M677_A12

November 20, 2023

1 Assignment 12

1.1 Due Tuesday, November 28th

1. Verify that a semidefinite program in standard form is a convex optmization program by proving that the set
$$\mathcal{S} = \{X \in \mathbb{R}^{n\times n} : X \succeq 0\}$$
of positive semidefinite matrix is a convex set.
2. Recast the optimization program
$$\underset{x\in\mathbb{R}^n}{\text{minimize}}\ \langle c, x\rangle \quad \text{s.to } \|Ax - b\|_2 \leq \langle d, x\rangle + e \ \text{ and } \ Mx = y$$
as a semidefinite program.