Chapter 4. Basic Concepts of Probability

Section 4.2. Discrete Probability Spaces

Definition. Consider sample space $\Omega = (\omega_1, \omega_2, \ldots)$ and let $p_1, p_2, \ldots$ be non-negative numbers where $\sum_{i=1}^{\infty} p_i = 1$. If $A \subset \Omega$, define $P(A) = \sum_{\omega_i \in A} p_i$. With $\mathcal{F} = \mathcal{P}(\Omega)$ (that is, the σ-field is the power set of ω), the measure space $(\Omega, \mathcal{F}, P)$ is the *discrete probability space*. We also use this term if Ω is finite and probability is similarly defined.

Note. In a discrete probability space, there is no need for measure theory.

Note. For some very elementary properties of basic probability, see my online Introduction to Probability and Statistics (MATH 1530) notes on "Introducing Probability" at: `http://faculty.etsu.edu/gardnerr/1530/Chapter10.pdf`.

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