Why

We model a real-valued output as corrupted by small random errors with a normal density. In other words, we make further distributional assumptions on the probabilistic errors linear model for the purposes of hypothesis testing and interval estimation.[1]

Definition

Let (x, A, e) be a probabilistic errors model and assume e has a normal density with mean 0 and covariance $\sigma^2 I$. In this case we call (x, A, e) a *classical linear model with normality assumption.* In this case y is normally distributed with mean Ax and variance $\sigma^2 I$.

[1] Future editions will define and need these sheets.