DSC_520_week8_Assignment01

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Load Libraries

```
if(!require('pander')) {
  install.packages('pander')
  library('pander')
}
```

```
## Loading required package: pander
```

```
## Warning: package 'pander' was built under R version 4.2.1
```

```
if(!require('ggplot2')) {
  install.packages('ggplot2')
  library('ggplot2')
}
```

```
## Loading required package: ggplot2
```

```
## Warning: package 'ggplot2' was built under R version 4.2.1
```

```
if(!require('knitr')) {
  install.packages('knitr')
  library('knitr')
}
```

```
## Loading required package: knitr
```

```
if(!require('tinytex')) {
  install.packages('tinytex')
  library('tinytex')
}
```

```
## Loading required package: tinytex
```

```
if(!require('ppcor')) {
  install.packages('ppcor')
  library('ppcor')
}
```

```
## Loading required package: ppcor
```

```
## Warning: package 'ppcor' was built under R version 4.2.1
```

```
## Loading required package: MASS
```

```
if(!require('formatR')) {
  install.packages('formatR')
  library('formatR')
}
```

```
## Loading required package: formatR
```

```
## Warning: package 'formatR' was built under R version 4.2.1
```

```
## Set the working directory to the root of your DSC 520 directory
setwd("C:/Users/chris/dsc520/data")
```

```
## Load the `data/r4ds/heights.csv` to
heights_df <- read.csv("C:/Users/chris/dsc520/data/r4ds/heights.csv")
head(heights_df)
```

```
##    earn   height    sex ed age  race
## 1 50000 74.42444   male 16  45 white
## 2 60000 65.53754 female 16  58 white
## 3 30000 63.62920 female 16  29 white
## 4 50000 63.10856 female 16  91 other
## 5 51000 63.40248 female 17  39 white
## 6  9000 64.39951 female 15  26 white
```

```
## Fit a linear model using the `age` variable as the predictor and `earn` as the


earn_lm <-  lm(age ~ ed + race + height + earn + sex, data = heights_df)
earn_lm
```

```
##
## Call:
## lm(formula = age ~ ed + race + height + earn + sex, data = heights_df)
##
## Coefficients:
##  (Intercept)            ed  racehispanic     raceother     racewhite
##    1.000e+02    -1.174e+00    -3.657e+00     3.741e+00     1.672e+00
##       height          earn       sexmale
##   -7.098e-01     1.416e-04     3.706e-01
```

```
## View the summary of your model using `summary()`
summary(earn_lm)
```

```
##
## Call:
## lm(formula = age ~ ed + race + height + earn + sex, data = heights_df)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -29.19 -11.42  -3.54   8.63  51.06
##
## Coefficients:
##                Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.000e+02  1.072e+01   9.329  < 2e-16 ***
## ed           -1.174e+00  1.974e-01  -5.948 3.57e-09 ***
## racehispanic -3.657e+00  2.391e+00  -1.530    0.126
## raceother     3.741e+00  3.417e+00   1.095    0.274
## racewhite     1.672e+00  1.537e+00   1.088    0.277
## height       -7.098e-01  1.641e-01  -4.325 1.66e-05 ***
## earn          1.416e-04  2.557e-05   5.537 3.78e-08 ***
## sexmale       3.706e-01  1.297e+00   0.286    0.775
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.37 on 1184 degrees of freedom
## Multiple R-squared:  0.06722,    Adjusted R-squared:  0.0617
## F-statistic: 12.19 on 7 and 1184 DF,  p-value: 4.142e-15
```

```
## Creating predictions using `predict()`
#age_predict_df <- data.frame(earn = predict(earn ~ ed + race + height + age + sex, data = heights_df),

earn_predict_df <- data.frame(ed = heights_df$ed, race = heights_df$race, height = heights_df$height, ag
earn_predict_df
```

```
##      ed     race   height age    sex   earn    age.1
## 1    16    white 74.42444  45   male  50000 37.54128
## 2    16    white 65.53754  58 female  60000 44.89454
## 3    16    white 63.62920  29 female  30000 42.00208
## 4    16    other 63.10856  91 female  50000 47.27164
## 5    17    white 63.40248  39 female  51000 43.96213
## 6    15    white 64.39951  26 female   9000 39.65617
## 7    12    white 61.65633  49 female  29000 47.95618
## 8    17    white 72.69854  46   male  32000 35.04432
## 9    15 hispanic 72.03947  21   male   2000 28.28316
## 10   12    white 72.23493  26   male  27000 40.53465
## 11   16    white 69.51215  65   male   6530 34.87418
## 12   11    white 68.03161  34   male  30000 45.11680
## 13   12    white 67.55693  27   male  12000 41.73169
## 14   12    white 65.43059  51 female  12000 42.87044
## 15   16    white 65.66285  35 female  22000 39.42599
## 16   12    white 67.75877  58   male  17000 42.29627
## 17   14    white 68.35184  29 female  40000 42.41314
## 18   13    white 69.60957  44   male  44000 43.63105
## 19   12    black 64.18457  55 female   7000 41.37497
## 20   13    black 73.07461  35   male  53000 40.77350
## 21   13    white 62.37553  51 female   5000 42.87421
## 22   14    white 63.02393  21 female  14000 42.51426
```

```
## 23   14    white 67.22990  22   male   5500 38.69600
## 24   12    white 65.55111  41 female  40000 46.74881
## 25   12    white 72.07965  45   male  34000 41.63585
## 26   12    black 63.09113  35 female  10000 42.57583
## 27   16    white 64.32355  60 female  27000 41.08451
## 28   16    white 71.64285  38   male  50000 39.51573
## 29   16    white 76.79309  33   male  41000 34.58582
## 30   14    white 63.89391  25 female  15000 42.03829
## 31   12    white 63.80262  33 female  25000 45.86641
## 32   17    white 71.59223  39   male  75000 41.91705
## 33   17    white 67.52196  31   male  27000 38.01095
## 34   12    white 64.39435  26 female  12000 43.60599
## 35   14    white 61.17822  78 female   7500 42.90419
## 36   14    black 66.98388  31 female  30000 40.29638
## 37   12    white 65.31646  57 female  21000 44.22557
## 38   14    white 63.57419  26 female  27000 43.96406
## 39   15    white 66.61100  65 female   3000 37.23698
## 40   12    white 64.91176  30 female  25000 45.07911
## 41   12    white 64.78968  41 female  24000 45.02420
## 42   18    white 66.93769  29 female  32000 37.58912
## 43   17    white 68.17281  30 female  10000 34.77171
## 44   12 hispanic 60.45066  21 female  11000 40.93419
## 45   13    white 64.79325  32 female  18700 43.09753
## 46   12    white 61.81492  29 female  20000 46.56949
## 47   10    white 71.57215  18   male   3500 40.02589
## 48    8    black 67.31441  56   male  13000 45.06860
## 49   12    white 69.89987  65   male  25000 41.90900
## 50   17    white 69.76170  41   male  21000 35.57171
## 51   17    white 67.74647  49 female  34000 38.47198
## 52   12    white 60.19022  65 female   6000 45.74079
## 53   12    white 71.00650  28   male  17000 39.99094
## 54   12    white 71.16680  32   male  35000 42.42538
## 55   13    white 72.73563  18   male   4000 35.74934
## 56   14    white 68.13822  55 female  14000 38.88399
## 57   12    white 66.37981  57 female  10000 41.91352
## 58   16    white 69.23278  29   male  25000 37.68725
## 59   14    white 63.27394  27 female  16000 42.61993
## 60   14 hispanic 61.82776  28   male  16000 38.68748
## 61   14    white 64.22121  43 female  16500 42.01832
## 62    9    white 63.84127  68 female   4000 46.38749
## 63    9    white 66.97477  52 female   3840 44.14059
## 64   12    white 71.45149  39   male  22000 40.38291
## 65   16    white 59.61265  53 female    200 40.63440
## 66   16    white 65.79939  27 female  26000 39.89535
## 67   15    white 66.45804  21 female   2500 37.27477
## 68   14    white 64.60288  39 female  17000 41.81818
## 69   13    white 70.44048  22 female   8000 37.57419
## 70   13    white 65.92281  68 female  12000 41.34723
## 71   12    white 61.85683  47 female  10000 45.12406
## 72   15    white 65.78444  67 female  10000 38.81468
## 73   12    white 71.83128  39   male  15000 39.12235
## 74    8 hispanic 67.04533  39 female   2400 39.73089
## 75   12 hispanic 68.30551  32   male  30000 38.41899
## 76   12    white 70.02546  33   male  30000 42.52770
```

```
