

# R Notebook

```
df <- readRDS("../Data/MentalHealthCLEAN.rds")
```

I am going to drop state from the dataset as more than 50% of the data is not populated and comments because it is a raw text field

```
df = df[,!(names(df) %in% c("state", "comments", "Timestamp"))]
```

```
model1 <- glm(treatment ~ ., data = df, family = binomial)
summary(model1)
```

```
##
## Call:
## glm(formula = treatment ~ ., family = binomial, data = df)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.7714  -0.3396   0.0002   0.5686   3.2066
##
## Coefficients: (4 not defined because of singularities)
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -3.09771    1.04464  -2.965  0.00302 **
## Age             0.02469    0.01319   1.873  0.06114 .
## Genderfemale_trans -0.78443    1.18646  -0.661  0.50851
## Genderfluid      -1.33262    1.30302  -1.023  0.30644
## Gendergenderqueer  0.86327    1.22662   0.704  0.48157
## Gendermale_cis    -0.72309    0.24765  -2.920  0.00350 **
## Genderunknown     14.92775  3956.18038   0.004  0.99699
## CountryAustria   -16.92006  1686.48454  -0.010  0.99200
## CountryBelgium    -1.88575    1.62581  -1.160  0.24610
## CountryBosnia and Herzegovina -18.57211  3956.18045  -0.005  0.99625
## CountryBrazil      0.09070    1.43829   0.063  0.94972
## CountryBulgaria     3.39288    2.77564   1.222  0.22156
## CountryCanada      0.06110    0.74220   0.082  0.93439
## CountryChina     -16.99848  3956.18042  -0.004  0.99657
## CountryColombia   -17.63015  2787.57956  -0.006  0.99495
## CountryCosta Rica -13.69869  3956.18045  -0.003  0.99724
## CountryCroatia     15.66563  2693.69750   0.006  0.99536
## CountryCzech Republic -19.61162  3956.18042  -0.005  0.99604
## CountryDenmark     16.39814  2797.44210   0.006  0.99532
## CountryFinland      0.70654    2.27197   0.311  0.75582
## CountryFrance       0.58902    1.43364   0.411  0.68118
## CountryGeorgia    -17.30065  3956.18044  -0.004  0.99651
## CountryGermany      0.13147    0.78832   0.167  0.86754
## CountryGreece     -12.33523  2796.35019  -0.004  0.99648
## CountryHungary    -18.15358  3956.18043  -0.005  0.99634
## CountryIndia        1.01801    1.32441   0.769  0.44210
## CountryIreland      0.31307    0.82631   0.379  0.70478
## CountryIsrael     -16.44156  1470.75487  -0.011  0.99108
## CountryItaly       -1.29926    1.37548  -0.945  0.34487
## CountryJapan       16.01293  3956.18044   0.004  0.99677
## CountryLatvia     -12.58501  3956.18045  -0.003  0.99746
## CountryMexico       1.66411    2.40986   0.691  0.48985
```

