```r
library(car)
```

```
## Loading required package: carData
```

```r
library(reshape2)
library(ggplot2)
library(MASS)
library(interactions)

source("clean_data.R")


df <- remove_cols(df, c("Color", "Model"))

# Remove columns with only one observation and affected rows
res <- convert_categorical(df, categorical)
design <- as.data.frame(res$dummy)

singles <- c()
bad_idx <- c()
for (col in colnames(design)) {
  if (sum(design[, col] != 0) <= 1) {
    singles <- c(singles, col)
    bad_idx <- c(bad_idx, which(design[, col] != 0))
  }
}
singles
```

```
##  [1] "MakeFiat"               "MakeLexus"              "Fuel.TypePetrol + CNG"
##  [4] "LocationDak. Kannada"   "LocationFaizabad"       "LocationGorakhpur"
##  [7] "LocationPurnea"         "LocationRohtak"         "LocationRudrapur"
## [10] "LocationSamastipur"     "LocationValsad"
```

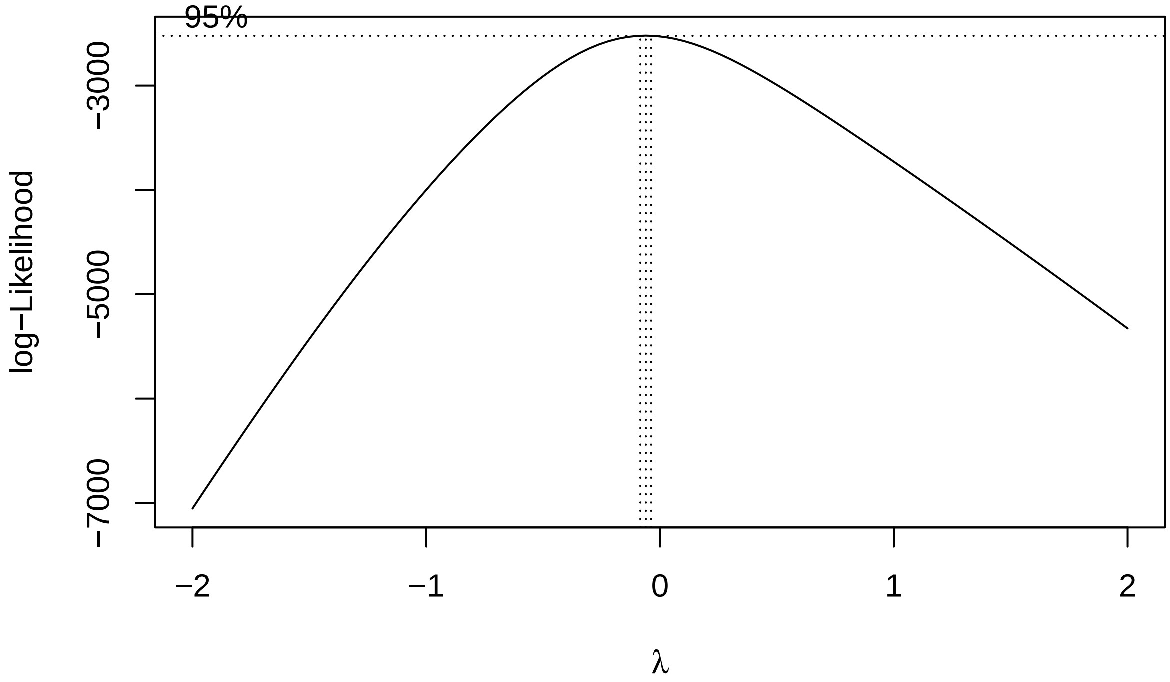
```r
bad_idx
```

```
##  [1]  662 1009 1169 1077  779  569  728  245  510  264  162
```

```r
df <- df[-bad_idx, ]
```

Box Cox

```r
bc <- boxcox(Price ~., data = df)
```



```r
bc$x[which.max(bc$y)]
```

```
## [1] -0.06060606
```

For the sake of interpretability, we will use a log transformation, since $\lambda \approx 0$.

Iteratively Remove Multicollinear Regressors

```r
x <- df
model <- lm(log(Price) ~., data = x)
removed <- c()

finished <- F
while(!finished) {
  temp <- car::vif(model)[, "GVIF^(1/(2*Df))"]
  worst <- names(which.max(temp))
  if (length(temp) > 0 && temp[worst] > sqrt(5)) {
    x <- remove_cols(x, c(worst))
    model <- lm(log(Price) ~., data = x)

    removed <- c(removed, worst)
  } else {
    finished <- T
  }
}

removed
```

```
## [1] "Max.Torque.Value"   "Max.Power.RPM"      "Max.Power.Value"
## [4] "Engine"             "Fuel.Tank.Capacity" "Height"
```

```r
which(abs(rstudent(model)) > 4)
```

```
##   44  366  492 1536 1681
##   39  268  345 1071 1171
```

After inspecting these data points, we do not find a good reason to remove them (i.e., they are not clerical errors).

Add Interactions

We consider only numerical interactions due to data sparsity; including categorical values produces NA's for most interactions. We do not expect kilometers driven to interact with torque or width, so those interactions are not considered.

```
names(model$coefficients)[names(model$coefficients) %in% numerical]
```

```
## [1] "Year"           "Kilometer"      "Max.Torque.RPM" "Length"
## [5] "Width"
```

```
model <- lm(
  log(Price) ~ . + Year:Kilometer + Year:Max.Torque.RPM
                   + Year:Length + Year:Width
                   + Max.Torque.RPM:Length + Max.Torque.RPM:Width
                   + Length:Width,
  data = x
)

anova(model)
```

```
## Analysis of Variance Table
##
## Response: log(Price)
##                         Df Sum Sq Mean Sq   F value    Pr(>F)
## Make                    25 354.44  14.178  482.1594 < 2.2e-16 ***
## Year                     1 178.52 178.525 6071.3552 < 2.2e-16 ***
## Kilometer                1   0.98   0.982   33.3800 9.430e-09 ***
## Fuel.Type                2  19.23   9.615  326.9979 < 2.2e-16 ***
## Transmission             1  20.31  20.313  690.7982 < 2.2e-16 ***
## Location                63  16.76   0.266    9.0458 < 2.2e-16 ***
## Owner                    3   0.46   0.153    5.2143  0.001397 **
## Seller.Type              2   0.33   0.165    5.6238  0.003697 **
## Max.Torque.RPM           1   1.67   1.669   56.7628 9.050e-14 ***
## Drivetrain               2   5.81   2.905   98.7875 < 2.2e-16 ***
## Length                   1  51.72  51.724 1759.0668 < 2.2e-16 ***
## Width                    1   5.06   5.063  172.1998 < 2.2e-16 ***
## Seating.Capacity         1   0.02   0.019    0.6507  0.419991
## Year:Kilometer           1   1.10   1.100   37.4187 1.251e-09 ***
## Year:Max.Torque.RPM      1   0.99   0.993   33.7868 7.690e-09 ***
## Year:Length              1   2.04   2.038   69.2926 < 2.2e-16 ***
## Year:Width               1   0.08   0.076    2.5959  0.107377
## Max.Torque.RPM:Length    1   0.28   0.276    9.3872  0.002229 **
## Max.Torque.RPM:Width     1   0.01   0.012    0.3960  0.529287
## Length:Width             1   0.01   0.014    0.4748  0.490893
## Residuals             1329  39.08   0.029
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Interactions with width don't seem to be significant; remove them.

