Assignment 4 of MATP6600/ISYE6780

(Due on Nov-16-2018 in class)

Exercises 5.5, 6.10(a,b), 6.11(a,b), 6.31 in the textbook "Nonlinear programming: theory and algorithms, 3rd Ed. by Bazaraa-Sherali-Shetty".

Bonus problem

Let $f(x, y)$ be a function on $\mathbb{R}^n \times \mathbb{R}^m$, and $X \subseteq \mathbb{R}^n$ and $Y \subseteq \mathbb{R}^m$ be two nonempty sets. Prove that

$$\sup_{y \in Y} \inf_{x \in X} f(x, y) \leq \inf_{x \in X} \sup_{y \in Y} f(x, y).$$

Give an example that the above inequality can hold with equality, and give another example that the above inequality can hold strictly.