FinalReport

Nick Mandarano and Patrick McHugh

4/26/2022

Introduction

Variable Selection

Our data comes from four different datasets. We used three of Riguang Wen's datasets from figshare.com – `players cv`, `players salary`, and `players stat`. We also used a dataset called `NBA RS 2020-1950 Stats` uploaded to zenodo.org by Pablo Gomez and Sandra Giral. From these datasets, we considered the following variables.

Variable	Description	Type	Source
Player	Name of player	Character	`players stat`
Age	Age of player	Numeric	`players stat`
G	Games played	Numeric	`players stat`
GS	Games started	Numeric	`players stat`
MP	Minutes played	Numeric	`players stat`
PER	Player efficiency rating	Numeric	`players stat`
PTS	Points	Numeric	`NBA RS 2020-1950 Stats`
X3PAr	3PA/FGA	Numeric	`players stat`
FTr	FTA/FGA	Numeric	`players stat`
TS	True shooting percentage	Numeric	`NBA RS 2020-1950 Stats`
ORB	Offensive rebounds	Numeric	`players stat`
DRB	Defensive rebounds	Numeric	`players stat`
TRB	Total rebounds	Numeric	`players stat`
AST	Assists	Numeric	`players stat`
STL	Steals	Numeric	`players stat`
BLK	Blocks	Numeric	`players stat`
TOV	Turnovers	Numeric	`players stat`
USG	Usage percentage	Numeric	`players stat`
ORtg	Offensive rating	Numeric	`players stat`
DRtg	Defensive rating	Numeric	`players stat`
OWS	Offensive win shares	Numeric	`players stat`
DWS	Defensive win shares	Numeric	`players stat`
WS	Win shares	Numeric	`players stat`
WS.48	Win shares per 48 minutes	Numeric	`players stat`
OBPM	Offensive box +/-	Numeric	`players stat`
DBPM	Defensive box +/-	Numeric	`players stat`
BPM	Box +/-	Numeric	`players stat`
VORP	Value over replacement player	Numeric	`players stat`
Pos	Position	Factor	`players salary`
Ht	Height in inches	Numeric	`players salary`
Wt	Weight in pounds	Numeric	`players salary`
PwrSix	Power Six College?	Indicator	`players cv`
International	International Player?	Indicator	`players cv`

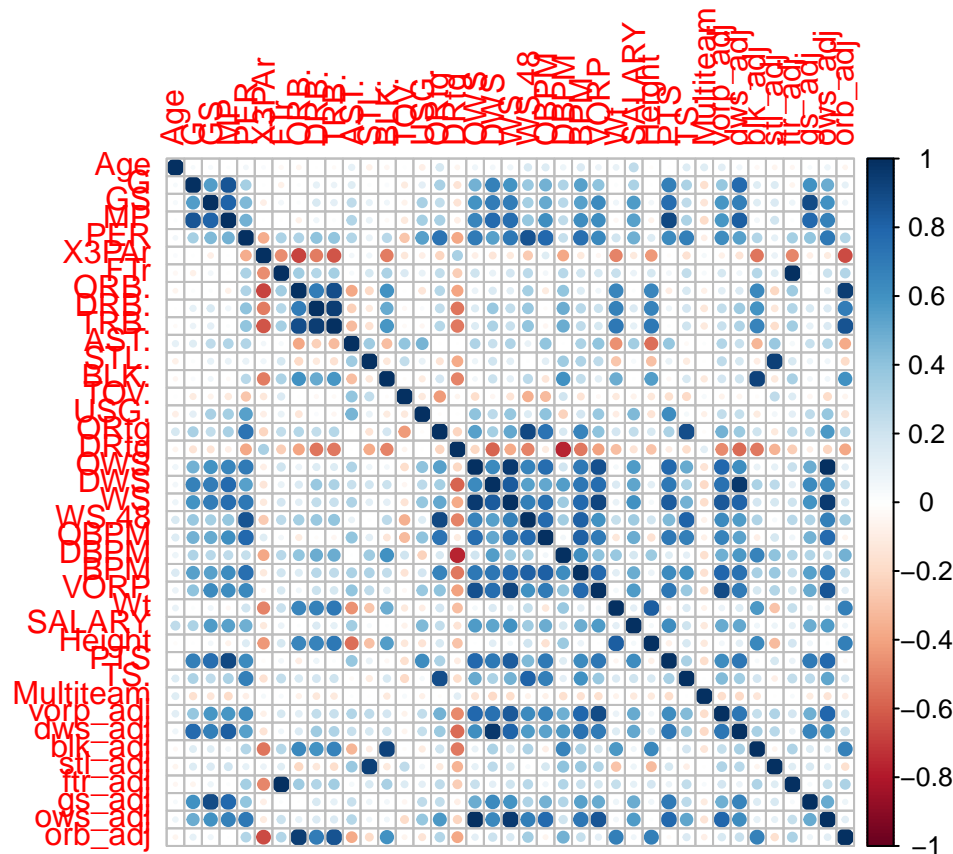| Variable	Description	Type	Source
Salary	Salary in dollars	Numeric	`players salary`

Exploratory Data Analysis

Immediately we can recognize that some variables are functions of others and therefore do not need to be considered. Specifically, `BPM = OBPM + DBPM`, so there is no need to include `BPM` in our model. Similarly, `WS = OWS + DWS` and `TRB = ORB + DRB`, so we can exclude `WS` and `TRB` from consideration if we include `OWS`, `DWS`, `ORB` and `DRB` in our model.

```
data <- read.csv("data/PlayerData.csv")[,-1]

# Which variables did we transform and why?
```

Correlation Matrix

```
corrplot(cor(data[sapply(data, is.numeric)]))
```



```
# Which did we remove from here and why?
```

Stepwise Regression Models

```
data <- read_csv("data/PlayerData.csv")
```

```
## New names:
## Rows: 385 Columns: 49
```

```
## -- Column specification
## --------------------------------------------------------- Delimiter: "," chr
## (9): Player, Tm, Place_of_Birth, Pos, Ht, Birth.Date, College, Internat... dbl
## (40): ...1, Age, G, GS, MP, PER, X3PAr, FTr, ORB., DRB., TRB., AST., STL...
## i Use `spec()` to retrieve the full column specification for this data. i
## Specify the column types or set `show_col_types = FALSE` to quiet this message.
## * `` -> `...1`
```

```r
data_regressors <- data %>% mutate(logsal = log(SALARY)) %>%
  dplyr::select(logsal, Age, G, GS, gs_adj, MP,PER, X3PAr, FTr, ftr_adj, ORB., orb_adj, DRB., TRB., AST
                STL., stl_adj, BLK., blk_adj, TOV., USG., ORtg, DRtg, OWS, ows_adj, DWS, dws_adj, WS.48
                OBPM, DBPM, VORP, vorp_adj, Pos, Height, PTS, TS., International, Conference)
attach(data_regressors)
Pos <- as.factor(Pos)
International <- as.factor(International)
Conference <- as.factor(Conference)

null = lm(logsal ~ 1, data = data_regressors)
full = lm(logsal ~ ., data = data_regressors)
summary(full)
```

```
##
## Call:
## lm(formula = logsal ~ ., data = data_regressors)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -3.01123 -0.45112  0.01986  0.53385  1.93193
##
## Coefficients:
##                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)     4.4225997  6.8296551   0.648  0.51771
## Age             0.0630723  0.0108876   5.793 1.57e-08 ***
## G              -0.0203828  0.0061556  -3.311  0.00103 **
## GS             -0.0006357  0.0044519  -0.143  0.88654
## gs_adj          0.0165965  0.0752748   0.220  0.82563
## MP              0.0005305  0.0003673   1.445  0.14951
## PER            -0.0174388  0.0784872  -0.222  0.82430
## X3PAr           0.6974562  0.6075721   1.148  0.25180
## FTr             4.1859741  3.5760217   1.171  0.24259
## ftr_adj        -6.1036319  4.9320476  -1.238  0.21674
## ORB.           -0.2008639  0.2006313  -1.001  0.31746
## orb_adj         0.2144035  0.2928215   0.732  0.46455
## DRB.           -0.2363441  0.1966500  -1.202  0.23026
## TRB.            0.4371859  0.3945849   1.108  0.26866
## AST.            0.0181086  0.0156213   1.159  0.24718
## STL.           -0.2181312  0.2047322  -1.065  0.28743
## stl_adj         0.6058089  0.5364506   1.129  0.25957
## BLK.           -0.0063714  0.1047194  -0.061  0.95152
## blk_adj        -0.2721569  0.3076517  -0.885  0.37698
## TOV.            0.0021125  0.0276936   0.076  0.93924
## USG.            0.0617779  0.0422083   1.464  0.14421
## ORtg            0.0220255  0.0249201   0.884  0.37740
## DRtg            0.0288892  0.0539888   0.535  0.59293
## OWS            -0.1233481  0.5093160  -0.242  0.80878
```

