Final code (final version)

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These are codes we use in our final version:

Data exploration: descriptive and visualization

|	Female (N=106)	Male (N=155)	Total (N=261)	p value
Deptartment,n%				< 0.001
- Molecular Biology	20 (18.9%)	30 (19.4%)	50 (19.2%)	
- Physiology	20 (18.9%)	20 (12.9%)	40 (15.3%)	
- Genetics	11 (10.4%)	10 (6.5%)	21 (8.0%)	
- Pediatrics	20 (18.9%)	10 (6.5%)	30 (11.5%)	
- Medicine	30 (28.3%)	50 (32.3%)	80 (30.7%)	
- Surgery	5 (4.7%)	35 (22.6%)	40 (15.3%)	
Area of emphasis n%				0.197
- Primarily research emphasis	46 (43.4%)	55 (35.5%)	101 (38.7%)	
- Primarily clinical emphasis	60 (56.6%)	100 (64.5%)	160 (61.3%)	
Certification,n%				0.074
- not certified	36 (34.0%)	37 (23.9%)	73 (28.0%)	
- Board certified	70 (66.0%)	118 (76.1%)	188 (72.0%)	
Publication rate				0.004
- Mean (SD)	5 (2)	5 (2)	5 (2)	
- Median (Q1, Q3)	5 (4, 7)	4 (3, 7)	4 (3, 7)	
Years since obtaining MD				< 0.001
- Mean (SD)	7 (4)	12 (7)	10 (6)	
- Median (Q1, Q3)	7 (5, 10)	10 (7, 15)	9 (6, 14)	
Rank,n%				< 0.001
- Assistant	69 (65.1%)	43 (27.7%)	112 (42.9%)	
- Associate	21 (19.8%)	43 (27.7%)	64 (24.5%)	
- Full professor	16 (15.1%)	69 (44.5%)	85 (32.6%)	
Salary				< 0.001
- Mean (SD)	124874 (59090)	186126 (90397)	161250 (84608)	
- Median (Q1, Q3)	113706 (79060, 148401)	162987 (114613, 244332)	141628 (95177, 210013)	

distribution of y

```
ori_y = ggplot(data_1,aes(x=mean_sal))+geom_histogram(aes(y=..density..)) + geom_density(col = "black",alpha=0)
```

not normal

```
library(HH)

data_2=data_1 %>%
  mutate(
    log_sal=log(mean_sal)
  )
ln_y = ggplot(data_2,aes(x=log_sal))+geom_histogram(aes(y=..density..)) + geom_density(col = "black",alpha=0)
data_2=data_2 %>%
    dplyr::select(-id,-mean_sal)

ori_y + ln_y
```
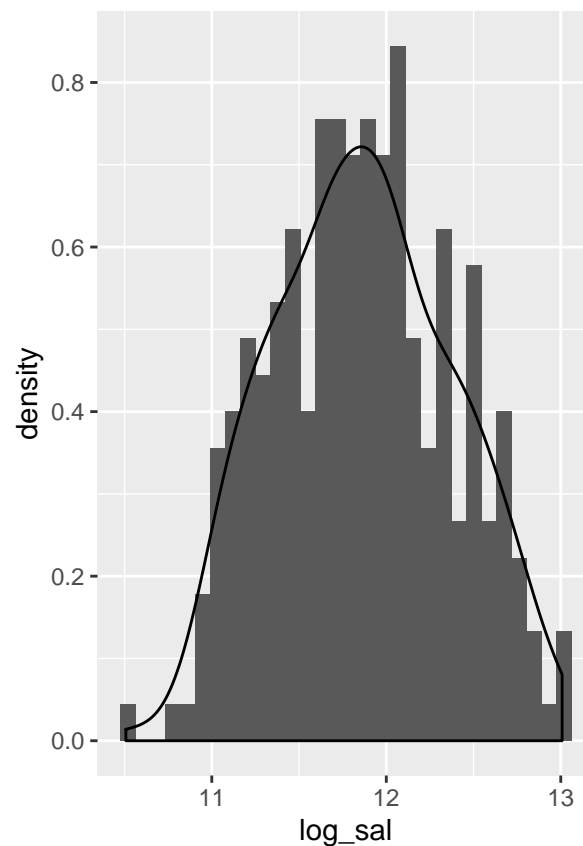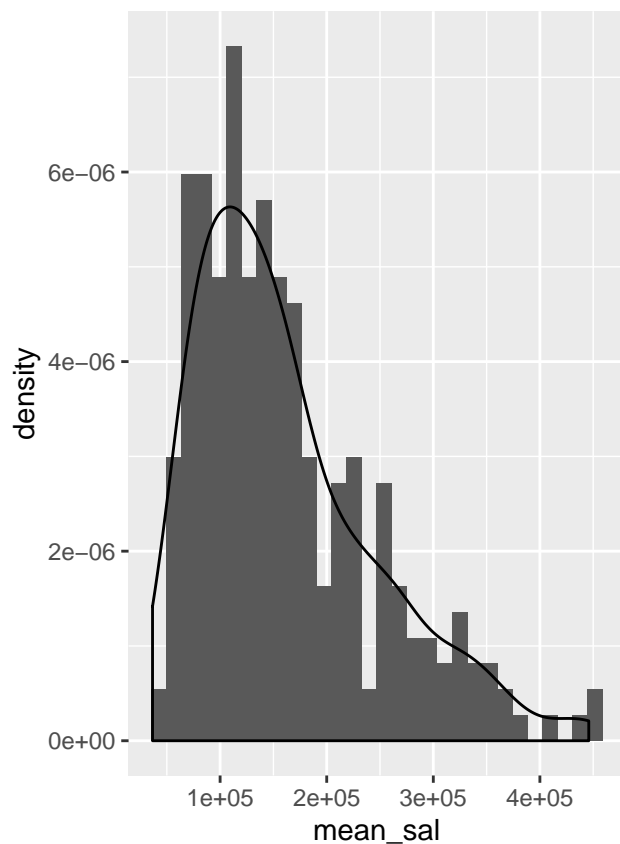
Visualization

```r
library(patchwork)

rank_gen = data_1 %>%
  group_by(gender) %>%
  ggplot(aes(x = rank, y = mean_sal, color = gender)) +
    geom_boxplot()

dept_gen = data_1 %>%
  group_by(gender) %>%
  ggplot(aes(x = dept, y = mean_sal, color = gender)) +
    geom_boxplot()

clin_gen = data_1 %>%
  group_by(gender) %>%
  ggplot(aes(x = clin, y = mean_sal, color = gender)) +
    geom_boxplot()

cert_gen = data_1 %>%
  group_by(gender) %>%
  ggplot(aes(x = cert, y = mean_sal, color = gender)) +
    geom_boxplot()

exp_gen = data_1 %>%
  group_by(gender) %>%
  ggplot(aes(x = exper, y = mean_sal, color = gender)) +
    geom_point() +
  geom_smooth(method="lm",aes(color=gender),se=FALSE)

(rank_gen + dept_gen)/(clin_gen + cert_gen)
```
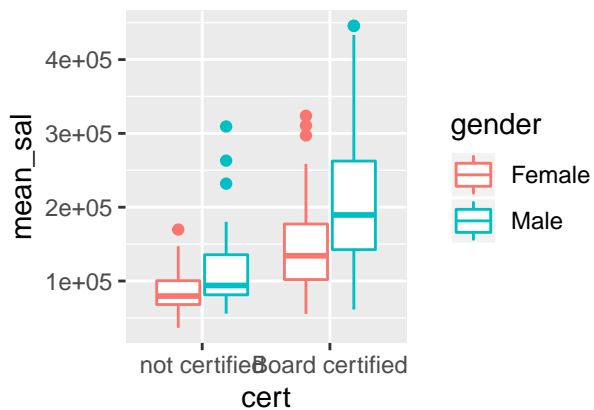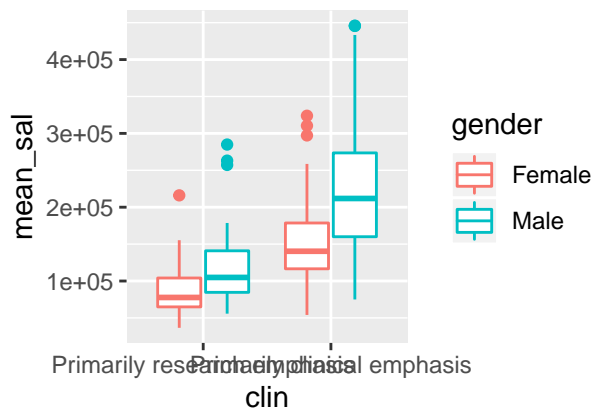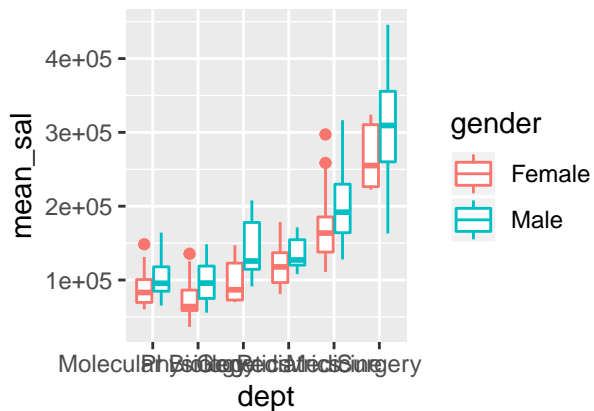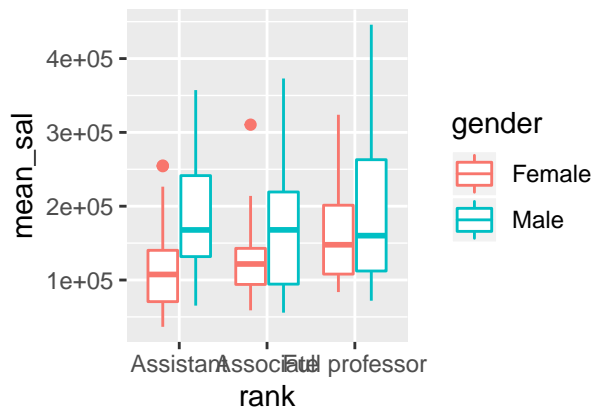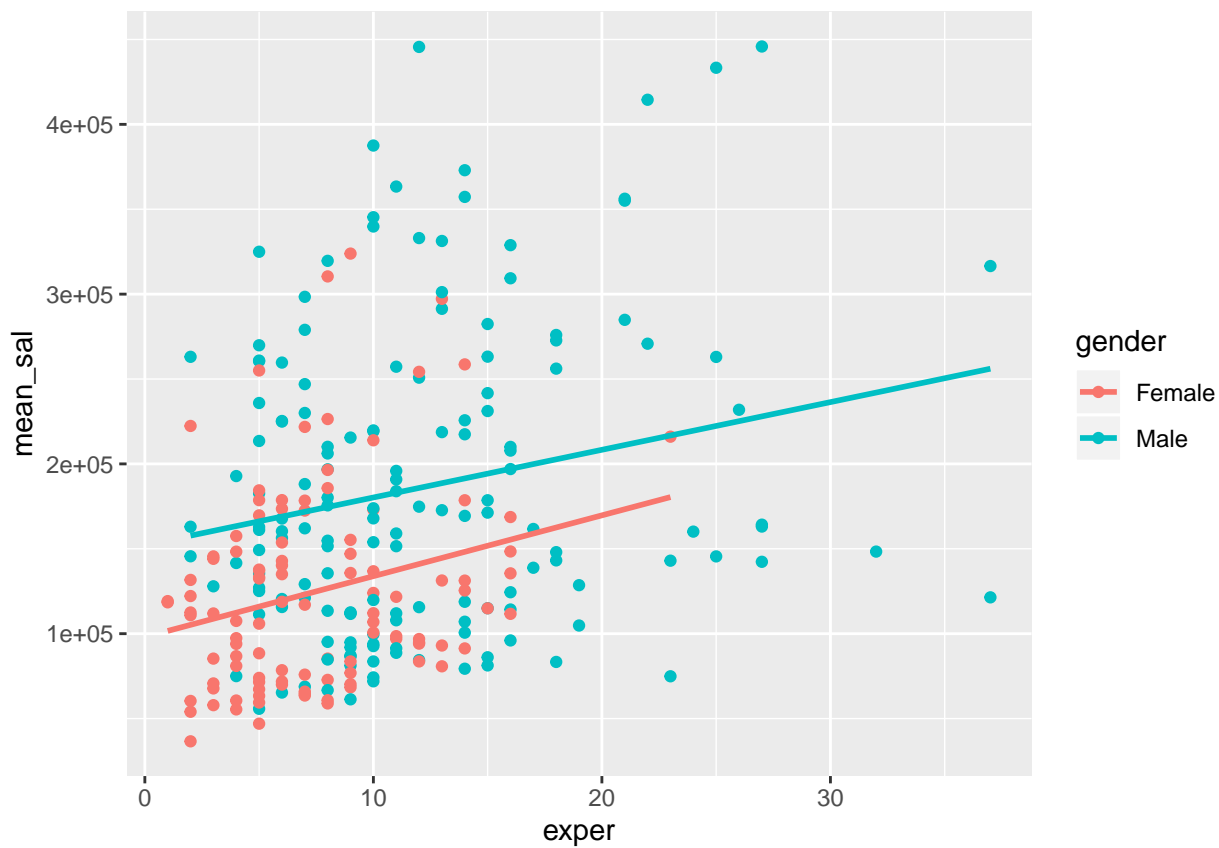
confounder one by one

```
##
## Call:
## lm(formula = log_sal ~ gender + dept, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.70544 -0.19433 -0.02501  0.16341  0.60779
##
## Coefficients:
##                Estimate Std. Error t value Pr(>|t|)
## (Intercept)    11.34504    0.04110 276.036  < 2e-16 ***
## genderMale      0.20521    0.03355   6.116 3.60e-09 ***
## deptPhysiology -0.13194    0.05385  -2.450  0.01496 *
## deptGenetics    0.20092    0.06602   3.044  0.00258 **
## deptPediatrics  0.30535    0.05919   5.158 5.02e-07 ***
## deptMedicine    0.64943    0.04569  14.215  < 2e-16 ***
## deptSurgery     1.07668    0.05453  19.743  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2534 on 254 degrees of freedom
## Multiple R-squared:  0.7578, Adjusted R-squared:  0.752
## F-statistic: 132.4 on 6 and 254 DF,  p-value: < 2.2e-16


##
## Call:
## lm(formula = log_sal ~ gender + clin, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.00911 -0.25023 -0.01895  0.24564  0.99426
##
## Coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    11.28894    0.04470 252.526  < 2e-16 ***
## genderMale                      0.33718    0.04671   7.218 5.89e-12 ***
## clinPrimarily clinical emphasis 0.60819    0.04710  12.912  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3694 on 258 degrees of freedom
## Multiple R-squared:  0.4769, Adjusted R-squared:  0.4728
## F-statistic: 117.6 on 2 and 258 DF,  p-value: < 2.2e-16


##
## Call:
## lm(formula = log_sal ~ gender + cert, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.11866 -0.27669 -0.01921  0.31081  1.01942
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)         11.28992    0.05510 204.888  < 2e-16 ***
## genderMale           0.33285    0.05233   6.360 9.11e-10 ***
## certBoard certified  0.51981    0.05726   9.078  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 0.4127 on 258 degrees of freedom
## Multiple R-squared:  0.3473, Adjusted R-squared:  0.3423
## F-statistic: 68.65 on 2 and 258 DF,  p-value: < 2.2e-16


##
## Call:
## lm(formula = log_sal ~ gender + prate, data = data_2)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.8027 -0.1953  0.0039  0.1925  0.7354
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 12.648300   0.060244 209.951  < 2e-16 ***
## genderMale   0.251814   0.038823   6.486 4.46e-10 ***
## prate       -0.189739   0.009824 -19.313  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3031 on 258 degrees of freedom
## Multiple R-squared:  0.6479, Adjusted R-squared:  0.6452
## F-statistic: 237.4 on 2 and 258 DF,  p-value: < 2.2e-16


##
## Call:
## lm(formula = log_sal ~ gender + exper, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.03299 -0.37372  0.04036  0.33276  1.02947
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 11.50693    0.05839 197.079  < 2e-16 ***
## genderMale   0.30755    0.06277   4.900 1.7e-06 ***
## exper        0.01686    0.00496   3.399 0.000784 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4637 on 258 degrees of freedom
## Multiple R-squared:  0.1757, Adjusted R-squared:  0.1693
## F-statistic:  27.5 on 2 and 258 DF,  p-value: 1.488e-11


##
## Call:
## lm(formula = log_sal ~ gender + rank, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.10798 -0.37872  0.01491  0.35397  1.03532
##
## Coefficients:
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)         11.615638   0.050964 227.919  < 2e-16 ***
## genderMale           0.349481   0.064420   5.425 1.34e-07 ***
## rankAssociate       -0.005225   0.076187  -0.069   0.9454
## rankFull professor   0.123166   0.073223   1.682   0.0938 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 0.4716 on 257 degrees of freedom
## Multiple R-squared:  0.151,  Adjusted R-squared:  0.1411
## F-statistic: 15.23 on 3 and 257 DF,  p-value: 3.747e-09


##
## Call:
## lm(formula = log_sal ~ gender + dept + clin + cert + prate +
##     exper, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.37721 -0.09918 -0.00188  0.09276  0.84947
##
## Coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   11.242591   0.151355  74.279  < 2e-16 ***
## genderMale                     0.057032   0.022253   2.563 0.010969 *
## deptPhysiology                -0.161226   0.032799  -4.916 1.60e-06 ***
## deptGenetics                   0.159349   0.043788   3.639 0.000332 ***
## deptPediatrics                 0.117206   0.060314   1.943 0.053105 .
## deptMedicine                   0.454642   0.050840   8.943  < 2e-16 ***
## deptSurgery                    0.803122   0.069021  11.636  < 2e-16 ***
## clinPrimarily clinical emphasis 0.138274  0.046296   2.987 0.003100 **
## certBoard certified            0.185086   0.023773   7.786 1.84e-13 ***
## prate                         -0.034756   0.019534  -1.779 0.076407 .
## exper                          0.026870   0.001686  15.940  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1508 on 250 degrees of freedom
## Multiple R-squared:  0.9155, Adjusted R-squared:  0.9121
## F-statistic: 270.9 on 10 and 250 DF,  p-value: < 2.2e-16


## Analysis of Variance Table
##
## Model 1: log_sal ~ gender
## Model 2: log_sal ~ gender + dept + clin + cert + prate + exper
##   Res.Df    RSS Df Sum of Sq      F    Pr(>F)
## 1    259 57.971
## 2    250  5.687  9    52.283 255.37 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1


##                   genderMale                    deptPhysiology
##                     1.370355                          1.601711
##                 deptGenetics                    deptPediatrics
##                     1.627611                          4.245875
##                 deptMedicine                       deptSurgery
##                     6.303365                          7.092848
## clinPrimarily clinical emphasis       certBoard certified
##                     5.833416                          1.306266
##                        prate                             exper
##                    16.488056                          1.259297


##
## Call:
## lm(formula = log_sal ~ gender + dept + clin + cert + exper, data = data_2)
##
## Residuals:
```

```
##      Min      1Q  Median      3Q     Max
## -0.37141 -0.10193  0.00088  0.08857  0.85727
##
## Coefficients:
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       10.978774   0.030533 359.571  < 2e-16 ***
## genderMale                         0.067914   0.021489   3.160  0.00177 **
## deptPhysiology                    -0.161289   0.032941  -4.896 1.75e-06 ***
## deptGenetics                       0.185849   0.041355   4.494 1.07e-05 ***
## deptPediatrics                     0.197355   0.040281   4.899 1.72e-06 ***
## deptMedicine                       0.523123   0.033360  15.681  < 2e-16 ***
## deptSurgery                        0.903383   0.040031  22.567  < 2e-16 ***
## clinPrimarily clinical emphasis    0.207987   0.024769   8.397 3.40e-15 ***
## certBoard certified                0.183073   0.023848   7.677 3.63e-13 ***
## exper                              0.026572   0.001685  15.774  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1515 on 251 degrees of freedom
## Multiple R-squared:  0.9144, Adjusted R-squared:  0.9114
## F-statistic: 298.1 on 9 and 251 DF,  p-value: < 2.2e-16
```