```r
model <- lm(
  log(Price) ~ . + Year:Kilometer + Year:Max.Torque.RPM
                 + Year:Length + Max.Torque.RPM:Length,
  data = x
)

anova(model)
```

```
## Analysis of Variance Table
##
## Response: log(Price)
##                         Df Sum Sq Mean Sq   F value    Pr(>F)
## Make                    25 354.44  14.178  481.9160 < 2.2e-16 ***
## Year                     1 178.52 178.525 6068.2914 < 2.2e-16 ***
## Kilometer                1   0.98   0.982   33.3632 9.505e-09 ***
## Fuel.Type                2  19.23   9.615  326.8329 < 2.2e-16 ***
## Transmission             1  20.31  20.313  690.4496 < 2.2e-16 ***
## Location                63  16.76   0.266    9.0412 < 2.2e-16 ***
## Owner                    3   0.46   0.153    5.2117  0.001402 **
## Seller.Type              2   0.33   0.165    5.6210  0.003708 **
## Max.Torque.RPM           1   1.67   1.669   56.7341 9.165e-14 ***
## Drivetrain               2   5.81   2.905   98.7377 < 2.2e-16 ***
## Length                   1  51.72  51.724 1758.1791 < 2.2e-16 ***
## Width                    1   5.06   5.063  172.1129 < 2.2e-16 ***
## Seating.Capacity         1   0.02   0.019    0.6504  0.420108
## Year:Kilometer           1   1.10   1.100   37.3998 1.262e-09 ***
## Year:Max.Torque.RPM      1   0.99   0.993   33.7697 7.752e-09 ***
## Year:Length              1   2.04   2.038   69.2576 < 2.2e-16 ***
## Max.Torque.RPM:Length    1   0.27   0.270    9.1768  0.002498 **
## Residuals             1332  39.19   0.029
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

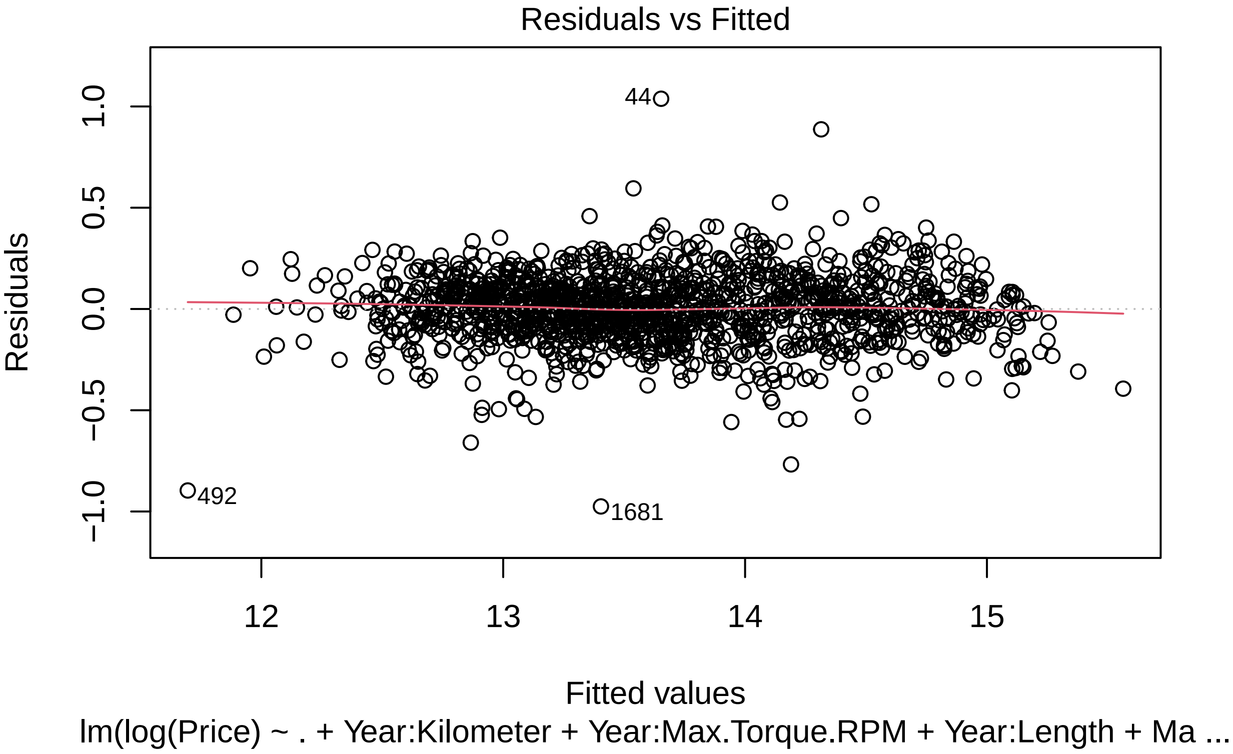
Seems reasonable now. We will double check our assumptions

