Example 1

Let $X_1, X_2, \ldots, X_{100}$ be 100 observations from Exp(1),

and $Y = \sum_{i=1}^{100} X_i$

↑ Note: $Y \sim GAM(100, 1)$ ← $\frac{1}{(1-t)^n}$

Estimate $P[Y > 110]$.

$Y = \sum_{i=1}^{100} X_i$

Note: $\frac{110-100}{100} \cdot 10 = \frac{10}{100} \cdot 10 = \frac{100}{100} = 1$

$$P[Y > 110] = P\left[\frac{Y}{100} > \frac{110}{100}\right] = P\left[\frac{\frac{Y}{100} - 1}{1/\sqrt{100}} > \frac{\frac{110}{100} - 1}{1/\sqrt{100}}\right]$$

$\approx Z$ ← by CLT

$\approx P[Z > 1]$

$= 0.1587$