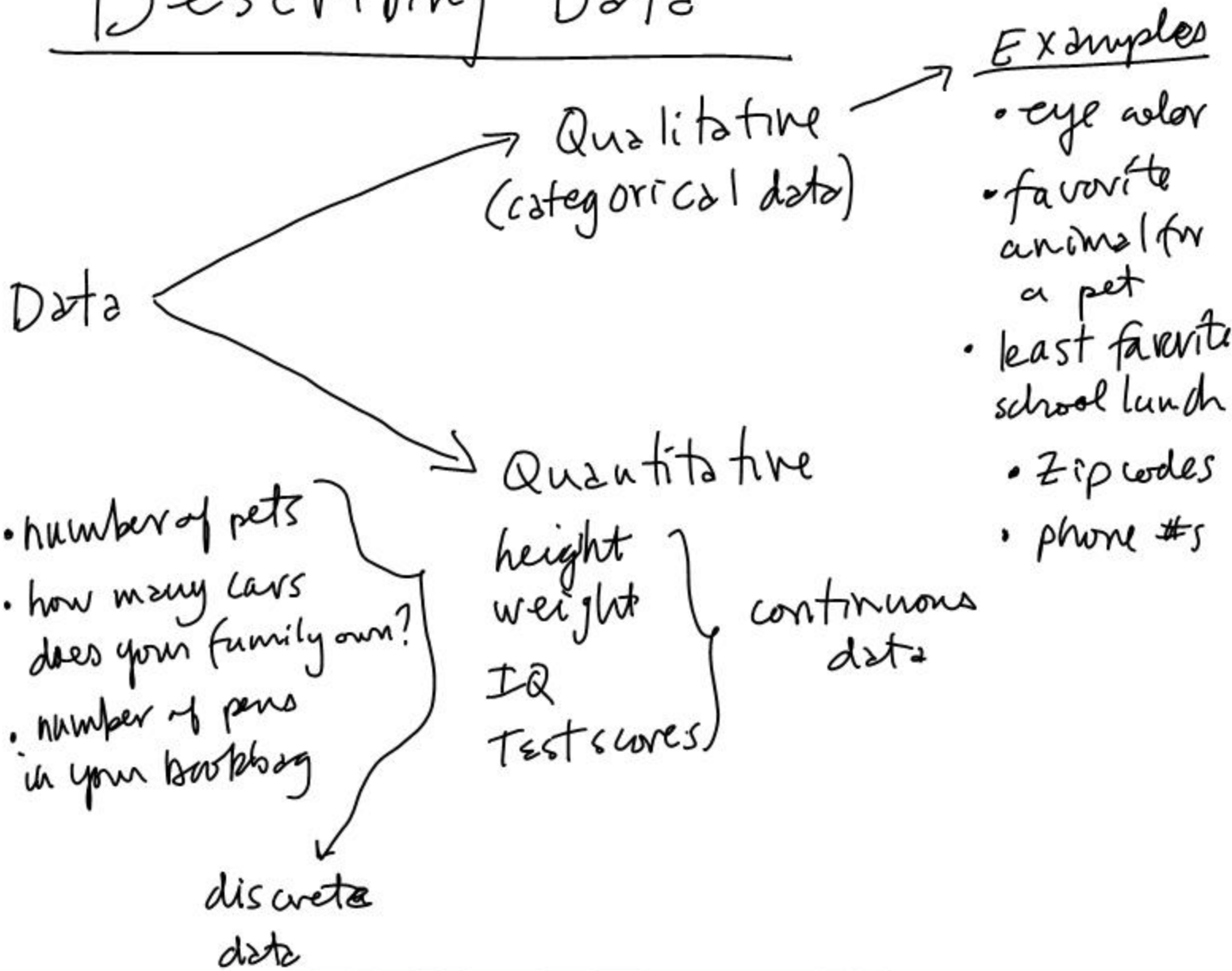
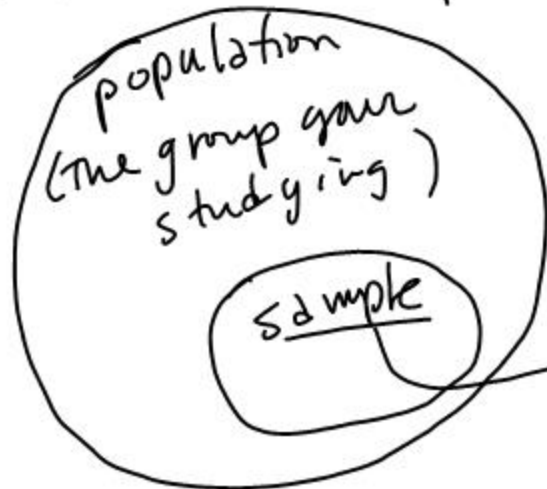


Describing Data



populations & samples



A good sample needs to be random.

The part of the population from which you get data

Presenting / summarizing Data

- Frequency tables + bar charts

These are ways to present discrete data.

