**regresssion\_task\_count\_threshold25\_All\_region\_0423.py // ALL REGIONS, No\_Log\_Transformation**

OLS Regression Results

==============================================================================

Dep. Variable: duration\_trimmed R-squared: 0.228

Model: OLS Adj. R-squared: 0.228

Method: Least Squares F-statistic: 5281.

Date: Thu, 24 Apr 2025 Prob (F-statistic): 0.00

Time: 17:08:21 Log-Likelihood: -3.9792e+05

No. Observations: 69849 AIC: 7.959e+05

Df Residuals: 69793 BIC: 7.965e+05

Df Model: 55

Covariance Type: HC3

============================================================================================

coef std err z P>|z| [0.025 0.975]

--------------------------------------------------------------------------------------------

Intercept 55.4736 1.458 38.055 0.000 52.617 58.331

C(region\_id)[T.2] -9.1930 2.490 -3.691 0.000 -14.074 -4.312

C(region\_id)[T.5] -31.0025 2.321 -13.360 0.000 -35.551 -26.454

C(region\_id)[T.6] -12.9339 3.382 -3.824 0.000 -19.563 -6.305

C(region\_id)[T.7] -34.7056 2.501 -13.876 0.000 -39.608 -29.803

C(region\_id)[T.8] -19.1243 2.072 -9.229 0.000 -23.186 -15.063

C(region\_id)[T.9] 61.3031 2.938 20.868 0.000 55.545 67.061

C(region\_id)[T.13] 1.7433 2.480 0.703 0.482 -3.117 6.604

C(region\_id)[T.16] -28.8669 3.767 -7.664 0.000 -36.250 -21.484

C(region\_id)[T.17] -37.7573 2.295 -16.449 0.000 -42.256 -33.258

C(region\_id)[T.18] -52.6891 2.746 -19.190 0.000 -58.070 -47.308

C(region\_id)[T.20] -8.6148 2.711 -3.177 0.001 -13.929 -3.301

C(region\_id)[T.21] -7.9543 3.424 -2.323 0.020 -14.666 -1.243

C(region\_id)[T.22] -43.4224 2.544 -17.068 0.000 -48.409 -38.436

C(region\_id)[T.25] -29.0493 2.403 -12.090 0.000 -33.758 -24.340

C(region\_id)[T.29] -48.1234 1.997 -24.103 0.000 -52.037 -44.210

C(region\_id)[T.32] -30.6797 2.876 -10.667 0.000 -36.317 -25.043

C(region\_id)[T.33] -34.0798 2.379 -14.323 0.000 -38.743 -29.416

C(region\_id)[T.37] -47.2494 2.678 -17.641 0.000 -52.499 -42.000

C(region\_id)[T.38] 27.9992 3.028 9.247 0.000 22.065 33.934

C(region\_id)[T.41] -22.5079 2.317 -9.716 0.000 -27.048 -17.968

C(region\_id)[T.42] -38.6782 2.276 -16.992 0.000 -43.140 -34.217

C(region\_id)[T.44] -31.9730 2.209 -14.472 0.000 -36.303 -27.643

C(region\_id)[T.45] 42.1705 2.346 17.976 0.000 37.572 46.768

C(region\_id)[T.46] -31.7949 2.181 -14.576 0.000 -36.070 -27.520

C(region\_id)[T.50] -39.0912 2.434 -16.060 0.000 -43.862 -34.321

C(region\_id)[T.51] -2.4817 2.938 -0.845 0.398 -8.240 3.277

C(region\_id)[T.52] 42.2682 3.392 12.460 0.000 35.619 48.917

C(region\_id)[T.54] 14.8920 2.801 5.317 0.000 9.403 20.381

C(region\_id)[T.57] -29.3641 2.278 -12.893 0.000 -33.828 -24.900

C(region\_id)[T.61] -11.5875 2.518 -4.601 0.000 -16.523 -6.652

C(region\_id)[T.63] -28.0038 2.789 -10.040 0.000 -33.470 -22.537

C(region\_id)[T.64] -36.7300 3.002 -12.235 0.000 -42.614 -30.846

C(region\_id)[T.65] -32.8200 2.523 -13.008 0.000 -37.765 -27.875

C(region\_id)[T.66] -11.0694 2.487 -4.451 0.000 -15.944 -6.195

C(region\_id)[T.68] -37.9287 2.453 -15.464 0.000 -42.736 -33.122

C(region\_id)[T.69] -14.0289 2.695 -5.205 0.000 -19.312 -8.746

C(region\_id)[T.71] 16.3590 2.546 6.426 0.000 11.369 21.349

C(region\_id)[T.73] -49.5168 2.226 -22.243 0.000 -53.880 -45.154

C(region\_id)[T.76] 18.2021 3.189 5.708 0.000 11.952 24.452

C(region\_id)[T.77] -4.6492 2.511 -1.851 0.064 -9.571 0.272

C(region\_id)[T.78] -1.2061 2.604 -0.463 0.643 -6.310 3.898

C(region\_id)[T.80] -29.7713 2.815 -10.575 0.000 -35.289 -24.254

C(region\_id)[T.81] -41.7542 2.971 -14.052 0.000 -47.578 -35.930

C(region\_id)[T.84] -33.1865 2.578 -12.873 0.000 -38.239 -28.134

C(region\_id)[T.85] -42.6720 2.688 -15.875 0.000 -47.940 -37.404

C(region\_id)[T.87] -21.5100 2.218 -9.699 0.000 -25.857 -17.163

C(region\_id)[T.90] -39.2368 2.426 -16.175 0.000 -43.991 -34.482

C(region\_id)[T.92] -3.7089 3.515 -1.055 0.291 -10.598 3.180

C(region\_id)[T.93] 10.0276 5.104 1.965 0.049 0.024 20.031

C(hour\_bin)[T.Morning] 43.2256 0.581 74.418 0.000 42.087 44.364

C(hour\_bin)[T.Afternoon] 24.7274 0.619 39.968 0.000 23.515 25.940

C(hour\_bin)[T.Evening] -12.4794 0.971 -12.847 0.000 -14.383 -10.575

task\_count\_c -3.7112 0.063 -58.544 0.000 -3.835 -3.587

high\_load 21.6508 0.780 27.756 0.000 20.122 23.180

task\_count\_c:high\_load 3.8538 0.073 52.469 0.000 3.710 3.998

avg\_distance\_km 0.1952 0.028 7.092 0.000 0.141 0.249

==============================================================================

Omnibus: 24851.717 Durbin-Watson: 0.995

Prob(Omnibus): 0.000 Jarque-Bera (JB): 114232.497

Skew: 1.690 Prob(JB): 0.00

Kurtosis: 8.274 Cond. No. 1.45e+15

==============================================================================

Notes:

[1] Standard Errors are heteroscedasticity robust (HC3)

[2] The smallest eigenvalue is 1.39e-23. This might indicate that there are

strong multicollinearity problems or that the design matrix is singular.

feature VIF

0 const 6.592616

1 task\_count\_c 5.381293

2 high\_load 3.470939

3 avg\_distance\_km 1.000043

4 interaction 3.626123

**regresssion\_task\_count\_threshold25\_All\_region\_log\_0423 copy.py // ALL REGIONS with Log\_Transformation**

OLS Regression Results

==============================================================================

Dep. Variable: log\_duration R-squared: 0.196

Model: OLS Adj. R-squared: 0.195

Method: Least Squares F-statistic: 1.383e+05

Date: Thu, 24 Apr 2025 Prob (F-statistic): 0.00

Time: 17:17:06 Log-Likelihood: -57940.

No. Observations: 69849 AIC: 1.160e+05

Df Residuals: 69793 BIC: 1.165e+05

Df Model: 55

Covariance Type: HC3

============================================================================================

coef std err z P>|z| [0.025 0.975]

--------------------------------------------------------------------------------------------

Intercept 3.3083 0.011 293.187 0.000 3.286 3.330

C(region\_id)[T.2] -0.1051 0.019 -5.666 0.000 -0.141 -0.069

C(region\_id)[T.5] -0.2482 0.019 -12.917 0.000 -0.286 -0.211

C(region\_id)[T.6] -0.2502 0.024 -10.385 0.000 -0.297 -0.203

C(region\_id)[T.7] -0.3239 0.020 -15.885 0.000 -0.364 -0.284

C(region\_id)[T.8] -0.1606 0.017 -9.232 0.000 -0.195 -0.127

C(region\_id)[T.9] 0.3422 0.021 16.327 0.000 0.301 0.383

C(region\_id)[T.13] 0.0376 0.019 1.984 0.047 0.000 0.075

C(region\_id)[T.16] -0.2285 0.036 -6.341 0.000 -0.299 -0.158

C(region\_id)[T.17] -0.3652 0.022 -16.964 0.000 -0.407 -0.323

C(region\_id)[T.18] -0.6552 0.028 -23.681 0.000 -0.709 -0.601

C(region\_id)[T.20] -0.0551 0.021 -2.621 0.009 -0.096 -0.014

C(region\_id)[T.21] -0.2054 0.024 -8.720 0.000 -0.252 -0.159

C(region\_id)[T.22] -0.4318 0.020 -21.422 0.000 -0.471 -0.392

C(region\_id)[T.25] -0.3228 0.019 -16.693 0.000 -0.361 -0.285

C(region\_id)[T.29] -0.4784 0.017 -28.645 0.000 -0.511 -0.446

C(region\_id)[T.32] -0.2801 0.022 -12.835 0.000 -0.323 -0.237

C(region\_id)[T.33] -0.3027 0.020 -15.442 0.000 -0.341 -0.264

C(region\_id)[T.37] -0.4580 0.022 -20.542 0.000 -0.502 -0.414

C(region\_id)[T.38] 0.2004 0.020 9.896 0.000 0.161 0.240

C(region\_id)[T.41] -0.1851 0.018 -10.045 0.000 -0.221 -0.149

C(region\_id)[T.42] -0.4297 0.018 -24.323 0.000 -0.464 -0.395

C(region\_id)[T.44] -0.3282 0.018 -18.281 0.000 -0.363 -0.293

C(region\_id)[T.45] 0.3218 0.017 18.937 0.000 0.288 0.355

C(region\_id)[T.46] -0.3194 0.019 -17.257 0.000 -0.356 -0.283

C(region\_id)[T.50] -0.3344 0.019 -17.197 0.000 -0.372 -0.296

C(region\_id)[T.51] -0.0268 0.022 -1.227 0.220 -0.070 0.016

C(region\_id)[T.52] 0.1991 0.024 8.256 0.000 0.152 0.246

C(region\_id)[T.54] 0.0958 0.020 4.884 0.000 0.057 0.134

C(region\_id)[T.57] -0.2267 0.018 -12.616 0.000 -0.262 -0.191

C(region\_id)[T.61] -0.1098 0.020 -5.532 0.000 -0.149 -0.071

C(region\_id)[T.63] -0.2683 0.021 -12.766 0.000 -0.309 -0.227

C(region\_id)[T.64] -0.3234 0.025 -13.145 0.000 -0.372 -0.275

C(region\_id)[T.65] -0.2716 0.019 -13.929 0.000 -0.310 -0.233

C(region\_id)[T.66] -0.1161 0.019 -6.044 0.000 -0.154 -0.078

C(region\_id)[T.68] -0.3646 0.021 -17.408 0.000 -0.406 -0.324

C(region\_id)[T.69] -0.1476 0.021 -6.884 0.000 -0.190 -0.106

C(region\_id)[T.71] 0.0871 0.019 4.660 0.000 0.050 0.124

C(region\_id)[T.73] -0.5372 0.021 -25.468 0.000 -0.579 -0.496

C(region\_id)[T.76] 0.1400 0.022 6.450 0.000 0.097 0.183

C(region\_id)[T.77] -0.0823 0.019 -4.247 0.000 -0.120 -0.044

C(region\_id)[T.78] -0.0606 0.020 -2.985 0.003 -0.100 -0.021

C(region\_id)[T.80] -0.2826 0.023 -12.408 0.000 -0.327 -0.238

C(region\_id)[T.81] -0.4736 0.022 -21.110 0.000 -0.518 -0.430

C(region\_id)[T.84] -0.3831 0.020 -19.224 0.000 -0.422 -0.344

C(region\_id)[T.85] -0.3724 0.020 -18.573 0.000 -0.412 -0.333

C(region\_id)[T.87] -0.2037 0.018 -11.465 0.000 -0.238 -0.169

C(region\_id)[T.90] -0.3589 0.020 -17.626 0.000 -0.399 -0.319

C(region\_id)[T.92] -0.0979 0.032 -3.083 0.002 -0.160 -0.036

C(region\_id)[T.93] 0.0557 0.040 1.384 0.166 -0.023 0.135

C(hour\_bin)[T.Morning] 1.3060 0.005 261.548 0.000 1.296 1.316

C(hour\_bin)[T.Afternoon] 1.1735 0.005 221.056 0.000 1.163 1.184

C(hour\_bin)[T.Evening] 0.8288 0.009 87.613 0.000 0.810 0.847

task\_count\_c -0.0152 0.000 -33.752 0.000 -0.016 -0.014

high\_load 0.0780 0.006 12.201 0.000 0.065 0.091

task\_count\_c:high\_load 0.0177 0.001 32.520 0.000 0.017 0.019

avg\_distance\_km 0.0012 0.000 8.267 0.000 0.001 0.001

==============================================================================

Omnibus: 3879.113 Durbin-Watson: 0.953

Prob(Omnibus): 0.000 Jarque-Bera (JB): 10644.259

Skew: -0.297 Prob(JB): 0.00

Kurtosis: 4.818 Cond. No. 1.45e+15

==============================================================================

Notes:

[1] Standard Errors are heteroscedasticity robust (HC3)

[2] The smallest eigenvalue is 1.39e-23. This might indicate that there are

strong multicollinearity problems or that the design matrix is singular.

feature VIF

0 const 6.592616

1 task\_count\_c 5.381293

2 high\_load 3.470939

3 avg\_distance\_km 1.000043

4 interaction 3.626123

**regresssion\_task\_count\_threshold25\_top14regions\_0423.py // TOP14 REGIONS(No\_Log\_Transformation)**

OLS Regression Results

==============================================================================

Dep. Variable: duration\_trimmed R-squared: 0.271

Model: OLS Adj. R-squared: 0.271

Method: Least Squares F-statistic: 6174.

Date: Thu, 24 Apr 2025 Prob (F-statistic): 0.00

Time: 17:19:01 Log-Likelihood: -1.5508e+05

No. Observations: 27498 AIC: 3.102e+05

Df Residuals: 27478 BIC: 3.104e+05

Df Model: 19

Covariance Type: HC3

============================================================================================

coef std err z P>|z| [0.025 0.975]

--------------------------------------------------------------------------------------------

Intercept 56.0630 1.523 36.817 0.000 53.079 59.048

C(region\_id)[T.8] -9.9276 1.937 -5.126 0.000 -13.723 -6.132

C(region\_id)[T.9] 69.5571 2.874 24.204 0.000 63.924 75.190

C(region\_id)[T.25] -20.5825 2.299 -8.954 0.000 -25.088 -16.077

C(region\_id)[T.29] -39.0587 1.885 -20.720 0.000 -42.753 -35.364

C(region\_id)[T.42] -29.4669 2.155 -13.672 0.000 -33.691 -25.243

C(region\_id)[T.44] -22.9893 2.104 -10.926 0.000 -27.113 -18.865

C(region\_id)[T.45] 50.9658 2.275 22.400 0.000 46.506 55.425

C(region\_id)[T.46] -22.9802 2.044 -11.245 0.000 -26.986 -18.975

C(region\_id)[T.71] 24.9065 2.438 10.218 0.000 20.129 29.684

C(region\_id)[T.77] 4.0805 2.380 1.715 0.086 -0.584 8.745

C(region\_id)[T.78] 7.4532 2.494 2.988 0.003 2.564 12.342

C(region\_id)[T.84] -23.6507 2.433 -9.721 0.000 -28.419 -18.882

C(region\_id)[T.87] -12.6636 2.134 -5.933 0.000 -16.847 -8.480

C(hour\_bin)[T.Morning] 42.7895 0.775 55.188 0.000 41.270 44.309

C(hour\_bin)[T.Afternoon] 18.8239 0.733 25.683 0.000 17.387 20.260

C(hour\_bin)[T.Evening] -5.5504 1.219 -4.555 0.000 -7.939 -3.162

task\_count\_c -3.2440 0.106 -30.686 0.000 -3.451 -3.037

high\_load 14.4038 1.298 11.095 0.000 11.859 16.948

task\_count\_c:high\_load 3.2589 0.117 27.945 0.000 3.030 3.487

avg\_distance\_km 0.0930 0.021 4.406 0.000 0.052 0.134

==============================================================================

Omnibus: 7946.154 Durbin-Watson: 0.974

Prob(Omnibus): 0.000 Jarque-Bera (JB): 29180.468

Skew: 1.422 Prob(JB): 0.00

Kurtosis: 7.170 Cond. No. 1.96e+15

==============================================================================

Notes:

[1] Standard Errors are heteroscedasticity robust (HC3)

[2] The smallest eigenvalue is 4.15e-24. This might indicate that there are

strong multicollinearity problems or that the design matrix is singular.

feature VIF

0 const 7.354885

1 task\_count\_c 6.837495

2 high\_load 3.557068

3 avg\_distance\_km 1.001474

4 interaction 4.257054

**regresssion\_task\_count\_threshold25\_top14regions\_log\_0423.py**

OLS Regression Results

==============================================================================

Dep. Variable: log\_duration R-squared: 0.251

Model: OLS Adj. R-squared: 0.251

Method: Least Squares F-statistic: 1.595e+05

Date: Thu, 24 Apr 2025 Prob (F-statistic): 0.00

Time: 17:21:57 Log-Likelihood: -21225.

No. Observations: 27498 AIC: 4.249e+04

Df Residuals: 27478 BIC: 4.265e+04

Df Model: 19

Covariance Type: HC3

============================================================================================

coef std err z P>|z| [0.025 0.975]

--------------------------------------------------------------------------------------------

Intercept 3.2815 0.011 288.428 0.000 3.259 3.304

C(region\_id)[T.8] -0.0515 0.015 -3.322 0.001 -0.082 -0.021

C(region\_id)[T.9] 0.4448 0.020 22.490 0.000 0.406 0.484

C(region\_id)[T.25] -0.2196 0.018 -12.399 0.000 -0.254 -0.185

C(region\_id)[T.29] -0.3715 0.015 -24.771 0.000 -0.401 -0.342

C(region\_id)[T.42] -0.3165 0.016 -19.939 0.000 -0.348 -0.285

C(region\_id)[T.44] -0.2223 0.016 -13.673 0.000 -0.254 -0.190

C(region\_id)[T.45] 0.4259 0.016 27.321 0.000 0.395 0.456

C(region\_id)[T.46] -0.2149 0.017 -12.928 0.000 -0.248 -0.182

C(region\_id)[T.71] 0.1872 0.017 10.992 0.000 0.154 0.221

C(region\_id)[T.77] 0.0246 0.017 1.405 0.160 -0.010 0.059

C(region\_id)[T.78] 0.0456 0.019 2.448 0.014 0.009 0.082

C(region\_id)[T.84] -0.2690 0.018 -14.880 0.000 -0.304 -0.234

C(region\_id)[T.87] -0.0992 0.016 -6.140 0.000 -0.131 -0.068

C(hour\_bin)[T.Morning] 1.2795 0.006 197.798 0.000 1.267 1.292

C(hour\_bin)[T.Afternoon] 1.1071 0.006 172.980 0.000 1.095 1.120

C(hour\_bin)[T.Evening] 0.8949 0.011 79.013 0.000 0.873 0.917

task\_count\_c -0.0136 0.001 -17.985 0.000 -0.015 -0.012

high\_load 0.0284 0.010 2.726 0.006 0.008 0.049

task\_count\_c:high\_load 0.0151 0.001 17.516 0.000 0.013 0.017

avg\_distance\_km 0.0007 0.000 4.802 0.000 0.000 0.001

==============================================================================

Omnibus: 1015.511 Durbin-Watson: 0.906

Prob(Omnibus): 0.000 Jarque-Bera (JB): 2260.769

Skew: -0.231 Prob(JB): 0.00

Kurtosis: 4.327 Cond. No. 1.96e+15

==============================================================================

Notes:

[1] Standard Errors are heteroscedasticity robust (HC3)

[2] The smallest eigenvalue is 4.15e-24. This might indicate that there are

strong multicollinearity problems or that the design matrix is singular.

feature VIF

0 const 7.354885

1 task\_count\_c 6.837495

2 high\_load 3.557068

3 avg\_distance\_km 1.001474

4 interaction 4.257054