

Principles of Estimation 1. Random Sample: A set of random variables X_1, X_2, \dots, X_n is called a random sample from a population with probability density function $f(x; \theta)$ or cumulative distribution function $F(x; \theta)$ if they are independent and identically distributed. Definition of Estimation and Estimator: If we use the value obtained from an estimator function as an approximation for the parameter θ , the obtained number is called an estimate and the random variable of the obtained function is called an estimator for θ . The role of the estimator function is to combine and summarize the sample members to obtain information about the unknown parameter and find its estimate, Draper, N and Smith, H (1998). Parameter: A parameter is a characteristic of a population that is typically a function of all members of the population. An estimator is a random variable whose probability distribution may or may not depend on the parameter θ , but the parameter θ is an unknown parameter. Estimator: A function $u = g(X_1, \dots, X_n)$ defined on a random sample is called an estimator. The estimator is also called a statistic. Introduction 1. The values of parameters are usually unknown. 2. Here, θ is an unknown parameter. 3. θ itself does not appear in the function.