1-dim Discrete Random Variables

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Name (parameters)	Definition	Mean	Variance	Generating Function
Dirac function at $a \in \mathbf{R}$	$\delta_{\{a\}}$	a	0	-
Bernoulli (p)	$p\delta_{\{1\}} + (1-p)\delta_{\{0\}}$	p	$p(1-p)$	$1 + p(z-1)$
Discrete Uniform on $\{1,\ldots,n\}$	$\sum_{k=1}^{n} \frac{1}{n}\delta_{\{k\}}$	$\frac{n+1}{2}$	$\frac{n^2-1}{12}$	$\frac{1}{n}\frac{1-z^n}{1-z}z$
Geometric(p)	$\sum_{k=1}^{\infty}(1-p)^{k-1}p\,\delta_{\{k\}}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$	$\frac{pz}{1-z(1-p)}$
Binomial (n,p)	$\sum_{k=0}^{n}\binom{n}{k}(1-p)^{k-1}p\,\delta_{\{k\}}$	np	$np(1-p)$	$(1+p(z-1))^n$
Poisson (λ)	$\sum_{k=0}^{\infty}\frac{\lambda^k}{k!}e^{-\lambda}\delta_{\{k\}}$	λ	λ	$e^{\lambda(z-1)}$