

Definition. A simple finite probability space is an ordered pair

$$(S, p)$$

such that S is set and p is a function with domain S and range a subset of $[0,1]$ such that

$$\sum_{s \in S} p(s) = 1.$$

Suppose (S, p) be a simple finite probability space. Let

$$\mathcal{A} = \{A : A \subset S\}$$

and let

$$P(A) = \sum_{s \in A} p(s) \text{ for } A \in \mathcal{A}.$$

One easily verifies that

$$(S, \mathcal{A}, P)$$

is a probability space. Note that

$$P(\cup_{i=1}^n A_i) = \sum_{i=1}^n P(A_i)$$

whenever A_1, \dots, A_n is a disjointed sequence of subsets of S .

A simple and frequently used function p as above is obtained by letting $p(s)$ equal one over the number of elements of S for each $s \in S$.