BIA 650 A Homework#9 W&A Chapter 7, Problem 70

# Management Overview

Problem Statement:

To compare 8 different characteristics of 25 Universities and form four clusters, each with a cluster centre. Comparing all characteristics/Variables, the universities that have minimum differences should fall under a cluster.

Data Sources:

* + The **inputs** are the Raw data available on Scores, Acceptance, Enrolment, Cost, Starting salary and other demographics.
  + The key **decision variables** are the indexes of the Universities that are to be chosen as cluster centres.
  + **Output** is the Sum of minimum differences of the characteristics

Model Approach:

* + Separate the data into inputs, decision variables, constraints and output and enter them on the spreadsheet.
  + The data is standardised and the minimum differences of characteristics between the Universities are calculated. Then, the sum of minimum differences is calculated.
  + The constraints, Decision Variables and objective cell to be minimized are added in Solver and it is run. We use solver’s **Evolutionary** algorithm.

Solution and Interpretation:

* The four clusters are as follows (Cluster Centres in Bold)
* **Texas**, Indiana, UNC:

The students admitted into these Schools have almost the same mean GMAT and mean GPA scores. The percentage of non-us citizens admitted is also almost similar. Their mean starting salaries range from 68 to 80.

* **Washington** U, Carnegie-Mellon, Rochester, SMU, Vanderbilt, Thunderbird:

The total cost for these Universities is similar. The percentage of minorities in these Schools is at most 10. They mostly admit students with a GPA of 3.2 -3.41.

* **Wharton**, Harvard, Stanford, Berkeley, Yale, MIT

It makes intuitive sense to say our model is quite accurate just by seeing that the above universities in the same cluster. All the above Universities are Ivy Leagues and they have a very small acceptance percentage boast a high percentage of students that enrol once accepted. They also require high GMAT scores and GPAs and they are very expensive to attend.

* **Duke,** Michigan, North-western, Virginia, Columbia, Chicago, Dartmouth, UCLA, NYU, Cornell:

On average, these Universities admit students with a GPA of 3.3 -3.4. Their acceptance rate is also very similar. They generally have a higher percentage of students fall under the minority category.