In [1]:

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

In [2]:

```python
df = pd.read_csv("advertising.csv")
```

In [3]:

```python
df.head(10)
```

Out[3]:

	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
5	8.7	48.9	75.0	7.2
6	57.5	32.8	23.5	11.8
7	120.2	19.6	11.6	13.2
8	8.6	2.1	1.0	4.8
9	199.8	2.6	21.2	15.6

In [4]:

```python
df.shape
```

Out[4]:

```
(200, 4)
```

In [5]:

```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 4 columns):
 #   Column     Non-Null Count  Dtype  
---  ------     --------------  -----  
 0   TV         200 non-null    float64
 1   Radio      200 non-null    float64
 2   Newspaper  200 non-null    float64
 3   Sales      200 non-null    float64
dtypes: float64(4)
memory usage: 6.4 KB
```

In [6]:

```python
df.describe()
```

Out[6]:

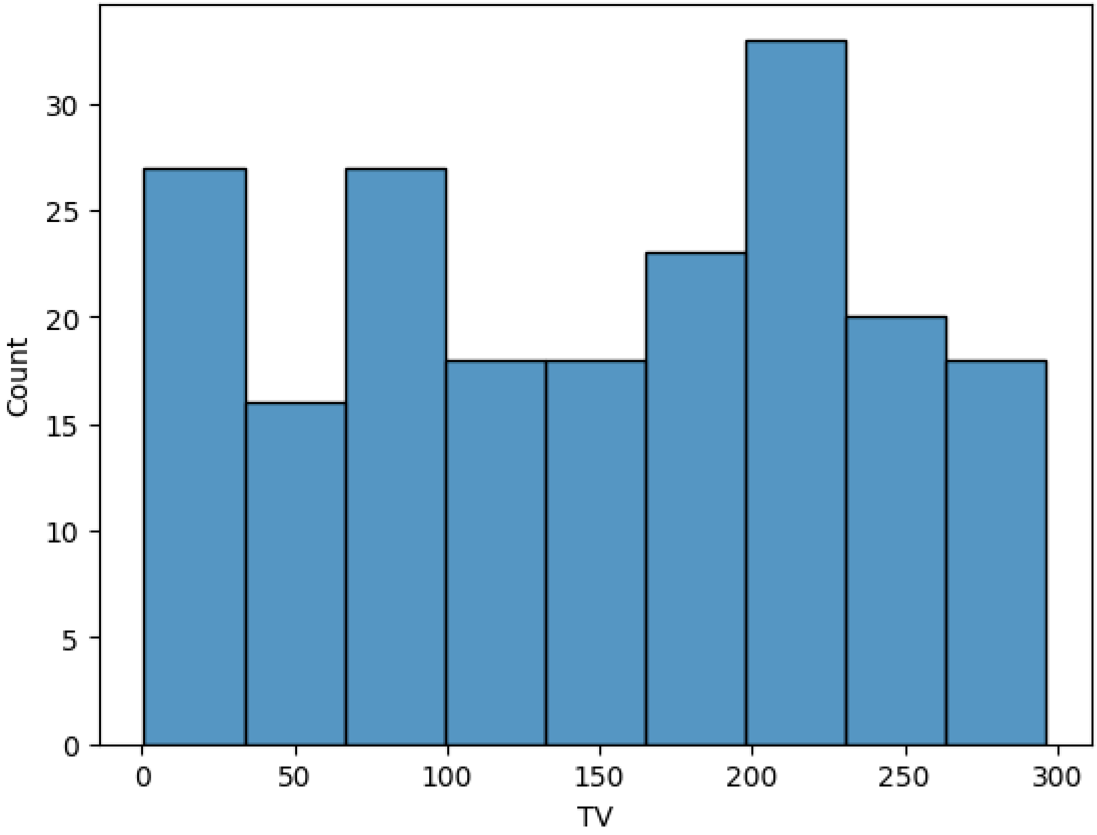
	TV	Radio	Newspaper	Sales
count	200.000000	200.000000	200.000000	200.000000
mean	147.042500	23.264000	30.554000	15.130500
std	85.854236	14.846809	21.778621	5.283892
min	0.700000	0.000000	0.300000	1.600000
25%	74.375000	9.975000	12.750000	11.000000
50%	149.750000	22.900000	25.750000	16.000000
75%	218.825000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

