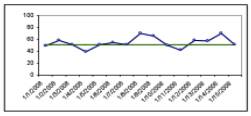
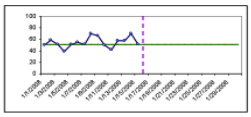
Procedure for Interpreting Run Charts

Testing a Change with a Run Chart

1. Plot the baseline

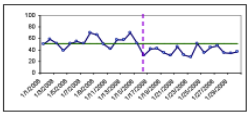


2. Extend the median & begin the test



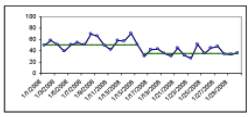
Testing a Change with a Run Chart

3. Continue to plot data following the change



4. Apply the rules

5. If there was a signal, re-plot with new median

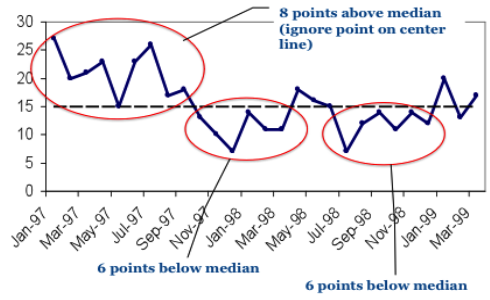


Run Charts Decision Rules

Signals of an effective change:

- Shift – 6 or more consecutive points above or below the median
- Trend – 5 or more consecutively increasing or decreasing points
- Runs – Are there too many or too few for just common cause variation?
- Astronomical Point – A dramatically different value

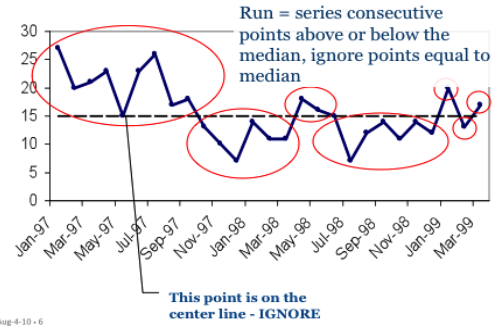
Signals



A Run

- A run is a sequence of consecutive points which all lie on the same side of the line
- Ignore points exactly on the line!

Counting Runs



How Many Runs?

- How many runs should we expect if the values all come from the same unchanged process with the baseline median?
- If there are fewer runs (or more), we have a signal that our change has made a difference in the process.
- Use the table on the following slide to determine expected number of runs.

Expected Runs Table

Count *USEFUL* values only – ignore those equal to the median!

If there are no signals in the data, how many runs would we expect to see?

If too few, then a signal that change was effective.

# obs	Lower	Upper	# obs	Lower	Upper
15	4	12	30	11	20
16	5	12	31	11	21
17	5	13	32	12	22
18	6	13	33	12	22
19	6	14	34	12	23
20	6	15	35	13	23
21	7	15	36	13	24
22	7	16	37	13	25
23	8	16	38	14	25
24	8	17	39	14	26
25	9	17	40	15	26
26	9	18	41	16	27
27	9	19	42	17	28
28	10	18	44	18	30
29	10	20	46	19	31