

Exercise 13

Bilal Kudaimi

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##A: Summary of the model

Warning: package 'tidyverse' was built under R version 4.0.3

-- Attaching packages -----

```
## v ggplot2 3.3.2      v purrr  0.3.4
## v tibble  3.0.3      v dplyr  1.0.2
## v tidyr   1.1.2      v stringr 1.4.0
## v readr   1.3.1      v forcats 0.5.0
```

Warning: package 'tidyr' was built under R version 4.0.3

Warning: package 'dplyr' was built under R version 4.0.3

-- Conflicts -----

```
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
```

##

Call:

```
## glm(formula = Risk1Yr ~ DGN + PRE4 + PRE5 + PRE6 + PRE7 + PRE8 +
##      PRE9 + PRE10 + PRE11 + PRE14 + PRE17 + PRE19 + PRE25 + PRE30 +
##      PRE32 + AGE, family = binomial(), data = ThoraricSurgery)
```

##

Deviance Residuals:

```
##      Min       1Q   Median       3Q      Max
## -1.6084  -0.5439  -0.4199  -0.2762   2.4929
```

##

Coefficients:

```
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -1.655e+01  2.400e+03  -0.007  0.99450
## DGNDGN2      1.474e+01  2.400e+03   0.006  0.99510
## DGNDGN3      1.418e+01  2.400e+03   0.006  0.99528
## DGNDGN4      1.461e+01  2.400e+03   0.006  0.99514
## DGNDGN5      1.638e+01  2.400e+03   0.007  0.99455
## DGNDGN6      4.089e-01  2.673e+03   0.000  0.99988
## DGNDGN8      1.803e+01  2.400e+03   0.008  0.99400
## PRE4         -2.272e-01  1.849e-01  -1.229  0.21909
## PRE5         -3.030e-02  1.786e-02  -1.697  0.08971 .
```

```

## PRE6PRZ1    -4.427e-01  5.199e-01  -0.852  0.39448
## PRE6PRZ2    -2.937e-01  7.907e-01  -0.371  0.71030
## PRE7T       7.153e-01  5.556e-01   1.288  0.19788
## PRE8T       1.743e-01  3.892e-01   0.448  0.65419
## PRE9T       1.368e+00  4.868e-01   2.811  0.00494 **
## PRE10T      5.770e-01  4.826e-01   1.196  0.23185
## PRE11T      5.162e-01  3.965e-01   1.302  0.19295
## PRE14OC12   4.394e-01  3.301e-01   1.331  0.18318
## PRE14OC13   1.179e+00  6.165e-01   1.913  0.05580 .
## PRE14OC14   1.653e+00  6.094e-01   2.713  0.00668 **
## PRE17T      9.266e-01  4.445e-01   2.085  0.03709 *
## PRE19T     -1.466e+01  1.654e+03  -0.009  0.99293
## PRE25T     -9.789e-02  1.003e+00  -0.098  0.92227
## PRE30T      1.084e+00  4.990e-01   2.172  0.02984 *
## PRE32T     -1.398e+01  1.645e+03  -0.008  0.99322
## AGE        -9.506e-03  1.810e-02  -0.525  0.59944
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 395.61  on 469  degrees of freedom
## Residual deviance: 341.19  on 445  degrees of freedom
## AIC: 391.19
##
## Number of Fisher Scoring iterations: 15

## [1] 83.61702

```

##B

According to the z-statistics from the summary, the variables PRE9, PRE14OC14, PRE17, and PRE30 had the greatest effect on the survival rate.

##C

The accuracy of the model was found to be 83.62%, meaning this model can accurately predict the likelihood of surviving a year after surgery 83.62% of the time.