Quiz 16 : Inequalities

written by Alvin Wan . alvinwan.com/cs70 . Wednesday, November 2, 2016

This quiz does not count towards your grade. It exists to simply gauge your understanding. Treat this as though it were a portion of your midterm or final exam.

1   Inequalities

1. (**True** or **False**) For a δ confidence, of an estimate being ϵ distance from the mean, we can take $n \geq \frac{1}{4\epsilon\sigma^2}$ for any set of i.i.d. random variables.

2. For any $n > 0$, when is $p^n(1-p)^n$ maximized? (Hint: No calculus is needed.)

2   Confidence Intervals

Consider a game of rock, paper, scissors between Sinho and Forest. With probability p, Sinho can predict Forest's move, and with probability $1 - 2p$, Forest can predict Sinho's move. If both predict the other, they will tie and neither wins. If only one player predicts successfully, that player wins. As it turns out, without this predictive power, Sinho and Forest are equally likely to win.

1. How can we estimate p?

2. How many games (n) will we need to watch, to predict p within 0.05 of the actual value, with 95% confidence?