In [7]:

```
sns.histplot(df["TV"])
```

Out[7]:

```
<Axes: xlabel='TV', ylabel='Count'>
```

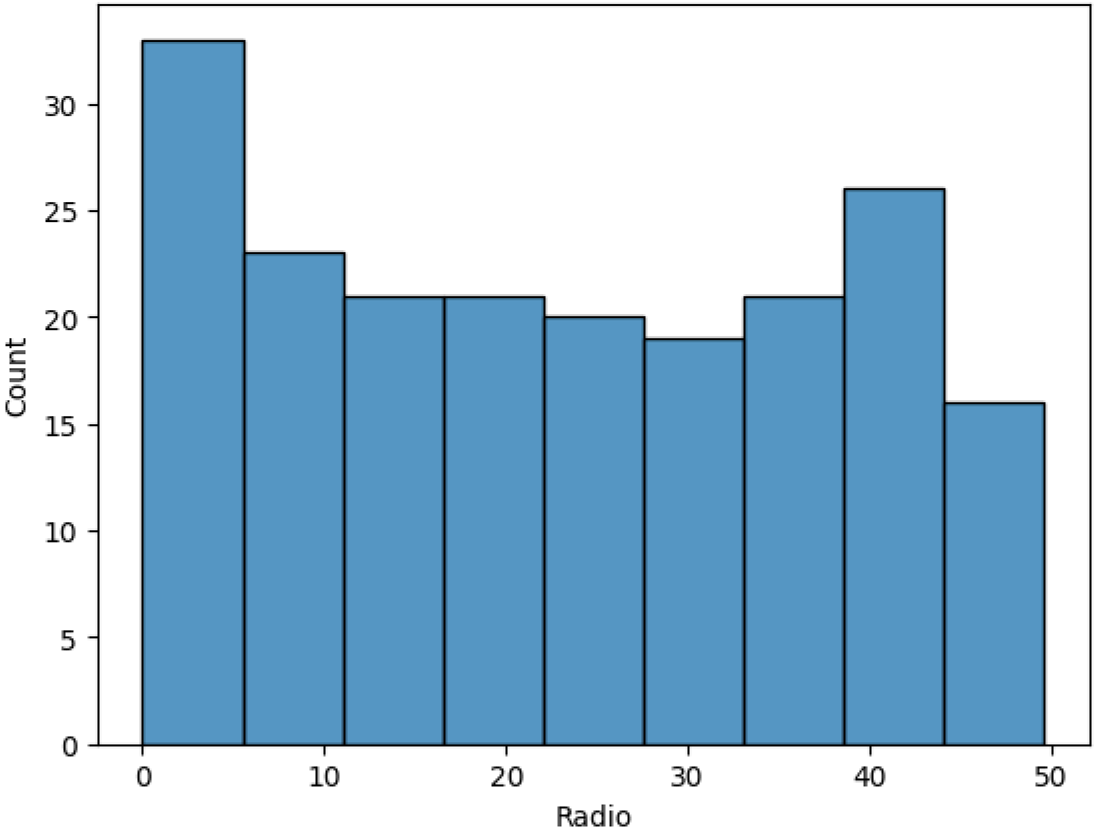


In [8]:

```
sns.histplot(df["Radio"])
```

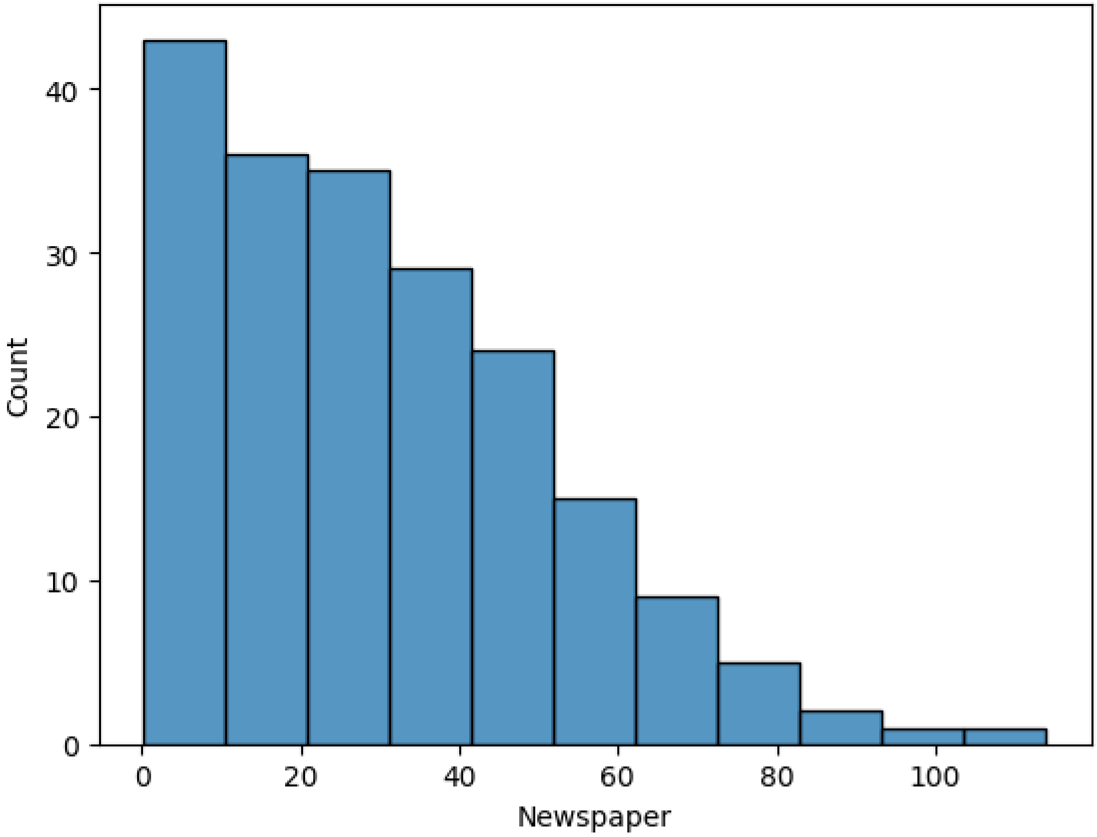
