**Result file**

**Question 1**

**ANOVA TEST ON PRICE~BRAND**

Df Sum Sq Mean Sq F value Pr(>F)

br 38 53723 1413.8 1292 <2e-16 \*\*\*

Residuals 247715 271094 1.1

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

**TUKEY PAIRWISE TEST**

diff lwr upr p adj

chrysler-alfa\_romeo -0.008071834 -0.174137966 0.1579942972 1.00000000

citroen-alfa\_romeo -0.044353398 -0.166352537 0.0776457414 0.99999793

honda-alfa\_romeo 0.004274901 -0.133716230 0.1422660316 1.00000000

lada-alfa\_romeo 0.025977965 -0.346266579 0.3982225102 1.00000000

mazda-alfa\_romeo 0.006974586 -0.113120785 0.1270699570 1.00000000

nissan-alfa\_romeo 0.014271332 -0.108571533 0.1371141968 1.00000000

saab-alfa\_romeo -0.052067966 -0.277309053 0.1731731212 1.00000000

seat-alfa\_romeo 0.105893083 -0.010636268 0.2224224349 0.15376644

smart-alfa\_romeo 0.113533965 -0.010105404 0.2371733347 0.13823278

subaru-alfa\_romeo -0.070465361 -0.274812155 0.1338814324 0.99999950

suzuki-alfa\_romeo 0.068094654 -0.074849779 0.2110390863 0.99886768

dacia-chevrolet 0.010009478 -0.182056185 0.2020751411 1.00000000

skoda-chevrolet 0.059321669 -0.070321862 0.1889651994 0.99950286

citroen-chrysler -0.036281563 -0.185171896 0.1126087691 1.00000000

honda-chrysler 0.012346735 -0.149906441 0.1745999119 1.00000000

lada-chrysler 0.034049800 -0.347854039 0.4159536388 1.00000000

mazda-chrysler 0.015046420 -0.132288027 0.1623808674 1.00000000

nissan-chrysler 0.022343166 -0.127239288 0.1719256205 1.00000000

peugeot-chrysler -0.136889494 -0.277015446 0.0032364579 0.06787323

saab-chrysler -0.043996131 -0.284865574 0.1968733113 1.00000000

seat-chrysler 0.113964918 -0.030477565 0.2584074008 0.45748423

smart-chrysler 0.121605800 -0.028631462 0.2718430614 0.39298933

subaru-chrysler -0.062393527 -0.283848157 0.1590611033 1.00000000

suzuki-chrysler 0.076166488 -0.090319703 0.2426526796 0.99950471

volvo-chrysler 0.141124593 -0.014029308 0.2962784950 0.15232539

honda-citroen 0.048628299 -0.068127529 0.1653841259 0.99993849

lada-citroen 0.070331363 -0.294574614 0.4352373402 1.00000000

mazda-citroen 0.051327984 -0.043610255 0.1462662224 0.98886192

nissan-citroen 0.058624730 -0.039766024 0.1570154837 0.95370484

saab-citroen -0.007714568 -0.220608716 0.2051795801 1.00000000

subaru-citroen -0.026111963 -0.216763433 0.1645395067 1.00000000

suzuki-citroen 0.112448052 -0.010122262 0.2350183653 0.13956617

hyundai-dacia -0.166714602 -0.339866115 0.0064369102 0.08121192

kia-dacia -0.158785605 -0.339759008 0.0221877982 0.21394060

skoda-dacia 0.049312191 -0.116710833 0.2153352145 0.99999999

rover-daewoo 0.210707258 -0.138683781 0.5600982974 0.94588551

lancia-daihatsu 0.220325482 -0.078306921 0.5189578857 0.62731256

rover-daihatsu -0.185724717 -0.505719519 0.1342700849 0.96755312

trabant-daihatsu 0.255462494 -0.110288853 0.6212138412 0.75030279

lada-fiat 0.355898491 -0.006297741 0.7180947224 0.06301576

lancia-fiat -0.167775559 -0.406932803 0.0713816843 0.74132255

mitsubishi-fiat 0.050609482 -0.055388059 0.1566070230 0.99881522

opel-fiat 0.017948928 -0.040654530 0.0765523857 0.99999998

