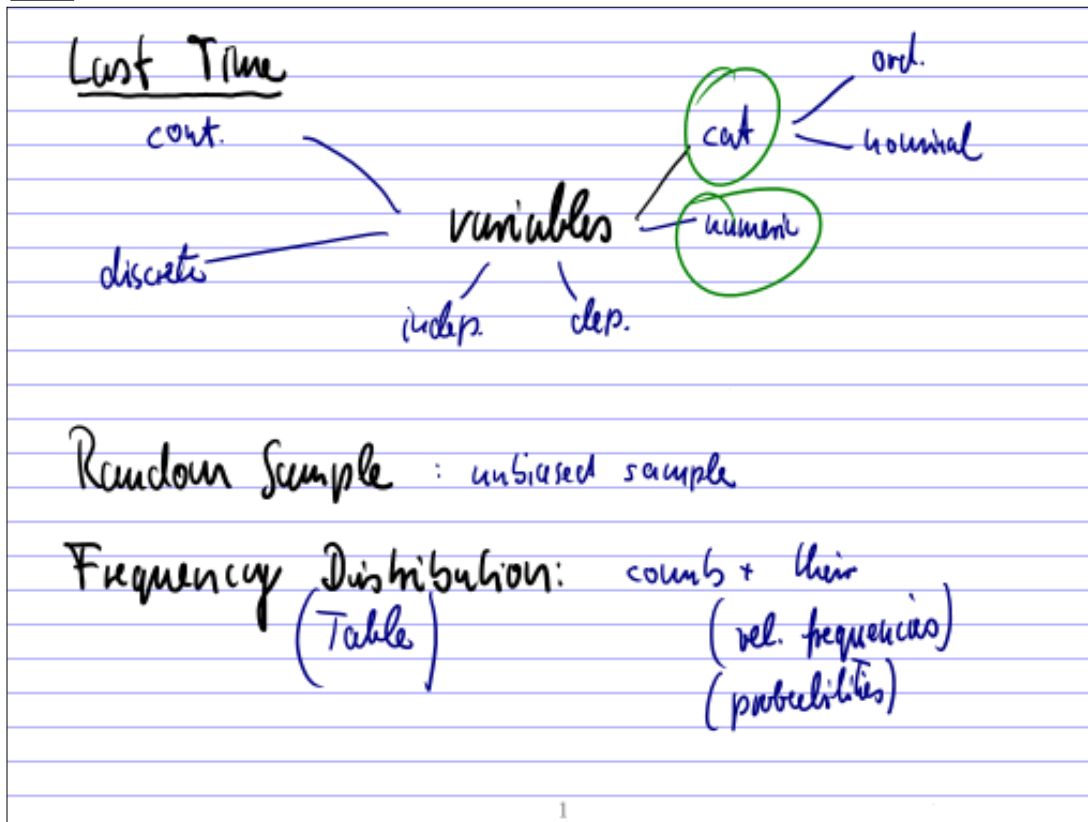


Panel 1



Panel 2

The BBC asked viewers to call in with their favorite song. 7500 people called, over half liked "Imagine". Does this represent a random sample? No!

Restaurant A collects voluntary "satisfaction" cards, restaurant B asks every 5<sup>th</sup> guest their opinion. Which one is closer to a random sample?

A  
B

2

Panel 3

A survey about voter opinion results in the following frequency distribution:

a) What is the winning prob.?

b) How many people, in %, are liberal or very liberal?

very liberal	0.05
liberal	0.2
neutral	0.25
conservative	0.3
very conservative	0.2
	<hr/>
	1

25%

3

Panel 4

Frequency Distribution tables can be done graphically:

① Table    ② Bar Chart    ③ Pie Chart

Ex: GSS data "degree"

① Stats / Tables / Freq

Frequency table results for HIGHEST DEGREE:			
HIGHEST DEGREE		Frequency	Relative Frequency
0 - Less than HS	297	0.14688428	
1 - High School	1003	0.49604353	
2 - Junior College	173	0.085558854	
3 - Bachelor	355	0.17556874	
4 - Graduate	194	0.095944606	

② Graphics / Bar Plot...

