

Shewhart Control Charts

C Chart: Formula

C Chart Formula

Data

Week	Incidents (c)
A	13
B	15
C	23
D	17
E	15
F	27
G	13
H	19
I	21
J	11
K	19
L	23
M	17
N	25
O	19
P	13
Q	23
R	19
S	21
T	15
Total ($\sum c$)	368
k	20

Calculation

$$\sum c = 368$$

$$k = 20$$

$$CL = \bar{c} = \frac{\sum c}{k}$$

$$\frac{\sum c}{k} = \frac{368}{20} = 18.4$$

$$UCL = \bar{c} + 3 * \sqrt{\bar{c}}$$

$$= 18.4 + 3 * \sqrt{18.4}$$

$$= 18.4 + 12.86856635$$

$$= 31.26856635 \text{ (31.269 to 3.d.p)}$$

$$LCL = \bar{c} - 3 * \sqrt{\bar{c}}$$

$$= 18.4 - 3 * \sqrt{18.4}$$

$$= 18.4 - 12.86856635$$

$$= 5.531433646 \text{ (5.531 to 3.d.p)}$$

$$CL = 18.4$$

Plot the incidents, CL, UCL and LCL as seen on the chart

Legend + Chart

c = incidents per sub group (per row)

$\sum c$ = sum of incidents

k = number of sub groups

CL = center line (Mean)

UCL = upper control limit ($\bar{c} + 3 * \sqrt{\bar{c}}$)

LCL = lower control limit ($\bar{c} - 3 * \sqrt{\bar{c}}$)

