Sensitivity Proofs

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Theorem 1. *The sensitivity of*

$$SSE = \sum_{i=1}^{k} \sum_{j=1}^{x_i} (y_{ij} - \overline{y}_i)^2$$

is bounded above by 3.

Proof. We take $y_{ij} \in [0, 1]$. This means that changing row ij changes y_{ij} by at most 1. This means that $\overline{y}_i$ can change by at most $\frac{1}{n}$, where n is the size of the database. So the term $(y_{ij} - \overline{y}_i)^2$ can change by at most $(1 - \frac{1}{n})^2$. □