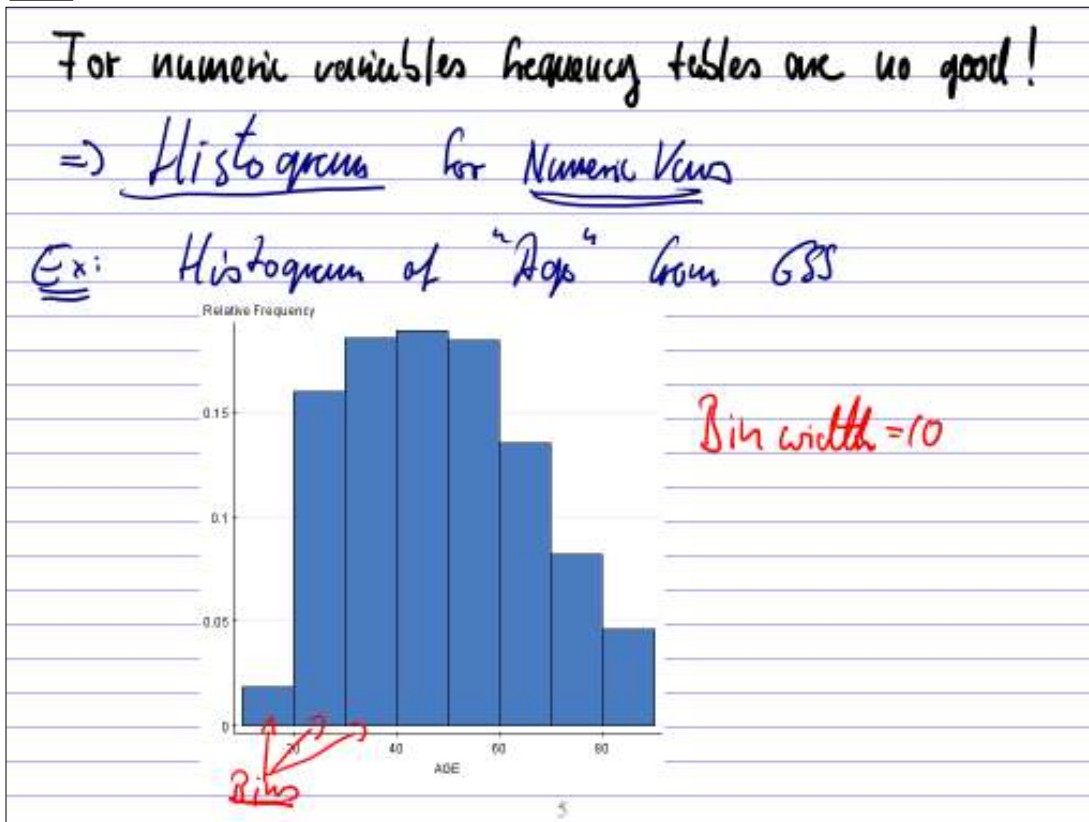
Ex: Pie chart for "Region"

③ Graphics / Pie Chart.

Applies to discrete or categ. vars.

