

Quality Analytics Simulation

Submitted by:

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Challenge 1

Use the sample statistics to calculate the control limits for the X-bar & R Graphs

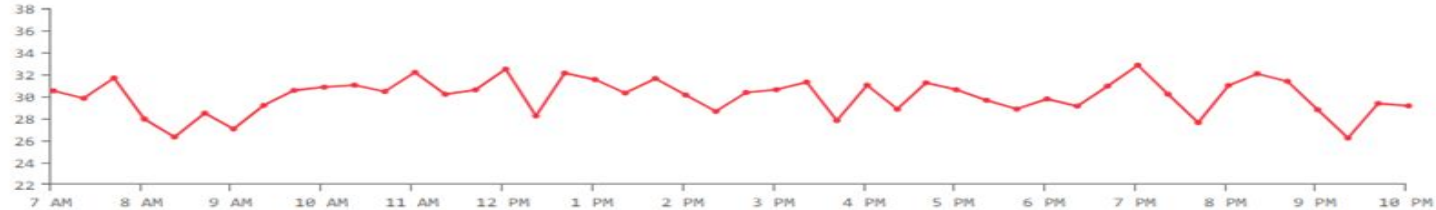
All units from the current batch



\bar{X}_1 32.90 \bar{X}_2 32.93 \bar{X}_3 23.67 \bar{X}_4 30.14 \bar{X}_5 26.29

X-bar 29.19 R 9.26

X-bar Chart



R Chart



This production shift has ended. Click reset below to start a new run.

