
$\tilde{x} = x_{\frac{(n+1)}{2}}$ $\qquad$ $\tilde{x} = \dfrac{x_{\frac{n}{2}} + x_{\frac{n}{2}+1}}{2}$ $\qquad$ $\bar{x} = \sum_{i=1}^{n} \dfrac{x_i}{n}$

P= (n-1)! $\qquad$ $P_r = \dfrac{n!}{(n-r)!}$ $\qquad$ $P_r = \dfrac{n!}{n_1!n_2!\ldots n_k!}$

$N_r = \dfrac{n!}{r!(n-r)!}$ $\qquad$ $P(A) = \dfrac{n}{N}$ $\qquad$ P= n!

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\qquad$ P(A) + P(A') = 1

$P(B \mid A) = \dfrac{P(A \cap B)}{P(A)}, \quad P(A) > false$ $\qquad$ $P(A) = \sum_{i=1}^{k} P(B_i \cap A) = \sum_{i=1}^{k} P(B_i)P(A \mid B_i)$

$P(B_r \mid A) = \dfrac{P(B_r \cap A)}{\sum_{i=1}^{k} P(B_i \cap A)} = \dfrac{P(B_r)P(A \mid B_r)}{\sum_{i=1}^{k} P(B_i)P(A \mid B_i)}$ $\qquad$ $P(B \mid A) = \left(\dfrac{P(B)}{P(A)}\right) P(A \mid B)$

$P(a < X < b) = \int_a^b f(x)dx$ $\qquad$ $\int_{-\infty}^{\infty} \mathrm{f(x)\,dx} = 1$ $\qquad$ $\sum_x \sum_y f(x,y) = 1$ $\qquad$ $\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} f(x,y)\,dx\,dy = 1$

P(a<x<b) = F(b) - F(a) $\qquad$ f(x) = dF(x)/dx

$g(x) = \sum_y f(x,y)$ $\qquad$ $h(y) = \sum_x f(x,y)$

$g(x) = \int_{-\infty}^{\infty} f(x,y)\,dy$ $\qquad$ $h(y) = \int_{-\infty}^{\infty} f(x,y)\,dx$

$f(x \mid y) = \dfrac{f(x,y)}{h(y)}, \quad h(y) > 0$ $\qquad$ $f(y \mid x) = \dfrac{f(x,y)}{g(x)}, \quad g(x) > 0$

f(x,y) = g(x) h(y) tells you something

  No other references or materials allowed

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

$\mu_{g(x)} = E[g(X)] = \sum_x g(x)\ f(x)$ $\mu_{g(x)} = E[g(X)] = \int_{-\infty}^{\infty} g(x)\ f(x)\ dx$

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

Deviation = x-μ

$\sigma^2 = E[(X-\mu)^2] = \sum_x (X-\mu)^2\ f(x)$ $\sigma^2 = E[(X-\mu)^2] = \int_{-\infty}^{\infty} (x-\mu)^2\ f(x)\ dx$

$\sigma^2 = E(X^2) - \mu^2$

$\sigma_{g(X)}{}^2 = E\langle[(g(X)-\mu_{g(X)})^2]\rangle = \sum_x [(g(X)-\mu_{g(X)})^2]\, f(x)$

$\sigma_{g(X)}{}^2 = E\langle[(g(X)-\mu_{g(X)})^2]\rangle = \int_{-\infty}^{\infty} (g(X)-\mu_{g(X)})^2\, f(x)\ dx$

$\sigma_{XY} = \int_{-\infty}^{\infty}\int_{-\infty}^{\infty} (X-\mu_X)(Y-\mu_Y) f(x,y)\ dx\ dy$ $\sigma_{XY} = E(XY) - \mu_X \mu_Y$ $\rho_{XY} = \frac{\sigma_{XY}}{\sigma_X \sigma_Y}$

$E[aX+b] = a\ E(X) + b(1)$ $E[g(X,Y) \pm h(X,Y)] = E[g(X,Y)] \pm E[h(X,Y)]$

$E[XY] = E[X] * E[Y]$ for a specific condition (what is it?)

$\sigma^2{}_{aX+bY} = a^2\sigma_X^2 + b^2\sigma_Y^2 + 2ab\sigma_{XY}$

$P(\mu - k\sigma < X < \mu + k\sigma) \geq \left[1 - \frac{1}{k^2}\right]$

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