

Chloe Lang
Professor Nelson
Frequentist Concepts
October 24, 2021

Q1

`dbinom(3, 4, 0.75, log = FALSE)`
= 0.421875

Q2

`pbinom(3, 4, 0.75, lower.tail = TRUE, log.p = FALSE)`
= 0.6835637

Q3

`1 - pbinom(3, 5, 0.75, lower.tail = TRUE, log.p = FALSE)`
= 0.68328125

Q4

`pnorm(1.2, 2, 2, lower.tail = TRUE, log.p = FALSE)`
= 0.3445783

Q5

`1 - pnorm(1.2, 2, 2, lower.tail = TRUE, log.p = FALSE)`
= 0.65544217

Q6

`pnorm(3.2, 2, 2) - pnorm(1.2, 2, 2)`
= 0.3811686

Q7

The parameters I chose were $a=4.00$ and $b=1.5$, giving a negatively, or left skewed distribution. As, I hit the sample size several times it was clear that the histogram was taking the form of the original distribution. The first sample of 50 placed the values mostly around the 4.00 value and filled in the “hump”. As you drew more and more samples, the hump filled in completely, and the “tail” on the left, became more apparent as values filled the bins. After several samples, the histogram was almost identical to the original distribution. Adding sample values then put less of an effect on the histogram.

Q8

I used the same parameters as I chose in question 7. By changing the sample size to 2, it significantly increased the number samples needed to start seeing a uniform shape to the histogram. After about 5 samples, the histogram began to look like the distribution shape. However, values skewed to the left were rarely given, making for a very large number of samples required to have a distribution curve observed in the histogram complete with tails (i.e., skewedness).

Q9

Changing the sample size from 2 to 15 made it so that every sample you do, the shape of the histogram barely changes. Only after hitting the sample button several times, was I able to create additional bins of values. By changing the sample size to 15, it appears that the majority of the time, values are only falling into the middle/mean bin and the 2 bins closest to it.

Q10

There is such a drastic change in the shape of the sampling distribution when you change the sample size from 1 to 2 is because you are doubling the values that are making up the sample histogram. By doubling the sample values, you are making the data more “precise”, which is shown by having less variation in the data.

Q11

The two main factors that determine the width of the sampling distribution of the mean are the sample size and the confidence interval (standard deviation). Increased sample sizes lead to decreased variation, which will reduce the standard deviation, leading to smaller standard deviations. Smaller sample sizes have the opposite effect, an increase in variation leading to increased, or wide standard deviations. The standard deviation determines the width of the confidence interval.

Q12

Following the pattern of single character and 2 character words...

$25 \times 25 \times 25$ or $25^3 \rightarrow 15,625$

Q13

410 pages

40 rows

81 positions per row

$410 \times 40 \times 81 = 1328400$

$\rightarrow 25^{1328400}$