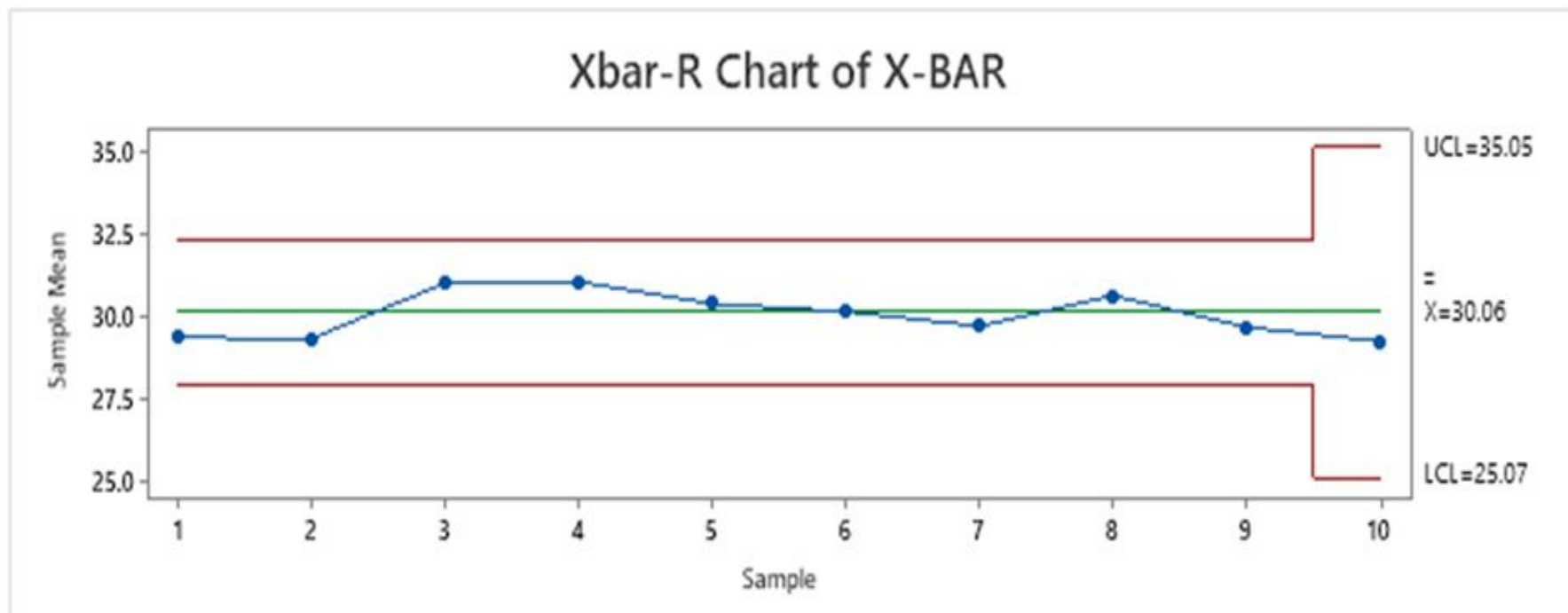


RESET

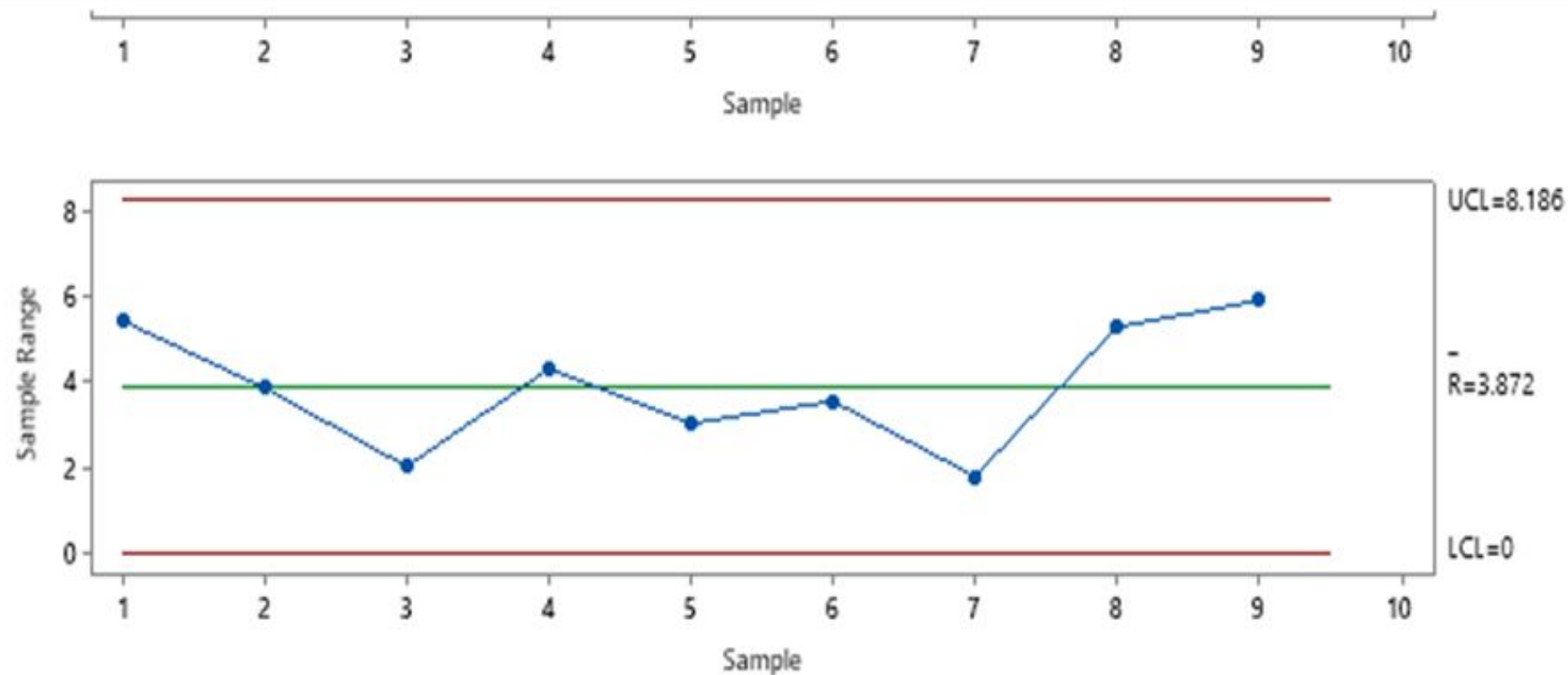


COPY DATA

Xbar-R Chart of X-BAR



Xbar-R Chart of X-BAR



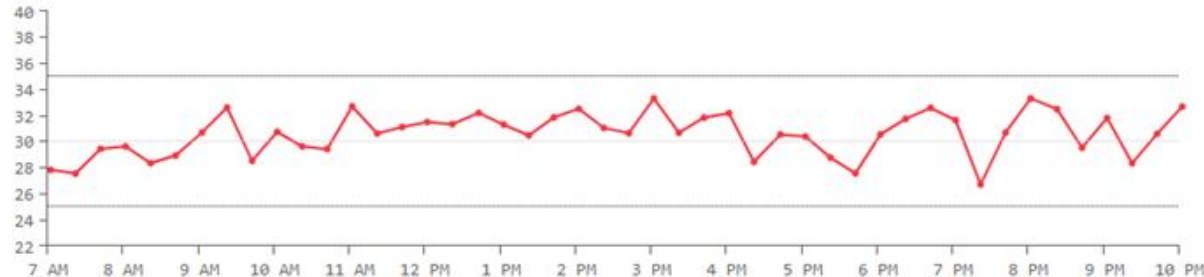
Tests are performed with unequal sample sizes.

