```r
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
library(glmnet)
```

```
## Warning: package 'glmnet' was built under R version 4.0.5
```

```
## Loading required package: Matrix
```

```
## Loaded glmnet 4.1-2
```

```r
pres_train_X <- read.csv("project_pres_train_X.csv")
pres_train_y <- read.csv("project_pres_train_y.csv")
pres_test_X <- read.csv("project_pres_test_X.csv")
pres_test_y <- read.csv("project_pres_test_y.csv")

sen_train_X <- read.csv("project_sen_train_X.csv")
sen_train_y <- read.csv("project_sen_train_y.csv")
sen_test_X <- read.csv("project_sen_test_X.csv")

pres_train_X <- scale(select(pres_train_X, -X))
pres_train_y <- select(pres_train_y, -X)
pres_test_X <- scale(select(pres_test_X, -X))
pres_test_y <- select(pres_test_y, -X)
sen_train_X <- scale(select(sen_train_X, -X))
sen_train_y <- select(sen_train_y, -X)
sen_test_X <- scale(select(sen_test_X, -X))

pres_log <- glm(pres_train_y$pres2016 ~ pres_train_X - 1, family="binomial")
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```r
summary(pres_log)
```

```
##
## Call:
## glm(formula = pres_train_y$pres2016 ~ pres_train_X - 1, family = "binomial")
##
## Deviance Residuals:
##         Min          1Q      Median          3Q         Max
```

```
## -3.672e-06  -3.672e-06  -3.672e-06   2.110e-08   2.110e-08
##
## Coefficients: (1 not defined because of singularities)
##                                      Estimate Std. Error z value Pr(>|z|)
## pres_train_XRegion                   2.171e-10  3.533e+05       0        1
## pres_train_XX2010.Population         -1.437e-08  9.808e+06       0        1
## pres_train_Xpres2000                 -7.020e-10  5.184e+05       0        1
## pres_train_Xpres2004                  1.559e-09  1.067e+06       0        1
## pres_train_Xpres2008                  8.349e-10  7.036e+05       0        1
## pres_train_Xpres2012                  7.357e-10  6.148e+05       0        1
## pres_train_Xsen1.3rdrecent           -2.203e-10  1.682e+05       0        1
## pres_train_Xsen2.3rdrecent           -2.134e-10  2.956e+05       0        1
## pres_train_Xgdp                       1.508e-08  1.029e+07       0        1
## pres_train_Xhigh.school.pop           8.694e-10  1.100e+06       0        1
## pres_train_Xsome.college              9.599e-12  4.440e+05       0        1
## pres_train_Xassociates                2.761e-10  4.927e+05       0        1
## pres_train_Xbachelors                -1.240e-10  4.496e+05       0        1
## pres_train_Xgrad.professional         2.448e-09  2.009e+06       0        1
## pres_train_Xmedian.age               -3.701e-10  4.248e+05       0        1
## pres_train_Xamer.indian               2.653e-10  2.478e+05       0        1
## pres_train_Xasian                     1.323e-09  1.685e+06       0        1
## pres_train_Xblack                     4.244e-10  3.399e+05       0        1
## pres_train_Xhisp.latino               1.657e-09  1.302e+06       0        1
## pres_train_Xhawaiian.pi               1.596e-09  1.569e+06       0        1
## pres_train_Xother.race               -8.071e-10  7.218e+05       0        1
## pres_train_Xwhite                           NA         NA      NA       NA
## pres_train_Xinc.party                 3.332e-10  2.621e+05       0        1
## pres_train_Xinc.w.recent             -1.712e-10  2.057e+05       0        1
## pres_train_Xrep.finance               1.961e-10  2.004e+05       0        1
## pres_train_Xdem.finance              -1.188e-10  2.170e+05       0        1
## pres_train_Xmedian.hh.income         -2.415e-09  1.669e+06       0        1
## pres_train_Xrecent.five.polling.avg.16 -8.954e-10  6.807e+05       0        1
## pres_train_Xpolling.party.lead.16    -7.047e-10  5.638e+05       0        1
## pres_train_Xpvi                       1.012e-09  7.544e+05       0        1
## pres_train_Xparty.pvi                 3.182e+01  1.664e+06       0        1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 6.9315e+01  on 50  degrees of freedom
## Residual deviance: 4.0462e-10  on 20  degrees of freedom
## AIC: 60
##
## Number of Fisher Scoring iterations: 25
```

