

## Box and whisker

Min

$Q_1$

Median

$Q_3$

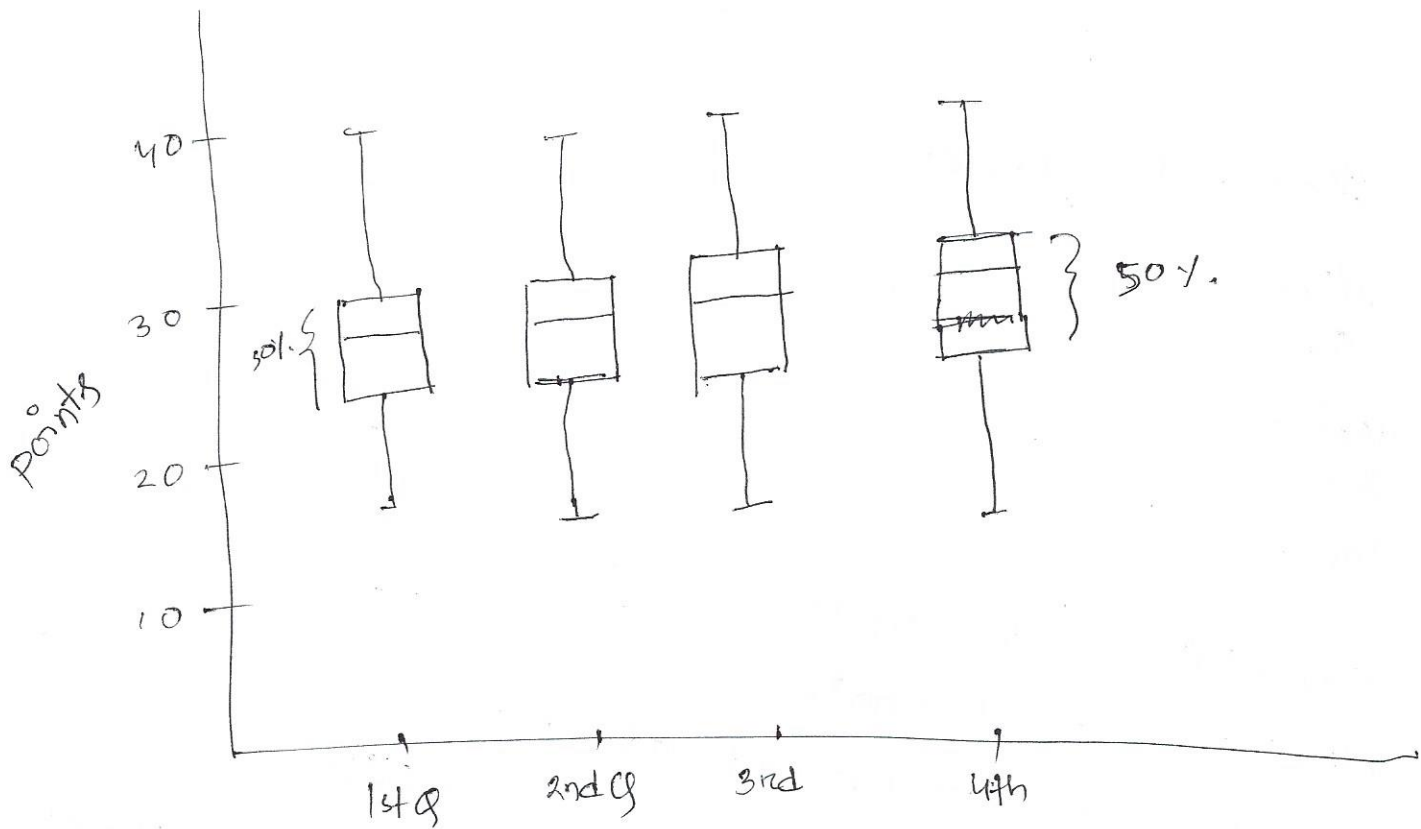
Max.

Ctrl + C → copy

Ctrl + V → paste

Ctrl + A → select all.

Select the formula ~~and~~ column from excel sheet  
and copy and paste in another column  
it will give you the Box & whisker for the  
of the column data.



they are ~~not~~ overlapping in 50% that is in the middle. so, they are not playing so much different.

$Q_1 = \text{Quartile (range, 1)}$

Interquartile Range

$$IQR = Q_3 - Q_1 \quad \text{How compressed}$$

Range : Max - Min.

IQ says, about how data is distributed.

Box-plot is not strongly affected by outliers.

Measure of center = mean  
Measure of spread = standard deviation.  
= average <sup>square</sup> distance of the data point from the mean.

$$\text{mean} = 107$$

$$\sum (x - \bar{x})^2 / (n-1)$$

$$130 - 107 = (23)^2$$

$$132 - 107 = (25)^2$$

$$132 - 107 = (13)^2$$

$$88 - 107 = (-19)^2$$

⋮

} add them up and divide  
by (# of obs<sup>n</sup> - 1) = variance

$$\text{stdev} = \sqrt{\text{variance}}$$

s.d formula in excel.

$$= \text{stdev}(\text{range}) = \text{stdev}(M2:M53)$$

Add IQ → Analysis pack

Bins

76

81

86

91

96

101

106

111

116

121

126

131

136

141

Data analysis → Histogram ~~use~~

Input : M2, M53

Bin Range : Highlight bin.

Labels → ~~yes~~ tick.

Output range → select the

area where you wanna put this

Create Frequency table → highlight →

→ Insert → create bar chart.

Click on the bar → right click → format

data series → gap width → 0.