

Project-2: Cluster Analysis

Overview: An equities analyst is studying the pharmaceutical industry and would like your help in exploring and understanding the financial data collected by her firm. Her main objective is to understand the structure of the pharmaceutical industry using some basic financial measures.

Financial data were gathered on 21 firms in the pharmaceutical industry, and is available in the file Pharmaceuticals.csv. For each firm, the following variables are recorded:

- (a) market capitalization (in \$billion)
- (b) beta
- (c) price/earnings ratio
- (d) return on equity
- (e) return on assets
- (f) asset turnover
- (g) leverage
- (h) estimated revenue growth
- (i) net profit margin
- (j) median recommendation (across major brokerages)
- (k) location of firm's headquarters
- (l) the stock exchange on which the firm is listed

Use cluster analysis to explore and analyze the given dataset as follows:

1. (30) Use only the quantitative variables (a)-(i) to cluster the 21 firms. Provide results and justify the various choices made in conducting the cluster analysis such as weights accorded different variables, the specific clustering algorithm/s used, the number of clusters formed, etc.
 2. (25) Interpret the clusters with respect to the quantitative variables that were used in forming the clusters.
 3. (20) Is there a pattern in the clusters with respect to the qualitative variables (j)-(l) (that were not used in forming the clusters)?
 4. (20) Provide an appropriate name for each cluster using any/all of the variables in the dataset.
- After the team uploads its project, I also ask that EACH INDIVIDUAL in the class complete a brief confidential survey on LATTE about the extent to which each member of your team contributed to the final product submitted. This is an opportunity to recognize leadership, egalitarian effort, social loafers and free riders (not that any of our teams would have any of the latter). You will receive credit simply for completing the survey, and your project grade will be influenced by how your teammates evaluate your contributions.

Deliverables: You should upload where indicated on Latte.
--