## 77   12    white 61.81039  38 female  10000 45.15702
## 78   13    white 62.95107  26 female   5000 42.46567
## 79   13    white 65.82114  63 female  12000 41.41940
## 80   10    white 70.39755  61 female  20000 42.82494
## 81   12    white 68.37778  36 female  20000 41.91099
## 82   14    white 69.93270  23   male  20000 38.83022
## 83   12    white 66.17181  20 female   1200 40.81536
## 84   16    white 68.45636  32 female    700 34.42767
## 85   16    white 69.90386  27   male  20000 36.50306
## 86   12 hispanic 61.14966  22 female  10000 40.29645
## 87   12    white 63.36335  73 female  30000 46.88606
## 88   14    white 64.14708  56 female  40000 45.39779
## 89   12    white 67.31839  89   male  25000 43.74141
## 90   17    white 60.67494  79 female  10000 40.09391
## 91   18    white 68.84090  63 female  60000 40.20209
## 92   12    white 67.68273  66 female  18000 42.12122
## 93   12    white 64.49677  33 female  16040 44.10523
## 94   14    black 66.81240  30 female  15000 38.29457
## 95   17    white 68.74644  23   male  10000 34.73512
## 96   13    white 67.06765  43 female  33000 43.50753
## 97   12    white 68.13799  30 female  18000 41.79806
## 98   12    white 63.34290  37 female  15000 44.77705
## 99   12    white 71.38667  22   male  21000 40.28736
## 100  17    black 63.98834  43 female  21000 37.62713
## 101  11    white 68.48639  37   male  37000 45.78497
## 102  17    white 67.51614  44 female  38000 39.20175
## 103  14 hispanic 65.60084  43 female  17000 35.78022
## 104  16    white 76.80019  30   male  32000 33.30667
## 105  12    white 67.10538  58 female  27500 43.87594
## 106  12    white 62.15164  44 female  16500 45.83499
## 107  18    white 66.86762  35 female  25000 36.64788
## 108  18    white 61.04220  43 female  27000 41.06606
## 109  12    white 64.12329  28 female   5000 42.80742
## 110  16    white 61.54482  38 female  70000 49.14437
## 111  12    white 62.55624  40 female   5000 43.91976
## 112  16    white 68.16377  24   male   5000 35.61470
## 113  15    white 63.65513  26 female  20000 41.74181
## 114  15    white 72.37352  21   male   4000 33.65875
## 115  16    white 64.14708  35 female  60000 45.88153
## 116  13    white 61.32670  31 female   5000 43.61870
## 117  12    white 74.36640  38   male  30000 39.44638
## 118  14    white 70.21016  35   male  70000 45.71169
## 119  16    white 71.10619  41   male  50000 39.89666
## 120  12    white 62.59484  39 female  44000 49.41352
## 121  14    white 64.05496  43 female  30000 44.04749
## 122  16    white 61.57362  40 female  10000 40.62982
## 123  17    white 70.48020  42 female  23000 34.97425
## 124  17    white 71.18591  62   male  45000 37.95842
## 125  14    white 71.43364  31   male  15000 37.05697
## 126  14    white 70.22885  71 female   4000 35.98432
## 127  14    white 67.28086  31   male  17000 40.28787
## 128  12    white 63.75869  32 female  30000 46.60543
## 129  12    white 67.08652  30 female  27500 43.88933
## 130   8    white 61.67960  69 female   5688 49.33469
```

```
## 131  13 hispanic 62.28600  56 female  18000 39.44858
## 132  13    black 68.29248  44   male  43000 42.75230
## 133  14    black 61.58948  44 female  32000 44.40861
## 134  18    black 68.41774  56 female  10000 31.75195
## 135  13    white 73.99126  45   male  60000 42.78590
## 136  12    other 67.56107  50 female  21000 44.70090
## 137  16    white 62.33793  22 female   2400 39.01137
## 138  15    white 66.24001  28 female   1000 37.21719
## 139  12    white 68.09847  27   male  27000 43.47082
## 140  14 hispanic 59.77087  28 female   6600 38.44619
## 141   8    white 68.06338  43   male  16000 46.63375
## 142  12    white 71.68015  26   male  90000 49.84726
## 143  12    white 66.35971  42 female   8000 41.64465
## 144  10    white 68.35626  32   male  20000 44.64449
## 145  12    white 68.45654  18 female  15000 41.14724
## 146  12    white 68.78610  60 female  12000 40.48860
## 147  16    white 64.10224  46 female  24000 40.81689
## 148  14    white 65.11349  39 female  20000 41.88044
## 149  12    white 60.64919  46 female  19000 47.25539
## 150  12    white 72.12570  49   male  10000 38.20552
## 151  16    white 65.51073  34 female  40000 42.08220
## 152  14    white 67.93190  64   male  25000 40.95829
## 153  12    white 70.44492  24   male  25000 41.52211
## 154  14    white 71.36585  32   male  25000 38.52077
## 155  16    white 71.12507  61   male  19000 35.49464
## 156  16    white 68.16014  48   male  44000 41.13844
## 157  14    white 60.11333  49 female  15000 44.72185
## 158  12    white 62.78820  36 female  17000 45.45393
## 159  12    white 68.07772  56   male  24000 43.06084
## 160  12    white 64.05084  37 female  23000 45.40708
## 161  12    white 69.71580  74   male  13000 40.34084
## 162  16    white 68.22067  46   male  65000 44.06841
## 163  12    white 60.88386  63 female   7000 45.38999
## 164  18    white 68.40754  63   male  40000 38.04892
## 165  17    white 66.00198  43 female  15000 37.02047
## 166  16    white 69.79789  25   male  20000 36.57828
## 167  12    white 71.01071  50   male  20000 40.41265
## 168  12    white 65.14241  42 female  20000 44.20755
## 169  12    white 65.96711  49 female  25000 44.32999
## 170  13    white 69.99053  37   male  49000 44.06847
## 171  12    white 61.87668  65 female  25000 47.23350
## 172  14    white 66.10888  57 female  11000 39.89977
## 173  15    white 61.05431  38 female  16000 43.02167
## 174  14    white 71.56357  43   male  35000 39.79611
## 175  18    white 74.34062  45   male 125000 45.87078
## 176  12    white 66.57699  47 female  23000 43.61395
## 177  16    white 66.11044  28 female  17000 38.40043
## 178  12    white 61.96569  41 female  27000 47.45345
## 179  14    white 71.74551  32   male  70000 44.62186
## 180  15    white 64.56222  47 female  35000 43.22146
## 181  12    white 60.19882  62 female  10000 46.30096
## 182  15    white 61.91637  39 female  35000 45.09955
## 183  12    white 66.41355  38 female  15000 42.59741
## 184  12    white 63.69852  39 female  12000 44.09991
```

```
## 185  12    white 71.29091  68   male   8000 38.51493
## 186  12    white 65.25376  50 female   8000 42.42969
## 187  18    white 73.00546  50   male  35000 34.07735
## 188  11    white 68.64007  51   male  45000 46.80843
## 189  14    white 64.38145  22 female  15000 41.69222
## 190  12    white 61.06026  77 female  15000 46.39732
## 191  18    white 66.78936  51 female  24000 36.56186
## 192  13    white 61.82930  32 female  25000 46.09331
## 193  14    black 62.60956  54 female  25000 42.69355
## 194  10    other 67.36466  28   male  20000 47.41698
## 195  12    white 68.01697  24 female  24000 42.73338
## 196  16    white 72.06415  46   male  44000 38.36727
## 197  12    white 70.10862  38   male  69000 47.98983
## 198  18    white 69.85249  44   male  62000 40.13776
## 199  14    black 67.45525  32   male  32000 40.61552
## 200  12    black 63.45313  33 female  20000 43.73456
## 201  18    other 66.29297  35 female  32000 40.11539
## 202  17    white 65.83480  50 female  25000 38.55483
## 203  18    white 71.01003  45   male 170000 54.60550
## 204  16    white 66.61942  33   male  35000 40.95797
## 205  16    black 75.56859  38   male  40000 33.64136
## 206  14    white 68.95220  30   male  33000 41.36660
## 207  12    white 65.34873  22 female  18000 43.77795
## 208  13    white 61.75212  43 female  30000 46.85594
## 209  12    white 61.76413  31 female  26000 47.45495
## 210  12    white 62.41147  21 female   5000 44.02252
## 211  16    white 61.90433  73 female  20000 41.81076
## 212  12    white 60.63861  30 female  17000 46.97976
## 213  14    white 64.82458  28 female  32000 43.78434
## 214  14    white 72.27075  22   male  15000 36.46276
## 215  14    white 71.67228  55   male  50000 41.84248
## 216  12    white 63.77093  39 female   8000 43.48224
## 217  14    white 70.78659  51   male  40000 41.05547
## 218  15    white 72.40979  41   male  40000 38.72946
## 219  12    white 66.08798  34   male  32750 45.71194
## 220  14    white 64.99933  69 female  20000 41.96147
## 221  15    black 64.52930  39 female  36000 41.71431
## 222  12    white 61.74268  64 female   6000 44.63881
## 223  14    black 65.84031  34 female  12000 38.55989
## 224  14    white 67.39964  63   male  60000 46.29099
## 225  13    white 64.02227  44 female  40000 46.66020
## 226  12    white 63.22614  38 female  43000 48.82384
## 227  16    white 67.49430  34 female  45000 41.38205
## 228  18    white 68.00212  39 female   6000 33.15278
## 229  10    other 63.85791  82 female   8000 47.83676
## 230  13    black 64.39506  39 female  20000 41.89213
## 231  12    black 66.43901  23   male  17000 41.56098
## 232  12    white 64.76538  32 female   2000 41.92694
## 233  12    white 64.53856  28   male  65000 51.37735
## 234  12    white 71.58593  41   male  50000 44.25140
## 235  12    white 68.34822  38 female  11000 40.65786
## 236  18    white 74.43320  30   male  35000 33.06389
## 237  12    white 63.21770  33   male  27000 46.93533
## 238  12    white 64.31432  61 female   3500 42.45947
```

```
