# Equation Notation in R

*SDS 291*

Let's get familiar with how you might write the regression equation we're about to fit in R. We need to know a little bit of different notation for equations.

- `$`: begin and end the equation.
- `$$`: before and after the equation put the equation in the center of a new line
- `\`: precedes any symbol, accent, operator, or other non-text item
- `_`: subscript
- `^`: superscript
- `{}`: any text that gets an accent (e.g., see *hat*) or to denote explicitly a word after a subscript/superscript
- `\beta`: $\beta$
- `\epsilon`: $\epsilon$
- `\cdot`: $\cdot$ (e.g., `\cdot Mileage` is $\cdot Mileage$)
- `\bar{}`: $\bar{y}$
- `\hat{}`: $\hat{y}$ (e.g., `\hat{\beta}` is $\hat{\beta}$ )
- `\widehat{}`: $\widehat{}$(e.g., `\widehat{SmithCollege}` is $\widehat{SmithCollege}$)

Some other features that may be useful in the course:

- `\ne`: $\neq$ or not-equal-to
- `\pm`: $\pm$ or plus-or-minus
- `\frac{}{}`: a fraction, where the numerator is in the first set of brackets and the denominator is in the other
- `\sqrt{}`: $\sqrt{}$ square root

Examples:

- `$H_0: \beta_1 \ne 0$` is $H_0 : \beta_1 \neq 0$.
- `$y = \beta_0+\beta_1 \cdot Mileage+\epsilon$` results in $y = \beta_0 + \beta_1 \cdot Mileage + \epsilon$.
- `$y = \beta_0+\beta_1 \cdot Mileage+\epsilon$` results in $y = \beta_0 + \beta_1 \cdot Mileage + \epsilon$.
- `$$\hat{y} = \hat{\beta}_0+\hat{\beta}_1 \cdot Mileage$$` results in

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 \cdot Mileage$$