Summary Statistics

Numerical

- Centrality measure (mean, median)
- Dispersion measure (range, percentiles, variance , standard deviation)

Categorical

- Total count
- Unique count
- Category Counts and proportions
- Per category statistics

Centrality Measure

One number to represent entire set of values

Number central to the data

Central tendency

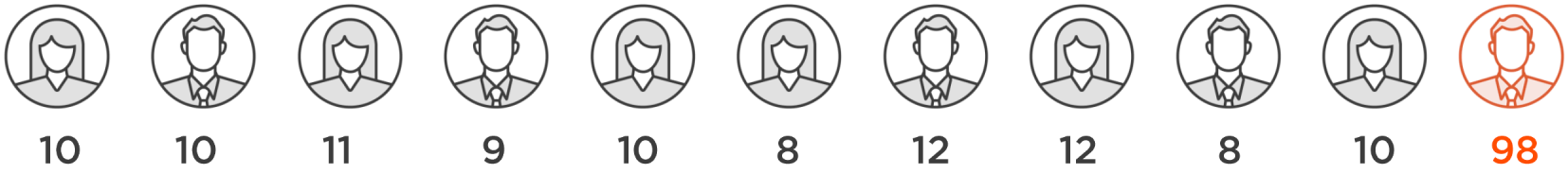
Mean / Average

Average behavior

Centrality Measure : Mean or Average

Mean age : sum of ages / count = 100 / 10 = 10

Problem : Affected by extreme values

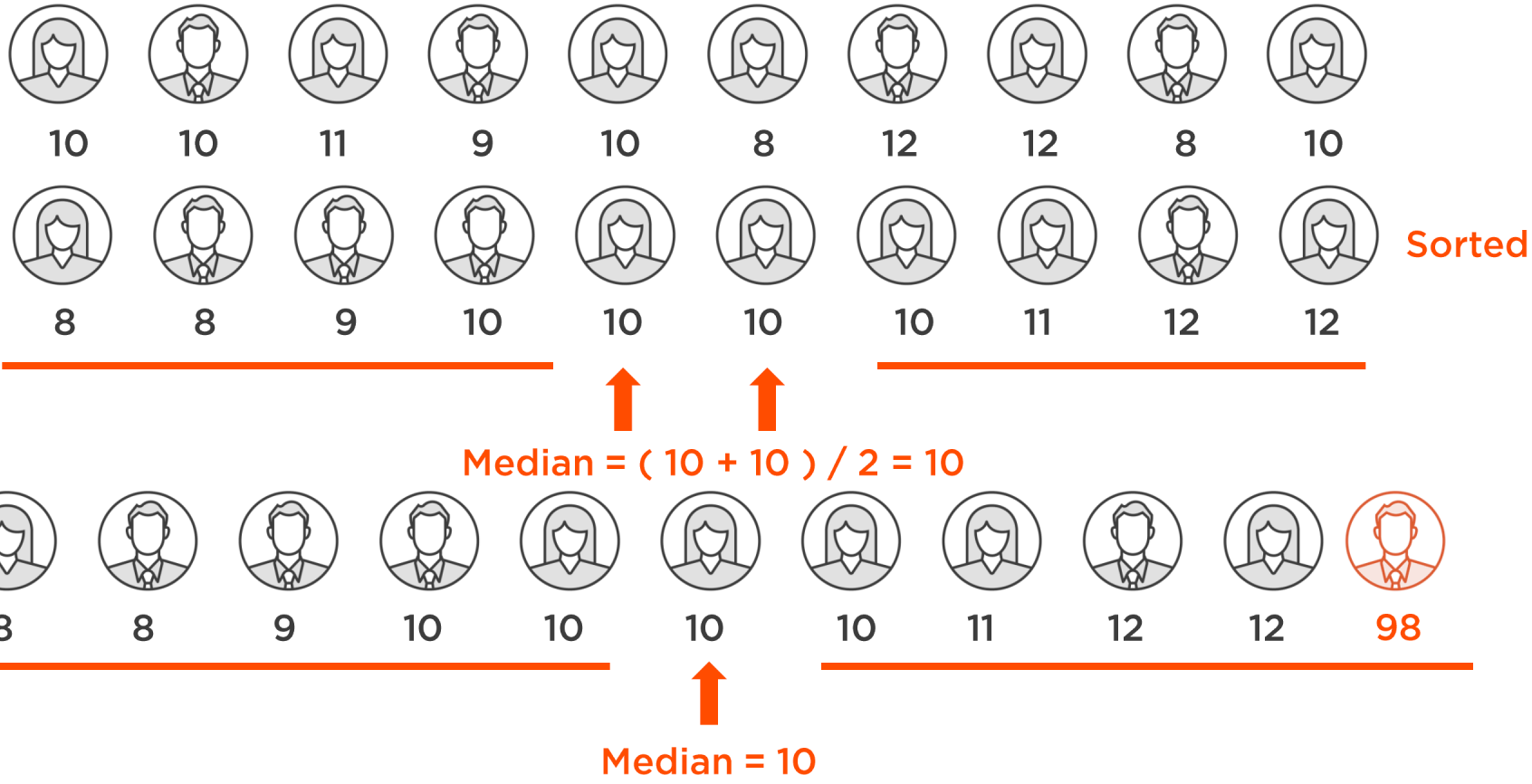