We are interested in the interaction effect of rank and experience. Is rank a modifier? Is experience a mpdifier?

rank is a modifier accroding to previsou study

```
gender_inter_rank=lm(log_sal~gender * rank + dept+clin+cert+exper,data=data_2)
summary(gender_inter_rank)
```

```
##
## Call:
## lm(formula = log_sal ~ gender * rank + dept + clin + cert + exper,
##     data = data_2)
##
## Residuals:
##      Min      1Q  Median      3Q     Max
## -0.32667 -0.08080 -0.01075  0.07646  0.86686
##
## Coefficients:
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       10.959335   0.027936 392.307  < 2e-16 ***
## genderMale                         0.074479   0.027568   2.702  0.00738 **
## rankAssociate                      0.173142   0.033904   5.107 6.55e-07 ***
## rankFull professor                 0.282281   0.039594   7.129 1.11e-11 ***
## deptPhysiology                    -0.175544   0.028871  -6.080 4.53e-09 ***
## deptGenetics                       0.184572   0.036206   5.098 6.84e-07 ***
## deptPediatrics                     0.208468   0.035528   5.868 1.41e-08 ***
## deptMedicine                       0.543204   0.029364  18.499  < 2e-16 ***
## deptSurgery                        0.931388   0.035267  26.409  < 2e-16 ***
## clinPrimarily clinical emphasis    0.197031   0.022175   8.885  < 2e-16 ***
## certBoard certified                0.191213   0.021363   8.951  < 2e-16 ***
## exper                              0.018171   0.001806  10.064  < 2e-16 ***
## genderMale:rankAssociate          -0.082943   0.044750  -1.853  0.06501 .
## genderMale:rankFull professor     -0.105271   0.046654  -2.256  0.02492 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1325 on 247 degrees of freedom
```

```
## Multiple R-squared:  0.9355, Adjusted R-squared:  0.9322
## F-statistic: 275.8 on 13 and 247 DF,  p-value: < 2.2e-16
```

experience is a modifier accroding to previsou study

```
gender_inter_exp = lm(log_sal~gender * exper + dept+clin+cert+exper,data=data_2)
summary(gender_inter_exp )
```

```
##
## Call:
## lm(formula = log_sal ~ gender * exper + dept + clin + cert +
##     exper, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.35773 -0.08939  0.00316  0.08263  0.81598
##
## Coefficients:
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  10.872211   0.038568 281.898  < 2e-16 ***
## genderMale                    0.210431   0.039156   5.374 1.76e-07 ***
## exper                         0.040069   0.003540  11.319  < 2e-16 ***
## deptPhysiology               -0.147480   0.032014  -4.607 6.52e-06 ***
## deptGenetics                  0.191426   0.040010   4.784 2.93e-06 ***
## deptPediatrics                0.217890   0.039243   5.552 7.19e-08 ***
## deptMedicine                  0.534964   0.032376  16.524  < 2e-16 ***
## deptSurgery                   0.914315   0.038792  23.569  < 2e-16 ***
## clinPrimarily clinical emphasis  0.208366   0.023951   8.700 4.53e-16 ***
## certBoard certified           0.174477   0.023147   7.538 8.78e-13 ***
## genderMale:exper             -0.016753   0.003901  -4.294 2.51e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1465 on 250 degrees of freedom
## Multiple R-squared:  0.9203, Adjusted R-squared:  0.9171
## F-statistic: 288.8 on 10 and 250 DF,  p-value: < 2.2e-16
```

try two EMM together. then rank is not sig

```
gender_inter_two=lm(log_sal~gender * rank + dept+clin+cert+gender*exper,data=data_2)
summary(gender_inter_two)
```

```
##
## Call:
## lm(formula = log_sal ~ gender * rank + dept + clin + cert + gender *
##     exper, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.31795 -0.07929 -0.01275  0.07078  0.85987
##
## Coefficients:
##                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)      10.906051   0.036673 297.390  < 2e-16 ***
## genderMale        0.133412   0.038125   3.499 0.000554 ***
## rankAssociate     0.141497   0.036537   3.873 0.000138 ***
```

```
## rankFull professor                  0.217020    0.049074    4.422 1.47e-05 ***
## deptPhysiology                      -0.166053    0.028962   -5.733 2.87e-08 ***
## deptGenetics                         0.188370    0.035963    5.238 3.49e-07 ***
## deptPediatrics                       0.219621    0.035606    6.168 2.82e-09 ***
## deptMedicine                         0.548131    0.029218   18.760  < 2e-16 ***
## deptSurgery                          0.939254    0.035170   26.706  < 2e-16 ***
## clinPrimarily clinical emphasis      0.205465    0.022327    9.203  < 2e-16 ***
## certBoard certified                  0.181479    0.021644    8.385 3.97e-15 ***
## exper                                0.026849    0.004302    6.241 1.89e-09 ***
## genderMale:rankAssociate            -0.040275    0.048384   -0.832 0.405994
## genderMale:rankFull professor       -0.018879    0.060486   -0.312 0.755215
## genderMale:exper                    -0.010471    0.004719   -2.219 0.027410 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1315 on 246 degrees of freedom
## Multiple R-squared:  0.9368, Adjusted R-squared:  0.9332
## F-statistic: 260.5 on 14 and 246 DF,  p-value: < 2.2e-16
```

```
knitr::kable(tidy(gender_inter_two))
```

term	estimate	std.error	statistic	p.value
(Intercept)	10.9060512	0.0366725	297.3901954	0.0000000
genderMale	0.1334115	0.0381254	3.4992834	0.0005536
rankAssociate	0.1414966	0.0365366	3.8727361	0.0001380
rankFull professor	0.2170200	0.0490740	4.4222975	0.0000147
deptPhysiology	-0.1660535	0.0289624	-5.7334193	0.0000000
deptGenetics	0.1883699	0.0359625	5.2379465	0.0000003
deptPediatrics	0.2196213	0.0356062	6.1680591	0.0000000
deptMedicine	0.5481307	0.0292178	18.7601654	0.0000000
deptSurgery	0.9392537	0.0351697	26.7063524	0.0000000
clinPrimarily clinical emphasis	0.2054649	0.0223268	9.2026151	0.0000000
certBoard certified	0.1814786	0.0216443	8.3846054	0.0000000
exper	0.0268494	0.0043019	6.2413506	0.0000000
genderMale:rankAssociate	-0.0402747	0.0483843	-0.8323933	0.4059943
genderMale:rankFull professor	-0.0188788	0.0604860	-0.3121189	0.7552146
genderMale:exper	-0.0104709	0.0047191	-2.2188437	0.0274105

so our final model is

```
gender_inter_exp=lm(log_sal~gender * exper +rank + dept + clin+cert,data=data_2)
summary(gender_inter_exp)
```

```
##
## Call:
## lm(formula = log_sal ~ gender * exper + rank + dept + clin +
##     cert, data = data_2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.32130 -0.07860 -0.00987  0.07100  0.86910
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)      10.903325   0.034805 313.272  < 2e-16 ***
## genderMale        0.128932   0.036912   3.493 0.000566 ***
## exper             0.027774   0.003545   7.834 1.38e-13 ***
```

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```
## rankAssociate                 0.118231   0.023648   5.000 1.09e-06 ***
## rankFull professor            0.208036   0.026112   7.967 5.90e-14 ***
## deptPhysiology               -0.165069   0.028755  -5.741 2.75e-08 ***
## deptGenetics                  0.189770   0.035827   5.297 2.60e-07 ***
## deptPediatrics                0.218603   0.035342   6.185 2.54e-09 ***
## deptMedicine                  0.546771   0.029045  18.825  < 2e-16 ***
## deptSurgery                   0.939830   0.034907  26.924  < 2e-16 ***
## clinPrimarily clinical emphasis  0.208175  0.021470  9.696  < 2e-16 ***
## certBoard certified           0.182166   0.020969   8.688 5.09e-16 ***
## genderMale:exper             -0.011728   0.003580  -3.276 0.001204 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1312 on 248 degrees of freedom
## Multiple R-squared:  0.9366, Adjusted R-squared:  0.9336
## F-statistic: 305.4 on 12 and 248 DF,  p-value: < 2.2e-16
```

```
knitr::kable(tidy(gender_inter_exp))
```

term	estimate	std.error	statistic	p.value
(Intercept)	10.9033248	0.0348047	313.271532	0.0000000
genderMale	0.1289315	0.0369123	3.492917	0.0005656
exper	0.0277735	0.0035450	7.834479	0.0000000
rankAssociate	0.1182307	0.0236483	4.999550	0.0000011
rankFull professor	0.2080364	0.0261120	7.967070	0.0000000
deptPhysiology	-0.1650686	0.0287549	-5.740539	0.0000000
deptGenetics	0.1897699	0.0358265	5.296914	0.0000003
deptPediatrics	0.2186033	0.0353421	6.185348	0.0000000
deptMedicine	0.5467712	0.0290446	18.825258	0.0000000
deptSurgery	0.9398303	0.0349067	26.924103	0.0000000
clinPrimarily clinical emphasis	0.2081748	0.0214696	9.696260	0.0000000
certBoard certified	0.1821661	0.0209685	8.687594	0.0000000
genderMale:exper	-0.0117282	0.0035803	-3.275776	0.0012042

```
## stratify exp levels:
summary(data_2)
```

```
##                   dept        gender                              clin
##   Molecular Biology:50   Female:106   Primarily research emphasis:101
##   Physiology       :40   Male  :155   Primarily clinical emphasis:160
##   Genetics         :21
##   Pediatrics       :30
##   Medicine         :80
##   Surgery          :40
##              cert          prate            exper
##   not certified  : 73   Min.   :1.300   Min.   : 1.00
##   Board certified:188   1st Qu.:3.200   1st Qu.: 6.00
##                         Median :4.400   Median : 9.00
##                         Mean   :4.932   Mean   :10.23
##                         3rd Qu.:6.900   3rd Qu.:14.00
##                         Max.   :8.700   Max.   :37.00
##            rank          log_sal
##   Assistant     :112   Min.   :10.51
##   Associate     : 64   1st Qu.:11.46
##   Full professor: 85   Median :11.86
##                        Mean   :11.86
##                        3rd Qu.:12.25
##                        Max.   :13.01
```

```r
data_stra_exp=data_2 %>%
  mutate(exper = as.factor(case_when(.$exper %in% c(0:5)~"very small",
                          .$exper %in% c(6:10)~"small",
                          .$exper %in% c(11:14)~"median",
                          .$exper %in% c(15:37)~"large")))
gender_inter_exp_1=lm(log_sal~gender +rank + dept + clin+cert,data=data_stra_exp %>% filter(exper=="very small")
summary(gender_inter_exp_1) %>% tidy() %>% knitr::kable()
```

term	estimate	std.error	statistic	p.value
(Intercept)	11.0075056	0.1257684	87.5220208	0.0000000
genderMale	0.1257741	0.0540886	2.3253341	0.0238410
rankAssociate	0.0304415	0.0877100	0.3470702	0.7298875
deptPhysiology	-0.1569668	0.1346849	-1.1654369	0.2489644
deptGenetics	0.2740391	0.1520060	1.8028169	0.0769982
deptPediatrics	0.3579820	0.1432083	2.4997295	0.0154994
deptMedicine	0.6765487	0.1410218	4.7974763	0.0000131
deptSurgery	1.0589394	0.1546548	6.8471161	0.0000000
clinPrimarily clinical emphasis	0.1188930	0.0620500	1.9160830	0.0606545
certBoard certified	0.1168796	0.0529226	2.2085010	0.0314743

```r
gender_inter_exp_2=lm(log_sal~gender +rank + dept + clin+cert,data=data_stra_exp %>% filter(exper=="small"))
summary(gender_inter_exp_2)%>% tidy() %>% knitr::kable()
```

term	estimate	std.error	statistic	p.value
(Intercept)	11.1273726	0.0341061	326.2580244	0.0000000
genderMale	0.0146175	0.0252336	0.5792884	0.5639089
rankAssociate	0.1682590	0.0277366	6.0663255	0.0000000
rankFull professor	0.2409081	0.0322452	7.4711222	0.0000000
deptPhysiology	-0.2011397	0.0427660	-4.7032603	0.0000097
deptGenetics	0.1430527	0.0505508	2.8298804	0.0057951
deptPediatrics	0.2159680	0.0524579	4.1169791	0.0000878
deptMedicine	0.5208469	0.0433483	12.0153848	0.0000000
deptSurgery	0.9218873	0.0533390	17.2835567	0.0000000
clinPrimarily clinical emphasis	0.2449037	0.0344593	7.1070521	0.0000000
certBoard certified	0.1528088	0.0331427	4.6106365	0.0000139

```r
gender_inter_exp_3=lm(log_sal~gender +rank + dept + clin+cert,data=data_stra_exp %>% filter(exper=="median"))
summary(gender_inter_exp_3)%>% tidy() %>% knitr::kable()
```

term	estimate	std.error	statistic	p.value
(Intercept)	11.2781577	0.0665408	169.4923216	0.0000000
genderMale	0.0014332	0.0468061	0.0306198	0.9757373
rankAssociate	0.0606880	0.0605796	1.0017897	0.3229521
rankFull professor	0.1842762	0.0608461	3.0285647	0.0044606
deptPhysiology	-0.1449490	0.0628290	-2.3070415	0.0267512
deptGenetics	0.1245966	0.0887069	1.4045880	0.1684836
deptPediatrics	0.1012183	0.0872291	1.1603736	0.2533294
deptMedicine	0.4291352	0.0679384	6.3165298	0.0000002
deptSurgery	0.8948438	0.0824680	10.8507979	0.0000000
clinPrimarily clinical emphasis	0.2815971	0.0482761	5.8330544	0.0000011
certBoard certified	0.2280466	0.0517990	4.4025317	0.0000877

```r
gender_inter_exp_4=lm(log_sal~gender +rank + dept + clin+cert,data=data_stra_exp %>% filter(exper=="large"))
summary(gender_inter_exp_4)%>% tidy() %>% knitr::kable()
```

term	estimate	std.error	statistic	p.value
(Intercept)	11.1536847	0.1000955	111.4304149	0.0000000
genderMale	-0.0153026	0.0609525	-0.2510587	0.8030228
rankAssociate	0.3402928	0.0968891	3.5121869	0.0010969
rankFull professor	0.3205875	0.0861832	3.7198373	0.0005982
deptPhysiology	-0.0604280	0.0640088	-0.9440578	0.3506704
deptGenetics	0.2475973	0.0782158	3.1655679	0.0029173
deptPediatrics	0.1551615	0.0864902	1.7939773	0.0801937
deptMedicine	0.5944219	0.0560110	10.6125986	0.0000000
deptSurgery	0.9646424	0.0676243	14.2647377	0.0000000
clinPrimarily clinical emphasis	0.1210105	0.0486623	2.4867404	0.0170550
certBoard certified	0.3202961	0.0511871	6.2573608	0.0000002

diaganosis

