

# DSC\_520\_week8\_Assignment00

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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: ppccor
```

```
## Warning: package 'ppccor' 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 outcome  
age_lm <- lm(formula = earn ~ ed + race + height + age + sex, data = heights_df)  
age_lm
```

```
##  
## Call:  
## lm(formula = earn ~ ed + race + height + age + sex, data = heights_df)  
##  
## Coefficients:  
## (Intercept)          ed  racehispanic    raceother    racewhite  
##   -41478.5      2768.4    -1414.3        371.0      2432.5  
##      height        age      sexmale  
##      202.5        178.3      10325.6
```

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

```
##  
## Call:  
## lm(formula = earn ~ ed + race + height + age + sex, data = heights_df)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -39423  -9827  -2208   6157 158723
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -41478.4    12409.4  -3.342 0.000856 ***
## ed           2768.4      209.9   13.190 < 2e-16 ***
## racehispanic -1414.3     2685.2  -0.527 0.598507
## raceother     371.0     3837.0   0.097 0.922983
## racewhite     2432.5     1723.9   1.411 0.158489
## height        202.5      185.6   1.091 0.275420
## age          178.3       32.2   5.537 3.78e-08 ***
## sexmale       10325.6     1424.5   7.249 7.57e-13 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 17250 on 1184 degrees of freedom
## Multiple R-squared:  0.2199, Adjusted R-squared:  0.2153
## F-statistic: 47.68 on 7 and 1184 DF,  p-value: < 2.2e-16
```

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

