```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
df=pd.read_csv("/content/advertising.csv")
df.head()
```

	TV	Radio	Newspaper	Sales
0	230.1	37.8	69.2	22.1
1	44.5	39.3	45.1	10.4
2	17.2	45.9	69.3	12.0
3	151.5	41.3	58.5	16.5
4	180.8	10.8	58.4	17.9

```
df.shape
```

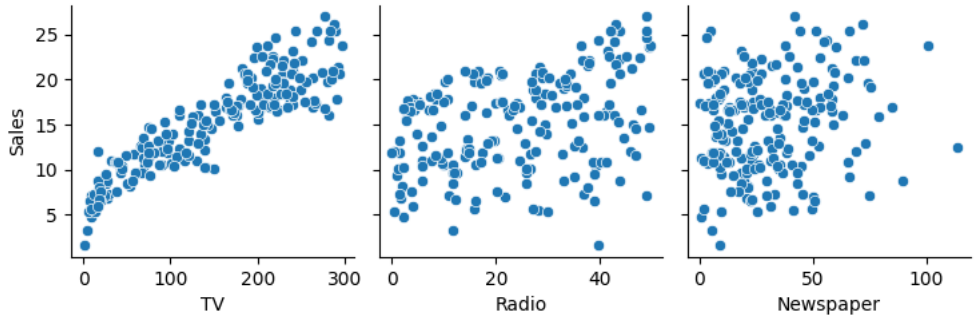
```
(200, 4)
```

```
df.describe()
```

	TV	Radio	Newspaper	Sales
count	200.000000	200.000000	200.000000	200.000000
mean	147.042500	23.264000	30.554000	15.130500
std	85.854236	14.846809	21.778621	5.283892
min	0.700000	0.000000	0.300000	1.600000
25%	74.375000	9.975000	12.750000	11.000000
50%	149.750000	22.900000	25.750000	16.000000
75%	218.825000	36.525000	45.100000	19.050000
max	296.400000	49.600000	114.000000	27.000000

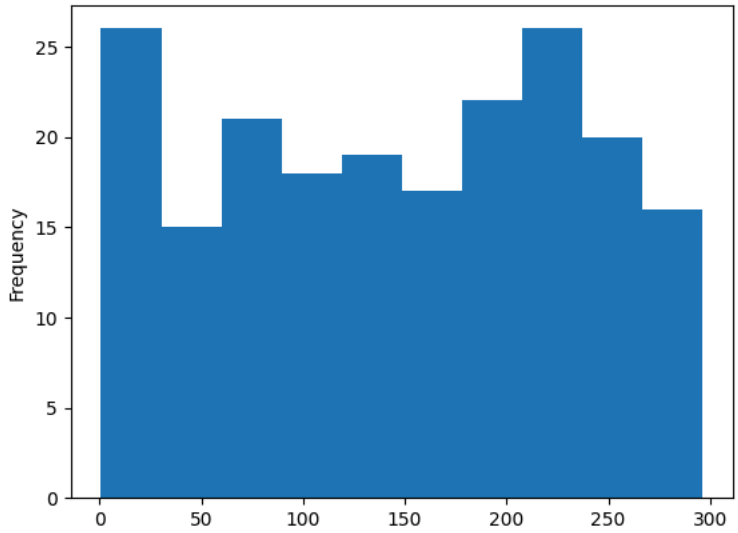
```
sns.pairplot(df, x_vars=['TV','Radio','Newspaper'],y_vars='Sales',kind='scatter')
```

```
<seaborn.axisgrid.PairGrid at 0x7cbca8f6fb50>
```