## CountryMoldova	13.71463	3956.18047	0.003	0.99723	
## CountryNetherlands	-0.38902	0.86216	-0.451	0.65184	
## CountryNew Zealand	-0.06124	1.12583	-0.054	0.95662	
## CountryNigeria	-12.89073	3956.18044	-0.003	0.99740	
## CountryNorway	-14.68685	3956.18045	-0.004	0.99704	
## CountryPhilippines	-17.52557	3956.18043	-0.004	0.99647	
## CountryPoland	0.16648	1.12600	0.148	0.88246	
## CountryPortugal	-13.93438	2638.90236	-0.005	0.99579	
## CountryRomania	-11.98156	3956.18046	-0.003	0.99758	
## CountryRussia	-16.10508	2043.24302	-0.008	0.99371	
## CountrySingapore	-1.03925	1.42275	-0.730	0.46512	
## CountrySlovenia	18.30652	3956.18043	0.005	0.99631	
## CountrySouth Africa	1.67653	1.86628	0.898	0.36901	
## CountrySpain	-13.54726	3956.18046	-0.003	0.99727	
## CountrySweden	-1.67983	1.31209	-1.280	0.20045	
## CountrySwitzerland	1.09826	1.42672	0.770	0.44143	
## CountryThailand	-14.58199	3956.18043	-0.004	0.99706	
## CountryUnited Kingdom	0.69497	0.67866	1.024	0.30582	
## CountryUnited States	0.13292	0.65596	0.203	0.83942	
## CountryUruguay	-12.41302	3956.18046	-0.003	0.99750	
## self_employedYes	-0.26467	0.35074	-0.755	0.45048	
## family_historyYes	0.99716	0.19089	5.224	1.75e-07	***
## work_interfereNo Response	-2.48064	0.56810	-4.367	1.26e-05	***
## work_interfereOften	3.62867	0.37227	9.747	< 2e-16	***
## work_interfereRarely	2.55924	0.30435	8.409	< 2e-16	***
## work_interfereSometimes	2.95602	0.27060	10.924	< 2e-16	***
## no_employees100-500	0.28337	0.40880	0.693	0.48820	
## no_employees26-100	0.33895	0.37193	0.911	0.36213	
## no_employees500-1000	0.22839	0.56037	0.408	0.68359	
## no_employees6-25	0.14977	0.34898	0.429	0.66780	
## no_employeesMore than 1000	-0.03769	0.41006	-0.092	0.92676	
## remote_workYes	-0.19293	0.21615	-0.893	0.37208	
## tech_companyYes	-0.12374	0.25339	-0.488	0.62533	
## benefitsNo	0.23253	0.28817	0.807	0.41971	
## benefitsYes	0.76529	0.28251	2.709	0.00675	**
## care_optionsNot sure	-0.16421	0.24652	-0.666	0.50535	
## care_optionsYes	0.76389	0.25339	3.015	0.00257	**
## wellness_programNo	-0.15946	0.31955	-0.499	0.61777	
## wellness_programYes	-0.50279	0.37525	-1.340	0.18029	
## seek_helpNo	-0.64607	0.26770	-2.413	0.01580	*
## seek_helpYes	-0.81009	0.32871	-2.464	0.01372	*
## anonymityNo	-0.10367	0.42665	-0.243	0.80802	
## anonymityYes	0.54541	0.24527	2.224	0.02617	*
## leaveSomewhat difficult	0.47296	0.32989	1.434	0.15166	
## leaveSomewhat easy	-0.26829	0.24303	-1.104	0.26962	
## leaveVery difficult	0.30820	0.37080	0.831	0.40586	
## leaveVery easy	0.13042	0.29818	0.437	0.66184	
## mental_health_consequenceNo	-0.08527	0.25886	-0.329	0.74185	
## mental_health_consequenceYes	-0.19693	0.26549	-0.742	0.45824	
## phys_health_consequenceNo	0.07394	0.24574	0.301	0.76349	
## phys_health_consequenceYes	0.01874	0.47989	0.039	0.96885	
## coworkersSome of them	0.39425	0.25792	1.529	0.12638	
## coworkersYes	1.06341	0.37818	2.812	0.00492	**
## supervisorSome of them	-0.41463	0.25564	-1.622	0.10482	

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## supervisorYes          -0.32886    0.29640   -1.110    0.26721
## mental_health_interviewNo  0.33856    0.30822    1.098    0.27202
## mental_health_interviewYes 1.00992    0.67652    1.493    0.13548
## phys_health_interviewNo    0.14836    0.21480    0.691    0.48975
## phys_health_interviewYes   0.40874    0.30438    1.343    0.17932
## mental_vs_physicalNo      -0.12645    0.24205   -0.522    0.60139
## mental_vs_physicalYes     -0.06918    0.25711   -0.269    0.78787
## obs_consequenceYes        0.28943    0.28374    1.020    0.30771
## continentAmericas          NA          NA          NA          NA
## continentAsia              NA          NA          NA          NA
## continentEurope            NA          NA          NA          NA
## continentOceania           NA          NA          NA          NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 1709.16  on 1232  degrees of freedom
## Residual deviance:  832.88  on 1139  degrees of freedom
## AIC: 1020.9
##
## Number of Fisher Scoring iterations: 16
model2 <- glm(seek_help~ Age+Gender+ family_history+ work_interfere+family_history+benefits+care_options+
summary(model2)

##
## Call:
## glm(formula = seek_help ~ Age + Gender + family_history + work_interfere +
##      family_history + benefits + care_options + anonymity + coworkers,
##      family = binomial, data = df)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.8043  -0.9283   0.4149   0.7820   1.6313
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)   -6.452e-01  4.227e-01  -1.526  0.126963
## Age            9.715e-03  9.906e-03   0.981  0.326717
## Genderfemale_trans 1.454e+01  5.739e+02   0.025  0.979793
## Genderfluid       2.844e-01  1.209e+00   0.235  0.814105
## Gendergenderqueer 5.714e-01  8.891e-01   0.643  0.520458
## Gendermale_cis    6.527e-02  1.816e-01   0.359  0.719289
## Genderunknown     1.474e+01  1.455e+03   0.010  0.991917
## family_historyYes -1.402e-01  1.604e-01  -0.874  0.382237
## work_interfereNo Response 1.164e-01  2.219e-01   0.524  0.600021
## work_interfereOften 7.010e-01  3.004e-01   2.334  0.019599 *
## work_interfereRarely 2.341e-01  2.615e-01   0.895  0.370669
## work_interfereSometimes 3.504e-01  2.127e-01   1.647  0.099500 .
## benefitsNo       2.260e+00  2.511e-01   9.000 < 2e-16 ***
## benefitsYes      5.132e-01  1.874e-01   2.738  0.006183 **
## care_optionsNot sure -6.478e-01  1.695e-01  -3.823  0.000132 ***
## care_optionsYes   2.465e-01  2.219e-01   1.111  0.266631
## anonymityNo      1.669e+00  6.234e-01   2.678  0.007411 **

```