```
par(mfrow = c(2, 2))
plot(gender_inter_exp)
```
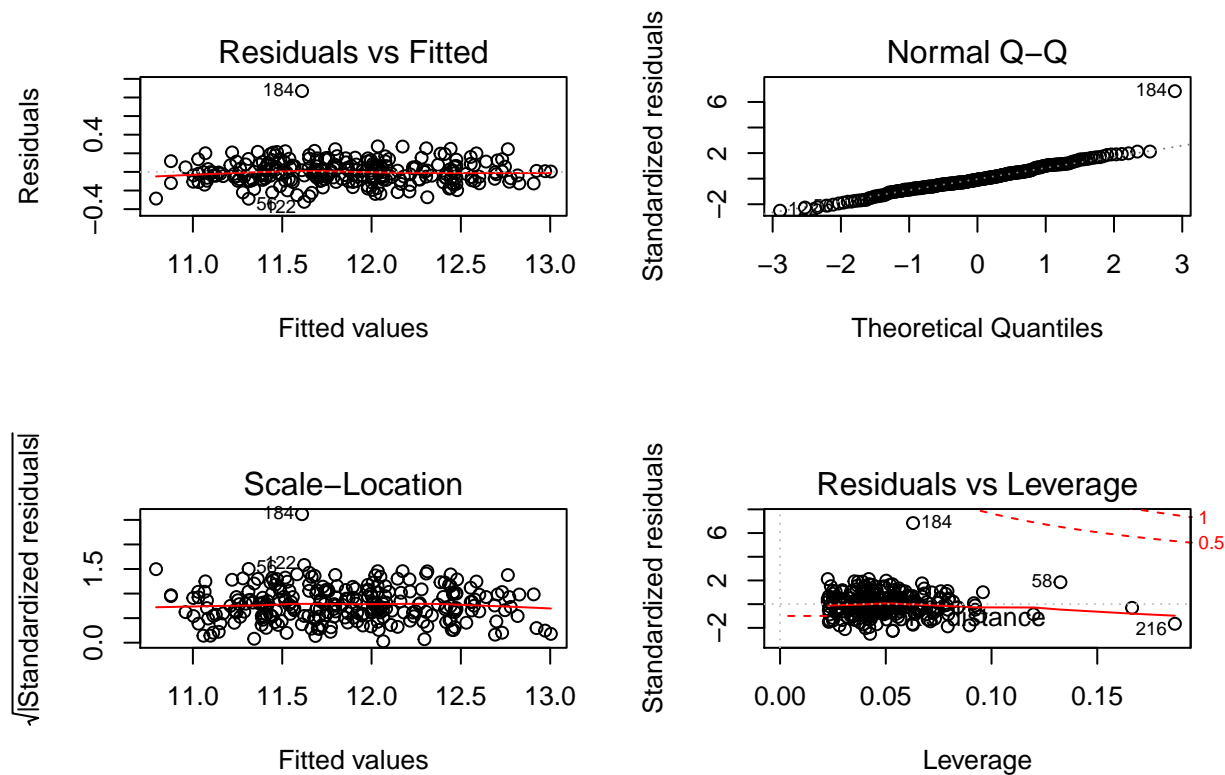

meet the constant varience and normality assumption ## 184 maybe a potential influential point

checking outlier and influential

outlier in Y

```
##             1              2              3              4              5
## -0.6216377267 -0.7451818190 -0.3246763191 -0.4351554387  0.2818954252
##             6              7              8              9             10
## -1.9386856988 -0.1306759463  1.3310823636 -1.5410367437  0.6302093015
##            11             12             13             14             15
##  0.0064123035  1.3943466072 -0.3733127163 -0.6644475221  1.0840849681
```

```
##           16            17            18            19            20
## -0.1311217348 -0.1932658039  0.4391577704 -0.3118990731  0.2951622790
##           21            22            23            24            25
##  1.1491738501  0.4190431230  1.1309592679  0.6157115698 -0.6824813596
##           26            27            28            29            30
## -1.2996061824 -0.2176666535 -0.2574563717 -0.0816744603 -0.0487223686
##           31            32            33            34            35
##  0.3872477727 -0.6024697152 -1.7127042179  0.0912835867 -0.3781541940
##           36            37            38            39            40
## -0.0202269138  0.5369598984 -0.3547897766 -0.3044480812  0.2840355411
##           41            42            43            44            45
##  0.8623541333  0.8372200841  1.6844590527 -0.4656806710 -0.1561362610
##           46            47            48            49            50
##  1.5593700708  0.0982115856  0.2760132343 -0.7467589508 -0.6657945044
##           51            52            53            54            55
##  0.7201655241  0.1410864891 -0.2973687363  0.1678954878 -0.3167201143
##           56            57            58            59            60
## -2.2572980821 -0.2602460260  1.8527350759 -1.7362062091  0.5614593959
##           61            62            63            64            65
##  1.5003440588  1.6397713560 -1.0747075835  1.6224206375  1.1763082287
##           66            67            68            69            70
## -0.0489510029 -0.4086665451 -0.0419189141 -0.7605288789  0.7707617101
##           71            72            73            74            75
## -0.0396987095 -0.1499546449  1.7555099691 -0.5519625864 -0.4960958181
##           76            77            78            79            80
##  1.0718339979 -1.2146521114 -0.3012483663  0.6339348105 -0.8547163614
##           81            82            83            84            85
##  0.9009637263 -2.2423895969 -0.7419084284 -0.8279780662 -0.0199824642
##           86            87            88            89            90
##  0.1744953822 -0.2934880705  1.0087268227  0.2417260609 -0.9326514392
##           91            92            93            94            95
## -0.1098870508 -0.7431398851  0.4764592013 -1.2936263507  0.9916710729
##           96            97            98            99           100
##  1.3217674322  0.8978222886 -0.4885750622  0.8755571899 -0.0783635192
##          101           102           103           104           105
##  1.1059669325 -1.4509236734 -0.6163626395 -0.4700441121 -0.2631105212
##          106           107           108           109           110
## -0.1639188637 -0.3286980463 -0.3990916332  0.0830068317  1.0921119199
##          111           112           113           114           115
## -0.4283100617 -0.6170442248  0.6277187439  0.1882087963  0.4001239937
##          116           117           118           119           120
## -0.8519820785  0.1233159648  0.4847574369 -0.8054866288  0.3440968111
##          121           122           123           124           125
## -0.3861593182 -2.5036520124  1.6783426145 -0.2962552575  0.2151905542
##          126           127           128           129           130
##  1.4158836373 -1.0322951735  0.4910700494  0.5571819857  0.5684503107
##          131           132           133           134           135
##  1.2001864836 -2.0309463104 -0.1298632050  1.1151830597 -1.7946554427
##          136           137           138           139           140
##  0.9969807054 -0.8617388139 -0.2822889184 -0.2621595265  0.2812353445
##          141           142           143           144           145
##  1.1169716847  0.1035920826 -0.4258034649  0.3774697240 -1.3357735314
##          146           147           148           149           150
## -1.6956978315 -0.0049079563 -0.0990687421 -0.7048888897 -0.8670182973
##          151           152           153           154           155
##  0.4033138973 -0.6105455802 -0.3090161170 -0.1752746489 -0.2005176749
##          156           157           158           159           160
##  0.4878979833  1.1783495890  0.5114531515  1.5148833901 -0.3923320702
##          161           162           163           164           165
## -0.6235570607 -0.3811594849 -0.1650003615 -0.8756636850  0.3864019699
##          166           167           168           169           170
```

```
##   1.0527515683 -1.8012897959 -0.2702227948  0.8018632742 -1.0862016170
##             171            172            173            174            175
## -0.4612618271 -0.8603153411 -0.5968497329 -2.1091174627 -0.6642068337
##             176            177            178            179            180
## -0.7730328685  0.1137679654  0.5289175670 -0.7685654724  0.5083715525
##             181            182            183            184            185
## -0.6196176399  1.9837188809  0.4764212946  6.8453110651 -0.0676634214
##             186            187            188            189            190
## -0.4630255521  0.3603001961  0.0007505437 -1.3827073474  1.0704558407
##             191            192            193            194            195
## -0.5190369298  1.0653026639  1.1245417036 -0.8400181612  0.2024089983
##             196            197            198            199            200
## -1.3834783462  1.5070631824  0.1223106776 -0.3436106626  0.4372280634
##             201            202            203            204            205
##   0.1800803713  0.0187359006  1.9016787122  2.1182174015  0.4051192053
##             206            207            208            209            210
##   0.8790559430  0.4405839687  2.1211294365 -0.4954912368 -1.4957561022
##             211            212            213            214            215
## -0.3799139203  1.1415798849  0.6648969089  0.2875215899 -0.7632146527
##             216            217            218            219            220
## -1.6562091085 -0.6443001130 -0.3740235385 -1.1661301648 -1.8769565672
##             221            222            223            224            225
## -0.7062751423 -1.0371019943  1.9313705006 -0.2947874010 -0.9612553860
##             226            227            228            229            230
## -0.5301074034 -0.9674241535 -0.6967789060  0.4370454855  0.0884646712
##             231            232            233            234            235
## -1.3294703811  0.0320564705  0.2162990684 -1.0483031687 -0.4471775061
##             236            237            238            239            240
##   0.0693743470 -0.5737988678  1.0199329522  1.8971498247  0.8637192819
##             241            242            243            244            245
##   1.0632119323 -0.1870346165 -0.4310331997  1.2503235403 -0.9999560422
##             246            247            248            249            250
##   0.4973331920  1.5499344878  0.9647220150  0.6849335060  0.0658245562
##             251            252            253            254            255
## -0.9551285042 -1.6610732271  0.0602807964 -0.4056407632 -0.5557610386
##             256            257            258            259            260
##   0.0411067273  0.5649697304 -0.0267217669 -0.9769508506  0.1805121942
##             261
##   0.5981233376
```

Any observation with an absolute studentized residual ri greater than 2.5 is considered an outlier. In this dataset, we think 184 case is an outliers in Y.

outlier in X

```
##      name          hii
## 1       1 0.04357000
## 2       2 0.03902594
## 3       3 0.04715744
## 4       4 0.07237292
## 5       5 0.04133721
## 6       6 0.04220224
## 7       7 0.04714516
## 8       8 0.05618222
## 9       9 0.03780335
## 10     10 0.03987791
## 11     11 0.03851602
## 12     12 0.04889132
## 13     13 0.05072827
## 14     14 0.04073625
## 15     15 0.03902594
```

```
## 16      16 0.04357000
## 17      17 0.03629874
## 18      18 0.04493120
## 19      19 0.16647122
## 20      20 0.03526654
## 21      21 0.05670585
## 22      22 0.03638618
## 23      23 0.03424389
## 24      24 0.04294492
## 25      25 0.04805816
## 26      26 0.03555218
## 27      27 0.04073625
## 28      28 0.03418676
## 29      29 0.03452764
## 30      30 0.04650434
## 31      31 0.05330117
## 32      32 0.05288256
## 33      33 0.03934356
## 34      34 0.05973820
## 35      35 0.04431655
## 36      36 0.03606943
## 37      37 0.07574887
## 38      38 0.05604591
## 39      39 0.08398795
## 40      40 0.05231091
## 41      41 0.04431655
## 42      42 0.04602011
## 43      43 0.04215920
## 44      44 0.09228563
## 45      45 0.03940500
## 46      46 0.03659341
## 47      47 0.07463551
## 48      48 0.06361033
## 49      49 0.04132738
## 50      50 0.03975947
## 51      51 0.06036550
## 52      52 0.05251364
## 53      53 0.05201694
## 54      54 0.06269553
## 55      55 0.04509150
## 56      56 0.05324130
## 57      57 0.07113249
## 58      58 0.13260199
## 59      59 0.06286402
## 60      60 0.05186472
## 61      61 0.04509150
## 62      62 0.05201730
## 63      63 0.05574823
## 64      64 0.04357904
## 65      65 0.04570357
## 66      66 0.04693695
## 67      67 0.05020499
## 68      68 0.05087162
## 69      69 0.06378568
## 70      70 0.04174816
## 71      71 0.06144914
## 72      72 0.04919575
## 73      73 0.06714678
## 74      74 0.06589974
## 75      75 0.05017037
## 76      76 0.05931157
```

```
## 77    77 0.07328533
## 78    78 0.04419399
## 79    79 0.06177930
## 80    80 0.04919575
## 81    81 0.04394157
## 82    82 0.05333092
## 83    83 0.05017037
## 84    84 0.06396377
## 85    85 0.04606731
## 86    86 0.06936229
## 87    87 0.05378537
## 88    88 0.09594505
## 89    89 0.05439071
## 90    90 0.04394157
## 91    91 0.09220166
## 92    92 0.07254548
## 93    93 0.07985358
## 94    94 0.06984083
## 95    95 0.07185562
## 96    96 0.06815172
## 97    97 0.06815172
## 98    98 0.07352995
## 99    99 0.07833344
## 100  100 0.07870242
## 101  101 0.07916750
## 102  102 0.07111275
## 103  103 0.06554358
## 104  104 0.07930963
## 105  105 0.08414135
## 106  106 0.06660956
## 107  107 0.06776796
## 108  108 0.06593879
## 109  109 0.09164993
## 110  110 0.07606374
## 111  111 0.06660956
## 112  112 0.05681290
## 113  113 0.06727865
## 114  114 0.05226794
## 115  115 0.05557460
## 116  116 0.06924724
## 117  117 0.05754474
## 118  118 0.05373136
## 119  119 0.05506009
## 120  120 0.07977648
## 121  121 0.05647907
## 122  122 0.04256719
## 123  123 0.05319293
## 124  124 0.04256719
## 125  125 0.08180209
## 126  126 0.04039438
## 127  127 0.09463092
## 128  128 0.05129636
## 129  129 0.05595490
## 130  130 0.05626425
## 131  131 0.05410533
## 132  132 0.04039438
## 133  133 0.07744250
## 134  134 0.04039438
## 135  135 0.08955324
## 136  136 0.05384333
## 137  137 0.07948748
```

```
## 138   138 0.04043231
## 139   139 0.05952766
## 140   140 0.05144805
## 141   141 0.05785271
## 142   142 0.02810386
## 143   143 0.04479805
## 144   144 0.03068096
## 145   145 0.02948661
## 146   146 0.04568390
## 147   147 0.02989135
## 148   148 0.02508678
## 149   149 0.04434493
## 150   150 0.02343940
## 151   151 0.02988654
## 152   152 0.02949013
## 153   153 0.02816021
## 154   154 0.02325422
## 155   155 0.03187339
## 156   156 0.02650593
## 157   157 0.02949173
## 158   158 0.05770621
## 159   159 0.02402258
## 160   160 0.03290869
## 161   161 0.02710148
## 162   162 0.02809504
## 163   163 0.03310236
## 164   164 0.03346379
## 165   165 0.02508678
## 166   166 0.02948661
## 167   167 0.02809504
## 168   168 0.02710148
## 169   169 0.04590719
## 170   170 0.03187339
## 171   171 0.02809504
## 172   172 0.11987751
## 173   173 0.04937586
## 174   174 0.03068898
## 175   175 0.02650593
## 176   176 0.06360581
## 177   177 0.03068898
## 178   178 0.04429925
## 179   179 0.04329317
## 180   180 0.02809504
## 181   181 0.04864137
## 182   182 0.05020477
## 183   183 0.02508678
## 184   184 0.06289705
## 185   185 0.04673500
## 186   186 0.07474907
## 187   187 0.04718704
## 188   188 0.04330473
## 189   189 0.02346706
## 190   190 0.02630840
## 191   191 0.02325422
## 192   192 0.04441413
## 193   193 0.02502803
## 194   194 0.03968523
## 195   195 0.05440186
## 196   196 0.02502803
## 197   197 0.04925117
## 198   198 0.02845258
```

```
## 199   199 0.02845258
## 200   200 0.02256246
## 201   201 0.02256246
## 202   202 0.05564948
## 203   203 0.03902350
## 204   204 0.02256246
## 205   205 0.04191535
## 206   206 0.02502803
## 207   207 0.02306465
## 208   208 0.04196923
## 209   209 0.02306465
## 210   210 0.02306465
## 211   211 0.04151773
## 212   212 0.04441413
## 213   213 0.02306465
## 214   214 0.04085714
## 215   215 0.04930122
## 216   216 0.18669691
## 217   217 0.04541543
## 218   218 0.05737302
## 219   219 0.02502803
## 220   220 0.07930076
## 221   221 0.05200531
## 222   222 0.03411852
## 223   223 0.03518081
## 224   224 0.05567044
## 225   225 0.03506359
## 226   226 0.03582531
## 227   227 0.04175430
## 228   228 0.04719225
## 229   229 0.03832319
## 230   230 0.04428647
## 231   231 0.03518081
## 232   232 0.06291755
## 233   233 0.03518081
## 234   234 0.03411852
## 235   235 0.03345424
## 236   236 0.06250639
## 237   237 0.03869495
## 238   238 0.03345424
## 239   239 0.03687524
## 240   240 0.03889635
## 241   241 0.04016914
## 242   242 0.04505509
## 243   243 0.04719225
## 244   244 0.03610301
## 245   245 0.03345424
## 246   246 0.03345424
## 247   247 0.03994860
## 248   248 0.03942384
## 249   249 0.06272814
## 250   250 0.03411852
## 251   251 0.04246842
## 252   252 0.06261655
## 253   253 0.05427108
## 254   254 0.04246842
## 255   255 0.03518081
## 256   256 0.04016914
## 257   257 0.06055377
## 258   258 0.06504155
## 259   259 0.04028979
```