Out[8]:

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



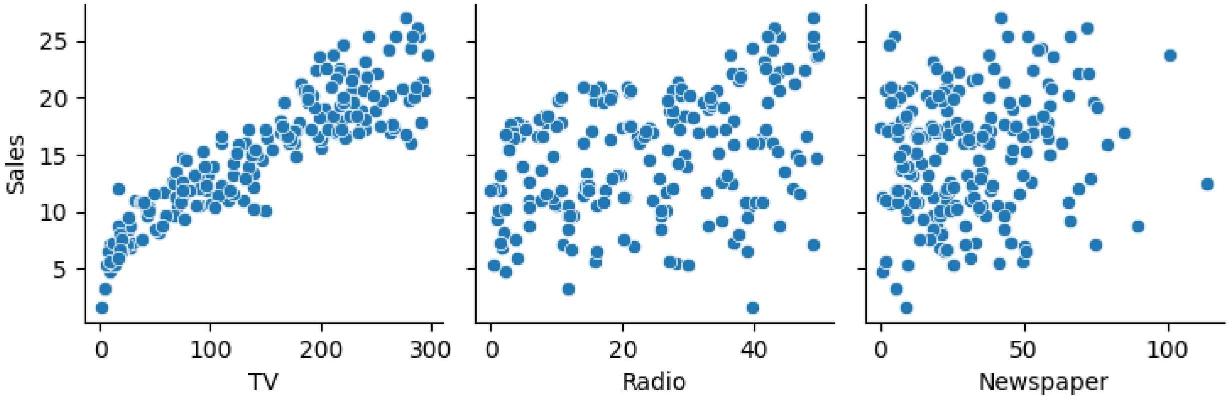
```
In [9]: sns.histplot(df["Newspaper"])
```

```
Out[9]: <Axes: xlabel='Newspaper', ylabel='Count'>
```



