# Find\_Best\_Number\_Players

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The goal of this session is to find how many players' efficiency combined would be the best correlation between PE\_Combined and pct.

```
ten <- read.csv('/home/chenjie/Desktop/Math564Project/POE/10_poe.csv')</pre>
nine <- read.csv('/home/chenjie/Desktop/Math564Project/POE/9_poe.csv')</pre>
eight <- read.csv('/home/chenjie/Desktop/Math564Project/POE/8_poe.csv')</pre>
seven <- read.csv('/home/chenjie/Desktop/Math564Project/POE/7_poe.csv')</pre>
six <-read.csv('/home/chenjie/Desktop/Math564Project/POE/6_poe.csv')</pre>
five <-read.csv('/home/chenjie/Desktop/Math564Project/POE/5_poe.csv')</pre>
four <-read.csv('/home/chenjie/Desktop/Math564Project/POE/4_poe.csv')</pre>
three <-read.csv('/home/chenjie/Desktop/Math564Project/POE/3_poe.csv')</pre>
two <-read.csv('/home/chenjie/Desktop/Math564Project/POE/2_poe.csv')</pre>
one <-read.csv('/home/chenjie/Desktop/Math564Project/POE/1_poe.csv')</pre>
ten$pct <- ten$pct*100
ten_14 <- ten[ten$season == 2014,]
plot(ten_14$sum_poe,ten_14$pct)+text(ten_14$pct ~ ten_14$sum_poe, labels=ten_14$team,data=ten_14, cex=0
                                                               O SA
                                                            О окс
      20
                                                                              O LAC
                O IND
                                          О нои
                                                    O MIA O POR
                                             O GS
      9
                                                   О МЕМ
                                                                                         O DA
en_14$pct
                                   О вки
                                                                   О СНА
      50
                                        O ATL
                                                        O NY
                                                          O NO
      4
                                         O CLE
                                                              O DET
               O SAC
      30
                     O O TABIOS
              O ORL
                        O PHI
                                                                              6.2
             5.4
                              5.6
                                              5.8
                                                              6.0
                                          ten_14$sum_poe
## integer(0)
ten_md_14 <- lm(ten_14$pct ~ ten_14$sum_poe)
summary(ten md 14)
##
## Call:
## lm(formula = ten_14$pct ~ ten_14$sum_poe)
```

```
##
## Residuals:
##
                   1Q
                        Median
   -23.0001 -10.5974 -0.1634
##
                                 10.4317
                                           29.1020
##
## Coefficients:
##
                   Estimate Std. Error t value Pr(>|t|)
                                   58.76
                                          -2.483
                                                    0.0193 *
## (Intercept)
                     -145.91
## ten_14$sum_poe
                       34.16
                                   10.24
                                           3.337
                                                    0.0024 **
## ---
## Signif. codes:
                    0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 13.56 on 28 degrees of freedom
## Multiple R-squared: 0.2846, Adjusted R-squared: 0.259
## F-statistic: 11.14 on 1 and 28 DF, p-value: 0.0024
ten_15 <- ten[ten$season == 2015,]
plot(ten_15\$sum_poe,ten_15\$pct)+text(ten_15\$pct ~ ten_15\$sum_poe, labels=ten_15\$team,data=ten_15, cex=0
                                                                             O GS
      80
                                               O ATL
      70
                                                                                   O LAC
                                                                      8 HOU
                                                O MEM
                                                                     o`
                                                  O Q<sub>II</sub> POR
      9
                                                                  0
ten_15$pct
                                                                                       Ото
                                                  O WSH
                                                            О окс
                                                                     O NO
      50
                                                                        O PHX
      40
                                                                          О СНА
                                        O DET
                                              O DEN
                                       O SAC
      30
                                                           O ORL
                                                         O LAL
              O PHI
                                          O MINO NY
                  5.0
                             5.2
                                       5.4
                                                  5.6
                                                             5.8
                                                                        6.0
                                                                                   6.2
                                         ten_15$sum_poe
## integer(0)
ten_md_15 <- lm(ten_15$pct ~ ten_15$sum_poe)
summary(ten_md_15)
##
## Call:
## lm(formula = ten_15$pct ~ ten_15$sum_poe)
##
## Residuals:
##
        Min
                   1Q
                         Median
                                       3Q
                                                Max
##
   -24.6320 -7.2465
                         0.0684
                                   8.7796
                                           29.0790
##
## Coefficients:
##
                   Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)
                  -138.013
                                52.445 -2.632 0.01367 *
                     32.977
                                 9.188
                                          3.589 0.00125 **
## ten_15$sum_poe
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 13.82 on 28 degrees of freedom
## Multiple R-squared: 0.3151, Adjusted R-squared: 0.2906
## F-statistic: 12.88 on 1 and 28 DF, p-value: 0.001249
ten_16 \leftarrow ten[ten$season == 2016,]
plot(ten_16$sum_poe,ten_16$pct)+text(ten_16$pct ~ ten_16$sum_poe, labels=ten_16$team,data=ten_16, cex=0
                                                                          O GS
                                                                    O SA
     80
                                                                                 O CLE
                                                      O TOR
ten_16$pct
     8
                            O CHA
                                           OOTLMIA O BOS
                                  Q_{D}
                                                                           O POR
                                                     О нои
                                               O UTAH
     40
                                                        O MIL
                                                                       O SAC
                                               O DEN
                         O NY
                                        O MIN O NO
                                O BKN PHX
                           O LAL
             O PHI
                        5.4
                                          5.6
                                                           5.8
                                                                             6.0
                                        ten_16$sum_poe
## integer(0)
ten_md_16 <- lm(ten_16$pct ~ ten_16$sum_poe)
summary(ten_md_16)
##
## Call:
## lm(formula = ten_16$pct ~ ten_16$sum_poe)
## Residuals:
                       Median
##
        Min
                  1Q
                                     3Q
                                              Max
  -24.3382 -12.1013 -0.0601
                                 9.9100
                                         22.7575
##
## Coefficients:
##
                  Estimate Std. Error t value Pr(>|t|)
                                 66.40 -3.404 0.002022 **
## (Intercept)
                    -226.00
## ten_16$sum_poe
                      49.02
                                 11.78
                                         4.160 0.000273 ***
## ---
                   0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Signif. codes:
## Residual standard error: 13.55 on 28 degrees of freedom
## Multiple R-squared: 0.3819, Adjusted R-squared: 0.3599
```

```
## F-statistic: 17.3 on 1 and 28 DF, p-value: 0.0002735
ten_17 \leftarrow ten[ten$season == 2017,]
plot(ten_17$sum_poe,ten_17$pct)+text(ten_17$pct ~ ten_17$sum_poe, labels=ten_17$team,data=ten_17, cex=0
                                                                                     O GS
     80
                                                                            O SA
     70
                                                         О нои
                                                   O BOS
                                                       O UTAN OF LAO TOR
ten_17$pct
     9
                                                  O WSH
                                       О окс
                   О МЕМ
                                   O ATL
     50
                                                                O IND
                                                                           O PORO CHI
                                                    O DET CHA
                        О мо
     4
                                                               O DAL
                                    O SAC
                                            O MIN
                                                                              O NY
                        O ORL
                O PHI
                                         O LAL
                                                                   ОРНХ
             O BKN
                      5.4
                                       5.6
                                                       5.8
                                                                        6.0
                                        ten_17$sum_poe
## integer(0)
ten_md_17 <- lm(ten_17$pct ~ ten_17$sum_poe)
summary(ten md 17)
##
## Call:
## lm(formula = ten_17$pct ~ ten_17$sum_poe)
##
## Residuals:
##
       Min
                 1Q Median
                                  3Q
                                         Max
  -26.334 -8.020 -1.529 10.049
                                      20.027
##
## Coefficients:
##
                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                   -113.033
                                 55.035
                                        -2.054 0.04943 *
## ten_17$sum_poe
                     28.422
                                 9.587
                                          2.965 0.00613 **
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 12.11 on 28 degrees of freedom
## Multiple R-squared: 0.2389, Adjusted R-squared: 0.2117
## F-statistic: 8.789 on 1 and 28 DF, p-value: 0.006129
plot(ten$sum_poe,ten$pct)
```

```
0
80
                                                        0
                                                                 0
                                                                     0
                                              0
                                      0
                                                                      8
                                    0 0
9
                                                                          0 0
                                                         0
4
                                                            0
                                                          0
                                                               0
                         0
                         0
           5.0
                     5.2
                                         5.6
                                                   5.8
                                                            6.0
                                                                      6.2
                               5.4
                                   ten$sum_poe
```

```
ten_md <- lm(ten$pct ~ ten$sum_poe)
summary(ten_md)</pre>
```

```
##
## Call:
## lm(formula = ten$pct ~ ten$sum_poe)
##
## Residuals:
##
        Min
                  1Q
                       Median
                                    3Q
                                             Max
                       0.5731 10.0537
##
   -31.3981 -10.4419
                                        30.4960
##
## Coefficients:
               Estimate Std. Error t value Pr(>|t|)
##
## (Intercept) -137.120
                            26.797
                                    -5.117 9.49e-07 ***
                                     6.989 8.81e-11 ***
## ten$sum_poe
                 32.812
                             4.695
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 13.37 on 148 degrees of freedom
## Multiple R-squared: 0.2481, Adjusted R-squared: 0.243
## F-statistic: 48.84 on 1 and 148 DF, p-value: 8.812e-11
```

