regression.Rmd*

Preview

```
---
title: "regression"
output: html_notebook
---
```

```{r}
head(data)
```

	economic_stability <int>	education <chr>	education_id <int>	facebook_user_rank <int>	gender <chr>	has_insurance <chr>	home_owner <chr>	id <int>	income <int>
1	27	Completed High School	1	10	M	*NA*	*NA*	1	25
2	8	Completed College	2	18	M	*NA*	O	2	357
3	13	null	0	19	M	*NA*	O	3	25
4	23	Completed College	2	16	M	*NA*	*NA*	4	51
5	23	null	0	16	F	*NA*	*NA*	5	51
6	25	null	0	15	F	*NA*	*NA*	6	48

6 rows | 1–10 of 20 columns

```{r}
#multivariate regression
regression_1 <- lm (insurance_segment_id~ income + economic_stability + education_id + facebook_user_rank + race_code + youtube_user_rank + gender_dum,  data=data)
summary(regression_1)
```

```
Call:
lm(formula = insurance_segment_id ~ income + economic_stability + 
    education_id + facebook_user_rank + race_code + youtube_user_rank + 
    gender_dum, data = data)

Residuals:
    Min      1Q  Median      3Q     Max 
-7.9773 -1.8173  0.4073  1.7124  5.1956 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)         6.448911   0.031061 207.617  < 2e-16 ***
income              0.003212   0.000106  30.315  < 2e-16 ***
economic_stability -0.073079   0.001076 -67.912  < 2e-16 ***
education_id        0.058476   0.007382   7.921 2.37e-15 ***
facebook_user_rank -0.054007   0.003367 -16.042  < 2e-16 ***
race_code           0.033800   0.004399   7.684 1.56e-14 ***
youtube_user_rank  -0.028307   0.003360  -8.425  < 2e-16 ***
gender_dum         -0.078893   0.014068  -5.608 2.05e-08 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.208 on 99992 degrees of freedom
Multiple R-squared:  0.112,     Adjusted R-squared:  0.112 
F-statistic:  1803 on 7 and 99992 DF,  p-value: < 2.2e-16
```