4

Panel 5



Panel 6

Create a Histogram by hand:

Data: 20, 22, 30, 50, 43, 41, 58, 21, 49, 33, 35, 36, 20, 22

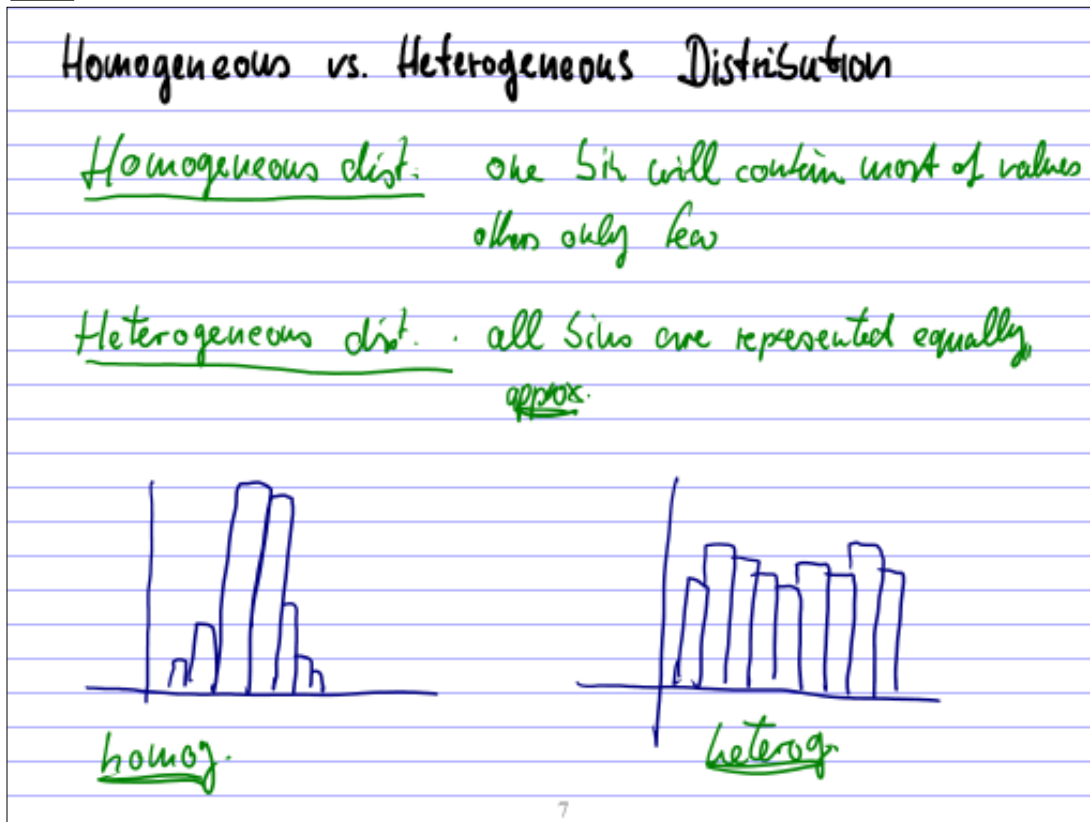
- Find largest: 80  
 smallest: 20
- Pick # of Bins: 8 (5-12)
- Find range: largest - smallest = 60
- $\frac{\text{range}}{\# \text{bins}} = \frac{60}{8} = 7.5 \rightarrow \text{round up} = 8$
- table

	rel. freqn	freq	rel. freq.
20-28		4	4/15
28-36		2	2/15
36-44		3	3/15
44-52		1	1/15
52-60		1	1/15
60-68		0	0
68-76		1	1/15
76-84		2	2/15

