Assignment 4.
Due Oct 16.

1. If \( \{X_i\} \) are independent observations from the uniform distribution on \([-\theta, \theta]\), i.e with density given by

\[
f(\theta, x) = \frac{1}{2\theta}; \quad -\theta \leq x \leq \theta
\]

Is there a sufficient statistic? What is it? Why is it sufficient?

2. For the uniform distribution on \([0, \theta]\), i.e

\[
f(\theta, x) = \frac{1}{\theta}; \quad 0 \leq x \leq \theta
\]

take \( t = \max\{x_1, \ldots, x_n\} \). What is \( E[t] \). Find a constant \( c \) such that \( u = ct \) is unbiased. What is the variance of \( u \)? Is it consistent with Cramér-Rao bound?