```

## anonymityYes          8.418e-01  1.877e-01  4.486 7.26e-06 ***
## coworkersSome of them  2.160e-01  1.823e-01  1.185 0.235920
## coworkersYes          3.495e-01  2.412e-01  1.449 0.147304
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 1480.3 on 1232 degrees of freedom
## Residual deviance: 1185.0 on 1213 degrees of freedom
## AIC: 1225
##
## Number of Fisher Scoring iterations: 14
model3 <- glm(seek_help~ work_interfere + benefits+ care_options+ anonymity , data =df, family=binomial)
summary(model3)

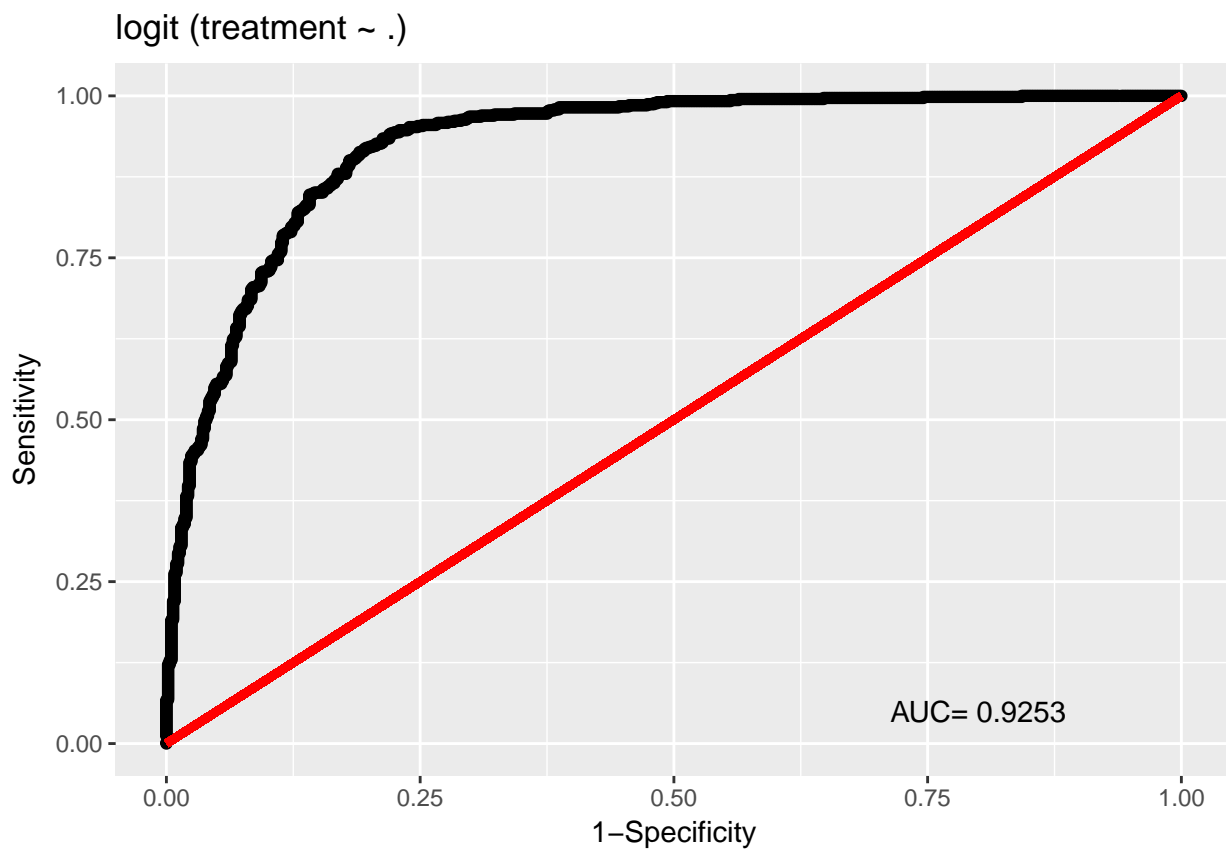
##
## Call:
## glm(formula = seek_help ~ work_interfere + benefits + care_options +
##      anonymity, family = binomial, data = df)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.8171  -0.9213   0.4119   0.8043   1.5077
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -0.1029     0.1968  -0.523  0.601285
## work_interfereNo Response  0.1120     0.2210   0.507  0.612212
## work_interfereOften    0.6785     0.2917   2.326  0.020016 *
## work_interfereRarely    0.1974     0.2565   0.770  0.441492
## work_interfereSometimes  0.2932     0.2026   1.447  0.147773
## benefitsNo           2.2535     0.2493   9.039 < 2e-16 ***
## benefitsYes          0.4985     0.1843   2.704  0.006846 **
## care_optionsNot sure  -0.6467     0.1680  -3.849  0.000119 ***
## care_optionsYes       0.2738     0.2199   1.245  0.213138
## anonymityNo           1.6010     0.6244   2.564  0.010345 *
## anonymityYes          0.8375     0.1861   4.499  6.83e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 1480.3 on 1232 degrees of freedom
## Residual deviance: 1192.9 on 1222 degrees of freedom
## AIC: 1214.9
##
## Number of Fisher Scoring iterations: 5
library(Deducer)