## 239  12    white 68.15146  37   male  42000 45.55673
## 240  18    white 67.49495  29 female  20000 35.49474
## 241  12    white 67.31617  29 female  15000 41.95671
## 242  12    white 72.98672  21   male  10000 37.59434
## 243   8    white 70.49116  78   male   6000 43.49476
## 244  16 hispanic 64.88575  23 female  17000 33.94018
## 245  16 hispanic 68.54049  65   male  35000 34.26477
## 246  14    white 76.68067  28   male  28000 35.17287
## 247  12    white 67.69396  33 female  15000 41.68854
## 248  17    white 61.97134  24 female  20000 40.58938
## 249  12    white 64.21270  29 female  20000 44.86748
## 250  12 hispanic 67.22247  42   male  10500 36.42717
## 251  16    white 69.90214  22   male  13000 35.51330
## 252  12    white 61.77745  52 female  10000 45.18040
## 253  12    white 63.08135  37 female   3000 43.26388
## 254  14    white 62.33487  29 female  24000 44.41906
## 255  13    white 68.69584  35 female  17000 40.08670
## 256  12    white 64.09801  48 female  11000 43.67477
## 257  14    white 69.03400  40 female  32000 40.79637
## 258  15    white 58.66032  26 female  17000 44.86256
## 259  12    other 66.22625  35 female   3000 43.10017
## 260  12    black 62.09126  21 female   2100 42.16718
## 261  11    black 75.13845  34   male   3192 34.60492
## 262  17    white 63.31428  26 female  17000 39.21141
## 263  13    white 64.55410  28 female  30000 44.86701
## 264  12    white 69.80036  32   male  15000 40.56395
## 265  16    white 67.84325  42 female  24000 38.16142
## 266  14    white 64.95007  67 female  10000 40.58075
## 267   8    white 69.21831  53   male  50000 50.62727
## 268  16    white 71.88612  53   male  50000 39.34305
## 269  17    white 63.52426  49 female  20000 39.48707
## 270  18 hispanic 62.67856  54 female  30000 34.99966
## 271  14    white 73.47394  45 female  22000 36.22910
## 272  12    white 75.09407  24   male  27000 38.50515
## 273  12    white 64.77306  38 female   4000 42.20462
## 274  17    white 66.25353  26 female  17500 37.19584
## 275  14    white 66.39351  28 female  16500 40.47636
## 276  16    white 64.00329  39 female  28000 41.45340
## 277  18    white 65.57394  50 female  52000 41.38852
## 278  16    white 64.27616  29 female  15000 39.41932
## 279  13    white 62.64666  32 female  19000 44.66371
## 280  12    white 72.55974  23   male  27000 40.30409
## 281   8    white 71.78231  58   male  15000 43.85238
## 282  14    white 71.50386  33   male  15000 37.00713
## 283  12    white 64.15775  55 female  14500 44.12786
## 284  13    white 64.22769  30 female  24000 44.24930
## 285  15    white 67.79798  36   male  18000 38.88855
## 286  12    white 62.27896  68 female   4000 43.97501
## 287  13    white 68.50410  57 female   4000 38.38241
## 288  12    white 60.11268  36 female    700 45.04552
## 289  12    white 64.97933  91 female  24000 44.88958
## 290  12    white 75.96951  39   male  27000 37.88374
## 291  12    white 72.32790  35 female  12000 37.97454
## 292  18    white 61.76565  47 female  22000 39.84470
```

```
## 293  13    white 61.61640  36 female  30000 46.95227
## 294  12    white 70.55408  61   male  35000 42.86031
## 295  12    white 74.08120  42   male  20000 38.23314
## 296  16    white 65.47242  32 female  32000 40.97685
## 297  12    other 63.36531  31 female   6000 45.55564
## 298  12    white 66.85000  39 female  12000 41.86290
## 299  12    white 63.26609  31 female  10000 44.12372
## 300  12    white 64.74551  18 female   1000 41.79948
## 301  15    white 63.54206  71 female  12000 40.68952
## 302  12    white 64.92311  36 female  16000 43.79694
## 303  16    white 63.24201  33 female  25000 41.56908
## 304  12    white 69.52456  27 female  25000 41.80482
## 305  12    white 67.97809  30   male  32000 44.26411
## 306  14    white 66.54874  43   male  35000 43.35578
## 307  12    white 64.58870  28 female   6000 42.61862
## 308  14    white 68.76669  44   male  80000 48.15200
## 309  14    white 68.08389  25 female  20000 39.77197
## 310  17    white 65.81591  38 female   1000 35.17059
## 311  13 hispanic 71.40238  38   male  28000 34.76380
## 312  16 hispanic 63.76354  23   male  26000 36.38147
## 313  12    white 73.52538  24   male  27000 39.61865
## 314  13    white 61.97999  41 female  18000 44.99537
## 315  12    white 65.21052  59 female   2000 41.61097
## 316  12    white 69.37547  66   male  20000 41.57339
## 317  16    white 66.08656  48 female   6000 36.86013
## 318  11    white 66.52544  63   male  25000 45.47808
## 319  12    white 73.17216  29   male  12000 37.74584
## 320  12    white 76.18488  57   male  12000 35.60734
## 321  14    white 69.52563  76   male  30000 40.53485
## 322  15    black 62.87571  22 female   4000 38.35788
## 323  13    black 62.78291  37 female  26000 43.88589
## 324  12    black 70.07592  35   male  23000 39.82881
## 325  12    white 71.06308  33   male  21000 40.51705
## 326  12    white 65.22338  62 female  25000 44.85791
## 327  16    white 70.38000  75   male  18000 35.88194
## 328  13    white 63.24725  44 female   4000 42.11387
## 329  12    white 63.92087  22 female  23900 45.62674
## 330  18    white 64.32948  40 female  35000 39.86521
## 331  14    white 66.73039  30   male  26000 41.95272
## 332  16    white 66.49049  36   male  25000 39.63380
## 333  13    white 68.01891  27 female  23500 41.48740
## 334  12    white 65.22522  22 female  12000 43.01622
## 335  12    white 67.12425  20 female  15000 42.09294
## 336  17    white 72.93588  23   male   3000 30.77036
## 337  12    white 63.57961  67 female   6000 43.33491
## 338  12    white 71.44772  69   male  14000 39.25304
## 339  16    white 63.28314  31 female  15000 40.12419
## 340  16    white 70.58955  48   male 175000 57.95945
## 341  18    white 73.37096  25   male   1000 29.00457
## 342  14    white 64.68889  63 female  10000 40.76615
## 343  13    white 65.92309  82   male  45000 46.38938
## 344  12    white 65.84832  81 female  15000 42.99863
## 345  13    white 59.20287  41 female  20000 47.24978
## 346  16    white 69.99012  30   male  35000 38.56535
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## 347  16    white 71.66564  28   male  40000 38.08386
## 348  12    white 64.20183  72 female  35000 46.99873
## 349  16    white 66.06455  54 female  50000 43.10477
## 350  18    white 69.66688  57   male 100000 45.64911
## 351  13    white 68.56316  28   male  35000 43.09970
## 352  12    white 67.72061  35 female  24000 42.94374
## 353  17    white 73.83110  43   male  35000 34.66510
## 354  16    white 72.53878  74   male  38000 37.18095
## 355  12    white 67.24277  52   male  30000 44.50293
## 356  12 hispanic 63.98628  39 female   5000 37.57510
## 357  18    white 66.74020  38   male 148000 54.52184
## 358  12    white 69.77329  32   male  30000 42.70670
## 359  15    white 63.75686  31 female   6500 39.75842
## 360  16    white 61.55948  37 female   3000 39.64888
## 361  18    white 69.29717  69   male  23000 35.01077
## 362  17    white 68.47821  41   male  40000 39.17258
## 363  14    white 72.11037  39   male  30000 38.70014
## 364  12    white 63.10641  37 female  14000 44.80334
## 365  12    white 68.71668  34 female  15000 40.96259
## 366  18    white 64.00637  36 female  26000 38.82045
## 367  12    white 71.00964  25 female   8000 38.34400
## 368  16    black 63.84402  27 female  24000 39.32810
## 369   8    white 66.10071  67   male   5124 46.48721
## 370  15    white 60.97499  25 female  10000 42.22856
## 371  16    white 67.75510  32 female  12000 36.52517
## 372  17    white 68.45831  34   male  50000 40.60238
## 373  13    white 63.80380  26 female  23000 44.40861
## 374  14    black 65.70889  34   male  40000 42.98768
## 375  13    black 61.93158  26 female   6000 41.65882
## 376  16    black 65.32257  30 female   5000 35.58878
## 377  18    white 65.96504  37   male 110000 49.69247
## 378  13 hispanic 72.04236  32   male  41000 36.14991
## 379  13    white 62.57023  78 female  23000 45.28423
## 380  12    white 70.43141  23   male  21000 40.96542
## 381  12    white 62.32131  29 female   4000 43.94495
## 382  12    white 70.70824  36   male  25000 41.33520
## 383  18    white 70.27755  46   male  30000 35.30585
## 384  11    white 63.87068  51 female  14000 45.43466
## 385  12    white 63.47754  35 female   6000 43.40736
## 386  12    white 64.59348  46 female  14000 43.74778
## 387  12    white 70.51344  27   male  43000 44.02171
## 388  15    white 61.70052  33 female  25000 43.83708
## 389  12    white 72.55343  66   male  40000 42.14896
## 390  17    white 67.58731  40   male  65000 43.34417
## 391  15    white 76.15187  32   male  16000 32.67559
## 392  12    white 65.57775  71 female   8000 42.19971
## 393  15    white 64.22912  39 female  20000 41.33438
## 394  14    white 60.31368  72 female  14000 44.43807
## 395  12    white 68.13747  74   male  45000 45.99137
## 396  11    white 60.94487  72 female   8000 46.66207
## 397  12    white 66.02238  28   male  12000 42.82096
## 398  14    white 62.88533  31 female   8000 41.76322
## 399  15    white 62.67241  32 female  16000 41.87309
## 400  15    white 73.68754  73   male   6000 33.00916
```

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## 401  12    white 70.10196  32   male  19000 40.91614
