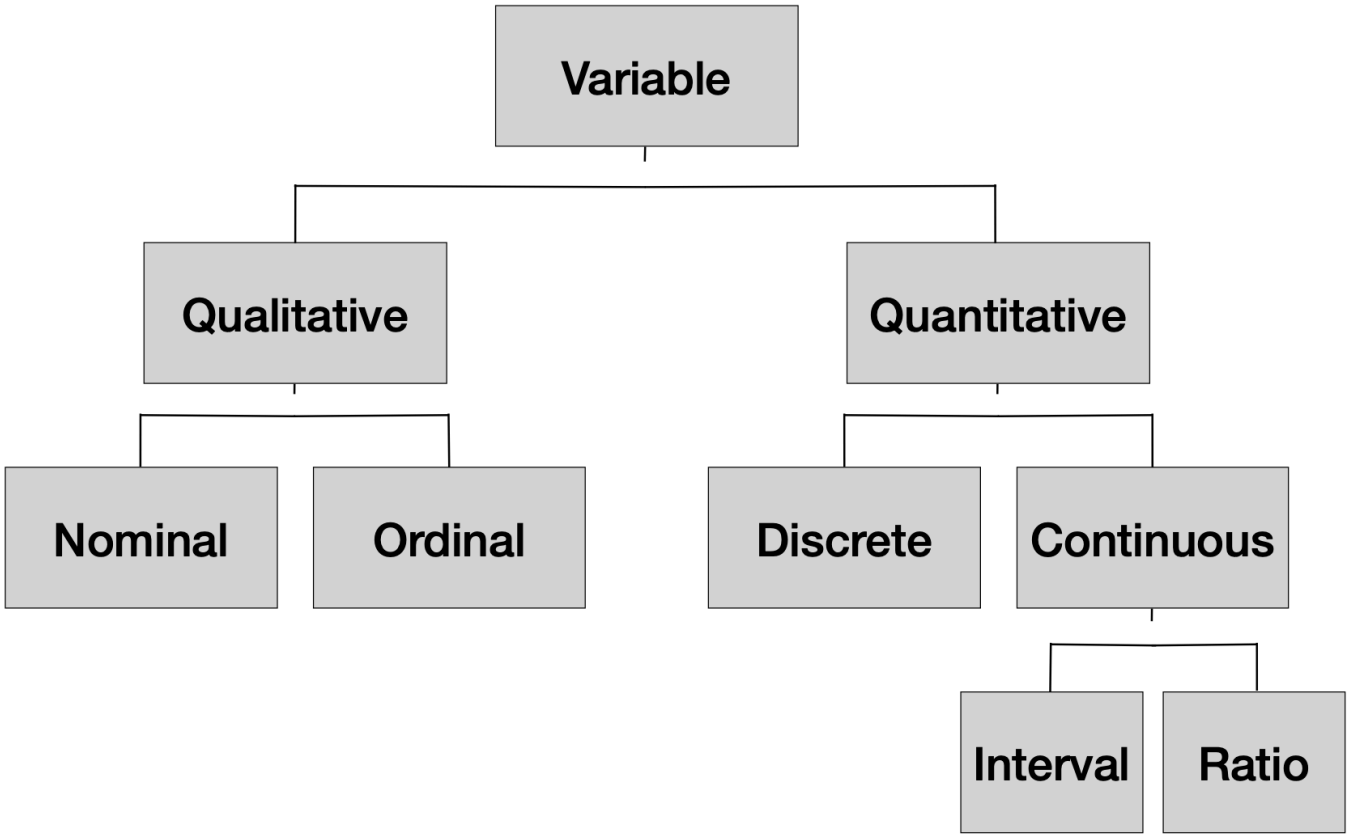
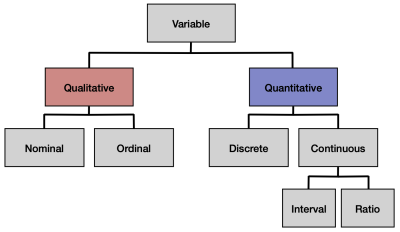
Measurement Scales

Scales of measurement (Data types)



Qualitative vs. Quantitative

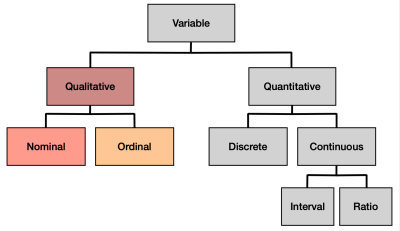


Qualitative:

- aka categorical, factors
- "not numeric", as in numbers serve as labels, not as things to add or subtract

Quantitative:

- reflects magnitude
- values are actually numbers you can add/subtract

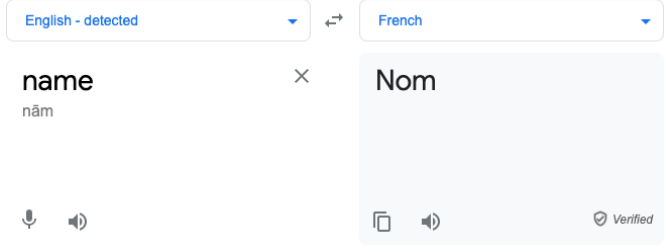


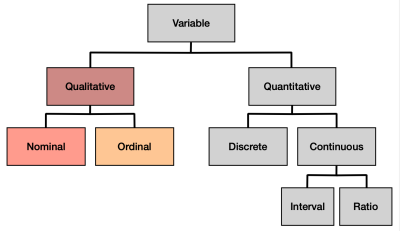
Qualitative Variables

Nominal vs. Ordinal

Nominal:

- Response options are groups
- There is no order
- Example -- What are different kinds of fruit?
  - apples: 1
  - blackberries: 2
  - coconut: 3



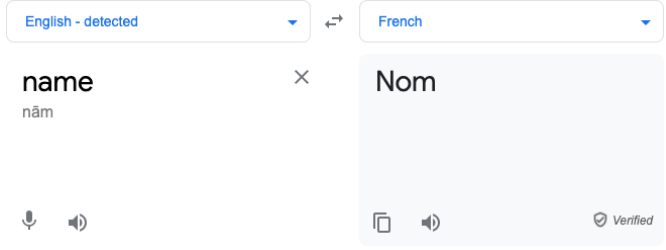


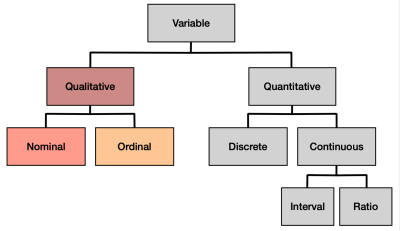
Qualitative Variables

Nominal vs. Ordinal

Nominal:

- Response options are groups
- There is no order
- Example -- What are different kinds of fruit?
  - apples: 3
  - blackberries: 1
  - coconut: 2



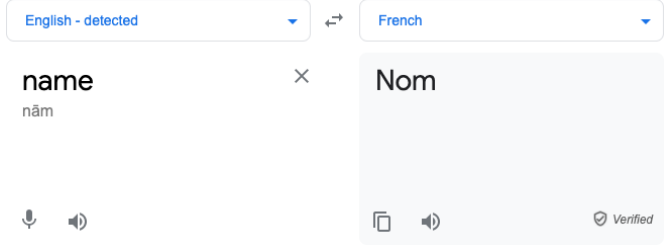


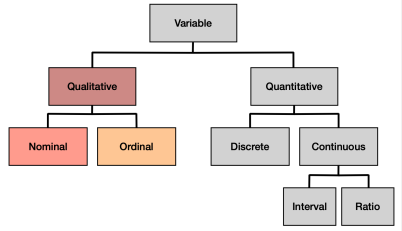
Qualitative Variables

Nominal vs. Ordinal

Nominal:

- Response options are groups
- There is no order
- Example -- What are different kinds of fruit?
  - apples: 312
  - blackberries: 19
  - coconut: 999





Qualitative Variables

Nominal vs. Ordinal

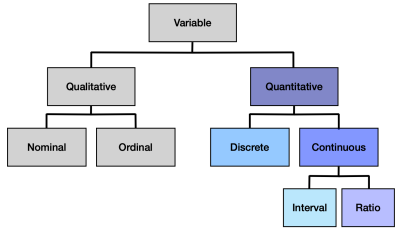
Nominal:

- Response options are groups
- There is no order
- Example -- What are different kinds of fruit?
  - apples: 1
  - blackberries: 2
  - coconut: 3

Ordinal:

- Response options are *ordered*
- No consistent distance between possible scores
- Example -- List the following fruits in order of preference
  - apples: 2
  - blackberries: 1
  - coconuts: 3

Quantitative Variables



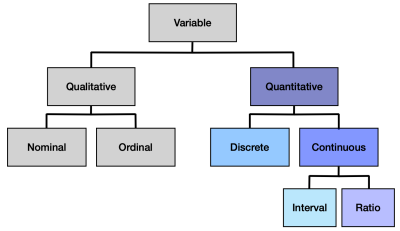
Discrete vs. Continuous

Discrete:

- Takes numeric values that are countable
- Must be finite number of possibilities
- Examples
  - # of children/family
  - # of students/class
- Often confused with categorical; context matters

Continuous

- Takes numeric values that are not necessarily countable
- Infinite number of possibilities
- Examples
  - Age
  - Height/weight
- AKA "scale" variables



