

LEANOhio

Transforming the Public Sector

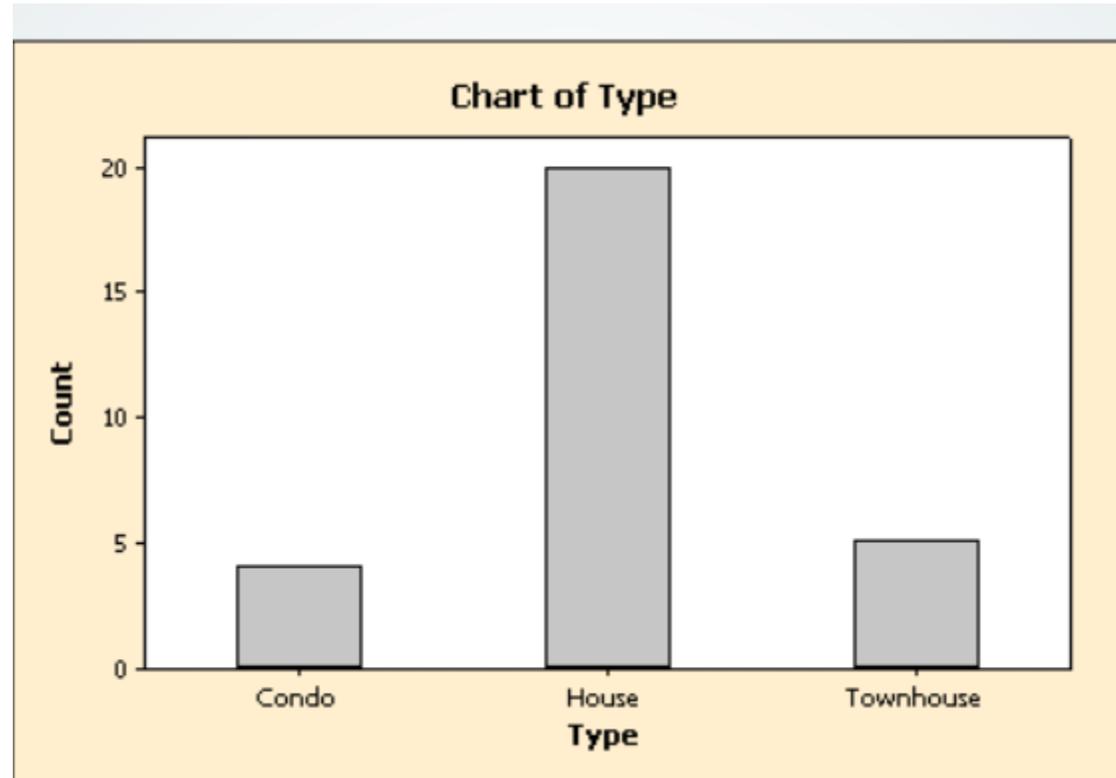
Green Belt

Reading the Graphs

SIMPLER. FASTER. BETTER. LESS COSTLY.

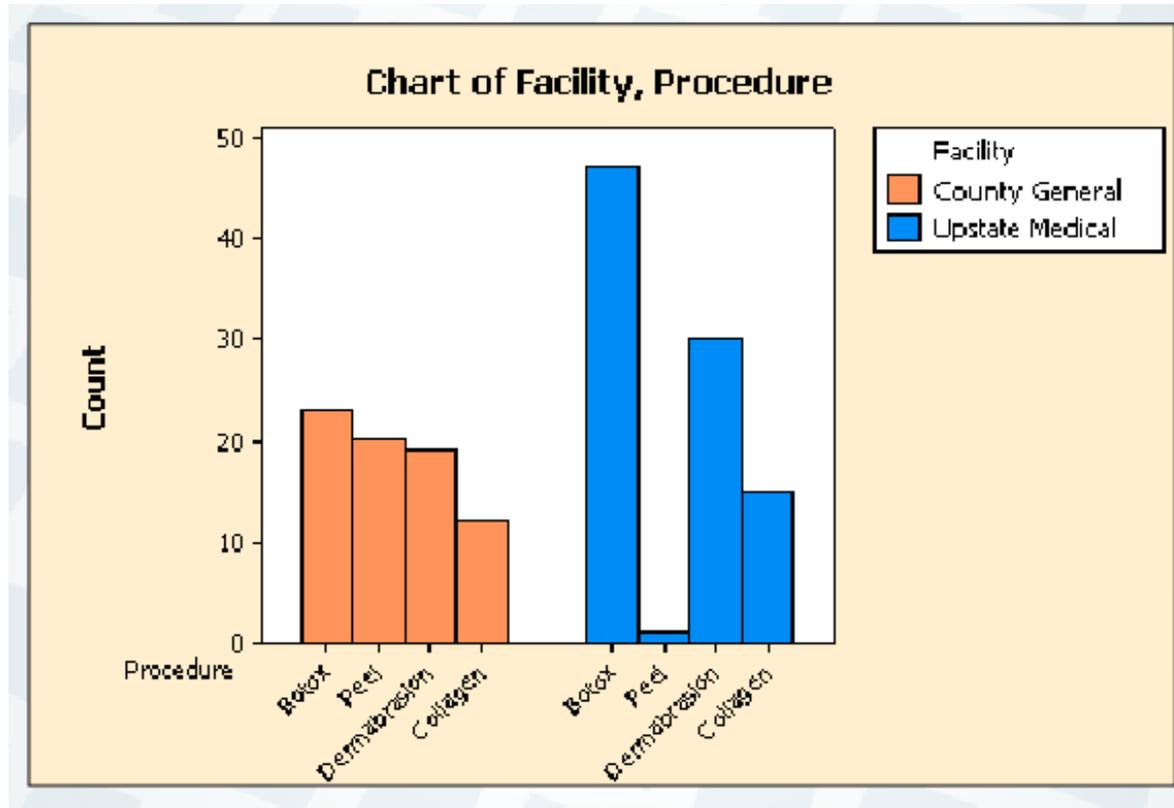
Reading the Graphs

- What type of chart is this?
- What type of home was sold most frequently?



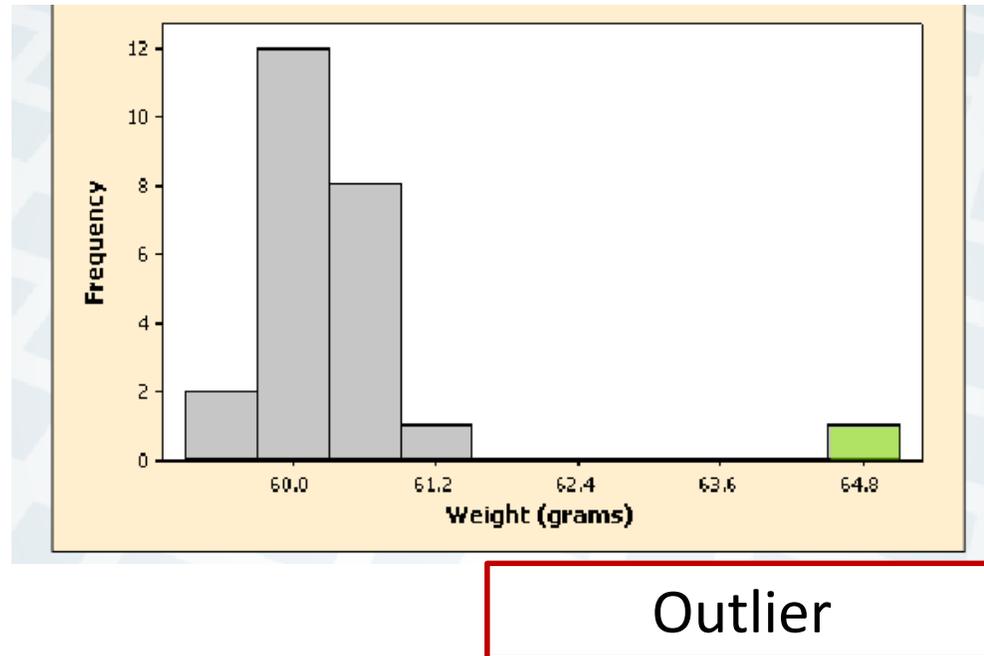
Reading the Graphs

- What Type of Chart is This?
- Which hospital is conducting more Botox?
- What would you investigate.