# Nine Players:

```
nine$pct <- nine$pct*100
nine_14 <- nine[nine$season == 2014,]
plot(nine_14$sum_poe,nine_14$pct)+text(nine_14$pct ~ nine_14$sum_poe, labels=nine_14$team,data=nine_14,</pre>
```

```
O SA
                                                           О окс
                                                                                    O LAC
                                        O IND
                                                                                            O POR
                                                                     O HOU
                                                                              O MIA
                                                                            O GS
                                                             O MEM
                                                                                                                  O DA
                                    О СНІ
                                                O PHX
                                                                          O TOR
nine_14$pct
                                                O BKN WSH
                                                                                               O CHA
        50
                                                                     O MIN
                                                                 S ATL
NY
                                              O DEN
        40
                                                                      8 NO
                                                                          O DET
                  O SAC
                                         O ORL BOS O UTAH
                                                            O LAL
       30
                               O PHI
        20
                                               O MIL
                             4.8
                                               5.0
                                                                5.2
                                                                                  5.4
                                                                                                   5.6
                                                     nine_14$sum_poe
```

```
## integer(0)
nine_md_14 <- lm(nine_14$pct ~ nine_14$sum_poe)</pre>
summary(nine_md_14)
##
## Call:
## lm(formula = nine_14$pct ~ nine_14$sum_poe)
##
## Residuals:
##
        Min
                  1Q
                       Median
                                     3Q
                                             Max
## -26.5879 -12.3210 -0.7581 11.0652
                                         25.8228
##
## Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
##
                    -104.60
                                  59.54
                                        -1.757
                                                  0.0899 .
## (Intercept)
                      29.99
                                  11.54
                                          2.599
                                                  0.0147 *
## nine_14$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.39 on 28 degrees of freedom
## Multiple R-squared: 0.1944, Adjusted R-squared: 0.1656
## F-statistic: 6.755 on 1 and 28 DF, p-value: 0.01475
nine_15 <- nine[nine$season == 2015,]</pre>
plot(nine_15\$sum_poe, nine_15\$pct)+text(nine_15\$pct ~ nine_15\$sum_poe, labels=nine_15\$team,data=nine_15,
```

```
O ATL
                                                                                            O LAC
                                              O HOU MEM
                                                               O SA
                                                                            O CLE
nine_15$pct
      9
                                                                           O DAL
                                                     O WSH
                                                                         O NO
      50
                                                              О МІА О ШТАН
                                                    O IND
      40
                                                                                     О СНА
                                        O DET
O DEN O SAC
      30
                                                            O ORL
                                                        O LAL
                                         O_{\mathsf{NA}^\mathsf{MIN}}
                        4.6
                                    4.8
                                                5.0
                                                            5.2
                                                                        5.4
                                                                                    5.6
            4.4
                                           nine_15$sum_poe
## integer(0)
nine_md_15 <- lm(nine_15$pct ~ nine_15$sum_poe)</pre>
summary(nine_md_15)
##
## Call:
## lm(formula = nine_15$pct ~ nine_15$sum_poe)
##
## Residuals:
##
         Min
                     1Q
                          Median
                                         3Q
                                                  Max
## -24.6017 -7.3182
                          0.3683
                                    7.9555
                                             28.5422
##
## Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
##
                       -108.63
                                      53.87
                                             -2.017 0.05342 .
## (Intercept)
                         30.99
                                               2.948 0.00638 **
## nine_15$sum_poe
                                      10.51
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
```

O GS

plot(nine\_16\$sum\_poe,nine\_16\$pct)+text(nine\_16\$pct ~ nine\_16\$sum\_poe, labels=nine\_16\$team,data=nine\_16,

## Residual standard error: 14.59 on 28 degrees of freedom
## Multiple R-squared: 0.2369, Adjusted R-squared: 0.2097
## F-statistic: 8.693 on 1 and 28 DF, p-value: 0.00638

nine\_16 <- nine[nine\$season == 2016,]</pre>

```
80
                                                                       O SA
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                                                                   О тово окс
                                                       O LAC
nine_16$pct
      9
                                    O ATL
                                            OODCHIMIA
                                   O CMIEM DETO IND
                                                                            O POR
                                              О нои
                                                    O UTAH
      40
                                                   O DEN
                                                             O SAC
                                              MIN O NO
                                       ОРНХ
                                O BKN
                              O LAL
             O PHI
           4.6
                           4.8
                                           5.0
                                                           5.2
                                                                          5.4
                                        nine_16$sum_poe
## integer(0)
nine_md_16 <- lm(nine_16$pct ~ nine_16$sum_poe)</pre>
summary(nine_md_16)
##
## Call:
## lm(formula = nine_16$pct ~ nine_16$sum_poe)
##
## Residuals:
##
        Min
                   1Q
                         Median
                                       3Q
                                               Max
## -18.4799 -10.8693
                         0.3306 11.1501 18.2782
##
## Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
##
                     -260.29
                                    52.79
                                          -4.931 3.35e-05 ***
## (Intercept)
                       61.19
                                           5.883 2.51e-06 ***
## nine_16$sum_poe
                                    10.40
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.52 on 28 degrees of freedom
## Multiple R-squared: 0.5528, Adjusted R-squared: 0.5368
## F-statistic: 34.61 on 1 and 28 DF, p-value: 2.51e-06
nine_17 <- nine[nine$season == 2017,]</pre>
```

O GS

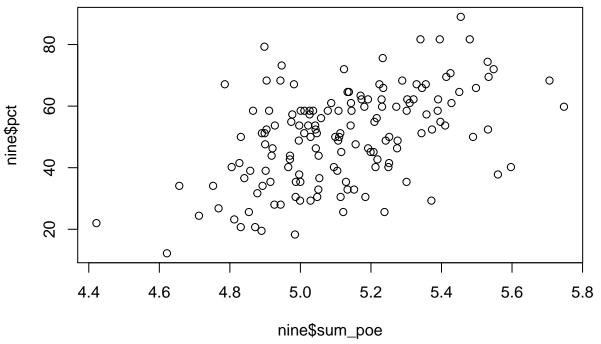
plot(nine\_17\\$sum\_poe, nine\_17\\$pct)+text(nine\_17\\$pct ~ nine\_17\\$sum\_poe, labels=nine\_17\\$team,data=nine\_17,

```
O GS
                                                                                      O SA
                                                                      O HOU
nine_17$pct
                                                        O UTAPD TOR
                                                                 O CLE
                                                                         O LAC
      9
                                         О окс
                               O MEM
      50
                                                 A MIL
                                                                                  О СНІ
                        O MIA
                                                               O DEN
                                                 O DET
                                            О СНА
                      0 8 NO
      40
                                                O SAC
                                      O MIN
O ORL
                                                                                        O NY
                 ОРН
                            O LAL
                                                                        ОРНХ
              O BKN
                     4.8
                                      5.0
                                                        5.2
                                                                         5.4
                                         nine_17$sum_poe
## integer(0)
nine_md_17 <- lm(nine_17$pct ~ nine_17$sum_poe)</pre>
summary(nine_md_17)
##
## Call:
## lm(formula = nine_17$pct ~ nine_17$sum_poe)
##
## Residuals:
##
       Min
                 1Q Median
                                   3Q
                                           Max
## -28.466 -7.461
                       1.417
                                9.369
                                       20.453
##
## Coefficients:
##
                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                      -114.01
                                    45.90 -2.484 0.01924 *
                        31.98
                                     8.94
                                            3.577 0.00129 **
## nine_17$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
```

## Residual standard error: 11.5 on 28 degrees of freedom
## Multiple R-squared: 0.3137, Adjusted R-squared: 0.2892
## F-statistic: 12.8 on 1 and 28 DF, p-value: 0.001289

##

plot(nine\$sum\_poe,nine\$pct)



```
nine_md_10 <- lm(nine$pct ~ nine$sum_poe)
summary(nine_md_10)</pre>
```

```
##
## Call:
## lm(formula = nine$pct ~ nine$sum_poe)
##
## Residuals:
##
      Min
                1Q
                   Median
                                3Q
                                       Max
                     0.935
  -29.312 -10.008
##
                             9.682
                                   36.939
##
## Coefficients:
               Estimate Std. Error t value Pr(>|t|)
##
                                    -5.073 1.16e-06 ***
## (Intercept) -125.784
                             24.795
                                      7.096 4.94e-11 ***
## nine$sum_poe
                  34.329
                              4.838
##
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 13.32 on 148 degrees of freedom
## Multiple R-squared: 0.2539, Adjusted R-squared: 0.2488
## F-statistic: 50.36 on 1 and 148 DF, p-value: 4.944e-11
```

### Eight players:

```
eight$pct <- eight$pct*100
eight_14 <- eight[eight$season == 2014,]
plot(eight_14$sum_poe,eight_14$pct)+text(eight_14$pct ~ eight_14$sum_poe, labels=eight_14$team,data=eight_14$pct</pre>
```

```
О окс
                                                                                            O LAG
                                                   О нои
                                                                   O POR
                                                                                 ОМА
                                                                    O GS
      9
                                                       О МЕМ
                                                                                   O DAL
                                       O PHX
                                                O TOR
eight_14$pct
                                            O PA BKN
                                                            O WSH
      50
                                                                   O MIN
                                          O NO DEN
                                                       O ATL
                                                                    O NY
      40
                                                                          O CLE
                                                                         O DET
               O SAC
                                                       O UTAH
      30
                                           O BOS
                                O ORL
              O PHI
      20
                                         O MIL
                     4.2
                                       4.4
                                                          4.6
                                                                            4.8
                                           eight_14$sum_poe
## integer(0)
eight_md_14 <- lm(eight_14$pct ~ eight_14$sum_poe)
summary(eight_md_14)
##
## Call:
## lm(formula = eight_14$pct ~ eight_14$sum_poe)
##
## Residuals:
##
        Min
                  1Q Median
                                     3Q
                                             Max
## -27.052 -11.543 -0.105 10.566
                                         25.839
##
## Coefficients:
```

O SA

Estimate Std. Error t value Pr(>|t|)

-1.765

2.568

0.0885 .