Challenge 2(total cost:\$2,964.80)

Keeping the Process in Control While Minimizing Costs

4 internal defects × \$3.20	\$12.80	Number of Recalibrations	3	Number of Labor Changes	3
521 external defects × \$4.50	\$2,344.50	Cost per Recalibration	\$75	Cost per Labor Change	\$100
Total Defect Costs	\$2,357.30	Total Recalibration Costs	\$225	Total Labor Change Costs	\$300

X-bar Chart



R Chart



Shift Over

This process produced 525 total defects and was out of control 30 times

Defects discovered

4

Defects shipped

521

Effective Yield

98%

Total Cost

\$2,964.80

RESET

COPY DATA

Challenge 3

PREPARE



CHALLENGES:

1

2

3

COMPANY:

A

B

C

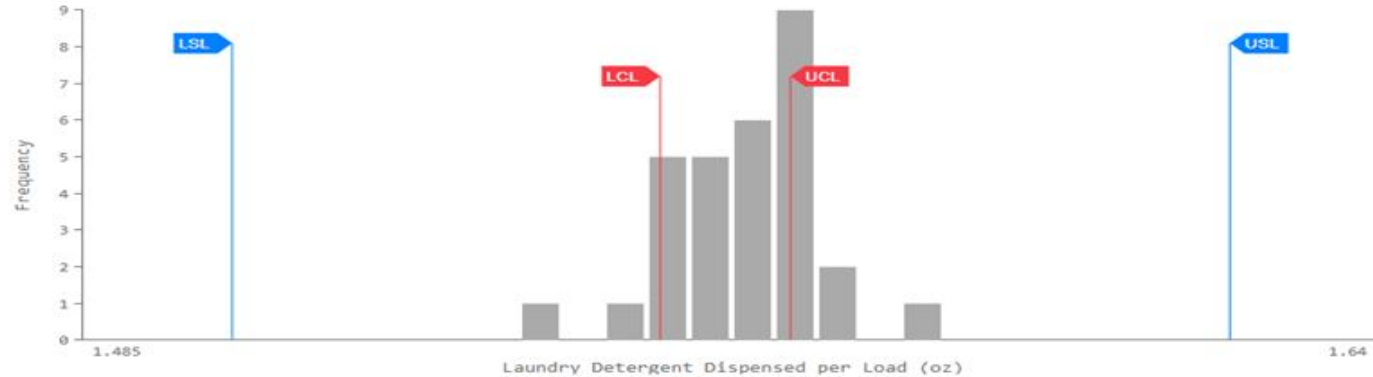
D

4

Determine whether each process is capable of producing to specifications

Hospital Laundry

The laundry department of a large hospital contains energy efficient industrial washing machines for laundering sheets and towels. High energy (HE) laundry detergent is automatically dispensed at the start of each load. If an insufficient amount of detergent is dispensed, the laundry will not be completely cleaned, while too much is unnecessarily costly and can damage the machine's bearings.



What is Hospital Laundry's process capability index?

7.53

Is this process capable?



