



**Why**

We have studied guessing random variables (see Estimates). What if we can use another random variable in making our estimate?

**Definition**

Let  $(\Omega, \mathcal{A}, \mathbf{P})$  be a probability space. Let  $U, V$  be sets. Let  $x : \Omega \rightarrow V$  and let  $y : \Omega \rightarrow U$ . An *estimator* or *predictor* for  $x$  given  $y$  is a function from  $U$  to  $V$ . An estimate, then, corresponds to a constant estimator, and vice versa. Some authors call the selection of an estimator *estimation* or an *estimation problem*.

**Error function**

An error function is a function  $e : U \times V \rightarrow \mathbf{R}$  which quantifies the cost of an error.