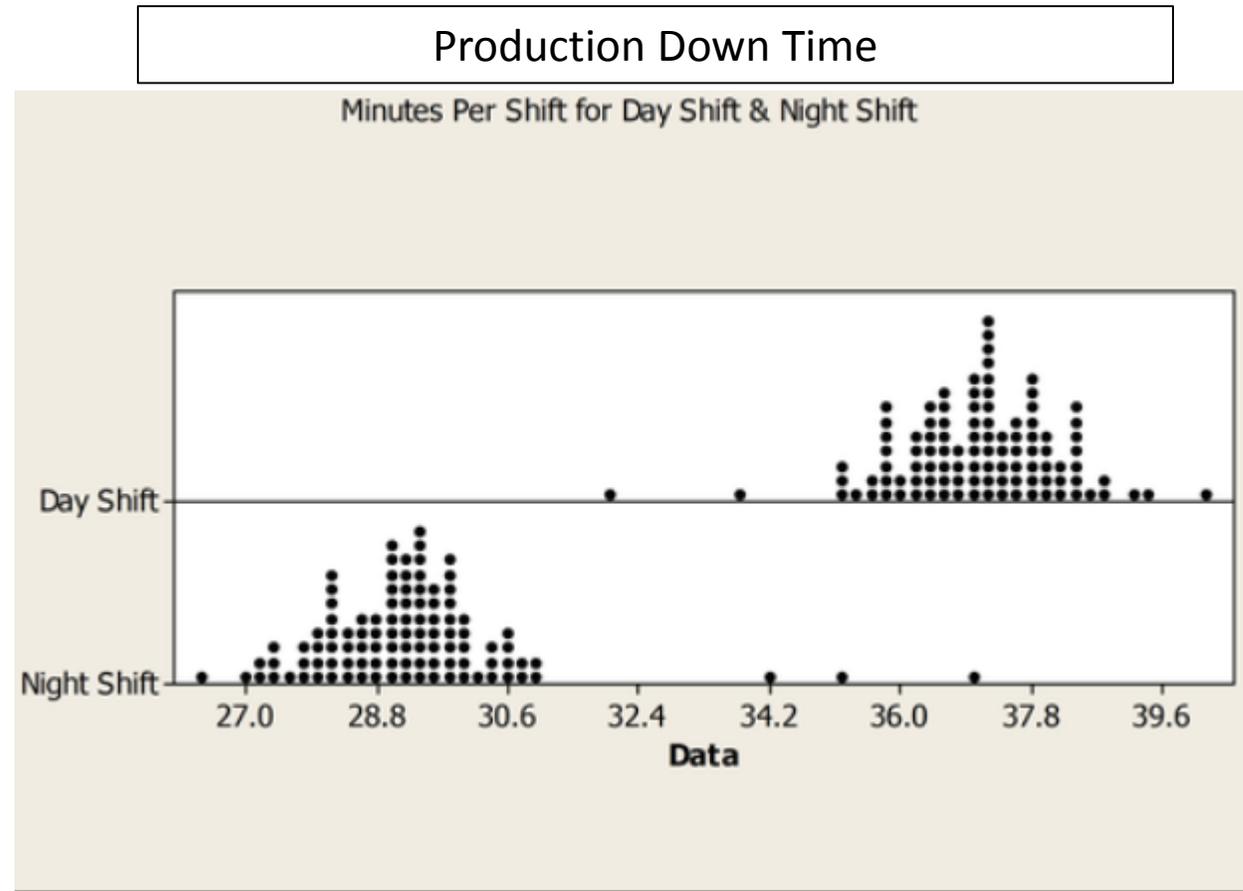
Reading graphs

- What type of graph is this?
- What is the shape?
- What does the graph tell us?



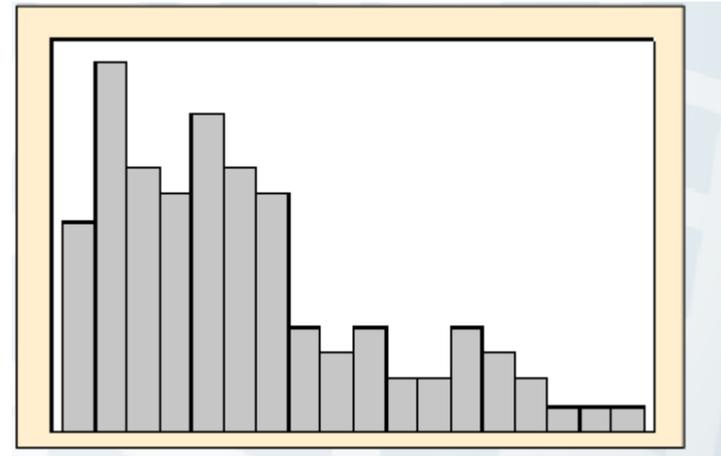
Reading the Graphs

- What Type of Plot is This?
- Are there any Outliers?



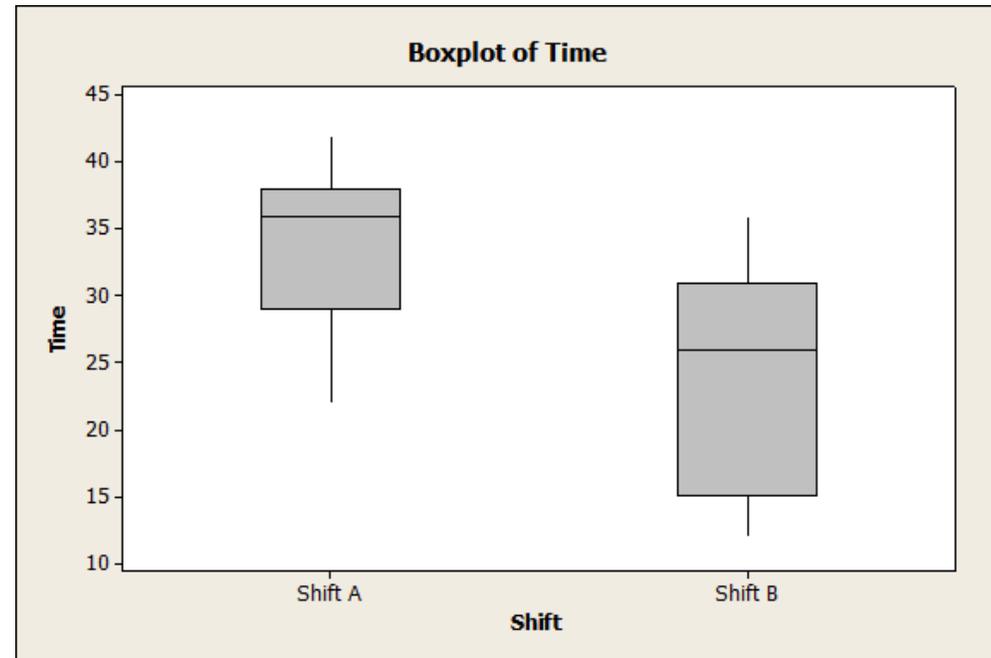
Reading the graphs

- What is the shape?
- What does the graph tell us?