## Loading required package: ggplot2
## Loading required package: JGR

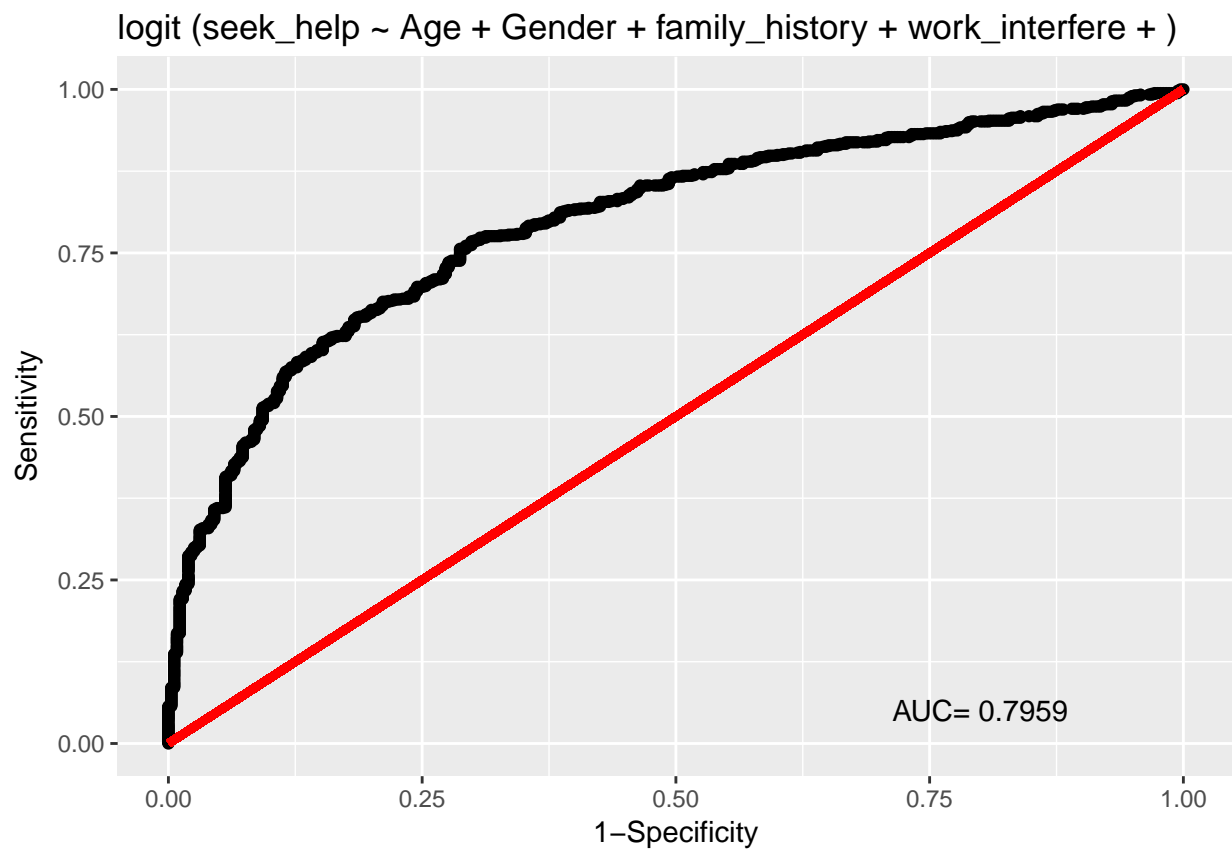
```

```
## Loading required package: rJava
## Loading required package: JavaGD
##
## Please type JGR() to launch console. Platform specific launchers (.exe and .app) can also be obtained
## Loading required package: car
## Loading required package: MASS
##
##
## Note Non-JGR console detected:
##   Deducer is best used from within JGR (http://jgr.markushelbig.org/).
##   To Bring up GUI dialogs, type deducer().
```

```
rocplot(model1)
```



```
rocplot(model2)
```



```
rocplot(model3)
```

