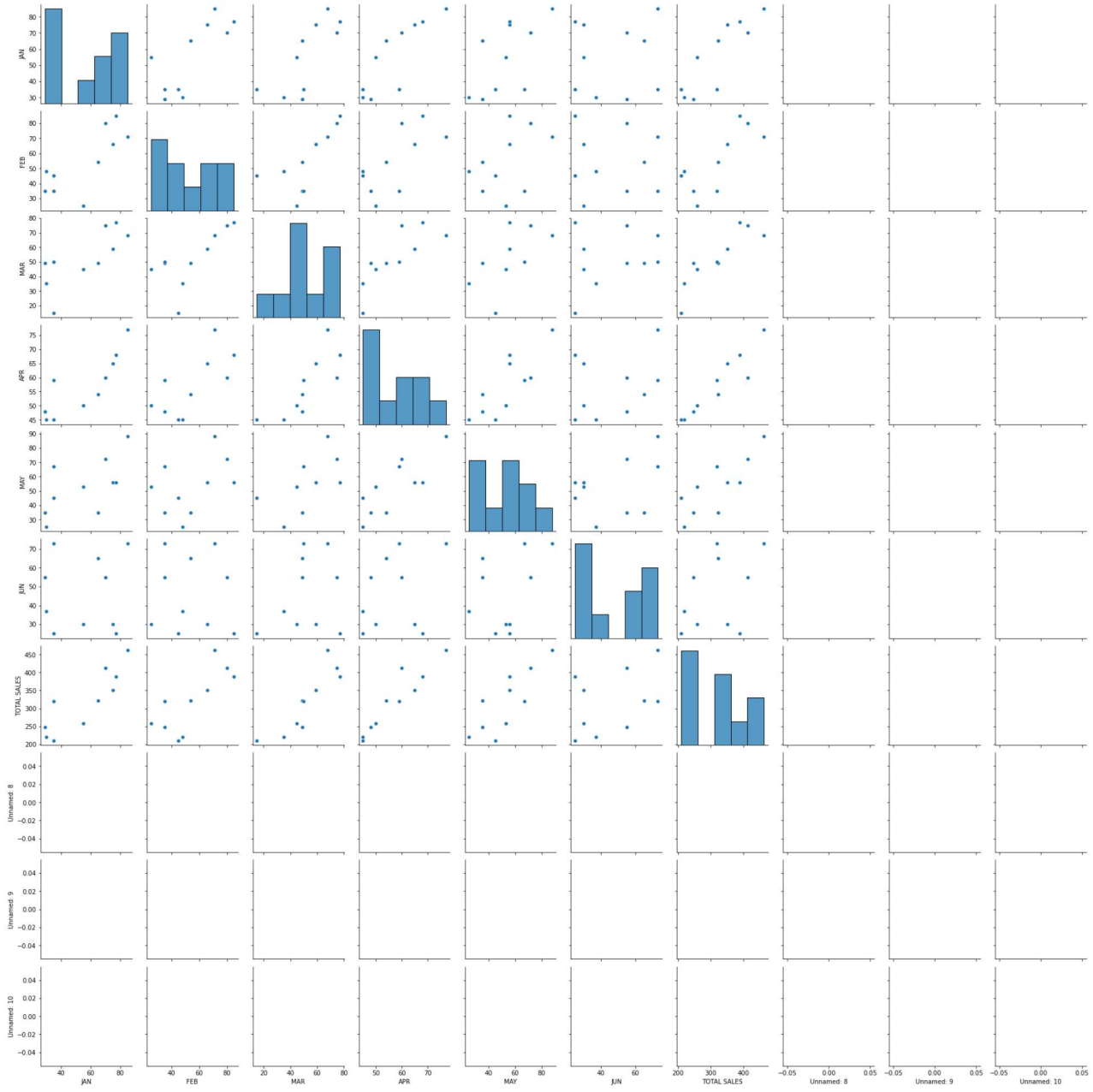
In [47]:
```
d=d.head(10)
d
```

Out[47]:

| | SALESMAN | JAN | FEB | MAR | APR | MAY | JUN | TOTAL SALES | Unnamed: 8 | Unnamed: 9 | Unnamed: 10 | Unnamed: 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | ANU | 70.0 | 80.0 | 75.0 | 60.0 | 72.0 | 55.0 | 412.0 | NaN | NaN | NaN | NaN |
| **1** | BABU | 30.0 | 48.0 | 35.0 | 45.0 | 25.0 | 37.0 | 220.0 | NaN | NaN | NaN | 1 Individua Sales using Sum() |
| **2** | CHANDRU | 65.0 | 54.0 | 49.0 | 54.0 | 35.0 | 65.0 | 322.0 | NaN | NaN | NaN | 2. Find the patterr trenc using conditiona fo.. |
| **3** | DAVID | 85.0 | 71.0 | 68.0 | 77.0 | 88.0 | 73.0 | 462.0 | NaN | NaN | NaN | 3. Analyze using Pivot table as columr percentage |
| **4** | EINSTEIN | 55.0 | 25.0 | 45.0 | 50.0 | 53.0 | 30.0 | 258.0 | NaN | NaN | NaN | 4. Insert Pivot charts |
| **5** | FAROOK | 35.0 | 45.0 | 15.0 | 45.0 | 45.0 | 25.0 | 210.0 | NaN | NaN | NaN | 5. Rank() - returns the rank of a giver value .. |
| **6** | GOWTHAM | 75.0 | 66.0 | 59.0 | 65.0 | 56.0 | 30.0 | 351.0 | NaN | NaN | NaN | NaN |
| **7** | HARSHITH | 29.0 | 35.0 | 49.0 | 48.0 | 35.0 | 55.0 | 247.0 | NaN | NaN | NaN | 33 |
| **8** | INIYAN | 35.0 | 35.0 | 50.0 | 59.0 | 67.0 | 73.0 | 319.0 | NaN | NaN | NaN | NaN |
| **9** | JOHN | 77.0 | 85.0 | 77.0 | 68.0 | 56.0 | 25.0 | 388.0 | NaN | NaN | NaN | NaN |

In [48]:
```
sns.pairplot(d)
```

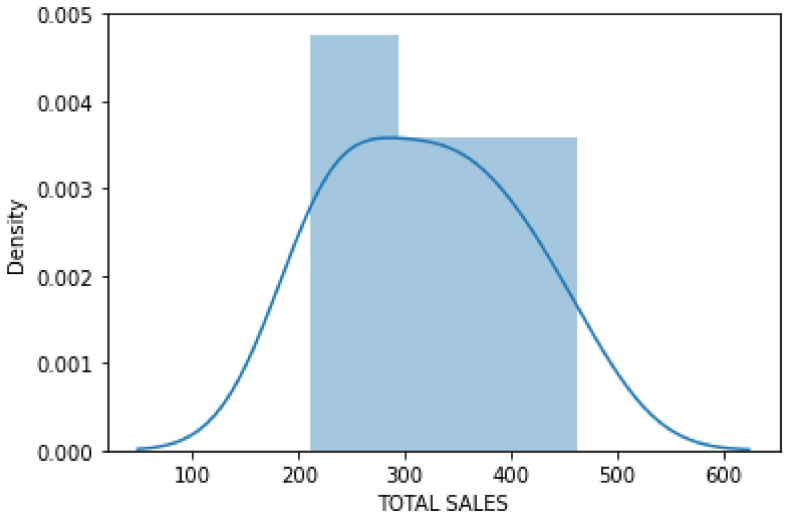
Out[48]: <seaborn.axisgrid.PairGrid at 0x2a760844400>