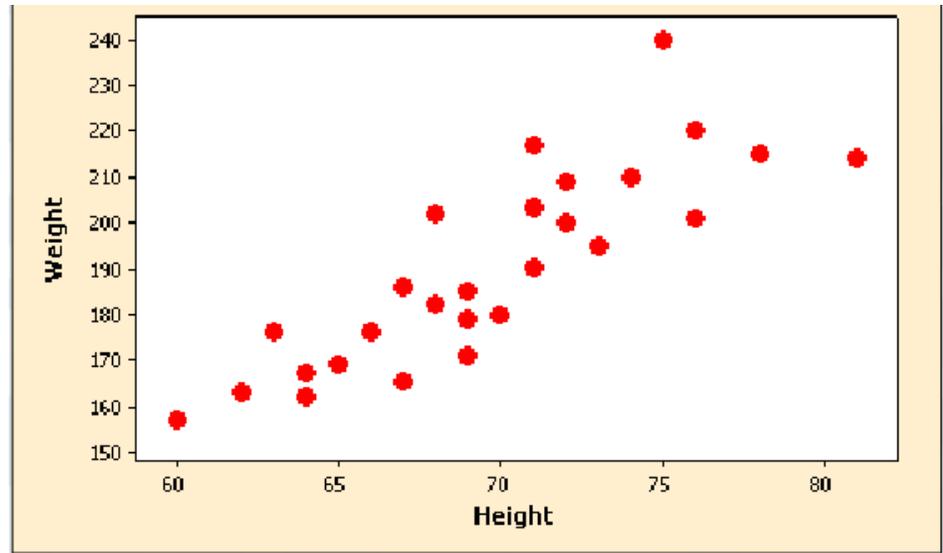
Reading the Graphs

- Which Shift is spending less time to conduct their work?
- Which Shift has more variation?
- Is there a statistical difference between the Shifts?



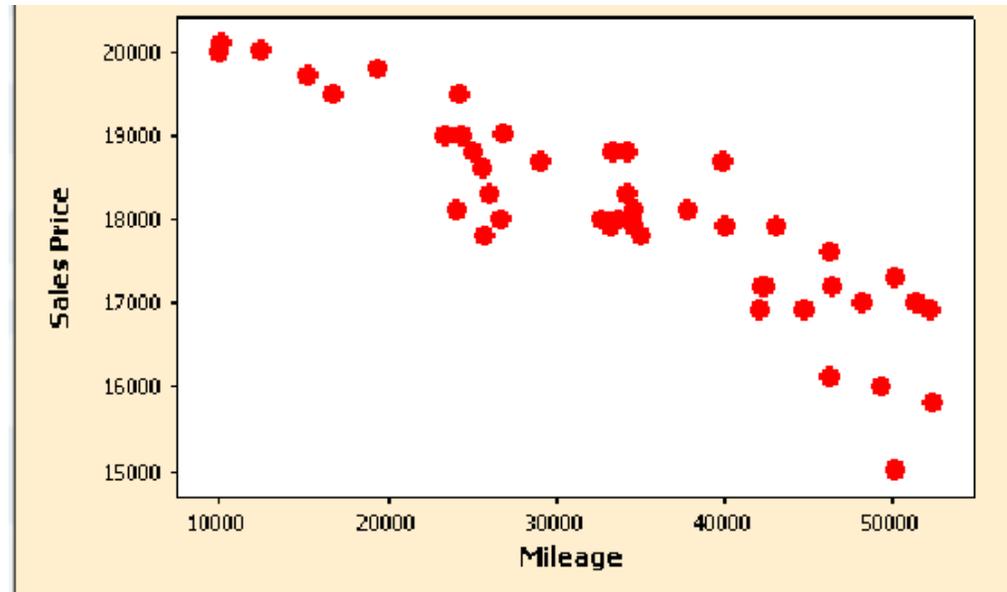
Reading the Charts

- What type of graph is this?
- What is the direction of the graph?
- What is the strength of the graph?



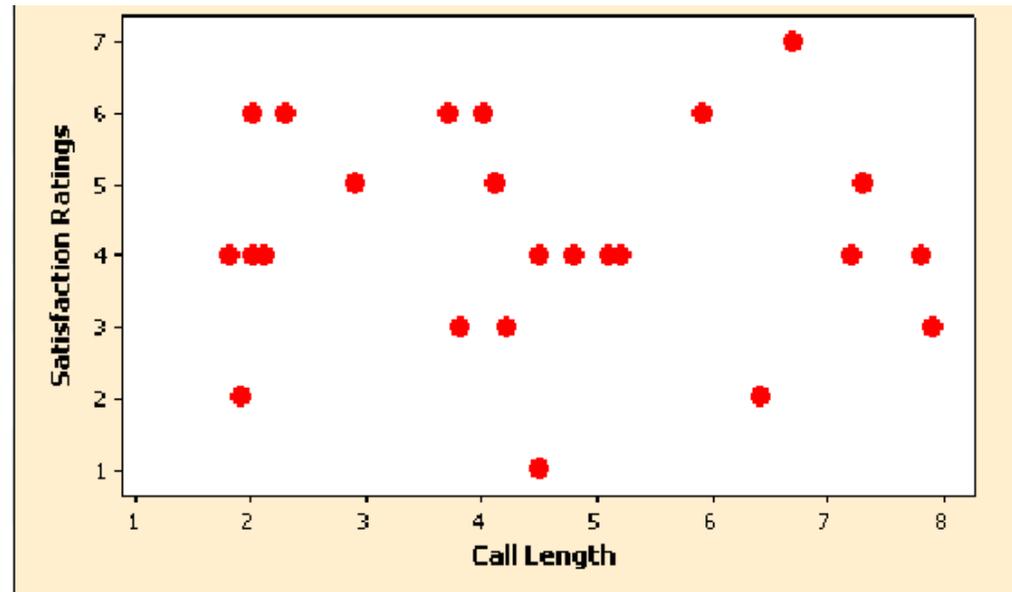
Reading the Charts

- What is the direction of the graph?
- What is the strength of the graph?