3

```
## ows_adj            8.4004018 11.6084572    0.724   0.46978
## DWS               -0.0896228  0.2381367   -0.376   0.70689
## dws_adj            1.2651898  0.7187115    1.760   0.07924 .
## WS.48             -4.9672150  5.4844609   -0.906   0.36574
## OBPM               0.1282551  0.1092672    1.174   0.24130
## DBPM               0.2533772  0.0860760    2.944   0.00347 **
## VORP              -0.2712728  0.1809745   -1.499   0.13481
## vorp_adj          -0.7052569  0.2948591   -2.392   0.01731 *
## PosC-F             0.2750336  0.3458740    0.795   0.42706
## PosF              -0.1731032  0.2057598   -0.841   0.40078
## PosF-C             0.0093911  0.2310966    0.041   0.96761
## PosF-G            -0.3437900  0.3114840   -1.104   0.27049
## PosG              -0.6538078  0.3138647   -2.083   0.03799 *
## PosG-F            -0.4935578  0.2866025   -1.722   0.08596 .
## Height             0.0037293  0.0313987    0.119   0.90553
## PTS                0.0001479  0.0005863    0.252   0.80099
## TS.               -0.9776647  3.2686250   -0.299   0.76504
## InternationalYes  -0.0470952  0.1147774   -0.410   0.68183
## ConferenceMulti   -0.6674140  0.1595178   -4.184 3.65e-05 ***
## ConferenceWest    -0.0894918  0.1003389   -0.892   0.37308
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8305 on 341 degrees of freedom
## Multiple R-squared:  0.5773, Adjusted R-squared:  0.524
## F-statistic: 10.83 on 43 and 341 DF,  p-value: < 2.2e-16
```

```r
bic = log(nrow(data_regressors))
stepbic_model <- stepAIC(object = null, scope = list(lower = null, upper = full),
direction = "both", k = bic)
```

```
## Start:  AIC=147.73
## logsal ~ 1
##
##              Df Sum of Sq    RSS     AIC
## + MP          1   205.936 350.46 -24.281
## + PTS         1   204.939 351.46 -23.186
## + dws_adj     1   177.276 379.12   5.983
## + DWS         1   155.441 400.96  27.542
## + GS          1   150.239 406.16  32.505
## + gs_adj      1   148.593 407.80  34.062
## + ows_adj     1   137.559 418.84  44.340
## + G           1   134.283 422.11  47.339
## + OWS         1   132.960 423.44  48.544
## + OBPM        1   126.131 430.27  54.704
## + VORP        1   116.845 439.55  62.925
## + vorp_adj    1   103.261 453.14  74.643
## + PER         1    96.356 460.04  80.465
## + WS.48       1    65.572 490.83 105.402
## + USG.        1    55.407 500.99 113.294
## + AST.        1    43.172 513.23 122.584
## + DBPM        1    40.236 516.16 124.779
## + ORtg        1    38.938 517.46 125.746
## + Age         1    33.751 522.65 129.587
## + TS.         1    28.177 528.22 133.671
```

4

```
## + Conference      2     33.141 523.26 135.989
## + DRtg             1     13.737 542.66 144.054
## + DRB.             1     10.839 545.56 146.105
## + stl_adj          1      8.592 547.81 147.687
## <none>                          556.40 147.726
## + TRB.             1      6.763 549.64 148.971
## + orb_adj          1      5.968 550.43 149.527
## + blk_adj          1      5.623 550.77 149.768
## + X3PAr            1      3.600 552.80 151.180
## + International    1      2.977 553.42 151.613
## + Height           1      2.359 554.04 152.043
## + TOV.             1      2.173 554.22 152.172
## + STL.             1      1.585 554.81 152.581
## + ftr_adj          1      1.264 555.13 152.803
## + ORB.             1      0.747 555.65 153.162
## + BLK.             1      0.669 555.73 153.216
## + FTr              1      0.451 555.95 153.366
## + Pos              6     15.293 541.10 172.715
##
## Step:  AIC=-24.28
## logsal ~ MP
##
##                   Df Sum of Sq    RSS      AIC
## + Age              1     31.599 318.86 -54.706
## + PER              1     11.787 338.67 -31.498
## + PTS              1     10.016 340.45 -29.491
## + OBPM             1      8.947 341.51 -28.284
## + DBPM             1      7.922 342.54 -27.130
## + ows_adj          1      7.724 342.74 -26.908
## + OWS              1      7.552 342.91 -26.715
## + USG.             1      7.500 342.96 -26.655
## + WS.48            1      7.398 343.06 -26.541
## + dws_adj          1      7.237 343.23 -26.360
## + DRtg             1      6.013 344.45 -24.990
## + Height           1      5.945 344.52 -24.914
## + orb_adj          1      5.930 344.53 -24.898
## + TRB.             1      5.716 344.75 -24.659
## + AST.             1      5.664 344.80 -24.600
## + VORP             1      5.647 344.82 -24.581
## <none>                          350.46 -24.281
## + DRB.             1      5.362 345.10 -24.263
## + Conference       2      9.952 340.51 -23.465
## + DWS              1      4.623 345.84 -23.440
## + vorp_adj         1      4.560 345.90 -23.370
## + ORB.             1      3.829 346.63 -22.556
## + X3PAr            1      3.805 346.66 -22.530
## + ORtg             1      2.919 347.54 -21.547
## + blk_adj          1      2.426 348.04 -21.001
## + gs_adj           1      2.122 348.34 -20.666
## + International    1      1.745 348.72 -20.249
## + G                1      1.657 348.81 -20.151
## + BLK.             1      1.508 348.95 -19.987
## + GS               1      1.217 349.24 -19.666
## + ftr_adj          1      0.799 349.66 -19.207
```

```
## + TS.              1      0.672 349.79 -19.066
## + FTr              1      0.618 349.84 -19.007
## + TOV.             1      0.051 350.41 -18.383
## + stl_adj          1      0.037 350.42 -18.368
## + STL.             1      0.014 350.45 -18.343
## + Pos              6     13.359 337.10  -3.524
## - MP               1    205.936 556.40 147.726
##
## Step:  AIC=-54.71
## logsal ~ MP + Age
##
##                  Df Sum of Sq    RSS     AIC
## + Conference      2     16.682 302.18 -63.488
## + PTS             1     11.385 307.48 -62.751
## + USG.            1     10.980 307.88 -62.243
## + PER             1      9.861 309.00 -60.847
## + orb_adj         1      7.474 311.39 -57.884
## + Height          1      6.376 312.49 -56.529
## + TRB.            1      6.304 312.56 -56.440
## + DBPM            1      5.690 313.17 -55.685
## + DRB.            1      5.453 313.41 -55.394
## + OWS             1      5.322 313.54 -55.233
## + ows_adj         1      5.162 313.70 -55.037
## + ORB.            1      5.111 313.75 -54.974
## <none>                         318.86 -54.706
## + dws_adj         1      4.642 314.22 -54.399
## + DRtg            1      4.605 314.26 -54.353
## + X3PAr           1      4.420 314.44 -54.127
## + OBPM            1      4.154 314.71 -53.801
## + VORP            1      3.468 315.40 -52.963
## + WS.48           1      3.223 315.64 -52.663
## + blk_adj         1      3.153 315.71 -52.579
## + AST.            1      3.140 315.72 -52.563
## + DWS             1      3.024 315.84 -52.421
## + G               1      2.245 316.62 -51.473
## + BLK.            1      2.202 316.66 -51.421
## + vorp_adj        1      1.725 317.14 -50.841
## + gs_adj          1      1.590 317.27 -50.677
## + International   1      1.579 317.28 -50.665
## + ftr_adj         1      1.258 317.61 -50.274
## + FTr             1      1.021 317.84 -49.988
## + GS              1      0.709 318.15 -49.609
## + ORtg            1      0.486 318.38 -49.340
## + stl_adj         1      0.273 318.59 -49.083
## + STL.            1      0.113 318.75 -48.889
## + TOV.            1      0.028 318.84 -48.786
## + TS.             1      0.000 318.86 -48.753
## + Pos             6     12.036 306.83 -33.800
## - Age             1     31.599 350.46 -24.281
## - MP              1    203.784 522.65 129.587
##
## Step:  AIC=-63.49
## logsal ~ MP + Age + Conference
##
```

```
##                   Df Sum of Sq    RSS      AIC
## + USG.            1     11.271 290.91  -72.170
## + PTS             1     11.175 291.01  -72.043
## + PER             1     10.001 292.18  -70.493
## + orb_adj         1      6.275 295.91  -65.614
## + OWS             1      5.042 297.14  -64.013
## + OBPM            1      4.879 297.30  -63.801
## + ows_adj         1      4.828 297.35  -63.735
## <none>                         302.18  -63.488
## + TRB.            1      4.595 297.59  -63.434
## + Height          1      4.391 297.79  -63.170
## + ORB.            1      4.116 298.06  -62.815
## + X3PAr           1      4.033 298.15  -62.707
## + AST.            1      3.904 298.28  -62.541
## + DRB.            1      3.730 298.45  -62.316
## + DBPM            1      3.300 298.88  -61.762
## + WS.48           1      2.974 299.21  -61.342
## + dws_adj         1      2.808 299.37  -61.129
## + VORP            1      2.567 299.61  -60.820
## + DRtg            1      2.501 299.68  -60.734
## + gs_adj          1      2.470 299.71  -60.694
## + G               1      2.230 299.95  -60.387
## + ftr_adj         1      1.755 300.43  -59.777
## + blk_adj         1      1.752 300.43  -59.773
## + DWS             1      1.615 300.57  -59.597
## + FTr             1      1.465 300.72  -59.406
## + BLK.            1      1.097 301.08  -58.935
## + GS              1      0.904 301.28  -58.689
## + vorp_adj        1      0.805 301.38  -58.561
## + ORtg            1      0.703 301.48  -58.431
## + International   1      0.541 301.64  -58.224
## + stl_adj         1      0.480 301.70  -58.147
## + STL.            1      0.206 301.97  -57.798
## + TOV.            1      0.070 302.11  -57.624
## + TS.             1      0.054 302.13  -57.603
## - Conference      2     16.682 318.86  -54.706
## + Pos             6      9.929 292.25  -40.631
## - Age             1     38.329 340.51  -23.465
## - MP              1    176.059 478.24  107.307
##
## Step:  AIC=-72.17
## logsal ~ MP + Age + Conference + USG.
##
##                   Df Sum of Sq    RSS      AIC
## + DBPM            1      9.830 281.08  -79.451
## + orb_adj         1      9.488 281.42  -78.982
## + Height          1      6.623 284.29  -75.083
## + ORB.            1      6.039 284.87  -74.292
## + TRB.            1      5.405 285.50  -73.437
## <none>                         290.91  -72.170
## + dws_adj         1      3.686 287.22  -71.126
## + DRB.            1      3.680 287.23  -71.118
## + blk_adj         1      3.270 287.64  -70.569
## + PER             1      3.148 287.76  -70.405
```

