analysis_crime_Torben

Louise Nygaard Christensen

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```
crime <- read_csv("crime.csv", col_types = cols()) %>%
  rename(rate = `crime rate`, not_hs = `not-hs`)
```

lm

```
crime_lm <- lm(rate ~ ., data = crime)
coef(crime_lm)
```

```
(Intercept)     funding          hs      not_hs     college    college4
489.6485970  10.9806703  -6.0885294   5.4803042   0.3770443   5.5004712
```

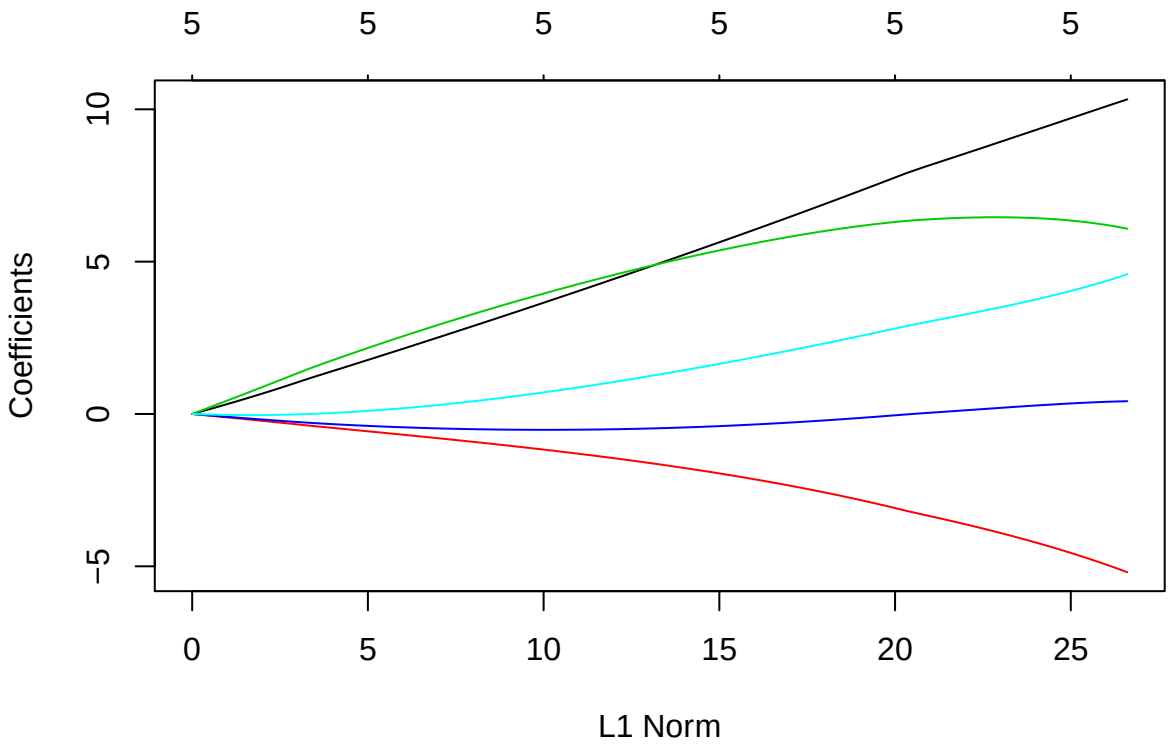
ridge

```
crime.ridge_ <- lm.ridge(rate ~ ., data = crime, lambda = seq(0, 100, 0.1))
crime.lambda <- crime.ridge_$lambda[which.min(crime.ridge_$GCV)]
crime.ridge <- lm.ridge(rate ~ ., data = crime, lambda = crime.lambda)
coef(crime.ridge)
```

```
                funding           hs       not_hs      college
465.49823474   8.14103367  -3.33486985   6.38516069   0.03419262
    college4
  3.02408444
```

```
## library(glmnet)
library(glmnetUtils)