Mean age : sum of ages / count = 198 / 11 = 18

Median

Middle value in the sorted list

Centrality Measure : Median



Spread / Dispersion Measure

How spread out values are from central value

Variability

Range

Difference between maximum and minimum

Spread : Range

10 10 11 9 10 8 12 12 8 10

Age range : max – min = 12 – 8 = 4

Problem : Affected by extreme values

10 10 11 9 10 8 12 12 8 10 98

Age range : max – min = 98 – 8 = 90

Percentiles

x percentile is y means x% of values are below y

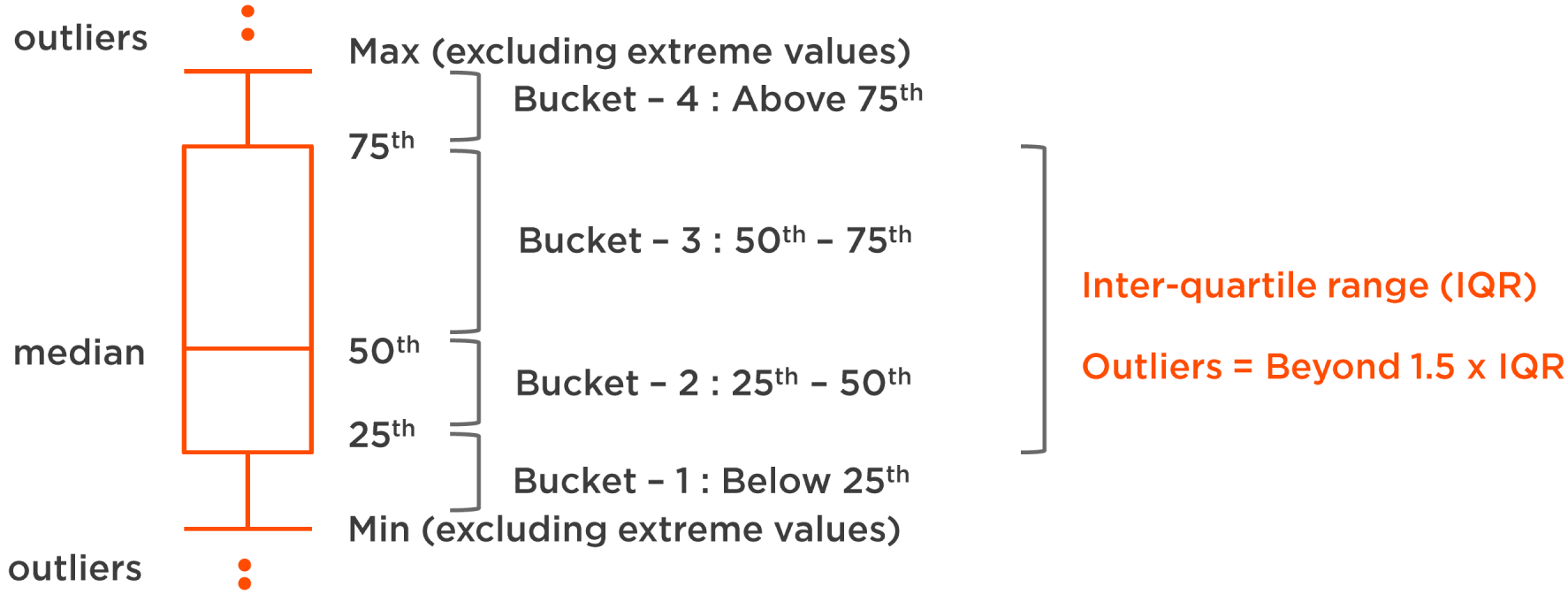
50 percentile is 10 means 50% of values are below 10

