

Advanced Optimization - Assignment 8

1. Verify that the inverse of the KKT matrix $K = \begin{bmatrix} G & A^T \\ A & 0 \end{bmatrix}$ is given by

$$K^{-1} = \begin{bmatrix} C & E \\ E^T & F \end{bmatrix},$$

where

$$\begin{aligned} C &= G^{-1} - G^{-1}A^T(AG^{-1}A^T)^{-1}AG^{-1}, \\ E &= G^{-1}A^T(AG^{-1}A^T)^{-1}, \\ F &= -(AG^{-1}A^T)^{-1}. \end{aligned}$$

Hint: apply Gauss-Jordan reduction by blocks to the augmented matrix $[K|I]$.