0.0159 \*

plot(eight\_15\$sum\_poe,eight\_15\$pct)+text(eight\_15\$pct ~ eight\_15\$sum\_poe, labels=eight\_15\$team,data=eig

62.45

13.73

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

## Residual standard error: 14.43 on 28 degrees of freedom
## Multiple R-squared: 0.1906, Adjusted R-squared: 0.1617
## F-statistic: 6.594 on 1 and 28 DF, p-value: 0.01586

-110.22

eight\_15 <- eight[eight\$season == 2015,]

35.27

##

##

## ---

## (Intercept)

## eight\_14\$sum\_poe

```
O ATL
      2
                                                                                            O LAC
                                    O HOU
                                                   O (S) MEM
                                                                             O CLE
                                                   O TOR POR CHI
eight_15$pct
      9
                                                                             O DAL
                                                O WSH
                                                           О окоо но
      50
                                                    O BOS
                                      O R PHX
                                                             O MIA O UTAH
      40
                                     OCHA DET
      30
                                                        O ORL
                                                           O LAL
              O PHI
                               O NY
                                     O MIN
                 4.0
                              4.2
                                          4.4
                                                                               5.0
                                                      4.6
                                                                   4.8
                                                                                           5.2
                                          eight_15$sum_poe
## integer(0)
eight_md_15 <- lm(eight_15$pct ~ eight_15$sum_poe)</pre>
summary(eight_md_15)
##
## Call:
## lm(formula = eight_15$pct ~ eight_15$sum_poe)
##
## Residuals:
##
         Min
                    1Q
                          Median
                                         3Q
                                                  Max
## -29.2727 -6.8746 -0.9712
                                    8.2485
                                             27.1580
##
## Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
##
                        -111.16
                                       45.50 -2.443 0.02111 *
## (Intercept)
```

3.548 0.00139 \*\*

plot(eight\_16\$sum\_poe,eight\_16\$pct)+text(eight\_16\$pct ~ eight\_16\$sum\_poe, labels=eight\_16\$team,data=eig

80

O GS

35.58

eight\_16 <- eight[eight\$season == 2016,]

## eight\_15\$sum\_poe

## ---

##

10.03

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

## Residual standard error: 13.87 on 28 degrees of freedom
## Multiple R-squared: 0.3101, Adjusted R-squared: 0.2855
## F-statistic: 12.59 on 1 and 28 DF, p-value: 0.001392

```
80
                                                                                     O CLI
                                                              O TOR
                                                                         О окс
eight_16$pct
                                                O LAC
      9
                                       O @MIAHA
                                                 O BOS
                                                                         O POR
                                  S DENCHO DAL
                                                             O HOU
                                                    О ИТАН
      40
                           O NO
                                                   O MIN
                                          O PHX
                                   ОВКМ
     20
                                         O LAL
             O PHI
                      4.2
                                    4.4
                                                   4.6
                                                                                5.0
                                                                 4.8
                                       eight_16$sum_poe
## integer(0)
eight_md_16 <- lm(eight_16$pct ~ eight_16$sum_poe)</pre>
summary(eight_md_16)
##
## Call:
## lm(formula = eight_16$pct ~ eight_16$sum_poe)
##
## Residuals:
##
        Min
                   1Q
                        Median
                                              Max
                                      3Q
## -25.8331 -8.1192
                        0.3643 11.5977 18.9631
##
## Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
##
                      -190.37
                                    47.21 -4.032 0.000386 ***
## (Intercept)
                                    10.42
                                            5.097 2.13e-05 ***
## eight_16$sum_poe
                        53.13
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12.41 on 28 degrees of freedom
## Multiple R-squared: 0.4813, Adjusted R-squared: 0.4627
## F-statistic: 25.98 on 1 and 28 DF, p-value: 2.129e-05
eight_17 <- eight[eight$season == 2017,]
plot(eight_17$sum_poe,eight_17$pct)+text(eight_17$pct ~ eight_17$sum_poe, labels=eight_17$team,data=eig
```

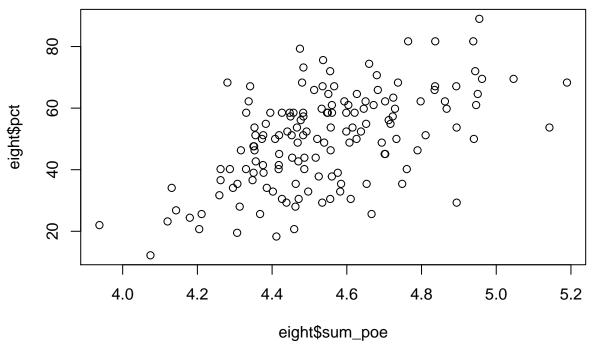
O GS

O SA

```
O GS
      80
                                                           O SA
      70
                                                                            О нои
                                                        O BOS
eight_17$pct
                             O TOR
                                                                              O LAC
      9
                                           О окс
                                        O MOPIND
                                                     O ATL
O POR
      50
                                ОМА
                                                                                      O CH
                                    O DE
                                              О СНА
                                O NO
      40
                     O DAL
                                             O MINO ON SAC
                        O PHI
                     O LAL
      30
                                                                                  O PHX
             O BKN
              4.2
                                  4.4
                                                     4.6
                                                                        4.8
                                        eight_17$sum_poe
## integer(0)
eight_md_17 <- lm(eight_17$pct ~ eight_17$sum_poe)</pre>
summary(eight_md_17)
##
## Call:
## lm(formula = eight_17$pct ~ eight_17$sum_poe)
##
## Residuals:
##
       Min
                 1Q
                     Median
                                  3Q
                                          Max
## -32.931 -7.271
                      0.983
                               6.214
                                       20.648
##
## Coefficients:
##
                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                      -114.89
                                    46.96 -2.447 0.02094 *
                         36.19
                                    10.30
                                            3.515 0.00152 **
## eight_17$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.57 on 28 degrees of freedom
## Multiple R-squared: 0.3062, Adjusted R-squared: 0.2814
```

## F-statistic: 12.36 on 1 and 28 DF, p-value: 0.001515

plot(eight\$sum\_poe,eight\$pct)



```
eight_md_10 <- lm(eight$pct ~ eight$sum_poe)
summary(eight_md_10)</pre>
```

```
##
## Call:
## lm(formula = eight$pct ~ eight$sum_poe)
##
## Residuals:
                                3Q
##
      Min
                1Q
                   Median
                                       Max
##
  -34.489 -8.897
                     0.214
                             8.295
                                    31.958
##
## Coefficients:
##
                 Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                 -128.079
                              22.207
                                      -5.767 4.54e-08 ***
                                       8.028 2.83e-13 ***
## eight$sum_poe
                   39.204
                               4.884
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12.87 on 148 degrees of freedom
## Multiple R-squared: 0.3034, Adjusted R-squared: 0.2986
## F-statistic: 64.45 on 1 and 148 DF, p-value: 2.83e-13
```

### Seven players:

```
seven$pct <- seven$pct*100
seven_14 <- seven[seven$season == 2014,]
plot(seven_14$sum_poe,seven_14$pct)+text(seven_14$pct ~ seven_14$sum_poe, labels=seven_14$team,data=sev</pre>
```

```
70
                                                                                                O LA
                                                     O HOO POR
                                                                     O GS
      9
                                                  O MEM
                                                                   O DAL
                                    O PHOOCHTOR
seven_14$pct
                       O BKN
                                                         O WSH
                                              О СНА
      50
                                                  O MIN
                                     O ATL
                                                 O^{Q_{\mathsf{DEN}}^{\mathsf{NY}}}
      40
                                   O NO
                                                            O CLE
                                                                      O DET
               O SAC
                                               O LAL
                            O ORL
      30
                                       O BOS
                ОРН
      20
                                  O MIL
           3.6
                               3.8
                                                  4.0
                                                                      4.2
                                                                                         4.4
                                            seven_14$sum_poe
## integer(0)
seven_md_14 <- lm(seven_14$pct ~ seven_14$sum_poe)</pre>
summary(seven_md_14)
##
## Call:
## lm(formula = seven_14$pct ~ seven_14$sum_poe)
##
## Residuals:
##
         Min
                     1Q
                           Median
                                           3Q
                                                     Max
## -27.0386 -12.5040 -0.3156 11.2938
                                                28.7098
##
##
   Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
##
                         -101.51
                                         61.33
                                                -1.655
                                                            0.1091
## (Intercept)
```

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38.45

seven\_15 <- seven[seven\$season == 2015,]</pre>

## seven\_14\$sum\_poe

## ---

##

15.55

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

## Residual standard error: 14.53 on 28 degrees of freedom ## Multiple R-squared: 0.1792, Adjusted R-squared: 0.1499 ## F-statistic: 6.115 on 1 and 28 DF, p-value: 0.01974

2.473

0.0197 \*

plot(seven\_15\\$sum\_poe, seven\_15\\$pct)+text(seven\_15\\$pct ~ seven\_15\\$sum\_poe, labels=seven\_15\\$team, data=sev

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seven_15$pct
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                                                              O NO
      50
                              O IND
                                                              О МІАО ИТАН
      40
                                   \mathsf{O}^{Q_{\mathsf{ET}}^{\mathsf{CHA}}}
                                        O DEN
                                 O SAC
      30
                          O ORL
                                                               O LAL
               O PHI
                              O NY O MIN
                     3.6
                                  3.8
                                                                            4.4
                                                                                          4.6
                                                4.0
                                                              4.2
                                           seven_15$sum_poe
## integer(0)
seven_md_15 <- lm(seven_15$pct ~ seven_15$sum_poe)</pre>
summary(seven_md_15)
##
## Call:
## lm(formula = seven_15$pct ~ seven_15$sum_poe)
##
## Residuals:
        Min
##
                  1Q Median
                                     3Q
                                             Max
   -32.024 -8.560
                      -1.839
                                 7.216
                                          29.325
##
## Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
##
                          -85.71
                                       41.78 -2.051 0.04968 *
## (Intercept)
                           34.15
                                       10.49
                                                3.255 0.00296 **
## seven_15$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
```

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##

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plot(seven\_16\\$sum\_poe, seven\_16\\$pct)+text(seven\_16\\$pct ~ seven\_16\\$sum\_poe, labels=seven\_16\\$team, data=sev

## Residual standard error: 14.23 on 28 degrees of freedom
## Multiple R-squared: 0.2745, Adjusted R-squared: 0.2486
## F-statistic: 10.59 on 1 and 28 DF, p-value: 0.002965

seven\_16 <- seven[seven\$season == 2016,]</pre>