YES



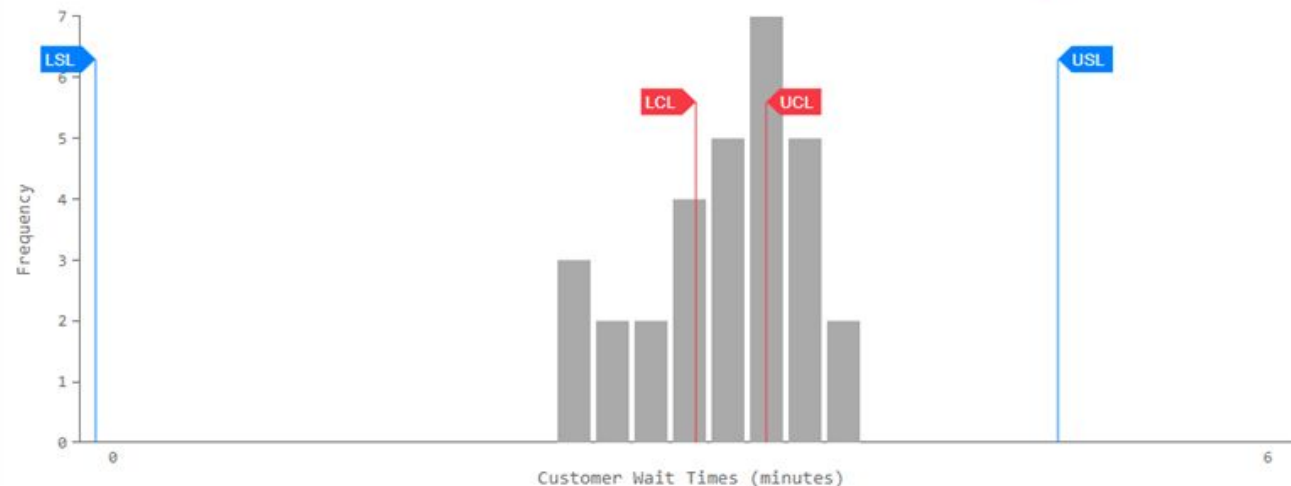
NO



Determine whether each process is capable of producing to specifications

Tea Shop

Herb's Tea Garden is a small tea shop specializing in blended loose leaf hot tea. Customers select from a variety of fine loose tea leaves, dried flowers and dried fruits to create their own unique tea blend. Because of the popularity of the tea shop, combined with the custom blending process, waiting times can sometimes be excessive; most customers would prefer to wait less than five minutes.



Spec Limits

Lower	Upper
0	5

Control Limits

Lower	Upper
2.8665	3.3051

What is Tea Shop's process capability index?

9.78

Is this process capable?



YES



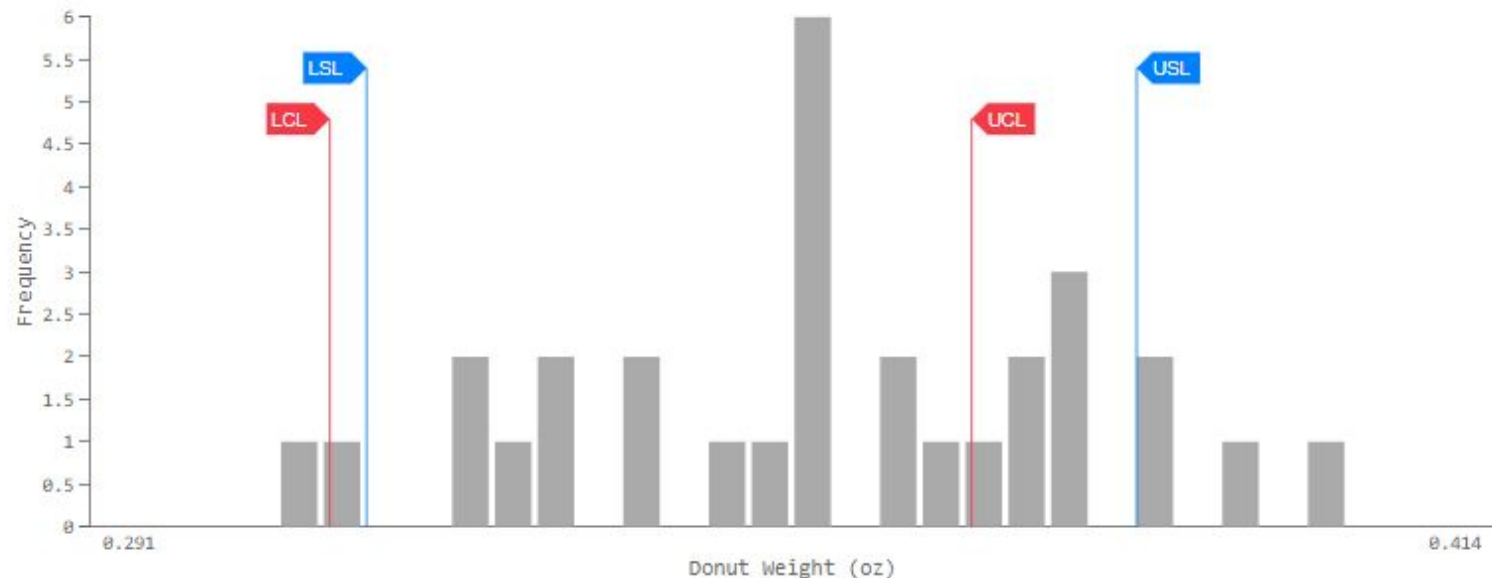
NO



Determine whether each process is capable of producing to specifications

Filled Donuts

Bob's Bakery carries a wide variety of pastries, including his famous filled donuts. Each donut is injected with a flavored jelly or cream. The customers complain if they feel that there isn't a sufficient amount of filling in their donuts. Overfilled donuts are messy and waste costly filling.