```r
pres_lasso <- glmnet(pres_train_X, pres_train_y$pres2016, family="binomial", intercept = F, alpha = 1)
summary(pres_lasso)
```

```
##           Length Class      Mode
## a0          74   -none-     numeric
## beta      2294   dgCMatrix  S4
## df          74   -none-     numeric
## dim          2   -none-     numeric
## lambda      74   -none-     numeric
## dev.ratio   74   -none-     numeric
```

```
## nulldev        1    -none-    numeric
## npasses        1    -none-    numeric
## jerr           1    -none-    numeric
## offset         1    -none-    logical
## classnames     2    -none-    character
## call           6    -none-    call
## nobs           1    -none-    numeric
```

```r
pres_ridge <- glmnet(pres_train_X, pres_train_y$pres2016, family="binomial", intercept = F, alpha = 0)
summary(pres_ridge)
```

```
##               Length Class      Mode
## a0              100   -none-    numeric
## beta           3100   dgCMatrix S4
## df              100   -none-    numeric
## dim               2   -none-    numeric
## lambda          100   -none-    numeric
## dev.ratio       100   -none-    numeric
## nulldev           1   -none-    numeric
## npasses           1   -none-    numeric
## jerr              1   -none-    numeric
## offset            1   -none-    logical
## classnames        2   -none-    character
## call              6   -none-    call
## nobs              1   -none-    numeric
```

```r
sen_log <- glm(sen_train_y$recent.res ~ sen_train_X - 1, family="binomial")
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```r
summary(sen_log)
```

```
##
## Call:
## glm(formula = sen_train_y$recent.res ~ sen_train_X - 1, family = "binomial")
##
## Deviance Residuals:
##          1           2           3           4           5           6
## -3.564e-06  -3.564e-06   2.110e-08   2.110e-08   2.110e-08   2.110e-08
##          7           8           9          10          11          12
## -3.564e-06   2.110e-08  -3.564e-06  -3.564e-06  -3.564e-06  -3.564e-06
##         13          14          15          16          17          18
## -3.564e-06  -3.564e-06   2.110e-08   2.110e-08   2.110e-08   2.110e-08
##         19          20          21          22          23          24
## -3.564e-06  -3.564e-06  -3.564e-06   2.110e-08   2.110e-08   2.110e-08
##         25          26          27          28          29          30
## -3.564e-06  -3.564e-06   2.110e-08   2.110e-08  -3.564e-06  -3.564e-06
##         31          32          33          34          35          36
## -3.564e-06  -3.564e-06  -3.564e-06   2.110e-08   2.110e-08  -3.564e-06
##         37
## -3.564e-06
##
```

```
## Coefficients: (3 not defined because of singularities)
##                                   Estimate Std. Error z value Pr(>|z|)
## sen_train_XRegion                  2.317e-06  7.434e+07       0        1
## sen_train_XX2020.Population       -3.197e-05  4.450e+08       0        1
## sen_train_Xpres2000               -4.122e-05  1.440e+08       0        1
## sen_train_Xpres2004                4.376e-05  1.303e+08       0        1
## sen_train_Xpres2008               -7.243e-06  1.169e+08       0        1
## sen_train_Xpres2012                4.799e-05  2.431e+08       0        1
## sen_train_Xpres2016               -8.431e-06  1.392e+08       0        1
## sen_train_Xpres2020               -3.080e-05  1.672e+08       0        1
## sen_train_Xsen1.recent            -5.083e-06  1.590e+08       0        1
## sen_train_Xsen2.recent             2.994e+01  1.470e+08       0        1
