Project 2

- Due Mar 1, 2024 by 11:55pm
- Points 50
- Submitting a file upload
- File Types pdf

Due: Friday, Mar 1, 2024 by 11:55 p.m.

Documents to Submit:

PDF document with a report of the quality control experiment including the appropriate quality control charts.

Introduction:

Quality Control uses certain tools to identify problems and suggest ways to continuously improve. These tools are certain charts and graphs that you will be making use of to determine if variations in measurements of a product are caused by small, normal variations that cannot be acted upon such as "common causes," or by some larger "special cause" that can be acted upon or fixed. This project will have you use X-bar and R charts.

Instructions:

You are a quality technician working to simulate a bottle filling station in a production line of some product shipped to a consumer. It could be any product that is bottled. For this test, the product bottled will be ordinary tap water. The objective is to determine the ability to control the volume of product shipped in the bottles. Since water has a weight of 1 gram per ml, weight will be used to determine volume. This is important since the consumer is interested in receiving the full volume and the manufacturer is interested in controlling cost by not shipping excess volume.

It is assumed that the filling station is running continuously. At 5 minute intervals samples are taken from the filling station for measurement. The bottles filled are the samples taken from the station for measurement. You may use any appropriate procedure to fill the samples for measurement. It is assumed that the samples are representative of all bottles produced during a days production. Students fill a bottle, weight it, record and repeat this 5 times in 5 minutes. This will be your first sample of size 5. Collect 10 samples of size 5.

After all the data is collected students will prepare a report of their finds. X-bar/R control charts will be created and included in your report. Calculate the appropriate UCL, Center Line and LCL as discussed in the student notes. Please find software online that will create these two charts. The report will contain the following sections:

1. Data collected along with the X-bar/R control charts.

2. An improvement plan - Consider the data you collected and based on the charts answer the following questions: Are any points outside the limits? Is the spread from UCL to LCL wide? Can you think of a way to measure the water more accurately? What process change do you think would result in less variation? Can you describe these changes on a new flow chart? If a potential process change would reduce the variation, you could repeat the project using the revised procedure

Things to Consider:

1. Consider the steps that are needed to occur to accomplish the assignment. Data collection must be well organized.
2. Decide how far you will fill the bottle. There is no set fill line, just make sure you pick a point. Find the weight of the bottle.   Go to any tap, use a funnel if necessary, and fill the empty bottle. Record the weight subtracting the weight of the bottle.

Grading

The rubric used to grade this project is below. Please look over this carefully.

Data Collection Rubric					
Criteria	**Ratings**				**Pts**
Data Collection and Analysis Report includes the data; calculation of the means, ranges and standard deviation; and a control chart for x-bar and r.	**30 pts** **Full Marks**	**29 pts** **Excellent** Report includes the data; calculation of the means, ranges and standard deviation; and a control chart for x-bar and r.	**20 pts** **Good** Report is missing key items such as the data; calculation of the means, ranges and standard deviation; and a control chart for x-bar and r.	**0 pts** **Missing** Data Collection and Analysis is missing	30 pts
Improvement Plan	**20 pts** **Excllent** All questions have been addressed	**10 pts** **Good** Some questions are missing and were not answered.	**0 pts** **Missing** Answers to questions are missing		20 pts