7

```
## + X3PAr          1     2.896 288.01 -70.068
## + gs_adj          1     2.744 288.17 -69.865
## + DRtg            1     2.668 288.24 -69.763
## + WS.48           1     2.627 288.28 -69.708
## + ows_adj         1     2.068 288.84 -68.963
## + OWS             1     2.002 288.91 -68.875
## + BLK.            1     1.972 288.94 -68.835
## + OBPM            1     1.647 289.26 -68.402
## + ORtg            1     1.586 289.32 -68.321
## + DWS             1     1.454 289.46 -68.145
## + PTS             1     1.253 289.66 -67.879
## + ftr_adj         1     0.913 290.00 -67.427
## + FTr             1     0.760 290.15 -67.224
## + VORP            1     0.739 290.17 -67.196
## + International   1     0.597 290.31 -67.007
## + stl_adj         1     0.538 290.37 -66.929
## + vorp_adj        1     0.412 290.50 -66.762
## + AST.            1     0.395 290.51 -66.740
## + GS              1     0.381 290.53 -66.721
## + TOV.            1     0.292 290.62 -66.603
## + TS.             1     0.183 290.73 -66.459
## + G               1     0.085 290.82 -66.329
## + STL.            1     0.065 290.84 -66.302
## - USG.            1    11.271 302.18 -63.488
## - Conference      2    16.974 307.88 -62.243
## + Pos             6    11.647 279.26 -52.181
## - Age             1    42.217 333.13 -25.951
## - MP              1   129.044 419.95  63.223
##
## Step:  AIC=-79.45
## logsal ~ MP + Age + Conference + USG. + DBPM
##
##                  Df Sum of Sq    RSS     AIC
## <none>                        281.08 -79.451
## + orb_adj         1     3.238 277.84 -77.958
## + Height          1     2.374 278.71 -76.763
## + DRtg            1     2.280 278.80 -76.632
## + OBPM            1     2.055 279.02 -76.323
## + ORB.            1     1.616 279.46 -75.718
## + ORtg            1     1.287 279.79 -75.264
## + gs_adj          1     1.262 279.82 -75.230
## + STL.            1     1.247 279.83 -75.210
## + ows_adj         1     1.033 280.05 -74.915
## + DWS             1     1.005 280.07 -74.877
## + OWS             1     0.979 280.10 -74.841
## + vorp_adj        1     0.852 280.23 -74.666
## + PTS             1     0.819 280.26 -74.621
## + TRB.            1     0.657 280.42 -74.399
## + BLK.            1     0.620 280.46 -74.347
## + WS.48           1     0.518 280.56 -74.207
## + International   1     0.514 280.57 -74.202
## + PER             1     0.490 280.59 -74.169
## + stl_adj         1     0.398 280.68 -74.042
## + VORP            1     0.324 280.76 -73.941
```