Spec Limits

Lower	Upper
0.32	0.38

Control Limits

Lower	Upper
0.315	0.365

What is Filled Donuts's process capability index?

1.0

Is this process capable?



YES



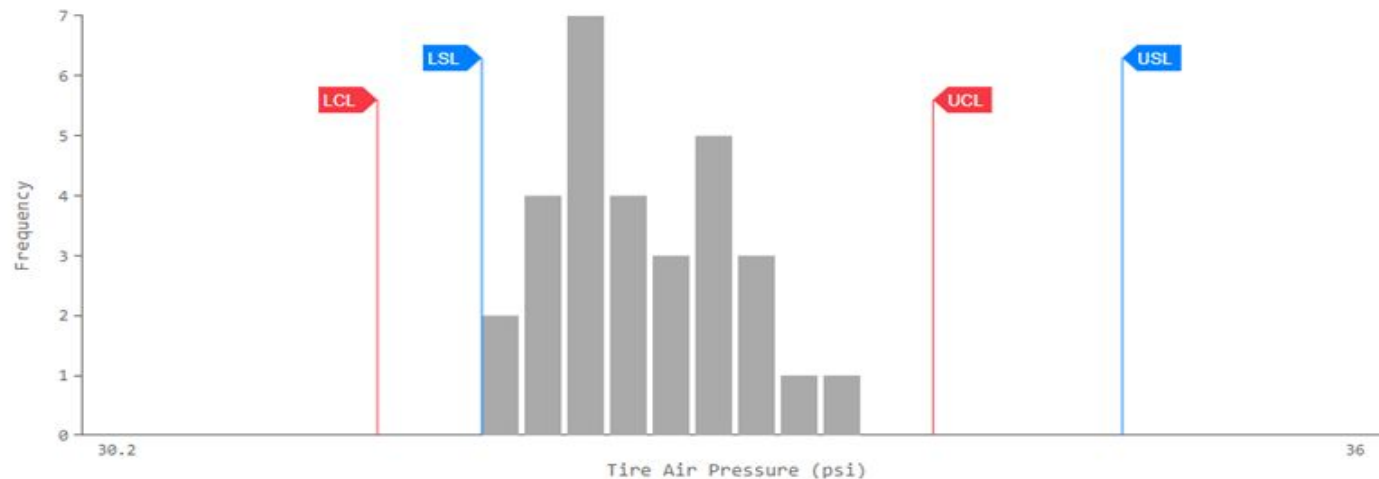
NO



Determine whether each process is capable of producing to specifications

Tire Pressure

One of the tasks on the turnaround list for a rental car agency is to check and adjust tire pressure. When a tire is over-inflated, it can cause a bouncy ride and poor handling. If it is under-inflated, it can cause premature wear due to increased friction.



Spec Limits

Lower	Upper
32	35

Control Limits

Lower	Upper
31.2763	33.8737

What is Tire Pressure's process capability index?

3.18

Is this process capable?



YES



NO

Challenge 4(\$8.3k)

PREPARE



CHALLENGES:

1

2

3

4

Can certain investments reduce your total cost of quality?

Hospital Lab

Prevention Costs

Labor Training Investment

Equipment Investment

Supplier Cost

Appraisal Costs

QA Sampling Rate

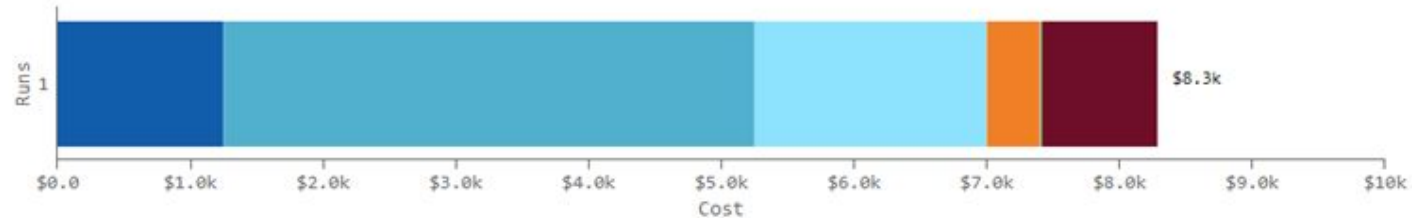
Internal Failure Costs

Defects Found (QA)

External Failure Costs

Defects Found (Consumers)

Extraordinary Failure Cost



Labor Training Investment

\$1,250.00



Equipment Investment

\$4,000.00



Supplier

\$1,750.00



Sample Size

5 - \$5.50



Sample Frequency

high



RUN TO END



RESET



COPY DATA