trabant-fiat -0.132638548 -0.451682311 0.1864052155 0.99994106

lada-ford 0.219523264 -0.140233202 0.5792797305 0.93728325

mitsubishi-ford -0.085765745 -0.183100650 0.0115691597 0.20599065

peugeot-ford 0.048583970 -0.008068085 0.1052360252 0.25948556

saab-ford 0.141477333 -0.062464476 0.3454191415 0.76392473

subaru-ford 0.123079938 -0.057519969 0.3036798436 0.79736898

trabant-ford -0.269013775 -0.585285063 0.0472575138 0.27697096

lada-honda 0.021703065 -0.348856154 0.3922622829 1.00000000

mazda-honda 0.002699685 -0.112065429 0.1174647990 1.00000000

nissan-honda 0.009996431 -0.107640734 0.1276335965 1.00000000

saab-honda -0.056342867 -0.278787648 0.1661019142 1.00000000

seat-honda 0.101618182 -0.009409846 0.2126462105 0.14301125

smart-honda 0.109259065 -0.009209610 0.2277277392 0.13210129

subaru-honda -0.074740262 -0.276000654 0.1265201297 0.99999639

suzuki-honda 0.063819753 -0.074676615 0.2023161212 0.99942415

kia-hyundai 0.007928997 -0.114901782 0.1307597774 1.00000000

lada-hyundai -0.338943795 -0.705792576 0.0279049872 0.12959804

toyota-hyundai -0.021797679 -0.125775305 0.0821799463 1.00000000

jeep-jaguar 0.002499861 -0.249162153 0.2541618745 1.00000000

mini-jaguar 0.057364457 -0.145764024 0.2604929383 1.00000000

mini-jeep 0.054864596 -0.128827881 0.2385570736 0.99999999

lada-kia -0.346872792 -0.717477642 0.0237320582 0.11266369

toyota-kia -0.029726677 -0.146265395 0.0868120418 1.00000000

mazda-lada -0.019003380 -0.383277288 0.3452705288 1.00000000

mitsubishi-lada -0.305289009 -0.675272727 0.0646947092 0.34618157

nissan-lada -0.011706633 -0.376895559 0.3534822924 1.00000000

opel-lada -0.337949563 -0.697236131 0.0213370054 0.10661150

peugeot-lada -0.170939294 -0.532357782 0.1904791939 0.99901892

saab-lada -0.078045931 -0.489149482 0.3330576194 1.00000000

seat-lada 0.079915118 -0.283198737 0.4430289731 1.00000000

smart-lada 0.087556000 -0.277901625 0.4530136251 1.00000000

subaru-lada -0.096443327 -0.496481067 0.3035944143 1.00000000

suzuki-lada 0.042116688 -0.330315444 0.4145488203 1.00000000

toyota-lada 0.317146115 -0.047644100 0.6819363306 0.23164053

volkswagen-lada 0.217426251 -0.141373189 0.5762256914 0.94248110

volvo-lada 0.107074794 -0.260431362 0.4745809488 1.00000000

mitsubishi-lancia 0.218385041 -0.032409753 0.4691798353 0.22852388

opel-lancia 0.185724487 -0.049002834 0.4204518084 0.45025823

renault-lancia 0.039025944 -0.197551546 0.2756034338 1.00000000

trabant-lancia 0.035137012 -0.356591814 0.4268658373 1.00000000

nissan-mazda 0.007296746 -0.088723297 0.1033167891 1.00000000

saab-mazda -0.059042552 -0.270851490 0.1527663870 1.00000000

subaru-mazda -0.077439947 -0.266878832 0.1119989382 0.99996043

suzuki-mazda 0.061120068 -0.059555489 0.1817956247 0.99636655

opel-mitsubishi -0.032660554 -0.128244061 0.0629229530 0.99999961

trabant-mitsubishi -0.183248030 -0.511105872 0.1446098122 0.98125319

saab-nissan -0.066339298 -0.279718064 0.1470394681 0.99999997

smart-nissan 0.099262633 -0.001154716 0.1996799830 0.05831760

subaru-nissan -0.084736693 -0.275929168 0.1064557818 0.99974906

