

Stat 160 Fall 2008  
Solutions to Assignment #7

- 14.21** A 99% confidence interval for  $\mu$ , the true mean BSRI masculinity score among male hotel managers, is given by

$$\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}} = 5.91 \pm 2.576 \frac{0.79}{\sqrt{148}} = [5.743, 6.077].$$

- 14.22** A 90% confidence interval for  $\mu$ , the true mean BSRI femininity score among male hotel managers, is given by

$$\bar{y} \pm z^* \frac{\sigma}{\sqrt{n}} = 5.29 \pm 1.645 \frac{0.78}{\sqrt{148}} = [5.185, 5.395].$$

- 14.23** The interval in Exercise 14.22 has a smaller margin of error because the  $z^*$  value corresponding to 90% confidence level is smaller than the  $z^*$  value corresponding to the 99% confidence level. Since the standard deviations are roughly the same (0.79 vs. 0.78) and the sample sizes are the same, the smaller the amount of confidence, the smaller the margin of error.

- 14.24** In order to have a margin of error within  $\pm 0.2$  at the 99% confidence level, we must choose the sample size  $n$  so that

$$0.2 = \frac{z^* \sigma}{\sqrt{n}} = \frac{2.576 \times 0.79}{\sqrt{n}}.$$

Solving for  $n$  gives

$$n = \frac{2.576^2 \times 0.79^2}{0.2^2} = 103.5347.$$

That is, we must sample at least 104 hotel managers.

- 14.30 (a)** A 99% confidence interval for the true mean study time (in minutes) of all first-year students at this university is

$$\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}} = 137 \pm 2.576 \frac{65}{\sqrt{269}} = [126.791, 147.209].$$

- 14.30 (b)** In order for the confidence interval constructed in (a) to be valid, we must know if the sample can be considered as a SRS of first-year students at this university.

- 14.36** Since the sample size for adults ages 18 to 29 is smaller, we conclude that the margin of error is larger than 3 percentage points.