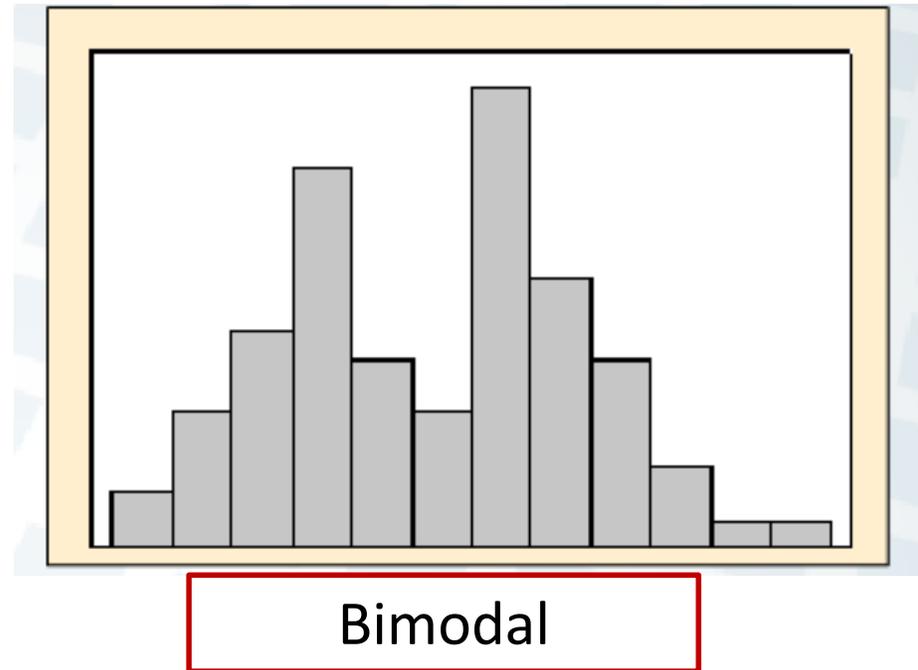
Reading the Charts

- What is the direction of the graph?
- What is the strength of the graph?



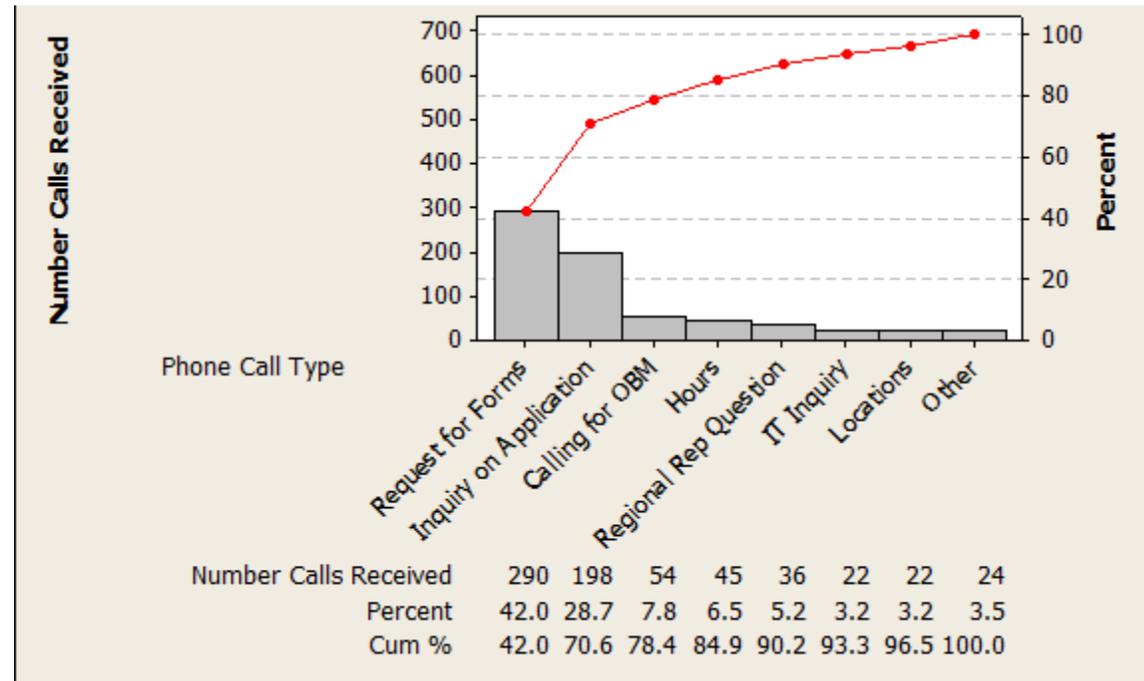
Reading the Graphs

- What type of graph is this?
- What is the shape?



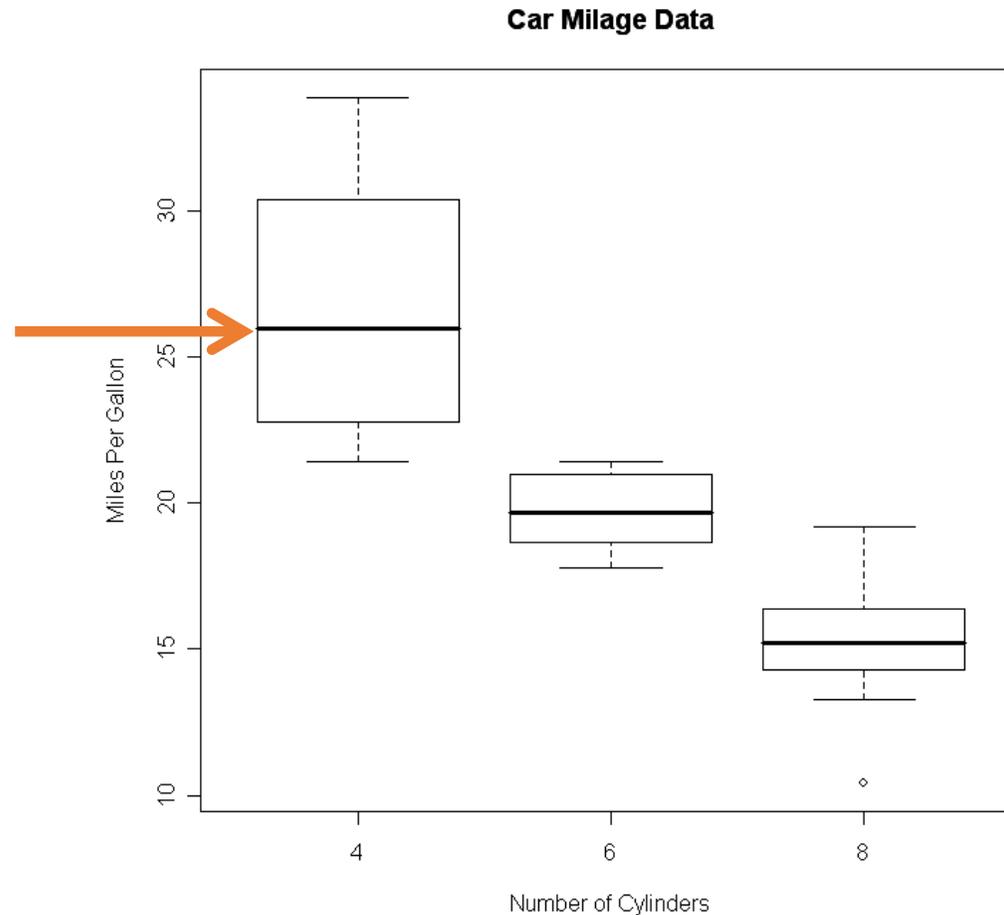
Reading the Graphs

- What type of graph is this?
- What is the largest issue?



