

Exploratory Analysis

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```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.0 --
## v ggplot2 3.2.1      v purrr  0.3.3
## v tibble  2.1.3      v dplyr  0.8.4
## v tidyr   1.0.2      v stringr 1.4.0
## v readr   1.3.1      v forcats 0.4.0

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()

library(readr)
library(foreign)
library(nnet)
library(ggplot2)
```

Consider separate models for Motion for Summary Judgement and Motion to Dismiss

Reading in the data. All columns not specified use ReadR's default.

Many values specified as characters will be later converted to factors, if needed. (Additionally, the MUDAC_ID column is left as a CHAR across all datasets for simpler joining.)

```
train_dockets <- read_csv(
  "train_dockets.csv",
  col_types = cols(
    circuit = col_character(),
    district = col_character(),
    diversity_residence = col_character(),
    filers_county = col_character(),
    jurisdiction = col_character(),
    mudac_id = col_character(),
    nos_code = col_character(),
    office = col_character(),
    origin_at_filing = col_character(),
    pro_se = col_character(),
    settled = col_logical(),
    summary_judgment = col_logical()
  )
)

train_other_motions <-
  read_csv("train_other_motions.csv",
    col_types = cols(mudac_id = col_character()))
```

```

train_terminating_motions <-
  read_csv("train_terminating_motions.csv",
    col_types = cols(mudac_id = col_character()))

train_dockets <- read_csv("train_dockets.csv",
  col_types = cols(mudac_id = col_character()))

train_other_merge <- full_join(train_other_motions,train_dockets,by="mudac_id")
train_terminate_merge <- full_join(train_terminating_motions,train_dockets,by="mudac_id")

#settled
summary(glm(settled~ motion_type+ filing_party+filed_before_joined+decison+decided_before_joined+proceeding_precentile +
  circuit + district + office + nos_code + statute + requested_damages_amt +
  jury_demand + jurisdiction + diversity_residence + participants +
  plaintiffs + defendants + attorneys_listed + judges_assigned +
  informa_pauperis + class_action + arbitration_at_filing +
  origin_at_filing + filers_county + issue_joined + pretrial_conf +
  total_entry_count + before_ij_entry_count + after_ij_entry_count +
  year_filed + days_opened, family = binomial, data = train_other_merge))

##
## Call:
## glm(formula = settled ~ motion_type + filing_party + filed_before_joined +
##      decison + decided_before_joined + proceeding_precentile +
##      circuit + district + office + nos_code + statute + requested_damages_amt +
##      jury_demand + jurisdiction + diversity_residence + participants +
##      plaintiffs + defendants + attorneys_listed + judges_assigned +
##      informa_pauperis + class_action + arbitration_at_filing +
##      origin_at_filing + filers_county + issue_joined + pretrial_conf +
##      total_entry_count + before_ij_entry_count + after_ij_entry_count +
##      year_filed + days_opened, family = binomial, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -1.9884  -0.9150  -0.6127   1.1300   2.7727
##
## Coefficients:
##
##              Estimate Std. Error z value
## (Intercept)      -1.446e+00  1.140e+01  -0.127
## motion_typeMotion for Injunction      -3.259e-02  1.298e-01  -0.251
## motion_typeMotion for Protective Order    7.578e-01  9.311e-02   8.139
## motion_typeMotion for Temporary Restraining Order  5.424e-02  1.568e-01   0.346
## motion_typeMotion in Limine    1.853e-01  9.376e-02   1.976
## motion_typeMotion to Certify Class    3.486e-01  2.194e-01   1.589
## motion_typeMotion to Compel Arbitration  1.001e-01  2.635e-01   0.380
## motion_typeMotion to Compel Discovery    4.927e-01  9.060e-02   5.438
## filing_partyOther    2.846e-01  1.506e-01   1.890
## filing_partyPlaintiff  1.509e-01  3.151e-02   4.789
## filing_partyUnknown    1.157e-01  4.919e-02   2.352
## filed_before_joinedTRUE    2.628e-01  5.424e-02   4.845
## decisonDenied as Moot   -4.818e-02  6.003e-02  -0.803
## decisonGranted    7.444e-02  3.569e-02   2.086
## decisonGranted in Part  1.392e-01  4.208e-02   3.309
## decisonOther    3.695e-01  6.582e-02   5.613
## decided_before_joinedTRUE  -1.849e-01  5.355e-02  -3.454
## proceeding_precentile    5.906e-02  6.784e-02   0.871
## circuit    1.105e+00  7.281e-02  15.181
## district   -1.083e-01  8.033e-03 -13.483
## office     -2.806e-03  1.064e-02  -0.264
## nos_code   -4.641e-03  1.234e-02  -0.376
## statute15 USC 1681    1.145e+01  1.153e+02   0.099

```

## statute15 USC 1692	1.520e+00	5.680e-01	2.676
## statute20 USC 1400	5.995e-02	6.147e-01	0.098
## statute20 USC 1415	2.196e+00	7.678e-01	2.860
## statute20 USC 1681	4.125e-01	5.638e-01	0.732
## statute28 USC 1331	1.085e-01	4.482e-01	0.242
## statute28 USC 1332	-1.877e-01	4.679e-01	-0.401
## statute28 USC 1343	-3.508e-01	4.653e-01	-0.754
## statute28 USC 1391	5.948e-01	5.815e-01	1.023
## statute28 USC 1441	6.746e-01	6.238e-01	1.081
## statute28 USC 1446	1.039e-01	5.290e-01	0.196
## statute28 USC 1983	-1.956e-01	4.477e-01	-0.437
## statute28 USC 2201	2.414e-03	5.792e-01	0.004
## statute28 USC 451	2.337e-01	4.567e-01	0.512
## statute29 USC 1132	1.408e-01	7.416e-01	0.190
## statute29 USC 1441	-2.140e-01	4.513e-01	-0.474
## statute29 USC 201	8.146e-01	5.560e-01	1.465
## statute29 USC 203	-1.215e-02	5.798e-01	-0.021
## statute29 USC 206	9.699e-01	6.726e-01	1.442
## statute29 USC 2601	2.767e-01	4.758e-01	0.582
## statute29 USC 2611	5.253e-01	1.488e+00	0.353
## statute29 USC 2617	-5.956e-02	5.096e-01	-0.117
## statute29 USC 2661	1.403e-01	5.864e-01	0.239
## statute29 USC 621	3.975e-01	4.550e-01	0.874
## statute29 USC 623	-7.639e-02	5.463e-01	-0.140
## statute29 USC 626	-2.096e-01	5.621e-01	-0.373
## statute29 USC 633	4.215e-01	7.481e-01	0.563
## statute29 USC 791	1.064e+00	6.074e-01	1.752
## statute42 USC 12101	1.756e-02	4.534e-01	0.039
## statute42 USC 12117	5.366e-01	5.084e-01	1.056
## statute42 USC 12131	6.576e-01	5.260e-01	1.250
## statute42 USC 1973	1.269e+01	1.338e+02	0.095
## statute42 USC 1981	1.082e-01	4.505e-01	0.240
## statute42 USC 1985	1.189e-01	4.797e-01	0.248
## statute42 USC 2000	-1.166e-01	4.477e-01	-0.260
## statute42 USC 2003	5.170e-01	5.123e-01	1.009
## statute42 USC 3601	4.350e-01	4.706e-01	0.924
## requested_damages_amt	-2.609e-05	7.395e-06	-3.528
## jury_demandB	-3.007e-02	4.973e-02	-0.605
## jury_demandD	-3.392e-01	7.743e-02	-4.382
## jury_demandN	-5.665e-01	7.378e-02	-7.678
## jury_demandP	-7.120e-02	5.003e-02	-1.423
## jurisdiction	8.006e-01	6.109e-02	13.104
## diversity_residence	-1.827e-02	4.622e-03	-3.954
## participants	-4.189e-03	5.575e-03	-0.751
## plaintiffs	1.030e-02	6.035e-03	1.706
## defendants	-1.008e-02	6.341e-03	-1.589
## attorneys_listed	6.288e-02	4.239e-03	14.835
## judges_assigned	6.425e-02	1.252e-02	5.131
## informa_pauperisFP	-5.779e-01	5.983e-02	-9.660
## class_actionTRUE	-3.480e-01	1.008e-01	-3.452
## arbitration_at_filingE	-4.469e-01	1.959e-01	-2.281
## arbitration_at_filingM	1.757e+00	6.304e-01	2.788
## arbitration_at_filingV	-5.628e-01	1.902e-01	-2.959
## arbitration_at_filingY	-7.381e-01	5.026e-01	-1.468

## origin_at_filing	1.679e-01	1.682e-02	9.984
## filers_county	8.528e-07	1.247e-06	0.684
## issue_joinedTRUE	1.297e+00	3.936e-02	32.961
## pretrial_confTRUE	-7.181e-01	3.745e-02	-19.176
## total_entry_count	-5.592e-03	7.105e-04	-7.871
## before_ij_entry_count	2.447e-03	6.971e-04	3.510
## after_ij_entry_count	3.573e-03	7.084e-04	5.043
## year_filed	-1.328e-03	5.136e-03	-0.259
## days_opened	-1.203e-04	3.609e-05	-3.333
##	Pr(> z)		
## (Intercept)	0.899058		
## motion_typeMotion for Injunction	0.801687		
## motion_typeMotion for Protective Order	3.98e-16	***	
## motion_typeMotion for Temporary Restraining Order	0.729374		
## motion_typeMotion in Limine	0.048133	*	
## motion_typeMotion to Certify Class	0.112104		
## motion_typeMotion to Compel Arbitration	0.704014		
## motion_typeMotion to Compel Discovery	5.40e-08	***	
## filing_partyOther	0.058769	.	
## filing_partyPlaintiff	1.67e-06	***	
## filing_partyUnknown	0.018690	*	
## filed_before_joinedTRUE	1.27e-06	***	
## decisonDenied as Moot	0.422183		
## decisonGranted	0.036993	*	
## decisonGranted in Part	0.000938	***	
## decisonOther	1.99e-08	***	
## decided_before_joinedTRUE	0.000553	***	
## proceeding_precentile	0.384026		
## circuit	< 2e-16	***	
## district	< 2e-16	***	
## office	0.791925		
## nos_code	0.706918		
## statute15 USC 1681	0.920865		
## statute15 USC 1692	0.007456	**	
## statute20 USC 1400	0.922313		
## statute20 USC 1415	0.004242	**	
## statute20 USC 1681	0.464392		
## statute28 USC 1331	0.808645		
## statute28 USC 1332	0.688340		
## statute28 USC 1343	0.450845		
## statute28 USC 1391	0.306294		
## statute28 USC 1441	0.279492		
## statute28 USC 1446	0.844297		
## statute28 USC 1983	0.662133		
## statute28 USC 2201	0.996674		
## statute28 USC 451	0.608857		
## statute29 USC 1132	0.849394		
## statute29 USC 1441	0.635378		
## statute29 USC 201	0.142903		
## statute29 USC 203	0.983279		
## statute29 USC 206	0.149306		
## statute29 USC 2601	0.560870		
## statute29 USC 2611	0.724032		
## statute29 USC 2617	0.906965		