Strongest correlation with insurance segment
1. Gender
2. Economic stability
3. Education
4. Facebook User Rank
5. Race
6. Youtube User

```{r}
# chi square for race by segment
options(scipen = 999)
library(gmodels)
CrossTable(data$insurance_segment_id,data$race)
```

```
   Cell Contents
|-------------------------|
|                       N |
| Chi-square contribution |
|           N / Row Total |
|           N / Col Total |
|         N / Table Total |
|-------------------------|


Total Observations in Table:  100000


                           | data$race
data$insurance_segment_id  | American Indian |           Asian |           Black |         Chinese |        Hispanic |        Japanese |           Other |      Portuguese |           White |       Row Total |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         1 |              41 |             130 |            1654 |              98 |            1452 |              31 |            6104 |               0 |            6840 |           16350 |
                           |           3.979 |          51.704 |         136.386 |          14.281 |          49.359 |           0.549 |         659.809 |           0.654 |          63.856 |               |
                           |           0.003 |           0.008 |           0.101 |           0.006 |           0.089 |           0.002 |           0.373 |           0.000 |           0.418 |           0.164 |
                           |           0.120 |           0.088 |           0.123 |           0.112 |           0.136 |           0.187 |           0.227 |           0.000 |           0.148 |               |
                           |           0.000 |           0.001 |           0.017 |           0.001 |           0.015 |           0.000 |           0.061 |           0.000 |           0.068 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         2 |              28 |             113 |            1865 |              45 |            1101 |              18 |            1412 |               0 |            2455 |            7037 |
                           |           0.643 |           0.765 |         887.751 |           4.494 |         162.806 |           3.418 |         122.573 |           0.281 |         191.232 |               |
                           |           0.004 |           0.016 |           0.265 |           0.006 |           0.156 |           0.003 |           0.201 |           0.000 |           0.349 |           0.070 |
                           |           0.082 |           0.076 |           0.138 |           0.051 |           0.103 |           0.188 |           0.052 |           0.000 |           0.053 |               |
                           |           0.000 |           0.001 |           0.019 |           0.000 |           0.011 |           0.000 |           0.014 |           0.000 |           0.025 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         3 |              38 |             126 |            1240 |              35 |             705 |               8 |            1409 |               0 |            3756 |            7317 |
                           |           6.728 |           2.922 |          65.750 |          13.209 |           7.426 |           1.415 |         159.342 |           0.293 |          43.861 |               |
                           |           0.005 |           0.017 |           0.169 |           0.005 |           0.096 |           0.001 |           0.193 |           0.000 |           0.513 |           0.073 |
                           |           0.111 |           0.085 |           0.092 |           0.040 |           0.066 |           0.048 |           0.052 |           0.000 |           0.082 |               |
                           |           0.000 |           0.001 |           0.012 |           0.000 |           0.007 |           0.000 |           0.014 |           0.000 |           0.038 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         3 |              38 |             126 |            1240 |              35 |             705 |               8 |            1409 |               0 |            3756 |            7317 |
                           |           6.728 |           2.922 |          65.750 |          13.209 |           7.426 |           1.415 |         159.342 |           0.293 |          43.861 |               |
                           |           0.005 |           0.017 |           0.169 |           0.005 |           0.096 |           0.001 |           0.193 |           0.000 |           0.513 |           0.073 |
                           |           0.111 |           0.085 |           0.092 |           0.040 |           0.066 |           0.048 |           0.052 |           0.000 |           0.082 |               |
                           |           0.000 |           0.001 |           0.012 |           0.000 |           0.007 |           0.000 |           0.014 |           0.000 |           0.038 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         4 |              27 |             120 |            1383 |              37 |             993 |              10 |            1474 |               1 |            3700 |            7745 |
                           |           0.010 |           0.259 |         110.761 |          14.024 |          33.384 |           0.635 |         178.718 |           1.538 |           4.834 |               |
                           |           0.003 |           0.015 |           0.179 |           0.005 |           0.128 |           0.001 |           0.190 |           0.000 |           0.478 |           0.077 |
                           |           0.079 |           0.081 |           0.103 |           0.042 |           0.093 |           0.060 |           0.055 |           0.250 |           0.080 |               |
                           |           0.000 |           0.001 |           0.014 |           0.000 |           0.010 |           0.000 |           0.015 |           0.000 |           0.037 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         5 |              73 |              73 |            1323 |              13 |             550 |               2 |            1471 |               0 |            5610 |            9115 |
                           |          56.121 |          28.340 |           7.412 |          55.964 |         183.974 |          11.395 |         393.139 |           0.365 |         473.421 |               |
                           |           0.008 |           0.008 |           0.145 |           0.001 |           0.060 |           0.000 |           0.161 |           0.000 |           0.615 |           0.091 |
                           |           0.213 |           0.049 |           0.098 |           0.015 |           0.052 |           0.012 |           0.055 |           0.000 |           0.122 |               |
                           |           0.001 |           0.001 |           0.013 |           0.000 |           0.005 |           0.000 |           0.015 |           0.000 |           0.056 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         6 |              47 |             319 |            1296 |             263 |            1558 |              43 |            5147 |               0 |            7788 |           16461 |
                           |           1.535 |          23.440 |         382.586 |          97.878 |          22.619 |           8.992 |         116.053 |           0.658 |           5.447 |               |
                           |           0.003 |           0.019 |           0.079 |           0.016 |           0.095 |           0.003 |           0.313 |           0.000 |           0.473 |           0.165 |
                           |           0.137 |           0.216 |           0.096 |           0.300 |           0.146 |           0.259 |           0.191 |           0.000 |           0.169 |               |
                           |           0.000 |           0.003 |           0.013 |           0.003 |           0.016 |           0.000 |           0.051 |           0.000 |           0.078 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         7 |              58 |             533 |            3585 |             361 |            3584 |              47 |            8468 |               3 |           13558 |           30197 |
                           |          19.847 |          16.709 |          57.109 |          35.185 |          40.238 |           0.195 |          14.341 |           2.659 |           9.102 |               |
                           |           0.002 |           0.018 |           0.119 |           0.012 |           0.119 |           0.002 |           0.280 |           0.000 |           0.449 |           0.302 |
                           |           0.170 |           0.360 |           0.266 |           0.412 |           0.336 |           0.283 |           0.315 |           0.750 |           0.294 |               |
                           |           0.001 |           0.005 |           0.036 |           0.004 |           0.036 |           0.000 |           0.085 |           0.000 |           0.136 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
                         8 |              30 |              65 |            1122 |              24 |             733 |               7 |            1427 |               0 |            2370 |            5778 |
                           |           5.306 |           4.897 |         151.907 |          13.995 |          21.867 |           0.700 |          10.532 |           0.231 |          32.098 |               |
                           |           0.005 |           0.011 |           0.194 |           0.004 |           0.127 |           0.001 |           0.247 |           0.000 |           0.410 |           0.058 |
                           |           0.088 |           0.044 |           0.083 |           0.027 |           0.069 |           0.042 |           0.053 |           0.000 |           0.051 |               |
                           |           0.000 |           0.001 |           0.011 |           0.000 |           0.007 |           0.000 |           0.014 |           0.000 |           0.024 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
              Column Total |             342 |            1479 |           13468 |             876 |           10676 |             166 |           26912 |               4 |           46077 |          100000 |
                           |           0.003 |           0.015 |           0.135 |           0.009 |           0.107 |           0.002 |           0.269 |           0.000 |           0.461 |               |
---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
```

```{r}
# chi square for race by segment
options(scipen = 999)
library(gmodels)
CrossTable(data$insurance_segment_id,data$gender)
```

```
   Cell Contents
|-------------------------|
|                       N |
| Chi-square contribution |
|           N / Row Total |
|           N / Col Total |
|         N / Table Total |
|-------------------------|


Total Observations in Table:  100000


                           | data$gender
data$insurance_segment_id  |         F |         M | Row Total |
---------------------------|-----------|-----------|-----------|
                         1 |      8981 |      7369 |     16350 |
                           |    15.886 |    16.825 |           |
                           |     0.549 |     0.451 |     0.164 |
                           |     0.170 |     0.156 |           |
                           |     0.090 |     0.074 |           |
---------------------------|-----------|-----------|-----------|
                         2 |      4209 |      2828 |      7037 |
                           |    67.062 |    74.790 |           |
                           |     0.598 |     0.402 |     0.070 |
                           |     0.080 |     0.060 |           |
                           |     0.042 |     0.028 |           |
---------------------------|-----------|-----------|-----------|
                         3 |      3865 |      3452 |      7317 |
                           |     0.013 |     0.015 |           |
                           |     0.528 |     0.472 |     0.073 |
                           |     0.073 |     0.073 |           |
                           |     0.039 |     0.035 |           |
---------------------------|-----------|-----------|-----------|
                         4 |      4051 |      3694 |      7745 |
                           |     0.258 |     0.288 |           |
                           |     0.523 |     0.477 |     0.077 |
                           |     0.077 |     0.078 |           |
                           |     0.041 |     0.037 |           |
---------------------------|-----------|-----------|-----------|
                         5 |      4794 |      4321 |      9115 |
                           |     0.029 |     0.032 |           |
                           |     0.526 |     0.474 |     0.091 |
                           |     0.091 |     0.091 |           |
                           |     0.048 |     0.043 |           |
---------------------------|-----------|-----------|-----------|
                         6 |      8211 |      8250 |     16461 |
                           |    25.225 |    28.132 |           |
                           |     0.499 |     0.501 |     0.165 |
                           |     0.156 |     0.175 |           |
                           |     0.082 |     0.083 |           |
---------------------------|-----------|-----------|-----------|
                         7 |     15308 |     14889 |     30197 |
                           |    23.607 |    26.328 |           |
                           |     0.507 |     0.493 |     0.302 |
                           |     0.290 |     0.315 |           |
                           |     0.153 |     0.149 |           |
---------------------------|-----------|-----------|-----------|
                         8 |      3305 |      2473 |      5778 |
                           |    21.953 |    24.483 |           |
                           |     0.572 |     0.428 |     0.058 |
                           |     0.063 |     0.052 |           |
                           |     0.033 |     0.025 |           |
---------------------------|-----------|-----------|-----------|
              Column Total |     52724 |     47276 |    100000 |
                           |     0.527 |     0.473 |           |
---------------------------|-----------|-----------|-----------|
```

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R Markdown

Console