

1) Slide 4 of Dr. Race's notes:

- Leaving out variables is not an option
- Offers a mechanism to deal with multicollinearity such that you can keep all of the raw variables in the model
- It is difficult to determine which variables to leave out
- There are more variables than observations in the data set
- You don't feel like taking the time to determine which variables are important or whether or not you have multicollinearity before starting modeling.

2) Ridge regression: 2 norm form of penalty (Slide 12 of Dr. Race's notes).

$$\lambda \sum_{j=1}^p \beta_j^2$$

Lasso: 1 norm form of penalty (Slide 23 of Dr. Race's notes).

$$\lambda \sum_{j=1}^p |\beta_j|$$

3) Ridge: All of the input variables likely to stay in the model without the problem of overfitting; consider using this technique if simplicity is not as important as generalizability (slide 17 and 31 of Dr. Race's notes).

Lasso: Technique can actually be used for variable selection i.e. all of the variables will not stay in the model; if simplicity of the model is desired use this technique (Slide 24-25, 32 of Dr. Race's notes).