```

## statute29 USC 2661 0.810924
## statute29 USC 621 0.382318
## statute29 USC 623 0.888788
## statute29 USC 626 0.709237
## statute29 USC 633 0.573139
## statute29 USC 791 0.079801 .
## statute42 USC 12101 0.969098
## statute42 USC 12117 0.291168
## statute42 USC 12131 0.211241
## statute42 USC 1973 0.924398
## statute42 USC 1981 0.810154
## statute42 USC 1985 0.804146
## statute42 USC 2000 0.794613
## statute42 USC 2003 0.312898
## statute42 USC 3601 0.355346
## requested_damages_amt 0.000418 ***
## jury_demandB 0.545384
## jury_demandD 1.18e-05 ***
## jury_demandN 1.61e-14 ***
## jury_demandP 0.154727
## jurisdiction < 2e-16 ***
## diversity_residence 7.70e-05 ***
## participants 0.452397
## plaintiffs 0.088013 .
## defendants 0.111978
## attorneys_listed < 2e-16 ***
## judges_assigned 2.89e-07 ***
## informa_pauperisFP < 2e-16 ***
## class_actionTRUE 0.000556 ***
## arbitration_at_filingE 0.022538 *
## arbitration_at_filingM 0.005311 **
## arbitration_at_filingV 0.003086 **
## arbitration_at_filingY 0.142002
## origin_at_filing < 2e-16 ***
## filers_county 0.494109
## issue_joinedTRUE < 2e-16 ***
## pretrial_confTRUE < 2e-16 ***
## total_entry_count 3.52e-15 ***
## before_ij_entry_count 0.000448 ***
## after_ij_entry_count 4.58e-07 ***
## year_filed 0.795924
## days_opened 0.000858 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 35836 on 27583 degrees of freedom
## Residual deviance: 31835 on 27498 degrees of freedom
## (57871 observations deleted due to missingness)
## AIC: 32007
##
## Number of Fisher Scoring iterations: 10

```

```
summary(glm(settled~ motion_type+ filing_party+filed_before_joined+decison+decided_before_joined+proceeding_precentile +
```

```
##
## Call:
## glm(formula = settled ~ motion_type + filing_party + filed_before_joined +
##      decision + decided_before_joined + proceeding_precentile +
##      circuit + district + office + nos_code + protected_class +
##      requested_damages_amt + jury_demand + jurisdiction + diversity_residence +
##      participants + plaintiffs + defendants + attorneys_listed +
##      judges_assigned + informa_pauperis + class_action + arbitration_at_filing +
##      origin_at_filing + filers_county + issue_joined + pretrial_conf +
##      total_entry_count + before_ij_entry_count + after_ij_entry_count +
##      year_filed + days_opened, family = binomial, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.0984  -0.9280  -0.5638   1.0768   2.8841
##
## Coefficients:
##
##              Estimate Std. Error z value
## (Intercept)      1.831e+02  2.812e+01  6.513
## motion_typeMotion for Injunction      -1.635e-01  3.554e-01  -0.460
## motion_typeMotion for Protective Order       7.844e-01  2.128e-01  3.686
## motion_typeMotion for Temporary Restraining Order  6.748e-01  4.210e-01  1.603
## motion_typeMotion in Limine       1.360e-01  2.182e-01  0.623
## motion_typeMotion to Certify Class       1.003e+00  5.955e-01  1.685
## motion_typeMotion to Compel Arbitration       9.560e-01  4.360e-01  2.193
## motion_typeMotion to Compel Discovery       3.690e-01  2.065e-01  1.787
## filing_partyOther       1.536e-01  4.175e-01  0.368
## filing_partyPlaintiff       2.761e-01  7.644e-02  3.612
## filing_partyUnknown       3.694e-02  1.262e-01  0.293
## filed_before_joinedTRUE      -4.367e-02  1.469e-01  -0.297
## decisonDenied as Moot       1.455e-01  1.427e-01  1.020
## decisonGranted      -1.700e-02  8.892e-02  -0.191
## decisonGranted in Part       1.320e-01  1.032e-01  1.278
## decisonOther       2.316e-01  1.690e-01  1.370
## decided_before_joinedTRUE       2.001e-01  1.465e-01  1.366
## proceeding_precentile       1.656e-01  1.659e-01  0.998
## circuit       1.174e+00  1.739e-01  6.752
## district      -1.247e-01  1.945e-02  -6.410
## office      -7.227e-03  2.477e-02  -0.292
## nos_code     -9.581e-02  3.119e-02  -3.072
## protected_classDisability       1.170e-01  1.254e-01  0.933
## protected_classNational Origin     -5.190e-01  1.421e+00  -0.365
## protected_classRace      -1.981e-01  1.054e-01  -1.880
## protected_classReligion       9.668e-01  6.141e-01  1.574
## protected_classSex      -1.216e-01  1.193e-01  -1.019
## requested_damages_amt     -2.080e-05  2.002e-05  -1.039
## jury_demandB       7.024e-01  1.326e-01  5.298
## jury_demandD       5.651e-01  2.277e-01  2.481
## jury_demandN       6.455e-01  1.653e-01  3.905
## jury_demandP       6.125e-01  1.242e-01  4.931
## jurisdiction       8.794e-01  1.050e-01  8.371
## diversity_residence     -2.251e-02  9.608e-03  -2.342
```

## participants	3.177e-02	3.060e-02	1.038
## plaintiffs	-2.927e-02	3.229e-02	-0.907
## defendants	-6.974e-02	3.672e-02	-1.899
## attorneys_listed	9.578e-02	1.460e-02	6.561
## judges_assigned	1.716e-01	3.194e-02	5.373
## informa_pauperisFP	-4.043e-01	1.328e-01	-3.044
## class_actionTRUE	-3.367e-01	2.498e-01	-1.348
## arbitration_at_filingE	5.548e-01	4.272e-01	1.299
## arbitration_at_filingV	-1.581e+00	5.031e-01	-3.142
## arbitration_at_filingY	2.154e-01	7.440e-01	0.289
## origin_at_filing	1.374e-01	4.950e-02	2.777
## filers_county	1.561e-06	2.845e-06	0.549
## issue_joinedTRUE	1.276e+00	9.758e-02	13.071
## pretrial_confTRUE	-3.874e-01	9.643e-02	-4.018
## total_entry_count	-6.808e-03	1.943e-03	-3.503
## before_ij_entry_count	1.349e-03	2.017e-03	0.669
## after_ij_entry_count	3.979e-03	1.913e-03	2.080
## year_filed	-7.312e-02	1.283e-02	-5.698
## days_opened	-9.559e-04	1.199e-04	-7.972
##	Pr(> z)		
## (Intercept)	7.35e-11	***	
## motion_typeMotion for Injunction	0.645448		
## motion_typeMotion for Protective Order	0.000228	***	
## motion_typeMotion for Temporary Restraining Order	0.109021		
## motion_typeMotion in Limine	0.533085		
## motion_typeMotion to Certify Class	0.092064	.	
## motion_typeMotion to Compel Arbitration	0.028341	*	
## motion_typeMotion to Compel Discovery	0.073985	.	
## filing_partyOther	0.712924		
## filing_partyPlaintiff	0.000304	***	
## filing_partyUnknown	0.769644		
## filed_before_joinedTRUE	0.766330		
## decisonDenied as Moot	0.307767		
## decisonGranted	0.848380		
## decisonGranted in Part	0.201097		
## decisonOther	0.170613		
## decided_before_joinedTRUE	0.172074		
## proceeding_precentile	0.318282		
## circuit	1.45e-11	***	
## district	1.46e-10	***	
## office	0.770458		
## nos_code	0.002128	**	
## protected_classDisability	0.351010		
## protected_classNational Origin	0.714840		
## protected_classRace	0.060167	.	
## protected_classReligion	0.115419		
## protected_classSex	0.308094		
## requested_damages_amt	0.298847		
## jury_demandB	1.17e-07	***	
## jury_demandD	0.013087	*	
## jury_demandN	9.43e-05	***	
## jury_demandP	8.19e-07	***	
## jurisdiction	< 2e-16	***	
## diversity_residence	0.019157	*	

