Test

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webshot::install\_phantomjs()

## It seems that the version of `phantomjs` installed is greater than or equal to the requested version.To install the requested version or downgrade to another version, use `force = TRUE`.

library(readr)  
library(Metrics) # RMSE/RMSLE

## Warning: package 'Metrics' was built under R version 4.0.5

library(dplyr)

## Warning: package 'dplyr' was built under R version 4.0.5

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

library(ggplot2)  
library(dgof) #ks.test

##   
## Attaching package: 'dgof'

## The following object is masked from 'package:stats':  
##   
## ks.test

library(fitdistrplus) #MLE

## Warning: package 'fitdistrplus' was built under R version 4.0.5

## Loading required package: MASS

## Warning: package 'MASS' was built under R version 4.0.4

##   
## Attaching package: 'MASS'

## The following object is masked from 'package:dplyr':  
##   
## select

## Loading required package: survival

library(actuar)

## Warning: package 'actuar' was built under R version 4.0.5

##   
## Attaching package: 'actuar'

## The following object is masked from 'package:grDevices':  
##   
## cm

library(stringr)

## Warning: package 'stringr' was built under R version 4.0.5

library(SuppDists)  
library(dplyr)  
library(EnvStats)

## Warning: package 'EnvStats' was built under R version 4.0.5

##   
## Attaching package: 'EnvStats'

## The following objects are masked from 'package:actuar':  
##   
## dpareto, ppareto, qpareto, rpareto

## The following object is masked from 'package:MASS':  
##   
## boxcox

## The following objects are masked from 'package:stats':  
##   
## predict, predict.lm

## The following object is masked from 'package:base':  
##   
## print.default

# Cleaning

data <- read\_csv("laptop\_price.csv")

##   
## -- Column specification --------------------------------------------------------  
## cols(  
## laptop\_ID = col\_double(),  
## Company = col\_character(),  
## Product = col\_character(),  
## TypeName = col\_character(),  
## Inches = col\_double(),  
## ScreenResolution = col\_character(),  
## Cpu = col\_character(),  
## Ram = col\_character(),  
## Memory = col\_character(),  
## Gpu = col\_character(),  
## OpSys = col\_character(),  
## Weight = col\_character(),  
## Price\_euros = col\_double()  
## )

head(data)

## # A tibble: 6 x 13  
## laptop\_ID Company Product TypeName Inches ScreenResolution Cpu Ram Memory  
## <dbl> <chr> <chr> <chr> <dbl> <chr> <chr> <chr> <chr>   
## 1 1 Apple MacBook~ Ultrabo~ 13.3 IPS Panel Retin~ Inte~ 8GB 128GB~  
## 2 2 Apple Macbook~ Ultrabo~ 13.3 1440x900 Inte~ 8GB 128GB~  
## 3 3 HP 250 G6 Notebook 15.6 Full HD 1920x10~ Inte~ 8GB 256GB~  
## 4 4 Apple MacBook~ Ultrabo~ 15.4 IPS Panel Retin~ Inte~ 16GB 512GB~  
## 5 5 Apple MacBook~ Ultrabo~ 13.3 IPS Panel Retin~ Inte~ 8GB 256GB~  
## 6 6 Acer Aspire 3 Notebook 15.6 1366x768 AMD ~ 4GB 500GB~  
## # ... with 4 more variables: Gpu <chr>, OpSys <chr>, Weight <chr>,  
## # Price\_euros <dbl>

company <- c('Dell','Lenovo','HP','Asus','Acer', "Apple")  
data <- data %>% filter(Company %in% company)  
data

