PROBLEM : 1

Use the Predictive Analysis to find the relationship between Price , Ads budget with Sales.

SOLUTION : 1

Independent Variables = Price (X1) & Ads budget (X2)
Dependent Variable = Sales

Line of Regression --> y = m1x1 + m2x2 + c
i.e., Sales = m1(Price) + m2(Ads budget) + c ----------(1)
where, m1 & m2 are slopes
& c is intercept

After using Regression , we got

m1 = -142.54
m2 = 0.102257
&
c = 3092.883

Now ,
Putting all the values in equation (1) we get,

Sales = -142.54(Price) + 0.102257(Ads budget) + 3092.883

which is the relationship between price ,ads budget with Sales.

PROBLEM : 2 & 3

2) What will be the sales if Price is 20$ and Ads Budget is 1700?

3) What will be the sales if price is 10$ and Ads Budget is 3500?

SOLUTION : 2 & 3

BY using the above relation we get,

x1	x2	y
20	1700	1700
10	3500	0

PROBLEM : 4

Find the optimum value for Price and Ads Budget to maximize the sales.
where,
cost per unit=8
Constraints:
min profit 4000 **profit >= 4000**
max budget 10000 **budget <= 10000**
min budget 1000 **budget >= 1000**

SOLUTION : 4

Decision variables = Price , Ads budget
Objective = To find Optimum value of Price and Ads Budget to Maximise the Sales

Constraints are,
Min profit 4000 i.e, Profit >= 4000
Max budget 10000 i.e, Budget <= 10000
Min budget 1000 i.e, Budget >= 1000
Also given that , cost per unit = 8

We know,
Sales = -142.54 (Price) + 0.102257 (Ads budget) + 3092.883
Total Profit = ((S.P-C.P)*Sales) - Adverting cost

After using Solver we get,

Price	15.16680568
Ads Budget	10000
Sales	1953.45
Cost per unit	8
Profit	4000

Thus the optimum values for Price and Ads Budget are $15 & $10000 to maximise the sales with the given constraints.

PROBLEM : 5

5) Maximize the Profit
Constraints:- Ads Budget <= 1000

SOLUTION : 5

Decision variables = Price , Ads budget
Objective = To find Optimum value of Price and Ads Budget to Maximise the Profit

Constraints , Ads Budget <= 1000

We know,
Sales = -142.54 (Price) + 0.102257 (Ads budget) + 3092.883
Total Profit = ((S.P-C.P)*Sales) - Adverting cost

After using Solver we get,

Price	**14.84853432**
Ads Budget	**0**
Sales	**976.2479**
Cost per unit	**8**
Profit	**6685.868**

So, without investing on Ads Budget and just increasing the Selling Price to $14 that's enough to get good Profit.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.933950245
R Square	0.87226306
Adjusted R Square	0.850973571
Standard Error	118.1823858
Observations	15

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	2	1144505.1	572252.5	40.97153	4.34E-06
Residual	12	167604.92	13967.08		
Total	14	1312110			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*
Intercept	3092.883488	200.17042	15.45125	2.77E-09	2656.75	3529.017	2656.75
X Variable 1	-142.5484493	17.152812	-8.3105	2.54E-06	-179.921	-105.176	-179.921
X Variable 2	0.10225716	0.036723	2.784556	0.01651	0.022245	0.18227	0.022245

Jpper 95.0%
3529.017
-105.176
0.18227