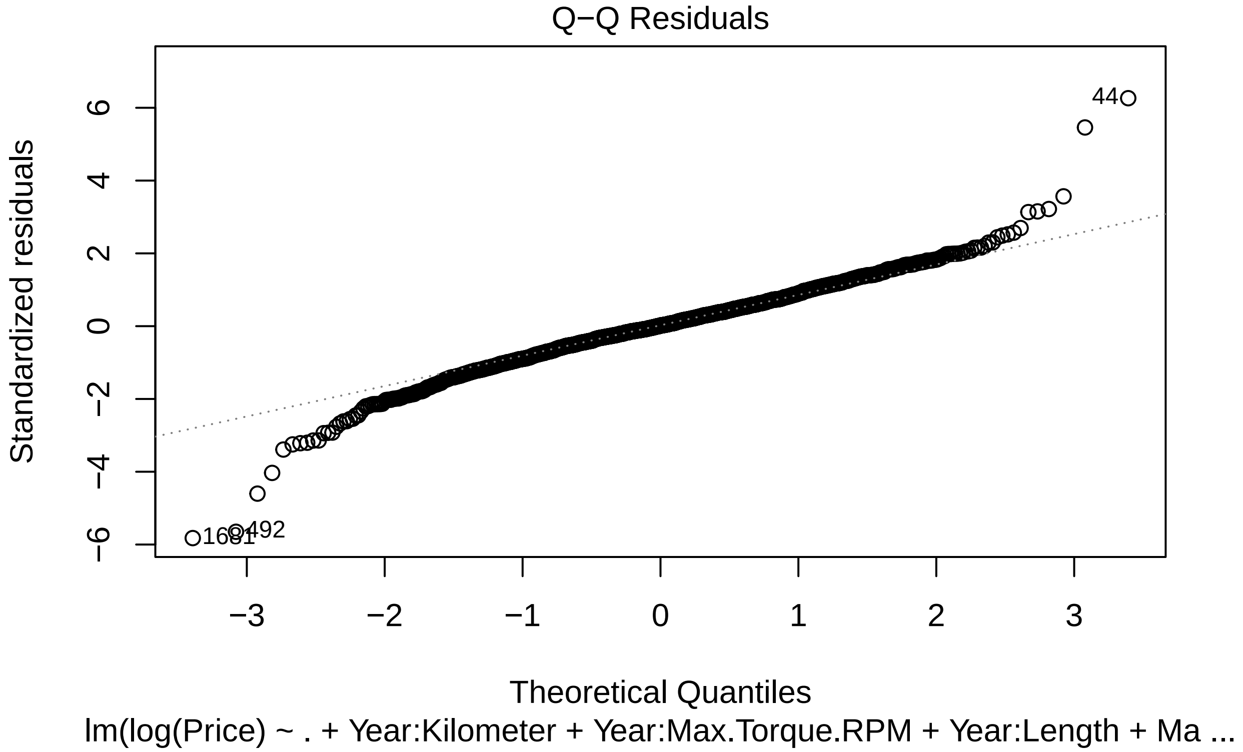
```r
vif(model, type = "predictor")
```

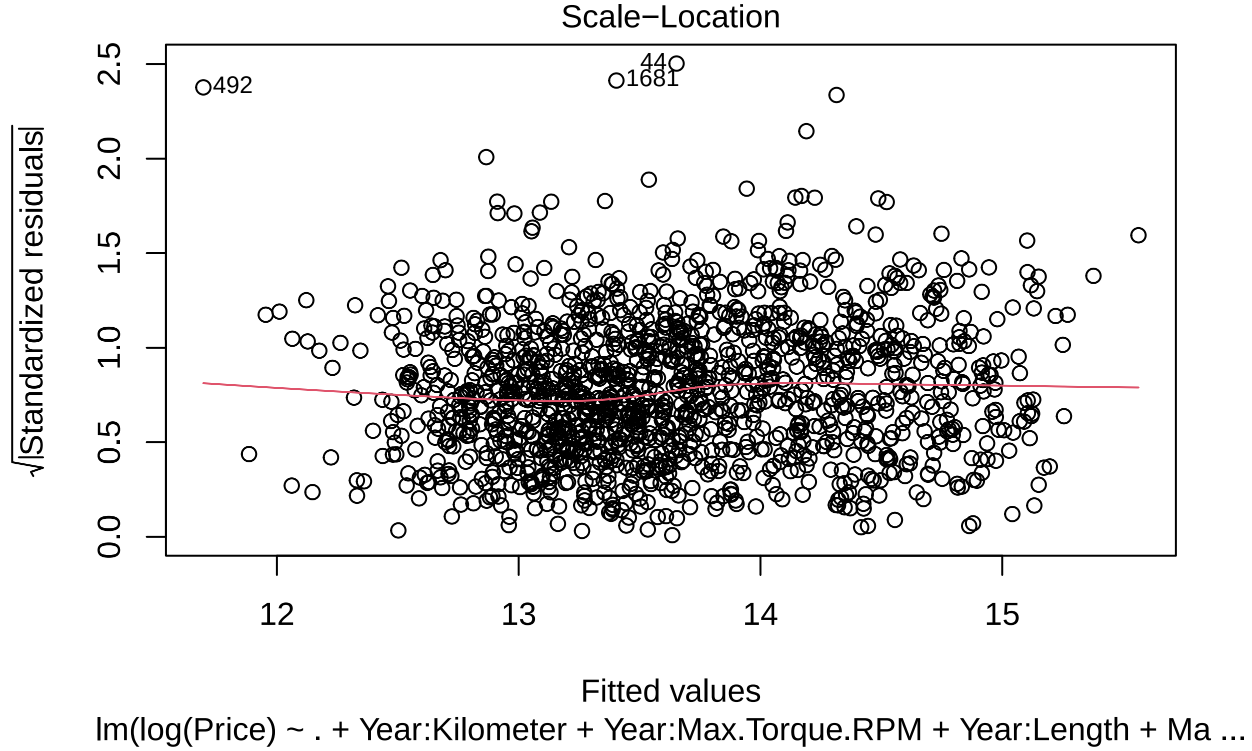
```
## GVIFs computed for predictors

##                        GVIF Df GVIF^(1/(2*Df))
## Make             119.109068 25        1.100320
## Year              75.935730  8        1.310774
## Kilometer        330.635985  3        2.629612
## Fuel.Type          5.334325  2        1.519742
## Transmission       1.851632  1        1.360747
## Location          16.448508 63        1.022473
## Owner              1.673586  3        1.089619
## Seller.Type        1.341372  2        1.076186
## Max.Torque.RPM   207.518246  6        1.559869
## Drivetrain         4.003689  2        1.414539
## Length           207.518246  6        1.559869
## Width              4.624641  1        2.150498
## Seating.Capacity   2.882982  1        1.697934
##                                      Interacts With
## Make                                          --
## Year             Kilometer, Max.Torque.RPM, Length
## Kilometer                                     Year
## Fuel.Type                                     --
## Transmission                                  --
## Location                                      --
## Owner                                         --
## Seller.Type                                   --
## Max.Torque.RPM                        Year, Length
## Drivetrain                                    --
## Length                        Year, Max.Torque.RPM
## Width                                         --
## Seating.Capacity                              --
##
## Make             Year, Kilometer, Fuel.Type, Transmission, Location, Owner, Seller.Type, Max.Torque.
## Year                                                   Make, Fuel.Type, Transmission, Location, Owner,
## Kilometer                   Make, Fuel.Type, Transmission, Location, Owner, Seller.Type, Max.Torque.
## Fuel.Type             Make, Year, Kilometer, Transmission, Location, Owner, Seller.Type, Max.Torque.
## Transmission             Make, Year, Kilometer, Fuel.Type, Location, Owner, Seller.Type, Max.Torque.
## Location             Make, Year, Kilometer, Fuel.Type, Transmission, Owner, Seller.Type, Max.Torque.
## Owner             Make, Year, Kilometer, Fuel.Type, Transmission, Location, Seller.Type, Max.Torque.
## Seller.Type             Make, Year, Kilometer, Fuel.Type, Transmission, Location, Owner, Max.Torque.
## Max.Torque.RPM                           Make, Kilometer, Fuel.Type, Transmission, Location, Owner,
## Drivetrain             Make, Year, Kilometer, Fuel.Type, Transmission, Location, Owner, Seller.Type,
## Length                                   Make, Kilometer, Fuel.Type, Transmission, Location, Owner,
## Width             Make, Year, Kilometer, Fuel.Type, Transmission, Location, Owner, Seller.Type, Max.T
## Seating.Capacity             Make, Year, Kilometer, Fuel.Type, Transmission, Location, Owner, Seller
```

