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**Finding MLEs (1)**

1. Let  $X_1, \dots, X_n | \theta \stackrel{\text{iid}}{\sim} \text{Exp}(\theta)$ . Find an MLE for  $\theta$ .
2. Let  $X_1, \dots, X_n | \theta \stackrel{\text{iid}}{\sim} \text{Uniform}[-\theta, \theta]$  where  $\theta > 0$ . Find  $\hat{\theta}_{MLE}$  if it exists.
3. Let  $X_1, \dots, X_n | \theta \stackrel{\text{iid}}{\sim} f(x|\theta)$  where

$$f(x|\theta) = \begin{cases} \theta x^{\theta-1} & \text{if } 0 < x < 1 \\ 0 & \text{o.w.} \end{cases}$$

and  $\theta > 0$ . Find an estimator of  $\theta$  using the method of maximum likelihood.