

Estimation

Estimate a True Mean μ

1. A survey of 200 college students reveal they sleep for a mean of 4.2 hours the night before a final exam with a standard deviation of 1.8 hours. Use the 90% confidence level to estimate the true mean sleep time. **Approximate your answer to the nearest tenths.**
2. A sample of 100 College students reveal they spend a mean of 2.2 hours per day on social media with a standard deviation of 0.8 hours. Use the 95% confidence level to estimate the true mean hours per day on social media. **Approximate your answer to the nearest tenths.**
3. A sample of 500 California resident reveal a mean lifespan of 83.5 years with a standard deviation of 9.7 years. Use the 99% confidence level to estimate the true mean lifespan. **Approximate your answer to the nearest tenths.**
4. A survey of 22 college students reveal that college students sleep for a mean of 7.5 hours a night with a standard deviation of 2.4 hours. Use the 95% confidence level to estimate the true mean sleep time. **Approximate your answer to the nearest tenths.**
5. A survey of 18 Hawaiian residents reveals a mean life span of 78.6 years with a standard deviation of 10.2 hours. Use the 90% confidence level to estimate the true mean life span. **Approximate your answer to the nearest tenths.**

The following data represents the amount of time (hours) students sleep during summer vacation.

8,7,8,10,6,7,9,8,12,7,7,8

6. Compute the mean and standard deviation.
Approximate your answer to the nearest thousandths.
7. Use the 99% confidence level to estimate the true mean sleep time.
Approximate your answer to the nearest tenths.

The following data represents the number of friends college students have on Instagram.

120, 333, 257, 186, 205, 228, 302, 210, 156

8. Compute the mean and standard deviation.
Approximate your answer to the nearest thousandths.
9. Use the 95% confidence level to estimate the true mean sleep time.
Approximate your answer to the nearest tenths.

The following data represents the number of pets college students have at home.

3,4,0,2,1,2,0,0,0,3,0,5

10. Compute the mean and standard deviation.
Approximate your answer to the nearest thousandths.
11. Use the 99% confidence level to estimate the true mean sleep time.
Approximate your answer to the nearest tenths.

Estimate a True Proportion P

12. A sample of 500 college students reveal that 55% believe in ghosts. Use the 95% confidence level to estimate the proportion that believe in ghosts.
Approximate your answer to the nearest thousandths.
13. A sample of 120 Las Vegas residents reveal that 72% favor a major league franchise relocating to the city and consequently increasing their local sales tax. Use the 99% confidence level to estimate the true proportion of city residents that favor the relocation of a major league franchise locating to the city.
Approximate your answer to the nearest thousandths.

A sample of 800 college students reveal that 128 believe in Big Foot.

14. Compute the sample proportion.
Approximate your answer to the nearest thousandths.
15. Use the 90% confidence level to estimate the true proportion that believe in Big Foot.
Approximate your answer to the nearest thousandths.

A sample of 120 Los Angeles residents reveal that 28 favor the legalization of marijuana for recreational use at home.

16. Compute the sample proportion.

Approximate your answer to the nearest thousandths.

17. Use the 90% confidence level to estimate the true proportion of residents who favor the legalization of marijuana for recreational use at home.

Approximate your answer to the nearest thousandths.

Estimate a Sample Size n

Use the margin of error E , confidence level, $1 - \alpha$ and known standard of deviation σ to find the minimum sample size n to estimate a true mean μ .

18. A new study using the 99% confidence level is to be conducted having a margin of error of ± 0.5 hours over the sleep time of college students during final exams week. If the known standard deviation from a past study is 1.2 hours, estimate the sample size need for this new study. **Approximate your answer to the nearest whole number.**

$$n = \left[\frac{z_{\alpha/2} \sigma}{E} \right]^2$$

Use the margin of error E , confidence level, $1 - \alpha$ and known sample proportion \bar{p} from a previous study to find the minimum sample size n to estimate the true proportion P .

19. A new study using the 95% confidence level over the proportion of college students who believe in Big Foot with a margin of error of $\pm 2\%$ is to be conducted. If a past study revealed that 15% believe in Big Foot, estimate the sample size n needed for this new study. **Approximate your answer to the nearest whole number.**

$$n = \frac{\left[z_{\alpha/2} \right]^2 \bar{p}(1 - \bar{p})}{E^2}$$

20. A new study using the 90% confidence level over the proportion of college students who believe in Big Foot with a margin of error of $\pm 1.5\%$ is to be conducted. If no past study exists on the subject, estimate the sample size n needed for this new study.
Approximate your answer to the nearest whole number.

$$n = \frac{[z_{\alpha/2}]^2 0.25}{E^2}$$