```

## participants                                0.299141
## plaintiffs                                0.364656
## defendants                                0.057540 .
## attorneys_listed                          5.34e-11 ***
## judges_assigned                          7.75e-08 ***
## informa_pauperisFP                       0.002334 **
## class_actionTRUE                         0.177642
## arbitration_at_filingE                   0.194070
## arbitration_at_filingV                   0.001679 **
## arbitration_at_filingY                   0.772240
## origin_at_filing                         0.005491 **
## filers_county                            0.583341
## issue_joinedTRUE                         < 2e-16 ***
## pretrial_confTRUE                       5.87e-05 ***
## total_entry_count                        0.000460 ***
## before_ij_entry_count                    0.503650
## after_ij_entry_count                     0.037488 *
## year_filed                              1.21e-08 ***
## days_opened                             1.56e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 6223.3 on 4658 degrees of freedom
## Residual deviance: 5394.4 on 4606 degrees of freedom
## (80796 observations deleted due to missingness)
## AIC: 5500.4
##
## Number of Fisher Scoring iterations: 5
##
##summary_judgement
summary(glm(summary_judgment~motion_type+ filing_party+filed_before_joined+decison+decided_before_joined
##
## Call:
## glm(formula = summary_judgment ~ motion_type + filing_party +
##      filed_before_joined + decison + decided_before_joined + proceeding_precentile +
##      circuit + district + office + nos_code + statute + requested_damages_amt +
##      jury_demand + jurisdiction + diversity_residence + participants +
##      plaintiffs + defendants + attorneys_listed + judges_assigned +
##      informa_pauperis + class_action + arbitration_at_filing +
##      origin_at_filing + filers_county + issue_joined + pretrial_conf +
##      total_entry_count + before_ij_entry_count + after_ij_entry_count +
##      year_filed + days_opened, family = binomial, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -1.9117  -0.5816  -0.3596  -0.1627   3.1858
##
## Coefficients:
##
##              Estimate Std. Error z value
## (Intercept)      -5.157e+01  1.424e+01  -3.621
## motion_typeMotion for Injunction      -4.820e-01  1.322e-01  -3.646
## motion_typeMotion for Protective Order     -9.588e-02  9.534e-02  -1.006

```


## motion_typeMotion for Temporary Restraining Order	-1.677e-01	1.517e-01	-1.105
## motion_typeMotion in Limine	-1.421e+00	1.048e-01	-13.552
## motion_typeMotion to Certify Class	3.572e-02	2.481e-01	0.144
## motion_typeMotion to Compel Arbitration	-2.687e+00	5.270e-01	-5.097
## motion_typeMotion to Compel Discovery	6.678e-02	9.082e-02	0.735
## filing_partyOther	3.986e-01	2.025e-01	1.968
## filing_partyPlaintiff	-1.668e-02	4.130e-02	-0.404
## filing_partyUnknown	1.282e-01	6.155e-02	2.082
## filed_before_joinedTRUE	2.686e-01	6.410e-02	4.190
## decisonDenied as Moot	6.521e-02	6.928e-02	0.941
## decisonGranted	-3.930e-01	4.540e-02	-8.657
## decisonGranted in Part	-2.910e-01	5.589e-02	-5.207
## decisonOther	-4.932e-01	8.571e-02	-5.754
## decided_before_joinedTRUE	-2.988e-01	6.396e-02	-4.672
## proceeding_precentile	4.473e-01	8.262e-02	5.414
## circuit	-4.484e-01	9.079e-02	-4.939
## district	2.107e-02	1.005e-02	2.096
## office	2.746e-02	1.316e-02	2.087
## nos_code	3.821e-02	1.479e-02	2.584
## statute15 USC 1681	-1.197e+01	1.787e+02	-0.067
## statute15 USC 1692	5.856e-01	6.031e-01	0.971
## statute20 USC 1400	-7.157e-01	6.682e-01	-1.071
## statute20 USC 1415	-3.263e-01	1.141e+00	-0.286
## statute20 USC 1681	-1.121e-01	6.168e-01	-0.182
## statute28 USC 1331	5.744e-02	4.434e-01	0.130
## statute28 USC 1332	-2.555e-01	4.754e-01	-0.537
## statute28 USC 1343	5.398e-01	4.659e-01	1.159
## statute28 USC 1391	-1.452e+00	8.799e-01	-1.650
## statute28 USC 1441	-1.108e-01	6.902e-01	-0.161
## statute28 USC 1446	4.109e-01	5.439e-01	0.755
## statute28 USC 1983	1.082e-01	4.422e-01	0.245
## statute28 USC 2201	9.503e-01	5.632e-01	1.687
## statute28 USC 451	-3.335e-02	4.582e-01	-0.073
## statute29 USC 1132	-3.800e-01	9.234e-01	-0.411
## statute29 USC 1441	-3.361e-02	4.488e-01	-0.075
## statute29 USC 201	-2.190e+00	1.115e+00	-1.964
## statute29 USC 203	3.510e-01	6.378e-01	0.550
## statute29 USC 206	2.154e-01	7.808e-01	0.276
## statute29 USC 2601	1.280e-01	4.967e-01	0.258
## statute29 USC 2611	-9.528e+00	2.291e+02	-0.042
## statute29 USC 2617	3.405e-01	5.411e-01	0.629
## statute29 USC 2661	-9.225e-01	8.733e-01	