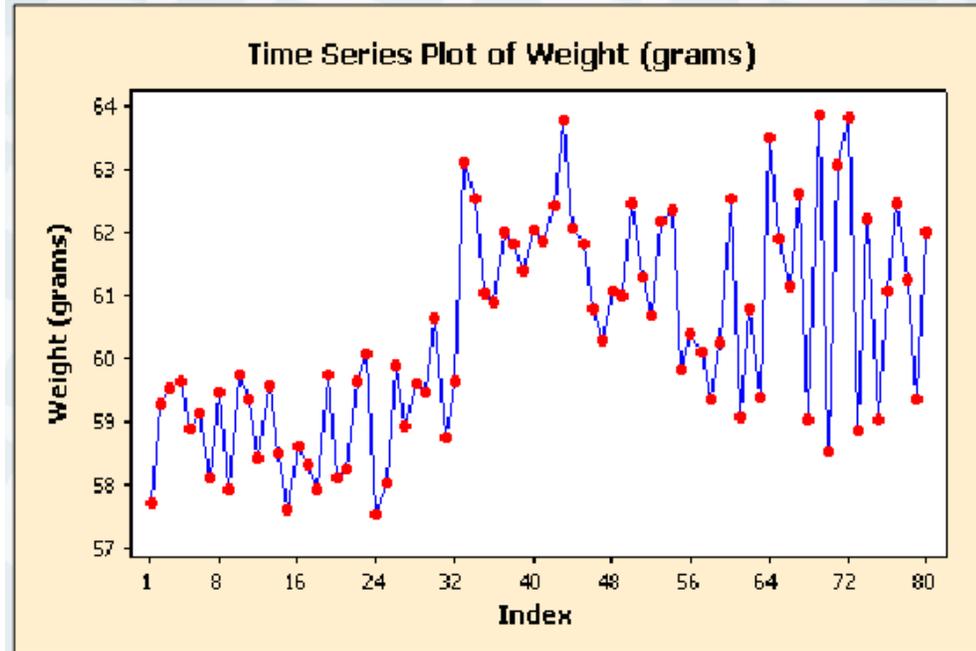
Reading the Graphs

- What type of graph is this?
- What does the red arrow indicate?
- Which has the most variation?



Reading the Graphs

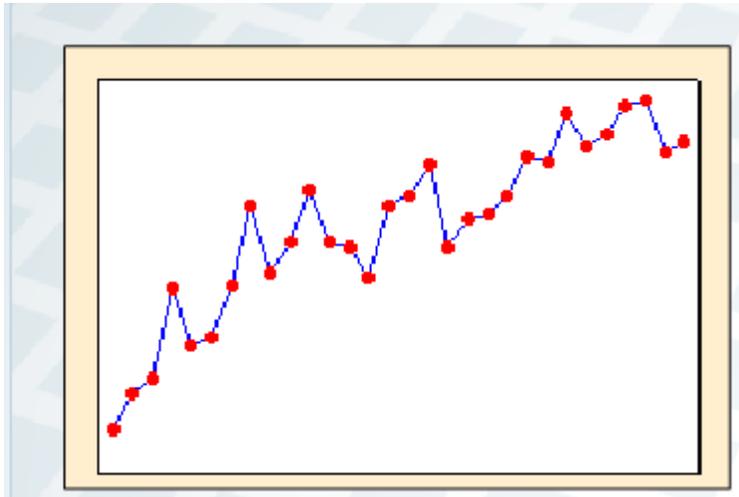
- What type of graph is this?
- Is the graph in control?
- What can you tell about the variation?



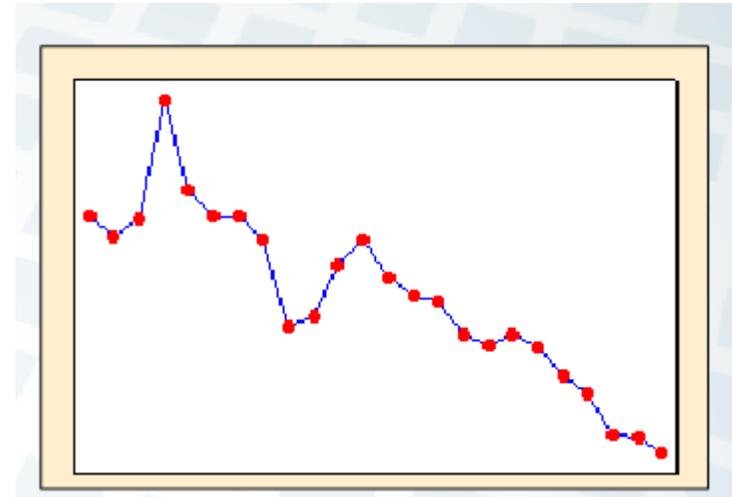
Time Series – Run Chart

Reading the Graphs

- What type of graphs are shown here?
- What is the Trend?



Positive

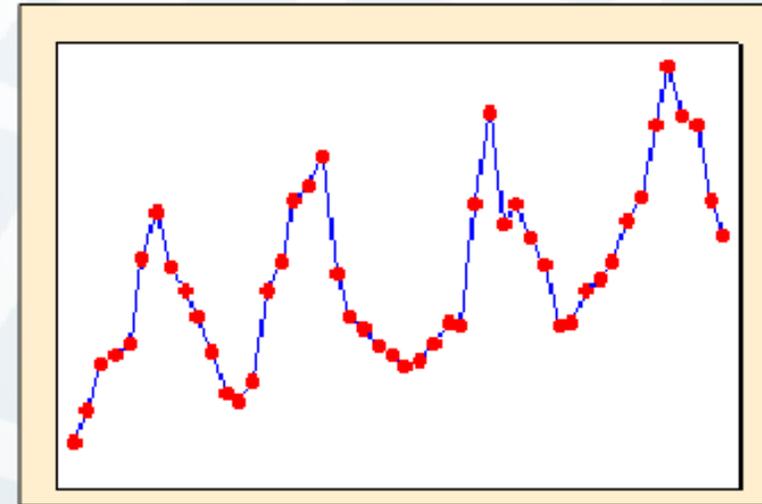


Negative

Time Series – Run Chart

Reading the Graphs

- What type of graph is shown here?
- What is the graph telling us?
- Is the data normal?



Time Series Plots
Seasonal Fluctuations

Reading the Graphs

- This is the minitab output from the graph before:
- If the confidence interval is 0.05, what is your decision?
 - Reject Ho
 - Fail to reject the Ho

Two-sample T for Recovery time

Method	N	Mean	StDev	SE Mean
Home	12	53.83	9.22	2.7
Hospital	10	66.10	8.14	2.6

P-Value = 0.004

Difference = mu (Home) - mu (Hospital)

Estimate for difference: -12.2667

95% CI for difference: (-20.0851, -4.4482)

T-Test of difference = 0 (vs not =): T-Value = -3.27 P-Value = 0.004 DF = 20

Both use Pooled StDev = 8.7538

Reject the Ho

- Given an alpha of 0.05, determine whether you reject or fail to reject the null hypothesis that the average quiz score after training is equal to the average quiz score before the training.