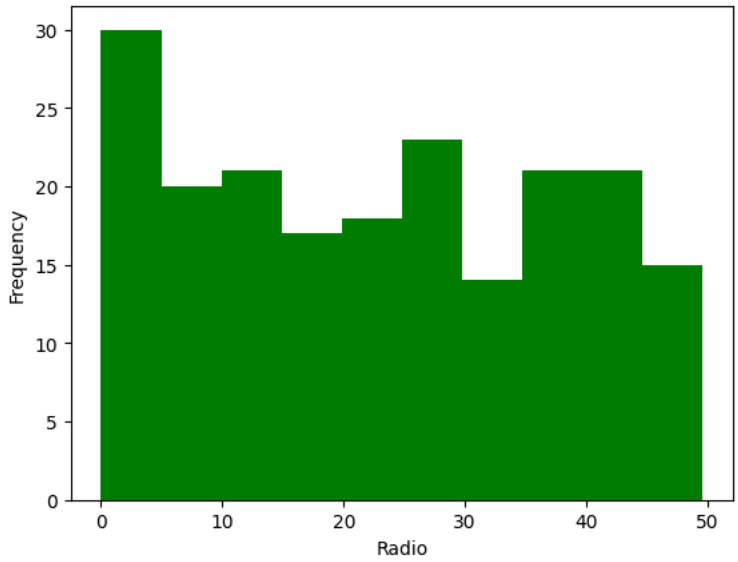

```
df['TV'].plot.hist(bins=10)
```

```
<Axes: ylabel='Frequency'>
```



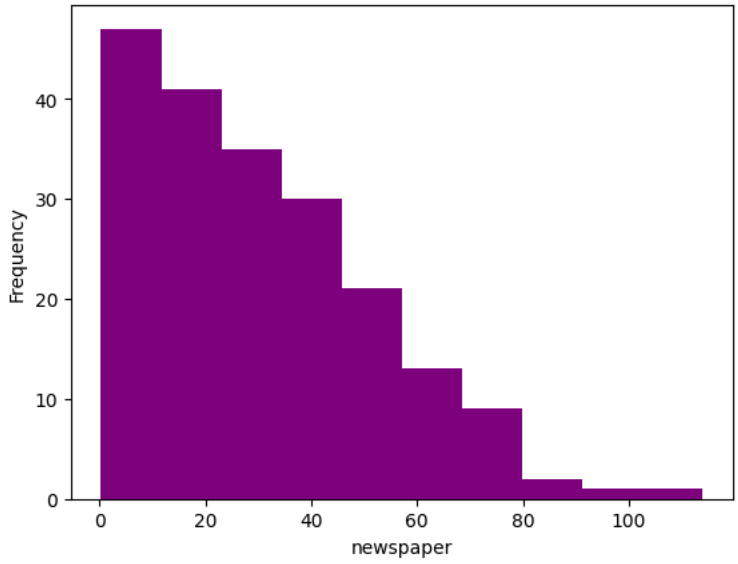

```
df['Radio'].plot.hist(bins=10,color="green",xlabel="Radio")
```

```
<Axes: xlabel='Radio', ylabel='Frequency'>
```

