

Assignment 1 Question 1

Sheen Thusoo

f. [2 marks] Write the equation for the sensitivity curve of $\alpha(\mathcal{P})$, given a population y_1, y_2, \dots, y_{N-1} .

The sensitivity curve of an attribute is

$$SC(y) = N[\alpha(\mathcal{P}^*) - \alpha(\mathcal{P})]$$

Then, for the excess kurtosis attribute, the sensitivity curve can be defined as

$$SC(y) = N \left[\left(\frac{\frac{1}{N} \sum_{u \in \mathcal{P}^*} (y_u - \overline{y_N})^4}{\left[\frac{1}{N} \sum_{u \in \mathcal{P}^*} (y_u - \overline{y_N})^2 \right]^2} - 3 \right) - \left(\frac{\frac{1}{N-1} \sum_{u \in \mathcal{P}} (y_u - \overline{y_{N-1}})^4}{\left[\frac{1}{N-1} \sum_{u \in \mathcal{P}} (y_u - \overline{y_{N-1}})^2 \right]^2} - 3 \right) \right]$$
$$SC(y) = N \left[\left(\frac{\frac{1}{N} \sum_{u \in \mathcal{P}^*} (y_u - \overline{y_N})^4}{\left[\frac{1}{N} \sum_{u \in \mathcal{P}^*} (y_u - \overline{y_N})^2 \right]^2} \right) - \left(\frac{\frac{1}{N-1} \sum_{u \in \mathcal{P}} (y_u - \overline{y_{N-1}})^4}{\left[\frac{1}{N-1} \sum_{u \in \mathcal{P}} (y_u - \overline{y_{N-1}})^2 \right]^2} \right) \right]$$