```
##      ed      race  beight age      sex      earn
## 1    16    white 74.42444 45    male 38666.1091
## 2    16    white 65.53754 58 female 28859.0888
## 3    16    white 63.62920 29 female 23301.9009
## 4    16    other 63.10856 91 female 32189.8351
## 5    17    white 63.40248 39 female 27807.3900
## 6    15    white 64.39951 26 female 20154.5994
## 7    12    white 61.65633 49 female 15395.0698
## 8    17    white 72.69854 46    male 41263.3218
## 9    15 hispanic 72.03947 21    male 27288.8369
## 10   12    white 72.23493 26    male 23761.5861
## 11   16    white 69.51215 65    male 41237.5589
## 12   11    white 68.03161 34    male 21568.5845
## 13   12    white 67.55693 27    male 22992.7118
## 14   12    white 65.43059 51 female 16515.8698
## 15   16    white 65.66285 35 female 24783.4853
## 16   12    white 67.75877 58    male 28560.9807
## 17   14    white 68.35184 29 female 18721.3982
## 18   13    white 69.60957 44    male 29207.8357
## 19   12    black 64.18457 55 female 14544.3151
## 20   13    black 73.07461 35    male 25872.2095
## 21   13    white 62.37553 51 female 18665.6566
## 22   14    white 63.02393 21 female 16216.2029
## 23   14    white 67.22990 22    male 27571.6999
## 24   12    white 65.55111 41 female 14757.2392
## 25   12    white 72.07965 45    male 27117.9070
```

##	26	12	black	63.09113	35	female	10756.8557
##	27	16	white	64.32355	60	female	28969.8920
##	28	16	white	71.64285	38	male	36854.7844
##	29	16	white	76.79309	33	male	37006.0629
##	30	14	white	63.89391	25	female	17105.5662
##	31	12	white	63.80262	33	female	12976.7884
##	32	17	white	71.59223	39	male	39791.1982
##	33	17	white	67.52196	31	male	37540.6444
##	34	12	white	64.39435	26	female	11848.4754
##	35	14	white	61.17822	78	female	26005.7817
##	36	14	black	66.98388	31	female	16368.5465
##	37	12	white	65.31646	57	female	17562.5809
##	38	14	white	63.57419	26	female	17219.1323
##	39	15	white	66.61100	65	female	27556.2002
##	40	12	white	64.91176	30	female	12666.4499
##	41	12	white	64.78968	41	female	14603.0691
##	42	18	white	66.93769	29	female	29508.5079
##	43	17	white	68.17281	30	female	27168.5325
##	44	12	hispanic	60.45066	21	female	6311.7243
##	45	13	white	64.79325	32	female	15767.4229
##	46	12	white	61.81492	29	female	11861.1148
##	47	10	white	71.57215	18	male	16664.2418
##	48	8	black	67.31441	56	male	14608.4818
##	49	12	white	69.89987	65	male	30242.6239
##	50	17	white	69.76170	41	male	39777.1684
##	51	17	white	67.74647	49	female	30469.9717
##	52	12	white	60.19022	65	female	17951.0732
##	53	12	white	71.00650	28	male	23869.4658
##	54	12	white	71.16680	32	male	24615.1354
##	55	13	white	72.73563	18	male	25204.8983
##	56	14	white	68.13822	55	female	23314.0315
##	57	12	white	66.37981	57	female	17777.8837
##	58	16	white	69.23278	29	male	34762.0762
##	59	14	white	63.27394	27	female	17336.6430
##	60	14	hispanic	61.82776	28	male	23700.9856
##	61	14	white	64.22121	43	female	20381.2946
##	62	9	white	63.84127	68	female	10920.1480
##	63	9	white	66.97477	52	female	8701.7514
##	64	12	white	71.45149	39	male	25920.9013
##	65	16	white	59.61265	53	female	26767.9291
##	66	16	white	65.79939	27	female	23384.7030
##	67	15	white	66.45804	21	female	19679.8843
##	68	14	white	64.60288	39	female	19745.3603
##	69	13	white	70.44048	22	female	15127.8122
##	70	13	white	65.92281	68	female	22415.0495
##	71	12	white	61.85683	47	female	15079.0596
##	72	15	white	65.78444	67	female	27745.4491
##	73	12	white	71.83128	39	male	25997.7994
##	74	8	hispanic	67.04533	39	female	-217.0009
##	75	12	hispanic	68.30551	32	male	20189.0596
##	76	12	white	70.02546	33	male	24562.3463
##	77	12	white	61.81039	38	female	13464.9267
##	78	13	white	62.95107	26	female	14324.6073
##	79	13	white	65.82114	63	female	21502.9460

##	80	10	white	70.39755	61	female	13767.8680
##	81	12	white	68.37778	36	female	14438.0539
##	82	14	white	69.93270	23	male	28297.2517
##	83	12	white	66.17181	20	female	11138.5456
##	84	16	white	68.45636	32	female	24814.1909
##	85	16	white	69.90386	27	male	34541.3451
##	86	12	hispanic	61.14966	22	female	6631.5572
##	87	12	white	63.36335	73	female	20019.9780
##	88	14	white	64.14708	56	female	22684.2290
##	89	12	white	67.31839	89	male	33999.2175
##	90	17	white	60.67494	79	female	34387.2621
##	91	18	white	68.84090	63	female	35956.1730
##	92	12	white	67.68273	66	female	19646.4220
##	93	12	white	64.49677	33	female	13117.3354
##	94	14	black	66.81240	30	female	16155.5240
##	95	17	white	68.74644	23	male	36362.1434
##	96	13	white	67.06765	43	female	18189.2674
##	97	12	white	68.13799	30	female	13319.6823
##	98	12	white	63.34290	37	female	13596.9185
##	99	12	white	71.38667	22	male	22876.6202
##	100	17	black	63.98834	43	female	26206.7441
##	101	11	white	68.48639	37	male	22195.5757
##	102	17	white	67.51614	44	female	29531.8197
##	103	14	hispanic	65.60084	43	female	16813.9003
##	104	16	white	76.80019	30	male	36472.5904
##	105	12	white	67.10538	58	female	18103.0967
##	106	12	white	62.15164	44	female	14603.8427
##	107	18	white	66.86762	35	female	30564.1411
##	108	18	white	61.04220	43	female	30811.0654
##	109	12	white	64.12329	28	female	12150.1980
##	110	16	white	61.54482	38	female	24484.5954
##	111	12	white	62.55624	40	female	13972.5494
##	112	16	white	68.16377	24	male	33654.1101
##	113	15	white	63.65513	26	female	20003.8811
##	114	15	white	72.37352	21	male	31203.2095
##	115	16	white	64.14708	35	female	24476.5794
##	116	13	white	61.32670	31	female	14887.2293
##	117	12	white	74.36640	38	male	26332.7938
##	118	14	white	70.21016	35	male	30493.0705
##	119	16	white	71.10619	41	male	37281.0332
##	120	12	white	62.59484	39	female	13802.0632
##	121	14	white	64.05496	43	female	20347.6343
##	122	16	white	61.57362	40	female	24847.0340
##	123	17	white	70.48020	42	female	29775.3602
##	124	17	white	71.18591	62	male	43809.9036
##	125	14	white	71.43364	31	male	30027.5806
##	126	14	white	70.22885	71	female	26590.1837
##	127	14	white	67.28086	31	male	29186.7466
##	128	12	white	63.75869	32	female	12789.5900
##	129	12	white	67.08652	30	female	13106.7845
##	130	8	white	61.67960	69	female	7892.4078
##	131	13	hispanic	62.28600	56	female	15692.3100
##	132	13	black	68.29248	44	male	26508.6772
##	133	14	black	61.58948	44	female	17594.2594

##	134	18	black	68.41774	56	female	32189.8893
##	135	13	white	73.99126	45	male	30273.3202
##	136	12	other	67.56107	50	female	14707.4816
##	137	16	white	62.33793	22	female	21792.3283
##	138	15	white	66.24001	28	female	20883.8615
##	139	12	white	68.09847	27	male	23102.3598
##	140	14	hispanic	59.77087	28	female	12958.9270
##	141	8	white	68.06338	43	male	14874.6673
##	142	12	white	71.68015	26	male	23649.2561
##	143	12	white	66.35971	42	female	15099.2638
##	144	10	white	68.35626	32	male	18509.3514
##	145	12	white	68.45654	18	female	11244.5410
##	146	12	white	68.78610	60	female	18800.0077
##	147	16	white	64.10224	46	female	26428.8368
##	148	14	white	65.11349	39	female	19848.7450
##	149	12	white	60.64919	46	female	14656.2392
##	150	12	white	72.12570	49	male	27840.4458
##	151	16	white	65.51073	34	female	24574.3806
##	152	14	white	67.93190	64	male	35202.5749
##	153	12	white	70.44492	24	male	23042.5474
##	154	14	white	71.36585	32	male	30192.1593
##	155	16	white	71.12507	61	male	40850.9230
##	156	16	white	68.16014	48	male	37932.6547
##	157	14	white	60.11333	49	female	20619.3713
##	158	12	white	62.78820	36	female	13306.3025
##	159	12	white	68.07772	56	male	28268.9541
##	160	12	white	64.05084	37	female	13740.2597
##	161	12	white	69.71580	74	male	31810.0826
##	162	16	white	68.22067	46	male	37588.3050
##	163	12	white	60.88386	63	female	17734.9109
##	164	18	white	68.40754	63	male	46194.0171
##	165	17	white	66.00198	43	female	29046.9362
##	166	16	white	69.79789	25	male	34163.2827
##	167	12	white	71.01071	50	male	27792.9912
##	168	12	white	65.14241	42	female	14852.7915
##	169	12	white	65.96711	49	female	16267.8954
##	170	13	white	69.99053	37	male	28036.8476
##	171	12	white	61.87668	65	female	18292.5383
##	172	14	white	66.10888	57	female	23259.7471
##	173	15	white	61.05431	38	female	21616.9194
##	174	14	white	71.56357	43	male	32193.5272
##	175	18	white	74.34062	45	male	44185.8584
##	176	12	white	66.57699	47	female	16034.7741
##	177	16	white	66.11044	28	female	23625.9877
##	178	12	white	61.96569	41	female	14031.2808
##	179	14	white	71.74551	32	male	30269.0304
##	180	15	white	64.56222	47	female	23931.9140
##	181	12	white	60.19882	62	female	17417.9044
##	182	15	white	61.91637	39	female	21969.7698
##	183	12	white	66.41355	38	female	14396.9526
##	184	12	white	63.69852	39	female	14025.5302
##	185	12	white	71.29091	68	male	31059.1848
##	186	12	white	65.25376	50	female	16301.7626
##	187	18	white	73.00546	50	male	44807.0382

##	188	11	white	68.64007	51	male	24722.9399
##	189	14	white	64.38145	22	female	16669.3705
##	190	12	white	61.06026	77	female	20266.8747
##	191	18	white	66.78936	51	female	33401.1483
##	192	13	