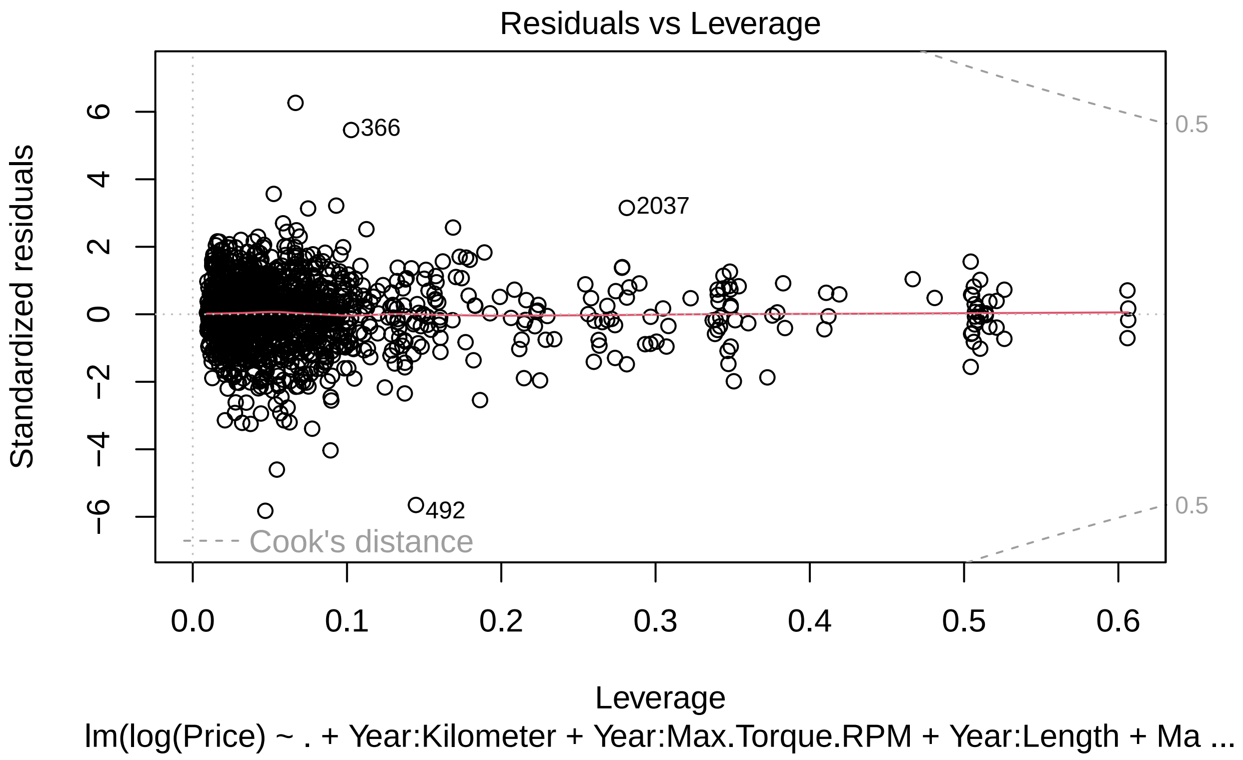
We get that GVIF^(1/(2*Df)) $> 2.236068 \approx \sqrt{5}$, for “Kilometer,” but this is known to be important is does not exceed the threshold by a lot, so we keep it.

```
plot(model)
```




Q−Q Residuals
Standardized residuals
Theoretical Quantiles
lm(log(Price) ~ . + Year:Kilometer + Year:Max.Torque.RPM + Year:Length + Ma ...
−6
−4
−2
0
2
4
6
−3
−2
−1
0
1
2
3
44
1681
492


Scale−Location
√|Standardized residuals|
Fitted values
lm(log(Price) ~ . + Year:Kilometer + Year:Max.Torque.RPM + Year:Length + Ma ...
0.0
0.5
1.0
1.5
2.0
2.5
12
13
14
15
492
44
1681



Backwards Stepwise Search

We do a backwards search since our model already conforms to the linear assumptions and is performing well. We simply wish to reduce the model size now.

```
reduced_model <- step(model, direction = "backward", data = x, trace = 0, k = log(nrow(x)))
old <- names(model$coefficients)
new <- names(reduced_model$coefficients)

old[!(old %in% new)]
```

```
##  [1] "LocationAhmedabad"     "LocationAllahabad"     "LocationAmbala Cantt"
##  [4] "LocationAmritsar"      "LocationAurangabad"    "LocationBangalore"
##  [7] "LocationBhopal"        "LocationBhubaneswar"   "LocationBulandshahar"
## [10] "LocationChandigarh"    "LocationChennai"       "LocationCoimbatore"
## [13] "LocationDehradun"      "LocationDelhi"         "LocationDharwad"
## [16] "LocationErnakulam"     "LocationFaridabad"     "LocationGhaziabad"
## [19] "LocationGoa"           "LocationGurgaon"       "LocationGuwahati"
## [22] "LocationHaldwani"      "LocationHyderabad"     "LocationIndore"
## [25] "LocationJaipur"        "LocationJalandhar"     "LocationJamshedpur"
## [28] "LocationKanpur"        "LocationKarnal"        "LocationKharar"
## [31] "LocationKheda"         "LocationKolkata"       "LocationKollam"
## [34] "LocationKota"          "LocationLucknow"       "LocationLudhiana"
## [37] "LocationMangalore"     "LocationMeerut"        "LocationMirzapur"
## [40] "LocationMohali"        "LocationMumbai"        "LocationMuzaffurpur"
## [43] "LocationMysore"        "LocationNagpur"        "LocationNashik"
## [46] "LocationNavi Mumbai"   "LocationNoida"         "LocationPanchkula"
## [49] "LocationPatna"         "LocationPune"          "LocationRaipur"
## [52] "LocationRanchi"        "LocationRanga Reddy"   "LocationRoorkee"
## [55] "LocationSalem"         "LocationSurat"         "LocationThane"
## [58] "LocationUdupi"         "LocationVadodara"      "LocationVaranasi"
## [61] "LocationWarangal"      "LocationYamunanagar"   "LocationZirakpur"
## [64] "OwnerSecond"           "OwnerThird"            "OwnerUnRegistered Car"
## [67] "Seller.TypeCorporate"  "Seller.TypeIndividual" "Seating.Capacity"
```

