1. The manufacturer of precision parts for drill presses produces round shafts for use in the construction of drill presses. The average diameter of a shaft is 0.56 inch. The inspection samples contain six shafts each. The average range of these samples is 0.006 inch. Determine the upper and lower control chart limits.

2. Nocaf Drinks, Inc., a producer of decaffeinated coffee, bottles Nocaf. Each bottle should have a net weight of 4 ounces. The machine that fills the bottles with coffee is new, and operations manager wants to make sure that it is properly adjusted. The operations manager takes a sample of n=8 bottles and records the average and range in ounces for each sample. The data for several samples are given in the following table. Note that every sample consists of 8 bottles.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sample | Sample Range | Sample Average | Sample | Sample Range | Sample Average |
| A | 0.41 | 4.00 | A | 0.56 | 4.17 |
| B | 0.55 | 4.16 | B | 0.62 | 3.93 |
| C | 0.44 | 3.99 | C | 0.54 | 3.98 |
| D | 0.48 | 4.00 | D | 0.44 | 4.01 |

Is the machine properly adjusted and in control?

3. Crabill Electronics Inc., makes resistors, and among the last 100 resistors inspected, the percentage defective has been 0.05. Determine the upper and lower limit for this process for 99.7% confidence.