1. (By Hand) At one university, the students are given z-scores at the end of each semester rather than the traditional GPAs. The mean and standard deviation of all students’ cumulative GPAs, on which the z-scores are based are 2.7 and .5, respectively.
   1. Translate each of the following z-scores to corresponding GPA: z=2.0, z=-1.0, and z=.5
   2. The president of the university wishes to graduate the top 16% of the students with *cum laude* honors and the top 2.5% with *summa cum laude* honors. Where (approximately) should the limits be set in terms of z-scores? In terms of GPAs? What assumption, if any, did you make about the distribution of the GPAs and the university?

3. Suppose you buy a new car whose advertised mileage is 25 miles per gallon (mpg). After driving your car for several months, you find that its mileage is 21.4 mpg. You telephone the manufacturer and learn that the standard deviation of gas mileages for all cars of the model you about is 1.15 mpg.

* 1. Find the z-score for the gas mileage of your car, assuming the advertised claim is correct. Does it appear that your car is getting unusually low gas mileage? Explain your answer.

4. Given a data set with a largest value of 760 and a smallest value of 135, what would you estimate the standard deviation to be?

5. Eastern States Bank and Trust monitors its drive-thru service times electronically to ensure that its speed of service is meeting the company’s goals. A sample of 28 drive-thru times was recently taken and is shown here.

|  |  |  |  |
| --- | --- | --- | --- |
| Speed of Service  (time in seconds) | | | |
| 68 | 71 | 73 | 76 |
| 79 | 83 | 85 | 88 |
| 90 | 92 | 93 | 103 |
| 116 | 119 | 130 | 134 |
| 138 | 145 | 146 | 147 |
| 156 | 156 | 162 | 178 |

1. Find the median, lower, upper quartiles, lower and upper inner fences for the data. Are there any outliers? Why/Why not?
2. Construct a box plot for the sample data.