25th, 50th , 75th

- Bucket – 1 : Below 25th
- Bucket – 2 : 25th – 50th
- Bucket – 3 : 50th - 75th
- Bucket – 4 : above 75th

Quartiles

Box-Whisker Plot



Variance

Measure of variability

How far each value in list from mean value

Small variance = less spread

High variance = large spread

Variance = $\frac{sum((value - mean)^2)}{count}$

Affected by extreme values

Unit is not clear

Standard Deviation

Standard deviation = $\sqrt{variance}$

Unit is same as that of the feature

Low standard deviation = less spread

High standard deviation = large spread

Overview

(Concepts)

Exploratory data analysis

- Distributions
- Grouping
- Crosstabs
- Pivots

Distributions

Univariate

- Histogram
- Kernel Density Estimation (KDE) plot

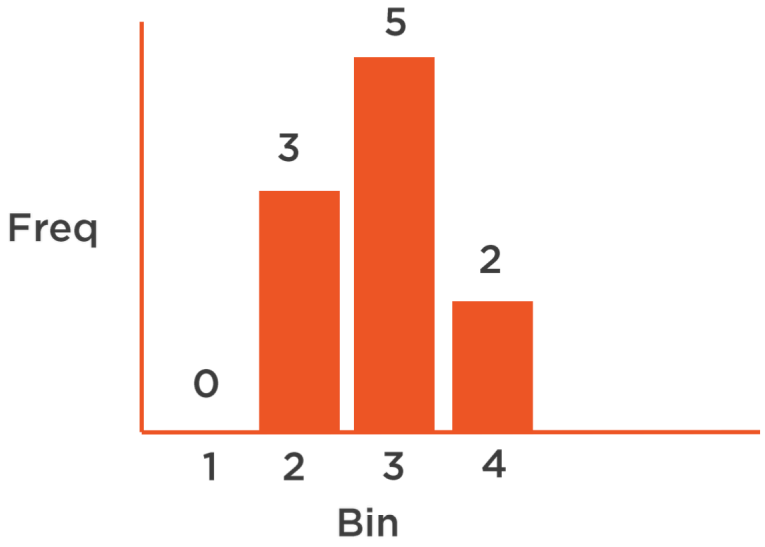
Bivariate

- Scatter plot

Histogram

Age	10	10	11	9	10	8	12	12	8	10
Bin	3	3	3	2	3	2	4	4	2	3

Bucket (bin) number	Bucket (bins)	Frequency
1	6-8	0
2	8-10	3
3	10-12	5
4	12-14	2



Kernel Density Estimation (KDE) Plot