Stat 134: Section 4

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September 5, 2018

Note: You may leave your answers in terms of Φ or Φ^{-1} as necessary, where $\Phi(x) = \int_{-\infty}^{x} \frac{1}{\sqrt{2\pi}} e^{-z^2/2} dz$, and Φ^{-1} is the inverse of Φ.

Problem 1

Let H be the number of heads in 400 tosses of a fair coin. Find normal approximations to

a. $P(190 \leq H \leq 210)$

b. $P(210 \leq H \leq 220)$

c. $P(H = 200)$

d. $P(H = 210)$

Ex 2.2.1 in Pitman's Probability

Problem 2

A fair coin is tossed repeatedly. Consider the following two possible outcomes: (i) 55 or more heads in the first 100 tosses, or (ii) 220 or more heads in the first 400 tosses.

a. Without calculation, say which of these outcomes is more likely. Why?

b. Confirm your answer to (a) by calculation.

Ex 2.2.3 in Pitman's Probability