```
O CLE
                                                       O TOR
seven_16$pct
                                                                O LAC
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                                             OCT CHMIA
                                                        O BOS
                                             OIND
                              O DET
                                                                                     O PO
                                     O MEMO CHI O DAL
                                                               О итанО нои
                                                       O WSH
      40
                                                     SAC O DEN
                                     O NO
                                                     O MIN
                                                 ОРНХ
                                        О вки
      20
                                     O LAL
             ОРН
                        3.6
                                       3.8
                                                     4.0
                                                                    4.2
                                                                                   4.4
                                       seven_16$sum_poe
## integer(0)
seven_md_16 <- lm(seven_16$pct ~ seven_16$sum_poe)</pre>
summary(seven_md_16)
##
## Call:
## lm(formula = seven_16$pct ~ seven_16$sum_poe)
##
## Residuals:
##
       Min
                 1Q Median
                                  3Q
                                         Max
## -19.473 -9.740 -1.963 11.045
                                      24.359
##
##
  Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
##
                      -147.98
                                    42.14 -3.512 0.00153 **
## (Intercept)
                        49.80
                                    10.58
                                            4.706 6.2e-05 ***
## seven_16$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12.88 on 28 degrees of freedom
## Multiple R-squared: 0.4416, Adjusted R-squared: 0.4217
## F-statistic: 22.14 on 1 and 28 DF, p-value: 6.199e-05
seven_17 <- seven[seven$season == 2017,]</pre>
plot(seven_17\$sum_poe, seven_17\$pct)+text(seven_17\$pct ~ seven_17\$sum_poe, labels=seven_17\$team, data=sev
```

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O GS

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                                                        О нои
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seven_17$pct
                                     O TOR
                                                                 О ИТАН
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                                                                O WSH
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                                              O ATO MEM O MIL
      50
                                          O O CHIO DEN
                                                  ОСНА
      4
                                              O SAC O MIN O ORL
                        O DAL
                                 O NY
              ОРН
      30
                           O LAL
                                ОРНХ
                     O BKN
                             3.8
                                                  4.0
                                                                      4.2
                                                                                          4.4
                                         seven_17$sum_poe
## integer(0)
seven_md_17 <- lm(seven_17$pct ~ seven_17$sum_poe)</pre>
summary(seven_md_17)
##
## Call:
## lm(formula = seven_17$pct ~ seven_17$sum_poe)
##
## Residuals:
##
        Min
                  1Q
                      Median
                                    ЗQ
                                            Max
## -16.557 -6.527
                        1.560
                                 4.705 18.996
##
##
   Coefficients:
##
                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                      -186.987
                                     35.205 -5.311 1.18e-05 ***
                        59.523
                                      8.834
                                               6.738 2.57e-07 ***
## seven_17$sum_poe
```

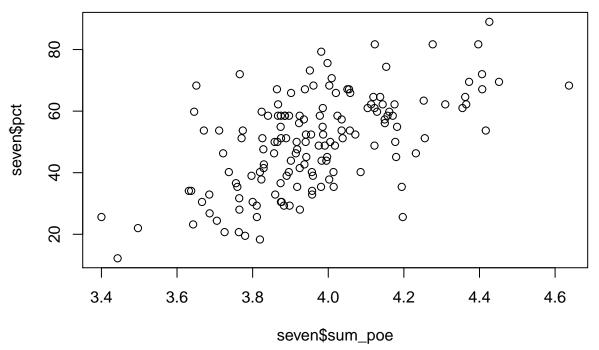
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.05 '.' 0.1 ' ' 1

## Residual standard error: 8.577 on 28 degrees of freedom ## Multiple R-squared: 0.6185, Adjusted R-squared: 0.6049 ## F-statistic: 45.4 on 1 and 28 DF, p-value: 2.573e-07

## ---

plot(seven\$sum\_poe,seven\$pct)

##



```
seven_md_10 <- lm(seven$pct ~ seven$sum_poe)
summary(seven_md_10)</pre>
```

```
##
## Call:
## lm(formula = seven$pct ~ seven$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                        Max
   -34.437 -8.878 -1.037
##
                             7.969
                                    31.935
##
## Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
##
## (Intercept)
                 -121.912
                              19.622 -6.213 5.00e-09 ***
                                       8.773 3.85e-15 ***
## seven$sum_poe
                   43.351
                                4.941
##
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
\mbox{\tt \#\#} Residual standard error: 12.5 on 148 degrees of freedom
## Multiple R-squared: 0.3421, Adjusted R-squared: 0.3377
## F-statistic: 76.97 on 1 and 148 DF, p-value: 3.854e-15
```

### Six players:

```
six$pct <- six$pct*100
six_14 <- six[six$season == 2014,]
plot(six_14$sum_poe,six_14$pct)+text(six_14$pct ~ six_14$sum_poe, labels=six_14$team,data=six_14, cex=0</pre>
```

```
О окс
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                                                   О нои
                                        ОМА
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                                 Oos MEM
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                                   CRIHX O TOR
six_14$pct
                          O BKN
                                                   O WSH
                                         O CHA
      50
                                               O MIN
                                   O ATL
                                        O NY
                                                   O DEN
      40
                                 O NO
                                                O CLE
                                                                     O DET
                      O SAC
                                          O LAL
      30
                           O BOSUTAH
              ОРН
      20
                    O MIL
                       3.2
                                        3.4
                                                         3.6
                                                                          3.8
                                         six_14$sum_poe
## integer(0)
six_md_14 <- lm(six_14$pct ~ six_14$sum_poe)
summary(six_md_14)
##
## Call:
## lm(formula = six_14$pct ~ six_14$sum_poe)
##
## Residuals:
##
        Min
                   1Q
                         Median
                                       3Q
                                                Max
## -26.4241 -12.3548 -0.3416 10.4148
                                           27.7256
##
## Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
##
                     -69.20
                                   52.62
                                         -1.315
                                                    0.1991
## (Intercept)
                       35.17
                                   15.50
                                           2.269
                                                    0.0312 *
## six_14$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.74 on 28 degrees of freedom
## Multiple R-squared: 0.1553, Adjusted R-squared: 0.1251
```

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plot(six\_15\\$sum\_poe,six\_15\\$pct)+text(six\_15\\$pct ~ six\_15\\$sum\_poe, labels=six\_15\\$team,data=six\_15, cex=0

## F-statistic: 5.147 on 1 and 28 DF, p-value: 0.0312

 $six_15 \leftarrow six[six$season == 2015,]$ 

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six_15$pct
                                       O TOR
                                        O ^{\text{WSH}} okc
                                                                 O NO
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                                                      O BOS
                                                                  O UTAH
                             O IND
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                              О СНА
                                                                                   O DET
                                         O DEN
                              O SAC
        30
                               O ORL
                                                                     O LAL
                   O PHI
                           O NY
                                 O MIN
                                               3.4
                                                                                  3.8
                                                                                                    4.0
                             3.2
                                                                3.6
                                                                                                                     4.2
                                                        six_15$sum_poe
```

```
## integer(0)
six_md_15 <- lm(six_15$pct ~ six_15$sum_poe)
summary(six_md_15)
##
## Call:
## lm(formula = six_15$pct ~ six_15$sum_poe)
##
## Residuals:
##
        Min
                  1Q
                       Median
                                    3Q
                                             Max
## -30.7254 -8.3770 -0.5019
                                9.2738
                                        27.5840
##
## Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
##
                    -55.44
                                39.46
                                      -1.405
                                                 0.1710
## (Intercept)
                     30.72
                                11.47
                                        2.679
                                                 0.0122 *
## six_15$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.9 on 28 degrees of freedom
## Multiple R-squared: 0.204, Adjusted R-squared: 0.1756
## F-statistic: 7.175 on 1 and 28 DF, p-value: 0.01223
six_16 \leftarrow six[six$season == 2016,]
plot(six_16\$sum_poe,six_16\$pct)+text(six_16\$pct ~ six_16\$sum_poe, labels=six_16\$team,data=six_16, cex=0
```

