

types of <sup>data</sup> variables & the values they take on ①

wed morning disc. sec. (week 1) subjects

variable	possible values
religion (categorical) (qualitative) R: character (nominal)	'no religion' 'Islam' 'catholic' 'protestant' ...
speed of maze running R: string (quantitative)	'very slow' ① 'slow' ② 'normal' ③ 'fast' ④ 'very fast' ⑤ R: num.
# leaves (quantitative)	possible values 0, 1, 2, ... R: int.
height (cm) (quantitative)	10.72 9.398 R: num.
temperature (°F) leading to max growth rate (quantitative)	72.38 69.7 ... R: num.

people

lab rats

plants (tomato seedlings)



do they have unique ~~places~~ on number line?

no

Qualitative (Qual)

are categories ordered?

no

nominal

yes

ordered categorical

yes

Quantitative (Quant)

is it?

no

Continuous

yes

discrete

only 2 values: boolean, binary { 0 } 2 val. <sup>more useful</sup>

dichotomous { 'yes' } 2 val.

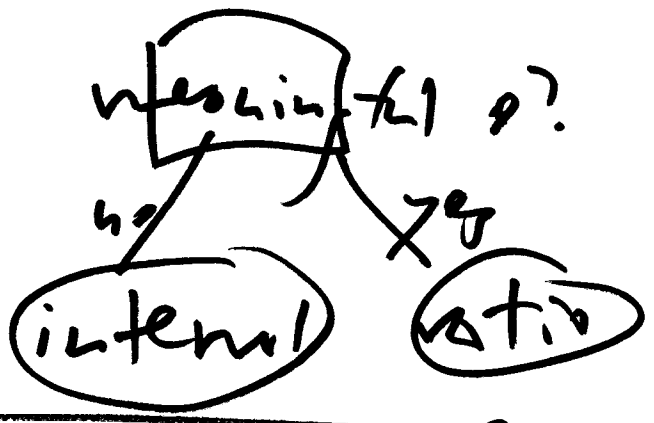
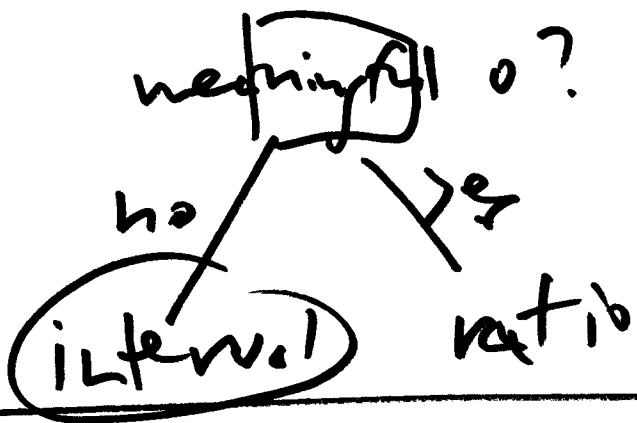
{ 'no' }

|

Isom

Continuous

discrete



SC max temp today

56°F

→ x °C

tomorrow

28°F

$$\frac{56}{28} = 2$$

~~"today was twice as hot as tomorrow"~~

→ y °C

$$\frac{x}{y} \neq 2$$

ratios not meaningful for temp in °F or °C

°F & °C do not have a zero that represents the absence of attribute

4 (max) it was 28°F warmer today (4)

than tomorrow ✓  $x - y$  ok

interval-  
scale

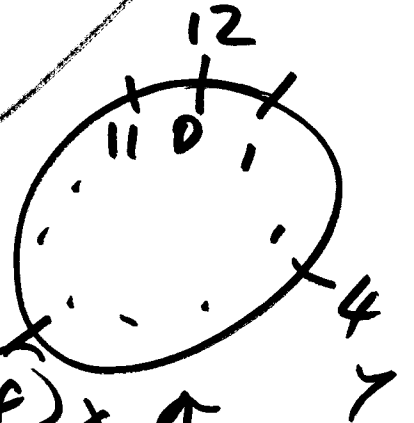
$\frac{x}{y}$  hot ok

$\frac{x}{y}$  ok

ratio  
scale

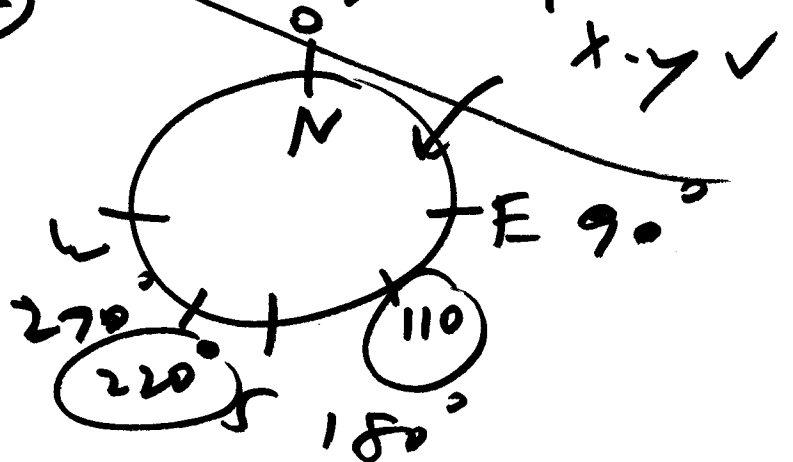
2 other  
interval-  
scale  
variables:

time  
on  
clock  
face



(2)

compass  
points



no kihal	no religion?	Islam?	...	pent. (5)
no religion	1	0	0	0
Islam	0	1	0	0
⋮				

dummy variables

