Question 4.1

Describe a situation or problem from your job, everyday life, current events, etc., for which a clustering model would be appropriate. List some (up to 5) predictors that you might use.

Supplier clustering:

Suppose we are in a position running in charge of a plant, we need to divide our current suppliers for a single type of material into clusters in order to better integrate resources to optimize our put-away and manufacture process, as well as reduce cost.

Table 1   Predictors in the Suppliers Clustering Model

Name	Definition	Data Type	Reason
Delivery-time	= Length of time from the date the order is made to the time of receiving material(often in days)	Ratio	The suppliers whose delivery time is relatively longer will have a negative effect on the production
On Time Delivery Rate	= (The actual material delivered on time by quantity / total material delivered confirmed by order) *100%	Ratio	Suppliers with lower on-time delivery rate will increase uncertainty
Qualification Rate	= (Qualified incoming batch/total incoming batch)*100%	Ratio	If the supplier has relatively low qualification rate, which means the materials are damaged and can't be used, it will add extra costs
Price Level	Different suppliers can offer various price for the same type of material.	Ratio	Obviously suppliers who offers high price level material will endanger the actual profit rate