suzuki-nissan 0.053823322 -0.069586813 0.1772334561 0.99982393

trabant-opel -0.150587476 -0.466324156 0.1651492042 0.99884051

saab-peugeot 0.092893363 -0.113966178 0.2997529036 0.99966638

subaru-peugeot 0.074495967 -0.109392407 0.2583843422 0.99996812

trabant-peugeot -0.317597745 -0.635758296 0.0005628062 0.05120895

trabant-renault -0.003888933 -0.321003493 0.3132256279 1.00000000

seat-saab 0.157961049 -0.051846525 0.3677686232 0.57716134

smart-saab 0.165601931 -0.048236377 0.3794402394 0.50528832

subaru-saab -0.018397395 -0.287093767 0.2502989769 1.00000000

suzuki-saab 0.120162620 -0.105388348 0.3457135876 0.99124897

volvo-saab 0.185120725 -0.032200053 0.4024415025 0.27379312

smart-seat 0.007640882 -0.084946182 0.1002279464 1.00000000

subaru-seat -0.176358444 -0.363556956 0.0108400675 0.10473999

suzuki-seat -0.037798430 -0.154925632 0.0793287733 0.99999992

volvo-seat 0.027159676 -0.073208959 0.1275283106 1.00000000

subaru-smart -0.183999327 -0.375704534 0.0077058812 0.08434163

suzuki-smart -0.045439312 -0.169642313 0.0787636894 0.99999755

volvo-smart 0.019518794 -0.089023671 0.1280612586 1.00000000

suzuki-subaru 0.138560015 -0.066128294 0.3432483240 0.80926138

volvo-suzuki 0.064958105 -0.065149096 0.1950653068 0.99720761

**VIF – MULTICOLINEARITY TEST**

Variables VIF

1 brand NA

2 price 1.928988

3 gearbox NA

4 powerPS 2.156506

5 kilometer 1.513601

6 notRepairedDamage NA

7 age\_of\_car 1.458770

8 exclamation NA

9 word\_count 1.130287

**Question 2 ANOVA - Partial F test**

Analysis of Variance Table

Model 1: log(price) ~ age\_of\_car + brand

Model 2: log(price) ~ age\_of\_car + brand + notRepairedDamage

Res.Df RSS Df Sum of Sq F Pr(>F)

1 247714 158330

2 247713 144240 1 14090 24198 < 2.2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

**Question 3 -**

**Anova Exclamation Mark**

Df Sum Sq Mean Sq F value Pr(>F)

Cars$exclamation 1 166 165.51 126.3 <2e-16 \*\*\*

Residuals 247752 324651 1.31

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

**Relationship of exclamation and word count with :**

**Price**

Call:

lm(formula = log(price) ~ exclamation + word\_count, data = data\_sub\_1)

Residuals:

Min 1Q Median 3Q Max

-45.834 -0.793 0.065 0.822 5.105

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 7.7377154 0.0055092 1404.50 <2e-16 \*\*\*

exclamation1 -0.3612458 0.0155115 -23.29 <2e-16 \*\*\*

word\_count 0.0931706 0.0009101 102.38 <2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.121 on 247751 degrees of freedom

Multiple R-squared: 0.04108, Adjusted R-squared: 0.04107

F-statistic: 5306 on 2 and 247751 DF, p-value: < 2.2e-16

**Duration**

Call:

lm(formula = log(dur + 1) ~ exclamation + word\_count, data = Cars)

Residuals:

Min 1Q Median 3Q Max

-2.2682 -0.7913 0.1744 0.8211 4.0573

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 1.8779163 0.0050442 372.293 < 2e-16 \*\*\*

exclamation1 -0.0729076 0.0142021 -5.134 2.84e-07 \*\*\*

word\_count 0.0030093 0.0008333 3.611 0.000305 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.027 on 247751 degrees of freedom

Multiple R-squared: 0.0001435, Adjusted R-squared: 0.0001355

F-statistic: 17.78 on 2 and 247751 DF, p-value: 1.892e-08

**Question 4**

1. lm(formula = (price) ~ ., data = data\_sub\_1)

Residuals:

Min 1Q Median 3Q Max

-65905 -2352 -251 1779 432254

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 7.185e+03 1.828e+02 39.296 < 2e-16 \*\*\*

brandaudi 3.258e+03 1.616e+02 20.164 < 2e-16 \*\*\*

brandbmw 2.675e+03 1.611e+02 16.605 < 2e-16 \*\*\*

brandchevrolet -1.663e+02 2.365e+02 -0.703 0.48187

brandchrysler -1.133e+03 2.577e+02 -4.397 1.10e-05 \*\*\*

brandcitroen 1.167e+03 1.896e+02 6.154 7.55e-10 \*\*\*

branddacia -4.210e+02 2.865e+02 -1.469 0.14178

branddaewoo 2.875e+02 3.938e+02 0.730 0.46540

branddaihatsu 1.350e+03 3.289e+02 4.105 4.05e-05 \*\*\*

brandfiat 1.381e+03 1.770e+02 7.804 6.00e-15 \*\*\*

brandford 1.311e+03 1.640e+02 7.996 1.29e-15 \*\*\*

brandhonda 1.397e+03 2.139e+02 6.532 6.50e-11 \*\*\*

brandhyundai 1.037e+02 1.985e+02 0.522 0.60141

brandjaguar 4.244e+03 3.321e+02 12.778 < 2e-16 \*\*\*

brandjeep 3.775e+03 3.028e+02 12.465 < 2e-16 \*\*\*

brandkia 3.134e+02 2.145e+02 1.461 0.14394

brandlada -1.682e+03 5.769e+02 -2.916 0.00354 \*\*

brandlancia 1.996e+03 3.937e+02 5.071 3.95e-07 \*\*\*

brandland\_rover 1.103e+04 2.989e+02 36.917 < 2e-16 \*\*\*

brandmazda 1.024e+03 1.862e+02 5.498 3.84e-08 \*\*\*

brandmercedes\_benz 2.976e+03 1.619e+02 18.383 < 2e-16 \*\*\*

brandmini 2.715e+03 1.967e+02 13.807 < 2e-16 \*\*\*

brandmitsubishi 6.536e+02 2.115e+02 3.090 0.00200 \*\*

brandnissan 1.795e+03 1.907e+02 9.412 < 2e-16 \*\*\*

brandopel 1.374e+03 1.616e+02 8.502 < 2e-16 \*\*\*

brandpeugeot 8.902e+02 1.727e+02 5.154 2.55e-07 \*\*\*

brandporsche 2.798e+04 2.192e+02 127.650 < 2e-16 \*\*\*

brandrenault 1.162e+03 1.681e+02 6.911 4.83e-12 \*\*\*

brandrover 6.444e+02 4.319e+02 1.492 0.13568

brandsaab 5.985e+01 3.488e+02 0.172 0.86378

brandseat 1.707e+03 1.811e+02 9.427 < 2e-16 \*\*\*

brandskoda 2.067e+03 1.832e+02 11.281 < 2e-16 \*\*\*

brandsmart 5.643e+02 1.964e+02 2.874 0.00406 \*\*

brandsubaru 4.241e+02 3.165e+02 1.340 0.18024

brandsuzuki 1.073e+03 2.221e+02 4.831 1.36e-06 \*\*\*

brandtoyota 1.601e+03 1.889e+02 8.472 < 2e-16 \*\*\*

brandtrabant 4.245e+03 5.153e+02 8.237 < 2e-16 \*\*\*

brandvolkswagen 3.442e+03 1.589e+02 21.665 < 2e-16 \*\*\*

brandvolvo 1.671e+03 2.010e+02 8.312 < 2e-16 \*\*\*

gearboxmanuell -5.715e+02 3.590e+01 -15.918 < 2e-16 \*\*\*

powerPS 6.278e+01 2.800e-01 224.240 < 2e-16 \*\*\*

kilometer -8.029e-02 3.558e-04 -225.673 < 2e-16 \*\*\*

notRepairedDamageNo 1.725e+03 4.289e+01 40.207 < 2e-16 \*\*\*

age\_of\_car -2.269e+02 2.317e+00 -97.962 < 2e-16 \*\*\*

exclamation1 -7.671e+02 8.698e+01 -8.819 < 2e-16 \*\*\*

word\_count 1.450e+02 5.319e+00 27.266 < 2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6276 on 247708 degrees of freedom

