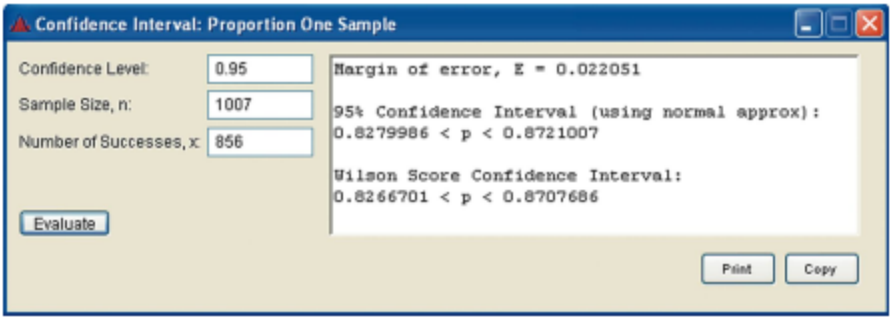
STATDISK



We will now proceed to show how the results for parts (a) and (b) can be obtained with manual calculations.

a. The margin of error is found by using Formula 7-1 with $z_{\alpha/2} = 1.96$ (as found in Example 2), $\hat{p} = 0.85$, $\hat{q} = 0.15$, and $n = 1007$.

$$E = z_{\alpha/2}\sqrt{\frac{\hat{p}\hat{q}}{n}} = 1.96\sqrt{\frac{(0.85)(0.15)}{1007}} = 0.0220545$$

b. Constructing the confidence interval is quite easy now that we know the values of $\hat{p}$ and E. We simply substitute those values to obtain this result:

$$\hat{p} - E < p < \hat{p} + E$$
$$0.85 - 0.0220545 < p < 0.85 + 0.0220545$$
$$0.828 < p < 0.872 \quad \text{(rounded to three significant digits)}$$

This same result could be expressed in the format of 0.85 ± 0.022 or (0.828, 0.872). If we want the 95% confidence interval for the true population *percentage*, we could express the result as $82.8\% < p < 87.2\%$.

c. Based on the confidence interval obtained in part (b), it does appear that more than 75% of adults know what Twitter is. Because the limits of 0.828 and 0.872 are likely to contain the true population proportion, it appears that the population proportion is a value greater than 0.75. (See also Exercise 43.)

d. Here is one statement that summarizes the results: 85% of U.S. adults know what Twitter is. That percentage is based on a Pew Research Center poll of 1007 randomly selected adults in the United States. In theory, in 95% of such polls, the percentage should differ by no more than 2.2 percentage points in either direction from the percentage that would be found by interviewing all adults in the United States.

Analyzing Polls Example 3 deals with a typical poll. When analyzing results from polls, we should consider the following.

1. The sample should be a simple random sample, not an inappropriate sample (such as a voluntary response sample).
2. The confidence level should be provided. (It is often 95%, but media reports often neglect to identify it.)
3. The sample size should be provided. (It is often provided by the media, but not always.)