

# MSAN 601: Linear Regression Analysis

## Quiz 4

by James D. Wilson (University of San Francisco)

There are 4 questions on this quiz. Each question is weighted equally. Grades will be out of 100 points. You have until 9:45. Good luck!

1. Write down 3 equivalent but different definitions of  $\hat{\beta}_{Ridge}$
2. Write down 2 equivalent but different definitions of  $\hat{\beta}_{LASSO}$
3. Let  $\hat{\beta}_1$  be the LASSO coefficient estimates when  $\lambda = 1$  and let  $\hat{\beta}_{100}$  be the LASSO coefficient estimates from the same data when  $\lambda = 100$ . What can we say about the L1-norm of  $\hat{\beta}_1$  vs. that of  $\hat{\beta}_{100}$ ?
4. For each method Ridge, LASSO, and OLS, discuss (briefly in 2 or fewer sentences) when you would use each method over the others. Be specific here, and note that simply saying to use LASSO or Ridge for prediction is not a complete answer!