In [49]:
```
sns.distplot(d['TOTAL SALES'])
```

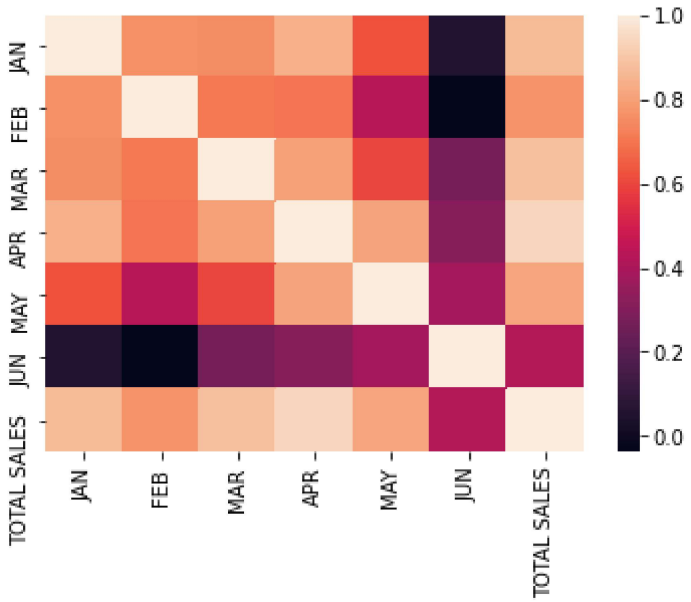
```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: FutureWarning:
`distplot` is a deprecated function and will be removed in a future version. Please adap
t your code to use either `displot` (a figure-level function with similar flexibility) o
r `histplot` (an axes-level function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

Out[49]: <AxesSubplot:xlabel='TOTAL SALES', ylabel='Density'>




In [50]:
```
d1=d[['JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN', 'TOTAL SALES']]
sns.heatmap(d1.corr())
```

Out[50]: <AxesSubplot:>




In [51]:
```
x=d1[['JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN']]
y=d1[ 'TOTAL SALES']
```

In [52]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.3)
```

In [53]:
```
from sklearn.linear_model import LinearRegression
```

In [54]:
```
lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[54]:
```
LinearRegression()
```

In [56]:
```
print(lr.intercept_)
```

```
-21.98349503881923
```

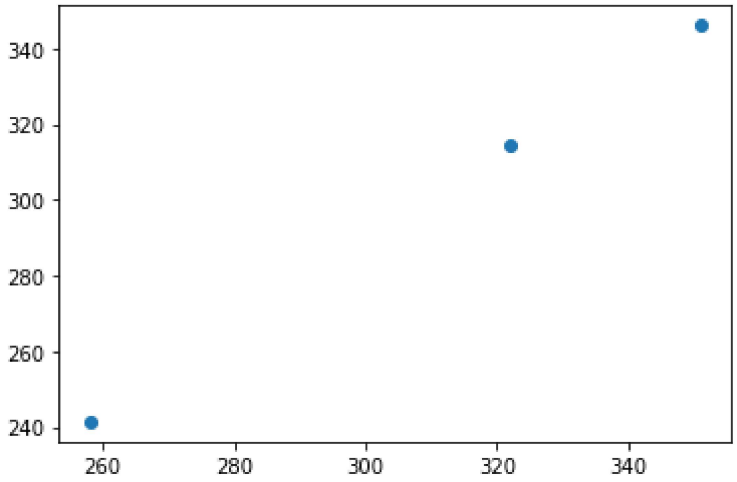
In [57]:
```
coeff =pd.DataFrame(lr.coef_,x.columns,columns=["Co-efficient"])
coeff
```

Out[57]:

| | Co-efficient |
|---|---|
| **JAN** | 0.623799 |
| **FEB** | 1.374083 |
| **MAR** | 0.863091 |
| **APR** | 1.385802 |
| **MAY** | 1.041095 |
| **JUN** | 1.046403 |

In [58]:
```
prediction =lr.predict(x_test)
py.scatter(y_test,prediction)
```

Out[58]:
```
<matplotlib.collections.PathCollection at 0x2a7657b83a0>
```




In [55]:
```
print(lr.score(x_test,y_test))
```

```
0.9209143047698785
```

In [ ]: