Conclusions

Contents

Overview

This rmarkdown report analyzes the models and draws inferences for the research question. The research question is whether voting blocs, echo nest music features and migration patterns can explain the points and voting patterns of the 2016 ESC. This can be converted into a statistical problem using multiple linear regression whereby determining whether voting blocs, echo nest music features and migration patterns significantly explain the points and voting patterns.

This question will be answer by:

1. Constricting t-tests
2. Observing the signs of the estimated coefficients
3. measuring the increase in variance explained (R-sq) with the addition of a predictor variable

Overall Model

```
##
## Call:
## lm(formula = my_model_overall_bct_from, data = processed_data)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.6714 -1.0056  0.0282  0.9735  3.1707
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)        2.20107    0.45207   4.869 1.42e-06 ***
## Average_Points     0.20808    0.06479   3.212 0.001386 **
## VBlocs1_TC_3       0.58153    0.19211   3.027 0.002568 **
## CAP_DIST_km        0.12954    0.06434   2.013 0.044490 *
## FC_NonCitzens      0.17855    0.07048   2.533 0.011538 *
## ComLANGFAM_y       0.37800    0.13986   2.703 0.007061 **
## liveness          -0.29223    0.06762  -4.322 1.79e-05 ***
## key_3              0.51047    0.23228   2.198 0.028329 *
## METRIC_Citizens    0.09698    0.06789   1.428 0.153639
## TC_PerfType_Solo   0.94943    0.26757   3.548 0.000416 ***
## key_2             -0.92510    0.45034  -2.054 0.040363 *
## VBlocs1_TC_13     -1.99317    1.10071  -1.811 0.070641 .
## key_6             -1.38873    0.44355  -3.131 0.001822 **
## time_signature_4  -0.88157    0.36291  -2.429 0.015408 *
## ComVBlocs1_y      -0.40286    0.17563  -2.294 0.022128 *
## VBlocs1_TC_1       0.50874    0.17131   2.970 0.003092 **
## key_5             -0.48380    0.19256  -2.512 0.012236 *
## OOA                0.47418    0.23786   1.994 0.046630 *
## speechiness        0.10033    0.06662   1.506 0.132541
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.43 on 639 degrees of freedom
## Multiple R-squared:  0.209,  Adjusted R-squared:  0.1867
## F-statistic: 9.379 on 18 and 639 DF,  p-value: < 2.2e-16
```

T-tests

Make sure to report:

1. the adjusted R-sq value
2. the degrees of freedom
3. the f statistic for f test
4. the p-value for f test

Note the notation for levels of significance

- * for 0.05
- ** for 0.01
- *** for 0.001

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	2.2010691	0.4520685	4.868884	0.0000014
Average_Points	0.2080819	0.0647886	3.211707	0.0013857
VBlocs1_TC_3	0.5815328	0.1921055	3.027154	0.0025680
CAP_DIST_km	0.1295394	0.0643381	2.013417	0.0444895
FC_NonCitzens	0.1785509	0.0704822	2.533276	0.0115382
ComLANGFAM_y	0.3779964	0.1398599	2.702679	0.0070611
liveness	-0.2922262	0.0676154	-4.321888	0.0000179
key_3	0.5104719	0.2322758	2.197697	0.0283287
METRIC_Citizens	0.0969807	0.0678903	1.428491	0.1536391
TC_PerfType_Solo	0.9494343	0.2675655	3.548419	0.0004160
key_2	-0.9250974	0.4503445	-2.054199	0.0403626
VBlocs1_TC_13	-1.9931653	1.1007066	-1.810805	0.0706405
key_6	-1.3887348	0.4435518	-3.130942	0.0018220
time_signature_4	-0.8815651	0.3629067	-2.429178	0.0154077
ComVBlocs1_y	-0.4028611	0.1756337	-2.293757	0.0221281
VBlocs1_TC_1	0.5087423	0.1713093	2.969730	0.0030924
key_5	-0.4838001	0.1925644	-2.512407	0.0122363
OOA	0.4741760	0.2378596	1.993513	0.0466300
speechiness	0.1003293	0.0666163	1.506078	0.1325414

Directional / Sign effects

Report the sign effects of each significant coefficient:

- + indicates the predictor variable has a positive effect on the dependent variable
- - indicates the predictor variables has a negative effect on the dependent variable

	coefficients
(Intercept)	2.2010691
Average_Points	0.2080819
VBlocs1_TC_3	0.5815328
CAP_DIST_km	0.1295394
FC_NonCitzens	0.1785509
ComLANGFAM_y	0.3779964
liveness	-0.2922262
key_3	0.5104719
METRIC_Citizens	0.0969807
TC_PerfType_Solo	0.9494343
key_2	-0.9250974
VBlocs1_TC_13	-1.9931653
key_6	-1.3887348
time_signature_4	-0.8815651
ComVBlocs1_y	-0.4028611
VBlocs1_TC_1	0.5087423
key_5	-0.4838001
OOA	0.4741760
speechiness	0.1003293

Explained Variance

Investigate the increase of variance explained by incorporating specific predictor variables. Observe the increase in R-sq when a predictor variable is included / excluded from the model. Do this for voting blocs, Echo Nest music factors and Migration patterns

- The removal of the voting block features from the overall model decreases the R-sq value from 0.20899 to 0.18369.
- The removal of the echo nest features from the overall model decreases the R-sq value from 0.20899 to 0.14807.
- The removal of the migration features from the overall model decreases the R-sq value from 0.20899 to 0.19337.

Televote Model

```
##
## Call:
## lm(formula = my_model_tele_bct, data = televote_data)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.6953 -1.0485  0.1163  1.0374  3.7539
##
## Coefficients:
##                 Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.26304    0.24167   9.364  < 2e-16 ***
## METRIC_Citizens  0.34461    0.07753   4.445 1.22e-05 ***
## Average_Points   0.39603    0.08918   4.441 1.24e-05 ***
## VBlocs1_TC_3     1.07370    0.36185   2.967 0.003236 **
## VBlocs2_TC_1    -0.77013    0.24756  -3.111 0.002037 **
## mode_1           0.70492    0.18910   3.728 0.000229 ***
## key_11           0.99686    0.31422   3.173 0.001661 **
## OOA              0.65497    0.35667   1.836 0.067249 .
## acousticness     0.32378    0.13542   2.391 0.017397 *
## danceability    -0.30145    0.12654  -2.382 0.017800 *
## key_7           -0.69771    0.38737  -1.801 0.072639 .
## VBlocs1_TC_13   -1.87918    1.14005  -1.648 0.100287
## ComLANGFAM_y     0.30175    0.20574   1.467 0.143465
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.519 on 314 degrees of freedom
## Multiple R-squared:  0.3206, Adjusted R-squared:  0.2946
## F-statistic: 12.35 on 12 and 314 DF,  p-value: < 2.2e-16
```

T-tests

Make sure to report:

1. the adjusted R-sq value
2. the degrees of freedom
3. the f statistic for f test
4. the p-value for f test

Note the notation for levels of significance

- * for 0.05
- ** for 0.01
- *** for 0.001

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	2.2630387	0.2416675	9.364267	0.0000000
METRIC_Citizens	0.3446076	0.0775317	4.444731	0.0000122
Average_Points	0.3960300	0.0891797	4.440808	0.0000124

	Estimate	Std. Error	t value	Pr(>|t|)
VBlocs1_TC_3	1.0736998	0.3618528	2.967229	0.0032358
VBlocs2_TC_1	-0.7701325	0.2475628	-3.110857	0.0020367
mode_1	0.7049206	0.1890984	3.727798	0.0002291
key_11	0.9968637	0.3142174	3.172529	0.0016606
OOA	0.6549741	0.3566687	1.836366	0.0672488
acousticness	0.3237773	0.1354227	2.390865	0.0173975
danceability	-0.3014478	0.1265360	-2.382308	0.0177995
key_7	-0.6977062	0.3873672	-1.801149	0.0726386
VBlocs1_TC_13	-1.8791771	1.1400542	-1.648322	0.1002867
ComLANGFAM_y	0.3017532	0.2057394	1.466677	0.1434647