-1.056
## statute29 USC 621	-1.309e-03	4.573e-01	-0.003
## statute29 USC 623	1.256e-01	5.831e-01	0.215
## statute29 USC 626	5.267e-01	6.028e-01	0.874
## statute29 USC 633	3.413e-01	8.491e-01	0.402
## statute29 USC 791	-5.127e-01	6.728e-01	-0.762
## statute42 USC 12101	3.516e-02	4.521e-01	0.078
## statute42 USC 12117	4.143e-01	5.454e-01	0.760
## statute42 USC 12131	2.863e-01	5.537e-01	0.517
## statute42 USC 1973	-1.192e+01	2.247e+02	-0.053
## statute42 USC 1981	1.972e-01	4.468e-01	0.441
## statute42 USC 1985	-9.679e-01	5.684e-01	-1.703
## statute42 USC 2000	2.796e-01	4.422e-01	0.632

## statute42 USC 2003	-3.000e-01	5.470e-01	-0.548
## statute42 USC 3601	-7.054e-01	4.935e-01	-1.429
## requested_damages_amt	1.896e-05	8.816e-06	2.151
## jury_demandB	-2.191e-01	6.413e-02	-3.417
## jury_demandD	1.734e-01	9.631e-02	1.801
## jury_demandN	3.448e-01	8.148e-02	4.232
## jury_demandP	4.572e-02	6.253e-02	0.731
## jurisdiction	3.170e-01	7.295e-02	4.345
## diversity_residence	-7.259e-03	5.490e-03	-1.322
## participants	-5.500e-02	8.375e-03	-6.567
## plaintiffs	5.859e-02	8.959e-03	6.540
## defendants	7.723e-02	9.268e-03	8.334
## attorneys_listed	-7.414e-02	6.508e-03	-11.392
## judges_assigned	-8.316e-03	1.622e-02	-0.513
## informa_pauperisFP	3.178e-01	5.815e-02	5.465
## class_actionTRUE	-4.698e-01	1.297e-01	-3.622
## arbitration_at_filingE	-4.013e-01	2.523e-01	-1.591
## arbitration_at_filingM	3.747e-01	7.871e-01	0.476
## arbitration_at_filingV	5.239e-01	1.963e-01	2.669
## arbitration_at_filingY	-9.775e-01	7.838e-01	-1.247
## origin_at_filing	-2.309e-02	2.308e-02	-1.001
## filers_county	-9.850e-07	1.641e-06	-0.600
## issue_joinedTRUE	-2.171e+00	5.795e-02	-37.470
## pretrial_confTRUE	4.708e-01	6.283e-02	7.492
## total_entry_count	-1.950e-02	1.962e-03	-9.942
## before_ij_entry_count	1.706e-02	1.867e-03	9.141
## after_ij_entry_count	1.948e-02	1.976e-03	9.854
## year_filed	1.773e-02	6.536e-03	2.713
## days_opened	2.970e-04	5.051e-05	5.881
##	Pr(> z)		
## (Intercept)	0.000293	***	
## motion_typeMotion for Injunction	0.000267	***	
## motion_typeMotion for Protective Order	0.314607		
## motion_typeMotion for Temporary Restraining Order	0.268967		
## motion_typeMotion in Limine	< 2e-16	***	
## motion_typeMotion to Certify Class	0.885508		
## motion_typeMotion to Compel Arbitration	3.44e-07	***	
## motion_typeMotion to Compel Discovery	0.462112		
## filing_partyOther	0.049061	*	
## filing_partyPlaintiff	0.686272		
## filing_partyUnknown	0.037341	*	
## filed_before_joinedTRUE	2.79e-05	***	
## decisonDenied as Moot	0.346588		
## decisonGranted	< 2e-16	***	
## decisonGranted in Part	1.92e-07	***	
## decisonOther	8.69e-09	***	
## decided_before_joinedTRUE	2.98e-06	***	
## proceeding_precentile	6.16e-08	***	
## circuit	7.87e-07	***	
## district	0.036069	*	
## office	0.036922	*	
## nos_code	0.009771	**	
## statute15 USC 1681	0.946609		
## statute15 USC 1692	0.331581		

## statute20 USC 1400	0.284102
## statute20 USC 1415	0.774849
## statute20 USC 1681	0.855775
## statute28 USC 1331	0.896944
## statute28 USC 1332	0.590957
## statute28 USC 1343	0.246622
## statute28 USC 1391	0.098954 .
## statute28 USC 1441	0.872450
## statute28 USC 1446	0.450010
## statute28 USC 1983	0.806767
## statute28 USC 2201	0.091526 .
## statute28 USC 451	0.941985
## statute29 USC 1132	0.680711
## statute29 USC 1441	0.940298
## statute29 USC 201	0.049564 *
## statute29 USC 203	0.582096
## statute29 USC 206	0.782661
## statute29 USC 2601	0.796589
## statute29 USC 2611	0.966822
## statute29 USC 2617	0.529154
## statute29 USC 2661	0.290787
## statute29 USC 621	0.997716
## statute29 USC 623	0.829396
## statute29 USC 626	0.382242
## statute29 USC 633	0.687681
## statute29 USC 791	0.446065
## statute42 USC 12101	0.938010
## statute42 USC 12117	0.447460
## statute42 USC 12131	0.605112
## statute42 USC 1973	0.957683
## statute42 USC 1981	0.658944
## statute42 USC 1985	0.088592 .
## statute42 USC 2000	0.527131
## statute42 USC 2003	0.583421
## statute42 USC 3601	0.152902
## requested_damages_amt	0.031465 *
## jury_demandB	0.000634 ***
## jury_demandD	0.071727 .
## jury_demandN	2.32e-05 ***
## jury_demandP	0.464644
## jurisdiction	1.39e-05 ***
## diversity_residence	0.186091
## participants	5.14e-11 ***
## plaintiffs	6.14e-11 ***
## defendants	< 2e-16 ***
## attorneys_listed	< 2e-16 ***
## judges_assigned	0.608173
## informa_pauperisFP	4.62e-08 ***
## class_actionTRUE	0.000293 ***
## arbitration_at_filingE	0.111683
## arbitration_at_filingM	0.634035
## arbitration_at_filingV	0.007615 **
## arbitration_at_filingY	0.212331
## origin_at_filing	0.317000