```
## 260   260 0.05797656
## 261   261 0.04255786


## [1] name hii
## <0 rows> (or 0-length row.names)
```

no outlier in X

influential cases

```
c=influence.measures(gender_inter_exp)
c
```

```
## Influence measures of
##   lm(formula = log_sal ~ gender * exper + rank + dept + clin +       cert, data = data_2) :
##
##          dfb.1_   dfb.gndM   dfb.expr   dfb.rnkA   dfb.rnFp dfb.dptPh   dfb.dptG
## 1    -6.64e-02  -1.88e-02   2.64e-02  -3.06e-03  -5.87e-02  5.74e-02   4.88e-02
## 2    -6.46e-02  -2.00e-02   1.37e-02  -5.18e-02   8.53e-03  6.49e-02   5.71e-02
## 3    -2.86e-02  -3.17e-02  -1.09e-02   3.21e-02   2.85e-02  2.60e-02   2.59e-02
## 4    -2.20e-02   2.96e-02   3.79e-03   1.63e-02   1.26e-02  5.07e-02   4.29e-02
## 5     2.96e-02   7.28e-03  -1.10e-02   2.74e-04   2.46e-02 -2.57e-02  -2.19e-02
## 6    -1.60e-01  -1.54e-02   1.30e-01  -4.69e-02  -1.82e-01  1.97e-01   1.25e-01
## 7    -8.53e-03  -1.74e-03   6.47e-03  -1.27e-02  -1.85e-04  1.28e-02   8.38e-03
## 8     1.01e-01   4.50e-03  -8.64e-02   3.51e-02   1.14e-01 -1.75e-01  -1.48e-01
## 9    -1.43e-01   1.44e-02   1.73e-02   4.72e-02  -4.69e-02  1.29e-01   1.10e-01
## 10    5.56e-02   1.97e-02  -1.38e-02   4.63e-02  -2.74e-03 -5.55e-02  -4.88e-02
## 11    5.35e-04   1.16e-04  -7.30e-05   3.95e-04  -1.64e-04 -5.45e-04  -4.80e-04
## 12    9.37e-02   2.49e-02  -7.42e-02   1.41e-01   1.20e-02 -1.38e-01  -9.10e-02
## 13   -2.40e-02   1.03e-02   1.50e-02   5.58e-04  -1.33e-02  4.63e-02   3.91e-02
## 14   -5.24e-02  -3.26e-03   6.43e-04  -3.31e-02   3.12e-02  5.47e-02   4.82e-02
## 15    9.41e-02   2.92e-02  -1.99e-02   7.55e-02  -1.24e-02 -9.46e-02  -8.32e-02
## 16   -1.40e-02  -3.97e-03   5.57e-03  -6.45e-04  -1.24e-02  1.21e-02   1.03e-02
## 17   -1.84e-02   9.95e-05   3.49e-03   4.37e-03  -8.59e-03  1.64e-02   1.40e-02
## 18    3.67e-02   5.40e-03  -3.08e-02   1.23e-02   4.40e-02 -4.47e-02  -2.85e-02
## 19   -1.49e-02   3.07e-02  -2.53e-02   1.23e-02   6.80e-02  2.03e-02   1.83e-02
## 20    2.23e-02  -2.85e-03  -1.55e-02   2.43e-03   1.90e-02 -2.84e-02  -1.79e-02
## 21    6.42e-02  -7.76e-02  -8.60e-03  -4.98e-02  -3.23e-02 -9.75e-02  -5.83e-02
## 22    4.13e-02   3.46e-03  -1.05e-02  -6.18e-03   2.46e-02 -3.65e-02  -3.11e-02
## 23    8.01e-02  -2.58e-02  -4.76e-02  -4.00e-03   4.88e-02 -1.06e-01  -6.59e-02
## 24    3.79e-02  -3.03e-02  -1.31e-02  -1.67e-02   3.67e-04 -5.42e-02  -3.30e-02
## 25   -5.83e-02  -1.14e-02   5.04e-02  -2.19e-02  -7.34e-02  7.03e-02   4.50e-02
## 26   -8.81e-02   4.11e-02   4.58e-02   1.48e-02  -3.77e-02  1.19e-01   7.37e-02
## 27   -1.72e-02  -1.07e-03   2.10e-04  -1.08e-02   1.02e-02  1.79e-02   1.58e-02
## 28   -1.86e-02   4.74e-03   1.17e-02  -1.03e-04  -1.29e-02  2.43e-02   1.52e-02
## 29   -6.03e-03   1.15e-03   4.00e-03  -3.53e-04  -4.67e-03  7.79e-03   4.88e-03
## 30   -4.22e-03  -4.53e-03  -1.80e-03   5.00e-03   4.62e-03  3.85e-03   3.85e-03
## 31    9.04e-02  -4.86e-02  -5.22e-02  -4.75e-03   3.05e-03 -4.35e-02  -3.59e-02
## 32   -1.30e-02   1.13e-03  -2.94e-02  -5.84e-02  -4.92e-04  5.52e-02   3.74e-02
## 33   -1.94e-01   7.89e-02   4.07e-02   6.60e-02   7.74e-02  1.73e-01   1.20e-01
## 34    5.64e-04   5.05e-03   1.21e-02   4.93e-03  -2.61e-03 -6.76e-03  -6.62e-03
## 35   -4.61e-02   2.32e-02   1.30e-02  -4.26e-02  -1.59e-02  3.72e-02   3.11e-02
## 36   -2.74e-03   5.63e-04  -7.86e-05   1.24e-03   1.02e-03  1.84e-03   1.68e-03
## 37   -7.66e-03   5.06e-02   9.06e-02  -1.90e-02   2.56e-02 -3.78e-02  -3.79e-02
## 38   -6.78e-02   4.41e-02   4.79e-02  -3.63e-04  -6.71e-04  4.18e-02   2.75e-02
## 39    1.33e-02  -2.32e-02  -4.26e-02   1.77e-03  -1.61e-02  3.40e-02   3.19e-02
## 40    1.80e-02   4.30e-03   1.58e-02   1.32e-03   2.68e-02 -2.45e-02  -2.17e-02
## 41    1.05e-01  -5.30e-02  -2.96e-02   9.74e-02   3.62e-02 -8.49e-02  -7.10e-02
## 42    2.99e-02   2.65e-02   7.28e-02  -6.53e-02  -7.72e-02 -7.05e-02  -5.31e-02
```

```
## 43    9.30e-02  2.07e-02  1.00e-01 -1.15e-01 -1.36e-01 -1.49e-01 -1.10e-01
## 44    2.24e-02 -5.21e-02 -9.37e-02  5.32e-02  6.68e-02  4.69e-02  4.93e-02
## 45   -1.52e-02 -1.69e-03 -9.20e-03  1.26e-02  1.16e-02  1.29e-02  1.25e-02
## 46    2.42e-01 -7.38e-02 -3.70e-02 -8.06e-02 -6.10e-02 -1.49e-01 -1.33e-01
## 47   -3.28e-04  1.73e-03  7.49e-03  9.24e-03 -1.17e-03 -1.18e-02 -1.07e-02
## 48    5.67e-03  2.46e-02  4.73e-02 -3.36e-02 -3.38e-02 -1.85e-02 -2.04e-02
## 49   -9.86e-02  4.87e-02  3.83e-02  2.13e-02  2.49e-02  7.82e-02  5.36e-02
## 50   -4.93e-02  4.76e-03 -2.10e-02  3.86e-02  4.55e-02  6.14e-02  4.43e-02
## 51   -3.36e-02  6.42e-02  3.80e-02 -7.20e-02 -9.29e-02  7.83e-02 -1.54e-02
## 52   -3.00e-03  5.51e-03 -5.34e-03  2.88e-03  1.17e-02  1.30e-02 -3.28e-03
## 53    4.21e-03 -1.30e-02  1.19e-02 -5.45e-03 -2.70e-02 -3.62e-02 -6.83e-03
## 54   -7.84e-03 -5.34e-03  3.06e-03 -7.26e-03 -5.29e-03  1.82e-02 -1.72e-03
## 55    5.96e-03 -9.58e-03  9.37e-03 -2.03e-03 -2.19e-02 -3.93e-02 -8.02e-03
## 56    7.80e-02 -9.18e-02  3.63e-02 -1.90e-01  3.53e-02 -2.89e-01 -5.63e-02
## 57    1.30e-02  1.06e-02 -6.60e-03  1.34e-02  1.20e-02 -2.88e-02  2.24e-03
## 58   -1.37e-01 -1.20e-01  1.26e-01 -1.51e-02 -3.50e-01  2.91e-01  8.48e-02
## 59    2.54e-02  8.04e-03 -7.02e-02  1.13e-01  3.88e-02 -2.56e-01 -3.80e-02
## 60   -1.05e-02  2.03e-02  1.64e-02  2.27e-02 -3.20e-02  7.92e-02  8.52e-03
## 61   -2.83e-02  4.56e-02 -4.46e-02  9.66e-03  1.04e-01  1.87e-01  3.82e-02
## 62    1.25e-02  9.44e-02 -1.48e-02 -1.46e-02  1.28e-01  2.18e-01  1.68e-02
## 63    4.95e-03 -8.20e-02  2.41e-03 -8.20e-02 -7.88e-03 -1.43e-01 -8.41e-03
## 64   -3.32e-02  4.21e-02 -4.25e-02  4.02e-03  1.01e-01  2.04e-01  4.26e-02
## 65   -4.16e-02 -8.20e-04 -7.48e-03 -1.79e-02  2.19e-02  1.18e-01 -1.87e-02
## 66    1.81e-03  2.50e-04  1.40e-04  9.38e-04 -5.62e-04 -4.96e-03  7.36e-04
## 67   -2.45e-03 -2.16e-02  2.24e-03  5.22e-03 -2.89e-02 -5.44e-02 -4.50e-03
## 68    3.90e-04 -2.63e-03 -3.46e-04 -2.68e-03  5.91e-04 -5.66e-03 -4.30e-04
## 69    2.83e-02 -8.83e-02 -2.41e-02  5.80e-02  6.55e-02 -7.83e-02  2.00e-02
## 70   -1.81e-02  1.31e-02 -1.47e-02 -4.18e-03  3.68e-02  9.79e-02  2.14e-02
## 71    1.79e-03  5.61e-04 -1.03e-03 -4.34e-03 -2.68e-04 -3.75e-03  9.42e-04
## 72   -1.07e-02  1.16e-02  1.10e-02  3.39e-03  4.01e-03 -1.67e-02 -2.01e-03
## 73   -1.75e-01  1.12e-01  2.09e-01 -1.02e-02  1.06e-01  2.45e-01  5.24e-02
## 74   -9.04e-03  9.19e-03 -2.85e-03 -1.48e-02 -6.22e-02 -5.31e-02  2.21e-02
## 75   -1.12e-02  1.72e-02  3.34e-04 -4.93e-02 -1.25e-02 -6.25e-02 -3.18e-03
## 76    1.17e-01 -8.54e-02 -8.02e-02 -3.22e-02 -2.32e-02  9.25e-02 -5.28e-02
## 77    5.15e-02 -5.16e-02 -1.09e-01  3.81e-03 -9.43e-02 -1.33e-01  4.26e-02
## 78   -4.07e-03  5.77e-03 -2.98e-03  1.57e-02  1.86e-02 -3.71e-02 -5.58e-03
## 79   -4.98e-02  1.59e-02  5.26e-02  5.29e-02 -1.02e-02  8.49e-02  1.71e-02
## 80   -6.12e-02  6.63e-02  6.25e-02  1.93e-02  2.29e-02 -9.51e-02 -1.15e-02
## 81    6.79e-02 -3.60e-02 -1.60e-02 -5.01e-02 -3.98e-02  1.12e-01  1.40e-03
## 82   -3.03e-01  2.23e-01  2.29e-01  5.90e-02  2.04e-02 -2.55e-01  8.19e-03
## 83   -1.68e-02  2.58e-02  5.00e-04 -7.38e-02 -1.87e-02 -9.35e-02 -4.75e-03
## 84   -1.07e-01  8.23e-02  8.52e-02  1.67e-02  8.15e-03 -6.81e-02  4.23e-02
## 85   -1.04e-03  1.16e-03  9.06e-04  6.48e-04  7.68e-04 -2.30e-03 -3.02e-04
## 86   -3.96e-03  3.95e-03  1.07e-02  1.20e-03  1.56e-02  1.83e-02 -6.40e-03
## 87   -2.67e-02  2.85e-02  2.96e-02  3.74e-03  4.41e-03 -3.15e-02 -3.43e-03
## 88   -1.67e-01  1.06e-01  1.99e-01  5.12e-02 -6.62e-02  1.23e-01 -1.37e-02
## 89    1.70e-02 -9.74e-03 -4.59e-03 -1.20e-02 -1.09e-02  2.28e-02 -1.10e-02
## 90   -7.03e-02  3.73e-02  1.65e-02  5.18e-02  4.13e-02 -1.16e-01 -1.45e-03
## 91    4.33e-03  4.84e-03  5.65e-05  3.57e-03  9.21e-04 -2.63e-03 -2.55e-02
## 92    9.96e-03 -2.51e-02 -1.86e-03 -4.92e-02  1.53e-02 -1.82e-02 -1.53e-01
## 93   -1.83e-02  4.58e-02  9.03e-03 -3.21e-02 -3.74e-02 -5.18e-03  8.02e-02
## 94    1.07e-02 -1.32e-02  2.56e-03  2.26e-02 -5.55e-02  7.50e-03 -2.10e-01
## 95   -2.37e-02  1.42e-02 -4.73e-02  2.58e-02  8.42e-02 -2.02e-02  1.70e-01
## 96   -4.21e-02 -1.06e-02 -3.97e-02  7.93e-03  6.44e-02 -2.04e-02  2.32e-01
## 97   -2.85e-02 -7.21e-03 -2.69e-02  5.37e-03  4.37e-02 -1.38e-02  1.57e-01
## 98    7.71e-03 -2.08e-02  2.81e-03 -3.93e-02  3.36e-03  4.25e-03 -7.67e-02
## 99   -1.28e-02  1.00e-01  4.12e-02 -7.97e-02 -7.40e-02 -1.07e-03  1.35e-01
## 100   3.12e-03 -7.18e-03 -1.76e-03  5.59e-03  6.72e-03  7.73e-04 -1.32e-02
## 101   1.92e-02 -3.67e-02 -1.26e-02  4.48e-02  1.43e-01 -2.08e-02  1.70e-01
## 102   1.52e-03 -3.19e-02 -1.13e-01  1.21e-01  1.12e-01 -4.07e-02 -2.94e-01
## 103  -3.54e-02  2.28e-02  3.95e-03  3.25e-02  2.54e-02 -9.43e-03 -1.21e-01
```

