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Analysis of relation between units sold and total profit

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ABSTRACT

We investigate whether there is a direct correlation between the quantity sold and the profit created from it. There are two variables – quantity sold and Total profit, our analysis will be focused on both of them. The analysis involves correlation and regression of both the variables and predicting the future value. The research paper also involves graphs which depict the sales at different quantities. There are 524 entries in the research paper which will help us determine our objectives.

Keywords— *Correlation, Regression, Straight line regression graph*

1. OBJECTIVES

- To determine the correlation between both the variables.
- To find the regression analysis.
- To interpret the results received.
- To interpret the data with the help of graphs.
- To depict the future value.

2. INTRODUCTION

The following is a secondary data of the various items sold in a Superstore. The items include Household, Cereals, Meat, Fruits, Baby Food, Personal Care, Cosmetics, Office supplies, Snacks, Vegetables and all other such items which can be easily found in a superstore.

The data includes various segments that the store deals in such as region supplies, order priority, order date, cost, revenue etc. but here we will be focussing only on our two variables namely the dependant variable TOTAL PROFIT and the independent variable UNITS SOLD. These two will eventually help us to get the desired relation and complete our main objectives.
The following is an extract from the entire data:

S. No.	Item Type	Units Sold	Total Profit
1	Household	3604	597290.92
2	Baby Food	8435	808579.1
3	Meat	4848	277305.6
4	Meat	7225	413270
5	Cereal	1975	174965.25
6	Meat	2542	145402.4
7	Household	4398	728880.54
8	Household	49	8120.77
9	Cosmetics	4031	700869.97
10	Cosmetics	7911	1375485.57
11	Fruits	5288	12744.08
12	Cosmetics	6792	1180925.04
13	Vegetables	5084	320952.92
14	Vegetables	9855	622146.15
15	Office Supplies	2831	357413.75
16	Cosmetics	2766	480924.42
17	Personal Care	445	11151.7
18	Baby Food	3687	353435.82

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19	Office Supplies	2339	295298.75
20	Beverages	3283	51411.78
21	Fruits	5428	13081.48
22	Personal Care	4718	118233.08
23	Office Supplies	9125	1152031.25
24	Personal Care	3656	91619.36
25	Personal Care	5345	133945.7
26	Cosmetics	8261	1436340.07
27	Personal Care	8502	213060.12
28	Office Supplies	9197	1161121.25
29	Snacks	5509	303766.26
30	Cereal	9629	853033.11
31	Vegetables	5781	364954.53
32	Household	5220	865110.6
33	Cereal	1232	109142.88
34	Meat	4134	236464.8
35	Household	6276	1040121.48
36	Meat	7036	402459.2
37	Personal Care	7826	196119.56
38	Personal Care	7089	177650.34
39	Beverages	5298	82966.68
40	Cosmetics	9958	1731397.46
41	Personal Care	605	15161.3
42	Household	3806	630768.38
43	Vegetables	8161	515203.93
44	Beverages	9298	145606.68
45	Office Supplies	4880	616100
46	Snacks	9598	529233.72
47	Baby Food	176	16871.36
48	Beverages	370	5794.2
49	Cereal	5964	528350.76
50	Office Supplies	9777	1234346.25
51	Fruits	6657	16043.37
52	Vegetables	8484	535594.92
53	Beverages	9170	143602.2
54	Personal Care	9656	241979.36
55	Vegetables	2916	184087.08
56	Meat	8955	512226
57	Cosmetics	9810	1705664.7
58	Meat	4547	260088.4
59	Vegetables	4265	269249.45
60	Personal Care	7094	177775.64
61	Baby Food	3196	306368.56
62	Meat	9762	558386.4
63	Meat	6017	344172.4
64	Snacks	8215	452975.1
65	Household	4641	769152.93
66	Clothes	615	45165.6
67	Cosmetics	3484	605763.08
68	Office Supplies	7628	963035
69	Office Supplies	9459	1194198.75
70	Meat	2418	138309.6
71	Meat	1979	113198.8
72	Meat	648	37065.6
73	Vegetables	2960	186864.8

Pivot Table:

Row Labels	Average of Total Profit
0-999	31104.55224
1000-1999	119840.5318
2000-2999	200007.3218
3000-3999	295836.6128
4000-4999	338467.4025
5000-5999	425249.8173
6000-6999	529970.9634
7000-7999	540398.2404
8000-8999	634780.9998
9000-10000	783741.554
Grand Total	**398005.4129**

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3. CORRELATION

	Column 1	*Column 2*
Column 1	1	
Column 2	0.587018	1

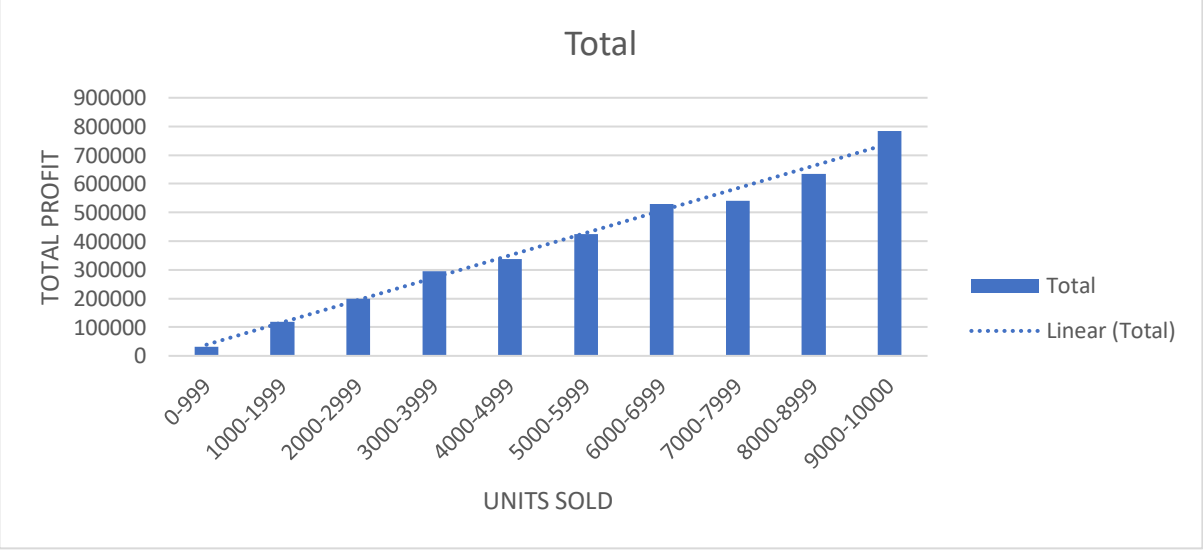
Interpretation: A weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5 and a strong positive correlation from 0.5 to 1. This data has a strong positive correlation of 0.58701. This means that change in quantity has a positive impact on change is sales amount.

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.587018							
R Square	0.34459014							
Adjusted R Square	0.34333456							
Standard Error	318047.634							
Observations	524							
ANOVA								
	df	**SS**	**MS**	**F**	**Significance F**			
Regression	1	2.7762E+13	2.7762E+13	274.448192	7.63078E-50			
Residual	522	5.2803E+13	1.0115E+11					
Total	523	8.0564E+13						
	Coefficients	**Standard Error**	**t Stat**	**P-value**	**Lower 95%**	**Upper 95%**	**Lower 95.0%**	**Upper 95.0%**
Intercept	-3967.0898	27960.5874	-0.1418815	0.88722836	-58896.19328	50962.0137	-58896.193	50962.0137
X Variable 1	78.8857947	4.76177223	16.566478	7.6308E-50	69.53120293	88.2403864	69.5312029	88.2403864

Interpretation: Y = a + bX

Y = 3967.0898 + 78.8857947X

This means that when there is an increase in the Units sold by 78.88 units, the Total Profit will increase by Rs.1.
Depicting the future value- Assume X=1000.



Substituting in the equation, we get the value of Y to be Rs.82852.8845. The graph shows the linear regression line where the x-axis is the units sold and the y-axis is the total profit.

4. CONCLUSION

The data shows that there is a positive strong correlation between the units sold and total profit. Units sold is an independent variable where as total profit is a dependent variable. It depends upon the units sold.. Through the regression analysis we can determine the future value by putting any amount of units sold with respect to the current data. There is a linear graph line in the paper which is determined through the regression analysis where the units sold is on the x-axis and the total profit is on the y-axis.

5. REFERENCES

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