Inspect Model Coefficients

```r
summary(reduced_model)
```

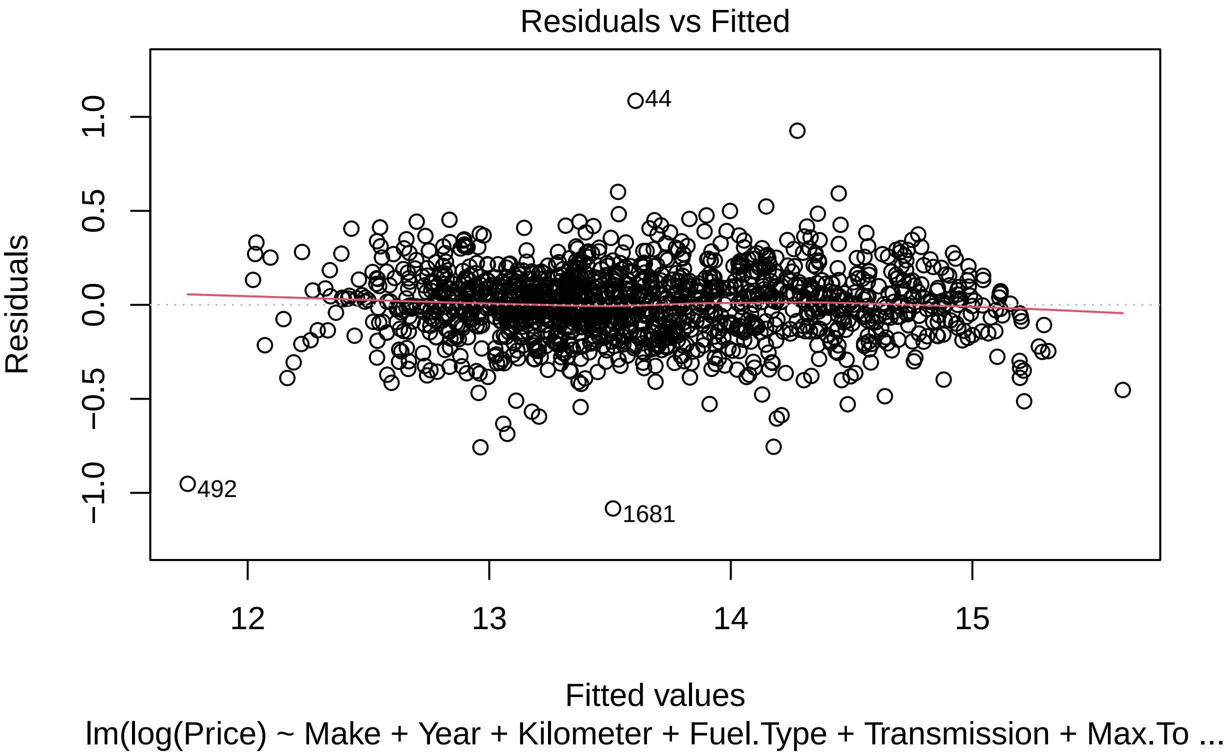
```
##
## Call:
## lm(formula = log(Price) ~ Make + Year + Kilometer + Fuel.Type +
##     Transmission + Max.Torque.RPM + Drivetrain + Length + Width +
##     Year:Kilometer + Year:Max.Torque.RPM + Year:Length + Max.Torque.RPM:Length,
##     data = x)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.08307 -0.10778  0.00302  0.11095  1.08538
##
## Coefficients:
##                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)            9.510e+01  4.616e+01   2.060 0.039566 *
## MakeBMW                1.874e-02  4.321e-02   0.434 0.664637
## MakeChevrolet         -8.118e-01  9.967e-02  -8.144 8.35e-16 ***
## MakeDatsun            -9.312e-01  7.499e-02 -12.418  < 2e-16 ***
## MakeFord              -5.886e-01  4.134e-02 -14.237  < 2e-16 ***
## MakeHonda             -5.243e-01  3.348e-02 -15.659  < 2e-16 ***
## MakeHyundai           -4.913e-01  2.934e-02 -16.744  < 2e-16 ***
## MakeIsuzu             -4.104e-01  1.386e-01  -2.960 0.003124 **
## MakeJaguar             4.304e-02  8.415e-02   0.511 0.609111
## MakeJeep              -3.526e-01  5.495e-02  -6.418 1.89e-10 ***
## MakeKia               -4.353e-01  4.853e-02  -8.970  < 2e-16 ***
## MakeLand Rover         8.907e-02  1.132e-01   0.787 0.431440
## MakeMahindra          -6.243e-01  3.534e-02 -17.663  < 2e-16 ***
## MakeMaruti Suzuki     -5.409e-01  3.008e-02 -17.979  < 2e-16 ***
## MakeMercedes-Benz      1.231e-01  3.561e-02   3.457 0.000563 ***
## MakeMG                -6.054e-01  5.996e-02 -10.095  < 2e-16 ***
## MakeMINI               7.174e-01  8.298e-02   8.645  < 2e-16 ***
## MakeMitsubishi        -2.063e-01  1.137e-01  -1.814 0.069817 .
## MakeNissan            -7.579e-01  5.559e-02 -13.634  < 2e-16 ***
## MakeRenault           -7.602e-01  4.110e-02 -18.499  < 2e-16 ***
## MakeSkoda             -4.933e-01  4.013e-02 -12.292  < 2e-16 ***
## MakeSsangyong         -8.659e-01  1.144e-01  -7.570 6.74e-14 ***
## MakeTata              -7.449e-01  3.963e-02 -18.799  < 2e-16 ***
## MakeToyota            -2.811e-01  3.210e-02  -8.757  < 2e-16 ***
## MakeVolkswagen        -5.047e-01  4.029e-02 -12.525  < 2e-16 ***
## MakeVolvo              4.204e-02  6.144e-02   0.684 0.493988
## Year                  -4.268e-02  2.289e-02  -1.865 0.062445 .
## Kilometer             -3.578e-04  1.296e-04  -2.761 0.005844 **
## Fuel.TypeDiesel       -1.317e-01  4.020e-02  -3.277 0.001075 **
## Fuel.TypePetrol       -1.608e-01  3.648e-02  -4.409 1.12e-05 ***
## TransmissionManual    -1.581e-01  1.340e-02 -11.799  < 2e-16 ***
## Max.Torque.RPM         1.250e-02  3.153e-03   3.965 7.72e-05 ***
## DrivetrainFWD         -2.699e-01  2.396e-02 -11.268  < 2e-16 ***
## DrivetrainRWD         -2.116e-01  2.905e-02  -7.283 5.44e-13 ***
## Length                -7.724e-02  1.032e-02  -7.484 1.26e-13 ***
## Width                  1.540e-03  1.163e-04  13.239  < 2e-16 ***
## Year:Kilometer         1.768e-07  6.427e-08   2.751 0.006026 ** 
## Year:Max.Torque.RPM   -6.132e-06  1.559e-06  -3.933 8.82e-05 ***
## Year:Length            3.866e-05  5.116e-06   7.555 7.51e-14 ***
## Max.Torque.RPM:Length -3.970e-08  1.460e-08  -2.719 0.006627 ** 
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 0.1905 on 1401 degrees of freedom
## Multiple R-squared:  0.9273, Adjusted R-squared:  0.9253 
## F-statistic: 458.2 on 39 and 1401 DF,  p-value: < 2.2e-16
```