white	61.82930	32	female	15167.2962
##	193	14	black	62.60956	54	female	19583.8326
##	194	10	other	67.36466	28	male	15533.9087
##	195	12	white	68.01697	24	female	12225.3586
##	196	16	white	72.06415	46	male	38366.5124
##	197	12	white	70.10862	38	male	25470.7014
##	198	18	white	69.85249	44	male	43098.8196
##	199	14	black	67.45525	32	male	26967.8803
##	200	12	black	63.45313	33	female	10473.5447
##	201	18	other	66.29297	35	female	28386.3322
##	202	17	white	65.83480	50	female	30261.2088
##	203	18	white	71.01003	45	male	43511.4977
##	204	16	white	66.61942	33	male	34946.1494
##	205	16	black	75.56859	38	male	35217.1679
##	206	14	white	68.95220	30	male	29346.8480
##	207	12	white	65.34873	22	female	11328.5008
##	208	13	white	61.75212	43	female	17113.0052
##	209	12	white	61.76413	31	female	12207.4384
##	210	12	white	62.41147	21	female	10555.4750
##	211	16	white	61.90433	73	female	30798.0036
##	212	12	white	60.63861	30	female	11801.2450
##	213	14	white	64.82458	28	female	17828.9120
##	214	14	white	72.27075	22	male	28592.3457
##	215	14	white	71.67228	55	male	34355.1778
##	216	12	white	63.77093	39	female	14040.1908
##	217	14	white	70.78659	51	male	33462.6362
##	218	15	white	72.40979	41	male	34776.6209
##	219	12	white	66.08798	34	male	23943.4083
##	220	14	white	64.99933	69	female	25174.7302
##	221	15	black	64.52930	39	female	20066.3422
##	222	12	white	61.74268	64	female	18087.1040
##	223	14	black	65.84031	34	female	16671.9125
##	224	14	white	67.39964	63	male	34916.5028
##	225	13	white	64.02227	44	female	17750.9584
##	226	12	white	63.22614	38	female	13751.5818
##	227	16	white	67.49430	34	female	24976.0035
##	228	18	white	68.00212	39	female	31507.0613
##	229	10	other	63.85791	82	female	14126.6688
##	230	13	black	64.39506	39	female	14502.4429
##	231	12	black	66.43901	23	male	19620.6667
##	232	12	white	64.76538	32	female	12993.4187
##	233	12	white	64.53856	28	male	22559.8703
##	234	12	white	71.58593	41	male	26304.7281
##	235	12	white	68.34822	38	female	14788.6748
##	236	18	white	74.43320	30	male	41530.0543
##	237	12	white	63.21770	33	male	23183.9446
##	238	12	white	64.31432	61	female	18072.8860
##	239	12	white	68.15146	37	male	24896.1214
##	240	18	white	67.49495	29	female	29621.3400
##	241	12	white	67.31617	29	female	12974.9809

##	242	12	white	72.98672	21	male	23022.2883
##	243	8	white	70.49116	78	male	21606.8465
##	244	16	hispanic	64.88575	23	female	18639.7662
##	245	16	hispanic	68.54049	65	male	37194.0874
##	246	14	white	76.68067	28	male	30555.0627
##	247	12	white	67.69396	33	female	13764.6871
##	248	17	white	61.97134	24	female	24843.0689
##	249	12	white	64.21270	29	female	12346.6060
##	250	12	hispanic	67.22247	42	male	21752.8060
##	251	16	white	69.90214	22	male	33649.4813
##	252	12	white	61.77745	52	female	15954.5038
##	253	12	white	63.08135	37	female	13543.9621
##	254	14	white	62.33487	29	female	17503.1117
##	255	13	white	68.69584	35	female	17092.5079
##	256	12	white	64.09801	48	female	15711.1467
##	257	14	white	69.03400	40	female	20820.8553
##	258	15	white	58.66032	26	female	18992.5571
##	259	12	other	66.22625	35	female	11762.6637
##	260	12	black	62.09126	21	female	8058.1599
##	261	11	black	75.13845	34	male	20575.0625
##	262	17	white	63.31428	26	female	25471.5877
##	263	13	white	64.55410	28	female	15005.7870
##	264	12	white	69.80036	32	male	24338.4659
##	265	16	white	67.84325	42	female	26473.0834
##	266	14	white	64.95007	67	female	24808.1504
##	267	8	white	69.21831	53	male	16891.5440
##	268	16	white	71.88612	53	male	39578.5901
##	269	17	white	63.52426	49	female	29615.0789
##	270	18	hispanic	62.67856	54	female	29256.9870
##	271	14	white	73.47394	45	female	22611.3479
##	272	12	white	75.09407	24	male	23983.8837
##	273	12	white	64.77306	38	female	14064.7948
##	274	17	white	66.25353	26	female	26066.7117
##	275	14	white	66.39351	28	female	18146.5814
##	276	16	white	64.00329	39	female	25160.6785
##	277	18	white	65.57394	50	female	32976.7524
##	278	16	white	64.27616	29	female	23432.8955
##	279	13	white	62.64666	32	female	15332.7915
##	280	12	white	72.55974	23	male	23292.4408
##	281	8	white	71.78231	58	male	18302.2076
##	282	14	white	71.50386	33	male	30398.4050
##	283	12	white	64.15775	55	female	16971.3658
##	284	13	white	64.22769	30	female	15296.3033
##	285	15	white	67.79798	36	male	32951.3276
##	286	12	white	62.27896	68	female	18908.8997
##	287	13	white	68.50410	57	female	20976.3581
##	288	12	white	60.11268	36	female	12764.5772
##	289	12	white	64.97933	91	female	23556.6329
##	290	12	white	75.96951	39	male	26835.6871
##	291	12	white	72.32790	35	female	15059.5504
##	292	18	white	61.76565	47	female	31670.7588
##	293	13	white	61.61640	36	female	15837.4031
##	294	12	white	70.55408	61	male	29661.8707
##	295	12	white	74.08120	42	male	26988.2608



##	296	16	white	65.47242	32	female	24210.0166
##	297	12	other	63.36531	31	female	10470.1824
##	298	12	white	66.85000	39	female	14663.6266
##	299	12	white	63.26609	31	female	12511.5481
##	300	12	white	64.74551	18	female	10493.1490
##	301	15	white	63.54206	71	female	28004.6366
##	302	12	white	64.92311	36	female	13738.5688
##	303	16	white	63.24201	33	female	23936.7178
##	304	12	white	69.52456	27	female	13065.5178
##	305	12	white	67.97809	30	male	23612.8961
##	306	14	white	66.54874	43	male	31178.1500
##	307	12	white	64.58870	28	female	12244.4335
##	308	14	white	68.76669	44	male	31805.5324
##	309	14	white	68.08389	25	female	17953.9306
##	310	17	white	65.81591	38	female	28117.7459
##	311	13	hispanic	71.40238	38	male	24654.2781
##	312	16	hispanic	63.76354	23	male	28738.1351
##	313	12	white	73.52538	24	male	23666.2634
##	314	13	white	61.97999	41	female	16802.5365
##	315	12	white	65.21052	59	female	17897.7382
##	316	12	white	69.37547	66	male	30314.7483
##	317	16	white	66.08656	48	female	27187.2182
##	318	11	white	66.52544	63	male	26434.4194
##	319	12	white	73.17216	29	male	24486.2620
##	320	12	white	76.18488	57	male	30088.7539
##	321	14	white	69.52563	76	male	37664.9053
##	322	15	black	62.87571	22	female	16700.3760
##	323	13	black	62.78291	37	female	13819.4161
##	324	12	black	70.07592	35	male	22496.6895
##	325	12	white	71.06308	33	male	24772.4377
##	326	12	white	65.22338	62	female	18435.2526
##	327	16	white	70.38000	75	male	43196.3109
##	328	13	white	63.24725	44	female	17594.0362
##	329	12	white	63.92087	22	female	11039.3950
##	330	18	white	64.32948	40	female	30941.7474
##	331	14	white	66.73039	30	male	28896.9865
##	332	16	white	66.49049	36	male	35454.9541
##	333	13	white	68.01891	27	female	15529.0212
##	334	12	white	65.22522	22	female	11303.4913
##	335	12	white	67.12425	20	female	11331.3908
##	336	17	white	72.93588	23	male	37210.4002
##	337	12	white	63.57961	67	female	18993.9457
##	338	12	white	71.44772	69	male	31269.2374
##	339	16	white	63.28314	31	female	23588.4396
##	340	16	white	70.58955	48	male	38424.5506
##	341	18	white	73.37096	25	male	40423.4603
##	342	14	white	64.68889	63	female	24042.0538
##	343	13	white	65.92309	82	male	35236.9418
##	344	12	white	65.84832	81	female	21949.5488
##	345	13	white	59.20287	41	female	16240.2405
##	346	16	white	69.99012	30	male	35093.7214
##	347	16	white	71.66564	28	male	35076.3661
##	348	12	white	64.20183	72	female	20011.4459
##	349	16	white	66.06455	54	female	28252.5810

##	350	18	white	69.66688	57	male	45379.1831
##	351	13	white	68.56316	28	male	26143.1111
##	352	12	white	67.72061	35	female	14126.6899
##	353	17	white	73.83110	43	male	40957.7259
##	354	16	white	72.53878	74	male	43455.1062
##	355	12	white	67.24277	52	male	27386.6842
##	356	12	hispanic	63.98628	39	female	10237.0591
##	357	18	white	66.74020	38	male	41398.8390
##	358	12	white	69.77329	32	male	24332.9842
##	359	15	white	63.75686	31	female	20915.9951
##	360	16	white	61.55948	37	female	24309.2611
##	361	18	white	69.29717	69	male	47443.9648
##	362	17	white	68.47821	41	male	39517.2932
##	363	14	white	72.11037	39	male	31591.0278
##	364	12	white	63.10641	37	female	13549.0364
##	365	12	white	68.71668	34	female	14150.0657
##	366	18	white	64.00637	36	female	30163.1118
##	367	12	white	71.00964	25	female	13009.6015
##	368	16	black	63.84402	27	female	20556.3105
##	369	8	white	66.10071	67	male	18756.5541
##	370	15	white	60.97499	25	female	19282.9171
##	371	16	white	67.75510	32	female	24672.2021
##	372	17	white	68.45831	34	male	38265.1413
##	373	13	white	63.80380	26	female	14497.2642
##	374	14	black	65.70889	34	male	26970.8926
##	375	13	black	61.93158	26	female	11685.7068
##	376	16	black	65.32257	30	female	21390.5907
##	377	18	white	65.96504	37	male	41063.5858
##	378	13	hispanic	72.04236	32	male	23714.0389
##	379	13	white	62.57023	78	female	23519.2693
##	380	12	white	70.43141	23	male	22861.5081
##	381	12	white	62.32131	29	female	11963.6455
##	382	12	white	70.70824	36	male	25235.5021
##	383	18	white	70.27755	46	male	43541.4908
##	384	11	white	63.87068	51	female	13431.6674
##	385	12	white	63.47754	35	female	13267.5736
##	386	12	white	