## # A tibble: 1,150 x 13  
## laptop\_ID Company Product TypeName Inches ScreenResolution Cpu Ram Memory  
## <dbl> <chr> <chr> <chr> <dbl> <chr> <chr> <chr> <chr>   
## 1 1 Apple MacBoo~ Ultrabo~ 13.3 IPS Panel Retin~ Inte~ 8GB 128GB~  
## 2 2 Apple Macboo~ Ultrabo~ 13.3 1440x900 Inte~ 8GB 128GB~  
## 3 3 HP 250 G6 Notebook 15.6 Full HD 1920x10~ Inte~ 8GB 256GB~  
## 4 4 Apple MacBoo~ Ultrabo~ 15.4 IPS Panel Retin~ Inte~ 16GB 512GB~  
## 5 5 Apple MacBoo~ Ultrabo~ 13.3 IPS Panel Retin~ Inte~ 8GB 256GB~  
## 6 6 Acer Aspire~ Notebook 15.6 1366x768 AMD ~ 4GB 500GB~  
## 7 7 Apple MacBoo~ Ultrabo~ 15.4 IPS Panel Retin~ Inte~ 16GB 256GB~  
## 8 8 Apple Macboo~ Ultrabo~ 13.3 1440x900 Inte~ 8GB 256GB~  
## 9 9 Asus ZenBoo~ Ultrabo~ 14 Full HD 1920x10~ Inte~ 16GB 512GB~  
## 10 10 Acer Swift 3 Ultrabo~ 14 IPS Panel Full ~ Inte~ 8GB 256GB~  
## # ... with 1,140 more rows, and 4 more variables: Gpu <chr>, OpSys <chr>,  
## # Weight <chr>, Price\_euros <dbl>

## Cleanning Screen Resolution

x <- c("IPS Panel Retina Display ","Full HD ","IPS Panel Full HD ","IPS Panel Full HD / Touchscreen ","Full HD / Touchscreen ","Touchscreen / Quad HD+ ","IPS Panel Touchscreen ", "Touchscreen ", "Quad HD+ / Touchscreen ","IPS Panel ","IPS Panel 4K Ultra HD / Touchscreen ","4K Ultra HD / Touchscreen ","IPS Panel 4K Ultra HD ", "4K Ultra HD ","Touchscreen ","IPS Panel Full HD ","IPS Panel ","IPS Panel Full HD ","IPS Panel Retina Display ","Touchscreen ","IPS Panel Quad HD+ ","IPS Panel Quad HD+ ","IPS Panel Quad HD+ / Touchscreen ","IPS Panel Touchscreen ","IPS Panel Full HD ","IPS Panel Touchscreen / 4K Ultra HD ","IPS Panel Touchscreen ","Touchscreen / Full HD ","Quad HD+ ","Touchscreen / 4K Ultra HD ","IPS Panel Touchscreen" ,"/ ")  
for (i in 1:length(x)){  
 data$ScreenResolution <- sub(x[i], "", data$ScreenResolution,fixed = TRUE)  
}

## Cleanning CPU Type

data$Cpu\_Type <- ''  
data$Cpu\_Series <- ''  
data$Cpu\_Speed <- ''  
for (i in 1:nrow(data)){  
 vec <- str\_split(data$Cpu[i], ' ',simplify =TRUE)  
 n <- length(vec)  
 data$Cpu\_Type[i] <- vec[1,1]  
 data$Cpu\_Speed[i] <- vec[1,n]  
 n <- n-1  
 temp <- vec[1,2]  
 for (j in 3:n){  
 temp <- paste(temp,vec[1,j])  
 }  
 data$Cpu\_Series[i] <- temp  
}

## Cleanning GPU Type

data$Gpu\_Type <- ''  
data$Gpu\_Series <- ''  
for (i in 1:nrow(data)){  
 data$Gpu\_Type[i] <- str\_split(data$Gpu[i], ' ', n=2)[[1]][1]  
 data$Gpu\_Series[i] <- str\_split(data$Gpu[i], ' ', n=2)[[1]][2]  
}

## Cleanning Memory

data$Memory\_1 <- ''  
data$Memory\_2 <- ''  
for (i in 1:nrow(data)){  
 data$Memory\_1[i] <- sub(' +', '',str\_split(data$Memory, ' + ', n=2)[[i]][1],fixed=TRUE)  
 data$Memory\_2[i] <- str\_split(data$Memory, ' + ', n=2)[[i]][2]  
}  
data$Memory\_2[is.na(data$Memory\_2)] = 0  
data[which(data$Memory\_1 =='1.0TB HDD'),]$Memory\_1 = '1TB HDD'  
  
data$Memory\_1\_Type <- ''  
data$Memory\_1\_Size <- ''  
data$Memory\_2\_Type <- ''  
data$Memory\_2\_Size <- ''  
  
