Kümelerle İlgili Teoremler

$$A \cup B = B \cup A$$
$$A \cup (B \cup C) = (A \cup B) \cup C = A \cup B \cup C$$
$$A \cap B = B \cap A$$
$$A \cap (B \cap C) = (A \cap B) \cap C = A \cap B \cap C$$
$$\left.\begin{array}{l} A \cap (B \cup C) = (A \cap B) \cup (A \cap C) \\ A \cup (B \cap C) = (A \cup B) \cap (A \cup C) \end{array}\right\}$$
$$A\text{-}B = A \cap B'$$
$$A \subset B \text{ ise } A' \supset B' \text{ ya da } B' \subset A'$$
$$\left.\begin{array}{l} A \cup \varnothing = A,\ A \cap \varnothing = \varnothing \\ A \cup \boldsymbol{E} = \boldsymbol{E},\ A \cap \boldsymbol{E} = A \end{array}\right\}$$
$$\left.\begin{array}{l} (A \cup B)' = A' \cap B' \\ (A \cap B)' = A' \cup B' \end{array}\right\}$$
$$A = (A \cap B) \cup (A \cap B')$$

Permütasyon

$${}_nP_r = \frac{n!}{(n-r)!}$$

Kombinasyon

$$C_{n,r} = \binom{n}{r} = \frac{n!}{r!\,(n-r)!}$$

Koşullu Olasılık

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

$$P(A_1 \cap A_2 \cap A_3) = P(A_1)P(A_2 \mid A_1)P(A_3 \mid A_1 \cap A_2)$$
$$P(A) = P(A_1)P(A \mid A_1) + P(A_2)P(A \mid A_2) + \ldots + P(A_n)P(A \mid A_n)$$

Bayes Teoremi

$$\boxed{P(A_i \setminus E) = \frac{P(A_i)\, P(E \setminus A_i)}{P(E)}}$$

Beklenen Değer

$$E(X) = \sum_{j=1}^{n} x_j f(x_j)$$

$$E(X) = \int_{-\infty}^{\infty} x f(x)\, dx$$

Varyans

$$\mathrm{Var}(X) = \sigma_x^2 = \sum_{i=1}^{n} (x_i - \mu)^2 f(x_i)$$

$$\mathrm{Var}(X) = \sigma_x^2 = \int_{-\infty}^{\infty} (x_i - \mu)^2 f(x)\, dx$$

$$\mathrm{Var}(X) = \sigma^2 = E[(X-\mu)^2] = E(X^2) - [E(X)]^2$$

Ortak Dağılım

$$E(X) = \mu_X = \sum_x \sum_y x f(x,y)$$
$$E(Y) = \mu_Y = \sum_x \sum_y y f(x,y)$$

$$\sigma_X^2 = E[(X-\mu_X)^2] = \sum_x \sum_y (x-\mu_X)^2 f(x,y)$$
$$\sigma_Y^2 = E[(Y-\mu_Y)^2] = \sum_x \sum_y (y-\mu_Y)^2 f(x,y)$$

$$\sigma_{XY} = \sum_x \sum_y (x-\mu_X)(y-\mu_Y) f(x,y)$$

$$\sigma_{XY} = E(XY) - E(X)E(Y) = E(XY) - \mu_x \mu_y$$

Korelasyon Katsayısı

$$\rho = \frac{\sigma_{XY}}{\sigma_X \sigma_Y}$$

Binom Dağılımı

$$b(x; n, p) = \binom{n}{x} p^x q^{n-x}$$