FORK 1002 Preparatory Course in Statistics:

3 Qualitative Explanatory Variables

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Contents:

Quantitative vs. Qualitative Variables

Quantitative Variables: Variables whose values can be ranked and compared in terms of distance. Examples:

- Wage, price, etc. (i.e. variables measured in money value)
- Years of education, travel time
- Temperature

Qualitative Variables: Variables whose values cannot be ranked and compared in terms of distance. Examples:

- Gender (man vs. woman)
- Region (e.g. north, west, south, east)
- Type of transport (e.g. train vs. bus)

Dummy Variables

How do we represent qualitative variables? Dummy variables!

- *Dummy Variable*: A variable that takes on two values, 0 or 1
- Example: Gender (man vs. woman), this produces two dummy variables

  $woman = 1$ when woman and 0 otherwise

  $man = 1$ when man and 0 otherwise
- Example: Means of transport (bike, bus or tram), this produces 3 dummy variables

  $bike = 1$ if person bikes and 0 otherwise
  $bus = 1$ if person takes bus and 0 otherwise

  $tram = 1$ if person takes tram and 0 otherwise
- Note: For technical reasons only $m - 1$ dummies can (in general) be included (due to the "dummy trap" issue), where m is the number of values/dummy variables

Combining Quantitative and Qualitative Variables

- Intercept dummies
- Slope dummies
- Intercept and slope dummies