```

## filers_county                                0.548365
## issue_joinedTRUE                             < 2e-16 ***
## pretrial_confTRUE                           6.77e-14 ***
## total_entry_count                            < 2e-16 ***
## before_ij_entry_count                       < 2e-16 ***
## after_ij_entry_count                        < 2e-16 ***
## year_filed                                  0.006667 **
## days_opened                                 4.09e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 27310  on 27583  degrees of freedom
## Residual deviance: 21206  on 27498  degrees of freedom
## (57871 observations deleted due to missingness)
## AIC: 21378
##
## Number of Fisher Scoring iterations: 11
summary(glm(summary_judgment~motion_type+ filing_party+filed_before_joined+decison+decided_before_joined
##
## Call:
## glm(formula = summary_judgment ~ motion_type + filing_party +
##      filed_before_joined + decison + decided_before_joined + proceeding_precentile +
##      circuit + district + office + nos_code + protected_class +
##      requested_damages_amt + jury_demand + jurisdiction + diversity_residence +
##      participants + plaintiffs + defendants + attorneys_listed +
##      judges_assigned + informa_pauperis + class_action + arbitration_at_filing +
##      origin_at_filing + filers_county + issue_joined + pretrial_conf +
##      total_entry_count + before_ij_entry_count + after_ij_entry_count +
##      year_filed + days_opened, family = binomial, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.0241  -0.6245  -0.3748  -0.0799   3.2987
##
## Coefficients:
##
##              Estimate Std. Error z value
## (Intercept)      -9.927e+01  3.453e+01  -2.875
## motion_typeMotion for Injunction      -1.012e+00  4.081e-01  -2.479
## motion_typeMotion for Protective Order     -3.460e-01  2.239e-01  -1.546
## motion_typeMotion for Temporary Restraining Order -1.434e+00  5.844e-01  -2.454
## motion_typeMotion in Limine      -1.460e+00  2.531e-01  -5.768
## motion_typeMotion to Certify Class      -1.851e-01  7.198e-01  -0.257
## motion_typeMotion to Compel Arbitration     -2.982e+00  7.781e-01  -3.833
## motion_typeMotion to Compel Discovery      -7.806e-02  2.137e-01  -0.365
## filing_partyOther      -1.042e-01  5.195e-01  -0.201
## filing_partyPlaintiff     -2.992e-01  9.640e-02  -3.104
## filing_partyUnknown      -1.097e-01  1.536e-01  -0.715
## filed_before_joinedTRUE       1.374e-01  1.722e-01   0.798
## decisonDenied as Moot       2.434e-01  1.652e-01   1.474
## decisonGranted      -3.610e-01  1.107e-01  -3.260
## decisonGranted in Part     -2.360e-02  1.269e-01  -0.186

```

## decisonOther	-2.616e-01	2.072e-01	-1.263
## decided_before_joinedTRUE	7.474e-02	1.706e-01	0.438
## proceeding_precentile	3.542e-01	1.944e-01	1.823
## circuit	4.798e-02	2.064e-01	0.232
## district	9.129e-03	2.301e-02	0.397
## office	-4.459e-02	2.910e-02	-1.532
## nos_code	3.074e-02	3.987e-02	0.771
## protected_classDisability	-9.765e-02	1.595e-01	-0.612
## protected_classNational Origin	1.631e+00	1.430e+00	1.141
## protected_classRace	1.441e-01	1.311e-01	1.099
## protected_classReligion	-1.710e+00	8.473e-01	-2.018
## protected_classSex	-1.437e-03	1.497e-01	-0.010
## requested_damages_amt	-1.131e-06	2.413e-05	-0.047
## jury_demandB	-4.603e-01	1.649e-01	-2.791
## jury_demandD	-4.164e-01	2.792e-01	-1.491
## jury_demandN	-6.180e-02	2.024e-01	-0.305
## jury_demandP	-2.082e-01	1.523e-01	-1.367
## jurisdiction	2.585e-01	1.455e-01	1.777
## diversity_residence	-1.873e-02	1.242e-02	-1.508
## participants	-5.906e-02	5.547e-02	-1.065
## plaintiffs	-1.260e-02	6.721e-02	-0.187
## defendants	9.437e-02	6.015e-02	1.569
## attorneys_listed	-2.223e-01	2.298e-02	-9.674
## judges_assigned	4.926e-02	3.950e-02	1.247
## informa_pauperisFP	7.861e-02	1.366e-01	0.576
## class_actionTRUE	6.911e-01	3.514e-01	1.967
## arbitration_at_filingE	-1.368e+01	2.556e+02	-0.054
## arbitration_at_filingV	1.143e+00	4.581e-01	2.495
## arbitration_at_filingY	6.922e-02	1.162e+00	0.060
## origin_at_filing	-5.406e-02	5.842e-02	-0.925
## filers_county	5.826e-06	3.520e-06	1.655
## issue_joinedTRUE	-2.290e+00	1.428e-01	-16.035
## pretrial_confTRUE	7.432e-01	1.529e-01	4.861
## total_entry_count	-2.293e-02	4.930e-03	-4.651
## before_ij_entry_count	1.998e-02	4.535e-03	4.406
## after_ij_entry_count	2.374e-02	4.906e-03	4.840
## year_filed	4.218e-02	1.601e-02	2.634
## days_opened	6.603e-04	1.503e-04	4.393
##	Pr(> z)		
## (Intercept)	0.004045	**	
## motion_typeMotion for Injunction	0.013180	*	
## motion_typeMotion for Protective Order	0.122179		
## motion_typeMotion for Temporary Restraining Order	0.014146	*	
## motion_typeMotion in Limine	8.03e-09	***	
## motion_typeMotion to Certify Class	0.797058		
## motion_typeMotion to Compel Arbitration	0.000127	***	
## motion_typeMotion to Compel Discovery	0.714908		
## filing_partyOther	0.840993		
## filing_partyPlaintiff	0.001912	**	
## filing_partyUnknown	0.474912		
## filed_before_joinedTRUE	0.424787		
## decisonDenied as Moot	0.140554		
## decisonGranted	0.001114	**	
## decisonGranted in Part	0.852448		

```

## decisonOther                0.206674
## decided_before_joinedTRUE   0.661329
## proceeding_precentile       0.068366 .
## circuit                     0.816227
## district                    0.691603
## office                      0.125438
## nos_code                    0.440709
## protected_classDisability    0.540277
## protected_classNational Origin 0.253878
## protected_classRace          0.271968
## protected_classReligion      0.043564 *
## protected_classSex           0.992343
## requested_damages_amt        0.962603
## jury_demandB                 0.005253 **
## jury_demandD                 0.135867
## jury_demandN                 0.760167
## jury_demandP                 0.171505
## jurisdiction                  0.075531 .
## diversity_residence          0.131539
## participants                 0.287031
## plaintiffs                   0.851351
## defendants                   0.116665
## attorneys_listed              < 2e-16 ***
## judges_assigned              0.212329
## informa_pauperisFP           0.564875
## class_actionTRUE             0.049228 *
## arbitration_at_filingE       0.957329
## arbitration_at_filingV       0.012592 *
## arbitration_at_filingY       0.952490
## origin_at_filing             0.354746
## filers_county                0.097924 .
## issue_joinedTRUE             < 2e-16 ***
## pretrial_confTRUE            1.17e-06 ***
## total_entry_count            3.31e-06 ***
## before_ij_entry_count        1.05e-05 ***
## after_ij_entry_count         1.30e-06 ***
## year_filed                   0.008429 **
## days_opened                  1.12e-05 ***

```

```

## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

## (Dispersion parameter for binomial family taken to be 1)
##

```

```

## Null deviance: 4989.5 on 4658 degrees of freedom

```

```

## Residual deviance: 3822.6 on 4606 degrees of freedom

```

```

## (80796 observations deleted due to missingness)

```

```

## AIC: 3928.6

```

```

##

```

```

## Number of Fisher Scoring iterations: 14

```

```

#outcome

```

```

#outcome_lm <- multinom(outcome~motion_type+ filing_party+filed_before_joined+decison+decided_before_jo

```

```

#z <- summary(outcome_lm)$coefficients/summary(outcome_lm)$standard.errors

```

```

#z

#p <- (1 - pnorm(abs(z), 0, 1)) * 2
#p

district_settle <- glm(settled~district,data=train_other_merge)
summary(district_settle)

##
## Call:
## glm(formula = settled ~ district, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.4050  -0.3814  -0.3608   0.6156   0.6716
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.5318292  0.0139156   38.22  <2e-16 ***
## district    -0.0029489  0.0002611  -11.29  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.2342234)
##
##      Null deviance: 19861  on 84667  degrees of freedom
## Residual deviance: 19831  on 84666  degrees of freedom
## (787 observations deleted due to missingness)
## AIC: 117387
##
## Number of Fisher Scoring iterations: 2

logLik(district_settle)

## 'log Lik.' -58690.73 (df=3)

district_summary <- glm(summary_judgment~district,data=train_other_merge)
summary(district_summary)

##
## Call:
## glm(formula = summary_judgment ~ district, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.1973  -0.1861  -0.1846  -0.1793   0.8222
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.1455018  0.0111700   13.026  < 2e-16 ***
## district     0.0007512  0.0002096    3.584 0.000338 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.150915)

```

```

##
## Null deviance: 12779 on 84667 degrees of freedom
## Residual deviance: 12777 on 84666 degrees of freedom
## (787 observations deleted due to missingness)
## AIC: 80171
##
## Number of Fisher Scoring iterations: 2
logLik(district_summary)

## 'log Lik.' -40082.46 (df=3)
circuit_settle <-glm(settled~circuit,data=train_other_merge)
summary(circuit_settle)

##
## Call:
## glm(formula = settled ~ circuit, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.3828  -0.3770  -0.3711   0.6230   0.6289
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.336239   0.015608  21.542  <2e-16 ***
## circuit      0.005818   0.002283   2.548   0.0108 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.2345583)
##
## Null deviance: 19861 on 84667 degrees of freedom
## Residual deviance: 19859 on 84666 degrees of freedom
## (787 observations deleted due to missingness)
## AIC: 117508
##
## Number of Fisher Scoring iterations: 2
logLik(circuit_settle)

