



## DECISION ANALYTICS.

### Lab09: Diet problem

#### BACKGROUND.

This exercise we will implement a diet problem model and compare the linear programming solution to the integer linear programming solution.

#### Task 1.

Let's assume a farmer can feed the animals using two different products, which have different nutritional composition and come at different costs as follows:

Feed	Energy	Protein	Calcium	Cost
A	2	5	4	9
B	4	3	1	7

In order to achieve the required quality of meat the farmer needs to ensure that the following minimum nutritional requirements are met:

Energy	Protein	Calcium
12	15	8

Define a Linear Program that optimises the cost of the mixture of feeds while at the same time meeting the minimum nutritional requirements.

#### Task 2.

Let's now assume that the above problem is a once-off decision only, so it is not about determining the optimal mixture of feed products but about determining how many units of each to buy to satisfy demand. The problem then is an Integer Linear Program, with the decision variables being integers.

Use a Mixed Integer Programming solver to solve the above problem and observe the difference.