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Integer Linear Programming Tricks with DEA (Data Envelopment Analysis) Applications

The fastest and most powerful solution methods are those for linear programming models. It is often advisable to use this format insteadof solving a nonlinear model where possible. It is interesting to note that several practical problems can be transformed into linear integer programs. For example, integer variables can be introduced so that anonlinear function can be approximated by a "piecewise linear" function. We first introduce some tricks in order to deal with nonlinearity issues. Moreover, we illustrate that how practically these tricks help us toaddress some problems in performance evaluation context. Nowadays, it is necessary to evaluate efficiency (doing things right) , effectiveness (doing the right things) and economy (doing things at a low price) in an organization. However, it is difficult to do this when there are multiple inputs and multiple outputs to the system. Data Envelopment Analysis (DEA) is a powerful nonparametric quantitative method in operations research and economics for evaluating the relative efficiency score of a set of Decision Making Units (DMUs), such as universities, car makers, hospitals, banks and so on.

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