## sen_train_Xsen1.2ndrecent          3.391e-06  6.664e+07       0        1
## sen_train_Xsen2.2ndrecent          3.522e-05  7.836e+07       0        1
## sen_train_Xsen1.3rdrecent         -2.496e-06  2.319e+07       0        1
## sen_train_Xsen2.3rdrecent          5.147e-06  8.110e+07       0        1
## sen_train_Xgdp                     2.800e-05  4.209e+08       0        1
## sen_train_Xhigh.school.pop        -1.122e-05  1.756e+08       0        1
## sen_train_Xsome.college           -8.143e-06  1.186e+08       0        1
## sen_train_Xassociates             -5.692e-06  8.458e+07       0        1
## sen_train_Xbachelors              -6.987e-06  1.360e+08       0        1
## sen_train_Xgrad.professional      -1.518e-05  1.922e+08       0        1
## sen_train_Xmedian.age              6.037e-08  5.312e+07       0        1
## sen_train_Xamer.indian             1.265e-06  2.908e+07       0        1
## sen_train_Xasian                   9.908e-06  1.480e+08       0        1
## sen_train_Xblack                  -8.524e-07  1.318e+07       0        1
## sen_train_Xhisp.latino             9.714e-06  1.311e+08       0        1
## sen_train_Xhawaiian.pi            -1.286e-05  1.405e+08       0        1
## sen_train_Xother.race             -1.252e-05  1.404e+08       0        1
## sen_train_Xwhite                         NA         NA      NA       NA
## sen_train_Xinc.party              -2.088e-06  5.115e+07       0        1
## sen_train_Xinc.w.recent            2.945e-06  3.794e+07       0        1
## sen_train_Xrep.finance             1.464e-06  2.897e+07       0        1
## sen_train_Xdem.finance            -3.199e-06  5.504e+07       0        1
## sen_train_Xmedian.hh.income        9.751e-06  1.478e+08       0        1
## sen_train_Xrecent.five.polling.avg 9.063e-07  4.575e+07       0        1
## sen_train_Xpolling.party.lead            NA         NA      NA       NA
## sen_train_Xpvi                    -3.555e-06  9.468e+07       0        1
## sen_train_Xparty.pvi                     NA         NA      NA       NA
## sen_train_Xemployment.rate         2.097e-06  4.921e+07       0        1
## sen_train_Xurban.pct.2010         -3.817e-06  7.467e+07       0        1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 5.1293e+01  on 37  degrees of freedom
## Residual deviance: 2.6673e-10  on  1  degrees of freedom
## AIC: 72
##
## Number of Fisher Scoring iterations: 25
```

```r
sen_lasso <- glmnet(sen_train_X, sen_train_y$recent.res, family="binomial", intercept = F, alpha = 1)
summary(sen_lasso)
```

```
##           Length Class    Mode
```

```
## a0           100    -none-    numeric
## beta        3900    dgCMatrix S4
## df           100    -none-    numeric
## dim            2    -none-    numeric
## lambda       100    -none-    numeric
## dev.ratio    100    -none-    numeric
## nulldev        1    -none-    numeric
## npasses        1    -none-    numeric
## jerr           1    -none-    numeric
## offset         1    -none-    logical
## classnames     2    -none-    character
## call           6    -none-    call
## nobs           1    -none-    numeric
```

```r
sen_ridge <- glmnet(sen_train_X, sen_train_y$recent.res, family="binomial", intercept = F, alpha = 0)
summary(sen_ridge)
```

```
##             Length Class     Mode
## a0           100    -none-    numeric
## beta        3900    dgCMatrix S4
## df           100    -none-    numeric
## dim            2    -none-    numeric
## lambda       100    -none-    numeric
## dev.ratio    100    -none-    numeric
## nulldev        1    -none-    numeric
## npasses        1    -none-    numeric
## jerr           1    -none-    numeric
## offset         1    -none-    logical
## classnames     2    -none-    character
## call           6    -none-    call
## nobs           1    -none-    numeric
```