for (i in 1:nrow(data)){   
 data$Memory\_1\_Type[i] <- str\_split(data$Memory\_1[i],' ', 2, simplify= T)[1,2]  
 data$Memory\_1\_Size[i] <- str\_split(data$Memory\_1[i],' ', 2, simplify= T)[1,1]  
   
 data$Memory\_2\_Type[i] <- str\_split(data$Memory\_2[i],' ', 2, simplify= T)[1,2]  
 data$Memory\_2\_Size[i] <- str\_split(data$Memory\_2[i],' ', 2, simplify= T)[1,1]  
}  
data[which(data$Memory\_1 =='1.0TB HDD'),]$Memory\_1 = '1TB HDD'  
  
data[which(data$Memory\_1\_Size =='1.0TB'),]$Memory\_1\_Size = '1TB'  
data[which(data$Memory\_1\_Size =='1TB'),]$Memory\_1\_Size = '1024GB'  
data[which(data$Memory\_1\_Size =='2TB'),]$Memory\_1\_Size = '2048GB'  
  
data[which(data$Memory\_2\_Size =='1.0TB'),]$Memory\_2\_Size = '1TB'  
data[which(data$Memory\_2\_Size =='1TB'),]$Memory\_2\_Size = '1024GB'  
data[which(data$Memory\_2\_Size =='2TB'),]$Memory\_2\_Size = '2048GB'  
  
data$Memory\_1\_Size <- sub('GB', "", data$Memory\_1\_Size,fixed = TRUE)  
data$Memory\_1\_Size <- as.numeric(data$Memory\_1\_Size)  
data$Memory\_2\_Size <- sub('GB', "", data$Memory\_2\_Size,fixed = TRUE)  
data$Memory\_2\_Size <- as.numeric(data$Memory\_2\_Size)

## Cleanning Ram

data$Ram <- as.numeric(sub('GB', "", data$Ram,fixed = TRUE))  
data$Cpu\_Speed <- as.numeric(sub('GHz', '', data$Cpu\_Speed, fixed=TRUE))

# Factoring

data$Company <- factor(data$Company)  
data$Product <- factor(data$Product)  
data$TypeName <- factor(data$TypeName)  
data$ScreenResolution <- factor(data$ScreenResolution)  
data$Cpu <- factor(data$Cpu)  
data$Memory <- factor(data$Memory)  
data$Gpu <- factor(data$Cpu)  
data$OpSys <- factor(data$OpSys)  
data$Memory\_1 <- factor(data$Memory\_1)  
data$Memory\_2 <- factor(data$Memory\_2)  
data$Gpu\_Type <- factor(data$Gpu\_Type)  
data$Gpu\_Series <- factor(data$Gpu\_Series)  
data$Weight <-as.numeric(str\_remove(data$Weight,'kg'))

head(data$Weight)

## [1] 1.37 1.34 1.86 1.83 1.37 2.10

## Relevelling

data %>% count(Company, sort = TRUE)

## # A tibble: 6 x 2  
## Company n  
## <fct> <int>  
## 1 Dell 297  
## 2 Lenovo 297  
## 3 HP 274  
## 4 Asus 158  
## 5 Acer 103  
## 6 Apple 21

data$Company <- relevel(data$Company, 'Dell')

data %>% count(Product, sort = TRUE)

## # A tibble: 506 x 2  
## Product n  
## <fct> <int>  
## 1 XPS 13 30  
## 2 Inspiron 3567 29  
## 3 250 G6 21  
## 4 Legion Y520-15IKBN 19  
## 5 Vostro 3568 19  
## 6 Inspiron 5570 18  
## 7 ProBook 450 18  
## 8 Alienware 17 15  
## 9 Inspiron 5567 14  
## 10 Aspire 3 12  
## # ... with 496 more rows

data$Product <- relevel(data$Product, 'XPS 13')

data %>% count(TypeName, sort = TRUE)

## # A tibble: 6 x 2  
## TypeName n  
## <fct> <int>  
## 1 Notebook 672  
## 2 Ultrabook 161  
## 3 Gaming 146  
## 4 2 in 1 Convertible 118  
## 5 Workstation 29  
## 6 Netbook 24

data$TypeName <- relevel(data$TypeName, 'Notebook')

data %>% count(ScreenResolution, sort = TRUE)