## 402  13    white 68.30324  39 female  21000 40.93165
## 403  18    white 69.52018  46 female  43000 37.31325
## 404  15    white 68.71778  21   male  35000 40.64231
## 405  10    white 70.49465  75   male   8000 41.42778
## 406  14    white 62.77760  41 female  21000 43.68009
## 407  12    white 65.12696  30 female   5800 42.20824
## 408  12    white 69.34231  46   male  17000 41.17222
## 409  14    white 67.54425  49   male  24000 41.09188
## 410  11    white 62.34081  71 female   5000 45.24649
## 411  12    white 66.17610  23 female  11000 42.19969
## 412  13    white 65.45162  27   male  10000 41.76914
## 413  14    white 69.78536  36   male  40000 41.76618
## 414  12    white 70.46079  47   male  40000 43.63437
## 415  14    black 65.75426  29 female  24000 40.31979
## 416  16    white 68.49064  26   male  24000 38.07247
## 417  16    white 68.13681  33   male  20000 37.75736
## 418  18    white 69.74409  50   male  60000 39.93157
## 419  13    white 64.55673  47 female  11000 42.17534
## 420  15    white 64.39143  40 female   5000 39.09563
## 421  16    white 65.29906  30 female  27000 40.39206
## 422  16    white 76.53780  41   male  89000 41.56233
## 423  14    white 70.02428  28   male  40000 41.59659
## 424  16    white 64.45588  26 female  15000 39.29175
## 425  14    white 64.17829  20 female   1000 39.85447
## 426  12    white 64.37256  60 female  22000 45.03714
## 427   8    white 63.68146  48 female  12000 48.80729
## 428  16    white 62.56621  28 female  22000 41.62407
## 429  12    black 57.50322  56 female  40000 50.78934
## 430  16    white 62.02662  44 female  40000 44.55532
## 431  14 hispanic 64.45005  53 female  35000 39.14532
## 432  12    white 63.63646  28 female   7000 43.43612
## 433  12    white 62.23202  37 female  14000 45.42401
## 434  12    white 64.01304  56 female  15000 44.30136
## 435  13    white 65.88741  34 female   6000 40.52295
## 436  12    black 69.29444  41 female  11000 38.31412
## 437  13    white 64.34100  31 female  10000 42.18690
## 438  14    white 70.70352  41   male  20000 38.28307
## 439  12    white 62.08915  73 female   7000 44.53445
## 440   9    white 68.29980  46   male  38000 48.40661
## 441   9    white 67.80439  58   male  29000 47.48415
## 442  10    white 61.77627  44 female  20000 48.94456
## 443  12    white 62.51287  57 female   8000 44.37525
## 444  16    white 68.73132  51   male  36000 39.60046
## 445  12    white 67.04634  44 female   1500 40.23707
## 446  18    white 64.29710  29 female  42000 40.87917
## 447  12    white 70.38619  22   male  25000 41.56380
## 448  10    white 68.95557  20   male  13000 43.22811
## 449  11    black 69.24640  51   male  30000 42.58242
## 450  12    white 68.57202  23   male   7000 40.30331
## 451  12    black 59.84566  48 female  31000 47.85249
## 452  12    black 66.42150  42 female  15000 40.91968
## 453  16    white 66.63238  49   male  50000 43.07230
## 454  15    white 66.24960  20   male   5000 38.14724
```

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## 455  12    black 70.23859  18 female    600 36.17162
## 456   8    black 64.48861  51 female  14000 46.84541
## 457  18    other 59.97167  35 female  40000 45.73497
## 458  18    white 68.26500  36   male  24000 35.88500
## 459  12    black 72.73850  24   male  22000 37.79727
## 460   8    white 71.86160  36   male  20000 44.50394
## 461  12    white 63.75193  38 female  20112 45.21041
## 462  13    white 67.34015  67   male  12000 40.71175
## 463  13    white 67.24025  40 female  41000 44.51756
## 464   9    black 71.46243  50   male  13000 40.95040
## 465  16    white 72.73708  31   male  60000 40.15469
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## 467  16    white 70.06343  36   male  38000 38.93802
## 468  14    white 71.13169  27 female   3000 35.20189
## 469  12    white 65.96480  30 female  13000 42.63281
## 470  12    white 74.80273  21   male   5000 35.59745
## 471  14    white 60.26324  37 female  20000 45.32328
## 472  12    white 72.45994  28   male  22000 39.66709
## 473   9    black 74.78834  55   male  28000 40.71310
## 474  12    white 59.80482  41 female  22000 48.27945
## 475  12    black 73.43138  44   male  30000 38.43799
## 476  12    black 64.59752  32 female  30000 44.33792
## 477  16    white 67.11170  31   male  30000 39.90070
## 478  12    white 61.05400  69 female  32000 48.80844
## 479  17    white 69.28213  43 female  26000 36.24938
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## 481  12    white 70.34138  33   male  25000 41.59561
## 482  10    white 67.63296  24 female  11000 43.51320
## 483  12    white 62.18865  53 female  13000 45.31323
## 484  15    white 63.78785  42 female  10000 40.23191
## 485  12    white 67.58146  45 female  12000 41.34370
## 486  11    white 63.51531  64 female   7000 44.69594
## 487  14    white 72.64024  37   male  57000 42.14637
## 488  16    white 72.82462  37   male  36000 36.69491
## 489  14 hispanic 69.40743  29   male  29000 35.14761
## 490  13    white 68.29110  19 female   8000 39.09988
## 491  11    black 70.64524  18   male   3000 37.76714
## 492  16    white 66.13450  41 female  20000 38.80806
## 493  12    white 66.37326  57   male  33000 45.54483
## 494  12 hispanic 68.30015  68 female  15000 35.92868
## 495  12    white 70.29628  33   male  16000 40.35350
## 496  12    white 61.82134  78 female   5000 44.44141
## 497  14    white 65.75500  43 female   8000 39.72626
## 498  16    black 63.02599  34 female  32000 41.04130
## 499  12    white 74.51779  24   male  14500 37.14460
## 500  12    white 66.59654  29 female  13000 42.18439
## 501   9    white 62.63598  25 female   7000 47.66774
## 502  18    black 64.71526  65 female  50000 40.04281
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## 504  14    white 71.47208  61   male  19000 37.59596
## 505  12    white 61.90178  55 female   9000 44.95058
## 506  12    black 64.74551  35 female  20000 42.81719
## 507  18 hispanic 71.71052  35   male  55000 32.49833
## 508  12    white 64.90903  40 female  10000 42.95752
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## 509  12    white 63.15415  19 female  13000 44.62789
## 510  13    white 63.97677  31 female  20000 43.86113
## 511  12    white 71.58899  26   male  30000 41.41786
## 512  12    white 63.59626  34 female  12000 44.17250
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## 514  12    white 64.97475  27 female  12500 43.26479
## 515  12    white 64.31371  29 female   8000 43.09696
## 516  16 hispanic 64.20908  32 female  15000 34.13737
## 517  14    white 66.97400  25   male  65000 47.30097
## 518  10    white 73.18381  21   male  25000 41.92560
## 519  14 hispanic 72.53887  21   male   8000 29.95190
## 520  14    other 64.50500  21   male  15000 44.04373
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## 523  16    white 66.61123  31   male  40000 41.67162
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## 527   6    black 73.91113  62   male   3000 41.31801
## 528  16    black 63.08713  19 female   1000 36.60928
## 529  11    black 62.03633  23 female   8000 44.21524
## 530  12    white 62.45248  18 female   5000 43.99340
## 531  16    white 67.03790  27 female  25000 38.87465
## 532  12    white 68.59331  57   male  20000 42.12859
## 533  12    white 72.67425  34   male  30000 40.64751
## 534  12    white 62.87129  35 female  12000 44.68710
## 535  14    white 67.22335  32 female  10000 38.96712
## 536  12    white 69.39067  19   male  16000 40.99633
## 537  12    white 71.41330  29   male  45000 43.66609
## 538  14    white 72.08596  54   male  40000 40.13315
## 539  14    white 70.21479  81   male  25000 39.33782
## 540  14    white 64.30326  52 female  19000 42.31399
## 541  16    white 64.13060  30 female  17600 39.89072
## 542  12    white 67.91112  67   male   7000 40.77244
## 543  12    white 74.34589  32   male  30000 39.46093
## 544  11    white 61.81896  47 female  18000 47.45731
## 545  16    white 65.12869  47 female  25000 40.22985
## 546   5    white 59.96125  62 female   6000 54.12004
## 547  18    white 69.38679  42   male  70000 41.60087
## 548  16    other 60.75150  34 female  15000 43.98985
## 549  17    white 64.93233  33 female  25000 39.19542
## 550  16    white 66.20340  28 female  35000 40.88268
## 551  16    white 69.91583  24   male  18000 36.21142
## 552  15    black 71.56571  30   male  28000 35.95771
## 553  11 hispanic 63.90538  21 female  15000 40.22203
## 554  14 hispanic 71.33306  28   male  22000 32.78977
## 555  12    white 73.39039  30   male  35000 40.84702
## 556  15    black 64.03798  46 female  18000 39.51482
## 557  14    white 67.84231  37   male  35000 42.43756
## 558  12    black 64.25282  21 female  16400 42.65727
## 559  16    black 65.64795  37   male  22000 38.13507
## 560  16    white 66.54677  58 female  30000 39.93111
## 561  12 hispanic 64.12242  27 female  17000 39.17728
## 562  14    black 64.11060  36 female  25000 41.62808
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## 563  12    white 62.21866  51 female  10000 44.86722
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## 565  12    white 63.24088  63 female  12500 44.49554
## 566  15    white 72.39141  45   male  35000 38.03467
## 567  12    white 74.58005  49   male 105000 49.91236
## 568  18    white 69.52920  40   male 100000 45.74684
## 569  12    white 69.33476  51   male  21000 41.74386
## 570  14    white 64.01763  56 female  10000 41.24263
## 571  12    white 71.93661  26   male  33000 41.59581
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## 574  16    white 71.11434  45   male  18000 35.36068
## 575   8    white 59.34178  61 female  15000 52.31242
## 576  13    white 68.31486  20   male   5000 39.02890
## 577  17    white 77.05128  42   male  60000 35.91854
## 578  14    white 68.41968  69 female  12000 38.40107
## 579  18    black 69.67201  38   male  28000 33.78046
## 580  18    white 69.28192  43   male  42000 37.71140
## 581  12    white 62.73899  33 female   2000 43.36533
## 582  18    black 72.79469  33   male  20000 30.43134
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## 584  17    black 72.19215  62   male  10000 30.61718