plot(glmnet(rate ~ ., data = crime, alpha = 0))
```

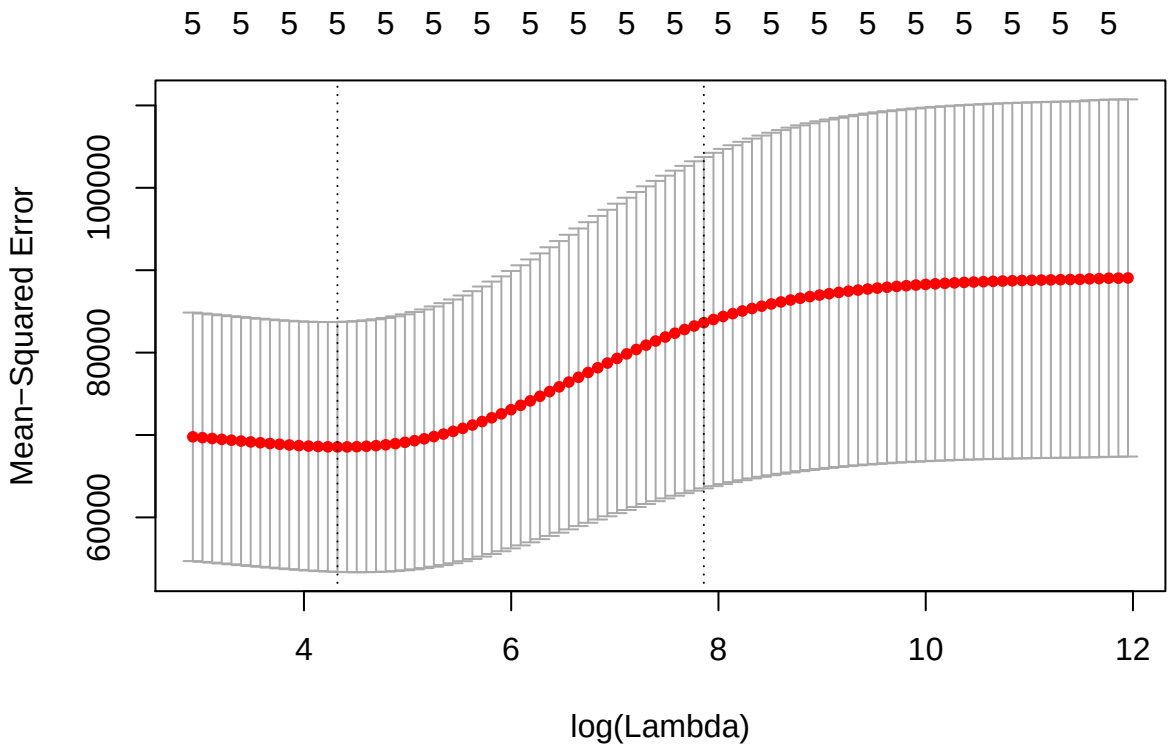



```
(crime_ridge_cv <- cv.glmnet(rate ~ ., data = crime, alpha = 0)) ## alpha = 0 (Ridge)
```

```
Call:
cv.glmnet.formula(formula = rate ~ ., data = crime, alpha = 0)

Model fitting options:
    Sparse model matrix: FALSE
    Use model.frame: FALSE
    Number of crossvalidation folds: 10
    Alpha: 0
    Deviance-minimizing lambda: 75.44439  (+1 SE): 2588.096
```

```
plot(crime_ridge_cv)
```

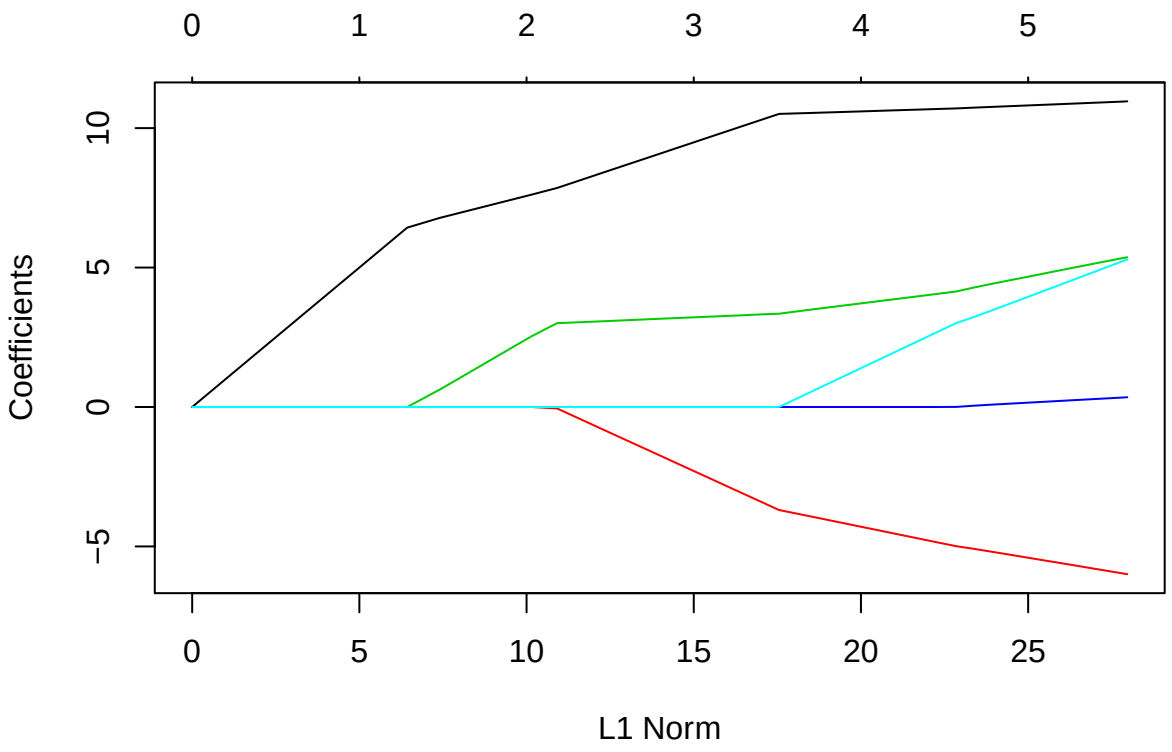



```
crime_ridge <- glmnet(rate ~ ., data = crime, alpha = 0, lambda = crime_ridge_cv$lambda.min)
coef(crime_ridge)
```