8

```
## - Conference      2     13.017 294.10 -73.928
## + G               1      0.247 280.83 -73.835
## + blk_adj         1      0.182 280.90 -73.747
## + AST.            1      0.174 280.91 -73.735
## + TS.             1      0.151 280.93 -73.705
## + DRB.            1      0.106 280.97 -73.642
## + dws_adj         1      0.099 280.98 -73.633
## + X3PAr           1      0.082 281.00 -73.609
## + FTr             1      0.071 281.01 -73.594
## + ftr_adj         1      0.052 281.03 -73.569
## + TOV.            1      0.025 281.05 -73.531
## + GS              1      0.008 281.07 -73.508
## - DBPM            1      9.830 290.91 -72.170
## - USG.            1     17.801 298.88 -61.762
## + Pos             6      5.519 275.56 -51.366
## - Age             1     39.226 320.31 -35.108
## - MP              1     93.538 374.62  25.195
```

```r
stepaic_model <- stepAIC(object = null, scope = list(lower = null, upper = full),
direction = "both", k = 2)
```

```
## Start:  AIC=143.77
## logsal ~ 1
##
##                   Df Sum of Sq    RSS     AIC
## + MP               1   205.936 350.46 -32.187
## + PTS              1   204.939 351.46 -31.093
## + dws_adj          1   177.276 379.12  -1.924
## + DWS              1   155.441 400.96  19.635
## + GS               1   150.239 406.16  24.598
## + gs_adj           1   148.593 407.80  26.155
## + ows_adj          1   137.559 418.84  36.434
## + G                1   134.283 422.11  39.433
## + OWS              1   132.960 423.44  40.638
## + OBPM             1   126.131 430.27  46.797
## + VORP             1   116.845 439.55  55.018
## + vorp_adj         1   103.261 453.14  66.736
## + PER              1    96.356 460.04  72.559
## + WS.48            1    65.572 490.83  97.496
## + USG.             1    55.407 500.99 105.388
## + AST.             1    43.172 513.23 114.677
## + DBPM             1    40.236 516.16 116.873
## + ORtg             1    38.938 517.46 117.840
## + Age              1    33.751 522.65 121.680
## + Conference       2    33.141 523.26 124.130
## + TS.              1    28.177 528.22 125.765
## + DRtg             1    13.737 542.66 136.148
## + DRB.             1    10.839 545.56 138.198
## + stl_adj          1     8.592 547.81 139.781
## + TRB.             1     6.763 549.64 141.064
## + orb_adj          1     5.968 550.43 141.621
## + blk_adj          1     5.623 550.77 141.862
## + X3PAr            1     3.600 552.80 143.273
## + International    1     2.977 553.42 143.707
## <none>                         556.40 143.772
```

```
## + Height          1      2.359 554.04 144.136
## + TOV.            1      2.173 554.22 144.266
## + STL.            1      1.585 554.81 144.674
## + ftr_adj         1      1.264 555.13 144.897
## + Pos             6     15.293 541.10 145.042
## + ORB.            1      0.747 555.65 145.255
## + BLK.            1      0.669 555.73 145.309
## + FTr             1      0.451 555.95 145.460
##
## Step:  AIC=-32.19
## logsal ~ MP
##
##                  Df Sum of Sq    RSS      AIC
## + Age             1     31.599 318.86 -66.566
## + PER             1     11.787 338.67 -43.358
## + PTS             1     10.016 340.45 -41.350
## + OBPM            1      8.947 341.51 -40.144
## + Conference      2      9.952 340.51 -39.278
## + DBPM            1      7.922 342.54 -38.990
## + ows_adj         1      7.724 342.74 -38.767
## + OWS             1      7.552 342.91 -38.574
## + USG.            1      7.500 342.96 -38.515
## + WS.48           1      7.398 343.06 -38.401
## + dws_adj         1      7.237 343.23 -38.220
## + DRtg            1      6.013 344.45 -36.850
## + Height          1      5.945 344.52 -36.773
## + orb_adj         1      5.930 344.53 -36.758
## + TRB.            1      5.716 344.75 -36.518
## + AST.            1      5.664 344.80 -36.460
## + VORP            1      5.647 344.82 -36.441
## + DRB.            1      5.362 345.10 -36.123
## + DWS             1      4.623 345.84 -35.300
## + vorp_adj        1      4.560 345.90 -35.230
## + Pos             6     13.359 337.10 -35.150
## + ORB.            1      3.829 346.63 -34.416
## + X3PAr           1      3.805 346.66 -34.390
## + ORtg            1      2.919 347.54 -33.407
## + blk_adj         1      2.426 348.04 -32.861
## + gs_adj          1      2.122 348.34 -32.525
## <none>                         350.46 -32.187
## + International   1      1.745 348.72 -32.109
## + G               1      1.657 348.81 -32.011
## + BLK.            1      1.508 348.95 -31.847
## + GS              1      1.217 349.24 -31.526
## + ftr_adj         1      0.799 349.66 -31.066
## + TS.             1      0.672 349.79 -30.926
## + FTr             1      0.618 349.84 -30.867
## + TOV.            1      0.051 350.41 -30.243
## + stl_adj         1      0.037 350.42 -30.228
## + STL.            1      0.014 350.45 -30.202
## - MP              1    205.936 556.40 143.772
##
## Step:  AIC=-66.57
## logsal ~ MP + Age
```

```
##
##                   Df Sum of Sq    RSS      AIC
## + Conference      2     16.682 302.18  -83.254
## + PTS             1     11.385 307.48  -78.564
## + USG.            1     10.980 307.88  -78.056
## + PER             1      9.861 309.00  -76.660
## + orb_adj         1      7.474 311.39  -73.697
## + Height          1      6.376 312.49  -72.342
## + TRB.            1      6.304 312.56  -72.253
## + DBPM            1      5.690 313.17  -71.498
## + DRB.            1      5.453 313.41  -71.207
## + OWS             1      5.322 313.54  -71.046
## + ows_adj         1      5.162 313.70  -70.850
## + ORB.            1      5.111 313.75  -70.787
## + dws_adj         1      4.642 314.22  -70.212
## + DRtg            1      4.605 314.26  -70.166
## + X3PAr           1      4.420 314.44  -69.940
## + OBPM            1      4.154 314.71  -69.614
## + Pos             6     12.036 306.83  -69.379
## + VORP            1      3.468 315.40  -68.776
## + WS.48           1      3.223 315.64  -68.476
## + blk_adj         1      3.153 315.71  -68.392
## + AST.            1      3.140 315.72  -68.376
## + DWS             1      3.024 315.84  -68.234
## + G               1      2.245 316.62  -67.286
## + BLK.            1      2.202 316.66  -67.234
## + vorp_adj        1      1.725 317.14  -66.654
## <none>                         318.86  -66.566
## + gs_adj          1      1.590 317.27  -66.490
## + International    1      1.579 317.28  -66.478
## + ftr_adj         1      1.258 317.61  -66.087
## + FTr             1      1.021 317.84  -65.801
## + GS              1      0.709 318.15  -65.422
## + ORtg            1      0.486 318.38  -65.153
## + stl_adj         1      0.273 318.59  -64.896
## + STL.            1      0.113 318.75  -64.702
## + TOV.            1      0.028 318.84  -64.599
## + TS.             1      0.000 318.86  -64.566
## - Age             1     31.599 350.46  -32.187
## - MP              1    203.784 522.65  121.680
##
## Step:  AIC=-83.25
## logsal ~ MP + Age + Conference
##
##                   Df Sum of Sq    RSS      AIC
## + USG.            1     11.271 290.91  -95.889
## + PTS             1     11.175 291.01  -95.762
## + PER             1     10.001 292.18  -94.212
## + orb_adj         1      6.275 295.91  -89.334
## + OWS             1      5.042 297.14  -87.732
## + OBPM            1      4.879 297.30  -87.521
## + ows_adj         1      4.828 297.35  -87.455
## + TRB.            1      4.595 297.59  -87.154
## + Height          1      4.391 297.79  -86.889
```

```
## + ORB.            1      4.116 298.06 -86.534
## + X3PAr           1      4.033 298.15 -86.427
## + AST.            1      3.904 298.28 -86.261
## + DRB.            1      3.730 298.45 -86.036
## + DBPM            1      3.300 298.88 -85.482
## + WS.48           1      2.974 299.21 -85.061
## + dws_adj         1      2.808 299.37 -84.849
## + VORP            1      2.567 299.61 -84.539
## + DRtg            1      2.501 299.68 -84.454
## + gs_adj          1      2.470 299.71 -84.413
## + Pos             6      9.929 292.25 -84.117
## + G               1      2.230 299.95 -84.106
## + ftr_adj         1      1.755 300.43 -83.496
## + blk_adj         1      1.752 300.43 -83.493
## + DWS             1      1.615 300.57 -83.317
## <none>                          302.18 -83.254
## + FTr             1      1.465 300.72 -83.125
## + BLK.            1      1.097 301.08 -82.655
## + GS              1      0.904 301.28 -82.408
## + vorp_adj        1      0.805 301.38 -82.281
## + ORtg            1      0.703 301.48 -82.151
## + International   1      0.541 301.64 -81.944
## + stl_adj         1      0.480 301.70 -81.867
## + STL.            1      0.206 301.97 -81.517
## + TOV.            1      0.070 302.11 -81.343
## + TS.             1      0.054 302.13 -81.323
## - Conference      2     16.682 318.86 -66.566
## - Age             1     38.329 340.51 -39.278
## - MP              1    176.059 478.24  91.494
##
## Step:  AIC=-95.89
## logsal ~ MP + Age + Conference + USG.
##
##                  Df Sum of Sq    RSS      AIC
## + DBPM            1      9.830 281.08 -107.123
## + orb_adj         1      9.488 281.42 -106.655
## + Height          1      6.623 284.29 -102.755
## + ORB.            1      6.039 284.87 -101.965
## + TRB.            1      5.405 285.50 -101.110
## + Pos             6     11.647 279.26  -99.620
## + dws_adj         1      3.686 287.22  -98.798
## + DRB.            1      3.680 287.23  -98.790
## + blk_adj         1      3.270 287.64  -98.242
## + PER             1      3.148 287.76  -98.078
## + X3PAr           1      2.896 288.01  -97.740
## + gs_adj          1      2.744 288.17  -97.538
## + DRtg            1      2.668 288.24  -97.436
## + WS.48           1      2.627 288.28  -97.381
## + ows_adj         1      2.068 288.84  -96.635
## + OWS             1      2.002 288.91  -96.548
## + BLK.            1      1.972 288.94  -96.508
## + OBPM            1      1.647 289.26  -96.075
## + ORtg            1      1.586 289.32  -95.994
## <none>                          290.91  -95.889
```