64.59348	46	female	15454.8599
##	387	12	white	70.51344	27	male	23591.3297
##	388	15	white	61.70052	33	female	20856.2451
##	389	12	white	72.55343	66	male	30958.2055
##	390	17	white	67.58731	40	male	39158.6045
##	391	15	white	76.15187	32	male	33929.5669
##	392	12	white	65.57775	71	female	20111.7316
##	393	15	white	64.22912	39	female	22438.0422
##	394	14	white	60.31368	72	female	24760.9132
##	395	12	white	68.13747	74	male	31490.5104
##	396	11	white	60.94487	72	female	16583.6340
##	397	12	white	66.02238	28	male	22860.3058
##	398	14	white	62.88533	31	female	17971.1735
##	399	15	white	62.67241	32	female	20874.7259
##	400	15	white	73.68754	73	male	40741.0372
##	401	12	white	70.10196	32	male	24399.5328
##	402	13	white	68.30324	39	female	17726.2301
##	403	18	white	69.52018	46	female	33062.5542

##	404	15	white	68.71778	21	male	30463.0151
##	405	10	white	70.49465	75	male	26609.3650
##	406	14	white	62.77760	41	female	19732.3926
##	407	12	white	65.12696	30	female	12710.0245
##	408	12	white	69.34231	46	male	26741.9694
##	409	14	white	67.54425	49	male	32449.5362
##	410	11	white	62.34081	71	female	16687.9737
##	411	12	white	66.17610	23	female	11674.3244
##	412	13	white	65.45162	27	male	25334.7993
##	413	14	white	69.78536	36	male	30585.3615
##	414	12	white	70.46079	47	male	27146.7351
##	415	14	black	65.75426	29	female	15762.9729
##	416	16	white	68.49064	26	male	34076.9000
##	417	16	white	68.13681	33	male	35253.3821
##	418	18	white	69.74409	50	male	44146.6915
##	419	13	white	64.55673	47	female	18394.0823
##	420	15	white	64.39143	40	female	22649.2109
##	421	16	white	65.29906	30	female	23818.3093
##	422	16	white	76.53780	41	male	38380.7980
##	423	14	white	70.02428	28	male	29207.3103
##	424	16	white	64.45588	26	female	22934.3737
##	425	14	white	64.17829	20	female	16271.6292
##	426	12	white	64.37256	60	female	17906.3761
##	427	8	white	63.68146	48	female	4553.3658
##	428	16	white	62.56621	28	female	22908.3689
##	429	12	black	57.50322	56	female	13369.8129
##	430	16	white	62.02662	44	female	25651.9685
##	431	14	hispanic	64.45005	53	female	18363.9273
##	432	12	white	63.63646	28	female	12051.6281
##	433	12	white	62.23202	37	female	13371.9936
##	434	12	white	64.01304	56	female	17120.3691
##	435	13	white	65.88741	34	female	16345.5695
##	436	12	black	69.29444	41	female	13082.6907
##	437	13	white	64.34100	31	female	15497.5505
##	438	14	white	70.70352	41	male	31662.7839
##	439	12	white	62.08915	73	female	19761.9842
##	440	9	white	68.29980	46	male	18225.8073
##	441	9	white	67.80439	58	male	20265.1386
##	442	10	white	61.77627	44	female	8991.1191
##	443	12	white	62.51287	57	female	16994.9240
##	444	16	white	68.73132	51	male	38583.2140
##	445	12	white	67.04634	44	female	15594.8965
##	446	18	white	64.29710	29	female	28973.8554
##	447	12	white	70.38619	22	male	22674.0488
##	448	10	white	68.95557	20	male	16491.0570
##	449	11	black	69.24640	51	male	22413.2261
##	450	12	white	68.57202	23	male	22485.0287
##	451	12	black	59.84566	48	female	12417.6732
##	452	12	black	66.42150	42	female	12679.2956
##	453	16	white	66.63238	49	male	37801.6257
##	454	15	white	66.24960	20	male	29784.9667
##	455	12	black	70.23859	18	female	9172.8812
##	456	8	black	64.48861	51	female	2819.2228
##	457	18	other	59.97167	35	female	27106.4276

##	458	18	white	68.26500	36	male	41350.9676
##	459	12	black	72.73850	24	male	21074.4603
##	460	8	white	71.86160	36	male	14395.5886
##	461	12	white	63.75193	38	female	13858.0399
##	462	13	white	67.34015	67	male	32849.3114
##	463	13	white	67.24025	40	female	17689.3048
##	464	9	black	71.46243	50	male	17146.8933
##	465	16	white	72.73708	31	male	35828.2159
##	466	16	white	70.28583	25	male	34262.0793
##	467	16	white	70.06343	36	male	36178.3833
##	468	14	white	71.13169	27	female	18927.6406
##	469	12	white	65.96480	30	female	12879.6650
##	470	12	white	74.80273	21	male	23389.9836
##	471	14	white	60.26324	37	female	18510.0861
##	472	12	white	72.45994	28	male	24163.7511
##	473	9	black	74.78834	55	male	18711.8231
##	474	12	white	59.80482	41	female	13593.7593
##	475	12	black	73.43138	44	male	24780.8166
##	476	12	black	64.59752	32	female	10526.9526
##	477	16	white	67.11170	31	male	34689.2159
##	478	12	white	61.05400	69	female	18839.1795
##	479	17	white	69.28213	43	female	29711.0852
##	480	14	white	64.41598	34	female	18816.0021
##	481	12	white	70.34138	33	male	24626.3120
##	482	10	white	67.63296	24	female	6610.8866
##	483	12	white	62.18865	53	female	16216.0656
##	484	15	white	63.78785	42	female	22883.6066
##	485	12	white	67.58146	45	female	15881.5469
##	486	11	white	63.51531	64	female	15677.6565
##	487	14	white	72.64024	37	male	31341.7070
##	488	16	white	72.82462	37	male	36915.7598
##	489	14	hispanic	69.40743	29	male	25413.9825
##	490	13	white	68.29110	19	female	14157.7057
##	491	11	black	70.64524	18	male	16812.4475
##	492	16	white	66.13450	41	female	25948.8021
##	493	12	white	66.37326	57	male	28102.1464
##	494	12	hispanic	68.30015	68	female	16281.3051
##	495	12	white	70.29628	33	male	24617.1799
##	496	12	white	61.82134	78	female	20599.2759
##	497	14	white	65.75500	43	female	20691.8489
##	498	16	black	63.02599	34	female	21638.8034
##	499	12	white	74.51779	24	male	23867.2018
##	500	12	white	66.59654	29	female	12829.2731
##	501	9	white	62.63598	25	female	3009.0652
##	502	18	black	64.71526	65	female	33044.9612
##	503	12	black	69.20172	35	female	11994.0965
##	504	14	white	71.47208	61	male	35384.4631
##	505	12	white	61.90178	55	female	16514.5877
##	506	12	black	64.74551	35	female	11091.8256
##	507	18	hispanic	71.71052	35	male	38023.5596
##	508	12	white	64.90903	40	female	14448.9315
##	509	12	white	63.15415	19	female	10349.2422
##	510	13	white	63.97677	31	female	15423.8022
##	511	12	white	71.58899	26	male	23630.7982

##	512	12	white	63.59626	34	female	13113.3075
##	513	13	white	70.06810	33	female	17013.7510
##	514	12	white	64.97475	27	female	12144.2942
##	515	12	white	64.31371	29	female	12367.0567
##	516	16	hispanic	64.20908	32	female	20107.4858
##	517	14	white	66.97400	25	male	28054.7962
##	518	10	white	73.18381	21	male	17525.4740
##	519	14	hispanic	72.53887	21	male	24621.5927
##	520	14	other	64.50500	21	male	24780.2172
##	521	16	white	63.93105	40	female	25324.3555
##	522	13	black	67.08204	37	female	14689.8817
##	523	16	white	66.61123	31	male	34587.8845
##	524	12	white	73.89562	22	male	23384.6202
##	525	13	white	63.44261	31	female	15315.6473
##	526	12	white	73.68861	36	male	25838.9524
##	527	6	black	73.91113	62	male	11477.2523
##	528	16	black	63.08713	19	female	18976.6337
##	529	11	black	62.03633	23	female	5635.2845
##	530	12	white	62.45248	18	female	10028.8694
##	531	16	white	67.03790	27	female	23635.4705
##	532	12	white	68.59331	57	male	28551.6510
##	533	12	white	72.67425	34	male	25276.9639
##	534	12	white	62.87129	35	female	13144.8235
##	535	14	white	67.22335	32	female	19027.8165
##	536	12	white	69.39067	19	male	21937.5714
##	537	12	white	71.41330	29	male	24130.1363
##	538	14	white	72.08596	54	male	34260.6348
##	539	14	white	70.21479	81	male	38695.9601
##	540	14	white	64.30326	52	female	22002.6379
##	541	16	white	64.13060	30	female	23581.7259
##	542	12	white	67.91112	67	male	30196.5575
##	543	12	white	74.34589	32	male	25258.8220
##	544	11	white	61.81896	47	female	12303.0319
##	545	16	white	65.12869	47	female	26814.9709
##	546	5	white	59.96125	62	female	-2008.7172
##	547	18	white	69.38679	42	male	42647.9218
##	548	16	other	60.75150	34	female	21549.3010
##	549	17	white	64.93233	33	female	27047.3255
##	550	16	white	66.20340	28	female	23644.8091
##	551	16	white	69.91583	24	male	34008.8586
##	552	15	black	71.56571	30	male	30211.8988
##	553	11	hispanic	63.90538	21	female	4242.8588
##	554	14	hispanic	71.33306	28	male	25625.5705
##	555	12	white	73.39039	30	male	24708.7495
##	556	15	black	64.03798	46	female	21214.9862
##	557	14	white	67.84231	37	male	30370.2464
##	558	12	black	64.25282	21	female	8495.8229
##	559	16	black	65.64795	37	male	33030.1826
##	560	16	white	66.54677	58	female	29063.4319
##	561	12	hispanic	64.12242	27	female	8124.9845
##	562	14	black	64.11060	36	female	16678.2959
##	563	12	white	62.21866	51	female	15865.5343
##	564	12	white	68.94602	37	male	25056.9992
##	565	12	white	63.24088	63	female	18212.1489

##	566	15	white	72.39141	45	male	35486.1117
##	567	12	white	74.58005	49	male	28337.3897
##	568	18	white	69.52920	40	male	42320.1496
##	569	12	white	69.33476	51	male	27631.9562
##	570	14	white	64.01763	56	female	22658.0177
##	571	12	white	71.93661	26	male	23701.1839
##	572	18	white	69.46231	25	male	39632.0570
##	573	10	white	63.07907	78	female	15317.2150
##	574	16	white	71.11434	45	male	37995.8977
##	575	8	white	59.34178	61	female	5992.6316
##	576	13	white	68.31486	20	male	24666.4100
##	577	17	white	77.05128	42	male	41431.4291
##	578	14	white	68.41968	69	female	25867.2656
##	579	18	black	69.67201	38	male	39559.9783
##	580	18	white	69.28192	43	male	42804.9915
##	581	12	white	