```
## 104  1.10e-03  6.27e-03 -7.90e-03 -1.43e-02 -5.50e-02  6.86e-03 -7.30e-02
## 105  6.62e-03  1.33e-02  4.84e-03 -3.53e-02 -9.03e-03  6.43e-03 -4.44e-02
## 106 -1.26e-02  9.28e-03  5.63e-03  7.01e-03  4.81e-03 -1.82e-03 -3.18e-02
## 107 -2.99e-02  2.51e-02  2.09e-02  8.80e-03  6.00e-03  7.95e-03 -4.77e-02
## 108 -1.52e-02  6.95e-03 -8.59e-03  2.50e-02  2.12e-02 -7.77e-03 -7.88e-02
## 109 -4.91e-03 -8.95e-04  3.26e-03  9.00e-03  9.27e-04  1.28e-03  1.83e-02
## 110 -1.69e-02 -1.33e-02  4.26e-02  1.03e-01  1.88e-02  2.27e-02  2.23e-01
## 111 -3.30e-02  2.43e-02  1.47e-02  1.83e-02  1.26e-02 -4.76e-03 -8.32e-02
## 112  2.91e-02 -7.44e-02 -3.57e-02  5.73e-02  4.95e-02 -3.01e-03  5.53e-03
## 113 -2.23e-02  1.11e-02  6.70e-03 -1.66e-02  2.93e-02  1.97e-02  2.91e-02
## 114 -9.06e-03  9.30e-03  1.07e-03  1.44e-02 -6.85e-04 -4.75e-04 -1.13e-03
## 115 -2.25e-02  1.10e-02  9.29e-03  2.27e-02 -1.58e-02  9.60e-04 -7.58e-04
## 116  2.08e-02 -4.18e-02  1.20e-02 -1.31e-03 -8.29e-02 -2.09e-02 -3.46e-02
## 117 -5.61e-03  1.54e-02  6.71e-03 -1.09e-02 -9.01e-03  4.80e-04 -1.21e-03
## 118 -2.18e-02  2.83e-02 -6.31e-04  4.10e-02  5.16e-03 -2.18e-03 -3.70e-03
## 119  3.51e-02 -5.06e-02  3.88e-03 -7.14e-02 -1.44e-02  4.42e-03  6.82e-03
## 120 -7.30e-03  2.21e-02  1.33e-02  1.51e-02 -5.52e-03  1.36e-02  9.88e-03
## 121  1.88e-02 -4.48e-02 -2.37e-02  3.73e-02  3.37e-02 -2.26e-03  3.14e-03
## 122 -1.50e-01  1.62e-01  1.39e-01  6.43e-02  1.97e-02  4.76e-02  4.55e-02
## 123  4.40e-02 -4.22e-02  2.57e-03 -8.66e-02 -5.17e-02  3.42e-02  5.48e-02
## 124 -1.75e-02  1.89e-02  1.62e-02  7.52e-03  2.30e-03  5.57e-03  5.32e-03
## 125  2.25e-02 -3.41e-02 -3.86e-02  3.92e-02  2.64e-02 -8.42e-03 -4.77e-03
## 126  5.64e-02 -6.30e-02 -3.86e-02 -5.00e-02 -2.77e-02 -2.08e-02 -2.31e-02
## 127  1.58e-01 -1.22e-01 -2.02e-01  3.00e-02 -5.81e-02 -1.66e-02 -1.53e-03
## 128  4.81e-02 -5.06e-02 -5.42e-02 -2.80e-03  7.73e-03 -1.34e-02 -1.06e-02
## 129  3.62e-02 -3.57e-02 -3.01e-02 -1.76e-02 -3.94e-03  6.67e-03  1.62e-02
## 130  1.46e-02 -4.46e-02 -3.74e-02  7.96e-02  4.19e-02 -1.25e-02 -8.51e-03
## 131 -6.23e-02 -4.14e-04  5.44e-02  1.20e-01  3.19e-02 -6.35e-03 -9.67e-03
## 132 -8.13e-02  9.07e-02  5.57e-02  7.20e-02  3.99e-02  3.00e-02  3.32e-02
## 133  1.46e-02 -1.01e-02 -1.78e-02  1.13e-03 -1.03e-02 -9.66e-04  2.64e-04
## 134  4.44e-02 -4.95e-02 -3.04e-02 -3.93e-02 -2.18e-02 -1.64e-02 -1.81e-02
## 135  2.02e-01 -2.05e-01 -3.60e-01  2.22e-01  2.08e-01 -9.10e-02 -8.20e-02
## 136  4.54e-02 -4.44e-02 -2.62e-02 -4.14e-02 -1.88e-02  1.61e-02  3.07e-02
## 137 -7.68e-02  8.67e-02  8.18e-02 -1.19e-01 -8.00e-02  1.81e-02  2.80e-02
## 138 -3.39e-04  1.59e-03 -7.88e-03  1.55e-02  1.21e-02  1.80e-03  3.61e-03
## 139 -2.21e-02  2.19e-02  2.15e-02  5.69e-03 -1.24e-03 -2.05e-03 -7.18e-03
## 140 -1.60e-02  1.48e-02  3.13e-02 -2.39e-02 -2.21e-02  1.70e-03 -2.16e-03
## 141  1.32e-01 -1.37e-01 -1.55e-01  4.71e-03  3.09e-02 -3.52e-02 -2.61e-02
## 142 -3.47e-03  6.48e-03  5.26e-03 -9.05e-03 -1.09e-02  5.88e-04 -2.57e-04
## 143  3.68e-03 -8.29e-03 -8.54e-03 -2.77e-02  9.17e-03 -2.50e-03  6.27e-03
## 144 -9.59e-03  7.15e-03 -8.04e-03  3.89e-02  4.76e-03 -2.82e-03 -1.67e-03
## 145  3.04e-02 -1.25e-01 -3.58e-02  8.05e-02  7.48e-02  1.50e-03  1.09e-02
## 146  8.25e-03 -1.60e-02  5.80e-02 -3.63e-02 -1.67e-01 -3.61e-02 -7.36e-02
## 147  1.55e-04 -7.23e-06  3.66e-05 -4.29e-04  7.67e-05  1.75e-05  5.86e-06
## 148  2.09e-03  2.11e-03  1.06e-03  3.13e-05 -4.65e-03  2.64e-04 -1.96e-04
## 149  4.52e-03 -3.52e-03  2.15e-02 -1.22e-02 -6.41e-02 -1.56e-02 -3.10e-02
## 150  1.29e-02  3.39e-03  2.12e-02 -1.33e-02 -6.52e-02  5.68e-03  1.09e-03
## 151 -1.09e-02  5.88e-03 -7.20e-03  4.00e-02  2.24e-03 -2.62e-03 -1.46e-03
## 152  1.74e-02 -6.23e-03  8.78e-03 -5.82e-02  9.27e-04  3.37e-03  1.72e-03
## 153  2.68e-03 -4.18e-03  1.18e-02 -9.57e-03 -3.20e-02  3.23e-03  1.39e-03
## 154  2.88e-03  1.45e-03  3.68e-03 -2.00e-03 -1.19e-02  9.77e-04  7.82e-05
## 155  4.78e-03 -4.68e-03  4.97e-03 -2.15e-02 -3.95e-03  1.69e-03  1.05e-03
## 156 -1.33e-02  3.90e-02  1.81e-02 -3.50e-02 -3.75e-02  8.74e-04 -2.79e-03
## 157 -3.55e-02  6.90e-03 -1.29e-02  1.08e-01 -1.01e-02 -5.36e-03 -2.37e-03
## 158  6.24e-03  5.04e-03  3.87e-03 -9.05e-03  3.29e-02  1.78e-02  1.69e-02
## 159 -2.03e-02  6.77e-04 -4.25e-02  2.92e-02  1.25e-01 -1.14e-02 -3.14e-03
## 160  2.19e-03 -8.75e-03  1.78e-02 -1.53e-02 -4.62e-02  4.87e-03  2.40e-03
## 161  1.61e-02 -5.26e-02 -2.09e-02  4.23e-02  4.36e-02 -5.12e-04  4.07e-03
## 162  9.23e-03 -3.38e-02 -1.15e-02  2.44e-02  2.40e-02  5.73e-05  2.80e-03
## 163  4.52e-03  6.42e-03 -5.18e-04  2.64e-03 -3.12e-03 -2.00e-04 -8.62e-04
## 164  1.72e-02 -8.96e-02 -1.74e-02  4.59e-02  3.67e-02  2.69e-03  8.58e-03
```

```
## 165 -8.15e-03 -8.24e-03 -4.12e-03 -1.22e-04  1.82e-02 -1.03e-03  7.63e-04
## 166 -2.39e-02  9.83e-02  2.81e-02 -6.34e-02 -5.89e-02 -1.18e-03 -8.60e-03
## 167  4.39e-02 -1.61e-01 -5.46e-02  1.16e-01  1.14e-01  2.72e-04  1.33e-02
## 168  6.96e-03 -2.28e-02 -9.06e-03  1.83e-02  1.89e-02 -2.22e-04  1.76e-03
## 169 -1.65e-02  6.85e-02  2.81e-02 -5.98e-02 -5.60e-02  2.53e-02  3.24e-02
## 170  2.60e-02 -2.54e-02  2.70e-02 -1.17e-01 -2.14e-02  9.18e-03  5.71e-03
## 171  1.12e-02 -4.10e-02 -1.39e-02  2.95e-02  2.90e-02  6.93e-05  3.39e-03
## 172  4.59e-02  9.44e-02 -4.97e-02  6.76e-02  7.87e-02 -1.43e-02 -1.57e-02
## 173 -1.17e-03 -6.96e-02 -3.05e-02  4.77e-02  3.29e-02 -4.41e-03  1.35e-02
## 174  7.06e-02  6.16e-03  8.54e-03 -1.78e-01  4.83e-02  5.53e-03  8.18e-04
## 175  1.81e-02 -5.32e-02 -2.46e-02  4.76e-02  5.11e-02 -1.19e-03  3.80e-03
## 176 -1.80e-02 -3.17e-02  1.32e-02 -7.84e-03 -8.88e-02 -2.17e-02 -2.12e-02
## 177 -3.78e-03 -3.29e-04 -4.56e-04  9.50e-03 -2.58e-03 -2.95e-04 -4.37e-05
## 178 -4.24e-04  2.19e-02  1.39e-03  4.48e-02  7.43e-03  5.20e-04 -9.95e-03
## 179  2.48e-02  4.02e-02 -1.05e-02  2.15e-02  1.80e-03 -3.20e-03 -5.92e-03
## 180 -1.23e-02  4.51e-02  1.53e-02 -3.25e-02 -3.20e-02 -7.64e-05 -3.73e-03
## 181  1.15e-02 -1.47e-02  1.48e-02 -6.33e-02 -1.28e-02 -1.38e-02 -2.58e-02
## 182 -4.12e-02 -6.94e-02  1.66e-03 -3.64e-02  5.39e-02  6.21e-02  1.03e-01
## 183 -1.01e-02 -1.02e-02 -5.08e-03 -1.50e-04  2.24e-02 -1.27e-03  9.42e-04
## 184  6.91e-02  9.28e-01  3.73e-01 -6.27e-01 -3.61e-01  2.85e-01  1.80e-01
## 185  1.47e-03 -1.00e-03  1.14e-03 -6.36e-03 -4.29e-04 -1.64e-03 -2.93e-03
## 186  5.01e-03  1.82e-02 -2.10e-02  2.59e-02  7.17e-03 -6.88e-03  2.36e-03
## 187 -4.29e-04  3.88e-02  2.09e-02 -3.16e-02 -2.50e-02  3.36e-03 -7.55e-03
## 188 -2.95e-06  2.45e-05  7.20e-06  5.76e-05 -1.37e-07  2.21e-06 -1.29e-05
## 189  2.49e-02  1.75e-02  2.44e-02 -1.04e-02 -8.47e-02  6.39e-03 -5.00e-04
## 190 -3.09e-02  8.11e-02  4.34e-02 -8.11e-02 -9.00e-02  2.96e-03 -5.26e-03
## 191  8.52e-03  4.29e-03  1.09e-02 -5.91e-03 -3.53e-02  2.89e-03  2.32e-04
## 192  1.31e-01 -1.06e-01 -8.38e-02 -1.59e-02  7.90e-03 -1.87e-02 -3.30e-02
## 193  6.76e-02 -8.81e-02 -5.68e-02 -1.29e-02 -1.15e-02 -2.09e-02 -1.56e-02
## 194 -9.93e-02  1.15e-01  1.12e-01 -1.51e-02 -2.09e-02  2.61e-02  1.60e-02
## 195 -1.82e-02  8.47e-03  2.26e-02  3.09e-03  1.78e-02  6.70e-04  6.38e-05
## 196 -8.33e-02  1.09e-01  7.00e-02  1.58e-02  1.42e-02  2.57e-02  1.92e-02
## 197 -1.07e-01  3.38e-02  1.27e-01  3.80e-02  1.50e-01 -1.29e-03 -2.13e-03
## 198  9.68e-03 -1.19e-02 -9.52e-03 -2.03e-04  1.73e-04 -2.77e-03 -1.90e-03
## 199 -2.72e-02  3.35e-02  2.67e-02  5.70e-04 -4.87e-04  7.78e-03  5.34e-03
## 200  9.51e-03 -1.74e-02  1.87e-03 -1.35e-02 -1.46e-02 -4.50e-03 -4.54e-03
## 201  3.92e-03 -7.15e-03  7.68e-04 -5.56e-03 -6.01e-03 -1.85e-03 -1.87e-03
## 202  3.03e-03 -2.61e-03 -2.52e-03  9.06e-05  5.82e-04 -4.86e-04 -6.47e-04
## 203  1.60e-01 -1.16e-01 -4.45e-02 -6.61e-02 -3.07e-02 -1.76e-02 -5.25e-02
## 204  4.65e-02 -8.49e-02  9.12e-03 -6.60e-02 -7.14e-02 -2.20e-02 -2.22e-02
## 205  1.89e-02 -2.40e-02 -8.95e-03 -1.11e-02 -8.61e-03  6.54e-03  1.40e-02
## 206  5.28e-02 -6.88e-02 -4.43e-02 -1.00e-02 -8.98e-03 -1.63e-02 -1.21e-02
## 207  1.80e-02 -2.60e-02 -1.01e-02 -9.32e-03 -9.60e-03 -6.34e-03 -5.33e-03
## 208 -1.59e-01  1.21e-01  3.04e-01 -1.72e-01 -1.98e-01  2.20e-02 -4.09e-03
## 209 -2.02e-02  2.92e-02  1.14e-02  1.05e-02  1.08e-02  7.13e-03  5.99e-03
## 210 -6.13e-02  8.85e-02  3.46e-02  3.18e-02  3.27e-02  2.16e-02  1.82e-02
## 211 -2.96e-03  2.79e-02  1.28e-02 -5.43e-02 -2.24e-02  6.66e-03  3.46e-03
## 212  1.40e-01 -1.14e-01 -8.98e-02 -1.71e-02  8.46e-03 -2.00e-02 -3.54e-02
## 213  2.72e-02 -3.92e-02 -1.53e-02 -1.41e-02 -1.45e-02 -9.58e-03 -8.04e-03
## 214 -8.82e-03 -1.00e-02  6.13e-03  3.54e-02  1.02e-02 -2.66e-03 -1.63e-03
## 215 -1.08e-01  9.12e-02  8.13e-02  3.87e-03 -1.47e-02  1.66e-02  2.50e-02
## 216  4.65e-01 -3.90e-01 -6.51e-01  1.44e-01  3.15e-02 -1.29e-01 -1.13e-01
## 217 -1.69e-02  4.82e-02  3.52e-02 -4.79e-02 -1.02e-01  1.39e-02  6.45e-03
## 218  2.25e-03  2.04e-02  1.91e-03 -4.79e-02 -1.81e-02 -6.52e-03 -1.49e-02
## 219 -7.01e-02  9.14e-02  5.89e-02  1.33e-02  1.19e-02  2.16e-02  1.61e-02
## 220  2.07e-01 -1.84e-01 -3.83e-01  2.05e-01  2.22e-01 -9.49e-02 -9.31e-02
## 221 -7.42e-02  8.34e-02  7.45e-02 -1.55e-03 -9.88e-03 -2.65e-03 -2.09e-02
## 222  1.00e-02 -6.67e-02 -3.00e-02  6.41e-02  5.89e-02 -3.19e-03  3.30e-03
## 223 -1.58e-02  1.33e-01  4.95e-02 -1.12e-01 -9.66e-02  4.09e-03 -7.76e-03
## 224  8.35e-03  1.61e-02 -4.61e-03 -1.87e-02  1.75e-02 -1.93e-03 -2.58e-03
## 225  1.83e-03  3.20e-02  2.16e-02 -1.34e-02 -7.20e-02  2.29e-03 -3.60e-03
```