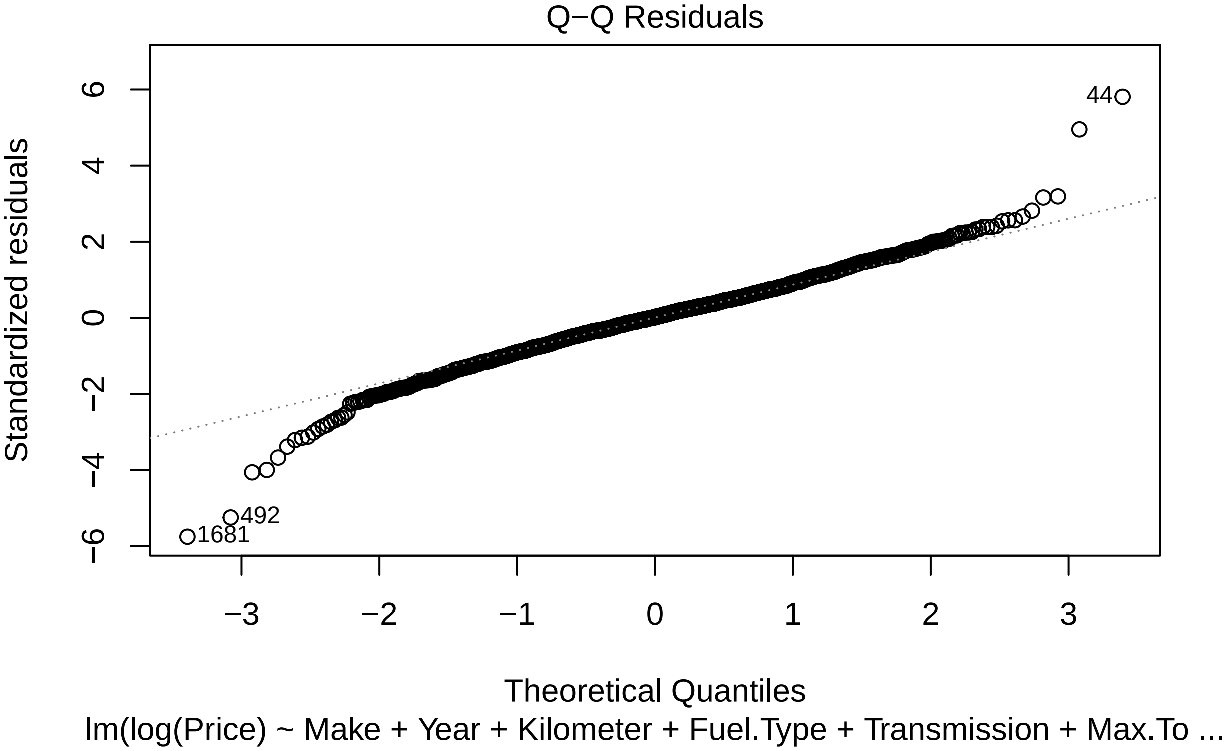
```r
anova(reduced_model)
```

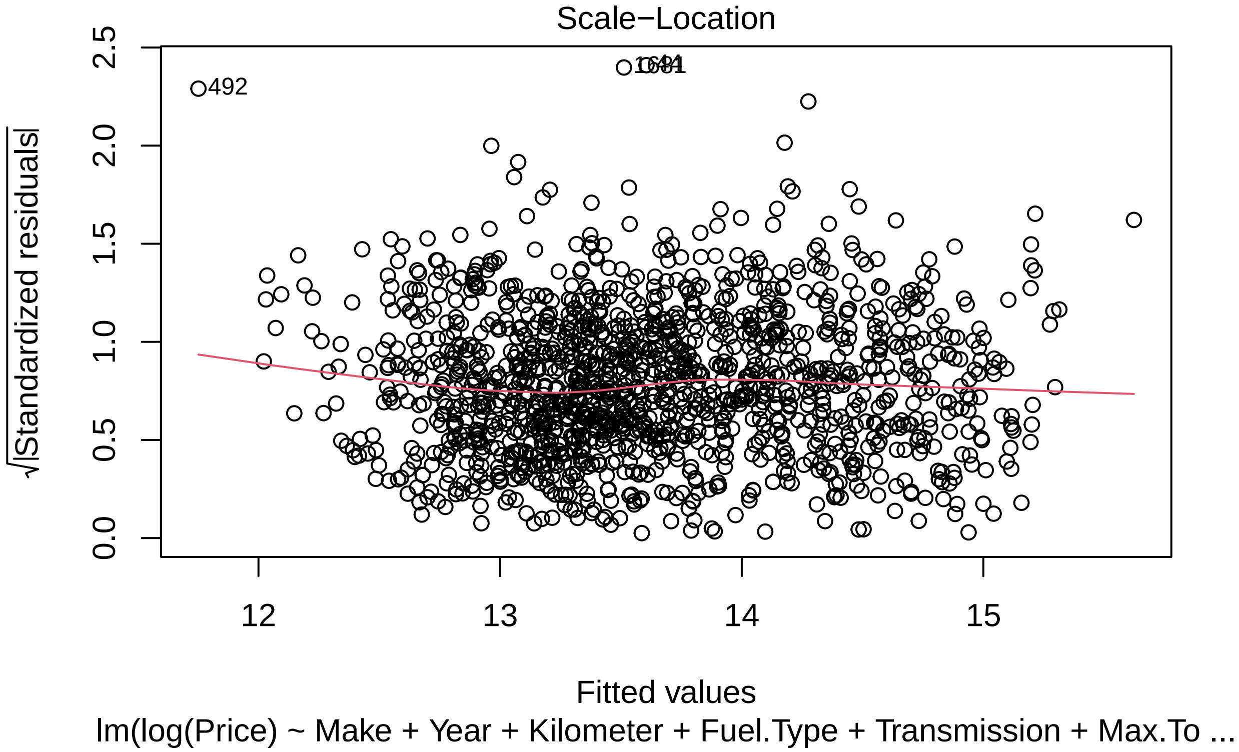
```
## Analysis of Variance Table
## 
## Response: log(Price)
##                         Df Sum Sq Mean Sq   F value    Pr(>F)    
## Make                    25 354.44  14.178  390.8754 < 2.2e-16 ***
## Year                     1 178.52 178.525 4921.9071 < 2.2e-16 ***
## Kilometer                1   0.98   0.982   27.0604 2.265e-07 ***
## Fuel.Type                2  19.23   9.615  265.0896 < 2.2e-16 ***
## Transmission             1  20.31  20.313  560.0141 < 2.2e-16 ***
## Max.Torque.RPM           1   1.14   1.139   31.4057 2.518e-08 ***
## Drivetrain               2   6.53   3.267   90.0706 < 2.2e-16 ***
## Length                   1  56.67  56.670 1562.3991 < 2.2e-16 ***
## Width                    1   5.64   5.636  155.3813 < 2.2e-16 ***
## Year:Kilometer           1   0.92   0.922   25.4311 5.184e-07 ***
## Year:Max.Torque.RPM      