62.73899	33	female	12761.4293
##	582	18	black	72.79469	33	male	39300.7266
##	583	15	other	66.12674	40	male	31264.7016
##	584	17	black	72.19215	62	male	41581.1624
##	585	12	black	72.22432	31	male	22218.4736
##	586	13	black	68.98432	37	female	15075.0462
##	587	12	white	67.17655	39	female	14729.7447
##	588	15	white	65.67095	38	female	22551.6751
##	589	12	white	67.34625	26	female	12446.1609
##	590	18	white	67.53278	39	female	31412.0315
##	591	15	black	64.57749	42	female	20611.0094
##	592	17	black	61.58435	33	female	23936.9644
##	593	17	white	69.38512	29	male	37561.2803
##	594	16	white	69.60982	41	male	36978.0554
##	595	16	white	66.07183	43	female	26292.7186
##	596	12	white	65.85618	23	male	21935.1390
##	597	14	white	66.39505	37	female	19751.6241
##	598	12	white	71.84415	42	male	26535.3159
##	599	12	white	68.89893	35	male	24690.8592
##	600	12	white	65.75578	34	male	23876.1458
##	601	14	white	69.44946	28	male	29090.9234
##	602	12	hispanic	60.15630	51	female	11601.2226
##	603	17	white	64.56873	43	female	28756.7391
##	604	12	white	61.58792	40	female	13776.4890
##	605	12	white	67.07979	30	female	13105.4221
##	606	14	white	67.21214	25	male	28103.0129
##	607	9	black	67.83994	62	female	8227.4802
##	608	16	black	65.61768	43	female	23768.2854
##	609	16	black	74.24347	41	male	35483.7745
##	610	18	white	65.47813	61	female	34918.6892
##	611	14	black	62.88988	73	female	23028.3538
##	612	17	white	68.10779	25	male	36589.4398
##	613	16	white	66.39806	21	female	22436.0990
##	614	16	white	65.49678	26	female	23145.1293
##	615	14	white	61.54580	20	female	15738.6145
##	616	18	white	72.62916	37	male	42412.9035
##	617	15	white	61.89058	40	female	22142.8505
##	618	12	white	69.81381	42	male	26124.2232
##	619	12	black	58.27594	58	female	13882.8767

##	620	12	white	68.37147	20	male	21909.5117
##	621	14	white	67.35070	23	female	17448.8725
##	622	12	white	63.83751	74	female	20294.2879
##	623	14	white	70.36153	35	male	30523.7178
##	624	14	white	72.49588	66	male	36483.2725
##	625	17	white	63.19196	39	female	27764.7635
##	626	12	white	66.26428	34	male	23979.1054
##	627	12	white	64.88321	41	female	14622.0070
##	628	12	white	60.58631	24	male	21046.4251
##	629	12	hispanic	60.81704	19	female	6029.3004
##	630	12	white	67.20153	31	female	13308.3751
##	631	12	white	73.11522	36	male	25722.8558
##	632	14	black	70.52104	32	female	17263.0368
##	633	12	white	64.49766	60	female	17931.7054
##	634	12	white	66.64803	43	female	15335.9451
##	635	11	white	62.07149	47	female	12354.1644
##	636	12	white	67.40431	45	female	15845.6803
##	637	12	white	68.69590	32	male	24114.8411
##	638	12	black	66.06555	50	female	14033.6501
##	639	15	black	66.18482	54	female	23076.0937
##	640	15	white	66.44449	24	male	30537.6398
##	641	13	white	65.50939	38	female	16982.2432
##	642	12	white	64.06472	71	female	19805.3814
##	643	14	black	72.11810	24	male	26485.5643
##	644	12	white	64.13901	38	female	13936.4144
##	645	16	white	64.75170	34	female	24420.6955
##	646	11	white	72.20326	31	male	21878.3301
##	647	14	white	71.00609	20	male	27979.6762
##	648	17	hispanic	64.19495	41	female	24477.7154
##	649	17	white	63.65898	25	female	25363.0775
##	650	12	white	66.86213	27	female	12526.4430
##	651	18	white	75.18170	30	male	41681.6067
##	652	17	hispanic	65.86811	26	female	22141.9392
##	653	12	white	67.14265	44	female	15614.3959
##	654	16	white	70.58245	30	male	35213.6535
##	655	12	white	68.35426	31	female	13541.7737
##	656	6	white	70.44056	75	male	15524.9714
##	657	16	white	66.50504	26	male	33674.8662
##	658	8	white	70.50765	22	male	11625.2021
##	659	12	white	62.66823	49	female	15599.9557
##	660	12	black	61.04436	39	female	11055.6492
##	661	12	black	64.86502	28	female	9867.9012
##	662	12	white	67.24574	46	male	26317.4657
##	663	14	white	64.93867	35	male	29425.7248
##	664	18	white	65.68957	52	male	43682.3600
##	665	12	white	66.51239	40	male	25099.1609
##	666	12	white	74.21724	41	male	26837.5026
##	667	16	white	73.80273	42	male	38005.3195
##	668	13	white	66.28297	22	female	14286.0193
##	669	16	white	68.93080	25	female	23662.1292
##	670	18	white	66.09704	44	female	32012.8469
##	671	16	white	74.36389	56	male	40615.1864
##	672	12	white	72.37949	27	male	23969.1583
##	673	12	white	65.61603	62	male	28840.3432

##	674	17	other	66.52629	54	male	39378.5663
##	675	12	white	64.73345	18	female	10490.7084
##	676	12	white	66.37034	73	male	30954.4084
##	677	12	white	64.52285	31	female	12766.0103
##	678	13	white	67.82326	42	female	18163.9569
##	679	16	white	64.15133	23	female	22337.8004
##	680	16	white	64.35311	63	female	29510.7878
##	681	12	white	63.33757	20	female	10564.6834
##	682	12	white	68.97627	28	female	13132.8052
##	683	12	white	67.44008	32	female	13534.9792
##	684	15	white	62.95530	66	female	26994.3161
##	685	12	white	66.85605	67	male	29982.9319
##	686	13	white	59.82544	28	female	14048.3511
##	687	11	white	61.85860	58	female	14272.3951
##	688	16	white	72.44135	41	male	37551.3699
##	689	16	white	66.60469	39	male	36012.9855
##	690	15	black	66.39671	60	female	24188.8151
##	691	12	black	66.38942	45	female	13207.7092
##	692	8	white	59.57195	64	female	6574.1450
##	693	16	white	65.33567	30	male	34151.3113
##	694	12	white	68.58468	82	female	22681.8966
##	695	12	white	71.66115	28	male	24002.0163
##	696	8	white	63.93733	58	female	6388.2051
##	697	8	hispanic	64.48913	27	male	7451.3825
##	698	12	white	64.24300	38	female	13957.4701
##	699	12	white	66.79827	77	female	21428.6765
##	700	13	white	65.99471	32	male	26336.2777
##	701	12	white	73.07390	24	male	23574.8500
##	702	7	white	73.82733	49	male	14343.1828
##	703	14	white	64.83539	22	female	16761.2824
##	704	12	white	63.11851	21	male	21024.2213
##	705	12	white	63.43203	40	female	14149.8751
##	706	12	white	66.34629	42	male	25422.1372
##	707	12	white	69.91938	53	male	28106.9340
##	708	12	hispanic	65.86858	33	female	9548.3577
##	709	12	white	63.44294	21	female	10764.3226
##	710	12	white	73.07807	91	male	35522.0146
##	711	16	white	63.01705	26	female	22643.0461
##	712	11	white	68.92440	34	female	11423.7632
##	713	12	white	73.14869	30	male	24659.8123
##	714	12	white	67.79395	46	female	16102.8752
##	715	12	white	63.62625	46	female	15259.0206
##	716	18	white	62.57749	42	female	30943.6203
##	717	16	black	70.10582	41	male	34646.0032
##	718	15	white	64.31609	40	female	22633.9553
##	719	12	white	65.75935	40	female	14621.0989
##	720	12	white	60.85753	71	female	19156.0062
##	721	12	white	72.05727	25	male	23547.3112
##	722	13	white	64.55149	78	female	23920.4236
##	723	14	white	64.24739	26	female	17355.4391
##	724	12	white	68.02362	66	male	30041.0319
##	725	13	white	73.89188	76	male	35780.6018
##	726	13	white	66.63394	33	male	26644.0094
##	727	9	white	69.86527	84	male	25318.2994



##	728	10	white	66.11651	58	female	12366.1550
##	729	12	white	71.34630	52	male	28217.5464
##	730	12	white	70.88307	43	male	26519.0245
##	731	7	black	71.47186	57	male	12860.2055
##	732	9	white	74.41812	61	male	22139.1614
##	733	16	white	74.69529	29	male	35868.0967
##	734	12	white	71.92581	32	male	24768.8163
##	735	16	hispanic	65.85539	30	female	20084.2164
##	736	12	black	64.52972	31	female	10334.9207
##	737	10	white	66.49255	75	female	15473.4491
##	738	12	white	71.70659	37	male	25615.9467
##	739	12	hispanic	60.09432	28	female	7487.6981
##	740	15	white	63.97287	37	female	22029.5514
##	741	13	white	64.81971	61	female	20943.5762
##	742	12	white	64.71230	32	female	12982.6709
##	743	12	black	61.97447	36	female	10709.0642
##	744	13	black	68.29414	71	male	31323.2034
##	745	14	black	73.48687	46	male	30685.3790
##	746	12	white	63.93752	77	female	20849.4467
##	747	17	white	68.21020	25	female	26284.5863
##	748	12	white	66.10164	52	female	16830.0439
##	749	17	white	71.22581	36	female	28856.5080
##	750	14	white	72.70185	26	male	29392.8451
##	751	14	white	61.42908	58	female	22490.5085
##	752	9	white	63.24714	45	female	6698.8758
##	753	9	white	64.36810	25	female	3359.7764
##	754	6	white	67.04141	62	female	2193.1969
##	755	12	white	63.15251	25	female	11418.7307
##	756	12	white	72.70741	48	male	27779.9235
##	757	16	white	66.07587	57	female	28789.7827
##	758	12	white	69.75553	22	female	12220.7658
##	759	8	white	67.89105	24	male	11452.0119
##	760	12	white	66.86191	33	female	13596.2172
##	761	16	white	74.10505	25	male	35035.3742
##	762	16	white	63.60244	27	female	22939.8764
##	763	12	white	60.20715	49	female	15101.6471
##	764	9	white	59.45893	46	female	6110.1616
##	765	16	other	74.59877	34	male	34678.6152
##	766	8	white	65.95294	66	female	8222.7431
##	767	12	white	64.16955	35	male	23733.2783
##	768	12	white	71.26410	25	male	23386.7131
##	769	12	white	63.12568	30	female	12304.8142
##	770	12	white	67.16629	26	female	12409.7245
##	771	11	white	68.58090	44	male	23462.8363
##	772	11	white	70.34383	51	male	25067.9084
##	773	12	white	66.38894	29	female	12787.2398
##	774	14	white	73.58718	34	male	30998.5292
##	775	14	white	64.78882	31	female	18356.5813
##	776	16	