## 'log Lik.' -58751.22 (df=3)
circuit_summary <-glm(summary_judgment~circuit,data=train_other_merge)
summary(circuit_summary)

##
## Call:
## glm(formula = summary_judgment ~ circuit, data = train_other_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.1877  -0.1857  -0.1857  -0.1837   0.8164
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.171586   0.012521  13.704  <2e-16 ***

```



```

## circuit      0.002011  0.001832  1.098    0.272
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.1509357)
##
## Null deviance: 12779  on 84667  degrees of freedom
## Residual deviance: 12779  on 84666  degrees of freedom
## (787 observations deleted due to missingness)
## AIC: 80183
##
## Number of Fisher Scoring iterations: 2
logLik(district_summary)

## 'log Lik.' -40082.46 (df=3)
train_terminate_merge <- full_join(train_terminating_motions,train_dockets,by="mudac_id")
head(train_terminate_merge)

## # A tibble: 6 x 39
##   mudac_id motion_type filing_party filed_before_jo~ proceeding_prec~ circuit
##   <chr>    <chr>      <chr>      <lgl>                <dbl>    <dbl>
## 1 7730941~ Motion to ~ Defendant FALSE                0        7
## 2 7730941~ Motion to ~ Defendant FALSE                0        7
## 3 7730941~ Motion to ~ Unknown FALSE                0        7
## 4 7730941~ Motion to ~ Unknown FALSE                0        7
## 5 7730941~ Motion to ~ Defendant FALSE                0        7
## 6 7730941~ Motion to ~ Defendant FALSE                0        7
## # ... with 33 more variables: district <dbl>, office <dbl>, primarytitle <chr>,
## #   nos_code <dbl>, nos_text <chr>, statute <chr>, protected_class <chr>,
## #   additional_nos <chr>, requested_damages_amt <dbl>, jury_demand <chr>,
## #   jurisdiction <dbl>, diversity_residence <dbl>, participants <dbl>,
## #   plaintiffs <dbl>, defendants <dbl>, attorneys_listed <dbl>,
## #   judges_assigned <dbl>, pro_se <dbl>, informa_pauperis <chr>,
## #   class_action <lgl>, arbitration_at_filing <chr>, origin_at_filing <dbl>,
## #   filers_county <dbl>, issue_joined <lgl>, pretrial_conf <lgl>,
## #   total_entry_count <dbl>, before_ij_entry_count <dbl>,
## #   after_ij_entry_count <dbl>, year_filed <dbl>, days_opened <dbl>,
## #   outcome <chr>, summary_judgment <dbl>, settled <dbl>
summary(glm(settled~ motion_type+ filing_party+filed_before_joined+proceeding_precentile+circuit+district))

##
## Call:
## glm(formula = settled ~ motion_type + filing_party + filed_before_joined +
##   proceeding_precentile + circuit + district + office + nos_code +
##   statute + requested_damages_amt + jury_demand + jurisdiction +
##   diversity_residence + participants + plaintiffs + defendants +
##   attorneys_listed + judges_assigned + informa_pauperis + class_action +
##   arbitration_at_filing + origin_at_filing + filers_county +
##   issue_joined + pretrial_conf + total_entry_count + before_ij_entry_count +
##   after_ij_entry_count + year_filed + days_opened, family = binomial,
##   data = train_terminate_merge)
##
## Deviance Residuals:

```