```
## 226 -1.47e-03  1.07e-02  1.74e-02 -1.36e-02 -5.10e-02  2.81e-03 -6.92e-04
## 227  9.44e-03  5.36e-02  4.96e-03  5.55e-03 -3.83e-02 -2.42e-03 -7.58e-03
## 228  2.14e-03 -1.12e-02  2.81e-02 -8.80e-02 -3.82e-02  6.40e-03  3.03e-03
## 229  2.58e-03 -4.96e-03 -1.74e-02  1.47e-02  4.83e-02 -3.18e-03 -1.40e-04
## 230 -1.00e-03 -5.29e-03 -1.45e-04 -8.56e-04  2.87e-03  3.08e-04  7.65e-04
## 231  1.08e-02 -9.15e-02 -3.39e-02  7.71e-02  6.62e-02 -2.80e-03  5.32e-03
## 232 -6.20e-04 -2.65e-03  5.11e-04 -9.51e-04 -9.92e-05  2.71e-04  4.12e-04
## 233 -1.75e-03  1.48e-02  5.50e-03 -1.25e-02 -1.07e-02  4.54e-04 -8.62e-04
## 234  1.02e-02 -6.74e-02 -3.04e-02  6.48e-02  5.95e-02 -3.23e-03  3.33e-03
## 235  5.02e-03 -2.67e-02 -1.45e-02  2.93e-02  2.85e-02 -1.81e-03  1.06e-03
## 236 -4.89e-04 -7.14e-04 -1.27e-03  6.75e-03  8.91e-04  1.92e-03  3.32e-03
## 237  8.93e-03  1.10e-02  7.05e-03 -5.41e-02  1.29e-03  7.63e-04 -1.25e-03
## 238 -1.15e-02  6.11e-02  3.31e-02 -6.70e-02 -6.51e-02  4.13e-03 -2.41e-03
## 239  8.30e-03 -3.00e-02 -6.94e-02  5.67e-02  1.97e-01 -1.20e-02  9.41e-04
## 240 -9.40e-03 -5.13e-03 -1.96e-02  9.17e-02  1.65e-02 -3.68e-03 -2.22e-04
## 241  7.97e-03 -7.42e-03 -4.62e-02  4.00e-02  1.25e-01 -8.79e-03 -1.21e-03
## 242 -1.99e-03 -3.40e-04  9.43e-03 -8.52e-03 -2.47e-02  1.91e-03  5.18e-04
## 243  1.32e-03 -6.93e-03  1.73e-02 -5.44e-02 -2.36e-02  3.96e-03  1.87e-03
## 244 -2.39e-02  4.76e-02  6.24e-02 -1.07e-01 -1.24e-01  1.12e-02  2.13e-03
## 245  1.12e-02 -5.99e-02 -3.24e-02  6.57e-02  6.39e-02 -4.05e-03  2.37e-03
## 246 -5.58e-03  2.97e-02  1.61e-02 -3.26e-02 -3.17e-02  2.01e-03 -1.18e-03
## 247 -3.46e-02  4.55e-02  8.84e-02 -1.45e-01 -1.77e-01  1.70e-02  5.18e-03
## 248 -1.66e-02 -2.27e-02 -8.51e-03  8.73e-02 -9.02e-03 -3.41e-04  2.90e-03
## 249  2.01e-03 -9.93e-03  1.78e-02  4.12e-02 -2.03e-02  7.67e-03 -6.15e-03
## 250 -6.36e-04  4.22e-03  1.90e-03 -4.06e-03 -3.73e-03  2.02e-04 -2.09e-04
## 251  2.28e-02 -2.38e-02 -5.77e-02  9.32e-02  1.16e-01 -1.14e-02 -3.97e-03
## 252 -3.33e-02 -1.69e-01 -7.20e-02  1.17e-01  5.78e-02 -1.46e-02  3.37e-02
## 253 -9.71e-04 -4.42e-03  5.34e-04 -1.30e-03  6.76e-04  3.89e-04  6.72e-04
## 254  9.66e-03 -1.01e-02 -2.45e-02  3.95e-02  4.90e-02 -4.82e-03 -1.68e-03
## 255  4.51e-03 -3.81e-02 -1.41e-02  3.21e-02  2.76e-02 -1.17e-03  2.22e-03
## 256  3.07e-04 -2.86e-04 -1.78e-03  1.54e-03  4.83e-03 -3.39e-04 -4.66e-05
## 257  1.37e-02 -5.37e-02 -2.20e-02  8.52e-02  4.13e-02 -8.71e-03 -3.26e-03
## 258 -6.26e-04  2.05e-03  8.56e-04 -1.91e-03 -4.31e-03  4.09e-04  1.32e-04
## 259 -1.85e-02  4.04e-02 -2.65e-02  3.39e-02  3.12e-02  3.92e-03  5.27e-03
## 260  2.45e-02 -2.87e-02 -2.52e-02  4.45e-03  6.98e-03 -5.24e-03 -2.85e-03
## 261  4.59e-02 -5.95e-02 -3.33e-02 -3.05e-03  1.91e-03 -9.82e-03 -6.31e-03
##     dfb.dptPd dfb.dptM dfb.dptS dfb.cPce dfb.crBc dfb.gnM.   dffit
## 1    2.83e-02  4.45e-02  3.50e-02  6.96e-03  4.80e-02  2.09e-03 -0.132515
## 2    4.55e-02  5.96e-02  5.15e-02  2.83e-03  4.46e-02 -4.46e-03 -0.150035
## 3    1.71e-02  2.81e-02  2.55e-02  3.22e-03  2.59e-02  1.59e-02 -0.072099
## 4    5.13e-02  7.06e-02  6.80e-02 -5.85e-02 -1.58e-02 -3.84e-02 -0.121348
## 5   -1.24e-02 -1.98e-02 -1.55e-02 -3.19e-03 -2.22e-02  1.78e-04  0.058428
## 6    1.68e-01  1.97e-01  1.74e-01  6.36e-02 -1.65e-01 -3.64e-02 -0.409239
## 7    1.38e-02  1.47e-02  1.36e-02  3.26e-03 -1.37e-02 -2.62e-03 -0.029009
## 8   -1.91e-01 -2.44e-01 -2.29e-01  1.81e-01  8.20e-02  3.10e-02  0.325267
## 9    4.78e-02  9.14e-02  7.28e-02  1.90e-02  1.41e-01 -5.03e-02 -0.306308
## 10  -3.95e-02 -5.12e-02 -4.42e-02 -2.31e-03 -3.68e-02  1.26e-03  0.128280
## 11  -3.70e-04 -4.94e-04 -4.29e-04 -2.59e-05 -4.04e-04  8.94e-05  0.001281
## 12  -1.50e-01 -1.59e-01 -1.47e-01 -3.48e-02  1.49e-01  2.25e-02  0.316740
## 13   4.90e-02  6.45e-02  6.11e-02 -5.00e-02 -1.87e-02 -1.91e-02 -0.086148
## 14   3.52e-02  4.86e-02  4.26e-02  2.94e-03  4.51e-02 -1.72e-02 -0.136770
## 15  -6.62e-02 -8.67e-02 -7.50e-02 -4.12e-03 -6.50e-02  6.49e-03  0.218544
## 16   5.97e-03  9.38e-03  7.37e-03  1.47e-03  1.01e-02  4.41e-04 -0.027931
## 17   6.59e-03  1.19e-02  9.46e-03  2.32e-03  1.70e-02 -4.73e-03 -0.037436
## 18  -3.86e-02 -4.50e-02 -3.96e-02 -1.43e-02  3.78e-02  6.44e-03  0.095097
## 19   5.80e-03  1.44e-02  1.40e-02  2.40e-03  3.43e-02 -3.80e-02 -0.139133
## 20  -2.35e-02 -2.81e-02 -2.50e-02 -9.72e-03  2.29e-02  1.02e-02  0.056330
## 21  -6.82e-02 -9.02e-02 -8.34e-02 -4.02e-02  6.66e-02  1.00e-01  0.281941
## 22  -1.56e-02 -2.70e-02 -2.14e-02 -4.94e-03 -3.56e-02  6.93e-03  0.081293
## 23  -8.46e-02 -1.03e-01 -9.25e-02 -3.77e-02  8.27e-02  5.26e-02  0.213084
## 24  -4.02e-02 -5.12e-02 -4.68e-02 -2.11e-02  3.93e-02  4.35e-02  0.130263
```

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```
## 25    6.13e-02  7.10e-02  6.23e-02  2.21e-02 -5.99e-02 -7.30e-03 -0.153179
## 26    9.31e-02  1.15e-01  1.04e-01  4.37e-02 -9.10e-02 -7.09e-02 -0.249869
## 27    1.15e-02  1.59e-02  1.39e-02  9.62e-04  1.48e-02 -5.64e-03 -0.044769
## 28    1.96e-02  2.38e-02  2.13e-02  8.54e-03 -1.92e-02 -1.09e-02 -0.048347
## 29    6.36e-03  7.65e-03  6.83e-03  2.70e-03 -6.21e-03 -3.14e-03 -0.015414
## 30    2.48e-03  4.15e-03  3.77e-03  4.89e-04  3.96e-03  2.20e-03 -0.010738
## 31   -3.65e-02 -3.70e-02 -2.49e-02 -3.61e-03 -1.86e-02  4.84e-02  0.091729
## 32    5.96e-02  5.41e-02  4.11e-02  1.56e-02 -5.74e-02  3.47e-02 -0.142177
## 33    1.89e-01  1.86e-01  1.47e-01  5.41e-02 -1.58e-01 -3.96e-02 -0.347970
## 34   -4.18e-03 -4.74e-03 -2.68e-03 -4.57e-04 -7.15e-03 -1.13e-02  0.022963
## 35    2.92e-02  2.75e-02  1.66e-02  1.44e-03  1.88e-02 -7.64e-03 -0.081291
## 36    1.36e-03  1.56e-03  1.04e-03  2.06e-04  1.43e-03 -1.01e-04 -0.003905
## 37   -9.65e-03 -1.88e-02 -5.56e-03 -7.03e-03 -5.79e-02 -9.62e-02  0.153501
## 38    4.68e-02  4.37e-02  3.40e-02  1.10e-02 -3.95e-02 -4.23e-02 -0.086298
## 39    3.65e-02  4.58e-02  3.92e-02 -4.14e-02 -1.11e-02  4.91e-02 -0.092018
## 40   -1.11e-02 -1.39e-02 -5.72e-03 -3.45e-03 -2.49e-02 -2.30e-02  0.066608
## 41   -6.67e-02 -6.29e-02 -3.79e-02 -3.30e-03 -4.30e-02  1.74e-02  0.185604
## 42   -7.44e-02 -7.88e-02 -6.33e-02 -2.71e-02  6.16e-02 -6.08e-02  0.183773
## 43   -1.59e-01 -1.65e-01 -1.32e-01 -5.42e-02  1.32e-01 -8.22e-02  0.354716
## 44    5.96e-02  7.73e-02  7.06e-02 -6.41e-02 -1.58e-02  8.01e-02 -0.148250
## 45    8.85e-03  1.09e-02  7.25e-03  1.65e-03  1.25e-02  6.65e-03 -0.031561
## 46   -1.13e-01 -1.26e-01 -8.43e-02 -1.57e-02 -1.04e-01  4.51e-02  0.304795
## 47   -1.50e-02 -1.68e-02 -1.47e-02  1.41e-02  6.82e-03 -8.06e-03  0.027836
## 48   -9.94e-03 -1.56e-02 -1.02e-02 -3.17e-03 -2.76e-02 -3.85e-02  0.071805
## 49    8.59e-02  8.34e-02  6.55e-02  2.34e-02 -7.22e-02 -3.50e-02 -0.154909
## 50    6.59e-02  6.72e-02  5.34e-02  2.12e-02 -5.50e-02  1.64e-02 -0.135326
## 51   -3.21e-02 -5.40e-02 -6.45e-02  6.86e-02  3.09e-02 -2.91e-02  0.182358
## 52   -6.18e-03 -9.18e-03 -1.00e-02  1.33e-02  7.26e-03 -1.46e-03  0.033149
## 53   -3.61e-03 -4.77e-03 -3.11e-03  2.19e-02 -2.23e-02  4.39e-03 -0.069529
## 54   -3.00e-03 -7.26e-03 -9.25e-03  1.55e-02  4.38e-03  9.08e-03  0.043338
## 55   -5.37e-03 -6.36e-03 -4.26e-03  2.34e-02 -2.21e-02  8.66e-04 -0.068699
## 56    7.94e-03 -1.71e-02  5.80e-03  1.51e-01 -2.10e-01  1.23e-02 -0.539789
## 57    3.82e-03  1.06e-02  1.39e-02 -2.41e-02 -5.99e-03 -1.63e-02 -0.071882
## 58    6.62e-02  7.63e-02  4.04e-02 -1.35e-01  1.08e-01  1.69e-01  0.727995
## 59   -1.39e-01 -1.19e-01 -1.05e-01  9.54e-02  1.98e-01 -4.79e-02 -0.451522
## 60    2.65e-02  2.55e-02  2.05e-02 -2.56e-02 -4.47e-02 -1.93e-03  0.131135
## 61    2.56e-02  3.03e-02  2.03e-02 -1.11e-01  1.05e-01 -4.12e-03  0.326859
## 62    9.28e-02  7.97e-02  7.49e-02 -8.66e-02 -1.49e-01 -4.76e-02  0.385431
## 63   -3.51e-02 -3.56e-02 -2.95e-02  4.80e-02  7.05e-02  4.27e-02 -0.261215
## 64    3.03e-02  3.49e-02  2.36e-02 -1.21e-01  1.11e-01  2.06e-03  0.347470
## 65   -3.43e-02 -6.19e-02 -7.27e-02  1.09e-01  4.36e-02  3.02e-02  0.257627
## 66    1.34e-03  2.50e-03  2.97e-03 -4.52e-03 -1.73e-03 -1.45e-03 -0.010841
## 67   -2.37e-02 -2.03e-02 -1.90e-02  2.15e-02  3.77e-02  1.01e-02 -0.093799
## 68   -1.57e-03 -1.55e-03 -1.27e-03  1.88e-03  2.94e-03  1.15e-03 -0.009685
## 69    4.14e-02  6.34e-02  7.29e-02 -7.32e-02 -4.00e-02  4.92e-02 -0.198344
## 70    1.68e-02  1.86e-02  1.27e-02 -5.72e-02  5.01e-02  7.13e-03  0.160747
## 71    2.59e-03  2.36e-03  2.14e-03 -4.03e-03 -2.78e-03  1.38e-03 -0.010137
## 72    3.61e-03 -1.37e-04 -1.31e-03  1.08e-02 -1.40e-02 -1.04e-02 -0.034042
## 73    5.55e-02  8.46e-02  9.39e-02 -1.34e-01  9.59e-02 -2.43e-01  0.472985
## 74    5.82e-03  1.21e-02  4.52e-03 -6.39e-02  6.04e-02  1.90e-02 -0.146401
## 75   -1.22e-02 -2.34e-02 -2.87e-02  2.24e-02  3.12e-02  2.58e-03 -0.113843
## 76   -4.79e-02 -5.84e-02 -4.55e-02  1.26e-01 -9.45e-02  8.18e-02  0.269219
## 77   -6.75e-03  1.37e-02  8.32e-04 -1.41e-01  1.51e-01  1.31e-01 -0.341905
## 78    2.45e-03 -3.49e-03 -4.86e-03  2.19e-02 -2.38e-02  7.02e-04 -0.064658
## 79    2.08e-03  1.94e-02  2.15e-02 -4.29e-02  5.24e-02 -5.29e-02  0.162476
## 80    2.06e-02 -7.82e-04 -7.48e-03  6.18e-02 -7.99e-02 -5.95e-02 -0.194314
## 81    2.13e-02  3.18e-02  4.06e-02 -4.60e-02 -6.75e-02  2.47e-02  0.193080
## 82   -1.77e-02 -5.61e-02 -8.55e-02  1.15e-01  1.38e-01 -2.25e-01 -0.536627
## 83   -1.82e-02 -3.50e-02 -4.29e-02  3.35e-02  4.68e-02  3.86e-03 -0.170356
## 84    4.15e-02  4.81e-02  3.73e-02 -9.78e-02  6.92e-02 -8.33e-02 -0.216303
## 85    3.74e-04 -8.94e-05 -2.24e-04  1.44e-03 -1.77e-03 -9.08e-04 -0.004382
```