Multiple R-squared: 0.5594, Adjusted R-squared: 0.5594

F-statistic: 6990 on 45 and 247708 DF, p-value: < 2.2e-16

1. **Model with Log of price**

Call:

lm(formula = log(price) ~ ., data = data\_sub\_1)

Residuals:

Min 1Q Median 3Q Max

-10.1377 -0.3153 0.0317 0.3230 7.9407

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 8.162e+00 1.839e-02 443.929 < 2e-16 \*\*\*

brandaudi 4.272e-01 1.625e-02 26.297 < 2e-16 \*\*\*

brandbmw 4.447e-01 1.620e-02 27.449 < 2e-16 \*\*\*

brandchevrolet 1.865e-01 2.378e-02 7.845 4.36e-15 \*\*\*

brandchrysler -7.457e-02 2.591e-02 -2.878 0.004007 \*\*

brandcitroen 5.742e-02 1.907e-02 3.011 0.002601 \*\*

branddacia 3.367e-02 2.881e-02 1.168 0.242629

branddaewoo -6.118e-01 3.960e-02 -15.450 < 2e-16 \*\*\*

branddaihatsu -2.761e-01 3.307e-02 -8.351 < 2e-16 \*\*\*

brandfiat -5.966e-02 1.780e-02 -3.352 0.000801 \*\*\*

brandford -4.589e-02 1.649e-02 -2.783 0.005389 \*\*

brandhonda 1.927e-01 2.151e-02 8.956 < 2e-16 \*\*\*

brandhyundai 2.930e-02 1.996e-02 1.468 0.142183

brandjaguar 4.235e-01 3.340e-02 12.681 < 2e-16 \*\*\*

brandjeep 7.108e-01 3.045e-02 23.341 < 2e-16 \*\*\*

brandkia 2.695e-02 2.157e-02 1.250 0.211408

brandlada -3.661e-02 5.801e-02 -0.631 0.527959

brandlancia -6.229e-02 3.958e-02 -1.574 0.115604

brandland\_rover 1.005e+00 3.005e-02 33.427 < 2e-16 \*\*\*

brandmazda 9.294e-02 1.873e-02 4.963 6.96e-07 \*\*\*

brandmercedes\_benz 4.726e-01 1.628e-02 29.034 < 2e-16 \*\*\*

brandmini 5.787e-01 1.978e-02 29.262 < 2e-16 \*\*\*

brandmitsubishi -9.973e-02 2.127e-02 -4.689 2.75e-06 \*\*\*

brandnissan 7.125e-02 1.918e-02 3.715 0.000203 \*\*\*

brandopel -3.300e-02 1.625e-02 -2.031 0.042237 \*

brandpeugeot -4.848e-03 1.737e-02 -0.279 0.780136

brandporsche 1.079e+00 2.204e-02 48.944 < 2e-16 \*\*\*

brandrenault -1.624e-01 1.691e-02 -9.608 < 2e-16 \*\*\*

brandrover -3.443e-01 4.343e-02 -7.928 2.24e-15 \*\*\*

brandsaab 1.032e-01 3.508e-02 2.941 0.003270 \*\*

brandseat 1.156e-01 1.821e-02 6.350 2.15e-10 \*\*\*

brandskoda 3.314e-01 1.843e-02 17.988 < 2e-16 \*\*\*

