

# CENTRAL LIMIT THEOREM

Let  $X_1, X_2, \dots, X_n$  be independent identically distributed (iid) random variables with mean  $\mu$  and standard deviation  $\sigma$ .

Let  $T_n = X_1 + X_2 + \dots + X_n$  and  $\bar{X}_n = \frac{T_n}{n}$ .

Then, as  $n \rightarrow \infty$ ,

- The distribution of  $T_n$  approaches  $N(n\mu, \sigma\sqrt{n})$ .
- The distribution of  $\bar{X}_n$  approaches  $N(\mu, \frac{\sigma}{\sqrt{n}})$ .