CS302 - Assignment 19

Due: Thursday, May 3 at the beginning of class
Hand-in method: paper

1. **[8 points]** Pancakes are produced in Kansas and Mexico and consumed in New York and California. Kansas **produces** 15 tons of pancakes and Mexico 8. New York **consumes** 10 tons of pancakes and California 13. The transportation costs per ton are $4 from Mexico to New York, $1 from Mexico to California, $2 from Kansas to New York and $3 from Kansas to California.

   Write a linear program that decides the amounts of pancakes (in tons and fractions of tons) to be transported from each producer state to each consumer state so as to minimize the overall transportation cost assuming we must ship all pancakes produced.

   You do NOT need to solve it just write out the objective function and the constraints. Make sure it's clear what each of your variables represents.

2. **[10 points]** Moe is deciding how much Regular Duff and how much Duff Strong to order each week. Regular Duff costs Moe $1 per pint and he sells it for $2 per pint; Duff Strong costs $1.50 per pint and he sells it at $3 per pint. However, as part of a complicated marketing system, the Duff company will only sell Moe one pint of Duff Strong for every two pints or more of Regular Duff that Moe buys. Furthermore, Duff will not sell Moe more than 3,000 pints per week.

   (a) Assuming Moe can sell however much beer he has, write a linear program for deciding how much Regular Duff and how much Strong Duff to buy so as to maximize Moe's profit.

(b) Draw the constraints and indicate the feasibility region on a graph.

(c) State the solution and show where it is on your graph.