```
## + DWS            1    1.454 289.46  -95.818
## + PTS            1    1.253 289.66  -95.551
## + ftr_adj        1    0.913 290.00  -95.100
## + FTr            1    0.760 290.15  -94.897
## + VORP           1    0.739 290.17  -94.869
## + International  1    0.597 290.31  -94.680
## + stl_adj        1    0.538 290.37  -94.602
## + vorp_adj       1    0.412 290.50  -94.435
## + AST.           1    0.395 290.51  -94.413
## + GS             1    0.381 290.53  -94.394
## + TOV.           1    0.292 290.62  -94.276
## + TS.            1    0.183 290.73  -94.131
## + G              1    0.085 290.82  -94.002
## + STL.           1    0.065 290.84  -93.975
## - USG.           1   11.271 302.18  -83.254
## - Conference     2   16.974 307.88  -78.056
## - Age            1   42.217 333.13  -45.717
## - MP             1  129.044 419.95   43.457
##
## Step:  AIC=-107.12
## logsal ~ MP + Age + Conference + USG. + DBPM
##
##                   Df Sum of Sq    RSS      AIC
## + orb_adj         1    3.238 277.84 -109.584
## + Height          1    2.374 278.71 -108.389
## + DRtg            1    2.280 278.80 -108.258
## + OBPM            1    2.055 279.02 -107.949
## + ORB.            1    1.616 279.46 -107.344
## <none>                       281.08 -107.123
## + ORtg            1    1.287 279.79 -106.890
## + gs_adj          1    1.262 279.82 -106.855
## + STL.            1    1.247 279.83 -106.835
## + ows_adj         1    1.033 280.05 -106.541
## + DWS             1    1.005 280.07 -106.503
## + OWS             1    0.979 280.10 -106.467
## + vorp_adj        1    0.852 280.23 -106.292
## + PTS             1    0.819 280.26 -106.247
## + TRB.            1    0.657 280.42 -106.024
## + BLK.            1    0.620 280.46 -105.973
## + WS.48           1    0.518 280.56 -105.833
## + International   1    0.514 280.57 -105.828
## + PER             1    0.490 280.59 -105.795
## + stl_adj         1    0.398 280.68 -105.668
## + VORP            1    0.324 280.76 -105.567
## + G               1    0.247 280.83 -105.461
## + blk_adj         1    0.182 280.90 -105.373
## + AST.            1    0.174 280.91 -105.361
## + TS.             1    0.151 280.93 -105.330
## + DRB.            1    0.106 280.97 -105.268
## + dws_adj         1    0.099 280.98 -105.259
## + X3PAr           1    0.082 281.00 -105.235
## + FTr             1    0.071 281.01 -105.220
## + ftr_adj         1    0.052 281.03 -105.195
## + TOV.            1    0.025 281.05 -105.157
```

```
## + GS             1     0.008 281.07 -105.134
## + Pos            6     5.519 275.56 -102.758
## - DBPM           1     9.830 290.91  -95.889
## - Conference     2    13.017 294.10  -93.695
## - USG.           1    17.801 298.88  -85.482
## - Age            1    39.226 320.31  -58.828
## - MP             1    93.538 374.62    1.475
##
## Step:  AIC=-109.58
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj
##
##                 Df Sum of Sq    RSS      AIC
## + BLK.           1     2.920 274.92 -111.652
## + blk_adj        1     2.638 275.20 -111.257
## + DRtg           1     2.508 275.33 -111.075
## + OBPM           1     2.066 275.78 -110.458
## + AST.           1     1.870 275.97 -110.184
## <none>                       277.84 -109.584
## + ORB.           1     1.386 276.46 -109.509
## + TRB.           1     1.371 276.47 -109.489
## + DWS            1     1.349 276.49 -109.458
## + gs_adj         1     1.107 276.73 -109.121
## + DRB.           1     0.945 276.90 -108.896
## + X3PAr          1     0.915 276.93 -108.854
## + vorp_adj       1     0.880 276.96 -108.806
## + PTS            1     0.612 277.23 -108.433
## + G              1     0.554 277.29 -108.352
## + OWS            1     0.532 277.31 -108.321
## + ows_adj        1     0.517 277.32 -108.302
## + FTr            1     0.371 277.47 -108.098
## + ftr_adj        1     0.366 277.48 -108.092
## + ORtg           1     0.328 277.51 -108.038
## + Height         1     0.316 277.53 -108.022
## + dws_adj        1     0.276 277.57 -107.967
## + VORP           1     0.262 277.58 -107.948
## + International  1     0.229 277.61 -107.901
## + STL.           1     0.082 277.76 -107.697
## + stl_adj        1     0.057 277.78 -107.663
## + TOV.           1     0.051 277.79 -107.656
## + WS.48          1     0.029 277.81 -107.624
## + TS.            1     0.004 277.84 -107.590
## + GS             1     0.001 277.84 -107.586
## + PER            1     0.000 277.84 -107.585
## - orb_adj        1     3.238 281.08 -107.123
## - DBPM           1     3.580 281.42 -106.655
## + Pos            6     2.381 275.46 -100.898
## - Conference     2    13.274 291.12  -95.616
## - USG.           1    17.635 295.48  -87.892
## - Age            1    41.275 319.12  -58.260
## - MP             1    96.561 374.40    3.254
##
## Step:  AIC=-111.65
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK.
##
```

```
##                    Df Sum of Sq    RSS      AIC
## + DRtg              1     2.856 272.07 -113.672
## + DWS               1     1.782 273.14 -112.155
## + OBPM              1     1.563 273.36 -111.847
## <none>                         274.92 -111.652
## + STL.              1     1.238 273.68 -111.389
## + gs_adj            1     1.170 273.75 -111.294
## + TRB.              1     1.146 273.78 -111.259
## + vorp_adj          1     1.138 273.78 -111.249
## + Height            1     1.010 273.91 -111.069
## + DRB.              1     0.969 273.95 -111.011
## + AST.              1     0.786 274.14 -110.754
## + PTS               1     0.692 274.23 -110.622
## + ORB.              1     0.650 274.27 -110.563
## + G                 1     0.604 274.32 -110.498
## + ORtg              1     0.603 274.32 -110.498
## + dws_adj           1     0.560 274.36 -110.436
## + X3PAr             1     0.551 274.37 -110.424
## + ows_adj           1     0.502 274.42 -110.356
## + OWS               1     0.492 274.43 -110.341
## + VORP              1     0.474 274.45 -110.316
## + International     1     0.360 274.56 -110.156
## + stl_adj           1     0.331 274.59 -110.115
## + ftr_adj           1     0.237 274.68 -109.984
## + FTr               1     0.228 274.69 -109.971
## + TS.               1     0.155 274.77 -109.869
## + blk_adj           1     0.099 274.82 -109.790
## + PER               1     0.078 274.84 -109.761
## + WS.48             1     0.067 274.85 -109.746
## + GS                1     0.003 274.92 -109.656
## + TOV.              1     0.001 274.92 -109.652
## - BLK.              1     2.920 277.84 -109.584
## - orb_adj           1     5.538 280.46 -105.973
## + Pos               6     4.241 270.68 -105.637
## - DBPM              1     6.231 281.15 -105.024
## - Conference        2    13.578 288.50  -97.091
## - USG.              1    19.547 294.47  -87.208
## - Age               1    39.589 314.51  -61.857
## - MP                1    82.811 357.73  -12.281
##
## Step:  AIC=-113.67
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     DRtg
##
##                    Df Sum of Sq    RSS      AIC
## + OBPM              1     2.536 269.53 -115.278
## + ORtg              1     1.800 270.27 -114.228
## + WS.48             1     1.591 270.47 -113.931
## <none>                         272.07 -113.672
## + ows_adj           1     1.079 270.99 -113.202
## + OWS               1     1.017 271.05 -113.114
## + Height            1     0.993 271.07 -113.080
## + PER               1     0.863 271.20 -112.896
## + X3PAr             1     0.845 271.22 -112.870
```

```
## + STL.             1      0.808 271.26 -112.817
## + TS.              1      0.773 271.29 -112.768
## + PTS              1      0.769 271.30 -112.762
## + International    1      0.611 271.45 -112.538
## + gs_adj           1      0.611 271.45 -112.538
## + AST.             1      0.394 271.67 -112.230
## + vorp_adj         1      0.392 271.67 -112.227
## + dws_adj          1      0.391 271.67 -112.226
## + ftr_adj          1      0.374 271.69 -112.203
## + DRB.             1      0.321 271.74 -112.127
## + FTr              1      0.303 271.76 -112.102
## + G                1      0.290 271.78 -112.083
## + stl_adj          1      0.263 271.80 -112.044
## + TRB.             1      0.247 271.82 -112.022
## + TOV.             1      0.134 271.93 -111.862
## + VORP             1      0.126 271.94 -111.850
## + blk_adj          1      0.116 271.95 -111.837
## + DWS              1      0.084 271.98 -111.792
## + ORB.             1      0.042 272.02 -111.732
## + GS               1      0.000 272.06 -111.673
## - DRtg             1      2.856 274.92 -111.652
## - BLK.             1      3.268 275.33 -111.075
## + Pos              6      4.732 267.33 -108.427
## - orb_adj          1      6.021 278.09 -107.245
## - DBPM             1      8.677 280.74 -103.585
## - Conference       2     14.327 286.39  -97.913
## - USG.             1     22.348 294.41  -85.280
## - Age              1     40.455 312.52  -62.301
## - MP               1     64.976 337.04  -33.219
##
## Step:  AIC=-115.28
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     DRtg + OBPM