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## 86   2.93e-05 -2.59e-03 -5.56e-04  2.02e-02 -2.08e-02 -1.45e-02  0.047545
## 87   8.64e-03  7.80e-04 -1.84e-03  2.12e-02 -2.88e-02 -2.75e-02 -0.069843
## 88  -3.42e-02 -3.90e-02 -4.01e-02  1.03e-01  4.30e-02 -1.85e-01  0.328627
## 89  -8.19e-03 -1.14e-02 -9.01e-03  2.82e-02 -2.35e-02  6.75e-03  0.057863
## 90  -2.21e-02 -3.30e-02 -4.20e-02  4.76e-02  6.99e-02 -2.56e-02 -0.199894
## 91  -4.73e-03 -5.57e-03 -4.26e-03  1.27e-02 -9.62e-03 -7.39e-03 -0.034951
## 92  -3.48e-02 -3.97e-02 -3.36e-02  6.20e-02  2.90e-02 -7.22e-04 -0.207652
## 93  -2.35e-02 -3.37e-02 -4.01e-02  2.81e-02  4.20e-02 -2.12e-02  0.140141
## 94  -1.84e-02  1.68e-02  2.44e-02 -1.01e-01  1.14e-01 -2.10e-02 -0.354959
## 95  -3.68e-02 -5.09e-02 -5.79e-02  5.67e-02  8.48e-02  1.41e-02  0.275915
## 96  -3.81e-02 -5.86e-02 -7.03e-02  7.47e-02  1.02e-01  4.56e-02  0.357996
## 97  -2.59e-02 -3.97e-02 -4.77e-02  5.07e-02  6.94e-02  3.09e-02  0.242709
## 98   7.21e-03  1.60e-02  1.96e-02 -4.23e-02  2.83e-02  3.30e-03 -0.137429
## 99  -5.30e-03 -3.45e-02 -4.35e-02  7.07e-02 -6.85e-02 -5.51e-02  0.255133
## 100  3.73e-03  5.44e-03  6.51e-03 -4.61e-03 -6.77e-03  3.16e-03 -0.022858
## 101 -7.36e-03 -1.15e-02  3.57e-03  8.74e-02 -8.13e-02 -2.00e-02  0.324430
## 102 -7.20e-02 -9.03e-02 -9.78e-02  1.31e-01  8.48e-02  7.65e-02 -0.402356
## 103 -2.05e-02 -3.15e-02 -3.66e-02  5.50e-02  2.71e-02 -1.24e-02 -0.163034
## 104  5.88e-04  3.17e-03 -2.70e-03 -3.70e-02  3.67e-02  1.99e-02 -0.137740
## 105  1.78e-02  1.37e-02  1.20e-02 -1.71e-02 -2.96e-02 -1.54e-03 -0.079600
## 106 -4.57e-03 -7.77e-03 -9.33e-03  1.46e-02  6.42e-03 -7.26e-03 -0.043703
## 107  1.17e-02  1.29e-02  9.42e-03 -2.64e-02  1.86e-02 -2.26e-02 -0.088464
## 108 -1.54e-02 -2.18e-02 -2.47e-02  3.57e-02  1.94e-02  1.61e-03 -0.105857
## 109  1.58e-04  3.26e-03  3.61e-03 -8.84e-03  1.04e-02 -3.61e-03  0.026314
## 110  4.34e-02  7.30e-02  8.21e-02 -9.17e-02 -4.01e-02 -4.07e-02  0.313476
## 111 -1.19e-02 -2.03e-02 -2.44e-02  3.82e-02  1.68e-02 -1.90e-02 -0.114229
## 112 -7.64e-02  1.98e-02  2.87e-02 -2.58e-02  6.00e-03  4.16e-02 -0.151251
## 113  1.27e-01  4.84e-02  4.20e-02 -8.13e-02  1.18e-03  6.58e-03  0.168382
## 114  2.16e-02 -4.79e-03 -6.99e-03  9.01e-03  1.90e-03 -2.24e-03  0.044113
## 115  4.93e-02 -7.45e-03 -1.29e-02  1.89e-02  8.56e-04  3.27e-03  0.096897
## 116 -1.63e-01 -5.76e-02 -5.10e-02  1.10e-01 -1.12e-02  1.52e-02 -0.232260
## 117  1.51e-02 -4.12e-03 -5.86e-03  5.18e-03 -1.00e-03 -8.80e-03  0.030411
## 118  5.41e-02 -1.37e-02 -1.90e-02  2.34e-02  6.44e-03 -9.67e-03  0.115335
## 119 -8.87e-02  2.39e-02  3.25e-02 -3.90e-02 -1.20e-02  1.93e-02 -0.194297
## 120  7.56e-02  3.12e-02  2.80e-02 -3.45e-02 -4.66e-02 -9.21e-03  0.101134
## 121 -4.84e-02  1.18e-02  1.76e-02 -1.61e-02  4.37e-03  2.44e-02 -0.094317
## 122 -2.33e-01  8.43e-02  6.78e-02 -1.06e-01 -3.26e-02 -1.49e-01 -0.533628
## 123  2.71e-01  9.48e-02  1.02e-01 -2.13e-01  4.29e-02  1.81e-02  0.399282
## 124 -2.73e-02  9.85e-03  7.92e-03 -1.24e-02 -3.81e-03 -1.74e-02 -0.062352
## 125  1.46e-02 -8.66e-03 -5.83e-03  1.07e-02  1.06e-02  3.20e-02  0.064106
## 126  1.38e-01 -4.21e-02 -3.45e-02  5.90e-02  1.16e-02  4.96e-02  0.291090
## 127 -1.68e-01 -2.15e-02 -2.34e-02 -4.10e-02  3.81e-02  2.06e-01 -0.333784
## 128  4.02e-02 -1.99e-02 -1.56e-02  2.08e-02  1.09e-02  5.25e-02  0.114013
## 129  8.38e-02  2.74e-02  3.10e-02 -7.03e-02  1.94e-02  3.28e-02  0.135461
## 130  5.01e-02 -1.44e-02 -9.55e-03  2.75e-02  1.69e-02  2.87e-02  0.138608
## 131  1.32e-01 -1.33e-02 -8.21e-03  5.72e-02  1.32e-02 -5.49e-02  0.287300
## 132 -1.99e-01  6.07e-02  4.96e-02 -8.51e-02 -1.68e-02 -7.14e-02 -0.419350
## 133 -1.94e-02 -1.73e-03 -2.26e-03 -5.15e-03  3.51e-03  1.93e-02 -0.037551
## 134  1.09e-01 -3.31e-02 -2.71e-02  4.64e-02  9.15e-03  3.90e-02  0.228915
## 135 -3.65e-01 -1.50e-01 -1.44e-01  2.35e-01  1.36e-02  2.90e-01 -0.565400
## 136  1.55e-01  5.26e-02  5.80e-02 -1.26e-01  3.01e-02  3.47e-02  0.237830
## 137 -1.05e-01  1.31e-03 -1.07e-02 -6.13e-02  1.09e-01 -7.02e-02 -0.253095
## 138 -3.04e-02  6.37e-03  5.45e-03 -1.16e-02  3.15e-04  3.61e-03 -0.057838
## 139 -3.81e-02 -1.20e-02 -1.40e-02  3.31e-02 -1.04e-02 -2.17e-02 -0.065832
## 140  3.50e-02 -3.37e-03 -3.37e-03  1.15e-02 -4.26e-03 -2.38e-02  0.065376
## 141  8.60e-02 -4.95e-02 -3.85e-02  4.78e-02  3.03e-02  1.47e-01  0.276925
## 142 -6.55e-04  3.44e-03 -3.61e-03  2.50e-03  1.15e-03 -2.92e-03  0.017581
## 143 -1.03e-02 -2.90e-02 -2.48e-03 -2.21e-02  5.50e-02 -2.65e-04 -0.092060
## 144 -9.26e-03  1.19e-02 -1.20e-02  1.17e-02  1.51e-02  9.99e-04  0.067039
## 145  2.36e-02 -3.19e-02  5.61e-02 -3.35e-02 -2.96e-02  7.50e-02 -0.233204
## 146 -9.05e-02 -2.16e-01 -1.13e-01  2.45e-01 -6.84e-02 -8.37e-03 -0.372425
```

```
## 147  8.88e-05 -1.81e-04  1.36e-04 -1.49e-04 -1.66e-04 -9.08e-05 -0.000860
## 148 -6.92e-04 -5.29e-03  8.82e-04 -2.21e-03 -7.10e-04 -3.26e-03 -0.015860
## 149 -3.86e-02 -9.02e-02 -4.73e-02  1.02e-01 -2.72e-02 -6.28e-03 -0.151688
## 150 -4.91e-04 -4.16e-02  1.12e-02 -1.98e-02 -1.17e-02 -1.48e-02 -0.134256
## 151 -9.24e-03  1.33e-02 -1.24e-02  1.24e-02  1.55e-02  2.67e-03  0.070670
## 152  1.30e-02 -2.09e-02  1.82e-02 -1.87e-02 -2.25e-02 -6.46e-03 -0.106293
## 153  1.81e-03 -1.32e-02  5.23e-03 -7.20e-03 -6.10e-03 -3.99e-04 -0.052506
## 154 -3.80e-04 -8.64e-03  2.08e-03 -3.97e-03 -2.08e-03 -3.69e-03 -0.026992
## 155  5.25e-03 -6.05e-03  6.58e-03 -6.23e-03 -8.36e-03  2.65e-04 -0.036313
## 156 -6.22e-03  1.36e-02 -1.89e-02  1.20e-02  8.46e-03 -2.15e-02  0.080383
## 157 -2.33e-02  4.20e-02 -3.40e-02  3.61e-02  4.17e-02  1.72e-02  0.205573
## 158  5.25e-02  8.39e-02  5.35e-02 -6.34e-02 -6.67e-02  1.47e-03  0.126379
## 159 -1.58e-03  7.09e-02 -2.11e-02  3.48e-02  2.28e-02  2.00e-02  0.238293
## 160  3.57e-03 -1.57e-02  7.44e-03 -9.27e-03 -9.00e-03  2.61e-03 -0.072249
## 161  8.96e-03 -1.65e-02  2.49e-02 -1.54e-02 -1.18e-02  2.99e-02 -0.103945
## 162  6.09e-03 -9.57e-03  1.56e-02 -9.47e-03 -7.81e-03  1.98e-02 -0.064693
## 163 -2.22e-03 -9.75e-03  8.14e-04 -3.61e-03 -1.48e-04 -8.08e-03 -0.030470
## 164  1.83e-02 -1.85e-02  3.86e-02 -2.22e-02 -2.22e-02  5.61e-02 -0.162859
## 165  2.70e-03  2.06e-02 -3.44e-03  8.61e-03  2.77e-03  1.27e-02  0.061877
## 166 -1.86e-02  2.51e-02 -4.42e-02  2.64e-02  2.33e-02 -5.90e-02  0.183541
## 167  2.90e-02 -4.55e-02  7.41e-02 -4.50e-02 -3.71e-02  9.41e-02 -0.307658
## 168  3.88e-03 -7.15e-03  1.08e-02 -6.67e-03 -5.11e-03  1.30e-02 -0.045016
## 169  3.44e-02  8.74e-02  3.37e-02 -1.14e-01  3.28e-02 -3.92e-02  0.175765
## 170  2.85e-02 -3.29e-02  3.57e-02 -3.38e-02 -4.54e-02  1.44e-03 -0.197159
## 171  7.37e-03 -1.16e-02  1.88e-02 -1.15e-02 -9.45e-03  2.40e-02 -0.078300
## 172 -3.40e-02 -7.18e-02 -9.11e-03 -1.81e-02  2.05e-02 -9.80e-02 -0.317341
## 173 -1.38e-02 -3.20e-02  5.62e-03 -2.79e-02  8.35e-02  4.69e-02 -0.135848
## 174  3.51e-02 -8.16e-02  5.70e-02 -6.45e-02 -6.85e-02 -4.78e-02 -0.377932
## 175  8.47e-03 -1.85e-02  2.58e-02 -1.63e-02 -1.15e-02  2.92e-02 -0.109476
## 176 -7.08e-02 -1.20e-01 -7.57e-02  9.55e-02  9.26e-02  1.96e-02 -0.201309
## 177 -1.88e-03  4.36e-03 -3.05e-03  3.45e-03  3.66e-03  2.56e-03  0.020203
## 178  8.49e-03  3.24e-02  4.18e-04  2.78e-02 -6.42e-02 -1.02e-02  0.113709
## 179 -1.42e-02 -4.88e-02  1.49e-03 -1.66e-02  2.96e-03 -4.71e-02 -0.163358
## 180 -8.12e-03  1.28e-02 -2.08e-02  1.26e-02  1.04e-02 -2.64e-02  0.086304
## 181 -1.93e-02 -6.99e-02 -3.05e-02  8.44e-02 -3.96e-02  1.07e-03 -0.139931
## 182  1.39e-01  2.81e-01  1.53e-01 -2.91e-01  4.86e-02  8.99e-02  0.458811
## 183  3.33e-03  2.55e-02 -4.24e-03  1.06e-02  3.42e-03  1.57e-02  0.076305
## 184  6.04e-01  1.03e+00  5.50e-01 -9.25e-01 -8.91e-01 -6.35e-01  1.965224
## 185 -2.32e-03 -7.80e-03 -3.46e-03  9.22e-03 -4.10e-03 -4.25e-04 -0.014952
## 186 -2.94e-02 -4.51e-02 -1.55e-02 -2.01e-02  7.94e-02 -2.22e-02 -0.131398
## 187  9.48e-03  2.03e-02 -2.66e-03  1.67e-02 -5.15e-02 -2.54e-02  0.080040
## 188  1.45e-05  4.80e-05  2.10e-06  3.92e-05 -9.34e-05 -8.52e-06  0.000159
## 189 -5.24e-03 -7.03e-02  1.51e-02 -3.12e-02 -1.43e-02 -3.47e-02 -0.214743
## 190 -1.20e-02  3.13e-02 -4.06e-02  2.62e-02  1.69e-02 -4.29e-02  0.176008
## 191 -1.13e-03 -2.56e-02  6.17e-03 -1.17e-02 -6.16e-03 -1.09e-02 -0.079968
## 192 -8.73e-03  5.60e-02  1.13e-02  4.98e-02 -1.25e-01  8.88e-02  0.229730
## 193 -4.46e-02  3.21e-02 -2.04e-02  2.79e-02  4.12e-02  5.97e-02  0.180271
## 194  4.69e-02 -1.52e-02  2.16e-02 -2.14e-02 -4.27e-02 -1.05e-01 -0.170662
## 195  1.99e-03  1.46e-02  4.69e-03  4.54e-03  4.39e-04 -2.60e-02  0.048455
## 196  5.49e-02 -3.95e-02  2.52e-02 -3.43e-02 -5.08e-02 -7.35e-02 -0.222072
## 197  6.80e-03  1.03e-01  3.12e-02  3.42e-02  1.03e-02 -1.58e-01  0.343896
## 198 -5.49e-03  3.06e-03 -2.52e-03  3.05e-03  5.04e-03  9.38e-03  0.020890
## 199  1.54e-02 -8.59e-03  7.08e-03 -8.58e-03 -1.42e-02 -2.64e-02 -0.058698
## 200 -1.27e-02  1.55e-02 -5.78e-03  1.06e-02  1.19e-02  2.47e-03  0.066320
## 201 -5.23e-03  6.39e-03 -2.38e-03  4.38e-03  4.92e-03  1.01e-03  0.027307
## 202 -3.54e-04  8.55e-04  1.06e-04  8.86e-04 -2.03e-03  2.47e-03  0.004539
## 203  4.61e-03  1.14e-01  2.96e-02  8.83e-02 -2.41e-01  6.77e-02  0.385262
## 204 -6.21e-02  7.58e-02 -2.82e-02  5.20e-02  5.83e-02  1.20e-02  0.324121
## 205  9.18e-03  4.63e-02  2.68e-02 -5.76e-02  2.19e-02  1.18e-02  0.084593
## 206 -3.48e-02  2.51e-02 -1.60e-02  2.18e-02  3.22e-02  4.66e-02  0.140778
## 207 -1.51e-02  1.41e-02 -6.90e-03  1.08e-02  1.41e-02  1.29e-02  0.067587
```

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## 208 -6.21e-03  1.15e-01 -2.13e-03  5.05e-02  9.19e-03 -2.43e-01  0.447138
## 209  1.70e-02 -1.58e-02  7.76e-03 -1.21e-02 -1.58e-02 -1.45e-02 -0.076018
## 210  5.15e-02 -4.80e-02  2.35e-02 -3.68e-02 -4.79e-02 -4.39e-02 -0.230405
## 211  1.49e-02 -1.53e-02  2.18e-03 -1.18e-02 -1.86e-02 -7.92e-03 -0.078933
## 212 -9.35e-03  6.01e-02  1.21e-02  5.33e-02 -1.34e-01  9.52e-02  0.246263
## 213 -2.28e-02  2.13e-02 -1.04e-02  1.63e-02  2.12e-02  1.95e-02  0.102048
## 214 -8.20e-03  1.36e-02 -2.29e-04  8.79e-03  1.14e-02 -7.71e-03  0.059232
## 215  1.03e-02 -3.75e-02 -6.20e-03 -3.58e-02  8.60e-02 -8.20e-02 -0.173655
## 216 -2.07e-01 -3.35e-01 -2.30e-01  2.64e-01  3.26e-02  6.19e-01 -0.796334
## 217  1.42e-02 -3.24e-02 -5.30e-03 -1.51e-02 -1.94e-02 -1.00e-02 -0.140368
## 218 -8.84e-03 -4.75e-02 -2.97e-02  5.13e-02 -2.49e-02  1.28e-03 -0.092115
## 219  4.63e-02 -3.33e-02  2.12e-02 -2.89e-02 -4.27e-02 -6.19e-02 -0.186974
## 220 -1.25e-01 -2.75e-01 -1.66e-01  2.77e-01 -3.22e-02  3.12e-01 -0.553686
## 221 -4.82e-03 -7.36e-02 -4.18e-02  1.01e-01 -4.83e-02 -7.16e-02 -0.165255
## 222  6.19e-03  1.47e-02 -8.01e-02 -2.59e-03 -5.66e-03  4.64e-02 -0.194949
## 223 -1.47e-02 -3.02e-02  1.48e-01  5.10e-03  1.37e-02 -9.47e-02  0.370859
## 224 -9.63e-04 -2.15e-03 -2.90e-02 -2.14e-03 -2.30e-03 -1.60e-02 -0.071443
## 225 -1.18e-02 -9.85e-03 -1.02e-01 -3.23e-04  3.05e-03 -2.75e-02 -0.183211
## 226 -3.94e-03 -3.26e-03 -5.47e-02 -3.77e-04 -8.27e-04 -8.84e-03 -0.102035
## 227 -1.98e-02 -1.66e-02 -1.08e-01  2.81e-04  1.08e-02 -4.71e-02 -0.201917
## 228  1.58e-02  1.02e-02 -5.70e-02 -6.45e-03 -2.31e-02  6.88e-03 -0.154909
## 229  1.84e-03  1.50e-03  4.43e-02  4.20e-04  2.06e-03  3.82e-03  0.087103
## 230  1.95e-03  1.64e-03  9.97e-03 -3.68e-05 -1.12e-03  4.66e-03  0.019005
## 231  1.01e-02  2.07e-02 -1.02e-01 -3.50e-03 -9.37e-03  6.49e-02 -0.254264
## 232  9.76e-04  8.20e-04  3.81e-03 -3.38e-05 -6.67e-04  2.35e-03  0.008290
## 233 -1.64e-03 -3.36e-03  1.65e-02  5.67e-04  1.52e-03 -1.05e-02  0.041224
## 234  6.25e-03  1.49e-02 -8.10e-02 -2.62e-03 -5.72e-03  4.69e-02 -0.197064
## 235  1.94e-03  5.72e-03 -3.49e-02 -1.06e-03 -1.73e-03  1.82e-02 -0.083060
## 236  3.11e-03  5.30e-03  1.19e-02 -1.11e-02  3.18e-03  9.61e-04  0.017877
## 237  5.57e-03  2.12e-03 -5.13e-02 -4.71e-03 -1.17e-02 -1.27e-02 -0.114965
## 238 -4.43e-03 -1.31e-02  7.97e-02  2.42e-03  3.95e-03 -4.16e-02  0.189767
## 239  1.11e-02  9.14e-03  1.95e-01  1.60e-03  6.00e-03  2.43e-02  0.373186
## 240 -1.26e-02 -6.73e-03  7.47e-02  7.43e-03  2.17e-02  8.73e-03  0.173668
## 241  2.75e-03  2.19e-03  1.07e-01  1.16e-03  6.72e-03  5.06e-03  0.217562
## 242  1.22e-04  1.26e-04 -1.84e-02 -2.51e-04 -1.78e-03  6.04e-04 -0.040547
## 243  9.80e-03  6.33e-03 -3.52e-02 -3.99e-03 -1.43e-02  4.25e-03 -0.095770
## 244  4.67e-03 -7.52e-03  1.04e-01  2.19e-03 -5.03e-03 -2.61e-02  0.242256
## 245  4.35e-03  1.28e-02 -7.82e-02 -2.37e-03 -3.88e-03  4.08e-02 -0.186035
## 246 -2.16e-03 -6.36e-03  3.88e-02  1.18e-03  1.93e-03 -2.02e-02  0.092385
## 247  1.09e-02 -5.10e-03  1.33e-01  2.34e-03 -1.12e-02 -2.01e-02  0.317069
## 248 -7.81e-03 -2.24e-03  8.74e-02  7.82e-03  1.82e-02  2.52e-02  0.195414
## 249  2.60e-02  2.16e-02  8.76e-02  2.02e-02 -1.02e-01  1.11e-02  0.177003
## 250 -3.92e-04 -9.32e-04  5.07e-03  1.64e-04  3.59e-04 -2.94e-03  0.012347
## 251 -8.23e-03  1.83e-03 -8.27e-02 -1.32e-03  8.39e-03  8.56e-03 -0.201113
## 252 -5.04e-02 -1.88e-02 -1.81e-01 -4.09e-02  2.55e-01  1.33e-01 -0.430851
## 253  1.63e-03  1.37e-03  7.01e-03 -4.80e-05 -1.06e-03  3.92e-03  0.014411
## 254 -3.49e-03  7.75e-04 -3.51e-02 -5.59e-04  3.56e-03  3.63e-03 -0.085283
## 255  4.21e-03  8.63e-03 -4.23e-02 -1.46e-03 -3.91e-03  2.71e-02 -0.105977
## 256  1.06e-04  8.47e-05  4.13e-03  4.47e-05  2.59e-04  1.95e-04  0.008392
## 257 -1.75e-02 -3.10e-04  6.38e-02  4.90e-03  2.02e-02  1.39e-02  0.143239
## 258  2.21e-04 -3.48e-04 -3.47e-03 -2.37e-05 -3.21e-04  1.32e-04 -0.007034
## 259  1.52e-02  1.46e-03 -1.04e-01 -1.94e-03 -9.13e-03  1.44e-02 -0.200152
## 260 -8.61e-03 -4.15e-03  1.67e-02  5.69e-04  6.78e-03  2.34e-02  0.044694
## 261 -1.88e-02 -7.28e-03  5.94e-02  1.53e-03  1.40e-02  3.40e-02  0.125939
##      cov.r  cook.d    hat inf
## 1   1.0798 1.35e-03 0.0436
## 2   1.0652 1.73e-03 0.0390
## 3   1.1000 4.01e-04 0.0472
## 4   1.1249 1.14e-03 0.0724
## 5   1.0948 2.64e-04 0.0413
## 6   0.9022 1.27e-02 0.0422
```

