Sufficient statistics

stats6254suff 625.3 - Sufficiency

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Data Reduction

Let $\{X\}_n$ be i.i.d.
If $T : \mathbb{R}^n \to \mathbb{R}$ is a function such that $T(X)$ is a random variable then $T(X)$ is a statistic.

Sufficiency

$T(\mathrm{X})$ is called a sufficient statistic if the distribution of X, conditionally on $T(\mathrm{X})$ is a constant function of θ
The definition implies that if $T = T(\mathrm{X})$ is sufficient then $f_{X|T}(x|t)$ does not contain θ.

Minimal Sufficient Statistics

Ancillary statistics

The Likelihood Principle