ST 705 Linear models and variance components
Lab practice problem set 4

January 31, 2023

1. Let $G : \mathbb{R}^p \to \mathbb{R}$ defined by $G(\beta) := (y - X\beta)'W(y - X\beta)$. Derive an expression for $\nabla_\beta G(\beta)$.

2. Show that $I_n - P_X$ is the unique symmetric projection matrix onto $\mathrm{null}(X')$.