```
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six_16$pct
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                                                            O MIAO BOS
                                                 O IND
                                                                                        O POR
                                           O MEM O DAL O CHI O WSH
                                                                         О итанО нои
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                                       O SAC
                                        O NO
                                                        0
                                                     O PHX
                                      O BKN
                       O LAL
              O PHI
                      3.0
                                     3.2
                                                     3.4
                                                                     3.6
                                                                                     3.8
                                            six_16$sum_poe
## integer(0)
six_md_16 <- lm(six_16$pct ~ six_16$sum_poe)
summary(six_md_16)
##
## Call:
## lm(formula = six_16$pct ~ six_16$sum_poe)
##
## Residuals:
##
         Min
                    1Q
                          Median
                                         3Q
                                                   Max
## -20.1870 -10.9243 -0.7694
                                    8.6818
                                              29.7596
##
## Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
##
```

O GS

38.48 -3.229 0.00316 \*\*

4.537 9.82e-05 \*\*\*

plot(six\_17\$sum\_poe,six\_17\$pct)+text(six\_17\$pct ~ six\_17\$sum\_poe, labels=six\_17\$team,data=six\_17, cex=0

11.24

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

## Residual standard error: 13.08 on 28 degrees of freedom
## Multiple R-squared: 0.4237, Adjusted R-squared: 0.4031
## F-statistic: 20.59 on 1 and 28 DF, p-value: 9.815e-05

-124.25

 $six_17 \leftarrow six[six$season == 2017,]$ 

50.99

## (Intercept)

## ---

##

## six\_16\$sum\_poe

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six_17$pct
       9
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       50
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                                                       0 8 0
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                                          O SAC
                                                                   O ORL
                           O PHI
       30
                 O LAL
                                        ОРНХ
                       O BKN
                                 3.2
                                                      3.4
                                                                            3.6
                                                                                                 3.8
                                                   six_17$sum_poe
```

```
## integer(0)
six_md_17 <- lm(six_17$pct ~ six_17$sum_poe)
summary(six_md_17)
##
## Call:
## lm(formula = six_17$pct ~ six_17$sum_poe)
##
## Residuals:
##
       Min
                  1Q
                      Median
                                    ЗQ
                                            Max
## -20.2928 -5.2820 -0.3699
                               3.7841
                                       25.4610
##
## Coefficients:
##
                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                   -114.21
                                34.07
                                     -3.352 0.00231 **
                                10.03
                                       4.826 4.46e-05 ***
## six_17$sum_poe
                     48.41
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.26 on 28 degrees of freedom
## Multiple R-squared: 0.4541, Adjusted R-squared: 0.4346
## F-statistic: 23.29 on 1 and 28 DF, p-value: 4.458e-05
plot(six$sum_poe,six$pct)
```

```
0
80
                                               0
                                                                             0
                    0
                                                      0
                                              0
                                                      00
9
                                                         0
4
                                                        0
                                 0
        0
                                               0
       0
            3.0
                      3.2
                                 3.4
                                                       3.8
                                            3.6
                                                                  4.0
                                                                             4.2
                                   six$sum_poe
```

```
six_md_10 <- lm(six$pct ~ six$sum_poe)
summary(six_md_10)</pre>
```

```
##
## Call:
## lm(formula = six$pct ~ six$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                       Max
   -33.990 -10.476 -1.351
##
                             8.497
                                    30.996
##
## Coefficients:
               Estimate Std. Error t value Pr(>|t|)
##
## (Intercept) -87.619
                            17.815 -4.918 2.30e-06 ***
## six$sum_poe
                 40.468
                             5.229
                                     7.739 1.45e-12 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 13.01 on 148 degrees of freedom
## Multiple R-squared: 0.2881, Adjusted R-squared: 0.2833
## F-statistic: 59.88 on 1 and 148 DF, p-value: 1.445e-12
```

# Five players:

```
five$pct <- five$pct*100
five_14 <- five[five$season == 2014,]
plot(five_14$sum_poe,five_14$pct)+text(five_14$pct ~ five_14$sum_poe, labels=five_14$team,data=five_14,</pre>
```

```
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                                        0
                                           ОМА
                                                                      O POR
                                                            O HOU
                                       O GS MEM CHI O TOR
five_14$pct
                                                O CHA
       50
                  O NY
                                                    O DEN
       40
                                                            O CLE
                         O BOS UTAH
                                                                                         O DET
       30
                ОРН
       20
                                 O MIL
                      2.6
                                          2.8
                                                                                   3.2
                                                               3.0
                                                                                                        3.4
                                                 five_14$sum_poe
```

```
## integer(0)
five_md_14 <- lm(five_14$pct ~ five_14$sum_poe)</pre>
summary(five_md_14)
##
## Call:
## lm(formula = five_14$pct ~ five_14$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                       Max
## -29.457 -11.885
                     2.615 11.191
                                    24.243
##
## Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
##
                     -45.40
                                 41.46
                                        -1.095
                                                 0.2829
## (Intercept)
                      33.97
                                        2.306
                                                 0.0287 *
## five_14$sum_poe
                                 14.73
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.7 on 28 degrees of freedom
## Multiple R-squared: 0.1596, Adjusted R-squared: 0.1296
## F-statistic: 5.317 on 1 and 28 DF, p-value: 0.02874
five_15 <- five[five$season == 2015,]
plot(five_15$sum_poe,five_15$pct)+text(five_15$pct ~ five_15$sum_poe, labels=five_15$team,data=five_15,
```

```
O GS
       80
                                                O ATL
       70
                         O HOU
                                                                                                               O LAC
                                         O (D)ENSA
       9
                                                                      O DAL
five_15$pct
                                        O TOR
                                  O WSH OKC
                                                      O NO
       50
                                         O MIL BOS
                              8 BKN
                                                          O UTAH
       40
                            О СНА
                                    O DET
                              O DEN
       30
                              O ORL
                                                                  O LAL
                 O PH NY
                                O MIN
                    2.6
                                    2.8
                                                    3.0
                                                                                     3.4
                                                                     3.2
                                                                                                     3.6
                                                    five_15$sum_poe
```

```
## integer(0)
five_md_15 <- lm(five_15$pct ~ five_15$sum_poe)</pre>
summary(five_md_15)
##
## Call:
## lm(formula = five_15$pct ~ five_15$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                       Max
## -33.751 -9.069
                     0.414
                             8.729
                                    30.750
##
## Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
##
## (Intercept)
                     -36.58
                                  34.32
                                       -1.066
                                                  0.2956
                      30.40
                                         2.531
                                                  0.0173 *
## five_15$sum_poe
                                  12.01
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.07 on 28 degrees of freedom
## Multiple R-squared: 0.1862, Adjusted R-squared: 0.1571
## F-statistic: 6.405 on 1 and 28 DF, p-value: 0.01728
five_16 <- five[five$season == 2016,]
plot(five_16\$sum_poe,five_16\$pct)+text(five_16\$pct ~ five_16\$sum_poe, labels=five_16\$team,data=five_16,
```

```
80
                                               O SA
                                                                                            O CLI
                                                                 O TOR OKC
five_16$pct
      9
                                     O BOS O ATL
                                                          O MIA
                                                       O IND
                                                       O _{\text{MI}} wsh
                                                                         O UTAH
                                                     O MIL ORL
      40
                                                      O MIN
                       O PHX
                                        О вки
                            O LAL
              O PHI
          2.4
                           2.6
                                            2.8
                                                             3.0
                                                                               3.2
                                           five_16$sum_poe
## integer(0)
five_md_16 <- lm(five_16$pct ~ five_16$sum_poe)</pre>
summary(five_md_16)
##
## Call:
## lm(formula = five_16$pct ~ five_16$sum_poe)
##
## Residuals:
##
        Min
                  1Q Median
                                    ЗQ
                                             Max
## -18.738 -9.405 -0.239
                                 6.781 33.344
##
## Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
##
                       -112.96
                                      39.39
                                             -2.868 0.007766 **
## (Intercept)
                                              4.145 0.000284 ***
## five_16$sum_poe
                         57.51
                                      13.87
```

O GS

plot(five\_17\$sum\_poe,five\_17\$pct)+text(five\_17\$pct ~ five\_17\$sum\_poe, labels=five\_17\$team,data=five\_17,

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

## Residual standard error: 13.57 on 28 degrees of freedom
## Multiple R-squared: 0.3803, Adjusted R-squared: 0.3582
## F-statistic: 17.18 on 1 and 28 DF, p-value: 0.0002843

five\_17 <- five[five\$season == 2017,]

## ---

##

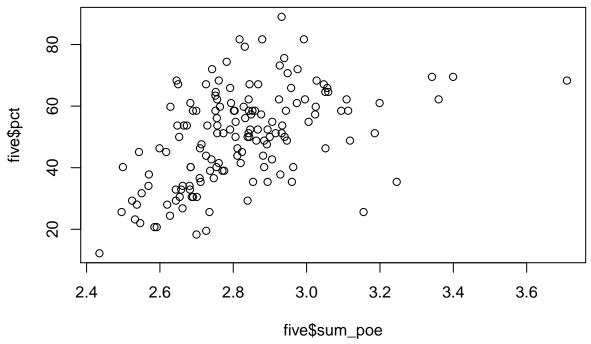
```
O GS
                                              O SA
                                 О нои
                                           O BOS
                                                                    O UTAH
O WSH
                                                     O TOR
                                                                                O LAC
                                                                                                           O CLI
five_17$pct
       9
                                                     О окс
       20
                                 O POR
                                                   O DET
                                        О СНА
                                         O SAC
       40
                        O NY
                                                              O MIN
                      O PHI
       30
                                ОРНХ
                              O BKN
                          2.6
                                               2.8
                                                                    3.0
                                                                                         3.2
                                                  five_17$sum_poe
```

```
## integer(0)
five_md_17 <- lm(five_17$pct ~ five_17$sum_poe)</pre>
summary(five_md_17)
##
## Call:
## lm(formula = five_17$pct ~ five_17$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                ЗQ
                                       Max
## -19.855 -6.335 -1.605
                             4.792
                                    25.862
##
## Coefficients:
##
                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                     -56.60
                                 33.54 -1.688 0.10259
                                 11.87
                      37.79
                                        3.185 0.00354 **
## five_17$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.9 on 28 degrees of freedom
```

## Multiple R-squared: 0.266, Adjusted R-squared: 0.2397 ## F-statistic: 10.14 on 1 and 28 DF, p-value: 0.003536

plot(five\$sum\_poe,five\$pct)

29



```
five_md_10 <- lm(five$pct ~ five$sum_poe)
summary(five_md_10)</pre>
```

```
##
## Call:
## lm(formula = five$pct ~ five$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                       Max
   -37.355 -9.953
                   -0.609
##
                             8.665
                                   34.764
##
## Coefficients:
                Estimate Std. Error t value Pr(>|t|)
##
## (Intercept)
                 -60.199
                             16.471
                                    -3.655 0.000357 ***
## five$sum_poe
                  39.031
                              5.821
                                      6.705 3.96e-10 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
\#\# Residual standard error: 13.5 on 148 degrees of freedom
## Multiple R-squared: 0.233, Adjusted R-squared: 0.2278
## F-statistic: 44.96 on 1 and 148 DF, p-value: 3.963e-10
```