Paired T-Test and CI: Post-test, Pre-test

Paired T for Post-test - Pre-test

	N	Mean	StDev	SE Mean
Post-test	21	83.0476	9.3887	2.0488
Pre-test	21	76.6190	10.7586	2.3477
Difference	21	6.42857	5.28745	1.15382

P-Value = 0.000

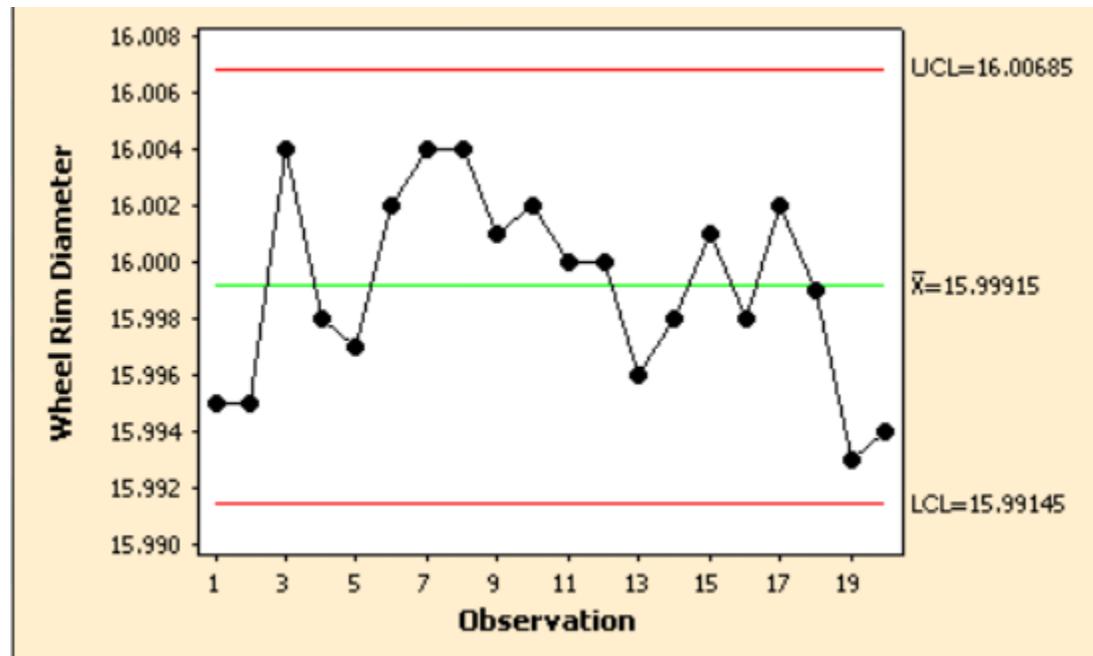
95% CI for mean difference: (4.02175, 8.83539)

T-Test of mean difference = 0 (vs not = 0): T-Value = 5.57 P-Value = 0.000

Reject the Ho (the test scores are different)

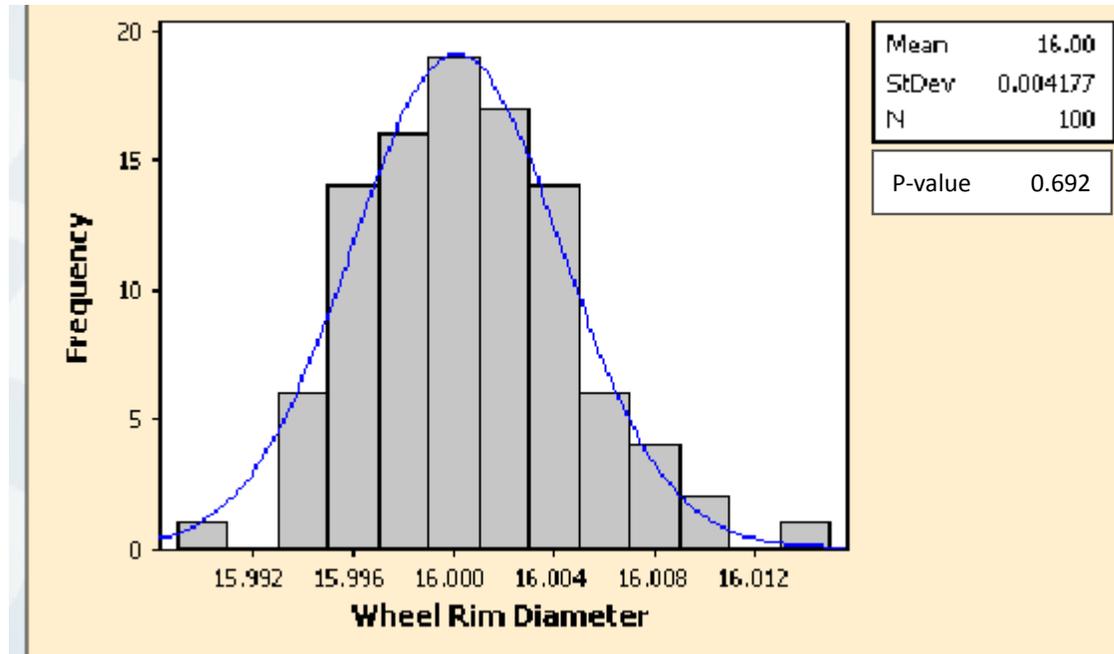
Reading the Graphs

- What type of graph is this?
- Is the process in control?
- Where do the UCL and LCL come from?



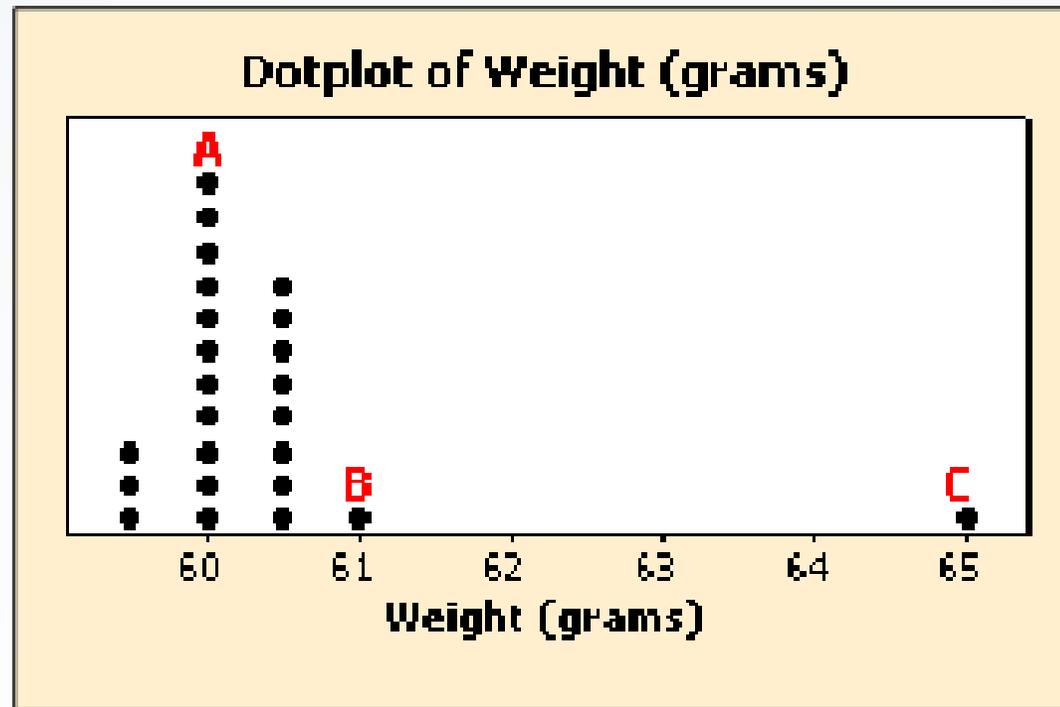
Reading the Graphs

- What type of graph is this?
- Is this data normal?



