



Intro to Statistics with R: Introduction

# Types of variables

# Types of variables

- Nominal
- Ordinal
- Interval
- Ratio

# Nominal variables

- Used to assign individual cases to categories
- DataCamp students come from many different countries
- *Country of origin* is a nominal variable

# Ordinal variables

- Used to rank order cases
- Countries may be ranked according to overall population
- *Ranking* is an ordinal variable

# Interval variables

- Used to rank order cases where the distance, or interval, between each value is equal
- Each country has a longitude and latitude
- *Longitude* and *latitude* are interval variables

# Ratio variables

- Same as interval variables but have a “true zero”
- Population (Population of 0 = extinct)
- Temperature °K (the Kelvin scale)



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# Let's Practice!



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# On the Theory of Scales of Measurement



# Types of variables

TABLE 1

Scale	Basic Empirical Operations	Mathematical Group Structure	Permissible Statistics (invariantive)
NOMINAL	Determination of equality	<i>Permutation group</i> $x' = f(x)$ $f(x)$ means any one-to-one substitution	Number of cases Mode Contingency correlation
ORDINAL	Determination of greater or less	<i>Isotonic group</i> $x' = f(x)$ $f(x)$ means any monotonic increasing function	Median Percentiles
INTERVAL	Determination of equality of intervals or differences	<i>General linear group</i> $x' = ax + b$	Mean Standard deviation Rank-order correlation Product-moment correlation
RATIO	Determination of equality of ratios	<i>Similarity group</i> $x' = ax$	Coefficient of variation

# Race results



2:34:01

2:34:03

2:34:09

...

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# Quick summary

# Types of variables

- Independent vs. dependent variables
- Vaccine trial example
  - Independent = treatment (nominal)
  - Dependent = disease rate (ratio)

# Discrete vs. continuous

Variable Type	Discrete or Continuous?
Nominal	Discrete
Ordinal	Discrete
Interval	Continuous
Ratio	Continuous

# Summary

- Know your variable types!
- Nominal
- Ordinal
- Interval
- Ratio





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# Congratulations!