COMMON DISCRETE DISTRIBUTIONS

Bernoulli Distribution $Bern(p)$

A rand. var. X has a Bernoulli distribution with param. $p \in (0,1)$, if its pdf is:

$$X \begin{pmatrix} 0 & 1 \\ 1-p & p \end{pmatrix}.$$

Discrete Uniform Distribution $U(m)$

A random variable X has a Discrete Uniform distr. with param. $m \in \mathbb{N}$, if its pdf is:

$$X \begin{pmatrix} k \\ \frac{1}{m} \end{pmatrix}_{k=\overline{1,m}}.$$

Binomial Distribution $B(n,p)$

A r.v. X has B.D. with param. $n \in \mathbb{N}$ and $p \in (0,1)$ ($q = 1-p$), if its pdf is:

$$X \begin{pmatrix} k \\ C_n^k p^k q^{n-k} \end{pmatrix}_{k=\overline{0,n}}$$

Hypergeometric Distribution $\mathcal{H}.(N, n_1, n)$

A r.v. X has a Hypergeometric distr. with param. $N, n_1, n \in \mathbb{N}$ ($n, n_1 \leq N$), if its pdf is:

$$X \begin{pmatrix} k \\ \frac{C_{n_1}^k \, C_{N-n_1}^{n-k}}{C_N^n} \end{pmatrix}_{k=\overline{0,n}}$$

Negative Binomial (Pascal) Distribution $NB(n, p)$

A r.v. X has a NBD with param. $n \in \mathbb{N}$ and $p \in (0,1)$ if its pdf is:

$$X \begin{pmatrix} k \\ C_{n+k-1}^{k} p^n q^k \end{pmatrix}_{k=0,1,\dots}$$

Geometric Distribution $Geo(p)$

A r.v. X has a GD with param. $p \in (0,1)$, if its pdf is:

$$X \begin{pmatrix} k \\ p q^k \end{pmatrix}_{k=0,1,\dots}$$

Poisson Distribution $P(\lambda)$

A r.v. X has a PD with param. $\lambda > 0$, if its pdf is:

$$X \begin{pmatrix} k \\ \frac{\lambda^k}{k!} e^{-\lambda} \end{pmatrix}_{k=0,1,\dots}$$