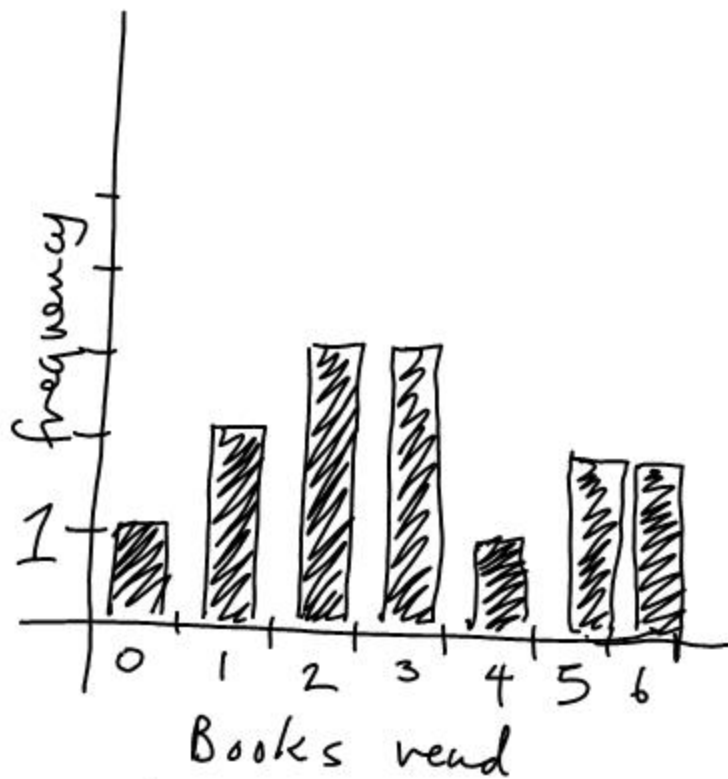
Ex. Number of books read last summer

2, 5, 1, 2, 3, 1, 0, 4, 5, 2, 6, 3, 6

Frequency Table \longrightarrow bar chart

Books	Tally	Frequency
0		1
1		2
2		3
3		2
4		1
5		2
6		2

###



Note: bars are not touching
Because it's discrete data

For continuous data —

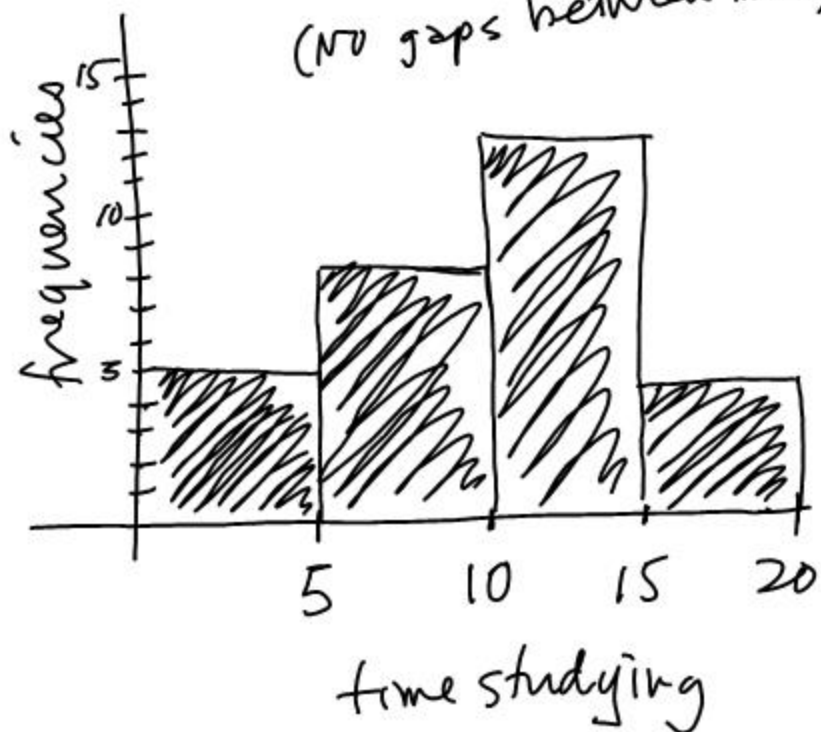
Grouped frequency table and Histograms

Ex. Minutes spent on math hw
grouped frequency table

time studying	$0 \leq t < 5$	$5 \leq t < 10$	$10 \leq t < 15$	$15 \leq t < 20$
number of students	5	8	12	4

histogram

(no gaps between bars)



8B #3 (a) continuous

(b) grouped frequency table

Mass (kg)	$1 \leq w < 2$	$2 \leq w < 3$	$3 \leq w < 4$	$4 \leq w < 5$
Number of chickens	8	24	50	14

(c) 96 dead birds

Two Important ways to describe large datasets

• Measures of central tendency

Mean

Median

Mode

• Measures of Dispersion (spread)

Shumber summary

Range

Interquartile range

Variance

Standard Deviation

EX. Find the 5 number summary

$[0, 1, 1, 2, 3, 3, 3, 4]$ 5 $[7, 9, 9, 10, 11, 11, 12, 13]$

$\frac{17+1}{2} = 9$ 2.5 is the first quartile (Q1) 5 is the median or 2nd quartile (Q2) 10.5 is the third quartile (Q3)

25th percentile 50th percentile 75th percentile

5 number Summary: 0, 2.5, 5, 10.5, 13

min Q1 Q2 Q3 max

Range: Maximum - Minimum

$$13 - 0 = \underline{\underline{13}}$$

Interquartile Range: Q3 - Q1

$$10.5 - 2.5 = \underline{\underline{8}}$$

Variance & Standard Deviation

σ^2

σ

Ex. 5, 6, 8, 9 Find the variance

The mean is $\mu = 7$

X	deviations from the mean	
	$X - \mu$	$(X - \mu)^2$
5	-2	4
6	-1	1
8	1	1
9	2	4

10 ← sum of the squared deviations

average squared deviation: $\frac{10}{4} = 2.5 = \sigma^2$

standard deviation: $\sigma = \sqrt{2.5} = \underline{1.58}$

HW 8B #2ab, #4

8C #1

Find the variance of 10, 14, 15, 21