## 585  12    black 72.22432  31   male  31000 39.43637
## 586  13    black 68.98432  37 female  17000 38.20984
## 587  12    white 67.17655  39 female  16000 42.19738
## 588  15    white 65.67095  38 female  35000 42.43445
## 589  12    white 67.34625  26 female   3000 40.23653
## 590  18    white 67.53278  39 female  16000 34.90162
## 591  15    black 64.57749  42 female  35000 41.53853
## 592  17    black 61.58435  33 female  27000 40.18296
## 593  17    white 69.38512  29   male  25000 36.40530
## 594  16    white 69.60982  41   male  40000 39.54315
## 595  16    white 66.07183  43 female  45000 42.39176
## 596  12    white 65.85618  23   male  14000 43.22207
## 597  14    white 66.39505  37 female  25000 41.67859
## 598  12    white 71.84415  42   male  40000 42.65242
## 599  12    white 68.89893  35   male  34000 43.89361
## 600  12    white 65.75578  34   male  40000 46.97412
## 601  14    white 69.44946  28   male  35000 41.29677
## 602  12 hispanic 60.15630  51 female  12000 41.28471
## 603  17    white 64.56873  43 female  30000 40.16136
## 604  12    white 61.58792  40 female  23000 47.15533
## 605  12    white 67.07979  30 female   2000 40.28411
## 606  14    white 67.21214  25   male  20000 40.76135
## 607   9    black 67.83994  62 female  10000 42.72644
## 608  16    black 65.61768  43 female  60000 43.16557
## 609  16    black 74.24347  41   male  12000 30.61805
## 610  18    white 65.47813  61 female  25000 37.63418
## 611  14    black 62.88988  73 female  22000 42.06987
## 612  17    white 68.10779  25   male   8000 34.90532
## 613  16    white 66.39806  21 female   2000 36.07275
## 614  16    white 65.49678  26 female  18600 39.06254
## 615  14    white 61.54580  20 female  20000 44.41289
## 616  18    white 72.62916  37   male 100000 43.54641
```

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## 617  15    white 61.89058  40 female  50000 47.24139
## 618  12    white 69.81381  42   male  27000 42.25322
## 619  12    black 58.27594  58 female   1000 44.71967
## 620  12    white 68.37147  20   male  18000 42.00292
## 621  14    white 67.35070  23 female  17000 39.86770
## 622  12    white 63.83751  74 female  10000 43.71811
## 623  14    white 70.36153  35   male  14000 37.67642
## 624  14    white 72.49588  66   male   7200 35.19873
## 625  17    white 63.19196  39 female  33000 41.56333
## 626  12    white 66.26428  34   male  23000 44.20650
## 627  12    white 64.88321  41 female  10000 42.97585
## 628  12    white 60.58631  24   male  22000 48.09532
## 629  12 hispanic 60.81704  19 female  13000 40.95726
## 630  12    white 67.20153  31 female  33000 44.58632
## 631  12    white 73.11522  36   male  36000 41.18391
## 632  14    black 70.52104  32 female  10000 34.95424
## 633  12    white 64.49766  60 female   6000 42.68325
## 634  12    white 66.64803  43 female  12000 42.00627
## 635  11    white 62.07149  47 female  10000 46.14550
## 636  12    white 67.40431  45 female  21000 42.74355
## 637  12    white 68.69590  32   male  26000 42.90518
## 638  12    black 66.06555  50 female  22000 42.16333
## 639  15    black 66.18482  54 female  23000 38.69878
## 640  15    white 66.44449  24   male  20000 40.13243
## 641  13    white 65.50939  38 female  10000 41.35755
## 642  12    white 64.06472  71 female  15000 44.26468
## 643  14    black 72.11810  24   male   7000 33.76648
## 644  12    white 64.13901  38 female  15000 44.21195
## 645  16    white 64.75170  34 female  26000 40.63903
## 646  11    white 72.20326  31   male  10000 39.32428
## 647  14    white 71.00609  20   male   3000 35.66163
## 648  17 hispanic 64.19495  41 female  27000 34.67240
## 649  17    white 63.65898  25 female  28000 40.52399
## 650  12    white 66.86213  27 female  15000 42.27900
## 651  18    white 75.18170  30   male  55000 35.36396
## 652  17 hispanic 65.86811  26 female  20000 32.49376
## 653  12    white 67.14265  44 female   8500 41.15968
## 654  16    white 70.58245  30   male  30000 37.43706
## 655  12    white 68.35426  31 female  20000 41.92769
## 656   6    white 70.44056  75   male  22000 48.14341
## 657  16    white 66.50504  26   male  25000 39.62348
## 658   8    white 70.50765  22   male   3000 43.05834
## 659  12    white 62.66823  49 female  16000 45.39751
## 660  12    black 61.04436  39 female  10000 44.02868
## 661  12    black 64.86502  28 female  15000 42.02451
## 662  12    white 67.24574  46   male  28000 44.21768
## 663  14    white 64.93867  35   male  31500 44.00316
## 664  18    white 65.68957  52   male  95000 47.76448
## 665  12    white 66.51239  40   male  38000 46.15392
## 666  12    white 74.21724  41   male  30000 39.55226
## 667  16    white 73.80273  42   male  35900 35.98647
## 668  13    white 66.28297  22 female  12000 41.09158
## 669  16    white 68.93080  25 female  10000 35.40749
## 670  18    white 66.09704  44 female  45000 40.02623
```

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## 671  16    white 74.36389  56   male  40000 36.16857
## 672  12    white 72.37949  27   male  21500 39.65341
## 673  12    white 65.61603  62   male  14000 43.39253
## 674  17    other 66.52629  54   male  38000 42.34359
## 675  12    white 64.73345  18 female   1000 41.80803
## 676  12    white 66.37034  73   male  14000 42.85710
## 677  12    white 64.52285  31 female  15000 43.93948
## 678  13    white 67.82326  42 female  24000 41.69706
## 679  16    white 64.15133  23 female   4500 38.02146
## 680  16    white 64.35311  63 female  18000 39.78940
## 681  12    white 63.33757  20 female  14000 44.63926
## 682  12    white 68.97627  28 female  10000 40.07048
## 683  12    white 67.44008  32 female   9500 41.09013
## 684  15    white 62.95530  66 female  11000 40.96445
## 685  12    white 66.85605  67   male  17000 42.93704
## 686  13    white 59.82544  28 female   6000 44.82590
## 687  11    white 61.85860  58 female   2500 45.23485
## 688  16    white 72.44135  41   male  40000 37.53325
## 689  16    white 66.60469  39   male  25000 39.55274
## 690  15    black 66.39671  60 female  28000 39.25622
## 691  12    black 66.38942  45 female  33000 43.49069
## 692   8    white 59.57195  64 female   4000 50.59179
## 693  16    white 65.33567  30   male   4100 37.49475
## 694  12    white 68.58468  82 female  25000 42.47197
## 695  12    white 71.66115  28   male  32000 41.64977
## 696   8    white 63.93733  58 female  13000 48.76724
## 697   8 hispanic 64.48913  27   male   8000 42.70873
## 698  12    white 64.24300  38 female  17000 44.42127
## 699  12    white 66.79827  77 female  15000 42.32433
## 700  13    white 65.99471  32   male  18000 42.51619
## 701  12    white 73.07390  24   male  12000 37.81559
## 702   7    white 73.82733  49   male   7000 42.44203
## 703  14    white 64.83539  22 female   1200 39.41635
## 704  12    white 63.11851  21   male  14000 45.16535
## 705  12    white 63.43203  40 female  17000 44.99692
## 706  12    white 66.34629  42   male  30000 45.13927
## 707  12    white 69.91938  53   male  25000 41.89515
## 708  12 hispanic 65.86858  33 female  22000 38.64565
## 709  12    white 63.44294  21 female  15000 44.70603
## 710  12    white 73.07807  91   male  27000 39.93616
## 711  16    white 63.01705  26 female  20000 41.02092
## 712  11    white 68.92440  34 female   9000 41.13955
## 713  12    white 73.14869  30   male  17000 38.47035
## 714  12    white 67.79395  46 female   1800 39.74886
## 715  12    white 63.62625  46 female  18000 45.00062
## 716  18    white 62.57749  42 female  25000 39.69313
## 717  16    black 70.10582  41   male  20000 34.68762
## 718  15    white 64.31609  40 female  75000 49.05891
## 719  12    white 65.75935  40 female   3500 41.43375
## 720  12    white 60.85753  71 female  36000 49.51417
## 721  12    white 72.05727  25   male  30000 41.08546
## 722  13    white 64.55149  78 female  25000 44.16102
## 723  14    white 64.24739  26 female   1000 39.80542
## 724  12    white 68.02362  66   male  60000 48.19572
```

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## 725  13    white 73.89188  76   male  35000 39.31723