```

##      Min      1Q   Median      3Q      Max
## -2.4142  -0.8203  -0.5516   1.0434   2.8343
##
## Coefficients:
##
##              Estimate Std. Error z value
## (Intercept)      -2.364e+00  7.402e+00  -0.319
## motion_typeMotion for Judgment on the Pleadings  1.904e-01  9.166e-02   2.078
## motion_typeMotion for Summary Judgment          2.360e-01  7.186e-02   3.284
## motion_typeMotion to Consolidate              -1.277e-01  1.017e-01  -1.255
## motion_typeMotion to Dismiss                  2.625e-01  7.010e-02   3.744
## motion_typeMotion to Remand                   3.881e-01  1.201e-01   3.232
## motion_typeMotion to Transfer Venue          -2.206e-01  1.073e-01  -2.055
## filing_partyOther                             2.272e-01  9.519e-02   2.387
## filing_partyPlaintiff                        3.406e-02  3.057e-02   1.114
## filing_partyUnknown                          9.242e-02  3.050e-02   3.030
## filed_before_joinedTRUE                     3.933e-01  2.313e-02  17.008
## proceeding_precentile                       -5.983e-01  2.954e-02 -20.250
## circuit                                       1.286e+00  4.615e-02  27.874
## district                                    -1.204e-01  5.090e-03 -23.654
## office                                       -1.642e-02  6.690e-03  -2.455
## nos_code                                    5.228e-02  7.551e-03   6.923
## statute15 USC 1681                          1.230e+01  8.873e+01   0.139
## statute15 USC 1692                         -8.592e-02  3.863e-01  -0.222
## statute20 USC 1400                         -9.517e-01  3.858e-01  -2.467
## statute20 USC 1415                         -6.255e-01  4.324e-01  -1.447
## statute20 USC 1681                         -6.304e-01  3.834e-01  -1.644
## statute28 USC 1331                         -4.358e-01  3.156e-01  -1.381
## statute28 USC 1332                         -5.758e-01  3.264e-01  -1.764
## statute28 USC 1343                         -7.609e-01  3.261e-01  -2.333
## statute28 USC 1391                         -6.845e-01  4.438e-01  -1.542
## statute28 USC 1441                         -8.119e-01  4.077e-01  -1.991
## statute28 USC 1446                         -7.988e-01  3.580e-01  -2.231
## statute28 USC 1983                         -5.943e-01  3.150e-01  -1.886
## statute28 USC 2201                         -3.663e-01  3.841e-01  -0.954
## statute28 USC 451                         -3.942e-01  3.229e-01  -1.221
## statute29 USC 1132                         -3.249e-01  4.668e-01  -0.696
## statute29 USC 1441                         -6.420e-01  3.171e-01  -2.024
## statute29 USC 201                          3.448e-01  3.921e-01   0.879
## statute29 USC 203                         -6.274e-01  4.369e-01  -1.436
## statute29 USC 206                          9.307e-01  4.849e-01   1.919
## statute29 USC 2601                         2.191e-01  3.314e-01   0.661
## statute29 USC 2611                         2.564e-01  1.041e+00   0.246
## statute29 USC 2617                        -2.396e-01  3.536e-01  -0.678
## statute29 USC 2661                         9.379e-02  3.864e-01   0.243
## statute29 USC 621                         -3.231e-01  3.215e-01  -1.005
## statute29 USC 623                         -5.529e-01  3.620e-01  -1.527
## statute29 USC 626                         -1.965e-01  3.796e-01  -0.518
## statute29 USC 633                         -7.485e-01  5.436e-01  -1.377
## statute29 USC 791                          1.750e-01  3.928e-01   0.446
## statute42 USC 12101                       -5.439e-01  3.191e-01  -1.704
## statute42 USC 12117                        4.896e-01  3.575e-01   1.370
## statute42 USC 12131                       -4.999e-02  3.456e-01  -0.145
## statute42 USC 1973                         2.258e+00  8.501e-01   2.656
## statute42 USC 1981                       -5.544e-01  3.174e-01  -1.747

```

## statute42 USC 1982	1.093e+01	6.832e+01	0.160
## statute42 USC 1985	-3.689e-01	3.416e-01	-1.080
## statute42 USC 2000	-4.778e-01	3.154e-01	-1.515
## statute42 USC 2003	-7.254e-01	3.491e-01	-2.078
## statute42 USC 3601	-3.582e-01	3.320e-01	-1.079
## requested_damages_amt	-2.684e-05	5.326e-06	-5.040
## jury_demandB	2.483e-01	3.497e-02	7.101
## jury_demandD	-8.954e-02	5.006e-02	-1.789
## jury_demandN	-5.420e-01	4.781e-02	-11.337
## jury_demandP	3.754e-02	3.431e-02	1.094
## jurisdiction	6.516e-01	4.830e-02	13.490
## diversity_residence	-1.777e-02	3.171e-03	-5.604
## participants	3.291e-02	3.489e-03	9.433
## plaintiffs	-1.996e-02	4.014e-03	-4.972
## defendants	-5.550e-02	3.776e-03	-14.698
## attorneys_listed	4.842e-02	2.741e-03	17.663
## judges_assigned	4.913e-02	8.746e-03	5.618
## informa_pauperisFP	-5.963e-01	3.438e-02	-17.345
## class_actionTRUE	-2.320e-01	6.946e-02	-3.341
## arbitration_at_filingE	-1.894e-01	1.186e-01	-1.597
## arbitration_at_filingM	6.949e-01	6.638e-01	1.047
## arbitration_at_filingV	1.064e-01	1.198e-01	0.888
## arbitration_at_filingY	-1.426e+00	4.382e-01	-3.253
## origin_at_filing	4.980e-02	1.065e-02	4.674
## filers_county	2.497e-06	7.229e-07	3.454
## issue_joinedTRUE	1.379e+00	2.518e-02	54.745
## pretrial_confTRUE	-1.842e-01	2.515e-02	-7.322
## total_entry_count	-5.462e-03	7.208e-04	-7.577
## before_ij_entry_count	3.167e-03	7.449e-04	4.251
## after_ij_entry_count	1.624e-03	7.195e-04	2.257
## year_filed	-1.320e-02	3.412e-03	-3.870
## days_opened	1.047e-04	2.874e-05	3.644
##	Pr(> z)		
## (Intercept)	0.749384		
## motion_typeMotion for Judgment on the Pleadings	0.037723	*	
## motion_typeMotion for Summary Judgment	0.001023	**	
## motion_typeMotion to Consolidate	0.209450		
## motion_typeMotion to Dismiss	0.000181	***	
## motion_typeMotion to Remand	0.001230	**	
## motion_typeMotion to Transfer Venue	0.039835	*	
## filing_partyOther	0.016993	*	
## filing_partyPlaintiff	0.265113		
## filing_partyUnknown	0.002444	**	
## filed_before_joinedTRUE	< 2e-16	***	
## proceeding_precentile	< 2e-16	***	
## circuit	< 2e-16	***	
## district	< 2e-16	***	
## office	0.014086	*	
## nos_code	4.41e-12	***	
## statute15 USC 1681	0.889730		
## statute15 USC 1692	0.823987		
## statute20 USC 1400	0.013633	*	
## statute20 USC 1415	0.147998		
## statute20 USC 1681	0.100126		

## statute28 USC 1331	0.167303
## statute28 USC 1332	0.077751 .
## statute28 USC 1343	0.019632 *
## statute28 USC 1391	0.122996
## statute28 USC 1441	0.046461 *
## statute28 USC 1446	0.025672 *
## statute28 USC 1983	0.059229 .
## statute28 USC 2201	0.340278
## statute28 USC 451	0.222196
## statute29 USC 1132	0.486487
## statute29 USC 1441	0.042950 *
## statute29 USC 201	0.379163
## statute29 USC 203	0.151065
## statute29 USC 206	0.054958 .
## statute29 USC 2601	0.508369
## statute29 USC 2611	0.805402
## statute29 USC 2617	0.498003
## statute29 USC 2661	0.808222
## statute29 USC 621	0.314929
## statute29 USC 623	0.126662
## statute29 USC 626	0.604774
## statute29 USC 633	0.168592
## statute29 USC 791	0.655872
## statute42 USC 12101	0.088339 .
## statute42 USC 12117	0.170832
## statute42 USC 12131	0.885005
## statute42 USC 1973	0.007901 **
## statute42 USC 1981	0.080680 .
## statute42 USC 1982	0.872931
## statute42 USC 1985	0.280242
## statute42 USC 2000	0.129799
## statute42 USC 2003	0.037697 *
## statute42 USC 3601	0.280648
## requested_damages_amt	4.66e-07 ***
## jury_demandB	1.24e-12 ***
## jury_demandD	0.073693 .
## jury_demandN	< 2e-16 ***
## jury_demandP	0.273914
## jurisdiction	< 2e-16 ***
## diversity_residence	2.10e-08 ***
## participants	< 2e-16 ***
## plaintiffs	6.62e-07 ***
## defendants	< 2e-16 ***
## attorneys_listed	< 2e-16 ***
## judges_assigned	1.94e-08 ***
## informa_pauperisFP	< 2e-16 ***
## class_actionTRUE	0.000836 ***
## arbitration_at_filingE	0.110348
## arbitration_at_filingM	0.295171
## arbitration_at_filingV	0.374636
## arbitration_at_filingY	0.001141 **
## origin_at_filing	2.96e-06 ***
## filers_county	0.000552 ***
## issue_joinedTRUE	< 2e-16 ***