brandsmart 1.226e-01 1.975e-02 6.210 5.31e-10 \*\*\*

brandsubaru -2.422e-02 3.182e-02 -0.761 0.446685

brandsuzuki 1.511e-01 2.234e-02 6.766 1.33e-11 \*\*\*

brandtoyota 3.127e-01 1.900e-02 16.459 < 2e-16 \*\*\*

brandtrabant 1.141e+00 5.182e-02 22.012 < 2e-16 \*\*\*

brandvolkswagen 4.030e-01 1.598e-02 25.225 < 2e-16 \*\*\*

brandvolvo 2.139e-01 2.021e-02 10.584 < 2e-16 \*\*\*

gearboxmanuell -4.982e-02 3.610e-03 -13.800 < 2e-16 \*\*\*

powerPS 6.717e-03 2.815e-05 238.585 < 2e-16 \*\*\*

kilometer -7.569e-06 3.578e-08 -211.574 < 2e-16 \*\*\*

notRepairedDamageNo 7.249e-01 4.313e-03 168.064 < 2e-16 \*\*\*

age\_of\_car -6.647e-02 2.330e-04 -285.320 < 2e-16 \*\*\*

exclamation1 -1.189e-01 8.746e-03 -13.592 < 2e-16 \*\*\*

word\_count 2.115e-02 5.349e-04 39.550 < 2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6311 on 247708 degrees of freedom

Multiple R-squared: 0.6963, Adjusted R-squared: 0.6962

F-statistic: 1.262e+04 on 45 and 247708 DF, p-value: < 2.2e-16

1. **Box Cox Fit**

lm(formula = (price^lambda - 1)/lambda ~ ., data = data\_sub\_1)

Residuals:

Min 1Q Median 3Q Max

-47.886 -1.481 -0.013 1.367 38.765

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 1.973e+01 7.880e-02 250.322 < 2e-16 \*\*\*

brandaudi 2.065e+00 6.963e-02 29.653 < 2e-16 \*\*\*

brandbmw 2.065e+00 6.943e-02 29.739 < 2e-16 \*\*\*

brandchevrolet 6.578e-01 1.019e-01 6.455 1.08e-10 \*\*\*

brandchrysler -4.250e-01 1.111e-01 -3.827 0.000130 \*\*\*

brandcitroen 3.082e-01 8.173e-02 3.771 0.000163 \*\*\*

branddacia -1.330e-03 1.235e-01 -0.011 0.991404

branddaewoo -2.250e+00 1.697e-01 -13.257 < 2e-16 \*\*\*

branddaihatsu -8.808e-01 1.417e-01 -6.215 5.15e-10 \*\*\*

brandfiat -6.639e-02 7.628e-02 -0.870 0.384126

brandford 1.052e-02 7.068e-02 0.149 0.881631

brandhonda 8.921e-01 9.220e-02 9.676 < 2e-16 \*\*\*

brandhyundai 9.765e-02 8.556e-02 1.141 0.253742

brandjaguar 1.944e+00 1.431e-01 13.578 < 2e-16 \*\*\*

brandjeep 3.194e+00 1.305e-01 24.476 < 2e-16 \*\*\*

brandkia 1.140e-01 9.243e-02 1.233 0.217520

brandlada -4.712e-01 2.486e-01 -1.895 0.058064 .