```
6 x 1 sparse Matrix of class "dgCMatrix"
                     s0
(Intercept) 461.1006597
funding       8.4618112
hs           -3.5570330
not_hs        6.4311409
college       0.1009805
college4      3.2153404
```

LASSO

```
plot(glmnet(rate ~ ., data = crime, alpha = 1))
```

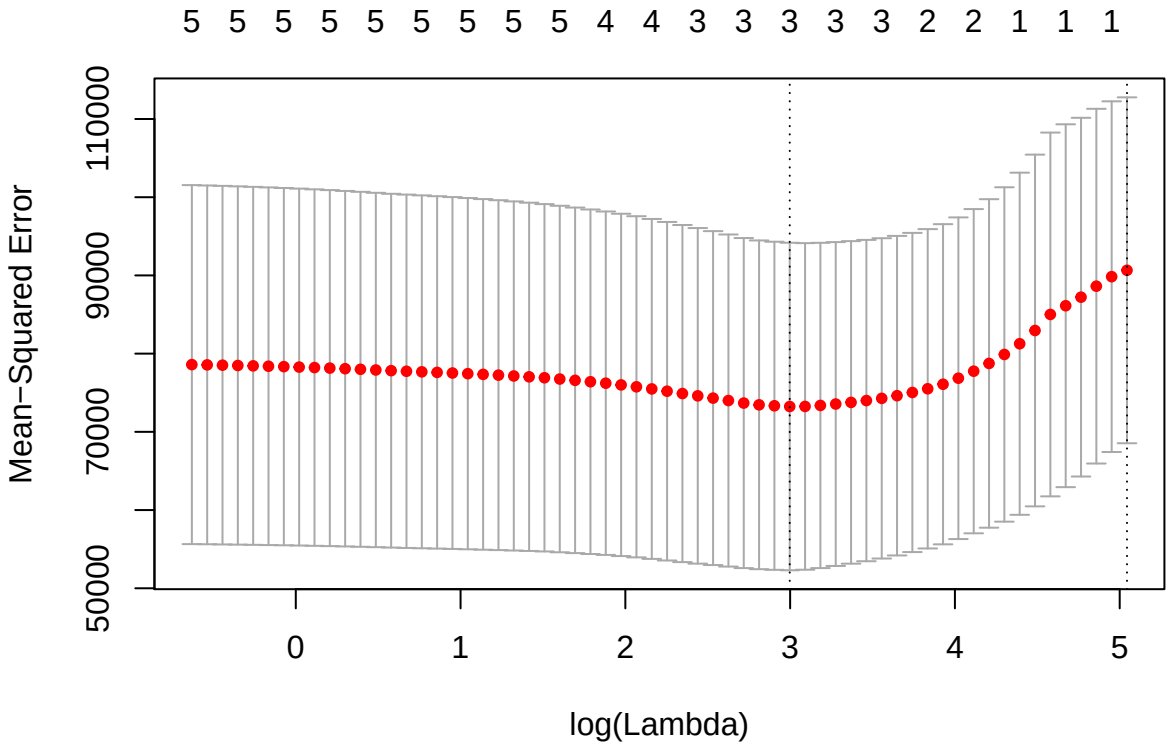



```
(crime_lasso_cv <- cv.glmnet(rate ~ ., data = crime, alpha = 1)) ## alpha = 1 (LASSO)
```

```
Call:
cv.glmnet.formula(formula = rate ~ ., data = crime, alpha = 1)

Model fitting options:
    Sparse model matrix: FALSE
    Use model.frame: FALSE
    Number of crossvalidation folds: 10
    Alpha: 1
    Deviance-minimizing lambda: 20.03869  (+1 SE): 155.1523
```

```
plot(crime_lasso_cv)
```




```
crime_lasso <- glmnet(rate ~ ., data = crime, alpha = 1, ## alpha = 0: LASSO
                              lambda = unlist(crime_lasso_cv[c("lambda.min", "lambda.1se")]))
(lasso_coef <- coef(crime_lasso))
```

```
6 x 2 sparse Matrix of class "dgCMatrix"
                s0         s1
(Intercept) 717.96 452.186252
funding          .    9.656911
hs               .   -2.527286
not_hs           .    3.229431
college          .    .
college4         .    .
```

```
lasso_coef %>% as.matrix() %>% abs() %>% colSums()
```

```
      s0       s1
717.9600 467.5999
```