1   1.25   1.247   34.3901 5.618e-09 ***
## Year:Length              1   2.19   2.187   60.3045 1.559e-14 ***
## Max.Torque.RPM:Length    1   0.27   0.268    7.3935  0.006627 ** 
## Residuals             1401  50.82   0.036                        
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

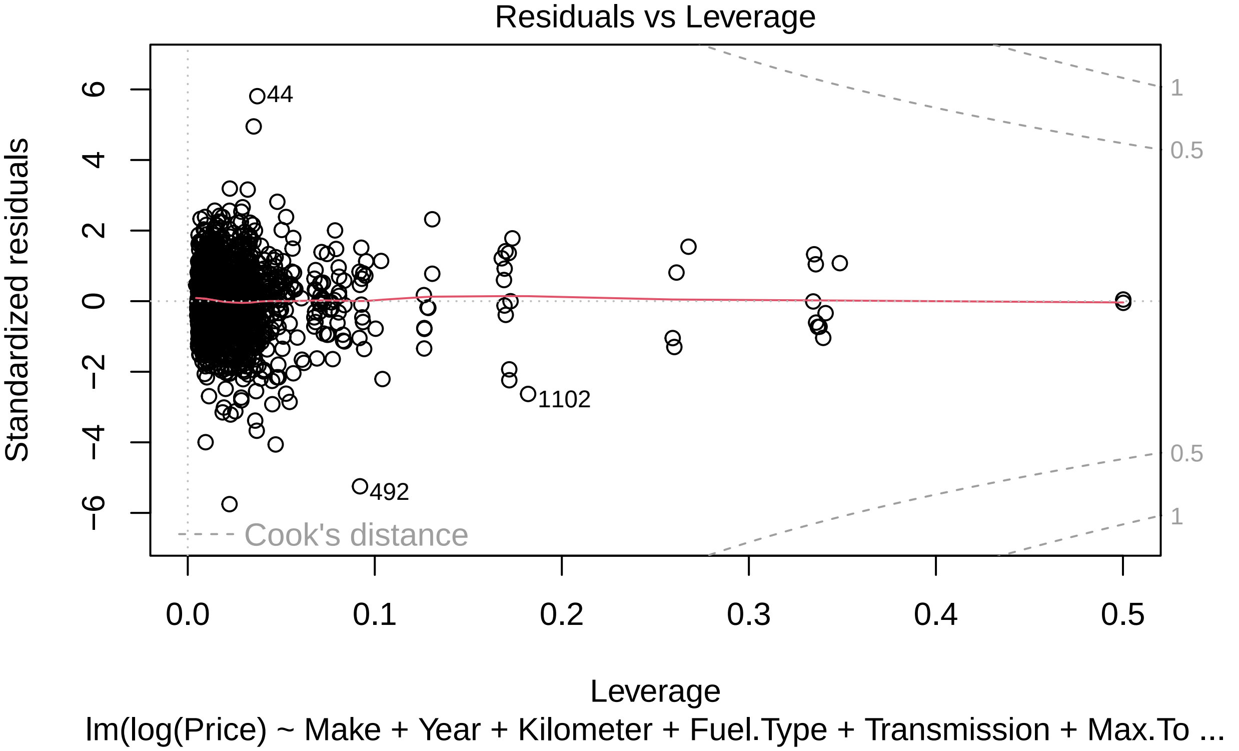
Final Model Verification

```r
plot(reduced_model)
```


Residuals vs Fitted
Residuals
1.0
0.5
0.0
−0.5
−1.0
44
492
1681
12
13
14
15
Fitted values
lm(log(Price) ~ Make + Year + Kilometer + Fuel.Type + Transmission + Max.To ...


Q−Q Residuals
Standardized residuals
6
4
2
0
−2
−4
−6
44
492
1681
−3
−2
−1
0
1
2
3
Theoretical Quantiles
lm(log(Price) ~ Make + Year + Kilometer + Fuel.Type + Transmission + Max.To ...





Normalized Coefficients

```
normalized <- remove_cols(x, old[!(old %in% new)]) # removed from multicollinearity test
normalized <- remove_cols(x, c("Seating.Capacity", "Seller.Type"))
```