Quantitative Variables

Continuous

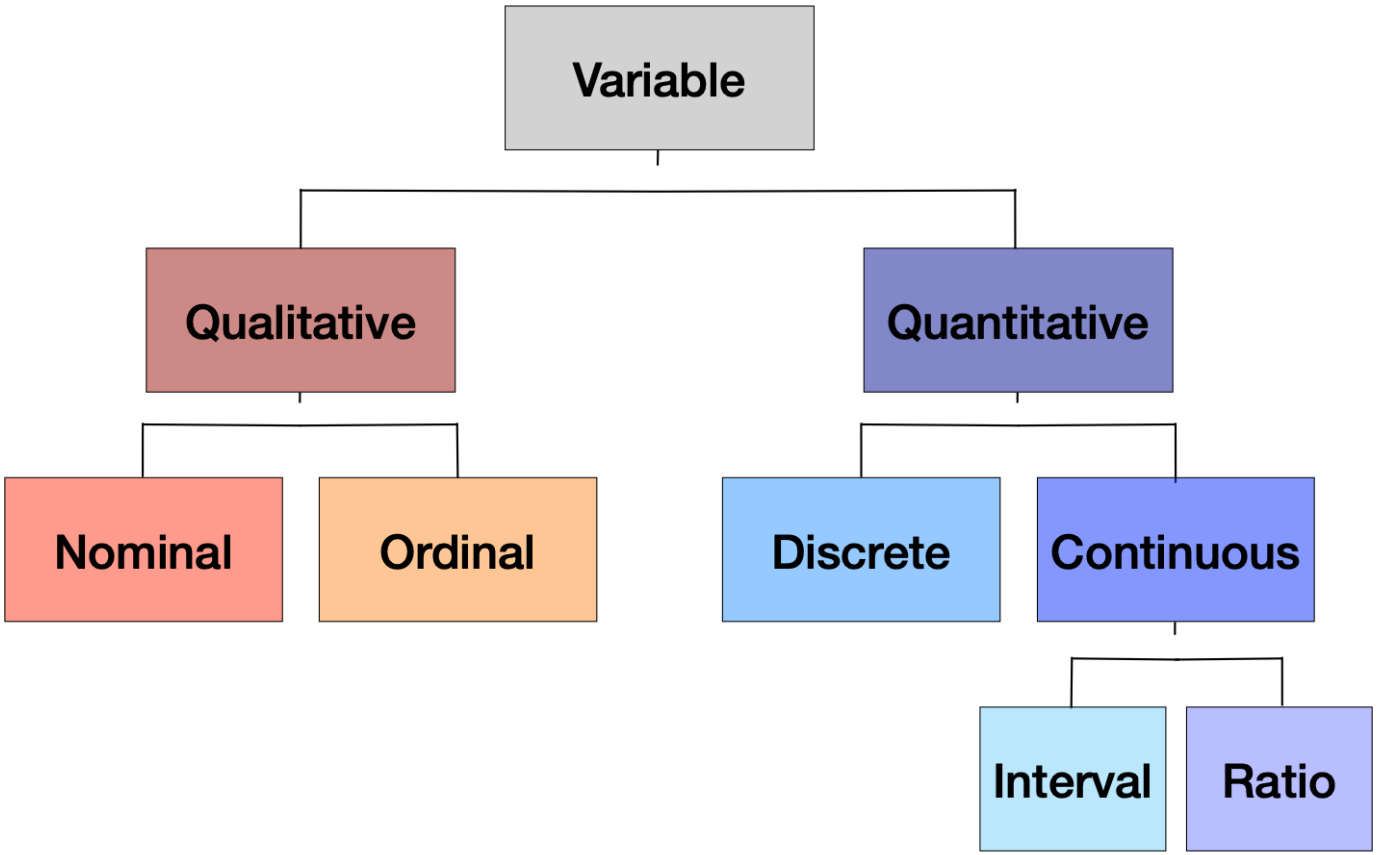
Interval:

- Responses are ordered (like ordinal)
- Distance between responses is the same (unlike ordinal)
- No meaningful 0
- Examples
  - temp in Farenheit
- Not as common unless you treat Likert scale as interval (it is technically ordinal)

Ratio

- Same as interval, but now with a meaningful 0
- 0 indicates the absence of something
- Example
  - How many words did you recall on a memory test?
  - 0 words recalled is meaningful!

Pitfalls?


Variable
Qualitative
Quantitative
Nominal
Ordinal
Discrete
Continuous
Interval
Ratio

Pitfalls

Confusing Nominal and Ordinal

- lose information about order you might want
- or maybe you don't care and it doesn't matter

Confusing Interval and Ratio

- lots of stats are interpreted in regards to 0
- if there is no meaningful 0, how do you interpret?

Confusing Qualitative and Quantitative

- happens more than you think; esp in the machine learning world
- can straight up get the wrong numbers (will come back to this with correlation!)

Next time

Describing data