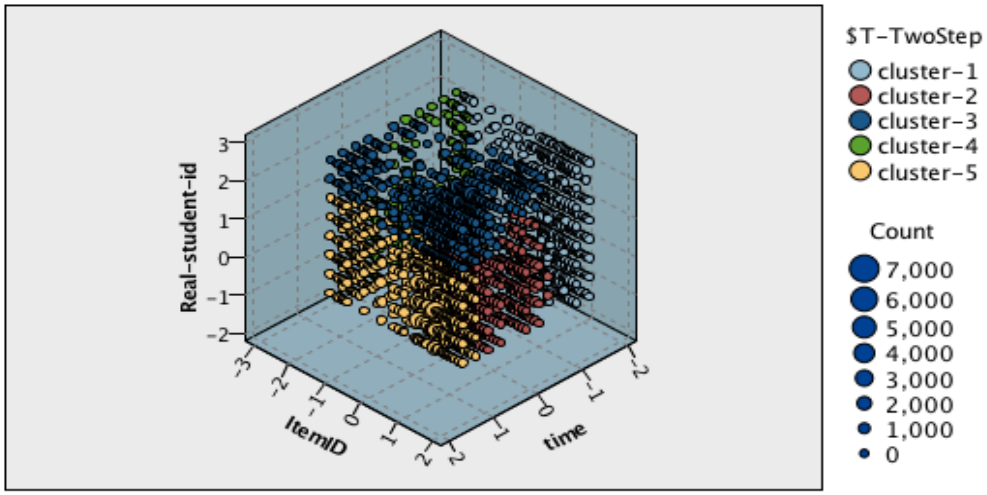
SUMMARY

PROBLEM 1

The First Problem requires us to enforce increase in rate of some items for a set of class of students and for certain period of time. This needs to be done in such a way that Increase in total Revenue is maximised and Penalty is minimized. The penalty is product of change in price and segment weight and hour weight as given in queston.

The data mining techniqu used to solve this problem is **Clustering.**
Two Step clustering has been used to find clusters of Items, Student-class and time. To apply this clustering, we needed to normalize all three inputs to get unbiased output. Also to in-cooperate quantity we ran a python script on our data to duplicate items according to quantity. 5 clusters were obtained.



Thus including the effect of penalty and percentage change of revenue of items on different student class and diff items we changed the prices of itmes as given below.

	ItemID	ItemName	max-new-price
22	129	Plain Dosa	17.600
23	130	Masala Dosa	23.100
24	132	Onion Uttapam	23.100
25	134	Plain Maggi	16.500
26	135	Fried Maggi	23.100
27	138	Paneer Franky	24.200
28	139	Veg Rice	23.100
29	140	Egg Rice	28.600
30	141	Chicken Rice	44.000
31	142	Chicken Sandwich	27.500
32	146	Butter Chicken	93.500
33	148	Tandury Chicke...	99.000

Applying the model to testing data we saw the final price for December sales is increased to Rs 1199839.1 from Rs 1140943. Thus making a total increase of **5.1%** and penalty 19,919.7.