1. The Threaded Screw Products Co., Inc. makes #8 wood screws that are intended to have a mean torque strength of 150 in-lbs. Engineers at the company routinely test screws in a destructive process to ensure the mean torque strength is at least 150 in-lbs. In the most recent batch, the engineers tested 50 random screws and found a sample mean torque strength of 149.5 in-lbs. They know the standard deviation around the mean is 8.3 in-lbs.

   (a) Construct confidence intervals for the population mean torque strength for the following confidence levels using the Empirical Rule.

      i. 68%

      ii. 95%

      iii. 99.7%

   (b) Construct confidence intervals for the population mean torque strength for the following confidence levels.

      i. 75%

      ii. 90%

      iii. 99%

2. Iowa State University would like to understand student debt when graduating from the University. The take a random sample of 80 graduating seniors and find that their average debt is \$17,500. The University knows the standard deviation around the average debt is \$8,000. Construct an 85% confidence interval for the mean student debt.

3. Proctor & Gamble is trying to understand usage of its Old Spice deodorant. They recruited a random sample of 121 customers to record how many days they use Old Spice in the coming year. At the conclusion of the survey, the average number of days a customer used Old Spice in the year was 205 days. P&G knows that the variance around the population mean is 196 days^2. Construct a 97% confidence interval for the mean number of days Old Spice is used across its customers.