brandlancia 3.950e-02 1.697e-01 0.233 0.815902

brandland\_rover 5.088e+00 1.288e-01 39.501 < 2e-16 \*\*\*

brandmazda 4.796e-01 8.026e-02 5.976 2.29e-09 \*\*\*

brandmercedes\_benz 2.153e+00 6.976e-02 30.866 < 2e-16 \*\*\*

brandmini 2.621e+00 8.476e-02 30.916 < 2e-16 \*\*\*

brandmitsubishi -2.718e-01 9.117e-02 -2.982 0.002868 \*\*

brandnissan 5.181e-01 8.220e-02 6.303 2.93e-10 \*\*\*

brandopel 4.556e-02 6.963e-02 0.654 0.512926

brandpeugeot 4.147e-02 7.444e-02 0.557 0.577491

brandporsche 6.439e+00 9.448e-02 68.155 < 2e-16 \*\*\*

brandrenault -4.907e-01 7.246e-02 -6.772 1.27e-11 \*\*\*

brandrover -1.150e+00 1.861e-01 -6.176 6.60e-10 \*\*\*

brandsaab 4.271e-01 1.503e-01 2.841 0.004498 \*\*

brandseat 6.423e-01 7.804e-02 8.230 < 2e-16 \*\*\*

brandskoda 1.487e+00 7.897e-02 18.825 < 2e-16 \*\*\*

brandsmart 3.447e-01 8.463e-02 4.073 4.65e-05 \*\*\*

brandsubaru 2.200e-02 1.364e-01 0.161 0.871849

brandsuzuki 6.769e-01 9.573e-02 7.071 1.54e-12 \*\*\*

brandtoyota 1.327e+00 8.143e-02 16.296 < 2e-16 \*\*\*

brandtrabant 4.878e+00 2.221e-01 21.963 < 2e-16 \*\*\*

brandvolkswagen 1.957e+00 6.848e-02 28.573 < 2e-16 \*\*\*

brandvolvo 1.052e+00 8.663e-02 12.145 < 2e-16 \*\*\*

gearboxmanuell -3.187e-01 1.547e-02 -20.593 < 2e-16 \*\*\*

powerPS 3.239e-02 1.207e-04 268.463 < 2e-16 \*\*\*

kilometer -3.866e-05 1.533e-07 -252.117 < 2e-16 \*\*\*

notRepairedDamageNo 2.794e+00 1.849e-02 151.121 < 2e-16 \*\*\*

age\_of\_car -2.841e-01 9.984e-04 -284.581 < 2e-16 \*\*\*

exclamation1 -5.559e-01 3.749e-02 -14.831 < 2e-16 \*\*\*

word\_count 1.010e-01 2.293e-03 44.061 < 2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.705 on 247708 degrees of freedom

Multiple R-squared: 0.7257, Adjusted R-squared: 0.7256

F-statistic: 1.456e+04 on 45 and 247708 DF, p-value: < 2.2e-16

**################## Eugene scaled model results ##########################**

Call:

lm(formula = log(price) ~ gearbox + scale\_powerPS + scale\_kilometer +

brand + notRepairedDamage + word\_count + scale\_age + exclamation,

data = data\_sub\_1)

Residuals:

Min 1Q Median 3Q Max

-10.1377 -0.3153 0.0317 0.3230 7.9407

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 7.2646380 0.0168996 429.870 < 2e-16 \*\*\*

gearboxmanuell -0.0498246 0.0036104 -13.800 < 2e-16 \*\*\*

scale\_powerPS 0.4183999 0.0017537 238.585 < 2e-16 \*\*\*

scale\_kilometer -0.3021477 0.0014281 -211.574 < 2e-16 \*\*\*

brandaudi 0.4272086 0.0162455 26.297 < 2e-16 \*\*\*

brandbmw 0.4446540 0.0161995 27.449 < 2e-16 \*\*\*

brandchevrolet 0.1865201 0.0237771 7.845 4.36e-15 \*\*\*

brandchrysler -0.0745733 0.0259147 -2.878 0.004007 \*\*

brandcitroen 0.0574220 0.0190682 3.011 0.002601 \*\*

branddacia 0.0336659 0.0288126 1.168 0.242629

branddaewoo -0.6118043 0.0395985 -15.450 < 2e-16 \*\*\*

branddaihatsu -0.2761498 0.0330683 -8.351 < 2e-16 \*\*\*

brandfiat -0.0596614 0.0177969 -3.352 0.000801 \*\*\*

brandford -0.0458927 0.0164912 -2.783 0.005389 \*\*

brandhonda 0.1926597 0.0215112 8.956 < 2e-16 \*\*\*

brandhyundai 0.0292991 0.0199624 1.468 0.142183

brandjaguar 0.4235486 0.0333992 12.681 < 2e-16 \*\*\*

brandjeep 0.7107668 0.0304512 23.341 < 2e-16 \*\*\*

brandkia 0.0269522 0.0215668 1.250 0.211408

brandlada -0.0366109 0.0580089 -0.631 0.527959

brandlancia -0.0622861 0.0395844 -1.574 0.115604

brandland\_rover 1.0045930 0.0300536 33.427 < 2e-16 \*\*\*

brandmazda 0.0929360 0.0187272 4.963 6.96e-07 \*\*\*

brandmercedes\_benz 0.4725668 0.0162762 29.034 < 2e-16 \*\*\*

brandmini 0.5787058 0.0197769 29.262 < 2e-16 \*\*\*

brandmitsubishi -0.0997303 0.0212708 -4.689 2.75e-06 \*\*\*

brandnissan 0.0712492 0.0191789 3.715 0.000203 \*\*\*

brandopel -0.0330010 0.0162472 -2.031 0.042237 \*

brandpeugeot -0.0048480 0.0173676 -0.279 0.780136

brandporsche 1.0789466 0.0220447 48.944 < 2e-16 \*\*\*

brandrenault -0.1624326 0.0169059 -9.608 < 2e-16 \*\*\*

brandrover -0.3443172 0.0434317 -7.928 2.24e-15 \*\*\*

brandsaab 0.1031718 0.0350789 2.941 0.003270 \*\*

brandseat 0.1156235 0.0182079 6.350 2.15e-10 \*\*\*

brandskoda 0.3314395 0.0184255 17.988 < 2e-16 \*\*\*

brandsmart 0.1226216 0.0197458 6.210 5.31e-10 \*\*\*

brandsubaru -0.0242160 0.0318232 -0.761 0.446685

brandsuzuki 0.1511134 0.0223351 6.766 1.33e-11 \*\*\*

brandtoyota 0.3127280 0.0190000 16.459 < 2e-16 \*\*\*

brandtrabant 1.1406237 0.0518189 22.012 < 2e-16 \*\*\*

brandvolkswagen 0.4030494 0.0159780 25.225 < 2e-16 \*\*\*

brandvolvo 0.2139364 0.0202124 10.584 < 2e-16 \*\*\*

notRepairedDamageNo 0.7248729 0.0043131 168.064 < 2e-16 \*\*\*

word\_count 0.0211548 0.0005349 39.550 < 2e-16 \*\*\*

scale\_age -0.4269351 0.0014963 -285.320 < 2e-16 \*\*\*

exclamation1 -0.1188743 0.0087461 -13.592 < 2e-16 \*\*\*

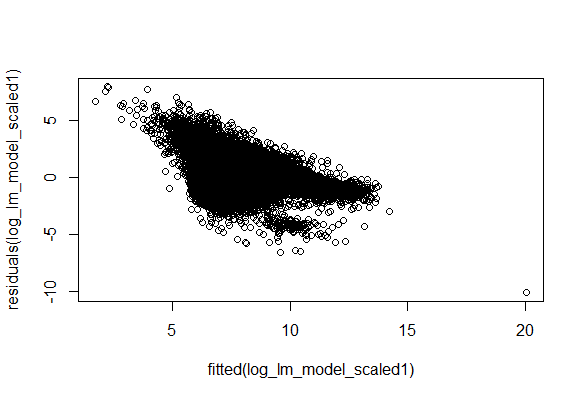
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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6311 on 247708 degrees of freedom

Multiple R-squared: 0.6963, Adjusted R-squared: 0.6962

F-statistic: 1.262e+04 on 45 and 247708 DF, p-value: < 2.2e-16



**Question 5**

**Anova of price vs whether or not car stays up more than 24hours**

summary(AOV\_dur\_price)

Df Sum Sq Mean Sq F value Pr(>F)

as.factor(Cars$flag) 1 4503 4503 3483 <2e-16 \*\*\*

Residuals 247752 320314 1

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

>

>

**Anova of age of car vs whether or not car stays up more than 24hours**

> AOV\_dur\_age = aov(Cars$age\_of\_car~ as.factor(Cars$flag))

> summary(AOV\_dur\_age)

Df Sum Sq Mean Sq F value Pr(>F)

as.factor(Cars$flag) 1 14294 14294 346.9 <2e-16 \*\*\*

Residuals 247752 10207905 41

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1