```r
for (col in colnames(normalized)) {
  if (col != "Price" && !(col %in% categorical)) {
    normalized[, col] <- (normalized[, col] - mean(normalized[, col])) / sd(normalized[, col])
  }
}

normalized_model <- lm(log(Price) ~ . + Year:Kilometer + Year:Max.Torque.RPM
                   + Year:Length + Max.Torque.RPM:Length, data = normalized)

sort(abs(normalized_model$coefficients), decreasing = T)
```

```
##           (Intercept)         MakeSsangyong            MakeDatsun
##          14.479239336           0.872512749           0.857115032
##         MakeChevrolet           MakeRenault            MakeNissan
##           0.798238688           0.749256440           0.733447399
##              MakeTata              MakeMINI                MakeMG
##           0.718998608           0.704054157           0.596345412
##          MakeMahindra              MakeFord     MakeMaruti Suzuki
##           0.596297888           0.572746578           0.523222676
##        MakeVolkswagen             MakeSkoda             MakeHonda
##           0.518324656           0.509078901           0.485869081
##           MakeHyundai             MakeIsuzu         LocationSalem
##           0.465042221           0.437700433           0.420870279
##               MakeKia              MakeJeep        LocationMysore
##           0.415501427           0.333574675           0.320886296
##                  Year  LocationBulandshahar    LocationAurangabad
##           0.313783661           0.313704055           0.293113281
##    LocationCoimbatore         DrivetrainFWD        MakeMitsubishi
##           0.269393557           0.263692508           0.249563035
##            MakeToyota           LocationGoa     LocationBangalore
##           0.248826742           0.248093841           0.246496783
##        LocationKollam                Length         DrivetrainRWD
##           0.226788237           0.226439416           0.221018253
##       LocationChennai        LocationIndore     LocationErnakulam
##           0.216077914           0.209724881           0.208988890
##       LocationDharwad       Fuel.TypePetrol     LocationHyderabad
##           0.207341744           0.189472148           0.185525949
##     LocationJalandhar        MakeLand Rover        LocationNagpur
##           0.181224043           0.180846132           0.167588274
##      LocationGuwahati       Fuel.TypeDiesel         LocationUdupi
##           0.167182283           0.164673775           0.148042941
##     MakeMercedes-Benz    TransmissionManual                 Width
##           0.145432782           0.143902253           0.135371333
##          LocationPune        LocationJaipur      LocationAmritsar
##           0.131030713           0.122967074           0.121805119
##            OwnerThird          LocationKota        LocationMohali
##           0.121210169           0.117146416           0.115934495
##         LocationThane        LocationMumbai        LocationRaipur
##           0.102055354           0.100701797           0.099272043
##      LocationMirzapur        LocationKarnal         LocationNoida
##           0.098291704           0.096670247           0.095972455
##  LocationAmbala Cantt   LocationNavi Mumbai     LocationAllahabad
##           0.092130013           0.092020794           0.090599537
##         LocationKheda        LocationKanpur OwnerUnRegistered Car
##           0.088221751           0.086058622           0.082215522
##   LocationBhubaneswar       LocationKolkata         LocationDelhi
##           0.080119830           0.076002757           0.071607021
##     LocationFaridabad   LocationMuzaffurpur   LocationRanga Reddy
##           0.069764717           0.068179314           0.066742019
##            MakeJaguar      LocationWarangal     LocationAhmedabad
##           0.065901543           0.063180846           0.062246218
##         LocationPatna      LocationDehradun        LocationNashik
##           0.062160128           0.059305473           0.058196769
##        Max.Torque.RPM     LocationMangalore        LocationKharar
##           0.056697498           0.056620215           0.056298195
##      LocationVaranasi       LocationRoorkee        LocationRanchi
##           0.048878372           0.047629067           0.046096495
##      LocationLudhiana           Year:Length         LocationSurat
##           0.043273053           0.041510876           0.041112278
##        LocationMeerut             Kilometer    LocationChandigarh
##           0.038541407           0.034232361           0.031825300
##             MakeVolvo        LocationBhopal     LocationPanchkula
##           0.030938615           0.029053023           0.027400801
##      LocationZirakpur     LocationGhaziabad   LocationYamunanagar
##           0.026027821           0.023076512           0.023015393
##       LocationLucknow           OwnerSecond   Year:Max.Torque.RPM
##           0.021634758           0.020113875           0.018733584
## Max.Torque.RPM:Length        Year:Kilometer    LocationJamshedpur
##           0.017715033           0.017494262           0.017254036
##               MakeBMW      LocationHaldwani       LocationGurgaon
##           0.012673995           0.010949026           0.010276737
##      LocationVadodara
##           0.009552204
```

Confidence Intervals

```r
confint(reduced_model, level = 0.95)
```

```
##                               2.5 %        97.5 %
## (Intercept)            4.547396e+00  1.856477e+02
## MakeBMW               -6.602817e-02  1.035016e-01
## MakeChevrolet         -1.007281e+00 -6.162404e-01
## MakeDatsun            -1.078298e+00 -7.841001e-01
## MakeFord              -6.697386e-01 -5.075326e-01
## MakeHonda             -5.900076e-01 -4.586369e-01
## MakeHyundai           -5.488761e-01 -4.337524e-01
## MakeIsuzu             -6.823497e-01 -1.384600e-01
## MakeJaguar            -1.220379e-01  2.081188e-01
## MakeJeep              -4.604327e-01 -2.448569e-01
## MakeKia               -5.305453e-01 -3.401349e-01
## MakeLand Rover        -1.329586e-01  3.111020e-01
## MakeMahindra          -6.936231e-01 -5.549561e-01
## MakeMaruti Suzuki     -5.998648e-01 -4.818426e-01
## MakeMercedes-Benz      5.324385e-02  1.929706e-01
## MakeMG                -7.229815e-01 -4.877246e-01
## MakeMINI               5.546073e-01  8.801579e-01
## MakeMitsubishi        -4.293712e-01  1.673447e-02
## MakeNissan            -8.669420e-01 -6.488544e-01
## MakeRenault           -8.408366e-01 -6.796076e-01
## MakeSkoda             -5.720421e-01 -4.145890e-01
## MakeSsangyong         -1.090227e+00 -6.414793e-01
## MakeTata              -8.226646e-01 -6.671974e-01
## MakeToyota            -3.440356e-01 -2.181091e-01
## MakeVolkswagen        -5.837269e-01 -4.256451e-01
## MakeVolvo             -7.849495e-02  1.625703e-01
## Year                  -8.757891e-02  2.221399e-03
## Kilometer             -6.120361e-04 -1.035533e-04
## Fuel.TypeDiesel       -2.106099e-01 -5.288107e-02
## Fuel.TypePetrol       -2.323631e-01 -8.925600e-02
## TransmissionManual    -1.843935e-01 -1.318227e-01
## Max.Torque.RPM         6.315101e-03  1.868420e-02
## DrivetrainFWD         -3.169270e-01 -2.229383e-01
## DrivetrainRWD         -2.685680e-01 -1.545884e-01
## Length                -9.748973e-02 -5.699824e-02
## Width                  1.311510e-03  1.767784e-03
## Year:Kilometer         5.069930e-08  3.028336e-07
## Year:Max.Torque.RPM   -9.190592e-06 -3.073084e-06
## Year:Length            2.861917e-05  4.869220e-05
## Max.Torque.RPM:Length -6.834755e-08 -1.105992e-08
```