# 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**

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| --- | --- | --- | --- |
| 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 |