Reading the Graphs

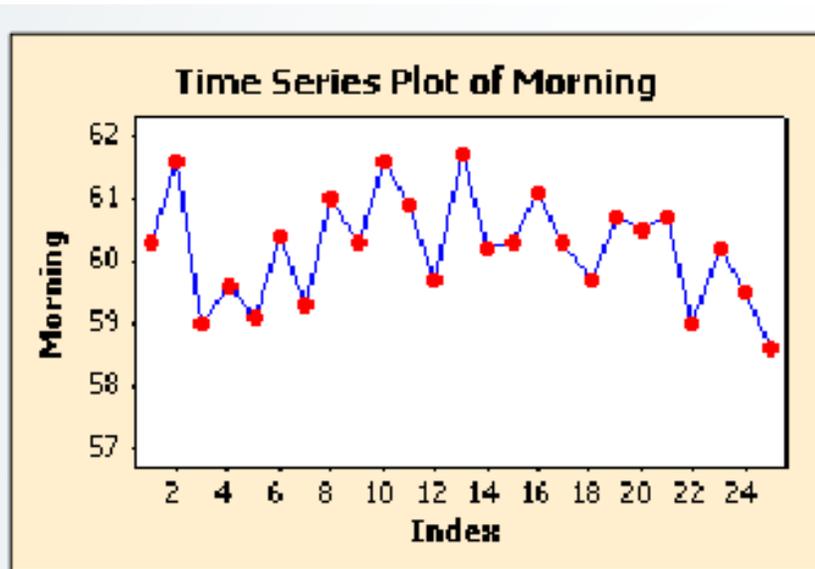
- Which point is an outlier?



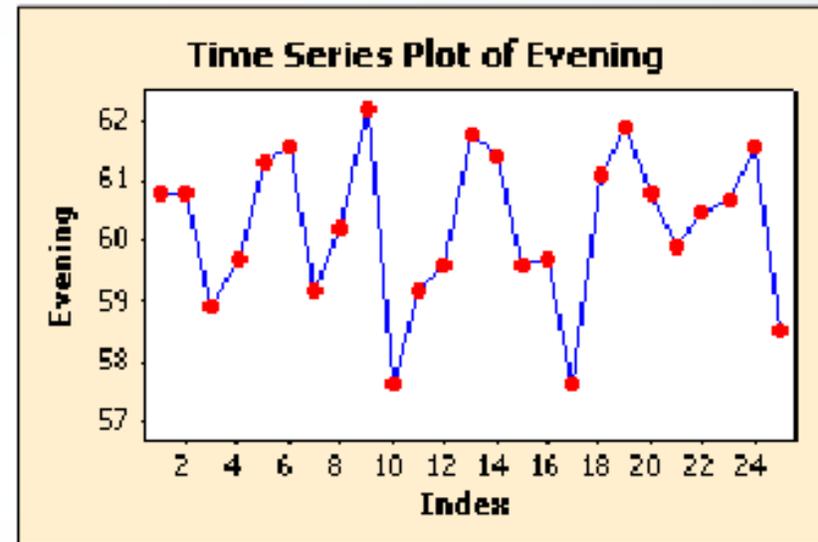
C

Reading the Graphs

- Which shift's data seem to stay most consistent?

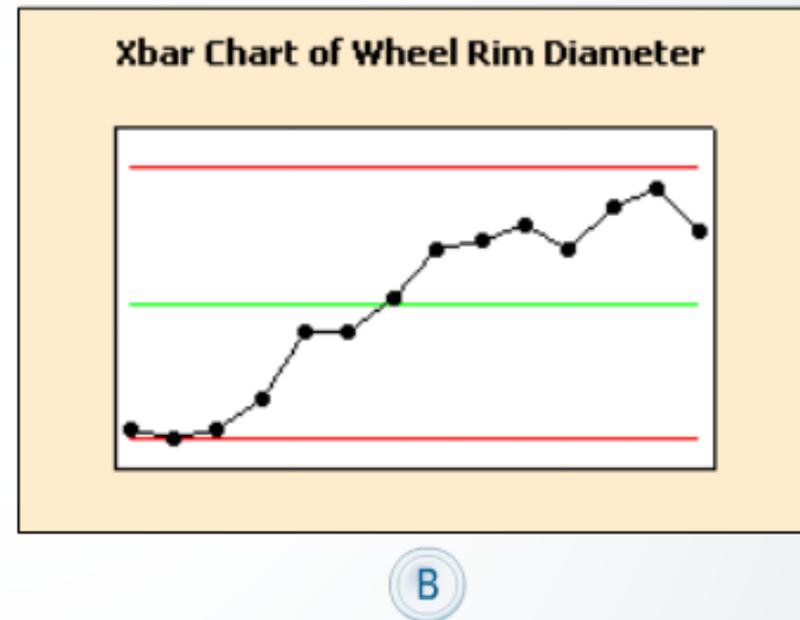
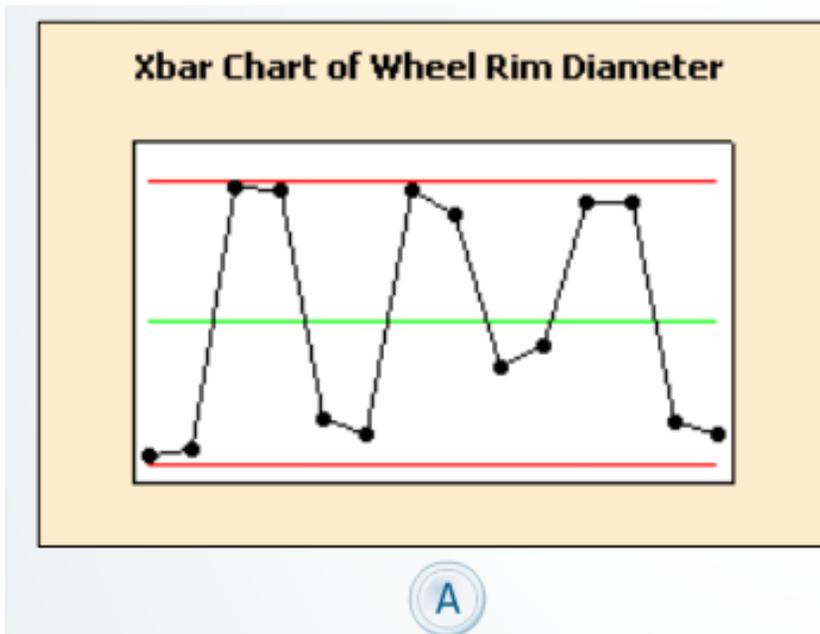


This ONE!