```

## pretrial_confTRUE                2.44e-13 ***
## total_entry_count                3.53e-14 ***
## before_ij_entry_count            2.13e-05 ***
## after_ij_entry_count             0.024029 *
## year_filed                      0.000109 ***
## days_opened                     0.000269 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 77897  on 65276  degrees of freedom
## Residual deviance: 68675  on 65196  degrees of freedom
## (19498 observations deleted due to missingness)
## AIC: 68837
##
## Number of Fisher Scoring iterations: 10
summary(glm(summary_judgment~ motion_type+ filing_party+filed_before_joined+proceeding_precentile+circuit+district+office+nos_code+statute+requested_damages_amt+jury_demand+jurisdiction+diversity_residence+participants+plaintiffs+defendants+attorneys_listed+judges_assigned+informa_pauperis+class_action+arbitration_at_filing+origin_at_filing+filers_county+issue_joined+pretrial_conf+total_entry_count+before_ij_entry_count+after_ij_entry_count+year_filed+days_opened, family = binomial, data = train_terminate_merge))
##
## Call:
## glm(formula = summary_judgment ~ motion_type + filing_party +
##      filed_before_joined + proceeding_precentile + circuit + district +
##      office + nos_code + statute + requested_damages_amt + jury_demand +
##      jurisdiction + diversity_residence + participants + plaintiffs +
##      defendants + attorneys_listed + judges_assigned + informa_pauperis +
##      class_action + arbitration_at_filing + origin_at_filing +
##      filers_county + issue_joined + pretrial_conf + total_entry_count +
##      before_ij_entry_count + after_ij_entry_count + year_filed +
##      days_opened, family = binomial, data = train_terminate_merge)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.2194  -0.8011  -0.4674   0.8356   2.8927
##
## Coefficients:
##              Estimate Std. Error z value
## (Intercept)      2.266e+01  7.636e+00  2.968
## motion_typeMotion for Judgment on the Pleadings  3.998e-01  9.552e-02  4.186
## motion_typeMotion for Summary Judgment          1.646e+00  7.492e-02 21.966
## motion_typeMotion to Consolidate                6.006e-01  1.110e-01  5.409
## motion_typeMotion to Dismiss                   -8.113e-02  7.401e-02 -1.096
## motion_typeMotion to Remand                    -1.583e-01  1.451e-01 -1.090
## motion_typeMotion to Transfer Venue             3.932e-01  1.180e-01  3.333
## filing_partyOther                               -3.064e-01  1.167e-01 -2.626
## filing_partyPlaintiff                         -1.236e-01  3.296e-02 -3.751
## filing_partyUnknown                           -2.076e-02  3.238e-02 -0.641
## filed_before_joinedTRUE                       5.104e-01  2.539e-02 20.104
## proceeding_precentile                         9.407e-01  3.032e-02 31.030
## circuit                                         -1.881e-01  4.584e-02 -4.104
## district                                       -3.933e-03  5.092e-03 -0.772
## office                                         2.192e-03  6.697e-03  0.327
## nos_code                                       2.262e-02  7.917e-03  2.858
## statute15 USC 1681                           -1.193e+01  1.367e+02 -0.087

```

## statute15 USC 1692	3.824e-01	3.613e-01	1.058
## statute20 USC 1400	9.876e-03	3.526e-01	0.028
## statute20 USC 1415	5.613e-01	4.291e-01	1.308
## statute20 USC 1681	-2.123e-01	3.819e-01	-0.556
## statute28 USC 1331	1.747e-01	2.854e-01	0.612
## statute28 USC 1332	3.337e-01	2.986e-01	1.117
## statute28 USC 1343	1.567e-01	2.994e-01	0.524
## statute28 USC 1391	-1.710e-01	4.543e-01	-0.376
## statute28 USC 1441	-1.387e-01	4.130e-01	-0.336
## statute28 USC 1446	5.806e-01	3.318e-01	1.750
## statute28 USC 1983	1.927e-01	2.847e-01	0.677
## statute28 USC 2201	9.351e-01	3.513e-01	2.662
## statute28 USC 451	3.826e-01	2.937e-01	1.303
## statute29 USC 1132	1.350e-01	4.616e-01	0.292
## statute29 USC 1441	1.246e-01	2.874e-01	0.434
## statute29 USC 201	-1.171e+00	5.166e-01	-2.266
## statute29 USC 203	1.620e-01	4.279e-01	0.379
## statute29 USC 206	-7.026e-01	5.378e-01	-1.306
## statute29 USC 2601	3.548e-02	3.090e-01	0.115
## statute29 USC 2611	-1.155e+01	1.307e+02	-0.088
## statute29 USC 2617	-3.055e-01	3.371e-01	-0.906
## statute29 USC 2661	4.901e-01	3.765e-01	1.302
## statute29 USC 621	1.835e-01	2.932e-01	0.626
## statute29 USC 623	5.649e-01	3.355e-01	1.684
## statute29 USC 626	3.029e-02	3.686e-01	0.082
## statute29 USC 633	1.300e+00	4.815e-01	2.699
## statute29 USC 791	4.828e-01	3.632e-01	1.329
## statute42 USC 12101	1.987e-01	2.898e-01	0.686
## statute42 USC 12117	-8.981e-01	3.642e-01	-2.466
## statute42 USC 12131	-1.916e-01	3.300e-01	-0.581
## statute42 USC 1973	-1.103e+01	9.677e+01	-0.114
## statute42 USC 1981	3.055e-01	2.874e-01	1.063
## statute42 USC 1982	-9.511e+00	1.128e+02	-0.084
## statute42 USC 1985	-1.359e+00	3.577e-01	-3.799
## statute42 USC 2000	4.131e-01	2.851e-01	1.449
## statute42 USC 2003	5.203e-01	3.197e-01	1.627
## statute42 USC 3601	-4.783e-01	3.113e-01	-1.537
## requested_damages_amt	-1.649e-05	5.320e-06	-3.100
## jury_demandB	9.057e-02	3.580e-02	2.530
## jury_demandD	3.839e-01	5.054e-02	7.595
## jury_demandN	1.851e-01	4.366e-02	4.241
## jury_demandP	-1.595e-04	3.455e-02	-0.005
## jurisdiction	6.647e-02	4.099e-02	1.622
## diversity_residence	-6.251e-03	3.120e-03	-2.003
## participants	-5.544e-02	5.545e-03	-10.000
## plaintiffs	5.219e-02	5.902e-03	8.844
## defendants	7.166e-02	5.605e-03	12.784
## attorneys_listed	-1.544e-02	2.997e-03	-5.151
## judges_assigned	-4.517e-02	9.059e-03	-4.986
## informa_pauperisFP	3.338e-01	2.958e-02	11.286
## class_actionTRUE	-3.158e-01	7.632e-02	-4.138
## arbitration_at_filingE	9.557e-03	1.258e-01	0.076
## arbitration_at_filingM	1.162e-02	6.571e-01	0.018
## arbitration_at_filingV	7.711e-02	1.301e-01	0.593

## arbitration_at_filingY	-2.817e-01	3.609e-01	-0.781
## origin_at_filing	-4.400e-02	1.147e-02	-3.836
## filers_county	1.341e-06	7.759e-07	1.729
## issue_joinedTRUE	-1.864e+00	3.185e-02	-58.535
## pretrial_confTRUE	4.941e-01	3.406e-02	14.509
## total_entry_count	-2.047e-02	1.380e-03	-14.834
## before_ij_entry_count	1.775e-02	1.368e-03	12.978
## after_ij_entry_count	2.108e-02	1.397e-03	15.087
## year_filed	-1.636e-02	3.505e-03	-4.668
## days_opened	3.746e-05	3.010e-05	1.244
##	Pr(> z)		
## (Intercept)	0.002995	**	
## motion_typeMotion for Judgment on the Pleadings	2.84e-05	***	
## motion_typeMotion for Summary Judgment	< 2e-16	***	
## motion_typeMotion to Consolidate	6.35e-08	***	
## motion_typeMotion to Dismiss	0.272999		
## motion_typeMotion to Remand	0.275504		
## motion_typeMotion to Transfer Venue	0.000858	***	
## filing_partyOther	0.008637	**	
## filing_partyPlaintiff	0.000176	***	
## filing_partyUnknown	0.521500		
## filed_before_joinedTRUE	< 2e-16	***	
## proceeding_precentile	< 2e-16	***	
## circuit	4.06e-05	***	
## district	0.439847		
## office	0.743482		
## nos_code	0.004268	**	
## statute15 USC 1681	0.930461		
## statute15 USC 1692	0.289879		
## statute20 USC 1400	0.977657		
## statute20 USC 1415	0.190836		
## statute20 USC 1681	0.578227		
## statute28 USC 1331	0.540470		
## statute28 USC 1332	0.263782		
## statute28 USC 1343	0.600575		
## statute28 USC 1391	0.706668		
## statute28 USC 1441	0.736964		
## statute28 USC 1446	0.080195	.	
## statute28 USC 1983	0.498612		
## statute28 USC 2201	0.007778	**	
## statute28 USC 451	0.192704		
## statute29 USC 1132	0.769978		
## statute29 USC 1441	0.664535		
## statute29 USC 201	0.023453	*	
## statute29 USC 203	0.705043		
## statute29 USC 206	0.191404		
## statute29 USC 2601	0.908594		
## statute29 USC 2611	0.929568		
## statute29 USC 2617	0.364729		
## statute29 USC 2661	0.193012		
## statute29 USC 621	0.531491		
## statute29 USC 623	0.092232	.	
## statute29 USC 626	0.934514		
## statute29 USC 633	0.006953	**	

```

## statute29 USC 791                0.183732
## statute42 USC 12101              0.492851
## statute42 USC 12117              0.013654 *
## statute42 USC 12131              0.561450
## statute42 USC 1973                0.909254
## statute42 USC 1981                0.287822
## statute42 USC 1982                0.932832
## statute42 USC 1985                0.000146 ***
## statute42 USC 2000                0.147378
## statute42 USC 2003                0.103681
## statute42 USC 3601                0.124386
## requested_damages_amt            0.001937 **
## jury_demandB                     0.011417 *
## jury_demandD                     3.08e-14 ***
## jury_demandN                     2.23e-05 ***
## jury_demandP                     0.996318
## jurisdiction                     0.104885
## diversity_residence              0.045132 *
## participants                     < 2e-16 ***
## plaintiffs                       < 2e-16 ***
## defendants                       < 2e-16 ***
## attorneys_listed                 2.59e-07 ***
## judges_assigned                  6.16e-07 ***
## informa_pauperisFP               < 2e-16 ***
## class_actionTRUE                 3.50e-05 ***
## arbitration_at_filingE           0.939436
## arbitration_at_filingM           0.985896
## arbitration_at_filingV           0.553345
## arbitration_at_filingY           0.435080
## origin_at_filing                 0.000125 ***
## filers_county                    0.083822 .
## issue_joinedTRUE                 < 2e-16 ***
## pretrial_confTRUE                 < 2e-16 ***
## total_entry_count                 < 2e-16 ***
## before_ij_entry_count             < 2e-16 ***
## after_ij_entry_count              < 2e-16 ***
## year_filed                       3.04e-06 ***
## days_opened                       0.213422
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 80793  on 65276  degrees of freedom
## Residual deviance: 65465  on 65196  degrees of freedom
## (19498 observations deleted due to missingness)
## AIC: 65627
##
## Number of Fisher Scoring iterations: 11

```