## 726  13    white 66.63394  33   male   9000 40.78833
## 727   9    white 69.86527  84   male  35000 46.87070
## 728  10    white 66.11651  58 female  11000 44.58962
## 729  12    white 71.34630  52   male  12000 39.04189
## 730  12    white 70.88307  43   male  30000 41.91894
## 731   7    black 71.47186  57   male  19000 44.14075
## 732   9    white 74.41812  61   male   9000 39.95818
## 733  16    white 74.69529  29   male  30000 34.51765
## 734  12    white 71.92581  32   male   9000 38.20584
## 735  16 hispanic 65.85539  30 female  15000 32.96877
## 736  12    black 64.52972  31 female   8000 41.27154
## 737  10    white 66.49255  75 female  10000 44.18113
## 738  12    white 71.70659  37   male  33000 41.75909
## 739  12 hispanic 60.09432  28 female  12000 41.32870
## 740  15    white 63.97287  37 female  18000 41.23313
## 741  13    white 64.81971  61 female  30000 44.67847
## 742  12    white 64.71230  32 female  12500 43.45109
## 743  12    black 61.97447  36 female  10000 43.36846
## 744  13    black 68.29414  71   male   8500 37.86701
## 745  14    black 73.48687  46   male  21000 34.77685
## 746  12    white 63.93752  77 female  21000 45.20438
## 747  17    white 68.21020  25 female  21000 36.30242
## 748  12    white 66.10164  52 female   5000 41.40313
## 749  17    white 71.22581  36 female  22000 34.30343
## 750  14    white 72.70185  26   male  30000 38.28029
## 751  14    white 61.42908  58 female 123000 59.07729
## 752   9    white 63.24714  45 female   8000 47.37549
## 753   9    white 64.36810  25 female   2000 45.73039
## 754   6    white 67.04141  62 female   7600 48.14704
## 755  12    white 63.15251  25 female  10000 44.20435
## 756  12    white 72.70741  48   male  35000 41.33182
## 757  16    white 66.07587  57 female  15000 38.14184
## 758  12    white 69.75553  22 female   4000 38.66793
## 759   8    white 67.89105  24   male  16000 46.75607
## 760  12    white 66.86191  33 female    200 40.18394
## 761  16    white 74.10505  25   male  23000 33.94564
## 762  16    white 63.60244  27 female  16000 40.03912
## 763  12    white 60.20715  49 female   6000 45.72877
## 764   9    white 59.45893  46 female    600 49.01686
## 765  16    other 74.59877  34   male  28000 36.37165
## 766   8    white 65.95294  66 female   4000 46.06238
## 767  12    white 64.16955  35   male  15000 44.56085
## 768  12    white 71.26410  25   male  15000 39.52495
## 769  12    white 63.12568  30 female  25000 46.34692
## 770  12    white 67.16629  26 female  15000 42.06309
## 771  11    white 68.58090  44   male  40000 46.14258
## 772  11    white 70.34383  51   male  30000 43.47552
## 773  12    white 66.38894  29 female   5000 41.19920
## 774  14    white 73.58718  34   male  35000 38.35969
## 775  14    white 64.78882  31 female  16000 41.54463
## 776  16    white 63.53549  40 female  28000 41.78546
## 777  15    white 67.63722  42   male  20000 39.28580
## 778  13    white 65.60212  30   male  21000 43.21957
```

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## 779  12    black 68.83580  42   male  17000 39.85968
## 780  13    white 59.93190  50 female  24000 47.29857
## 781  12    white 60.79660  75 female  25000 48.00016
## 782  12    white 75.03414  46   male  40000 40.38808
## 783  13    white 63.93496  19 female   8000 42.19199
## 784  15 hispanic 62.74962  45 female  19000 36.91342
## 785  16    white 67.22273  69 female  45000 41.57482
## 786  17    black 64.10166  33   male   5000 35.65219
## 787  14    black 63.43396  40 female  24000 41.96681
## 788  14    white 67.07147  19 female   5000 38.36708
## 789  16    white 65.87795  34   male  33000 41.20115
## 790  14    white 65.22229  24 female  24000 42.36948
## 791  13    white 62.64251  23 female   6000 42.82627
## 792  14    white 66.43623  55 female  90000 50.85132
## 793  18    white 64.09800  47 female  57000 43.14403
## 794  14    white 70.74232  54   male  13800 37.37780
## 795  18    white 71.24931  37   male  30000 34.61607
## 796  12    white 71.70961  40   male  15000 39.20871
## 797  14    white 59.66460  75 female  15000 45.04037
## 798  12    white 69.78665  29   male  31000 42.83878
## 799  17    white 73.99725  40   male  33000 34.26403
## 800  18    white 67.55916  61   male  30000 37.23544
## 801  12    white 74.33899  38   male  12000 36.91760
## 802  12    white 75.00721  22   male   5000 35.45230
## 803  12    white 68.16158  59   male  21000 42.57661
## 804  18    white 62.58655  46 female  28000 40.11141
## 805  12    white 72.03875  31   male  12000 38.55037
## 806  12    white 64.49414  46 female  19000 44.52614
## 807  14    white 62.60842  35 female   6000 41.67665
## 808  13    white 65.90543  60 female   5300 40.41106
## 809  13    white 60.87601  28 female  15000 45.35429
## 810  12    white 73.12189  46   male  17000 38.48937
## 811  12    black 65.54228  78 female   4700 40.08563
## 812  12    white 62.07427  65 female   9500 44.89892
## 813  12    white 64.53591  22   male   1700 42.41794
## 814  12    white 62.35350  31 female   5400 44.12029
## 815  12    white 68.11736  31   male  10000 41.05075
## 816  15    white 58.88042  83 female  25000 45.83887
## 817  16    white 68.42126  43 female  35000 39.30839
## 818  18    white 62.78644  44 female  28000 39.96952
## 819  12    white 62.76001  40 female  42000 49.01314
## 820  12    white 67.82704  58   male  45000 46.21172
## 821  12    white 64.15770  51 female  55000 49.86142
## 822  16    white 70.10556  30 female  36000 38.25439
## 823  10    white 70.27167  31   male  25000 43.99272
## 824  12    white 72.18899  28   male  19000 39.43471
## 825  11    white 68.90136  50   male  38000 45.63198
## 826  14    white 63.07259  37 female  15000 42.62128
## 827   5    white 57.97290  85 female   4500 55.31907
## 828  14    white 63.11989  27 female  96000 54.05476
## 829  12    white 62.70556  47 female  11000 44.66318
## 830  15    white 72.57431  34   male   9000 34.22406
## 831  14    white 69.41363  24 female   5000 36.70455
## 832  12    white 69.82504  51   male  50000 45.50133
```

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## 833  13    white 64.89705  44 female   6000 41.22593
## 834  13    white 71.51572  22   male 100000 50.20584
## 835  13    white 61.91616  46 female  16500 44.82832
## 836  14    white 71.60782  40   male  32000 39.34000
## 837  18    white 72.75964  41   male  30000 33.54399
## 838  16    white 67.91167  42 female  10000 36.13089
## 839  12    white 66.13226  19 female  15000 42.79708
## 840   8    white 59.90598  83 female   6500 50.70860
## 841  18    white 60.30743  63 female  26000 41.44606
## 842  12    white 64.87640  59 female  17000 43.97166
## 843  18    other 62.80542  59 female  22000 41.17526
## 844  12    white 63.93523  41 female  10000 43.64875
## 845  14    white 70.50475  58   male  50000 42.67122
## 846  12    white 67.17893  35   male  20000 43.13256
## 847  12    white 62.90287  31 female    400 43.02249
## 848  14    white 65.08065  59 female  16000 41.33748
## 849  12    white 66.42656  66 female  10000 41.88034
## 850  13    white 62.94001  58 female  14000 43.74764
## 851  15    white 65.19972  20 female   5000 38.52189
## 852  16    white 73.78851  34   male  40000 36.57700
## 853  13    white 67.18860  55 female   5000 39.45776
## 854  17    white 67.54551  47 female  25000 37.34052
## 855  12    white 65.25626  51 female  12000 42.99418
## 856  16    white 63.70218  34 female  58000 45.91419
## 857  16    white 67.83460  26 female  18000 37.31815
## 858  12    white 65.48821  18   male   1000 41.64287
## 859  17    white 71.76438  47   male  21000 34.15016
## 860  12    black 65.69804  62   male  11000 41.23753
## 861  12    white 63.66103  36 female  13000 44.26809
## 862  16    other 59.63484  88 female  20000 45.49032
## 863  12    black 71.69116  35   male  25000 38.96541
## 864  12    white 63.51513  43 female    600 42.61621
## 865  14    black 67.28185  26   male  25000 39.74762
## 866  12    white 67.84666  28   male  36000 44.92368
## 867  13    other 64.05579  33 female  15000 45.16582
## 868  12    white 65.62335  51 female   3500 41.53028
## 869  16    white 64.61287  34 female  19005 39.74730
## 870  14    white 70.36270  54   male  62000 44.47087
## 871  12    white 70.13582  42   male  25000 41.74152
## 872  12    white 66.03882  52   male  50000 48.18890
## 873  12    white 65.66768  61   male  40000 47.03665
## 874  18    white 73.68208  26   male  26000 32.32295
## 875  12    white 62.23430  48 female  22000 46.55494
## 876  17    white 65.58047  39 female  21000 38.16908
## 877  12    white 62.34291  65 female   6108 44.22804
## 878  18    black 64.71665  64 female  30000 37.21046
## 879  12    white 63.41644  78 female   6000 43.45073
## 880  16    white 70.93384  29   male  27000 36.76293
## 881  16    white 65.78463  42 female   4000 36.79132
## 882   6    other 61.52156  72 female   4416 53.68305
## 883  10    white 63.13920  87 female   5000 45.85358
## 884  18    white 66.56994  40   male  45000 40.06114
## 885  14    white 60.76265  45 female  18000 44.68565
## 886  15    white 66.40241  22 female   6000 37.80975
```

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## 887  12    white 72.40009  24   male  14000 38.57702