Directional / Sign effects

Report the sign effects of each significant coefficient:

- + indicates the predictor variable has a positive effect on the dependent variable
- - indicates the predictor variables has a negative effect on the dependent variable

	coefficients
(Intercept)	2.2630387
METRIC_Citizens	0.3446076
Average_Points	0.3960300
VBlocs1_TC_3	1.0736998
VBlocs2_TC_1	-0.7701325
mode_1	0.7049206
key_11	0.9968637
OOA	0.6549741
acousticness	0.3237773
danceability	-0.3014478
key_7	-0.6977062
VBlocs1_TC_13	-1.8791771
ComLANGFAM_y	0.3017532

Explained Variance

Investigate the increase of variance explained by incorporating specific predictor variables. Observe the increase in R-sq when a predictor variable is included / excluded from the model. Do this for voting blocs, Echo Nest music factors and Migration patterns

- The removal of the voting block features from the televote model decreases the R-sq value from 0.32058 to 0.28814.
- The removal of the echo nest features from the televote model decreases the R-sq value from 0.32058 to 0.27296.
- The removal of the migration features from the televote model decreases the R-sq value from 0.32058 to 0.27784.

Jury Model

```
##
## Call:
## lm(formula = my_model_jury_form, data = jury_data)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.0963 -1.1107 -0.0648  1.0644  3.6173
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)        1.83982    0.41895   4.391 1.53e-05 ***
## VBlocs2_TC_4       1.69551    0.27077   6.262 1.21e-09 ***
## key_3              1.00919    0.26191   3.853 0.000141 ***
## TC_PerfType_Solo   1.53092    0.42200   3.628 0.000332 ***
## liveness          -0.26215    0.07656  -3.424 0.000696 ***
## ComVBlocs1_y      -0.43580    0.21889  -1.991 0.047320 *
## ComLANGFAM_y       0.39571    0.19859   1.993 0.047142 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.476 on 324 degrees of freedom
## Multiple R-squared:  0.2127, Adjusted R-squared:  0.1981
## F-statistic: 14.59 on 6 and 324 DF,  p-value: 9.53e-15
```

T-tests

Make sure to report:

1. the adjusted R-sq value
2. the degrees of freedom
3. the f statistic for f test
4. the p-value for f test

Note the notation for levels of significance

- * for 0.05
- ** for 0.01
- *** for 0.001

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.8398226	0.4189523	4.391485	0.0000153
VBlocs2_TC_4	1.6955145	0.2707750	6.261711	0.0000000
key_3	1.0091938	0.2619094	3.853217	0.0001405
TC_PerfType_Solo	1.5309157	0.4220042	3.627727	0.0003321
liveness	-0.2621547	0.0765632	-3.424031	0.0006963
ComVBlocs1_y	-0.4358035	0.2188863	-1.991004	0.0473201
ComLANGFAM_y	0.3957054	0.1985860	1.992615	0.0471423

Directional / Sign effects

Report the sign effects of each significant coefficient:

- + indicates the predictor variable has a positive effect on the dependent variable
- - indicates the predictor variables has a negative effect on the dependent variable

	coefficients
(Intercept)	1.8398226
VBlocs2_TC_4	1.6955145
key_3	1.0091938
TC_PerfType_Solo	1.5309157
liveness	-0.2621547
ComVBlocs1_y	-0.4358035
ComLANGFAM_y	0.3957054

Explained Variance

Investigate the increase of variance explained by incorporating specific predictor variables. Observe the increase in R-sq when a predictor variable is included / excluded from the model. Do this for voting blocs, Echo Nest music factors and Migration patterns

- The removal of the voting block features from the televote model decreases the R-sq value from 0.21266 to 0.11738.
- The removal of the echo nest features from the televote model decreases the R-sq value from 0.21266 to 0.11738.