

# Left Tail - Activity

Suppose you run a poll of 1000 people where in the true population 60% of the population supports you. What is the probability that the poll is not within 10-percentage-points of the true value?

Fill out the poll everywhere so  
Kushal knows how long to explain  
Go to [pollev.com/cse312su21](http://pollev.com/cse312su21)

## Chernoff Bound (left tail)

Let  $X_1, X_2, \dots, X_n$  be *independent* Bernoulli random variables.

Let  $X = \sum X_i$ , and  $\mu = \mathbb{E}[X]$ . For any  $0 \leq \delta \leq 1$

$$\mathbb{P}(X \leq (1 - \delta)\mu) \leq \exp\left(-\frac{\delta^2\mu}{2}\right)$$