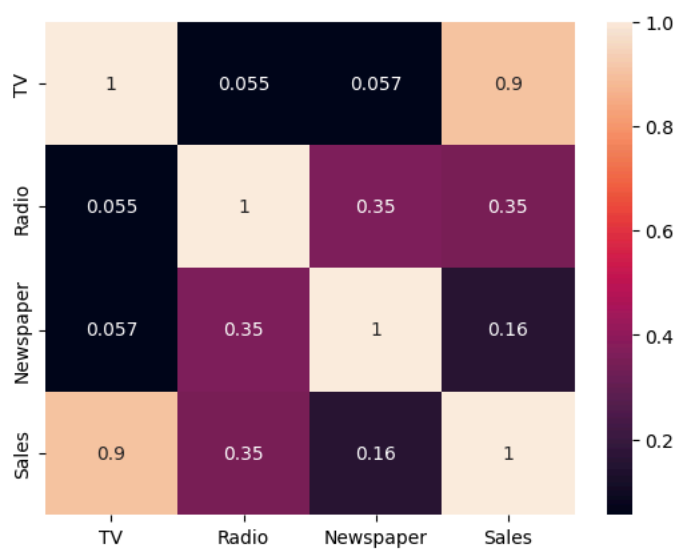



```
df['Newspaper'].plot.hist(bins=10,color="purple",xlabel="newspaper")
```

```
<Axes: xlabel='newspaper', ylabel='Frequency'>
```




```
sns.heatmap(df.corr(),annot = True)
plt.show()
```




```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(df[['TV']],df[['Sales']], test_size = 0.3,random_state=0)
```

```
print(x_train)
```

```
        TV
131  265.2
96   197.6
181  218.5
19   147.3
153  171.3
..     ...
67   139.3
192   17.2
117   76.4
47   239.9
172   19.6

[140 rows x 1 columns]
```

```
print(y_train)
```

```
     Sales
131   17.7
96    16.7
181   17.2
19    14.6
153   16.0
..     ...
67    13.4
192    5.9
117    9.4
47    23.2
172    7.6

[140 rows x 1 columns]
```

```
from sklearn.linear_model import LinearRegression
model = LinearRegression()
model.fit(x_train,y_train)
```

```
▾ LinearRegression
LinearRegression()
```

```
res= model.predict(x_test)
```

```
print(res)
```

```
[[10.93127621]
 [ 9.88042193]
 [12.09159447]
 [22.99968079]
 [16.45920756]
 [10.21976029]
 [ 7.6199906 ]
 [20.28497391]
```

```
[ 8.4464437 ]
[17.95886418]
[21.44529217]
[11.91645209]
[15.71485245]
[17.42249065]
[11.32534656]
[13.72260788]
[21.68063975]
[ 7.18213465]
[11.23230217]
[18.82362968]
[22.88474361]
[14.82272095]
[16.72739433]
[14.35202581]
[10.07198391]
[13.88133066]
[16.20744039]
[18.36388094]
[19.40378881]
[ 8.51759529]
[10.85465142]
[18.03001578]
[22.50709285]
[20.3725451 ]
[ 7.86628457]
[ 8.16731053]
[10.40584907]
[17.03936669]
[10.88749061]
[ 8.51212209]
[ 9.16343282]
[ 8.86788005]
[14.96502414]
[18.61564811]
[18.93309367]
[12.76479799]
[ 7.6145174 ]
[ 8.06879294]
[14.02363385]
[12.86878878]
[13.15339515]
[19.70481478]
[21.03480222]
[17.26376787]
[ 9.59034237]
[10.55362545]
[23.17482317]
[16.58509115]
```

```
model.coef_
```

```
array([[0.05473199]])
```

```
model.intercept_
```

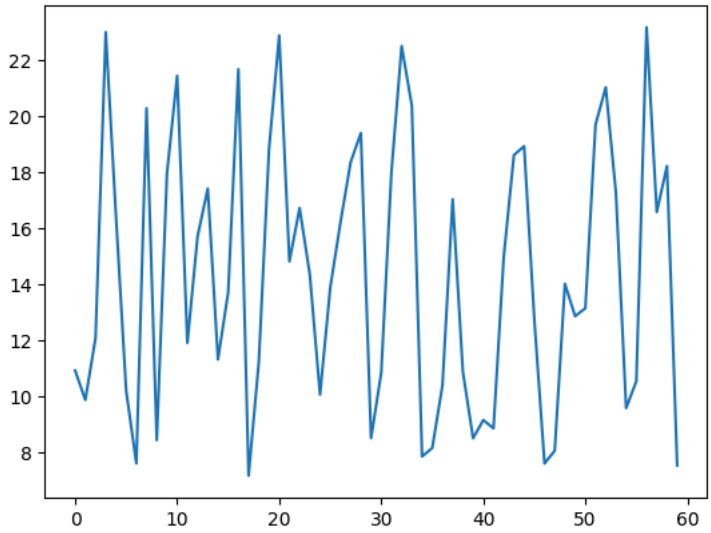
```
array([7.14382225])
```

```
0.05473199*69.2+ 7.14382225
```

```
10.931275958
```

```
plt.plot(res)
```

```
[<matplotlib.lines.Line2D at 0x7cbca2f95000>]
```




```
plt.scatter(x_test,y_test)
plt.plot(x_test, 7.14382225+0.05473199* x_test,'r')
plt.show()
```