# four players:

```
four$pct <- four$pct*100
four_14 <- four[four$season == 2014,]
plot(four_14$sum_poe,four_14$pct)+text(four_14$pct ~ four_14$sum_poe, labels=four_14$team,data=four_14,</pre>
```

```
O SA
                                         О окс
       70
                                                                                                             O LA
                                                              О нои
                                                                          O POR
                            O GS
                            ОРНХ
                                                             O TOR
four_14$pct
       50
                        O NY
                                          O DEN
       40
                                              O NO
                                     O CLE
                                                                                                O DET
       30
                    0
                                 O UTAH
                  O PHI
       20
                                   O MIL
                                   2.2
                                                          2.4
                                                                                  2.6
                                                                                                         2.8
                                                   four_14$sum_poe
```

#### ## integer(0) four\_md\_14 <- lm(four\_14\$pct ~ four\_14\$sum\_poe)</pre> summary(four\_md\_14) ## ## Call: ## lm(formula = four\_14\$pct ~ four\_14\$sum\_poe) ## ## Residuals: Min ## 1Q Median 3Q Max ## -31.870 -9.326 2.063 9.888 22.541 ## ## Coefficients: Estimate Std. Error t value Pr(>|t|) ## -36.4434.42 -1.059 0.2988 ## (Intercept) 38.31 2.519 0.0178 \* ## four\_14\$sum\_poe 15.21 ## ---## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.05 '.' 0.1 ' ' 1 ## ## Residual standard error: 14.48 on 28 degrees of freedom ## Multiple R-squared: 0.1847, Adjusted R-squared: 0.1556 ## F-statistic: 6.344 on 1 and 28 DF, p-value: 0.01777

plot(four\_15\$sum\_poe,four\_15\$pct)+text(four\_15\$pct ~ four\_15\$sum\_poe, labels=four\_15\$team,data=four\_15,

four\_15 <- four[four\$season == 2015,]</pre>

```
O GS
       80
                                         O ATL
      70
                                                                                                   O LA
                           O HOU
                                                      O CLE
                           O POR
       9
                                                             O DAL
four_15$pct
                                           O TOR
                                    O \text{ wsh } O \text{ okc}
                                                     O NO
      50
                          O PHO BOS O MIL
                                                       O UTAH
       40
                        О СНА
                                       O DET
                                  O DEN
                           O SAC
       30
                                  O ORL
                                                         O LAL
                      O NY
                                   O MIN
                2.0
                              2.2
                                           2.4
                                                         2.6
                                                                      2.8
                                                                                    3.0
                                                                                                 3.2
                                              four_15$sum_poe
## integer(0)
four_md_15 <- lm(four_15$pct ~ four_15$sum_poe)</pre>
summary(four_md_15)
##
## Call:
## lm(formula = four_15$pct ~ four_15$sum_poe)
##
## Residuals:
##
        Min
                    1Q Median
                                       3Q
                                                Max
## -31.017 -10.171
                          1.097
                                    8.116
                                           32.716
##
```

Estimate Std. Error t value Pr(>|t|)

-0.201

1.968

0.842

plot(four\_16\\$sum\_poe,four\_16\\$pct)+text(four\_16\\$pct ~ four\_16\\$sum\_poe, labels=four\_16\\$team,data=four\_16,

0.059 .

28.450

12.226

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

## Residual standard error: 15.66 on 28 degrees of freedom
## Multiple R-squared: 0.1216, Adjusted R-squared: 0.09018

## F-statistic: 3.874 on 1 and 28 DF, p-value: 0.059

four\_16 <- four[four\$season == 2016,]</pre>

-5.713

24.066

## Coefficients:

## four\_15\$sum\_poe

## (Intercept)

##

##

## ---

```
O GS
       80
                                                    O SA
                                                                                                               O CLI
                                    OKOR OKOR
                                                                                            O LAC
four_16$pct
       9
                                 O BOS CHA
                                            O MIA O ATL
                                          O MEM DET O IND
                                                             O HOU O PHINSH
       40
                           O PHX
                 O LAL
                     O PHI
                  2.0
                                          2.2
                                                                  2.4
                                                                                          2.6
                                                    four_16$sum_poe
```

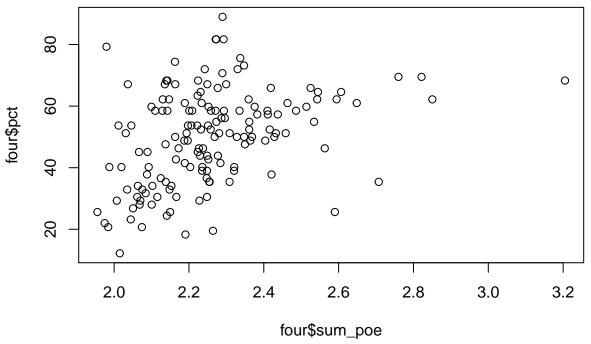
```
## integer(0)
four_md_16 <- lm(four_16$pct ~ four_16$sum_poe)</pre>
summary(four_md_16)
##
## Call:
## lm(formula = four_16$pct ~ four_16$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                ЗQ
                                        Max
## -29.021 -9.798 -1.455
                             9.368
                                    36.566
##
## Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
##
                     -41.08
                                  36.75
                                        -1.118
                                                  0.2731
## (Intercept)
## four_16$sum_poe
                      40.84
                                  16.43
                                        2.486
                                                  0.0192 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.6 on 28 degrees of freedom
## Multiple R-squared: 0.1808, Adjusted R-squared: 0.1515
## F-statistic: 6.179 on 1 and 28 DF, p-value: 0.01916
four_17 <- four[four$season == 2017,]</pre>
plot(four_17\$sum_poe,four_17\$pct)+text(four_17\$pct ~ four_17\$sum_poe, labels=four_17\$team,data=four_17,
```

```
O GS
                                   O SA
                    О нои
                                           O BOS
                                                                           O WSH LAC
four_17$pct
                                                          O TOR
                                                                                                                   O CLI
        9
                                                            О окс
                                                          O MEM O ATL
        20
                                   O POR
                                                          MIAO CHI
                                          O DET CHA
                                      O NO
        4
                                             O SAC
                          O NY
                                                                 O MIN
                                              O ORL
                       O PHI
O LAL
O PHX
                                O BKN
              2.0
                                      2.2
                                                             2.4
                                                                                    2.6
                                                                                                            2.8
                                                      four_17$sum_poe
```

```
## integer(0)
four_md_17 <- lm(four_17$pct ~ four_17$sum_poe)</pre>
summary(four_md_17)
##
## Call:
## lm(formula = four_17$pct ~ four_17$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                ЗQ
                                       Max
## -20.974 -5.850 -1.520
                             3.582 31.505
##
## Coefficients:
##
                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                     -22.70
                                 28.98
                                        -0.783
                                                 0.4402
                      31.79
                                        2.516
                                                 0.0179 *
## four_17$sum_poe
                                 12.64
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
```

## Residual standard error: 12.54 on 28 degrees of freedom
## Multiple R-squared: 0.1844, Adjusted R-squared: 0.1553
## F-statistic: 6.33 on 1 and 28 DF, p-value: 0.01789

plot(four\$sum\_poe,four\$pct)



```
four_md_10 <- lm(four$pct ~ four$sum_poe)
summary(four_md_10)</pre>
```

```
##
## Call:
## lm(formula = four$pct ~ four$sum_poe)
##
## Residuals:
##
      Min
                1Q
                   Median
                                3Q
                                       Max
  -34.753 -10.506
##
                     0.116
                             8.521
                                   38.135
##
## Coefficients:
                Estimate Std. Error t value Pr(>|t|)
##
                 -21.060
                             14.144
                                    -1.489
                                               0.139
## (Intercept)
## four$sum_poe
                  31.433
                              6.236
                                      5.041 1.33e-06 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 14.24 on 148 degrees of freedom
## Multiple R-squared: 0.1465, Adjusted R-squared: 0.1408
## F-statistic: 25.41 on 1 and 148 DF, p-value: 1.335e-06
```

### three players:

```
three$pct <- three$pct*100
three_14 <- three[three$season == 2014,]
plot(three_14$sum_poe,three_14$pct)+text(three_14$pct ~ three_14$sum_poe, labels=three_14$team,data=three_14$team</pre>
```

```
O SA
                                        О окс
                                                                                                                  O LA
                              O IND
O POR
                                            O MHOU
                                 O GS
        9
                                         O MEM
                               O PAR DAL
                                          ООТОВНІ
three_14$pct
        50
                                         O MIN
                                              O DEN
        40
                        O LAL
        30
                       UTAH O BOS
                        O ORL
                     ОРН
                   O MIL
                         1.6
                                                 1.8
                                                                        2.0
                                                                                                2.2
                                                     three_14\sum_poe
```

```
## integer(0)
```

three\_md\_14 <- lm(three\_14\$pct ~ three\_14\$sum\_poe)

```
summary(three_md_14)
##
## Call:
## lm(formula = three_14$pct ~ three_14$sum_poe)
##
## Residuals:
##
        Min
                  1Q
                       Median
                                    3Q
                                            Max
## -23.7791 -12.0189 -0.0047 10.4040
                                        23.3130
##
##
  Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
##
                      -41.96
                                  29.45
                                        -1.425 0.16534
## (Intercept)
                       54.78
                                  17.48
                                          3.134 0.00403 **
## three_14$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 13.8 on 28 degrees of freedom
## Multiple R-squared: 0.2596, Adjusted R-squared: 0.2332
## F-statistic: 9.82 on 1 and 28 DF, p-value: 0.004025
three_15 <- three[three$season == 2015,]</pre>
plot(three_15\$sum_poe,three_15\$pct)+text(three_15\$pct ~ three_15\$sum_poe, labels=three_15\$team,data=thr
```

```
70
                     O HOU O MMSA
                                                                                     O LA
                         POR TOR
three_15$pct
      9
                                            O CHI
                                                      O DAL
                          O NO O WSH
                   O MIA BOS
     50
                             O MIL
                                O DEN DET
      4
                 О СНА
               O SAC
      30
                              O ORL
                     O LAL
                  O NY
                            O MIN
                                 1.8
                                             2.0
                                                          2.2
                                                                       2.4
                    1.6
                                                                                    2.6
                                       three_15$sum_poe
## integer(0)
three_md_15 <- lm(three_15$pct ~ three_15$sum_poe)</pre>
summary(three_md_15)
##
## Call:
## lm(formula = three_15$pct ~ three_15$sum_poe)
##
## Residuals:
##
       Min
                 1Q Median
                                  3Q
                                         Max
## -30.678 -8.279 -0.401 10.288
                                     32.730
##
## Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
##
                        2.647
                                   23.898
                                            0.111
                                                     0.9126
## (Intercept)
## three_15$sum_poe
                       27.616
                                   13.837
                                            1.996
                                                     0.0558 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.63 on 28 degrees of freedom
## Multiple R-squared: 0.1245, Adjusted R-squared: 0.09328
## F-statistic: 3.984 on 1 and 28 DF, p-value: 0.05576
```

