regression-pr-01

January 4, 2024

[26]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[27]:
```
df=pd.read_csv('../08-Linear-Regression-Models/Advertising.csv')
```

[28]:
```
df.head()
```

[28]:

	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	9.3
3	151.5	41.3	58.5	18.5
4	180.8	10.8	58.4	12.9

[29]:
```
df['total_spend']=df['TV']+df['radio']+df['newspaper']
```

[30]:
```
df
```

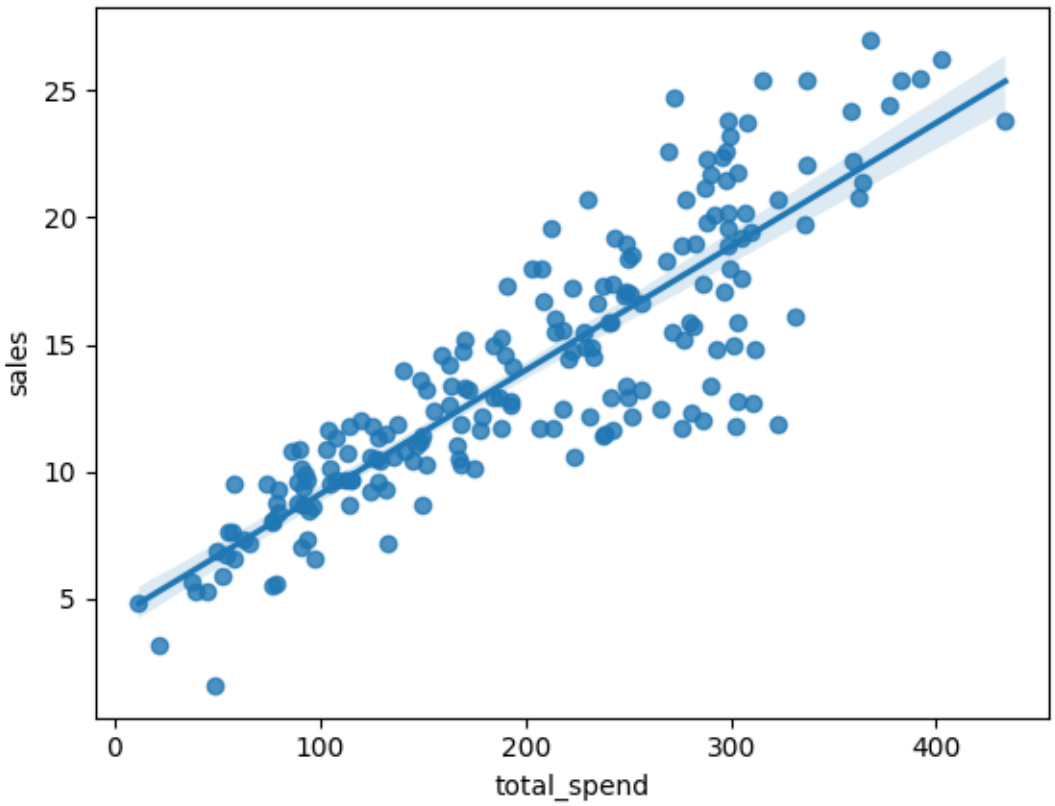
[30]:

	TV	radio	newspaper	sales	total_spend
0	230.1	37.8	69.2	22.1	337.1
1	44.5	39.3	45.1	10.4	128.9
2	17.2	45.9	69.3	9.3	132.4
3	151.5	41.3	58.5	18.5	251.3
4	180.8	10.8	58.4	12.9	250.0
..	…	…	…	…	…
195	38.2	3.7	13.8	7.6	55.7
196	94.2	4.9	8.1	9.7	107.2
197	177.0	9.3	6.4	12.8	192.7
198	283.6	42.0	66.2	25.5	391.8
199	232.1	8.6	8.7	13.4	249.4

[200 rows x 5 columns]

