Theorem The discrete uniform distribution is a special case of the Zipf distribution when $\alpha = 0$, $a = 1$, and $b = n$.

Proof The Zipf(α, n) distribution has probability mass function

$$f(x) = \frac{1}{x^\alpha \sum_{i=1}^{n} (1/i)^\alpha} \qquad x = 1, 2, \ldots, n.$$

When $\alpha = 0$, this becomes

$$\begin{aligned} f(x) &= \frac{1}{x^0 \sum_{i=i}^{n} (1/i)^0} \\ &= \frac{1}{\sum_{i=1}^{n} 1} \\ &= 1/n \qquad\qquad x = 1, 2, \ldots, n, \end{aligned}$$

the probability mass function of a discrete uniform$(1, n)$ random variable.