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## 7    1.1051 6.50e-05 0.0471
## 8    1.0173 8.11e-03 0.0562
## 9    0.9665 7.18e-03 0.0378
## 10   1.0751 1.27e-03 0.0399
## 11   1.0961 1.27e-07 0.0385
## 12   1.0003 7.69e-03 0.0489
## 13   1.1022 5.73e-04 0.0507
## 14   1.0735 1.44e-03 0.0407
## 15   1.0311 3.67e-03 0.0390
## 16   1.1009 6.02e-05 0.0436
## 17   1.0915 1.08e-04 0.0363
## 18   1.0924 6.98e-04 0.0449
## 19   1.2580 1.49e-03 0.1665   *
## 20   1.0875 2.45e-04 0.0353
## 21   1.0424 6.11e-03 0.0567
## 22   1.0837 5.10e-04 0.0364
## 23   1.0204 3.49e-03 0.0342
## 24   1.0795 1.31e-03 0.0429
## 25   1.0804 1.81e-03 0.0481
## 26   0.9999 4.79e-03 0.0356
## 27   1.0960 1.55e-04 0.0407
## 28   1.0874 1.80e-04 0.0342
## 29   1.0912 1.84e-05 0.0345
## 30   1.1052 8.91e-06 0.0465
## 31   1.1045 6.49e-04 0.0533
## 32   1.0918 1.56e-03 0.0529
## 33   0.9399 9.24e-03 0.0393
## 34   1.1204 4.07e-05 0.0597
## 35   1.0946 5.10e-04 0.0443
## 36   1.0933 1.18e-06 0.0361
## 37   1.1232 1.82e-03 0.0757
## 38   1.1092 5.75e-04 0.0560
## 39   1.1450 6.54e-04 0.0840
## 40   1.1074 3.43e-04 0.0523
## 41   1.0606 2.65e-03 0.0443
## 42   1.0649 2.60e-03 0.0460
## 43   0.9474 9.61e-03 0.0422
## 44   1.1480 1.70e-03 0.0923
## 45   1.0958 7.69e-05 0.0394
## 46   0.9624 7.10e-03 0.0366
## 47   1.1384 5.98e-05 0.0746
## 48   1.1210 3.98e-04 0.0636
## 49   1.0677 1.85e-03 0.0413
## 50   1.0723 1.41e-03 0.0398
## 51   1.0915 2.56e-03 0.0604
## 52   1.1112 8.49e-05 0.0525
## 53   1.1066 3.73e-04 0.0520
## 54   1.1228 1.45e-04 0.0627
## 55   1.0979 3.64e-04 0.0451
## 56   0.8499 2.20e-02 0.0532
## 57   1.1306 3.99e-04 0.0711
## 58   1.0137 4.04e-02 0.1326   *
## 59   0.9593 1.56e-02 0.0629
## 60   1.0934 1.33e-03 0.0519
## 61   0.9803 8.18e-03 0.0451
## 62   0.9649 1.13e-02 0.0520
## 63   1.0504 5.25e-03 0.0557
## 64   0.9592 9.23e-03 0.0436
## 65   1.0269 5.10e-03 0.0457
## 66   1.1057 9.08e-06 0.0469
## 67   1.1000 6.79e-04 0.0502
```

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## 68   1.1103 7.24e-06 0.0509
## 69   1.0921 3.03e-03 0.0638
## 70   1.0661 1.99e-03 0.0417
## 71   1.1228 7.94e-06 0.0614
## 72   1.1072 8.95e-05 0.0492
## 73   0.9603 1.71e-02 0.0671
## 74   1.1104 1.65e-03 0.0659
## 75   1.0954 1.00e-03 0.0502
## 76   1.0548 5.57e-03 0.0593
## 77   1.0524 8.97e-03 0.0733
## 78   1.0974 3.23e-04 0.0442
## 79   1.0999 2.04e-03 0.0618
## 80   1.0668 2.91e-03 0.0492
## 81   1.0564 2.87e-03 0.0439
## 82   0.8530 2.18e-02 0.0533
## 83   1.0780 2.24e-03 0.0502
## 84   1.0862 3.60e-03 0.0640
## 85   1.1048 1.48e-06 0.0461
## 86   1.1307 1.75e-04 0.0694
## 87   1.1088 3.77e-04 0.0538
## 88   1.1051 8.31e-03 0.0959
## 89   1.1111 2.59e-04 0.0544
## 90   1.0531 3.08e-03 0.0439
## 91   1.1602 9.43e-05 0.0922   *
## 92   1.1039 3.32e-03 0.0725
## 93   1.1318 1.52e-03 0.0799
## 94   1.0376 9.67e-03 0.0698
## 95   1.0784 5.86e-03 0.0719
## 96   1.0317 9.83e-03 0.0682
## 97   1.0841 4.53e-03 0.0682
## 98   1.1234 1.46e-03 0.0735
## 99   1.0984 5.01e-03 0.0783
## 100  1.1436 4.04e-05 0.0787
## 101  1.0733 8.09e-03 0.0792
## 102  1.0156 1.24e-02 0.0711
## 103  1.1056 2.05e-03 0.0655
## 104  1.1315 1.46e-03 0.0793
## 105  1.1466 4.89e-04 0.0841
## 106  1.1276 1.47e-04 0.0666
## 107  1.1242 6.04e-04 0.0678
## 108  1.1189 8.65e-04 0.0659
## 109  1.1598 5.35e-05 0.0916   *
## 110  1.0714 7.55e-03 0.0761
## 111  1.1183 1.01e-03 0.0666
## 112  1.0953 1.76e-03 0.0568
## 113  1.1068 2.19e-03 0.0673
## 114  1.1100 1.50e-04 0.0523
## 115  1.1066 7.25e-04 0.0556
## 116  1.0900 4.15e-03 0.0692
## 117  1.1174 7.14e-05 0.0575
## 118  1.1001 1.03e-03 0.0537
## 119  1.0780 2.91e-03 0.0551
## 120  1.1382 7.90e-04 0.0798
## 121  1.1083 6.87e-04 0.0565
## 122  0.7892 2.14e-02 0.0426   *
## 123  0.9595 1.22e-02 0.0532
## 124  1.0957 3.00e-04 0.0426
## 125  1.1450 3.17e-04 0.0818
## 126  0.9883 6.49e-03 0.0404
## 127  1.1007 8.57e-03 0.0946
## 128  1.0970 1.00e-03 0.0513
```

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## 129 1.0984 1.42e-03 0.0560
## 130 1.0980 1.48e-03 0.0563
## 131 1.0330 6.34e-03 0.0541
## 132 0.8831 1.34e-02 0.0404
## 133 1.1414 1.09e-04 0.0774
## 134 1.0288 4.03e-03 0.0404
## 135 0.9767 2.44e-02 0.0896
## 136 1.0572 4.35e-03 0.0538
## 137 1.1012 4.93e-03 0.0795
## 138 1.0938 2.58e-04 0.0404
## 139 1.1166 3.35e-04 0.0595
## 140 1.1065 3.30e-04 0.0514
## 141 1.0477 5.89e-03 0.0579
## 142 1.0838 2.39e-05 0.0281
## 143 1.0929 6.54e-04 0.0448
## 144 1.0792 3.47e-04 0.0307
## 145 0.9887 4.17e-03 0.0295
## 146 0.9490 1.06e-02 0.0457
## 147 1.0864 5.71e-08 0.0299
## 148 1.0805 1.94e-05 0.0251
## 149 1.0745 1.77e-03 0.0443
## 150 1.0375 1.39e-03 0.0234
## 151 1.0772 3.85e-04 0.0299
## 152 1.0649 8.71e-04 0.0295
## 153 1.0791 2.13e-04 0.0282
## 154 1.0773 5.63e-05 0.0233
## 155 1.0863 1.02e-04 0.0319
## 156 1.0692 4.99e-04 0.0265
## 157 1.0095 3.25e-03 0.0295
## 158 1.1032 1.23e-03 0.0577
## 159 0.9569 4.35e-03 0.0240
## 160 1.0810 4.03e-04 0.0329
## 161 1.0614 8.33e-04 0.0271
## 162 1.0762 3.23e-04 0.0281
## 163 1.0885 7.17e-05 0.0331
## 164 1.0474 2.04e-03 0.0335
## 165 1.0726 2.96e-04 0.0251
## 166 1.0245 2.59e-03 0.0295
## 167 0.9138 7.21e-03 0.0281
## 168 1.0791 1.56e-04 0.0271
## 169 1.0680 2.38e-03 0.0459
## 170 1.0232 2.99e-03 0.0319
## 171 1.0724 4.73e-04 0.0281
## 172 1.1518 7.75e-03 0.1199
## 173 1.0881 1.42e-03 0.0494
## 174 0.8593 1.08e-02 0.0307
## 175 1.0579 9.24e-04 0.0265
## 176 1.0908 3.12e-03 0.0636
## 177 1.0866 3.15e-05 0.0307
## 178 1.0867 9.97e-04 0.0443
## 179 1.0680 2.06e-03 0.0433
## 180 1.0698 5.75e-04 0.0281
## 181 1.0857 1.51e-03 0.0486
## 182 0.9013 1.60e-02 0.0502
## 183 1.0683 4.49e-04 0.0251
## 184 0.0739 2.42e-01 0.0629    *
## 185 1.1053 1.73e-05 0.0467
## 186 1.1263 1.33e-03 0.0747
## 187 1.0986 4.95e-04 0.0472
## 188 1.1016 1.96e-09 0.0433
## 189 0.9760 3.53e-03 0.0235
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## 190 1.0192 2.38e-03 0.0263
## 191 1.0639 4.93e-04 0.0233
## 192 1.0391 4.06e-03 0.0444
## 193 1.0115 2.50e-03 0.0250
## 194 1.0576 2.24e-03 0.0397
## 195 1.1122 1.81e-04 0.0544
## 196 0.9774 3.78e-03 0.0250
## 197 0.9836 9.05e-03 0.0493
## 198 1.0839 3.37e-05 0.0285
## 199 1.0781 2.66e-04 0.0285
## 200 1.0675 3.39e-04 0.0226
## 201 1.0764 5.76e-05 0.0226
## 202 1.1160 1.59e-06 0.0556
## 203 0.9061 1.13e-02 0.0390
## 204 0.8504 7.97e-03 0.0226
## 205 1.0906 5.52e-04 0.0419
## 206 1.0380 1.53e-03 0.0250
## 207 1.0679 3.53e-04 0.0231
## 208 0.8671 1.52e-02 0.0420
## 209 1.0650 4.46e-04 0.0231
## 210 0.9589 4.06e-03 0.0231
## 211 1.0913 4.81e-04 0.0415
## 212 1.0299 4.66e-03 0.0444
## 213 1.0541 8.03e-04 0.0231
## 214 1.0941 2.71e-04 0.0409
## 215 1.0752 2.32e-03 0.0493
## 216 1.1214 4.84e-02 0.1867     *
## 217 1.0803 1.52e-03 0.0454
## 218 1.1099 6.55e-04 0.0574
## 219 1.0064 2.69e-03 0.0250
## 220 0.9504 2.33e-02 0.0793
## 221 1.0830 2.10e-03 0.0520
## 222 1.0312 2.92e-03 0.0341
## 223 0.8970 1.05e-02 0.0352
## 224 1.1110 3.94e-04 0.0557
## 225 1.0405 2.58e-03 0.0351
## 226 1.0771 8.03e-04 0.0358
## 227 1.0471 3.14e-03 0.0418
## 228 1.0783 1.85e-03 0.0472
## 229 1.0850 5.86e-04 0.0383
## 230 1.1023 2.79e-05 0.0443
## 231 0.9954 4.96e-03 0.0352
## 232 1.1246 5.31e-06 0.0629
## 233 1.0897 1.31e-04 0.0352
## 234 1.0299 2.99e-03 0.0341
## 235 1.0790 5.32e-04 0.0335
## 236 1.1239 2.47e-05 0.0625
## 237 1.0776 1.02e-03 0.0387
## 238 1.0324 2.77e-03 0.0335
## 239 0.9049 1.06e-02 0.0369
## 240 1.0545 2.32e-03 0.0389
## 241 1.0347 3.64e-03 0.0402
## 242 1.1016 1.27e-04 0.0451
## 243 1.0954 7.08e-04 0.0472
## 244 1.0071 4.50e-03 0.0361
## 245 1.0346 2.66e-03 0.0335
## 246 1.0764 6.59e-04 0.0335
## 247 0.9673 7.69e-03 0.0399
## 248 1.0448 2.94e-03 0.0394
## 249 1.0971 2.42e-03 0.0627
## 250 1.0909 1.18e-05 0.0341
```

```
## 251 1.0492 3.11e-03 0.0425
## 252 0.9721 1.42e-02 0.0626
## 253 1.1142 1.60e-05 0.0543
## 254 1.0912 5.61e-04 0.0425
## 255 1.0748 8.66e-04 0.0352
## 256 1.0979 5.44e-06 0.0402
## 257 1.1032 1.58e-03 0.0606
## 258 1.1272 3.82e-06 0.0650
## 259 1.0445 3.08e-03 0.0403
## 260 1.1169 1.54e-04 0.0580
## 261 1.0803 1.22e-03 0.0426
```

try the model without outlier

```
data_no_184=data_2[-184,]
gender_no_184=lm(log_sal~gender * exper +rank + dept + clin+cert,data=data_no_184)
summary(gender_no_184)
```

```
##
## Call:
## lm(formula = log_sal ~ gender * exper + rank + dept + clin +
##     cert, data = data_no_184)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.32984 -0.07244 -0.01281  0.08040  0.28101
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  10.901154   0.031409 347.067  < 2e-16 ***
## genderMale                    0.098036   0.033558   2.921  0.00381 **
## exper                         0.026579   0.003203   8.298 6.91e-15 ***
## rankAssociate                 0.131614   0.021413   6.146 3.16e-09 ***
## rankFull professor            0.216546   0.023590   9.179  < 2e-16 ***
## deptPhysiology               -0.172456   0.025967  -6.641 1.96e-10 ***
## deptGenetics                  0.183945   0.032339   5.688 3.62e-08 ***
## deptPediatrics                0.199326   0.031994   6.230 2.00e-09 ***
## deptMedicine                  0.519788   0.026450  19.652  < 2e-16 ***
## deptSurgery                   0.922498   0.031583  29.209  < 2e-16 ***
## clinPrimarily clinical emphasis  0.226087   0.019518  11.584  < 2e-16 ***
## certBoard certified           0.199022   0.019052  10.446  < 2e-16 ***
## genderMale:exper             -0.009676   0.003242  -2.984  0.00313 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1184 on 247 degrees of freedom
## Multiple R-squared:  0.9483, Adjusted R-squared:  0.9458
## F-statistic: 377.6 on 12 and 247 DF,  p-value: < 2.2e-16
```

model changed a lot so it is an influential point

```
par(mfrow = c(2, 2))
plot(gender_no_184)
```