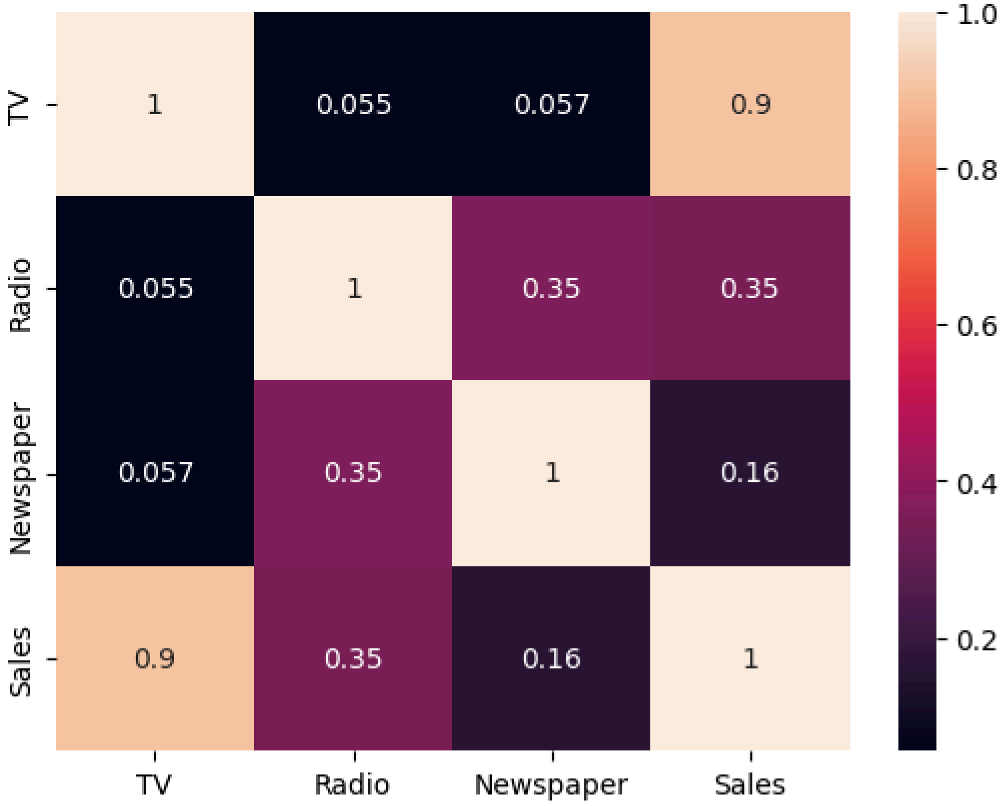
```
In [10]: sns.pairplot(df,x_vars=['TV','Radio','Newspaper'],y_vars='Sales',kind='scatter
```

```
Out[10]: <seaborn.axisgrid.PairGrid at 0x2d2073fcec0>
```



```
In [21]: sns.heatmap(df.corr(),annot=True)
```

```
Out[21]: <Axes: >
```



In [12]:
```
scaler = StandardScaler()
```

In [13]:
```
columns_to_scale = ['TV', 'Radio','Newspaper']
df[columns_to_scale] = scaler.fit_transform(df[columns_to_scale])
```

In [14]:
```
X=df.drop(columns='Sales')
Y=df['Sales']
```

In [15]:
```
X_train,X_test,Y_train,Y_test=train_test_split(X,Y,test_size=0.2,random_state=
```

In [16]:
```
model=LinearRegression()
model.fit(X_train,Y_train)
```

Out[16]:
```
▾ LinearRegression
Parameters
  fit_intercept   True
         copy_X   True
            tol   1e-06
         n_jobs   None
       positive   False
```

```
In [17]: prediction=model.predict(X_test)
         prediction
```

```
Out[17]: array([17.99747206, 11.02863798, 19.14207387, 15.16467067,  8.56496638,
                10.89550601, 24.92202604, 10.61757023, 18.6998404 , 17.29854871,
                14.66680343, 13.03094656, 19.28219899, 10.98418026, 13.7677926 ,
                14.4988402 , 16.92235556, 17.30704485, 17.78993353, 21.29009711,
                19.23977212, 10.98691684,  9.77272715, 11.18064352,  8.34136167,
                13.13093624, 21.59478295, 17.04191764, 24.83365506, 11.62133637,
                16.22765284, 21.95021111,  9.21285178,  9.94421377,  9.82032335,
                10.22691037, 15.74967394,  9.51795157, 13.67254607, 12.42186513])
```

```
In [18]: accuracy_score=model.score(X_test,Y_test)*100
```

```
In [22]: print(f"Accuracy of model: {int(accuracy_score)}%")
```

```
Accuracy of model: 91%
```

```
In [ ]:
```

```
In [ ]:
```