##
##                  Df Sum of Sq    RSS      AIC
## + vorp_adj         1      2.994 266.54 -117.579
## + VORP             1      2.081 267.45 -116.262
## + Height           1      1.421 268.11 -115.313
## <none>                          269.53 -115.278
## + STL.             1      1.007 268.52 -114.719
## + PER              1      0.711 268.82 -114.296
## + International    1      0.682 268.85 -114.254
## + ftr_adj          1      0.598 268.93 -114.134
## + gs_adj           1      0.584 268.94 -114.113
## + FTr              1      0.495 269.03 -113.986
## + stl_adj          1      0.440 269.09 -113.908
## + dws_adj          1      0.396 269.13 -113.845
## + X3PAr            1      0.327 269.20 -113.746
## - OBPM             1      2.536 272.06 -113.672
## + WS.48            1      0.213 269.32 -113.582
## + TS.              1      0.193 269.34 -113.554
## + G                1      0.185 269.35 -113.542
## - BLK.             1      2.660 272.19 -113.497
## + DRB.             1      0.126 269.40 -113.458
```

```
## + AST.             1     0.097 269.43 -113.416
## + TRB.             1     0.081 269.45 -113.394
## + DWS              1     0.063 269.47 -113.368
## + blk_adj          1     0.058 269.47 -113.361
## + PTS              1     0.050 269.48 -113.350
## + TOV.             1     0.023 269.51 -113.311
## + ows_adj          1     0.014 269.51 -113.299
## + OWS              1     0.009 269.52 -113.291
## + ORB.             1     0.008 269.52 -113.290
## + GS               1     0.003 269.53 -113.283
## + ORtg             1     0.001 269.53 -113.280
## - DRtg             1     3.829 273.36 -111.847
## + Pos              6     5.488 264.04 -111.199
## - orb_adj          1     5.737 275.27 -109.169
## - DBPM             1     9.708 279.24 -103.655
## - Conference       2    14.888 284.42  -98.579
## - USG.             1    18.840 288.37  -91.266
## - MP               1    35.120 304.65  -70.122
## - Age              1    35.311 304.84  -69.880
##
## Step:  AIC=-117.58
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     DRtg + OBPM + vorp_adj
##
##                    Df Sum of Sq    RSS      AIC
## + G                 1     1.996 264.54 -118.473
## + ows_adj           1     1.693 264.84 -118.031
## + Height            1     1.409 265.13 -117.620
## <none>                          266.54 -117.579
## + OWS               1     1.371 265.17 -117.564
## + PER               1     0.984 265.55 -117.003
## + dws_adj           1     0.984 265.55 -117.003
## + STL.              1     0.915 265.62 -116.902
## + gs_adj            1     0.594 265.94 -116.437
## + International     1     0.590 265.94 -116.432
## + WS.48             1     0.541 265.99 -116.361
## + ftr_adj           1     0.485 266.05 -116.279
## + X3PAr             1     0.464 266.07 -116.249
## + stl_adj           1     0.408 266.13 -116.168
## - DRtg              1     2.398 268.93 -116.131
## + TS.               1     0.380 266.15 -116.128
## + FTr               1     0.378 266.16 -116.125
## + PTS               1     0.356 266.18 -116.093
## + GS                1     0.248 266.29 -115.937
## + DWS               1     0.192 266.34 -115.856
## + AST.              1     0.166 266.37 -115.819
## + DRB.              1     0.148 266.39 -115.792
## + TOV.              1     0.141 266.39 -115.783
## + ORtg              1     0.109 266.43 -115.736
## - BLK.              1     2.685 269.22 -115.720
## + blk_adj           1     0.092 266.44 -115.712
## + VORP              1     0.091 266.44 -115.711
## + TRB.              1     0.069 266.47 -115.678
## + ORB.              1     0.004 266.53 -115.584
```

```
## - vorp_adj          1       2.994 269.53 -115.278
## + Pos                6       5.914 260.62 -114.218
## - OBPM               1       5.138 271.67 -112.227
## - orb_adj            1       5.774 272.31 -111.327
## - DBPM               1      11.498 278.03 -103.319
## - Conference         2      15.545 282.08  -99.755
## - USG.               1      19.472 286.01  -92.432
## - Age                1      36.241 302.78  -70.495
## - MP                 1      37.906 304.44  -68.384
##
## Step:  AIC=-118.47
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     DRtg + OBPM + vorp_adj + G
##
##                    Df Sum of Sq    RSS      AIC
## + dws_adj           1       2.688 261.85 -120.404
## + ows_adj           1       1.977 262.56 -119.361
## + OWS               1       1.541 263.00 -118.722
## - DRtg              1       1.210 265.75 -118.716
## + PER               1       1.523 263.02 -118.695
## <none>                            264.54 -118.473
## + STL.              1       1.347 263.19 -118.438
## + Height            1       1.238 263.30 -118.279
## + ftr_adj           1       0.828 263.71 -117.679
## + X3PAr             1       0.808 263.73 -117.651
## - G                 1       1.996 266.54 -117.579
## + FTr               1       0.709 263.83 -117.506
## + International     1       0.663 263.88 -117.439
## + WS.48             1       0.547 263.99 -117.269
## + stl_adj           1       0.457 264.08 -117.138
## + TS.               1       0.314 264.23 -116.930
## + DWS               1       0.265 264.27 -116.858
## + VORP              1       0.236 264.30 -116.816
## + DRB.              1       0.235 264.31 -116.814
## + PTS               1       0.226 264.31 -116.802
## + TOV.              1       0.192 264.35 -116.752
## + gs_adj            1       0.179 264.36 -116.733
## + AST.              1       0.164 264.38 -116.712
## + ORtg              1       0.151 264.39 -116.692
## + TRB.              1       0.149 264.39 -116.689
## + blk_adj           1       0.013 264.53 -116.492
## + GS                1       0.007 264.53 -116.483
## + ORB.              1       0.007 264.53 -116.483
## - BLK.              1       2.788 267.33 -116.436
## + Pos               6       5.740 258.80 -114.918
## - vorp_adj          1       4.805 269.35 -113.542
## - OBPM              1       6.321 270.86 -111.382
## - orb_adj           1       6.657 271.20 -110.905
## - DBPM              1      11.301 275.84 -104.367
## - USG.              1      13.107 277.65 -101.855
## - Conference        2      15.461 280.00 -100.604
## - MP                1      19.531 284.07  -93.048
## - Age               1      36.875 301.41  -70.232
##
```

```
## Step:  AIC=-120.4
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##      DRtg + OBPM + vorp_adj + G + dws_adj
##
##                 Df Sum of Sq    RSS      AIC
## + ows_adj        1     2.833 259.02 -122.593
## + OWS            1     2.176 259.68 -121.616
## + PER            1     1.594 260.26 -120.755
## + DWS            1     1.396 260.45 -120.463
## <none>                        261.85 -120.404
## + Height         1     0.892 260.96 -119.718
## + WS.48          1     0.795 261.06 -119.575
## + DRB.           1     0.685 261.17 -119.413
## + X3PAr          1     0.673 261.18 -119.395
## - BLK.           1     2.134 263.99 -119.280
## + International  1     0.584 261.27 -119.263
## + PTS            1     0.463 261.39 -119.086
## + ftr_adj        1     0.441 261.41 -119.053
## + TRB.           1     0.435 261.42 -119.044
## + VORP           1     0.422 261.43 -119.025
## + STL.           1     0.415 261.44 -119.015
## + TS.            1     0.414 261.44 -119.013
## + FTr            1     0.333 261.52 -118.895
## + blk_adj        1     0.291 261.56 -118.833
## + TOV.           1     0.189 261.66 -118.682
## + AST.           1     0.167 261.69 -118.649
## + ORtg           1     0.155 261.70 -118.632
## + stl_adj        1     0.120 261.73 -118.580
## - dws_adj        1     2.688 264.54 -118.473
## + GS             1     0.026 261.82 -118.443
## + ORB.           1     0.011 261.84 -118.420
## + gs_adj         1     0.008 261.84 -118.416
## - DRtg           1     3.616 265.47 -117.125
## - G              1     3.699 265.55 -117.003
## + Pos            6     4.795 257.06 -115.520
## - orb_adj        1     5.608 267.46 -114.246
## - vorp_adj       1     6.933 268.79 -112.343
## - MP             1     7.652 269.50 -111.314
## - OBPM           1     7.770 269.62 -111.147
## - DBPM           1    11.655 273.51 -105.638
## - USG.           1    12.479 274.33 -104.480
## - Conference     2    15.452 277.30 -102.331
## - Age            1    35.154 297.01  -73.904
##
## Step:  AIC=-122.59
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##      DRtg + OBPM + vorp_adj + G + dws_adj + ows_adj
##
##                 Df Sum of Sq    RSS      AIC
## + VORP           1     3.181 255.84 -125.349
## + WS.48          1     2.591 256.43 -124.463
## + PER            1     2.501 256.52 -124.328
## + DWS            1     2.310 256.71 -124.042
## + OWS            1     1.640 257.38 -123.038
```

```
