

Assignment 2 of MATP6600/ISYE6780

(Due on Oct-09-2018 in class)

Exercises 3.1 (a,b,c), 3.6, 3.10, 3.27, 3.45 in the textbook “Nonlinear programming: theory and algorithms, 3rd Ed. by Bazaraa-Sherali-Shetty”.

Additional problems

1. Suppose that f is a convex function on \mathbb{R}^n and it is upper bounded on \mathbb{R}^n . Prove that f is a constant.
2. Let f be a convex function on \mathbb{R}^n and g a concave function on \mathbb{R}^n . Assume $g(\mathbf{x}) \leq f(\mathbf{x})$ for any $\mathbf{x} \in \mathbb{R}^n$. Prove that there is an affine function $h(\mathbf{x}) = \mathbf{a}^\top \mathbf{x} + b$ such that $g(\mathbf{x}) \leq h(\mathbf{x}) \leq f(\mathbf{x})$ for any $\mathbf{x} \in \mathbb{R}^n$.