## 888  14    white 69.32629  24 female  35000 41.01361
## 889  16    white 64.14805  29 female  15000 39.51026
## 890  12    black 62.50258  29 female  12000 43.27674
## 891  12    white 59.63618  47 female   1000 45.42622
## 892  15    black 69.84609  33   male  32000 37.74462
## 893  12    white 72.79965  19   male   1500 36.52380
## 894  16    black 64.87412  23 female   3000 35.62396
## 895  12    white 64.27539  42 female  35000 46.94651
## 896  15    white 71.60516  48   male  70000 43.54767
## 897  16    white 67.13204  28 female  21000 38.24155
## 898  11    white 69.10554  18   male  50000 47.18586
## 899   9    white 70.90079  21   male  15000 43.30429
## 900   8    black 65.99266  35 female   9000 45.06994
## 901  14    black 63.21551  25 female  10000 40.13991
## 902  12    white 71.37289  47   male  30000 41.57125
## 903  14    white 72.07876  21   male  16000 36.74062
## 904  12    white 67.93927  51   male  20000 42.59285
## 905  17    white 71.94711  54   male 100000 45.20436
## 906  12    white 65.66242  43 female  10000 42.42274
## 907  14    white 66.47077  63   male  35000 43.41112
## 908  16    white 65.42764  31 female   7000 37.46942
## 909  14    black 71.35958  27   male   8000 34.44647
## 910  10    white 73.69928  50   male  11000 39.57775
## 911   9    white 70.20955  47   male  25000 45.21064
## 912  14    white 64.33590  45 female  25000 43.14024
## 913  14    white 69.23577  48   male  30000 40.74061
## 914  18    white 63.16803  34 female  48000 42.53003
## 915  12    white 67.97178  46 female  17000 41.77447
## 916  16    white 72.63630  24   male  26000 35.41291
## 917  12    white 62.64564  61 female  10000 44.56414
## 918  18    white 71.15194  53   male  60000 38.93224
## 919  18    white 64.94458  29 female  22000 37.58821
## 920  13    white 64.22719  83 female   6200 41.72973
## 921  16    white 64.74690  32 female  24000 40.35930
## 922  14    white 70.69914  40   male  20000 38.28618
## 923  14    white 69.61523  30 female   7000 36.84459
## 924  16    black 67.70270  48 female  30000 37.43851
## 925  18    white 66.09329  28 female  23000 36.91438
## 926  12    white 64.39957  40 female  20000 44.73484
## 927  16    white 65.88019  29 female   3000 36.58192
## 928  16    white 69.73543  41   male  30000 38.03830
## 929  14    white 63.79241  23 female  12000 41.68563
## 930  12    white 70.60792  38   male  40000 43.52993
## 931  14    white 63.83650  23 female  15000 42.07904
## 932  16    white 63.41338  45 female  36000 43.00469
## 933  12    white 66.23722  53 female  10000 42.01473
## 934  14    white 68.38071  48 female  13000 38.57030
## 935  12    black 61.52425  27 female  10000 43.68804
## 936  12    black 68.53243  37   male  30000 41.91540
## 937  13    white 64.46456  32   male  23000 44.31018
## 938  17    white 69.60981  68   male  20000 35.53796
## 939  13    white 65.37075  82 female  19000 42.73007
## 940  11    black 60.75108  66   male  20000 47.19696
```

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## 941  14    black 63.99366  63   male  28000 42.50638
## 942  10    white 64.58116  80 female  13000 45.96259
## 943  12    white 64.13895  75   male  12000 44.15787
## 944  11    white 69.30129  23   male  20000 42.79986
## 945  12    white 73.63658  30   male  25000 39.25658
## 946  13    white 68.19243  52 female  25000 41.57658
## 947  16    white 66.59646  40 female  18000 38.19701
## 948  10    white 61.80107  68 female   6000 46.94499
## 949  13    white 72.24264  23   male  16000 37.79810
## 950  16    white 73.46034  38   male  45000 37.51778
## 951  14    white 69.87076  69   male  25000 39.58203
## 952  14    white 63.51997  38 female  12000 41.87902
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## 954  12    white 62.91207  18 female  10000 44.37502
## 955  12    white 70.72026  36   male  14000 39.76941
## 956  12    white 63.74181  31 female  15000 44.49389
## 957  12    white 60.36111  39 female  10000 46.18576
## 958   4    white 65.76632  64 female   1200 50.49373
## 959  14    white 58.92336  62 female  15000 45.56652
## 960  13    white 63.10044  64 female  10000 43.06749
## 961  12    white 66.20177  18   male   2000 41.27794
## 962  13    white 65.44585  33 female   4000 40.55324
## 963  14    white 64.39271  32 female  10000 40.97639
## 964  12    white 65.77418  23 female   1500 41.14008
## 965  17 hispanic 65.50058  26   male  18000 32.84210
## 966  15    white 72.89740  24   male   4000 33.28688
## 967  16    white 72.44737  26   male  28000 35.83015
## 968  14    white 74.32628  22 female  10000 33.92526
## 969  16    white 64.65599  22 female   3000 37.45089
## 970  12    white 70.61207  21   male  12000 39.56307
## 971  13    white 68.07568  45 female  19000 40.81005
## 972  16    white 70.49066  39   male  36000 38.35162
## 973  16    white 64.21713  59 female   7000 38.32867
## 974  11    white 58.72468  34 female  35000 52.06037
## 975  18    white 67.90288  43   male  40000 38.40714
## 976  14    white 67.93034  25   male  15000 39.54371
## 977  13    white 68.82437  43 female   8000 38.72135
## 978  14    white 69.43574  55 female  25000 39.52023
## 979  18    white 75.26532  38   male  28000 31.48225
## 980  14    white 69.13342  35   male  22000 39.68071
## 981  13    black 72.04506  24   male  21500 37.04489
## 982  12    white 68.33676  23 female   3000 39.53344
## 983  13    white 71.53957  28   male  23000 39.28814
## 984  12    white 72.35495  73   male  18000 39.17534
## 985  16    white 67.29746  71   male  20000 38.35315
## 986  12 hispanic 63.21394  46 female  16000 39.68058
## 987  12    white 69.21808  26   male  15000 40.97727
## 988  17 hispanic 62.87644  32 female  53000 39.28909
## 989  12    white 72.30503  27   male  26000 40.34332
## 990  12    other 65.43678  28 female   4000 43.80212
## 991  16    white 72.68583  59   male  10000 33.11265
## 992  12    white 69.12368  51   male  43000 45.00819
## 993  14    other 68.80012  33   male  17000 41.27807
## 994  12 hispanic 61.49719  38 female   4000 39.20036
```

```
## 995  15    white 73.19213  48   male  50000 39.58982
## 996  18    white 66.86296  51 female  55000 40.89824
## 997  16    white 63.07393  41 female  28000 42.11308
## 998  14    white 62.15914  48 female   5000 41.85399
## 999  13    white 65.39749  49 female  18000 42.56953
## 1000 15 hispanic 71.56490  62   male  21000 31.30982
## 1001 12    white 67.19160  33 female  12000 41.62042
## 1002 16 hispanic 65.49676  62 female  33000 35.77157
## 1003 13 hispanic 72.42630  64   male  50000 37.15149
## 1004  9 hispanic 65.38834  74 female   6000 40.24290
## 1005 14    white 63.81682  59 female  16000 42.23458
## 1006 12    white 68.20842  50   male  35000 44.52532
## 1007 12    white 68.29211  43 female  25000 42.67964
## 1008 14    white 76.38236  26   male  20000 34.25207
## 1009 12    white 62.61693  36 female  18000 45.71706
## 1010 14    white 74.39722  78   male  34000 37.64314
## 1011 16    white 68.47598  25   male  25000 38.22445
## 1012 17    white 72.08176  77   male  20000 33.78331
## 1013 12    white 67.56834  69   male  33000 44.69654
## 1014 12    white 64.54943  73 female   4000 42.36336
## 1015  8    white 60.10434  77 female  20000 52.47898
## 1016 16    white 72.36485  33   male  40000 37.58755
## 1017 14    white 63.72689  40 female  14000 42.01528
## 1018 12    white 68.01107  48 female  12000 41.03875
## 1019 12    white 61.14690  31 female  25000 47.75151
## 1020 10    white 67.08765  72 female  70000 52.25282
## 1021 17    white 67.20368  55 female  38000 39.42355
## 1022 12    white 63.04842  28 female  14000 44.84451
## 1023 13    white 60.24540  37 female  15000 45.80192
## 1024 16    white 73.56450  31   male  17000 33.47993
## 1025 14    white 68.81879  66   male  60000 45.28364
## 1026 15    white 66.74730  69 female  15000 38.83906
## 1027 16    white 64.91763  86   male  25000 40.75026
## 1028 12 hispanic 62.20893  63   male  18000 41.04769
## 1029 18    white 71.82154  47   male  70000 39.87262
## 1030 18    white 64.57803  59 female  30000 38.98094
## 1031 12    white 62.36229  51 female   8000 44.48213
## 1032 16    white 70.92462  34   male  30000 37.19417
## 1033 14    white 71.35941  32   male  27000 38.80848
## 1034 18    white 70.07702  43   male  47000 37.85485
## 1035 12 hispanic 66.55482  22   male  12000 37.11344
## 1036 17    white 61.77156  34 female  24000 41.29746
## 1037 12 hispanic 62.89387  35 female  13000 39.48307
## 1038 14    white 60.81635  37 female  80000 53.42478
## 1039 12    white 71.81258  18   male   5000 37.71994
## 1040 10    white 62.51972  60 female  25000 49.12468
## 1041 12    white 65.83384  44   male  28000 45.21988
## 1042 15    white 64.12672  20 female   8000 39.70824
## 1043 13    white 66.43378  51 female  10000 40.70139
## 1044 14    white 68.26159  41 female   9000 38.08858
## 1045 12    white 59.55762  37 female  20000 48.17178
## 1046 12    white 65.18920  71   male  12000 43.41237
## 1047 14    white 64.76620  66 female  15000 41.41911
## 1048 14    white 61.33605  36 female  20000 44.56177
```

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## 1049 14    white 63.90803  36 female  28000 43.86866
