fair → hilesiz

toss → yazı-tura atmak

sets → kümeler

subsets → alt kümeler → "$A \subset B$"

$\mathbb{Z}$, integers $\mathbb{N}$, natural numbers

$\mathbb{R}$, real numbers $\mathbb{Q}$, rasyonel $\frac{a}{b}$ $b \neq 0$

Superset → A B'yi kapsıyor demek

Universal set "Ω"

_____

Union – "$\cup$"   A or B

Intersection "$\cap$"   A and B

Complement $A^c, A', \bar{A}$

Diffrence A – B

Disjoint sets $A \cap B = \varnothing$ (empty set)

Partition $A_1, A_2 \dots A_n$ are disjoint

and $A_1 \cup A_2 \dots A_n = \Omega$

De morgan's law $\rightarrow (A \cap B)^c = A^c \cup B^c$

$\rightarrow (A \cup B)^c = A^c \cap B^c$

Distributive law $\rightarrow A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

$\rightarrow A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

Range $f(x)$'in alabildigi tüm degerler

$f(x) = 1$ and $f(x) = 2$ olamaz

$f(1) = 1$ and $f(-1) = 1$ olabilir

$f(x)$ tanimsiz olamaz

Countable $\rightarrow$ finite or enumarateable

$\mathbb{N}$ $\{1, 2, 3 \dots \}$ infinite and countable

$\mathbb{Q}$ $\{0.000 \dots 1, \dots \}$ infinite and countable

Power set $\rightarrow 2^n \rightarrow$ all subsets

Exhaustive set $\rightarrow A \cup B \cup C \dots \cup N = S$ ise

↳kesişim önemsiz

Outcome → Çıktı

Event → durum ⊂ Sample space

probability axioms

$P(A) \geq 0$ countable collection

$P(S) = 1$ ↳ disjoint
          ↳ $P(A_1) + P(A_2) = P(A_1 \cup A_2)$

6 rules → $P(A) = 1 - P(A^c)$ $P(\emptyset) = 0$

$P(A) \leq 1$ $P(A - B) = P(A) - P(A \cap B)$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

if $A \subset B \longrightarrow$ $P(A) \leq P(B)$

_____ _   _____ __   __   _

calculating prob → $P(A) = \dfrac{|A|}{|S|}$

Conditional prob. $P(A/B) = P(A \cap B)$

$$\overline{P(B)}$$

Chain rule $\quad P(A \cap B \cap C) = P(C) \cdot P(B/C) \cdot P(A/BC)$

independence $\rightarrow P(A/B) = P(A)$

$$\hookrightarrow \frac{P(A \cap B)}{P(B)} = P(A)$$

independence and conditionals are

different

$\rightarrow$ 3 events $\quad P(A \cap B \cap C) = P(A) \cdot P(B) \cdot P(C)$

law of the total probability

$B_1 \dots B_n$ be a partition

$$P(A) = \sum_{i=1}^{n} P(A \cap B_i) \rightarrow (A \cap B_1) \cup (A \cap B_n) = P(A)$$

※ Bayes rule $\quad P(A/B) = \dfrac{P(B/A) \cdot P(A)}{P(B)}$

ways $\rightarrow$ yol

Multiplication principle $\qquad 1 \rightarrow n_1 \quad 2 \rightarrow n_2$

↳possible outcomes $= n_1 \times n_2 \cdots n_k$

$k \to n_k$

Choose → seçme

Replacement → Torbaya atmak,

Ordering → sıralı → permütasyon

ordered sampling with replacement
↳ (K) → örnek sayısı
↳ (m) → toplam   küme elemanı

Ordered sampling without replacement
↳ $\dfrac{n!}{(n-k)!}$

Un ordered ''

''   ')

↳ $\dfrac{n!}{(n-k)! \cdot k!}$

↳ Unordered   ''   with   '')

$k \to n_k$

$\binom{n+k-1}{k}$ → n → yerleşilebilen yer sayısı
                   k → yerleşen   sayısı

Binomial Coefficient

$\hookrightarrow (a+b)^n = \sum_{k=0}^{n} \binom{n}{k} \cdot a^k \cdot b^{n-k}$