O GS

three\_16 <- three[three\$season == 2016,]</pre>

O ATL

80

plot(three\_16\$sum\_poe,three\_16\$pct)+text(three\_16\$pct ~ three\_16\$sum\_poe, labels=three\_16\$team,data=thr

```
80
                                        О окс
three_16$pct
                                                                                     O LAC
      9
                          O BOS
                                     O CHAO MIO ATL
                    O DAL POR O IND
                                O UTAH O CHI DET
                                                  О нои
                                                         O WSH
      40
                      O DEN
                           ОРНХ
                                    O BKN
                      O LAL
             O PHI
           1.4
                     1.5
                                1.6
                                          1.7
                                                    1.8
                                                               1.9
                                                                         2.0
                                                                                    2.1
                                       three_16$sum_poe
## integer(0)
three_md_16 <- lm(three_16$pct ~ three_16$sum_poe)</pre>
summary(three_md_16)
##
## Call:
## lm(formula = three_16$pct ~ three_16$sum_poe)
##
## Residuals:
##
       Min
                 1Q
                    Median
                                  3Q
                                         Max
## -26.547 -10.332
                      0.872
                               9.004
                                     35.139
##
## Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
##
                       -31.45
                                    38.36 -0.820
                                                     0.4193
## (Intercept)
                        49.53
                                    23.27
                                                     0.0422 *
## three_16$sum_poe
                                             2.129
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.99 on 28 degrees of freedom
## Multiple R-squared: 0.1393, Adjusted R-squared: 0.1086
## F-statistic: 4.533 on 1 and 28 DF, p-value: 0.04218
three_17 <- three[three$season == 2017,]</pre>
plot(three_17$sum_poe,three_17$pct)+text(three_17$pct ~ three_17$sum_poe, labels=three_17$team,data=thr
```

O GS

O SA

```
O GS
                      O SA
                О нои
                       O BOS
three_17$pct
                                                       O LAO UTAH
                                                                                       O CLI
                                      O TOP
      9
                                              О окс
                                    O MEM MIA
                                               O ATL
      50
              O DET
                               O CHA
      40
                O DAL
O NY
                              O SAC
                   O PHI
                                    O MIN
                            O ORL
      30
               O BKN
                    1.6
                                      1.8
                                                      2.0
                                                                       2.2
                                                                                        2.4
                                        three_17$sum_poe
## integer(0)
three_md_17 <- lm(three_17$pct ~ three_17$sum_poe)</pre>
summary(three_md_17)
##
## Call:
## lm(formula = three_17$pct ~ three_17$sum_poe)
##
## Residuals:
##
       Min
                 1Q Median
                                  ЗQ
                                          Max
## -20.066 -6.852
                     -0.252
                               4.065
                                       32.344
##
##
  Coefficients:
##
                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                         1.566
                                    22.258
                                             0.070
                                                      0.9444
                        28.206
                                    12.891
                                                      0.0372 *
## three_17$sum_poe
                                              2.188
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12.83 on 28 degrees of freedom
## Multiple R-squared: 0.146, Adjusted R-squared: 0.1155
```

## F-statistic: 4.787 on 1 and 28 DF, p-value: 0.03718

plot(three\$sum\_poe,three\$pct)

```
0
      80
                               \infty
                     0
                                                                            0
                                                                                            0
                                                  000
                                                                             0
      9
three$pct
                    0 0
                   0
                                                     0
                    0
      40
                                    0
                                  0
                         1.6
                                       1.8
                                                                 2.2
                                                                              2.4
            1.4
                                                    2.0
                                                                                            2.6
                                             three$sum_poe
```

```
three_md_10 <- lm(three$pct ~ three$sum_poe)
summary(three_md_10)</pre>
```

```
##
## Call:
## lm(formula = three$pct ~ three$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                       Max
  -31.935 -11.082 -0.276
##
                             9.647
                                    37.528
##
## Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
##
## (Intercept)
                   -8.535
                              12.119
                                      -0.704
                                                 0.482
                                       4.853 3.06e-06 ***
## three$sum_poe
                   34.844
                               7.181
## ---
                   0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Signif. codes:
\#\# Residual standard error: 14.32 on 148 degrees of freedom
## Multiple R-squared: 0.1373, Adjusted R-squared: 0.1314
## F-statistic: 23.55 on 1 and 148 DF, p-value: 3.06e-06
```

## two players:

```
two$pct <- two$pct*100
two_14 <- two[two$season == 2014,]
plot(two_14$sum_poe,two_14$pct)+text(two_14$pct ~ two_14$sum_poe, labels=two_14$team,data=two_14, cex=0</pre>
```

```
O SA
                                        О окс
       70
                                                                                                         O LA
                             O HON PORO MIA
       9
                                   О МЕМ
                                       O PHX O CHI
two_14$pct
                            QHA WSH
       50
                                         O MIN
                             O ATL
       46
                                0
                                       O CLE
                   O DET
                              O SAC
                 O LAL
                 O ORL
                      О РНІ
                  O MIL
               1.0
                            1.1
                                         1.2
                                                     1.3
                                                                  1.4
                                                                               1.5
                                                                                            1.6
                                                                                                         1.7
                                                 two_14$sum_poe
```

```
## integer(0)
two_md_14 <- lm(two_14$pct ~ two_14$sum_poe)</pre>
summary(two_md_14)
##
## Call:
## lm(formula = two_14$pct ~ two_14$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                 3Q
                                        Max
## -26.147 -12.513
                     1.799 11.767
                                     24.697
##
## Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
##
                    -12.62
                                 23.83
                                       -0.529
                                                 0.6006
## (Intercept)
                     56.22
## two_14$sum_poe
                                 21.26
                                         2.644
                                                 0.0133 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.34 on 28 degrees of freedom
## Multiple R-squared: 0.1998, Adjusted R-squared: 0.1712
## F-statistic: 6.991 on 1 and 28 DF, p-value: 0.01327
two_{15} \leftarrow two[two$season == 2015,]
plot(two_15\$sum_poe,two_15\$pct)+text(two_15\$pct ~ two_15\$sum_poe, labels=two_15\$team,data=two_15, cex=0
```

```
O GS
       80
                           O ATL
                                                                                                           O LAC
                         O MEM O SA
       9
                                                                    O DAL
two_15$pct
                                       O WSH
       50
       46
                   О СНА
                                    O DET
                            O DEN
                 O SAC
       30
                           O ORL
                     O LAL
                   O PHI
                           O NY
                                    O MIN
                1.0
                                 1.2
                                                 1.4
                                                                  1.6
                                                                                  1.8
                                                                                                  2.0
                                                  two_15$sum_poe
```

```
## integer(0)
two_md_15 <- lm(two_15$pct ~ two_15$sum_poe)</pre>
summary(two_md_15)
##
## Call:
## lm(formula = two_15$pct ~ two_15$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                 ЗQ
                                        Max
## -31.977 -9.925
                     0.098 10.001 31.181
##
## Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
##
                     24.12
                                 16.41
                                         1.470
                                                  0.153
## (Intercept)
                     22.47
                                 14.02
                                         1.603
                                                   0.120
## two_15$sum_poe
##
## Residual standard error: 15.99 on 28 degrees of freedom
## Multiple R-squared: 0.08406,
                                    Adjusted R-squared: 0.05135
## F-statistic: 2.57 on 1 and 28 DF, p-value: 0.1202
two_16 \leftarrow two[two\$season == 2016,]
plot(two_16$sum_poe,two_16$pct)+text(two_16$pct ~ two_16$sum_poe, labels=two_16$team,data=two_16, cex=0
```

```
O GS
       80
                                          O SA
                                                                                                 O LAC
two_16$pct
       9
                         O BOS O CHA
       40
                                  O MIL
                                        O SAC
                                   O MIN
                            O PHX
                                          О вки
       20
                        O LAL
                    ОРН
                     1.0
                                1.1
                                            1.2
                                                        1.3
                                                                    1.4
                                                                               1.5
                                                                                           1.6
                                              two_16$sum_poe
## integer(0)
two_md_16 <- lm(two_16$pct ~ two_16$sum_poe)</pre>
summary(two_md_16)
```

```
##
## Call:
## lm(formula = two_16$pct ~ two_16$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                ЗQ
                                        Max
## -32.563 -10.378
                     2.953
                             9.399
                                    32.447
##
## Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
##
                    -3.318
                                25.861 -0.128
                                                 0.8988
## (Intercept)
                    48.699
                               23.473
                                        2.075
## two_16$sum_poe
                                                 0.0473 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 16.04 on 28 degrees of freedom
## Multiple R-squared: 0.1332, Adjusted R-squared: 0.1023
## F-statistic: 4.304 on 1 and 28 DF, p-value: 0.04732
two_17 \leftarrow two[two$season == 2017,]
plot(two_17\$sum_poe,two_17\$pct)+text(two_17\$pct ~ two_17\$sum_poe, labels=two_17\$team,data=two_17, cex=0
```

```
O GS
       80
                                    O SA
       70
                              O HOU
O BOS
                                 0
                                              O CLE
                                                                                      O UTAH O LAC
two_17$pct
       9
                                                                О окс
                        O DEN O PO
       20
                                                     (C) MCAH
                           O NO CHA
                      O DET
       4
                                                                                                           O PI
                 O LAL
                            O BKN
                   1.0
                                 1.1
                                               1.2
                                                              1.3
                                                                            1.4
                                                                                          1.5
                                                                                                         1.6
                                                  two_17$sum_poe
```

```
## integer(0)
two_md_17 <- lm(two_17$pct ~ two_17$sum_poe)</pre>
summary(two_md_17)
##
## Call:
## lm(formula = two_17$pct ~ two_17$sum_poe)
##
## Residuals:
##
       Min
                                ЗQ
                1Q Median
                                       Max
## -24.519 -9.834
                     0.619
                             7.673 32.778
##
## Coefficients:
##
                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                     34.65
                                19.25
                                        1.800
                                                0.0827 .
                     13.47
                                16.75
                                        0.804
                                                0.4283
## two_17$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 13.73 on 28 degrees of freedom
## Multiple R-squared: 0.02255,
                                  Adjusted R-squared:
                                                         -0.01235
## F-statistic: 0.6461 on 1 and 28 DF, p-value: 0.4283
plot(two$sum_poe,two$pct)
```

```
0
80
                     0
                                                    0
                                                                            0
                                                 0
                                      0 0
9
                                       0
                                0
40
                                               0
         0
         1.0
                     1.2
                                 1.4
                                              1.6
                                                          1.8
                                                                      2.0
                                  two$sum_poe
```

```
two_md_10 <- lm(two$pct ~ two$sum_poe)
summary(two_md_10)</pre>
```

```
##
## Call:
## lm(formula = two$pct ~ two$sum_poe)
##
## Residuals:
       Min
##
                1Q
                   Median
                                3Q
                                       Max
                     1.342
  -33.744 -10.914
##
                             9.850
                                    35.669
##
## Coefficients:
               Estimate Std. Error t value Pr(>|t|)
##
## (Intercept)
                 15.820
                             9.172
                                     1.725 0.086648 .
                             8.117
                                     3.759 0.000245 ***
## two$sum_poe
                 30.511
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
## Residual standard error: 14.73 on 148 degrees of freedom
## Multiple R-squared: 0.08715,
                                    Adjusted R-squared: 0.08098
## F-statistic: 14.13 on 1 and 148 DF, p-value: 0.000245
```

