Highly Innovative Quorum (HiQ)

Data Manipulation

GROUP I

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Create the database using the following fields.

Period in Weeks	Demand	Stock	Sales	Profit
1	1500	1500	-	-
2	2000	2500	-	-
3	3500	3000	-	-
4	5000	4500	-	-
5	6000	6500	-	-
6	6550	7000	-	-
7	8000	7550	-	-

Make an assumption that the price of buying one unit of product X is 600/=
and the market price for one unit of product X is 750/=

Design an algorithm that calculates the Sales and Profit for product X and update the the missing data for sales and profit.

I.e Sales = Demand=Stock ; **if** and only **if** Demand =Stock.
else
Sales = Stock; **if** and only **if** Stock < Demand.
else
Sales = Demand ; **if** and only **if** Stock > Demand.(This might lead to a loss, assume any remaining products for that week expires and can not be sold in the next week, the profit will be negative.)

Update the Sales and Profit with values obtained using your algorithm.

Using the Demand and Stock values for each week, calculate the regression equation using the least- Square- problem equation. You will ne to do research in statistics.

Use the below equation.

The Least Squares Approach

- Solving the two normal equations leads to

$$b_2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^{n}(x_i - \bar{x})^2}$$
$$b_1 = \bar{y} - b_2\bar{x}$$

or

$$b_2 = \frac{\sum_{i=1}^{n} x_i y_i - n\bar{x}\bar{y}}{\sum_{i=1}^{n} x_i^2 - n\bar{x}^2}$$
$$b_1 = \bar{y} - b_2\bar{x}$$

Using b1, the equation you solved, predict the Stock for the below projected demand levels for the next four weeks.

Period in weeks	Estimated demand	Estimated Stock	Estimated Sales	Estimated Profit
8	8750	-	-	-
9	9000	-	-	-
10	9500	-	-	-
11	1000	-	-	-

Using google API for Data Visualization or Otherwise python, Plot a line Graph for Profit against Demand.
N.B Represent estimated profit values as a dotted line on the same graph.

You need to represent your algorithm as a flowchart or a pseudo code before implementing.

There is no restriction on Implementation Languages.
You will decide on how you will partake on this as a group.
Feel Free to consult other innovators in the major Group.

Regards.