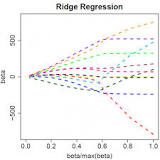
Can ridge regression have negative coefficients?



Note that for both ridge regression and the lasso the regression coefficients can move from positive to negative values as they are shrunk toward zero.

A negative coefficient suggests that as the independent variable increases, the dependent variable tends to decrease. The coefficient value signifies how much the mean of the dependent variable changes given a one-unit shift in the independent variable while holding other variables in the model constant.

The L2 penalty that is added to a ridge regression model has the effect of shrinking the regression coefficients closer to zero

The ridge penalty shrinks the regression coefficient estimate towards zero, but not exactly zero. For this reason, the ridge regression has long been criticized of not being able to perform variable selection.

Why will ridge regression not shrink some coefficients to zero like lasso?

It is said that because the shape of the constraint in LASSO is a diamond, the least squares solution obtained might touch the corner of the diamond such that it leads to a shrinkage of some variable. However, in ridge regression, because it is a circle, it will often not touch the axis x (which is zero)