A random sample of 24 mini-van purchasers is drawn from the population of all persons who purchased a mini-van within the last year. Here are their ages:

23
43
27
45
30
32
26
42
43
25
38
35
28
26
44
47
40
34
45
43
43
42
32
32

| | |
|---|---|
| Average | 36.0416667 |
| SD | 7.52484311 |

We recognize this as ONE POSSIBLE sample of size 24 from all the possible samples of size 24 that could have been selected from the population of mini-van purchasers.

Our 95% confidence interval for the population average age is:

Sample average $\pm$ 2 * (SEaverage)

Where SEaverage is $\dfrac{\sqrt{24} * 7.5248}{24} = 1.536$ so a 95% confidence interval is

$36.04 \pm (2 * 1.536) = 36.04$ years $\pm 3.072$ years

To write an article about Denver for a tourist magazine you would like to estimate the average nightly cost for a hotel room in the Denver area. You open up the yellow pages and take a random sample of 45 hotels from the hundreds of hotels.

The sample of 45 hotels gives an average nightly cost of $55.98 and a standard deviation of $10.73.

a) Give a 95% confidence interval for the mean nightly cost of a hotel room in this area.

b) The distribution of costs is not normal. The distribution is skewed because there are several expensive hotels downtown. Explain why the confidence interval in (a) is valid anyway.

c) The Denver Chamber of Commerce claims the average price is $54.50 per night.  Is you average of $55.98 unreasonable?

d) Your editor finds the confidence interval in (a) is too wide.  Describe two things that can be done to make the interval narrower.