[31]:
```
sns.regplot(data=df,x='total_spend',y='sales')
```

[31]: <AxesSubplot:xlabel='total_spend', ylabel='sales'>



[32]:
```
X=df['total_spend']
Y=df['sales']
```

[33]:
```
np.polyfit(X,Y,deg=1)
```

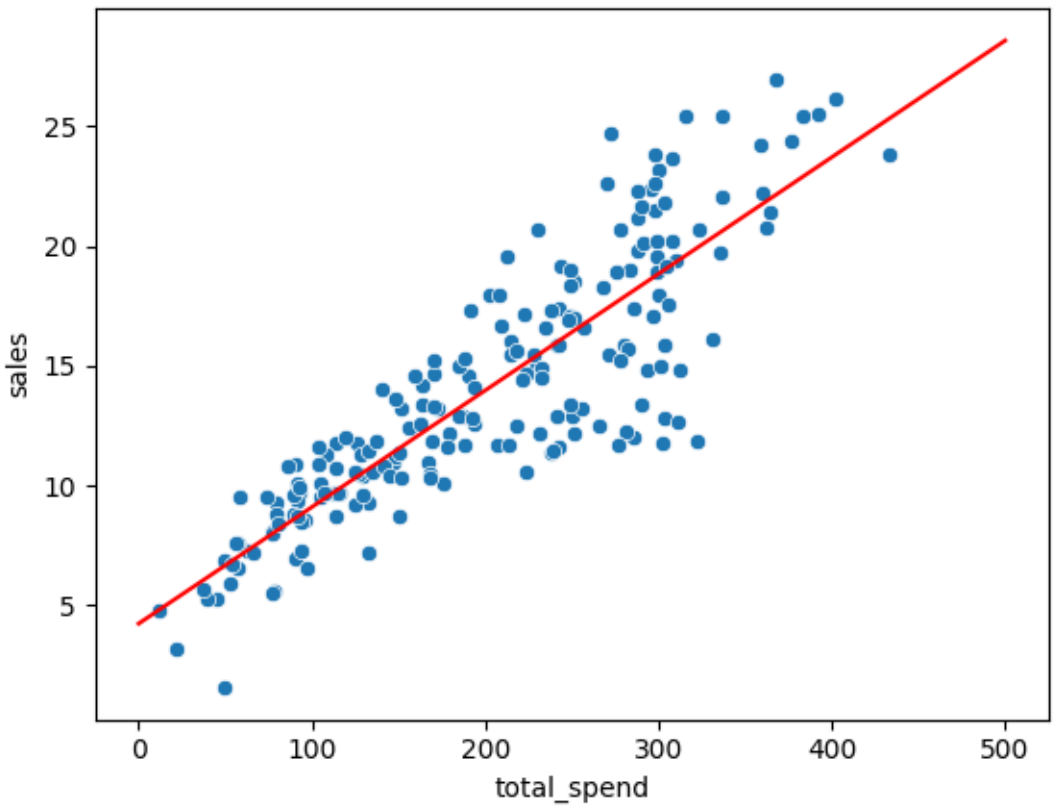
[33]: array([0.04868788, 4.24302822])

[34]:
```
potential_spend=np.linspace(0,500,100)
```

[35]:
```
predicted_sales=0.04868788*potential_spend+4.24302822
```

[36]:
```
sns.scatterplot(x='total_spend',y='sales',data=df)
plt.plot(potential_spend,predicted_sales,color='red')
```

[36]: [<matplotlib.lines.Line2D at 0x7f766822ece0>]



[37]:
```
spend=200
predicted_sale=0.04868788*spend+4.24302822
```

[38]:
```
predicted_sale
```

[38]: 13.98060422

[39]:
```
np.polyfit(X,Y,3)
```

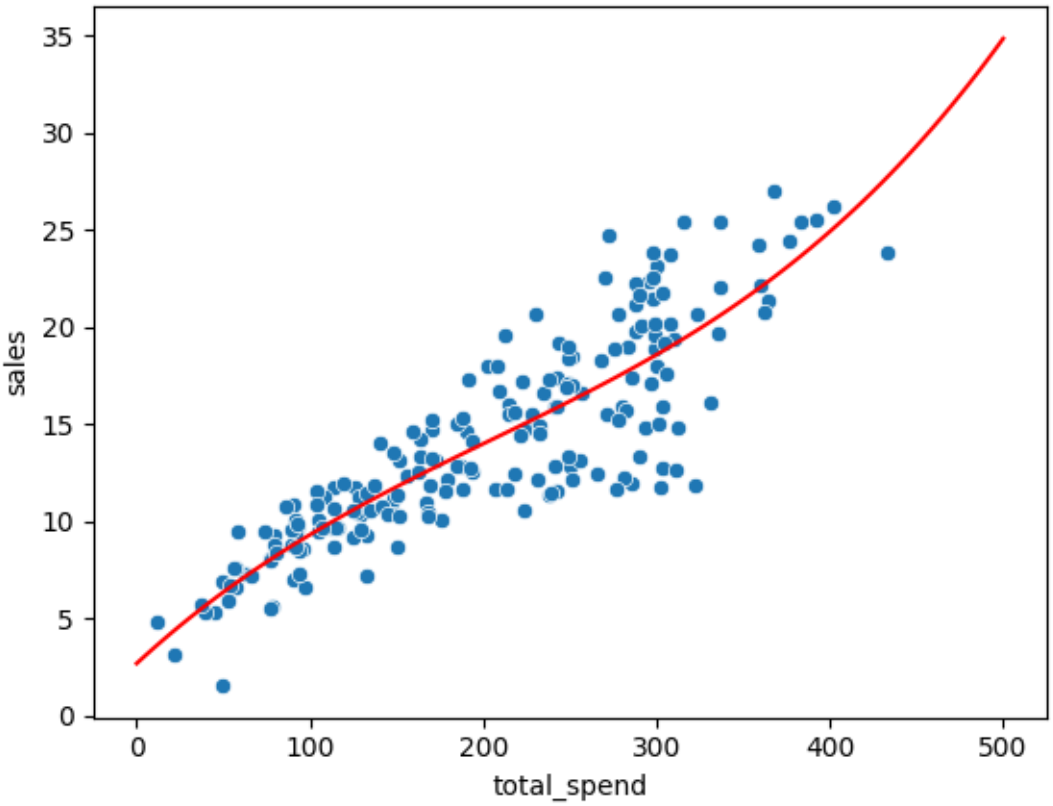
[39]: array([3.07615033e-07, -1.89392449e-04, 8.20886302e-02, 2.70495053e+00])

[40]:
```
pot_spend=np.linspace(0,500,100)
```

[41]:
```
pred_sales=3.07615033e-07*pot_spend**3 + (-1.89392449e-04)*pot_spend**2  + 8.
↪20886302e-02*pot_spend + 2.70495053e+00
```

[42]:
```
sns.scatterplot(x='total_spend',y='sales',data=df)
plt.plot(pot_spend,pred_sales,color='red')
```

[42]: [<matplotlib.lines.Line2D at 0x7f76682913f0>]


35
30
25
20
15
10
5
0
sales
0
100
200
300
400
500
total_spend

[ ]: