Homework 7

Start Assignment

- Due Mar 25 by 8am
- Points 20
- Submitting a file upload
- File Types pdf
- Available Mar 18 at 8am - Mar 25 at 8am

Suggested reading

Chapter 7.1 and 7.4

Practice problems *(do not turn in)*

1. **[DPV] Problem 7.1** (Can you use the dual LP to prove it's optimal?)
2. **[DPV] Problem 7.4** (LP for Duff beer)
3. **[DPV] Problem 7.5** (LP for canine products)
4. **[DPV] Problem 7.6** (Give an example of an LP with unbounded feasible region but bounded optimum.)
5. **[DPV] Problem 7.11** (dual to the example)
6. **[DPV] Problem 7.12** (prove that point (1.5, 0.5, 0) is optimal)

Graded problem

Consider the following variant of the SAT problem, denoted by **3-sol-SAT**:

Input: a boolean formula f with *m clauses and n variables*, in conjunctive normal form.

Output: Three distinct assignments of the variables such that f evaluates to true, or return NO otherwise.

In this problem assignments are considered distinct if at least one variable is assigned different boolean value. For example, if $f(x, y, z, w) = (x \vee y) \wedge (x \vee \bar{z}) \wedge (y \vee w)$ then the following distinct assignments are valid:

(x,y,z,w)=(T,T,T,T); (T,F,F,T), (F,T,F,F).

Show that 3-sol-SAT is NP-complete.