

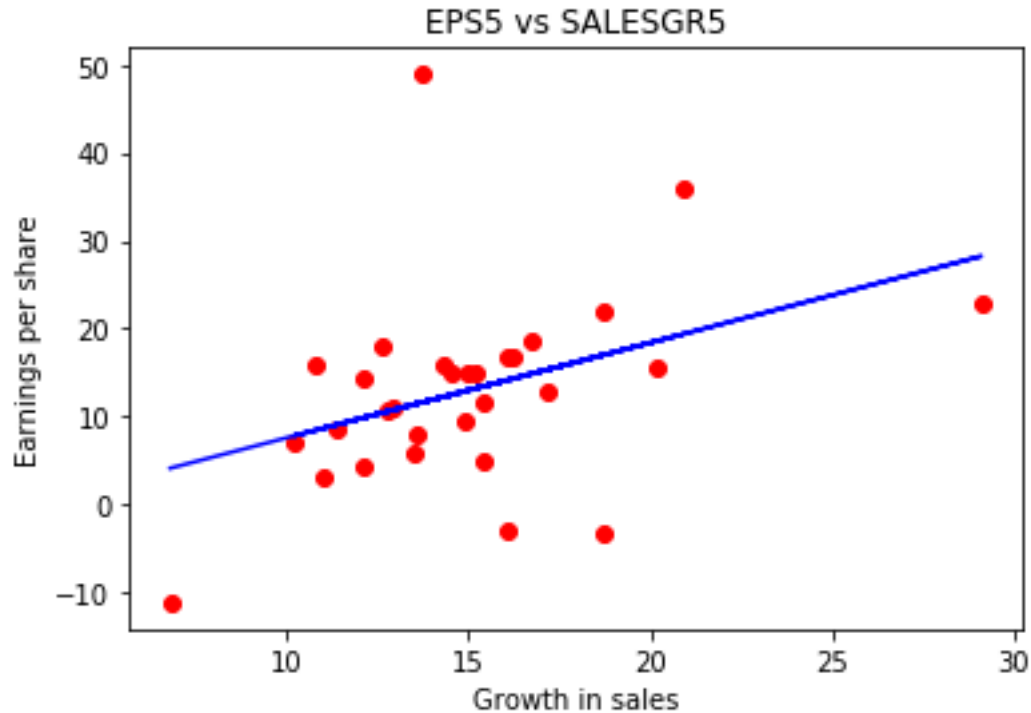
In Table 8.1, financial performance data of 30 chemical companies are presented. Use growth in earnings per share, labelled EPS5, as the dependent variable and growth in sales, labelled SALESGR5, as the independent variable. (A description of these variables is given in Section 8.3.) Plot the data, compute a regression line, and test that  $\beta = 0$  and  $\alpha = 0$ . Are earnings affected by sales growth for these chemical companies? Which company's

earnings were highest, considering its growth in sales?

#### DATASET:

Type	Types	symbol	obsno	pe	ror5	de	salesgr5	eps5	npm1	payout1
1	Chem	dia	1	9	13	0.7	20.2	15.5	7.2	0.43
1	Chem	dow	2	8	13	0.7	17.2	12.7	7.3	0.38
1	Chem	stf	3	8	13	0.4	14.5	15.1	7.9	0.41
1	Chem	ei	4	9	12.2	0.2	12.9	11.1	5.4	0.57
1	Chem	uc	5	5	10	0.4	13.6	8	6.7	0.32
1	Chem	pwt	6	6	9.8	0.5	12.1	14.5	3.8	0.51
1	Chem	gra	7	10	9.9	0.5	10.2	7	4.8	0.38
1	Chem	hrc	8	9	10.3	0.3	11.4	8.7	4.5	0.48
1	Chem	mto	9	11	9.5	0.4	13.5	5.9	3.5	0.57
1	Chem	acy	10	9	9.9	0.4	12.1	4.2	4.6	0.49
1	Chem	cs	11	7	7.9	0.4	10.8	16	3.4	0.49
1	Chem	ald	12	7	7.3	0.6	15.4	4.9	5.1	0.27
1	Chem	rom	13	7	7.8	0.4	11	3	5.6	0.32
1	Chem	rei	14	10	6.5	0.4	18.7	-3.1	1.3	0.38
1	Chem	lub	15	13	24.9	0	16.2	16.9	12.5	0.32
1	Chem	nac	16	14	24.6	0	16.1	16.9	11.2	0.47
1	Chem	suc	17	5	14.9	1.1	13.7	48.9	5.8	0.10
1	Chem	cab	18	6	13.8	0.6	20.9	36	10.9	0.16
1	Chem	imc	19	10	13.5	0.5	14.3	16	8.4	0.40
1	Chem	dxt	20	12	14.9	0.3	29.1	22.8	4.9	0.36
1	Chem	frm	21	14	15.4	0.3	15.2	15.1	21.9	0.23
1	Chem	apc	22	13	11.6	0.4	18.7	22.1	8.1	0.20
1	Chem	mlt	23	12	14.2	0.2	16.7	18.7	8.2	0.37
1	Chem	thk	24	12	13.8	0.1	12.6	18	5.6	0.34
1	Chem	wtc	25	7	12	0.5	15	14.9	3.6	0.36
1	Chem	etl	26	7	11	0.3	12.8	10.8	5	0.34
1	Chem	fro	27	6	13.8	0.2	14.9	9.6	4.4	0.31
1	Chem	lia	28	12	11.5	0.4	15.4	11.7	7.2	0.51
1	Chem	wil	29	9	6.4	0.7	16.1	-2.8	6.8	0.22
1	Chem	akz	30	14	3.8	0.6	6.8	-11.1	0.9	1.00

**PLOT:**



**PYTHON CODE:**

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from scipy import stats

#importing the dataset
dataset = pd.read_excel("C:\\Users\\Akshay\\Downloads\\(updated) Chemical Companies.xls")

X = dataset['salesgr5']
y = dataset['eps5']

#calculating the values for alpha and beta
slope, intercept, r_value, p_value, Std_error=stats.linregress(X,y)
r2_value=r_value*r_value
y1=X*slope+intercept

#plotting the points
plt.scatter(X, y, color = 'red')
plt.plot(X,y1, color = 'blue')
plt.title('EPS5 vs SALESGR5')
plt.xlabel('Growth in sales')
plt.ylabel('Earnings per share')
plt.show()
```

**Are earnings affected by sales growth for these chemical companies?**

Yes, earnings are affected by sales growth as the correlation coefficient  $r = 0.392244480252414$ .

**Which company's earnings were highest, considering its growth in sales?**

Considering growth in sales, **dxt** has the highest earnings.

**Results:**

slope=1.080747624481917

intercept=-3.209433684344903

rvalue=0.3922444802524149

pvalue=0.032042547931648145

stderr=0.4789725685270735

r2value=0.1538557322884871

**$y1 = (\text{slope} * X) + \text{intercept}$**

**y1**=18.621668 15.379425 12.461407 10.732211 11.488734 9.867613 7.814192 9.111089 11.380659  
9.867613 8.462641 13.434080 8.678790 17.000547 14.298678 14.190603 11.596809 19.378192  
12.245257 **28.240322** 13.217930 17.000547 14.839052 10.407986 13.001781 10.624136 12.893706  
13.434080 14.190603 4.139650