Statistics Notes

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X	Description	Domain	PDF	CDF	μ	σ^2
D. Uniform	Equally likely outcomes	$a \dots b$	$\frac{1}{b-a+1}$	$\frac{x-a+1}{b-a+1}$	$\frac{a+b}{2}$	$\frac{(b-a+2)(b-a)}{12}$
Binomial	Chance for x successes in n trials	$0 \dots n$	$\binom{n}{x} p^x (1-p)^{n-x}$	—	np	$np(1-p)$
Poisson	Chance for x events over λ rate	$0 \dots \infty$	$\frac{\lambda^x e^{-\lambda}}{x!}$	—	λ	λ
N. Binomial[1]	Chance for rth success on xth trial	$n \dots \infty$	$\binom{x-1}{r-1} p^r (1-p)^{x-r}$	—	$\frac{r}{p}$	$\frac{r(1-p)}{p^2}$
C. Uniform	Flat distribution	$[a, b]$	$\frac{a}{b}$	$\frac{x-a}{b-a}$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$
Normal[2]	Bell curve	$(-\infty, \infty)$	$\frac{e^{\frac{-(x-\mu)^2}{2\sigma^2}}}{\sigma\sqrt{2\pi}}$	$P(Z \leq \frac{x-\mu}{\sigma})$	μ	σ^2
Gamma[3]	Chance for the rth event to take x time	$[0, \infty)$	$\frac{\lambda^r e^{-\lambda x}}{(r-1)!} x^{r-1}$	—	$\frac{r}{\lambda}$	$\frac{r}{\lambda^2}$

[1] Use $r = 1$ for a geometric distribution. Does not have a simple continuous counterpart.
[2] PDF may also be represented as $\mu + \sigma Z$ or $N(\mu, \sigma^2)$.
[3] Use $r = 1$ for an exponential distribution. Recall that $0! = 1$.

If a CDF is not displayed, use a table or calculator, because integration is impractical. For the normal distribution, the function provided will give the Z value to look up on a table.

https://stattrek.com/online-calculator/binomial.aspx
https://stattrek.com/online-calculator/poisson.aspx
https://stattrek.com/online-calculator/normal.aspx
