

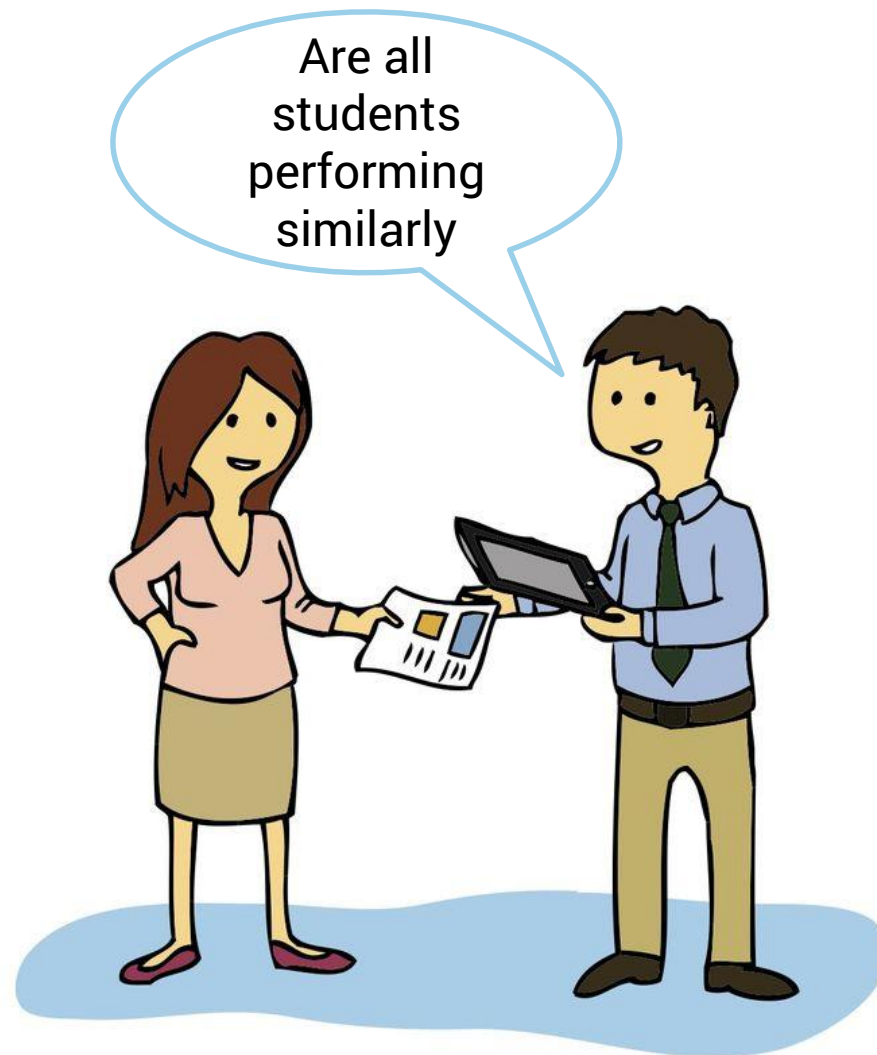
# In the previous video

- Understanding range of data
- Calculating range
- Calculating Inter Quartile Range





# Variance



# Data

ID	Marks	Teacher feedback	Gender
X001	80	good	Male
X002	40	bad	Female
X003	75	good	Male
X004	90	excellent	Female
X005	40	bad	Female
X006	69	good	Female
X007	72	good	Male
X008	34	bad	Male
X009	99	excellent	Male
X010	79	good	Female

Mean = 67.8

Median = 73.5

Mode = 40

# Data

ID	Marks	Teacher feedback	Gender	Distance (Marks - Mean)
X001	80	good	Male	12
X002	40	bad	Female	-28
X003	75	good	Male	7
X004	90	excellent	Female	22
X005	40	bad	Female	-28
X006	69	good	Female	1
X007	72	good	Male	4
X008	34	bad	Male	-34
X009	99	excellent	Male	31
X010	79	good	Female	11

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Median = 73.5

Mode = 40

# Possible methods to calculate spread



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- Take sum of all the distances

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X009	99	excellent	Male	31
X010	79	good	Female	11
Sum of Distances				0



# Possible methods to calculate spread

- Take sum of all the distances
- Take sum of squared sum of distances

ID	Marks	Teacher feedback	Gender	Distance (Marks - Mean)	Squared Distance
X001	80	good	Male	12	149
X002	40	bad	Female	-28	773
X003	75	good	Male	7	52
X004	90	excellent	Female	22	493
X005	40	bad	Female	-28	773
X006	69	good	Female	1	1
X007	72	good	Male	4	18
X008	34	bad	Male	-34	1142
X009	99	excellent	Male	31	973
X010	79	good	Female	11	125
Sum				0	4500

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X010	79	good	Female	11	125
Sum				0	4500

So, in this case average of squared distances is 450.

# Variance

- Variance is the average squared deviations from the mean.

- $\sigma^2 = \frac{\Sigma(x - \bar{x})^2}{n}$