white	63.53549	40	female	25244.2632
##	777	15	white	67.63722	42	male	33988.5965
##	778	13	white	65.60212	30	male	25900.1813
##	779	12	black	68.83580	42	male	23493.7191
##	780	13	white	59.93190	50	female	17992.5790
##	781	12	white	60.79660	75	female	19856.8833

##	782	12	white	75.03414	46	male	27894.4214
##	783	13	white	63.93496	19	female	13275.6963
##	784	15	hispanic	62.74962	45	female	19361.5648
##	785	16	white	67.22273	69	female	31161.6332
##	786	17	black	64.10166	33	male	34772.2452
##	787	14	black	63.43396	40	female	17254.5059
##	788	14	white	67.07147	19	female	16679.1216
##	789	16	white	65.87795	34	male	34974.3231
##	790	14	white	65.22229	24	female	17196.2264
##	791	13	white	62.64251	23	female	13727.2214
##	792	14	white	66.43623	55	female	22969.4197
##	793	18	white	64.09800	47	female	32143.0015
##	794	14	white	70.74232	54	male	33988.5826
##	795	18	white	71.24931	37	male	42133.5187
##	796	12	white	71.70961	40	male	26151.4676
##	797	14	white	59.66460	75	female	25164.4014
##	798	12	white	69.78665	29	male	23800.7803
##	799	17	white	73.99725	40	male	40456.4566
##	800	18	white	67.55916	61	male	45665.6349
##	801	12	white	74.33899	38	male	26327.2444
##	802	12	white	75.00721	22	male	23609.6902
##	803	12	white	68.16158	59	male	28820.8435
##	804	18	white	62.58655	46	female	31658.6667
##	805	12	white	72.03875	31	male	24613.3809
##	806	12	white	64.49414	46	female	15434.7457
##	807	14	white	62.60842	35	female	18628.3179
##	808	13	white	65.90543	60	female	20985.1031
##	809	13	white	60.87601	28	female	14261.0664
##	810	12	white	73.12189	46	male	27507.2384
##	811	12	black	65.54228	78	female	18920.1932
##	812	12	white	62.07427	65	female	18332.5466
##	813	12	white	64.53591	22	male	21489.5139
##	814	12	white	62.35350	31	female	12326.7703
##	815	12	white	68.11736	31	male	23819.3977
##	816	15	white	58.88042	83	female	29200.4103
##	817	16	white	68.42126	43	female	26768.4195
##	818	18	white	62.78644	44	female	31342.5326
##	819	12	white	62.76001	40	female	14013.8094
##	820	12	white	67.82704	58	male	28574.8042
##	821	12	white	64.15770	51	female	16258.1418
##	822	16	white	70.10556	30	female	24791.5060
##	823	10	white	70.27167	31	male	18718.8705
##	824	12	white	72.18899	28	male	24108.8895
##	825	11	white	68.90136	50	male	24597.5413
##	826	14	white	63.07259	37	female	19078.9085
##	827	5	white	57.97290	85	female	1689.6672
##	828	14	white	63.11989	27	female	17305.4515
##	829	12	white	62.70556	47	female	15250.9058
##	830	15	white	72.57431	34	male	33561.8074
##	831	14	white	69.41363	24	female	18044.8665
##	832	12	white	69.82504	51	male	27731.2253
##	833	13	white	64.89705	44	female	17928.0789
##	834	13	white	71.51572	22	male	25671.1102
##	835	13	white	61.91616	46	female	17681.1293

##	836	14	white	71.60782	40	male	31667.5776
##	837	18	white	72.75964	41	male	43152.5366
##	838	16	white	67.91167	42	female	26486.9380
##	839	12	white	66.13226	19	female	10952.2359
##	840	8	white	59.90598	83	female	10029.5412
##	841	18	white	60.30743	63	female	34228.3577
##	842	12	white	64.87640	59	female	17830.0863
##	843	18	other	62.80542	59	female	31959.4718
##	844	12	white	63.93523	41	female	14430.0642
##	845	14	white	70.50475	58	male	34653.6923
##	846	12	white	67.17893	35	male	24342.6022
##	847	12	white	62.90287	31	female	12438.0040
##	848	14	white	65.08065	59	female	23408.1626
##	849	12	white	66.42656	66	female	19392.0784
##	850	13	white	62.94001	58	female	20028.0733
##	851	15	white	65.19972	20	female	19246.8025
##	852	16	white	73.78851	34	male	36576.0121
##	853	13	white	67.18860	55	female	20353.3958
##	854	17	white	67.54551	47	female	30072.6751
##	855	12	white	65.25626	51	female	16480.5731
##	856	16	white	63.70218	34	female	24208.1945
##	857	16	white	67.83460	26	female	23618.4802
##	858	12	white	65.48821	18	male	20969.1181
##	859	17	white	71.76438	47	male	41252.4807
##	860	12	black	65.69804	62	male	26424.4671
##	861	12	white	63.66103	36	female	13483.0300
##	862	16	other	59.63484	88	female	30951.5842
##	863	12	black	71.69116	35	male	22823.7357
##	864	12	white	63.51513	43	female	14701.6104
##	865	14	black	67.28185	26	male	25862.9519
##	866	12	white	67.84666	28	male	23229.6768
##	867	13	other	64.05579	33	female	13734.9527
##	868	12	white	65.62335	51	female	16554.8998
##	869	16	white	64.61287	34	female	24392.5871
##	870	14	white	70.36270	54	male	33911.7176
##	871	12	white	70.13582	42	male	26189.4203
##	872	12	white	66.03882	52	male	27142.9136
##	873	12	white	65.66768	61	male	28672.4983
##	874	18	white	73.68208	26	male	40664.7574
##	875	12	white	62.23430	48	female	15333.7916
##	876	17	white	65.58047	39	female	28248.3777
##	877	12	white	62.34291	65	female	18386.9383
##	878	18	black	64.71665	64	female	32866.9382
##	879	12	white	63.41644	78	female	20922.2447
##	880	16	white	70.93384	29	male	35106.4978
##	881	16	white	65.78463	42	female	26056.2648
##	882	6	other	61.52156	72	female	797.1448
##	883	10	white	63.13920	87	female	16934.1209
##	884	18	white	66.56994	40	male	41720.9735
##	885	14	white	60.76265	45	female	20037.6298
##	886	15	white	66.40241	22	female	19846.9243
##	887	12	white	72.40009	24	male	23438.4192
##	888	14	white	69.32629	24	female	18027.1821
##	889	16	white	64.14805	29	female	23406.9552

##	890	12	black	62.50258	29	female	9567.8687
##	891	12	white	59.63618	47	female	14629.4337
##	892	15	black	69.84609	33	male	30398.6287
##	893	12	white	72.79965	19	male	22627.8044
##	894	16	black	64.87412	23	female	20051.6674
##	895	12	white	64.27539	42	female	14677.2414
##	896	15	white	71.60516	48	male	35861.8257
##	897	16	white	67.13204	28	female	23832.8362
##	898	11	white	69.10554	18	male	18933.1767
##	899	9	white	70.90079	21	male	14294.8581
##	900	8	black	65.99266	35	female	270.9036
##	901	14	black	63.21551	25	female	14535.7266
##	902	12	white	71.37289	47	male	27331.4142
##	903	14	white	72.07876	21	male	28375.1677
##	904	12	white	67.93927	51	male	27349.4039
##	905	17	white	71.94711	54	male	42537.6022
##	906	12	white	65.66242	43	female	15136.3841
##	907	14	white	66.47077	63	male	34728.4305
##	908	16	white	65.42764	31	female	24022.6473
##	909	14	black	71.35958	27	male	26866.8924
##	910	10	white	73.69928	50	male	22800.6392
##	911	9	white	70.20955	47	male	18790.7852
##	912	14	white	64.33590	45	female	20761.1236
##	913	14	white	69.23577	48	male	32613.7228
##	914	18	white	63.16803	34	female	29636.7618
##	915	12	white	67.97178	46	female	16138.8821
##	916	16	white	72.63630	24	male	34559.6854
##	917	12	white	62.64564	61	female	17735.0206
##	918	18	white	71.15194	53	male	44966.6562
##	919	18	white	64.94458	29	female	29104.9521
##	920	13	white	64.22719	83	female	24746.2773
##	921	16	white	64.74690	32	female	24063.1168
##	922	14	white	70.69914	40	male	31483.5933
##	923	14	white	69.61523	30	female	19155.5063
##	924	16	black	67.70270	48	female	25081.9657
##	925	18	white	66.09329	28	female	29159.2349
##	926	12	white	64.39957	40	female	14345.7776
##	927	16	white	65.88019	29	female	23757.6696
##	928	16	white	69.73543	41	male	37003.4885
##	929	14	white	63.79241	23	female	16728.4071
##	930	12	white	70.60792	38	male	25571.7973
##	931	14	white	63.83650	23	female	16737.3345
##	932	16	white	63.41338	45	female	26111.0553
##	933	12	white	66.23722	53	female	17035.7995
##	934	14	white	68.38071	48	female	22115.0051
##	935	12	black	61.52425	27	female	9013.1761
##	936	12	black	68.53243	37	male	22540.7794
##	937	13	white	64.46456	32	male	26026.4597
##	938	17	white	69.60981	68	male	44560.6037
##	939	13	white	65.37075	82	female	24799.5175
##	940	11	black	60.75108	66	male	23367.6855
##	941	14	black	63.99366	63	male	31794.3964
##	942	10	white	64.58116	80	female	15977.9586
##	943	12	white	64.13895	75	male	30859.2146

##	944	11	white	69.30129	23	male	19864.3277
##	945	12	white	73.63658	30	male	24758.5980
##	946	13	white	68.19243	52	female	20021.7372
##	947	16	white	66.59646	40	female	25864.0334
##	948	10	white	61.80107	68	female	13275.4205
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##	950	16	white	73.46034	38	male	37222.7804