## 1050 15    white 65.98172  21 female    265 37.29648
## 1051 14    white 69.35291  74   male  35000 41.36530
## 1052 14 hispanic 65.99869  32 female  26000 36.77194
## 1053 17    white 66.64220  34 female  27000 38.26485
## 1054 12    white 68.37846  30 female  14000 41.06110
## 1055 16    white 65.51632  33   male  32000 41.31628
## 1056 14    white 69.09659  32 female  10000 37.63744
## 1057 16    white 69.32438  30   male   7000 35.07400
## 1058 17    white 71.01265  46   male  28000 35.67474
## 1059 13    white 73.87646  54   male  60000 42.86739
## 1060  4    white 68.53997  62   male  12000 50.42445
## 1061 13    white 75.15666  75 female  15000 35.21749
## 1062 11    white 71.85208  63   male  15000 40.28140
## 1063 15    white 64.38789  32 female  26000 42.07108
## 1064 16 hispanic 71.68615  25   male  26000 30.75778
## 1065 10    black 62.75757  36 female  18720 46.39471
## 1066 12    black 63.80686  73 female  12000 42.35092
## 1067 17    white 70.42836  39   male  80000 43.45104
## 1068 13    white 66.41484  39 female  48000 46.09444
## 1069 16    other 62.49871  27   male  18000 43.54492
## 1070 15    white 69.73083  65   male  85000 47.00164
## 1071 12    black 63.64059  47 female  35000 45.72502
## 1072 16    white 68.70302  22   male   5000 35.23192
## 1073 13 hispanic 64.18301  22 female   9000 36.82791
## 1074 16    white 67.13533  27 female  30000 39.51333
## 1075 14    white 71.67133  58   male  80000 46.09020
## 1076 16    white 65.06636  32 female  35000 41.68979
## 1077 14    white 63.38769  34 female  12000 41.97291
## 1078 18    white 69.66276  34   male 200000 59.80888
## 1079 16    white 64.20871  45 female   4000 37.90995
## 1080 12    white 68.04928  18   male   2000 39.96653
## 1081 18    white 65.95546  69 female  24000 37.15379
## 1082 15 hispanic 66.31635  23   male   2000 32.34559
## 1083 17    white 69.68933  30   male  15000 34.77367
## 1084 12    white 62.25103  65 female   6000 44.27797
## 1085 12    white 65.91611  75   male   5000 41.90541
## 1086 12 hispanic 66.49011  21 female   1500 35.30232
## 1087 18    white 63.54176  48 female  28000 39.43338
## 1088 12    white 69.91641  35 female   9000 39.26158
## 1089 14    white 74.14910  52   male  60000 41.50004
## 1090 12    white 65.50048  19   male   1200 41.66248
## 1091  3 hispanic 61.64302  64 female   1400 49.29312
## 1092 13    white 66.43334  43 female   7000 40.27700
## 1093 12    white 62.27002  31 female  21000 46.38802
## 1094 12    white 69.05178  58   male  44000 45.20080
## 1095 16    black 67.69980  36   male  29000 37.66959
## 1096 14 hispanic 71.82785  18   male   3000 29.74875
## 1097 13    black 64.32170  22   male  12000 41.18224
## 1098 12 hispanic 72.47294  28   male  20000 34.04515
## 1099  5    black 61.72064  73 female   1200 50.51956
## 1100 16    white 73.76301  25   male  37000 36.17039
## 1101 10    other 66.28669  60   male   8000 46.48333
## 1102 16 hispanic 67.89220  30   male  35000 34.72494
```
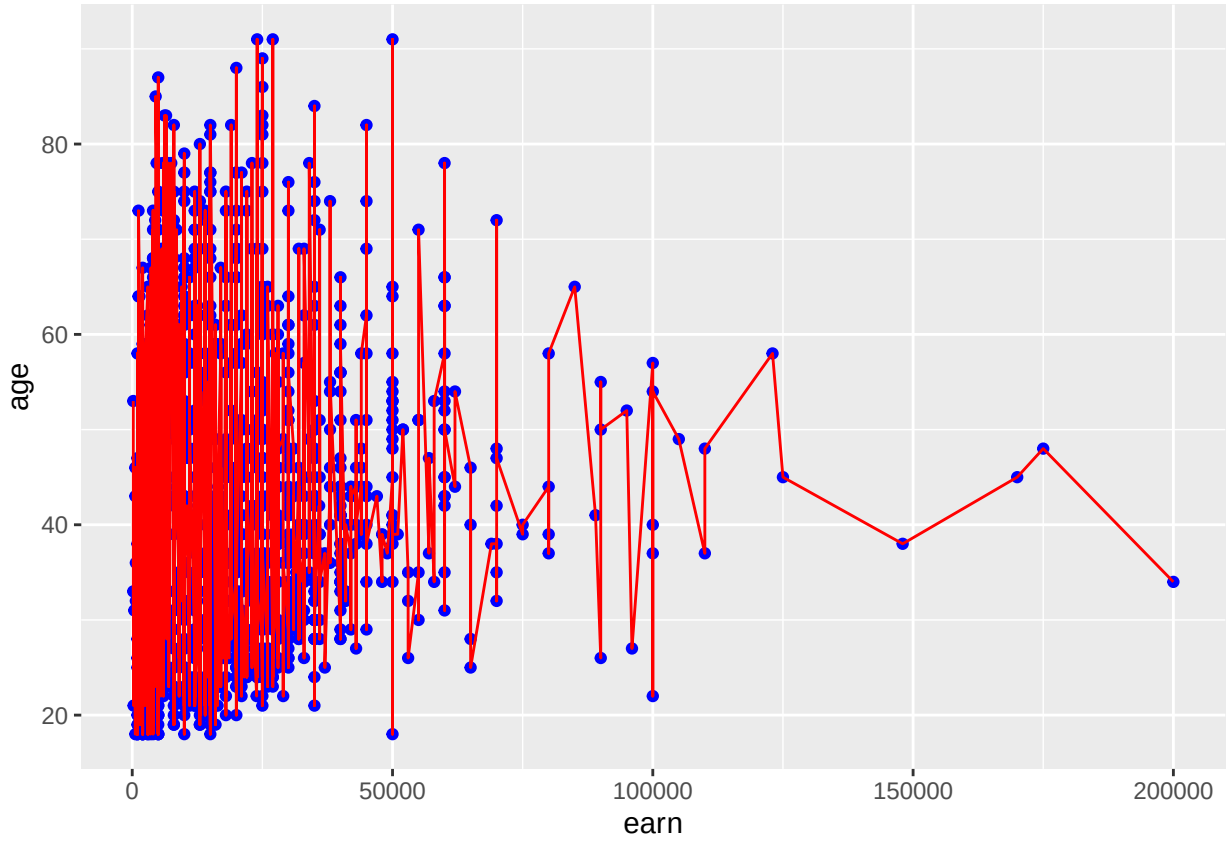

```
## 1103 14    other 61.94551  37   male  25000 47.27622
## 1104 10    white 71.17571  29 female  18000 41.98944
## 1105 16    black 62.52137  36 female  30000 41.11636
## 1106 18    white 69.24438  69   male  20000 34.62354
## 1107  6 hispanic 71.20133  40   male  12000 40.85813
## 1108 12    white 65.93158  68 female  10000 42.23168
## 1109 14    white 71.89919  48   male  18000 37.15121
## 1110 12    black 72.11578  26   male  20000 37.95616
## 1111 16    white 67.54589  43 female  31000 39.36347
## 1112 10 hispanic 63.50634  36   male   6000 40.77557
## 1113 13    white 69.84664  40   male  12000 38.93258
## 1114 16    white 66.35971  33 female  13000 37.65722
## 1115 17    white 66.51458  34 female  26000 38.21386
## 1116 11    black 68.06513  31 female  15000 40.92681
## 1117 17    white 63.77365  28 female  30000 40.72573
## 1118 14    white 64.70483  41 female   2000 39.62229
## 1119 13    other 69.95972  22   male   5000 39.92995
## 1120 14    white 71.26888  26 female  53000 42.18293
## 1121 13    white 61.87336  18 female   2000 42.80596
## 1122 17    white 70.85695  29   male  25000 35.36055
## 1123 12    white 74.30637  18   male   5000 35.94977
## 1124 13    white 64.20481  27 female  21000 43.84083
## 1125 15    white 69.74732  27 female  17000 36.99270
## 1126 13    white 64.00159  37 female  12000 42.71097
## 1127 14 hispanic 69.62591  44   male  42000 36.83292
## 1128 12    white 73.66522  33   male  21000 38.66997
## 1129 12 hispanic 62.72194  65 female   6000 38.61413
## 1130 14    white 73.55019  24   male  25000 36.97027
## 1131 14    white 66.08877  19 female   3000 38.78149
## 1132 15    white 65.39048  67 female   3600 38.18828
## 1133 12    white 70.91890  19   male   4000 38.21272
## 1134 14    white 68.52425  58   male  20000 39.82998
## 1135 15    white 60.29879  50   male  52000 49.02501
## 1136 12    white 64.01087  43 female  60000 50.67348
## 1137 13    white 63.81617  41 female  15000 43.26729
## 1138 16    white 71.89981  50   male  90000 44.99607
## 1139 14    white 61.41213  65 female  26000 45.35717
## 1140 12    white 68.69143  21   male   2000 39.51071
## 1141 12    white 67.11030  61 female  16000 42.24441
## 1142 11 hispanic 64.56858  27 female  24000 41.02539
## 1143 16 hispanic 68.26174  28   male  15000 31.63127
## 1144 17    white 74.42452  43   male  42000 35.23485
## 1145 12    white 65.19333  43 female  10000 42.75572
## 1146 13 hispanic 70.70130  36   male  17000 33.70419
## 1147 14    white 64.43980  34 female  30000 43.77433
## 1148 17    white 68.86163  37 female  32000 37.39728
## 1149 17 hispanic 64.38678  34 female  36000 35.81035
## 1150 13 hispanic 71.90196  20   male  10000 31.86095
## 1151 15    white 62.55289  29 female  20000 42.52421
## 1152 12    white 64.88607  29 female  24000 44.95578
## 1153 12    white 71.65621  32   male  17000 39.52975
## 1154 14    white 65.15171  48 female  23000 42.27801
## 1155 12    white 64.28045  33 female  25000 45.52723
## 1156 12    white 70.88341  50   male  50000 44.75007
```

```
## 1157 12    white 61.76662  30 female  20000 46.60378
## 1158 16    white 66.27003  33 female  30000 40.12754
## 1159 10    white 64.07142  39 female   7000 45.47501
## 1160 10    white 66.80599  78   male   7000 43.90453
## 1161 11    white 68.07656  32   male  30000 45.08489
## 1162 12    white 65.75189  24 female   3000 41.36825
## 1163 14    white 66.01494  43 female  20000 41.24057
## 1164 16    white 65.76547  59 female  40000 41.90138
## 1165 12    white 66.74771  77   male  10000 42.02296
## 1166 12    white 66.14089  37   male  16000 43.30311
## 1167  9    white 63.30037  51 female  11000 47.76242
## 1168 13    white 67.61928  43 female  16000 40.70930
## 1169 12    white 70.42987  27   male  18000 40.54181
## 1170 16    white 62.62478  26 female  12000 40.16681
## 1171 14    black 69.98806  21   male   4000 34.85374
## 1172 12    white 71.81932  45   male  60000 45.50142
## 1173 17    white 74.77192  40   male  43000 35.12983
## 1174 14    white 61.96560  39 female  31000 45.67215
## 1175 17    white 68.21042  39 female  50000 40.40775
## 1176 14    white 68.04935  29 female  27000 40.78747
## 1177 17    white 70.49075  56   male  30000 36.32833
## 1178 13    black 73.38321  21   male  12000 34.75014
## 1179 17    white 62.13713  30 female  20000 40.47169
## 1180 12    black 59.77629  76 female  15000 45.63664
## 1181 16    other 64.15965  37 female  25000 42.98633
## 1182  6 hispanic 60.19710  67 female   2000 46.88296
## 1183 15 hispanic 73.26521  20   male   3000 27.55465
## 1184 18    other 66.31204  48 female 110000 51.14420
## 1185 18    white 68.99589  71   male  55000 39.75482
## 1186 18    white 70.34337  53   male  58000 39.22305
## 1187 16    white 70.05628  36 female  10000 34.60859
## 1188 12    white 72.16573  29   male  19000 39.45122
## 1189 18    white 61.13580  82 female  15000 39.30080
## 1190 12    white 63.66416  33 female   8000 43.55802
## 1191 12    white 71.92584  50   male  60000 45.42581
## 1192 12    white 68.36849  27   male   6000 40.30622
```

```
## Plot the predictions against the original data
ggplot(data = heights_df, aes(y = age , x = earn)) +
  geom_point(color='blue') +
  geom_line(color='red',data = earn_predict_df, aes(y=age, x=earn))
```




```
mean_earn <- mean(heights_df$earn)
mean_earn
```

```
## [1] 23154.77
```

```
## Corrected Sum of Squares Total
sst <- sum((mean_earn - heights_df$earn)^2)
sst
```

```
## [1] 451591883937
```

```
## Corrected Sum of Squares for Model
ssm <- sum((mean_earn - earn_predict_df$age)^2)
head(ssm)
```

```
## [1] 636801309144
```

```
## Residuals
residuals <- heights_df$earn - earn_predict_df$age
head(residuals)
```

```
## [1] 49955 59942 29971 49909 50961  8974
```

```r
## Sum of Squares for Error
sse <- sum(residuals^2)
sse
```

```
## [1] 1.088334e+12
```

```r
## R Squared R^2 = SSM\SST
r_squared <- ssm/sst
r_squared
```

```
## [1] 1.410126
```

```r
## Number of observations
n <- NROW(earn_predict_df$age)
n
```

```
## [1] 1192
```

```r
## Number of regression parameters
p <- 2
```

```r
## Corrected Degrees of Freedom for Model (p-1)
dfm <- p - 1
dfm
```

```
## [1] 1
```

```r
## Degrees of Freedom for Error (n-p)
dfe <- n - p
dfe
```

```
## [1] 1190
```

```r
## Corrected Degrees of Freedom Total:   DFT = n - 1
dft <- n - 1
dft
```

```
## [1] 1191
```

```r
## Mean of Squares for Model:   MSM = SSM / DFM
msm <- ssm/dfm
msm
```

```
## [1] 636801309144
```

```r
## Mean of Squares for Error:   MSE = SSE / DFE
mse <- sse/dfe
mse
```

```
## [1] 914566031
```

```r
## Mean of Squares Total:   MST = SST / DFT
mst <- sst/dft
mst
```

```
## [1] 379170348
```

```r
## F Statistic F = MSM/MSE
f_score <- msm/mse
f_score
```

```
## [1] 696.288
```

```r
## Adjusted R Squared R2 = 1 - (1 - R2)(n - 1) / (n - p)
adjusted_r_squared <- 1 - (1 - r_squared)*(n-1) / (n-p)
adjusted_r_squared
```

```
## [1] 1.41047
```

```r
## Calculate the p-value from the F distribution
p_value <- pf(f_score, dfm, dft, lower.tail=F)
p_value
```

```
## [1] 3.339045e-121
```