Reading the Graphs

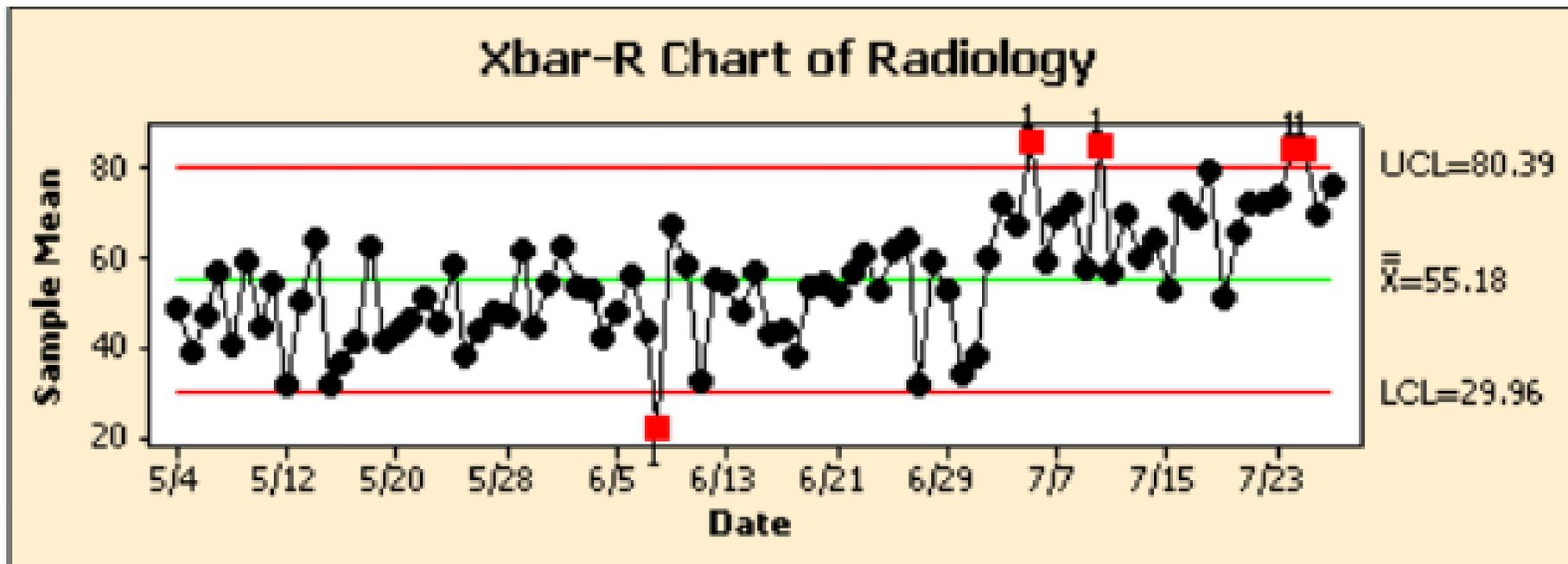
- Which control chart is out of control because the data are **increasing** and **decreasing** over time in a nonrandom pattern?



This One!

Reading the Graphs

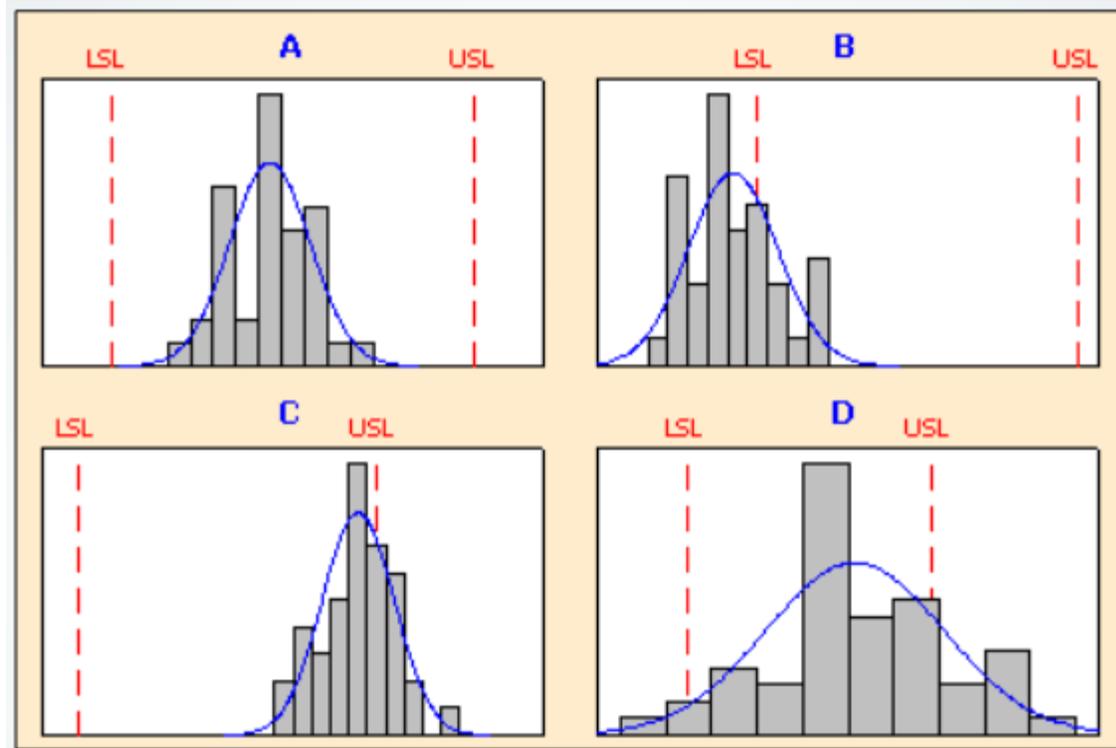
- Is there any evidence of Special-cause variation?
 - Yes



Reading the Graphs

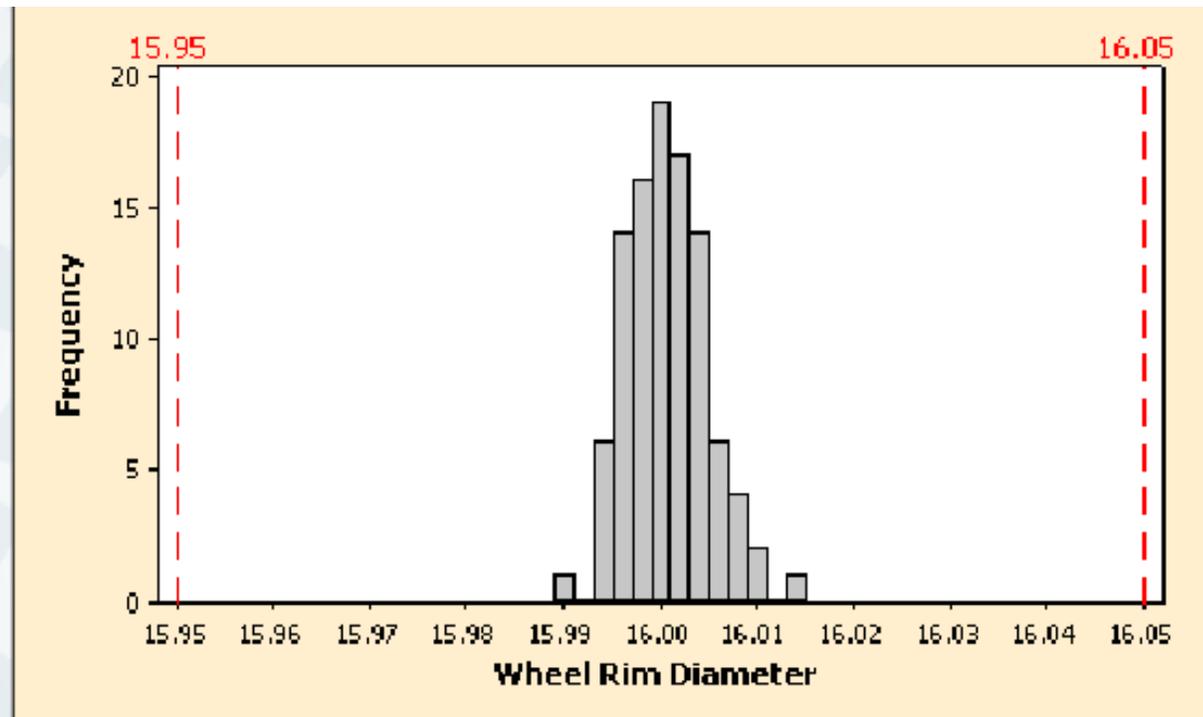
- Which of the following process is most capable?
- Where do the LSL and USL come from?

A



Reading the Graphs

- What type of graph is this?
- What are the Red Numbers?
- Is the Process meeting the demand?



Specification
Limits

Questions?