##	951	14	white	69.87076	69	male	36486.6619
##	952	14	white	63.51997	38	female	19347.7939
##	953	12	white	68.21243	18	female	11195.1150
##	954	12	white	62.91207	18	female	10121.9232
##	955	12	white	70.72026	36	male	25237.9352
##	956	12	white	63.74181	31	female	12607.8691
##	957	12	white	60.36111	39	female	13349.7875
##	958	4	white	65.76632	64	female	-3245.0904
##	959	14	white	58.92336	62	female	22696.3764
##	960	13	white	63.10044	64	female	21130.3757
##	961	12	white	66.20177	18	male	21113.5945
##	962	13	white	65.44585	33	female	16077.8607
##	963	14	white	64.39271	32	female	18454.6826
##	964	12	white	65.77418	23	female	11592.9463
##	965	17	hispanic	65.50058	26	male	32393.1131
##	966	15	white	72.89740	24	male	31844.1935
##	967	16	white	72.44737	26	male	34878.0395
##	968	14	white	74.32628	22	female	18682.9489
##	969	16	white	64.65599	22	female	22261.6774
##	970	12	white	70.61207	21	male	22541.4805
##	971	13	white	68.07568	45	female	18749.9744
##	972	16	white	70.49066	39	male	36799.7983
##	973	16	white	64.21713	59	female	28770.0419
##	974	11	white	58.72468	34	female	9358.5761
##	975	18	white	67.90288	43	male	42525.7702
##	976	14	white	67.93034	25	male	28248.4300
##	977	13	white	68.82437	43	female	18544.9585
##	978	14	white	69.43574	55	female	23576.7469
##	979	18	white	75.26532	38	male	43124.9641
##	980	14	white	69.13342	35	male	30275.0572
##	981	13	black	72.04506	24	male	23702.4150
##	982	12	white	68.33676	23	female	12111.8051
##	983	13	white	71.53957	28	male	26745.7601
##	984	12	white	72.35495	73	male	32166.1414
##	985	16	white	67.29746	71	male	41858.9593
##	986	12	hispanic	63.21394	46	female	11328.8024
##	987	12	white	69.21808	26	male	23150.7487
##	988	17	hispanic	62.87644	32	female	22606.0204
##	989	12	white	72.30503	27	male	23954.0819
##	990	12	other	65.43678	28	female	10354.6935
##	991	16	white	72.68583	59	male	40810.3298
##	992	12	white	69.12368	51	male	27589.2180
##	993	14	other	68.80012	33	male	27789.5115
##	994	12	hispanic	61.49719	38	female	9554.7759
##	995	15	white	73.19213	48	male	36183.1481
##	996	18	white	66.86296	51	female	33416.0495
##	997	16	white	63.07393	41	female	25329.1137

##	998	14	white	62.15914	48	female	20855.2932
##	999	13	white	65.39749	49	female	18920.9216
##	1000	15	hispanic	71.56490	62	male	34503.1847
##	1001	12	white	67.19160	33	female	13662.9718
##	1002	16	hispanic	65.49676	62	female	25717.3078
##	1003	13	hispanic	72.42630	64	male	29497.4823
##	1004	9	hispanic	65.38834	74	female	8456.4766
##	1005	14	white	63.81682	59	female	23152.2687
##	1006	12	white	68.20842	50	male	27225.5973
##	1007	12	white	68.29211	43	female	15668.8304
##	1008	14	white	76.38236	26	male	30138.0561
##	1009	12	white	62.61693	36	female	13271.6261
##	1010	14	white	74.39722	78	male	39007.8866
##	1011	16	white	68.47598	25	male	33895.6295
##	1012	17	white	72.08176	77	male	46665.8409
##	1013	12	white	67.56834	69	male	30483.7594
##	1014	12	white	64.54943	73	female	20260.1300
##	1015	8	white	60.10434	77	female	8999.8835
##	1016	16	white	72.36485	33	male	36109.4539
##	1017	14	white	63.72689	40	female	19746.2970
##	1018	12	white	68.01107	48	female	16503.4425
##	1019	12	white	61.14690	31	female	12082.4646
##	1020	10	white	67.08765	72	female	15059.0320
##	1021	17	white	67.20368	55	female	31429.8895
##	1022	12	white	63.04842	28	female	11932.5639
##	1023	13	white	60.24540	37	female	15738.1124
##	1024	16	white	73.56450	31	male	35995.7467
##	1025	14	white	68.81879	66	male	35738.7547
##	1026	15	white	66.74730	69	female	28297.0106
##	1027	16	white	64.91763	86	male	44051.6547
##	1028	12	hispanic	62.20893	63	male	24482.0586
##	1029	18	white	71.82154	47	male	44032.4142
##	1030	18	white	64.57803	59	female	34379.8354
##	1031	12	white	62.36229	51	female	15894.6155
##	1032	16	white	70.92462	34	male	35996.1480
##	1033	14	white	71.35941	32	male	30190.8547
##	1034	18	white	70.07702	43	male	42965.9798
##	1035	12	hispanic	66.55482	22	male	18051.5572
##	1036	17	white	61.77156	34	female	26585.6519
##	1037	12	hispanic	62.89387	35	female	9302.6595
##	1038	14	white	60.81635	37	female	18622.0760
##	1039	12	white	71.81258	18	male	22249.6429
##	1040	10	white	62.51972	60	female	11994.5015
##	1041	12	white	65.83384	44	male	25674.9856
##	1042	15	white	64.12672	20	female	19029.5472
##	1043	13	white	66.43378	51	female	19487.3508
##	1044	14	white	68.26159	41	female	20842.7643
##	1045	12	white	59.55762	37	female	12830.4955
##	1046	12	white	65.18920	71	male	30358.6510
##	1047	14	white	64.76620	66	female	24592.6177
##	1048	14	white	61.33605	36	female	18548.9990
##	1049	14	white	63.90803	36	female	19069.7606
##	1050	15	white	65.98172	21	female	19583.4408
##	1051	14	white	69.35291	74	male	37273.3268

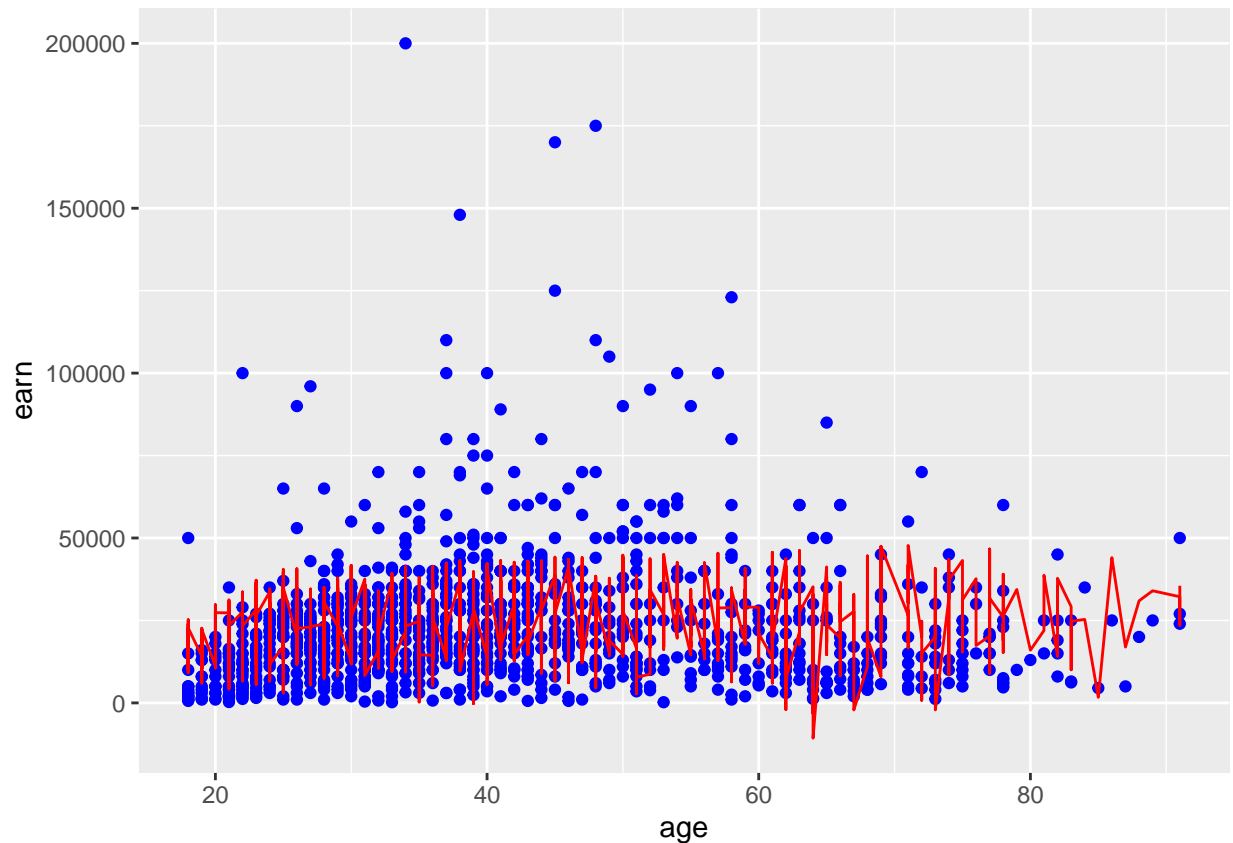
##	1052	14	hispanic	65.99869	32	female	14933.1175
##	1053	17	white	66.64220	34	female	27571.8341
##	1054	12	white	68.37846	30	female	13368.3701
##	1055	16	white	65.51632	33	male	34722.7980
##	1056	14	white	69.09659	32	female	19407.1016
##	1057	16	white	69.32438	30	male	34958.9257
##	1058	17	white	71.01265	46	male	40921.9696
##	1059	13	white	73.87646	54	male	31854.8061
##	1060	4	white	68.53997	62	male	7285.4865
##	1061	13	white	75.15666	75	female	25532.7953
##	1062	11	white	71.85208	63	male	27512.9308
##	1063	15	white	64.38789	32	female	21222.0666
##	1064	16	hispanic	71.68615	25	male	30698.8716
##	1065	10	black	62.75757	36	female	5330.9011
##	1066	12	black	63.80686	73	female	17677.2981
##	1067	17	white	70.42836	39	male	39555.5431
##	1068	13	white	66.41484	39	female	17343.8760
##	1069	16	other	62.49871	27	male	30980.5339
##	1070	15	white	69.73083	65	male	38513.4774
##	1071	12	black	63.64059	47	female	13007.7474
##	1072	16	white	68.70302	22	male	33406.6897
##	1073	13	hispanic	64.18301	22	female	10014.0941
##	1074	16	white	67.13533	27	female	23655.1984
##	1075	14	white	71.67133	58	male	34889.8971
##	1076	16	white	65.06636	32	female	24127.7999
##	1077	14	white	63.38769	34	female	18607.7977
##	1078	18	white	69.66276	34	male	41277.3729
##	1079	16	white	64.20871	45	female	26272.0901
##	1080	12	white	68.04928	18	male	21487.6690
##	1081	18	white	65.95546	69	female	36441.7623
##	1082	15	hispanic	66.31635	23	male	26486.6547
##	1083	17	white	69.68933	30	male	37801.1791
##	1084	12	white	62.25103	65	female	18368.3362
##	1085	12	white	65.91611	75	male	31219.0452
##	1086	12	hispanic	66.49011	21	female	7534.5608
##	1087	18	white	63.54176	48	female	32208.6791
##	1088	12	white	69.91641	35	female	14571.2835
##	1089	14	white	74.14910	52	male	34321.7628
##	1090	12	white	65.50048	19	male	21149.9046
##	1091	3	hispanic	61.64302	64	female	-10695.0501
##	1092	13	white	66.43334	43	female	18060.8363
##	1093	12	white	62.27002	31	female	12309.8671
##	1094	12	white	69.05178	58	male	28822.7828
##	1095	16	black	67.69980	36	male	33267.3286
##	1096	14	hispanic	71.82785	18	male	23942.7197
##	1097	13	black	64.32170	22	male	21782.0221
##	1098	12	hispanic	72.47294	28	male	20319.6483
##	1099	5	black	61.72064	73	female	-2123.6281
##	1100	16	white	73.76301	25	male	34966.1200
##	1101	10	other	66.28669	60	male	21021.3531
##	1102	16	hispanic	67.89220	30	male	30822.2084
##	1103	14	other	61.94551	37	male	27114.8368
##	1104	10	white	71.17571	29	female	8219.7201
##	1105	16	black	62.52137	36	female	21893.2375

##	1106	18	white	69.24438	69	male	47433.2766
##	1107	6	hispanic	71.20133	40	male	5591.6571
##	1108	12	white	65.93158	68	female	19648.4648
##	1109	14	white	71.89919	48	male	33152.9993
##	1110	12	black	72.11578	26	male	21304.9813
##	1111	16	white	67.54589	43	female	26591.1803
##	1112	10	hispanic	63.50634	36	male	14393.8408
##	1113	13	white	69.84664	40	male	28542.6225
##	1114	16	white	66.35971	33	female	24567.9753
##	1115	17	white	66.51458	34	female	27545.9955
##	1116	11	black	68.06513	31	female	8282.3919
##	1117	17	white	63.77365	28	female	25921.2056
##	1118	14	white	64.70483	41	female	20122.6088
##	1119	13	other	69.95972	22	male	23294.6047
##	1120	14	white	71.26888	26	female	18777.1153
##	1121	13	white	61.87336	18	female	12679.9719
##	1122	17	white	70.85695	29	male	37859.2899
##	1123	12	white	74.30637	18	male	22754.5746
##	1124	13	white	64.20481	27	female	14756.7604
##	1125	15	white	69.74732	27	female	21415.7003
##	1126	13	white	64.00159	37	female	16498.6466
##	1127	14	hispanic	69.62591	44	male	28132.7685
##	1128	12	white	73.66522	33	male	25299.3074
##	1129	12	hispanic	62.72194	65	female	14616.9468
##	1130	14	white	73.55019	24	male	29208.0060
##	1131	14	white	66.08877	19	female	16480.1504
##	1132	15	white	65.39048	67	female	27665.6816
##	1133	12	white	70.91890	19	male	22247.0002
##	1134	14	white	68.52425	58	male	34252.6915
##	1135	15	white	60.29879	50	male	33929.1756
##	1136	12	white	64.01087	43	female	14801.9864
##	1137	13	white	63.81617	41	female	17174.3177
##	1138	16	white	71.89981	50	male	39046.4516
##	1139	14	white	61.41213	65	female	23735.2001
##	1140	12	white	68.69143	21	male	22152.5998
##	1141	12	white	67.11030	61	female	18639.0026
##	1142	11	hispanic	64.56858	27	female	5446.9590
##	1143	16	hispanic	68.26174	28	male	30540.4243
##	1144	17	white	74.42452	43	male	41077.8797
##	1145	12	white	65.19333	43	female	15041.4045
##	1146	13	hispanic	70.70130	36	male	24155.7209
##	1147	14	white	64.43980	34	female	18820.8240
##	1148	17	white	68.86163	37	female	28556.1229
##	1149	17	hispanic	64.38678	34	female	23268.4327
##	1150	13	hispanic	71.90196	20	male	21545.9715
##	1151	15	white	62.55289	29	female	20315.6146
##	1152	12	white	64.88607	29	female	12482.9456
##	1153	12	white	71.65621	32	male	24714.2293
##	1154	14	white	65.15171	48	female	21461.2148
##	1155	12	white	64.28045	33	female	13073.5363
##	1156	12	white	70.88341	50	male	27767.2153
##	1157	12	white	61.76662	30	female	12029.6379
##	1158	16	white	66.27003	33	female	24549.8172
##	1159	10	white	64.07142	39	female	8564.3131