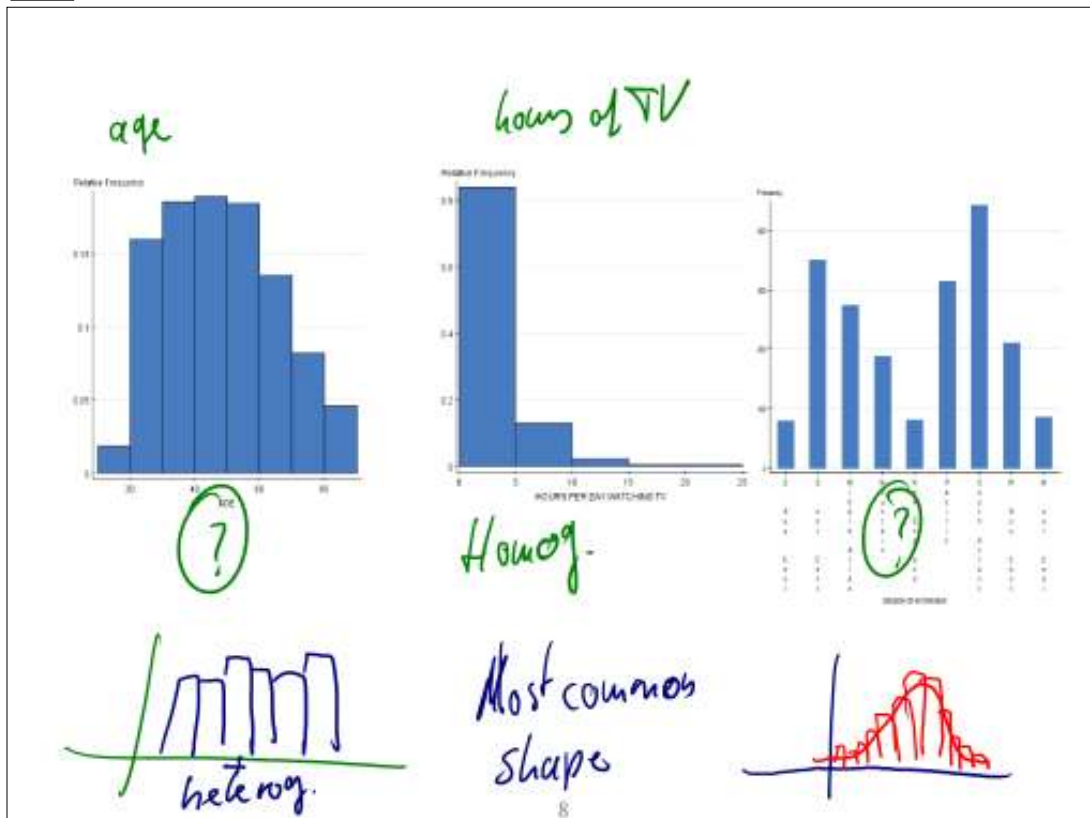
↑  
 ∈ 26, < 94

15

Panel 7



Panel 8



Panel 9

## Numeric Data Representation: Measures of Central Tendency

① Mean or Average: (sum of #'s) divided by (count)

$$\frac{1}{n} (x_1 + x_2 + x_3 + \dots + x_n)$$

$$\frac{1}{n} \sum x_i$$

↳ sigma = sum of

Symbol used:  $\bar{x}$  (x-bar) - sample mean  
 $\mu$  (mu) - population mean

9

Panel 10

Sample Age data is

20, 30, 40, 25, 45, 35

Find mean:  $\bar{x} = \frac{1}{6} (20 + 30 + 40 + 25 + 45 + 35) = \frac{225}{6} =$

(call  $\bar{x}$  as estimate for  $\mu$ )  $= \underline{\underline{37.5}}$

$$\bar{x} = \cancel{39}$$

$$\bar{x} = \cancel{38}$$

10

Panel 11

## ② Median or middle number

1) Sort data

2) Find middle # (if possible) or the one between the two middle numbers.

Ex: 20, 30, 40, 25, 45, 35

sorted: 20, 25, 30, 35, 40, 45

$$\text{middle: } \frac{30+35}{2} = \underline{\underline{32.5}}$$

11

Panel 12

## ③ Mode : most frequent #

Ex: 20, 30, 40, 25, 30, 45, 20

Mode = 30, 20

Mode is not necessarily unique!

④ 3 measures of central tendency

numeric: mean, median, mode

ord.: ~~mean~~, median, mode

nom.: ~~mean~~, ~~median~~, mode

Grade 25%  
Soph 28%  
jun 32% Mode  
senior 25%

12