IE 601, Optimization Techniques

Assignment 02, August 21, 2019

Due Wednesday, August 28, 2019 in class

Note: There are 5 questions on 1 page(s). Submit a report written in your own words. Write your name and roll number clearly on the report.

1. Exercise 3.1 [BJS, 2nd Ed.]
2. In the class, we showed that if B is a basis of A then the objective of an LP in the standard form can be written as $c_B^\intercal B^{-1}b - \left(c_B^\intercal B^{-1}N - c_N^\intercal\right) x_N$. Show that this is also equivalent to $c_B^\intercal B^{-1}b - \left(c_B^\intercal B^{-1}A - c^\intercal\right) x$
3. Exercise 3.37 [BJS, 2nd Ed.]
4. Exercise 3.38 [BJS, 2nd Ed.]
5. We argued in class that if a nonbasic column of $B^{-1}A$ is non-positive, then the feasible region is unbounded. Find the direction d corresponding to it. Explain why $Ad = 0$ holds for this direction. Lastly show that this d is an extreme direction of the feasible region.