```
## 1160 10    white 66.80599 78    male 26397.4121
## 1161 11    white 68.07656 32    male 21221.0799
## 1162 12    white 65.75189 24    female 11766.7366
## 1163 14    white 66.01494 43    female 20744.4800
## 1164 16    white 65.76547 59    female 29083.5410
## 1165 12    white 66.74771 77    male 31744.0301
## 1166 12    white 66.14089 37    male 24489.0307
## 1167 9     white 63.30037 51    female 7779.4733
## 1168 13    white 67.61928 43    female 18300.9593
## 1169 12    white 70.42987 27    male 23574.4094
## 1170 16    white 62.62478 26    female 22563.6220
## 1171 14    black 69.98806 21    male 25519.3751
## 1172 12    white 71.81932 45    male 27065.1986
## 1173 17    white 74.77192 40    male 40613.3081
## 1174 14    white 61.96560 39    female 19211.3766
## 1175 17    white 68.21042 39    female 28780.8774
## 1176 14    white 68.04935 29    female 18660.1502
## 1177 17    white 70.49075 56    male 42599.3329
## 1178 13    black 73.38321 21    male 23438.4463
## 1179 17    white 62.13713 30    female 25946.4583
## 1180 12    black 59.77629 76    female 17396.1190
## 1181 16    other 64.15965 37    female 22774.2754
## 1182 6     hispanic 60.19710 67    female -2147.8235
## 1183 15    hispanic 73.26521 20    male 27358.7166
## 1184 18    other 66.31204 48    female 30708.1363
## 1185 18    white 68.99589 71    male 47739.5697
## 1186 18    white 70.34337 53    male 44802.9412
## 1187 16    white 70.05628 36    female 25851.3464
## 1188 12    white 72.16573 29    male 24282.4848
## 1189 18    white 61.13580 82    female 37783.8453
## 1190 12    white 63.66416 33    female 12948.7538
## 1191 12    white 71.92584 50    male 27978.2810
## 1192 12    white 68.36849 27    male 23157.0308
```

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



```
mean_earn <- mean(heights_df$earn)
## Corrected Sum of Squares Total
sst <- sum((mean_earn - heights_df$earn)^2)
## Corrected Sum of Squares for Model
ssm <- sum((mean_earn - age_predict_df$earn)^2)
## Residuals
residuals <- heights_df$earn - age_predict_df$earn
## Sum of Squares for Error
sse <- sum(residuals^2)
## R Squared  $R^2 = SSM/SST$ 
r_squared <- ssm/sst
r_squared
```

```
## [1] 0.2198953
```

```
## Number of observations
n <- NROW(heights_df$earn)
n
```

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

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

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

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

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

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

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

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

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

```
## [1] 99302918657
```

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

```
## [1] 296041147
```

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

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

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

```
## [1] 335.4362
```

```
## Adjusted R Squared  $R^2 = 1 - (1 - R^2)(n - 1) / (n - p)$ 
adjusted_r_squared <- 1 - (1 - r_squared)*(n-1) / (n-p)
adjusted_r_squared
```

```
## [1] 0.2192397
```

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

```
## [1] 3.28441e-66
```