## + X3PAr          1      1.468 257.55 -122.781
## <none>                         259.02 -122.593
## + ftr_adj        1      1.289 257.73 -122.514
## + FTr            1      1.053 257.97 -122.161
## + DRB.           1      0.853 258.17 -121.863
## + Height         1      0.769 258.25 -121.738
## + TRB.           1      0.677 258.34 -121.601
## + TS.            1      0.563 258.45 -121.431
## + International  1      0.476 258.54 -121.300
## + ORtg           1      0.394 258.62 -121.179
## + blk_adj        1      0.277 258.74 -121.004
## + AST.           1      0.190 258.83 -120.875
## + STL.           1      0.149 258.87 -120.814
## + TOV.           1      0.148 258.87 -120.813
## - BLK.           1      2.560 261.58 -120.806
## + PTS            1      0.056 258.96 -120.676
## + GS             1      0.042 258.98 -120.655
## + gs_adj         1      0.036 258.98 -120.645
## + ORB.           1      0.008 259.01 -120.605
## + stl_adj        1      0.002 259.02 -120.596
## - ows_adj        1      2.833 261.85 -120.404
## - dws_adj        1      3.544 262.56 -119.361
## - orb_adj        1      3.982 263.00 -118.719
## - DRtg           1      4.019 263.04 -118.665
## - OBPM           1      4.411 263.43 -118.091
## - G              1      4.494 263.51 -117.970
## + Pos            6      4.228 254.79 -116.929
## - MP             1      5.985 265.00 -115.798
## - vorp_adj       1      9.766 268.78 -110.343
## - USG.           1     11.149 270.17 -108.367
## - DBPM           1     13.454 272.47 -105.098
## - Conference     2     15.647 274.67 -104.011
## - Age            1     35.468 294.49  -75.184
##
## Step:  AIC=-125.35
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     DRtg + OBPM + vorp_adj + G + dws_adj + ows_adj + VORP
##
##                  Df Sum of Sq    RSS      AIC
## + WS.48           1      5.423 250.41 -131.599
## + PER             1      4.586 251.25 -130.313
## + X3PAr           1      3.092 252.75 -128.030
## + ORtg            1      2.165 253.67 -126.622
## + ftr_adj         1      2.069 253.77 -126.475
## + FTr             1      1.707 254.13 -125.926
## + TS.             1      1.623 254.22 -125.799
## <none>                         255.84 -125.349
## + DRB.            1      0.908 254.93 -124.718
## + TRB.            1      0.751 255.09 -124.481
## + AST.            1      0.597 255.24 -124.249
## + Height          1      0.551 255.29 -124.179
## + TOV.            1      0.518 255.32 -124.129
## + DWS             1      0.453 255.38 -124.032
## + International   1      0.381 255.46 -123.923
```

```
## + blk_adj        1      0.357 255.48 -123.887
## + STL.           1      0.081 255.76 -123.472
## + ORB.           1      0.047 255.79 -123.420
## + PTS            1      0.038 255.80 -123.407
## + OWS            1      0.012 255.83 -123.367
## + gs_adj         1      0.010 255.83 -123.364
## + stl_adj        1      0.002 255.84 -123.353
## + GS             1      0.001 255.84 -123.352
## - orb_adj        1      2.920 258.76 -122.980
## - BLK.           1      3.152 258.99 -122.635
## - VORP           1      3.181 259.02 -122.593
## - DRtg           1      4.857 260.69 -120.109
## - dws_adj        1      4.875 260.71 -120.083
## - vorp_adj       1      4.938 260.77 -119.990
## - OBPM           1      5.235 261.07 -119.550
## - ows_adj        1      5.592 261.43 -119.025
## - MP             1      5.740 261.58 -118.807
## + Pos            6      3.572 252.27 -118.763
## - G              1      6.239 262.08 -118.073
## - USG.           1     13.195 269.03 -107.987
## - Conference     2     15.224 271.06 -107.096
## - DBPM           1     16.271 272.11 -103.610
## - Age            1     33.446 289.28  -80.046
##
## Step:  AIC=-131.6
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     DRtg + OBPM + vorp_adj + G + dws_adj + ows_adj + VORP + WS.48
##
##                 Df Sum of Sq    RSS      AIC
## - DRtg           1      0.289 250.70 -133.154
## - BLK.           1      0.406 250.82 -132.975
## <none>                        250.41 -131.599
## + Height         1      0.928 249.49 -131.027
## + AST.           1      0.852 249.56 -130.911
## + STL.           1      0.825 249.59 -130.870
## + ftr_adj        1      0.604 249.81 -130.528
## + PER            1      0.456 249.96 -130.300
## + FTr            1      0.443 249.97 -130.280
## + blk_adj        1      0.340 250.07 -130.121
## + stl_adj        1      0.293 250.12 -130.049
## + X3PAr          1      0.220 250.19 -129.936
## + International  1      0.183 250.23 -129.880
## + TOV.           1      0.180 250.23 -129.876
## + DWS            1      0.174 250.24 -129.866
## + ORtg           1      0.131 250.28 -129.800
## + DRB.           1      0.069 250.34 -129.705
## + TRB.           1      0.049 250.37 -129.674
## + ORB.           1      0.044 250.37 -129.667
## + OWS            1      0.043 250.37 -129.665
## + PTS            1      0.041 250.37 -129.662
## + TS.            1      0.029 250.38 -129.644
## + GS             1      0.004 250.41 -129.604
## + gs_adj         1      0.003 250.41 -129.603
## - USG.           1      3.237 253.65 -128.654
```

```
## - MP             1     4.046 254.46 -127.428
## + Pos            6     4.714 245.70 -126.915
## - WS.48           1     5.423 255.84 -125.349
## - VORP            1     6.013 256.43 -124.463
## - orb_adj         1     6.698 257.11 -123.437
## - vorp_adj        1     7.119 257.53 -122.807
## - dws_adj         1     7.188 257.60 -122.702
## - G               1     8.215 258.63 -121.172
## - DBPM            1     8.642 259.06 -120.536
## - OBPM            1     9.687 260.10 -118.986
## - ows_adj         1    10.126 260.54 -118.337
## - Conference      2    14.287 264.70 -114.236
## - Age             1    35.321 285.74  -82.798
##
## Step:  AIC=-133.15
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + BLK. +
##     OBPM + vorp_adj + G + dws_adj + ows_adj + VORP + WS.48
##
##                  Df Sum of Sq    RSS      AIC
## - BLK.            1     0.289 250.99 -134.710
## <none>                        250.70 -133.154
## + STL.            1     1.103 249.60 -132.852
## + Height          1     1.023 249.68 -132.729
## + AST.            1     0.979 249.72 -132.661
## + ftr_adj         1     0.472 250.23 -131.880
## + stl_adj         1     0.448 250.26 -131.843
## + FTr             1     0.359 250.34 -131.706
## + PER             1     0.297 250.41 -131.611
## + DRtg            1     0.289 250.41 -131.599
## + ORtg            1     0.273 250.43 -131.574
## + DWS             1     0.238 250.47 -131.520
## + blk_adj         1     0.237 250.47 -131.519
## + TOV.            1     0.193 250.51 -131.450
## + International   1     0.144 250.56 -131.376
## + ORB.            1     0.125 250.58 -131.347
## + OWS             1     0.059 250.64 -131.245
## + TRB.            1     0.051 250.65 -131.232
## + X3PAr           1     0.048 250.66 -131.228
## + DRB.            1     0.044 250.66 -131.222
## + PTS             1     0.039 250.66 -131.214
## + gs_adj          1     0.022 250.68 -131.188
## + GS              1     0.003 250.70 -131.159
## + TS.             1     0.002 250.70 -131.158
## - USG.            1     3.113 253.82 -130.403
## + Pos            6     4.910 245.79 -128.769
## - MP             1     6.224 256.93 -125.712
## - VORP            1     6.302 257.00 -125.597
## - dws_adj         1     7.257 257.96 -124.168
## - vorp_adj        1     7.582 258.29 -123.684
## - G               1     8.308 259.01 -122.603
## - orb_adj         1     8.548 259.25 -122.246
## - WS.48           1     9.991 260.69 -120.109
## - DBPM            1    10.696 261.40 -119.069
## - ows_adj         1    11.082 261.79 -118.502
```

```
## - Conference       2    14.106 264.81 -116.079
## - OBPM             1    14.273 264.98 -113.837
## - Age              1    36.316 287.02  -83.071
##
## Step:  AIC=-134.71
## logsal ~ MP + Age + Conference + USG. + DBPM + orb_adj + OBPM +
##     vorp_adj + G + dws_adj + ows_adj + VORP + WS.48
##
##                  Df Sum of Sq    RSS      AIC
## <none>                        250.99 -134.710
## + AST.            1     1.201 249.79 -134.557
## + Height          1     0.787 250.21 -133.919
## + STL.            1     0.564 250.43 -133.576
## + blk_adj         1     0.511 250.48 -133.494
## + PER             1     0.447 250.55 -133.397
## + ftr_adj         1     0.409 250.58 -133.338
## + FTr             1     0.310 250.68 -133.185
## + BLK.            1     0.289 250.70 -133.154
## + TOV.            1     0.248 250.75 -133.091
## + DWS             1     0.230 250.76 -133.062
## + ORB.            1     0.185 250.81 -132.994
## + ORtg            1     0.174 250.82 -132.976
## + DRtg            1     0.173 250.82 -132.975
## + stl_adj         1     0.172 250.82 -132.975
## + International   1     0.112 250.88 -132.883
## + OWS             1     0.056 250.94 -132.797
## + TRB.            1     0.040 250.95 -132.771
## + TS.             1     0.031 250.96 -132.758
## + PTS             1     0.030 250.96 -132.756
## + DRB.            1     0.023 250.97 -132.746
## + X3PAr           1     0.018 250.97 -132.738
## + gs_adj          1     0.012 250.98 -132.729
## + GS              1     0.001 250.99 -132.711
## - USG.            1     2.824 253.82 -132.403
## + Pos             6     4.306 246.69 -129.372
## - MP              1     5.946 256.94 -127.696
## - VORP            1     6.396 257.39 -127.023
## - vorp_adj        1     7.886 258.88 -124.800
## - orb_adj         1     8.261 259.25 -124.242
## - G               1     8.513 259.51 -123.869
## - dws_adj         1     8.775 259.77 -123.480
## - ows_adj         1    11.347 262.34 -119.688
## - DBPM            1    11.466 262.46 -119.512
## - Conference      2    14.001 264.99 -117.811
## - WS.48           1    13.151 264.14 -117.048
## - OBPM            1    18.393 269.39 -109.483
## - Age             1    36.726 287.72  -84.135
```

