

Fall 2011

INDU 6111 Theory of Operations Research
Term project
Due on Wednesday November 9 in class.

Please, print out the Expectation of Originality Form
(available from a link on our class web page),
fill it in, sign it, and attach it to your report.

Design for yourself the cheapest possible daily diet drawn out of a list of at least 10 and at most 30 foods. List these 10 to 30 foods along with their prices. Your report must specify the store (name and address) and date where and when they could be had for these prices.

List the nutritional constraints that your diet is subject to. These must include an equality constraint on calories, lower bounds on protein, calcium, and vitamin C, and between two and six lower bounds on other nutrients (iron, magnesium, other vitamins, whatever you choose). You may also add other constraints: for instance, upper bounds on the daily number of servings of each of the foods on your list.

Your report must specify reproducible sources (websites or books available in the Concordia library) of your information on recommended daily allowances and on nutritional values of your foods.

State the linear programming problem that you are led to solve. Solve it using any of the software packages listed on the class web page. Report the optimal solution and certify its optimality. Then let your calories requirement vary between 50% and 150% of your original figure and describe how the optimal solution and its cost depend on this parameter.

You can work on this project alone or in a team of at most three members.