STA 314 - Tutorial 10

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Agenda

1. AI in Industry Video
2. Ridge Regression
3. ISLR 6.6 Lab 2: Ridge Regresssion and the LASSO

AI in Industry - Rubikloud

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How retailers are using AI

https://www.cnbc.com/video/2017/05/16/how-retailers-are-using-ai.html

Ridge Regression

$$\text{LASSO}: \sum_{i=1}^{n}\left(y_i - \beta_0 - \sum_{j=1}^{p}\beta_j x_{i,j}\right)^2 + \lambda\sum_{j=1}^{p}|\beta_j|$$

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- Why do we not shrink β_0?
- Do you need to standardize the x variables?
- If x is a dummy variable (takes values 0,1) should you standardize it?

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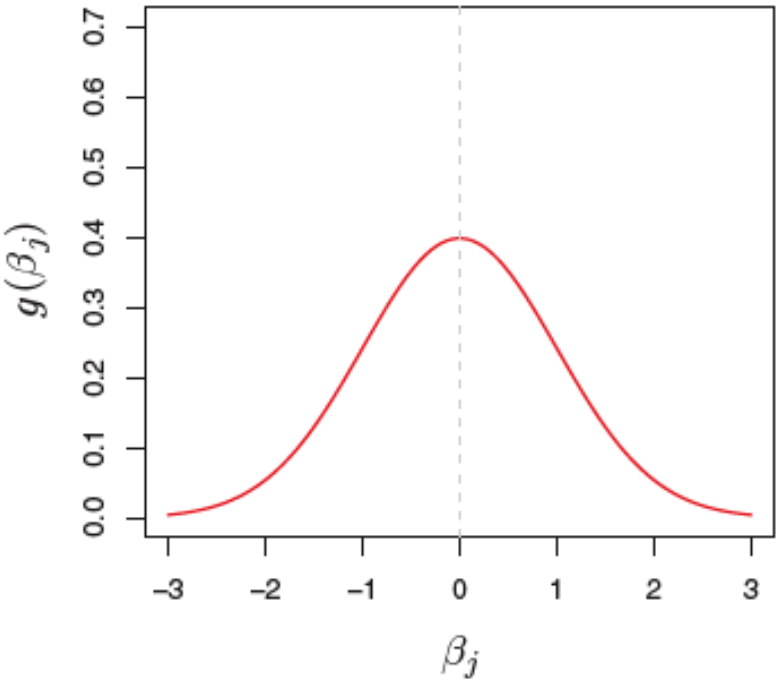
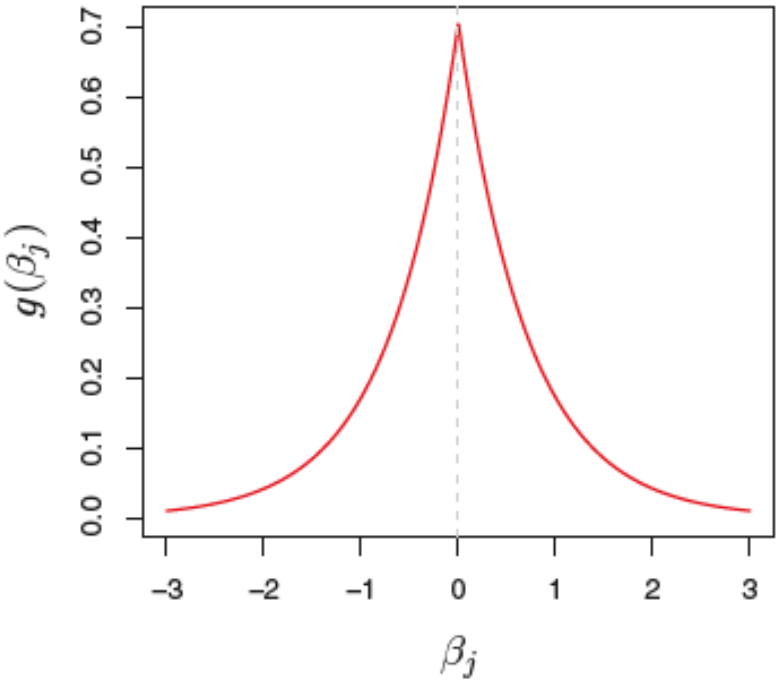
- Why do we not shrink β_0? **It's just the mean of the data when the covariates are 0, does not make sense to shrink.**
- Do you need to standardize the x variables? **Yes!**
- If x is a dummy variable (takes values 0,1) should you standardize it? **Unclear**

Bayesian Interpretation





- $p(\beta|X, Y) \propto f(Y|X, \beta)p(\beta)$
- **LASSO** - as if we put a Lapalace prior distribution on β and select the posterior mode as the solution
- **Ridge Regression** - as if we put a Normal prior distribution on β and select the posterior mode as the solution

ISLR 6.6 Lab 2: Ridge Regresssion and the LASSO

- Slightly different setup this time
- I will show you how to begin (import data/install packages)
- Everyone is to complete Lab at own pace, I will walk around to help and answer questions
- I will periodically stop the class and ask a question, please do your best to answer or listen to the student who is answering