Section 7.6

Confidence Intervals for a Population Mean ($\mu$)
($\sigma$ is unknown).

1. Gather $\bar{x}$, $s =$ sample std. dev., $n$, level of conf.
Verify $n > 30$ or pop. is normal.

2. $z = 1 - $(level of confidence)$

3. Look up $t_{a/2}$ on Table A2.

\[ df \quad 2\text{-tail} \]
\[ \downarrow \quad \downarrow \]
\[ n-1 \rightarrow t_{a/2} \]

4. $E = t_{a/2} \cdot \frac{s}{\sqrt{n}}$ \quad $\rightarrow$ max. error

5. Conf. interval: $\bar{x} - E < \mu < \bar{x} + E$.

The mean hours of sleep for 35 (random) Mt. SAC students was 3.4 hours a night with a std. dev of 1.6 hours. Construct a 96% confidence interval for the mean hours of sleep of all Mt. SAC students.

1. $\bar{x} = 3.4$, $s = 1.6$, $n = 35 > 30 \sqrt{ }$, Conf. = 0.96
2. $z = 1 - confl = 1 - 0.96 = 0.04$
3. Table A2

\[ df \quad 2\text{-tail} \]
\[ \downarrow \]
\[ n-1 \rightarrow 2.136 \]

4. $E = t_{a/2} \cdot \frac{s}{\sqrt{n}} \approx 2.136 \cdot \frac{1.6}{\sqrt{35}} \approx 0.58$

5. $\bar{x} - E < \mu < \bar{x} + E$

$3.4 - 0.58 < \mu < 3.4 + 0.58$

$2.82 < \mu < 3.98$. 