Variance Inflation Factors

```r
full = lm(logsal ~ ., data = data_regressors)
summary(full)
```

```
##
```

```
## Call:
## lm(formula = logsal ~ ., data = data_regressors)
##
## Residuals:
##       Min       1Q   Median       3Q      Max
## -3.01123 -0.45112  0.01986  0.53385  1.93193
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.4225997  6.8296551   0.648  0.51771
## Age              0.0630723  0.0108876   5.793 1.57e-08 ***
## G               -0.0203828  0.0061556  -3.311  0.00103 **
## GS              -0.0006357  0.0044519  -0.143  0.88654
## gs_adj           0.0165965  0.0752748   0.220  0.82563
## MP               0.0005305  0.0003673   1.445  0.14951
## PER             -0.0174388  0.0784872  -0.222  0.82430
## X3PAr            0.6974562  0.6075721   1.148  0.25180
## FTr              4.1859741  3.5760217   1.171  0.24259
## ftr_adj         -6.1036319  4.9320476  -1.238  0.21674
## ORB.            -0.2008639  0.2006313  -1.001  0.31746
## orb_adj          0.2144035  0.2928215   0.732  0.46455
## DRB.            -0.2363441  0.1966500  -1.202  0.23026
## TRB.             0.4371859  0.3945849   1.108  0.26866
## AST.             0.0181086  0.0156213   1.159  0.24718
## STL.            -0.2181312  0.2047322  -1.065  0.28743
## stl_adj          0.6058089  0.5364506   1.129  0.25957
## BLK.            -0.0063714  0.1047194  -0.061  0.95152
## blk_adj         -0.2721569  0.3076517  -0.885  0.37698
## TOV.             0.0021125  0.0276936   0.076  0.93924
## USG.             0.0617779  0.0422083   1.464  0.14421
## ORtg             0.0220255  0.0249201   0.884  0.37740
## DRtg             0.0288892  0.0539888   0.535  0.59293
## OWS             -0.1233481  0.5093160  -0.242  0.80878
## ows_adj          8.4004018 11.6084572   0.724  0.46978
## DWS             -0.0896228  0.2381367  -0.376  0.70689
## dws_adj          1.2651898  0.7187115   1.760  0.07924 .
## WS.48           -4.9672150  5.4844609  -0.906  0.36574
## OBPM             0.1282551  0.1092672   1.174  0.24130
## DBPM             0.2533772  0.0860760   2.944  0.00347 **
## VORP            -0.2712728  0.1809745  -1.499  0.13481
## vorp_adj        -0.7052569  0.2948591  -2.392  0.01731 *
## PosC-F           0.2750336  0.3458740   0.795  0.42706
## PosF            -0.1731032  0.2057598  -0.841  0.40078
## PosF-C           0.0093911  0.2310966   0.041  0.96761
## PosF-G          -0.3437900  0.3114840  -1.104  0.27049
## PosG            -0.6538078  0.3138647  -2.083  0.03799 *
## PosG-F          -0.4935578  0.2866025  -1.722  0.08596 .
## Height           0.0037293  0.0313987   0.119  0.90553
## PTS              0.0001479  0.0005863   0.252  0.80099
## TS.             -0.9776647  3.2686250  -0.299  0.76504
## InternationalYes -0.0470952  0.1147774  -0.410  0.68183
## ConferenceMulti -0.6674140  0.1595178  -4.184 3.65e-05 ***
## ConferenceWest  -0.0894918  0.1003389  -0.892  0.37308
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8305 on 341 degrees of freedom
## Multiple R-squared:  0.5773, Adjusted R-squared:  0.524
## F-statistic: 10.83 on 43 and 341 DF,  p-value: < 2.2e-16
```

```r
vif(full)[,3]
```

```
##          Age           G          GS      gs_adj          MP
##     1.137917    3.243957    3.139664    2.860245    7.115969
##          PER       X3PAr         FTr     ftr_adj        ORB.
##     9.340467    2.810743   13.073063   13.224638   18.340182
##      orb_adj        DRB.        TRB.        AST.        STL.
##     4.519097   27.029354   41.691431    3.399435    3.972902
##      stl_adj        BLK.     blk_adj        TOV.        USG.
##     3.690208    4.093339    3.718703    3.134092    4.975736
##         ORtg        DRtg         OWS     ows_adj         DWS
##     6.711468    5.000730   25.032131   24.153697    6.408014
##      dws_adj       WS.48        OBPM        DBPM        VORP
##     7.852270    9.454555    7.055519    4.132293    6.142057
##     vorp_adj         Pos      Height         PTS         TS.
##     4.199518    1.253044    2.572141    6.407896    4.792302
## International  Conference
##     1.147682    1.108974
```

```r
full2 = lm(logsal ~ . - WS.48 - PER - ORtg - PTS, data = data_regressors) # Sequentially removed highes
```

Added Variable Plots

Diagnostics

Leverage Points

Cook's Distances

Outliers

Model Fitting

Test for Interaction

Test for Higher Order

Model Validation

Final Model

Discussion

Conclusion