

Computer Assignment II (there is no I)

Math 20

Introduction to Linear Algebra and Multivariable Calculus

Due November 1, 2004 at 4:00AM

For information on using Microsoft Excel and the Solver package, use Excel's built-in help and the links on the course web site.

Submit your completed computer assignment on the course web site (click on "Dropbox" and follow the instructions). Name your file "CA_II_your_last_name.xls". Put each problem on a separate worksheet in the same file.

1. Redo the simplex method problem on the last homework with Excel.
2. Collect data about a day's worth of meals from Harvard University Dining Services by going to their website (<http://www.dining.harvard.edu/>). Click on "Full Menu for Nutrient Information" then each of the "Nutritive Analysis" links. Check every box and submit to get a table of nutritional information. Import this into Microsoft Excel (copy-and-paste from Explorer to Excel does part of this job; you'll have to clean it up a little bit).

Read about the Daily Reference Values and Recommended Daily Intakes on the FDA's web site (start at <http://www.fda.gov/fdac/special/foodlabel/dvs.html>). Choose a target calorie amount per day. This may be 2000 or 2350. Build constraints based on the following recommendations per day:

- At least 50g protein
- At least 300g total carbohydrates
- At most 30% of total calories from fat
- At least 25g fiber
- At least 5000IU Vitamin A
- At least 60 mg Vitamin C
- At least 18 mg iron
- At least 60 mcg Vitamin B₁₂

Use the Solver to find a menu that minimizes total calories subject to these constraints.

3. Repeat Problem 2, removing the carbohydrate lower bound and instead solving to minimize total carbohydrates.