$P(A|B) = \frac{P(AB)}{P(B)}$, $P(A) = \sum\limits_{k=1}^{n} P(A|B_k)P(B_k)$, $P(B_i|A) = \frac{P(A|B_i)P(B_i)}{\sum\limits_{k=1}^{n} P(A|B_k)P(B_k)}$

$f_X(x) = P(X = x)$, $E(H(X)) = \sum_x H(x)f_X(x)$,
$Var(X) = E((X - E(X))^2) = EX^2 - (EX)^2$

$P(|X - \mu| \geq c\sigma) \leq 1/c^2$
$\hat{E}X = \frac{X_1+X_2+...+X_n}{n}$, $\hat{V}X = \frac{X_1^2+X_2^2+...+X_n^2}{n-1} - \frac{(X_1+X_2+...+X_n)^2}{n(n-1)}$

$G_X(z) = E(z^X),\ G'_X(1) = EX,\ G''_X(1) + G'_X(1) - (G'_X(1))^2 = VX$

$f_{XY}(x, y) = P(X = x, Y = y),\ f_X(x) = \sum\limits_{y} f_{XY}(x, y),\ f_Y(y) = \sum\limits_{x} f_{XY}(x, y)$
$E(H(X, Y)) = \sum_x \sum_y H(x, y)f_{XY}(x, y)$

$Cov(X, Y) = E((X-\mu_x)(Y-\mu_y)) = E(XY)-E(X)E(Y)$, $\rho_{XY} = \frac{Cov(X,Y)}{\sqrt{VarX}\sqrt{VarY}}$
$f_{X|y}(x) = f_{X|Y=y}(x) = \frac{f_{XY}(x,y)}{f_Y(y)}$

$U_n$: $f_X(x) = \frac{1}{n},\ G_X(e^t) = \frac{\sum\limits_{k=1}^{n} e^{tx_k}}{n},\ EX = \frac{\sum\limits_{k=1}^{n} x_k}{n},\ VX = \frac{\sum\limits_{k=1}^{n} x_k^2}{n} - \left(\frac{\sum\limits_{k=1}^{n} x_k}{n}\right)^2$

$Be$: $f_X(x) = p^x(1 - p)^{1-x},\ G_X(e^t) = q + pe^t,\ EX = p,\ VX = p(1 - p)$

$Ge$: $f_X(x) = (1 - p)^{x-1}p,\ G_X(e^t) = \frac{pe^t}{1-qe^t},\ EX = \frac{1}{p},\ VX = \frac{q}{p^2}$

$Bi$: $f_X(x) = \binom{n}{x}p^x(1 - p)^{n-x},\ G_X(e^t) = (q + pe^t)^n,\ EX = np,\ VX = npq$

$NegBi$: $f_X(x) = \binom{x-1}{r-1}p^r(1 - p)^{x-r},\ G_X(e^t) = \frac{(pe^t)^r}{(1-qe^t)^r},\ EX = \frac{r}{p},\ VX = \frac{rq}{p^2}$

$HG$: $f_X(x) = \frac{\binom{r}{x}\binom{N-r}{n-x}}{\binom{N}{n}},\ G_X(e^t) = ,\ EX = n\frac{r}{N},\ VX = n\frac{r}{N}\frac{N-r}{N}\frac{N-n}{N-1}$

$Po$: $f_X(x) = \frac{e^{-k}k^x}{x!},\ G_X(e^t) = e^{k(e^t-1)},\ EX = k,\ VX = k$

$P(a \le X \le b) = \int\limits_a^b f(x)dx,$

$F(x) = P(X \le x) = \int\limits_{-\infty}^{x} f(t)dt,$

$P(a \le X \le b) = F(b) - F(a)$

$E(H(x)) = \int\limits_{-\infty}^{\infty} H(x)f(x)dx$

Ако $Y = g(X)$, $f_Y(y) = f_X(g^{-1}(y)) \left| \frac{dg^{-1}(y)}{dy} \right|$,

Непрекъснато равномерно разпределение:

$f(x) = \frac{1}{b-a},\ a < x < b;\quad E(e^{tX}) = \frac{e^{tb}-e^{ta}}{t(b-a)};\quad EX = \frac{a+b}{2};\quad VX = \frac{(b-a)^2}{12}$

Експоненциално разпределение:

$f(x) = \frac{1}{\beta}e^{-x/\beta},\ x, \beta > 0;\quad E(e^{tX}) = \frac{1}{1-\beta t};\quad EX = \beta;\quad VX = \beta^2;$

Нормално разпределение:

$f(x) = \frac{1}{\sqrt{2\pi}\sigma}e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2};\quad E(e^{tX}) = e^{\mu t + \frac{\sigma^2 t^2}{2}};\quad EX = \mu;\quad VX = \sigma^2$

Точкови оценки. Неизместеност: $E(\hat{\theta}) = \theta$

k-ти емпиричен момент: $M_k = \sum\limits_{i=1}^{n} \frac{X_i^k}{n}$

Функция на правдоподобие: $L(\theta) = \prod\limits_{i=1}^{n} f(x_i)$

$\bar{X} = \frac{1}{n}\sum\limits_{i=1}^{n} X_i,\ S^2 = \frac{1}{n-1}\sum\limits_{i=1}^{n}(X_i - \bar{X})^2$

Интервална оценка: $[L_1, L_2]$, такъв, че $P(L_1 \le \theta \le L_2) = 1 - \alpha$ се нарича $100(1-\alpha)\%$-ен доверителен интервал за параметъра $\theta$.

Ако $X_1, \ldots X_n$ е случайна извадка от $N(\mu, \sigma^2)$:

$\bar{X} \sim N(\mu, \sigma^2/n)$ , $\bar{X} \pm z_{\alpha/2}\sigma/\sqrt{n}$;

$(n-1)S^2/\sigma^2 \sim \chi^2_{n-1}$, $[(n-1)S^2/\chi^2_{\alpha/2}, (n-1)S^2/\chi^2_{1-\alpha/2}]$;

$\frac{\bar{X}-\mu}{S/\sqrt{n}} \sim T_{n-1}$, $\bar{X} \pm t_{\alpha/2}S/\sqrt{n}$

Хипотези:

$\alpha = P($се отхвърли$H_0|H_0$е вярна$)$, $\beta = P($не се отхвърли$H_0|H_1$е вярна$)$