Pravdepodobnosť a štatistika - vzorce

$$P(A)=\sum_i P(H_i)P(A|H_i),\qquad P(H_k\,|\,A)=\frac{P(H_k)P(A|H_k)}{\sum_i P(H_i)P(A|H_i)}$$

$$X\sim A(p),\quad H=\{0,1\},\quad f(0)=1-p,\,f(1)=p,\quad E(X)=p,\quad \mathrm{var}(X)=p(1-p)$$

$$X\sim R\{x_1,x_2,\ldots,x_n\},\quad f(x_i)=1/n,\quad E(X)=\sum_i x_i/n,\quad \mathrm{var}(X)=\sum_i (x_i-E(X))^2/n$$

$$X\sim Bi(n,p),\quad f(k)=C(n,k)p^k(1-p)^{n-k},k=0,1,\ldots,n,\quad E(X)=np,\quad \mathrm{var}(X)=np(1-p)$$

$$X\sim Po(\lambda),\quad f(k)=\lambda^k e^{-\lambda}/k!\quad k=0,1,\ldots,\quad E(X)=\lambda,\quad \mathrm{var}(X)=\lambda$$

$$X\sim G(p),\quad f(k)=(1-p)^k p\quad k=0,1,\ldots,\quad E(X)=\frac{1-p}{p},\quad \mathrm{var}(X)=\frac{1-p}{p^2}$$

$$X\sim R(a,b),\quad f(x)=\frac{1}{b-a}\quad x\in(a,b),\quad E(X)=\frac{a+b}{2},\quad \mathrm{var}(X)=\frac{(b-a)^2}{12}$$

$$X\sim Exp(\lambda),\quad f(x)=\lambda e^{-\lambda x}\quad x>0,\quad E(X)=\frac{1}{\lambda},\quad \mathrm{var}(X)=\frac{1}{\lambda^2}$$

$$X\sim N(\mu,\sigma^2),\quad f(x)=\frac{1}{\sigma\sqrt{2\pi}}\exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right),\quad E(X)=\mu,\quad \mathrm{var}(X)=\sigma^2$$

$$g(y)=f(h^{-1}(y))\left|\frac{dh^{-1}(y)}{dy}\right|,\ pre\ y\in K,\ kde\ K=\{h(x):\ f(x)>0\}$$

$$P((X,Y)\in[a,b)\times[c,d))=F(b,d)-F(a,d)-F(b,c)+F(a,c)$$

$$E(X)=\sum_{x\in H} xf(x)\qquad resp.\qquad E(X)=\int_{-\infty}^{\infty} xf(x)dx$$

$$\operatorname{var}(X) = \sum\nolimits_{x \in H} (x - E(X))^2 f(x) \quad resp. \quad \operatorname{var}(X) = \int_{-\infty}^{\infty} (x - E(X))^2 f(x) dx$$

$$\operatorname{var}(X) = E((X - E(X))^2), \qquad \sigma_X = \sqrt{\operatorname{var}(X)}$$

$$E(h(X)) = \sum\nolimits_{x \in H} h(x) f(x) \qquad resp. \qquad E(h(X)) = \int_{-\infty}^{\infty} h(x) f(x) dx$$

$$E(h(X,Y)) = \sum_{x \in H} \sum_{y \in K} h(x,y) f(x,y) \quad resp. \quad E(h(X,Y) = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} h(x,y) f(x,y) dxdy$$

$$\mu_k' = E(X^k), \qquad resp. \qquad \mu_k = E((X - E(X))^k)$$

$$\operatorname{cov}(X,Y) = \sum_{x \in H} \sum_{y \in K} (x - E(X))(y - E(Y)) f(x,y), \qquad resp.$$

$$\operatorname{cov}(X,Y) = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} (x - E(X))(y - E(Y)) f(x,y) dxdy$$

$$\rho(X,Y) = \frac{\operatorname{cov}(X,Y)}{\sqrt{\operatorname{var}(X) \operatorname{var}(Y)}}$$

$$Y_n = \frac{\sum_{i=1}^{n} X_i - mn}{b\sqrt{n}}$$ má asymptoticky normálne rozdelenie N(0,1)

$$M_k' = \frac{1}{n} \sum_{i=1}^{n} X_i^k \quad resp. \quad M_k = \frac{1}{n} \sum_{i=1}^{n} (X_i - \overline{X})^k \qquad S^2 = \frac{1}{n-1} \sum_{i=1}^{n} (X_i - \overline{X})^2$$