## one players:

```
one$pct <- one$pct*100
one_14 <- one[one$season == 2014,]
plot(one_14$sum_poe,one_14$pct)+text(ten_14$pct ~ ten_14$sum_poe, labels=ten_14$team,data=ten_14, cex=0</pre>
```

```
0
                          0
     70
                                                                                      0
                 0
                           0
                               00
      9
                             0
                                            0
one_14$pct
                            0
      50
                          0
                                  0 0
      46
                  00
                          0
      30
             0
                       0
      20
                     0
                   0.5
                              0.6
                                          0.7
                                                     8.0
                                                                0.9
                                                                            1.0
                                                                                       1.1
                                         one_14$sum_poe
```

```
## integer(0)
one_md_14 <- lm(one_14$pct ~ one_14$sum_poe)
summary(one_md_14)
##
## Call:
## lm(formula = one_14$pct ~ one_14$sum_poe)
##
## Residuals:
##
        Min
                  1Q
                       Median
                                    3Q
                                            Max
## -28.6721 -12.7919 -0.1711 11.8366
                                        24.2219
##
## Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
##
                     21.85
                                14.03
                                        1.557
                                                0.1306
## (Intercept)
                     49.87
                                24.37
                                        2.046
                                                0.0502 .
## one_14$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 14.96 on 28 degrees of freedom
## Multiple R-squared: 0.1301, Adjusted R-squared: 0.09902
## F-statistic: 4.187 on 1 and 28 DF, p-value: 0.05023
one_15 <- one[one$season == 2015,]
plot(one_15\$sum_poe,one_15\$pct)+text(ten_15\$pct ~ ten_15\$sum_poe, labels=ten_15\$team,data=ten_15, cex=0
```

```
0
      80
                                                   0
      2
                                                                                       0
                                        0
                                                            0
                                                  0
      9
                                 0
                                                                    0
one_15$pct
                                                                 0
                                                0
                                                       0
      50
                       0
                                    00
      46
                                    0
             0
                                                                               0
                     0
      30
                                 0
                               0
                                                             0
                               0
             0.45
                               0.50
                                                0.55
                                                                  0.60
                                                                                    0.65
                                         one_15$sum_poe
```

```
## integer(0)
one_md_15 <- lm(one_15$pct ~ one_15$sum_poe)</pre>
summary(one_md_15)
##
## Call:
## lm(formula = one_15$pct ~ one_15$sum_poe)
##
## Residuals:
       Min
##
                1Q Median
                                3Q
                                       Max
## -34.117 -5.839
                     0.270 11.643
                                    26.218
##
## Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
##
                    -10.30
                                33.71
                                      -0.306
                                                0.7621
## (Intercept)
                    111.30
                                61.99
                                                0.0834 .
## one_15$sum_poe
                                        1.795
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.82 on 28 degrees of freedom
## Multiple R-squared: 0.1032, Adjusted R-squared: 0.07122
## F-statistic: 3.224 on 1 and 28 DF, p-value: 0.08338
one_16 <- one[one$season == 2016,]
plot(one_16$sum_poe,one_16$pct)+text(ten_16$pct ~ ten_16$sum_poe, labels=ten_16$team,data=ten_16, cex=0
```

```
80
                             0
                                6
                                                                                     0
one_16$pct
      9
                           00
      40
                                       0
                              8
                   0
               0
                  0.5
                               0.6
                                            0.7
                                                        8.0
                                                                     0.9
                                                                                  1.0
                                        one_16$sum_poe
## integer(0)
one_md_16 <- lm(one_16$pct ~ one_16$sum_poe)</pre>
summary(one_md_16)
##
## Call:
## lm(formula = one_16$pct ~ one_16$sum_poe)
##
## Residuals:
##
       Min
                 1Q Median
                                  ЗQ
                                         Max
## -32.412 -10.428
                      1.926
                               9.084
                                     33.394
##
## Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
##
                      18.06
                                  16.83
                                           1.073
                                                   0.2925
## (Intercept)
                      57.53
                                  29.86
## one_16\sum_poe
                                           1.927
                                                   0.0642 .
## ---
```

0

plot(one\_17\$sum\_poe,one\_17\$pct)+text(ten\_17\$pct ~ ten\_17\$sum\_poe, labels=ten\_17\$team,data=ten\_17, cex=0

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

## Residual standard error: 16.19 on 28 degrees of freedom
## Multiple R-squared: 0.1171, Adjusted R-squared: 0.08556
## F-statistic: 3.713 on 1 and 28 DF, p-value: 0.06418

one\_17 <- one[one\$season == 2017,]

##

```
0
      80
                         0
      70
                           0
one_17$pct
                     0
                                   0
                                                                          0
                                                                                           0
      9
                        0
      20
                                         0
      40
                              0
                00
                                   0
                0
                  0
      30
                     0
                  0.5
                               0.6
                                            0.7
                                                         8.0
                                                                      0.9
                                                                                   1.0
                                           one_17$sum_poe
```

```
## integer(0)
one_md_17 <- lm(one_17$pct ~ one_17$sum_poe)</pre>
summary(one_md_17)
##
## Call:
## lm(formula = one_17$pct ~ one_17$sum_poe)
##
## Residuals:
##
       Min
                1Q Median
                                3Q
                                       Max
## -23.682 -8.672 -0.331
                             7.219
                                    34.094
##
## Coefficients:
##
                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                     29.94
                                11.41
                                        2.624
                                                0.0139 *
## one_17$sum_poe
                     35.16
                                19.56
                                                0.0830 .
                                        1.798
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 13.15 on 28 degrees of freedom
## Multiple R-squared: 0.1035, Adjusted R-squared: 0.07147
## F-statistic: 3.232 on 1 and 28 DF, p-value: 0.083
plot(one$sum_poe,one$pct)
```

```
0
80
                        00
                                                                                    0
                                                                            0
9
                                        0
                                   0
                                              0
                                \infty
                              \odot
          0
              0.5
                          0.6
                                      0.7
                                                 8.0
                                                             0.9
                                                                         1.0
                                                                                     1.1
                                      one$sum_poe
```

```
one_md_10 <- lm(one$pct ~ one$sum_poe)
summary(one_md_10)</pre>
```

```
##
## Call:
## lm(formula = one$pct ~ one$sum_poe)
##
## Residuals:
##
       Min
                1Q
                   Median
                                3Q
                                       Max
  -33.145 -11.424
                     0.953
                             9.725
##
                                    34.329
##
## Coefficients:
               Estimate Std. Error t value Pr(>|t|)
##
                             7.183
                                     3.129 0.002113 **
## (Intercept)
                 22.476
                 49.551
                            12.750
                                     3.886 0.000153 ***
## one$sum_poe
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
\mbox{\tt\#\#} Residual standard error: 14.68 on 148 degrees of freedom
## Multiple R-squared: 0.0926, Adjusted R-squared: 0.08646
## F-statistic: 15.1 on 1 and 148 DF, p-value: 0.0001532
```