## # A tibble: 11 x 2  
## ScreenResolution n  
## <fct> <int>  
## 1 1920x1080 728  
## 2 1366x768 288  
## 3 3840x2160 37  
## 4 3200x1800 27  
## 5 1600x900 23  
## 6 2560x1440 23  
## 7 2304x1440 6  
## 8 2560x1600 6  
## 9 1440x900 4  
## 10 1920x1200 4  
## 11 2880x1800 4

data$ScreenResolution <- relevel(data$ScreenResolution, '1920x1080')

data %>% count(Gpu\_Series, sort = TRUE)

## # A tibble: 102 x 2  
## Gpu\_Series n  
## <fct> <int>  
## 1 HD Graphics 620 250  
## 2 HD Graphics 520 160  
## 3 UHD Graphics 620 68  
## 4 GeForce GTX 1050 53  
## 5 GeForce 940MX 41  
## 6 Radeon 530 41  
## 7 HD Graphics 400 33  
## 8 HD Graphics 500 33  
## 9 GeForce GTX 1060 31  
## 10 GeForce 930MX 25  
## # ... with 92 more rows

data$Gpu\_Series <- relevel(data$Gpu\_Series, 'HD Graphics 620')

data %>% count(OpSys, sort = TRUE)

## # A tibble: 9 x 2  
## OpSys n  
## <fct> <int>  
## 1 Windows 10 935  
## 2 No OS 63  
## 3 Linux 62  
## 4 Windows 7 43  
## 5 Chrome OS 22  
## 6 macOS 13  
## 7 Mac OS X 8  
## 8 Android 2  
## 9 Windows 10 S 2

data$OpSys <- relevel(data$OpSys, 'Windows 10')

data %>% count(Gpu\_Type, sort = TRUE)

## # A tibble: 3 x 2  
## Gpu\_Type n  
## <fct> <int>  
## 1 Intel 642  
## 2 Nvidia 329  
## 3 AMD 179

data$Gpu\_Type <- relevel(factor(data$Gpu\_Type), 'Intel')

data %>% count(Gpu\_Series, sort = TRUE)

## # A tibble: 102 x 2  
## Gpu\_Series n  
## <fct> <int>  
## 1 HD Graphics 620 250  
## 2 HD Graphics 520 160  
## 3 UHD Graphics 620 68  
## 4 GeForce GTX 1050 53  
## 5 GeForce 940MX 41  
## 6 Radeon 530 41  
## 7 HD Graphics 400 33  
## 8 HD Graphics 500 33  
## 9 GeForce GTX 1060 31  
## 10 GeForce 930MX 25  
## # ... with 92 more rows

data$Gpu\_Series <- relevel(factor(data$Gpu\_Series), 'HD Graphics 620')

data %>% count(Cpu\_Type, sort = TRUE)

## # A tibble: 2 x 2  
## Cpu\_Type n  
## <chr> <int>  
## 1 Intel 1088  
## 2 AMD 62

data$Cpu\_Type <- relevel(factor(data$Cpu\_Type), 'Intel')

data %>% count(Cpu\_Series, sort = TRUE)

## # A tibble: 85 x 2  
## Cpu\_Series n  
## <chr> <int>  
## 1 Core i5 7200U 175  
## 2 Core i7 7500U 120  
## 3 Core i7 7700HQ 113  
## 4 Core i3 6006U 80  
## 5 Core i5 8250U 71  
## 6 Core i7 8550U 71  
## 7 Core i5 6200U 51  
## 8 Core i7 6500U 42  
## 9 Core i3 7100U 35  
## 10 Core i7 6700HQ 32  
## # ... with 75 more rows

data$Cpu\_Series <- relevel(factor(data$Cpu\_Series), 'Core i5 7200U')

#data %>% count(Cpu\_Speed, sort = TRUE)  
#data$Cpu\_Speed <- relevel(factor(data$Cpu\_Speed), '2.5GHz')

data %>% count(Memory\_1\_Type, sort = TRUE)

## # A tibble: 4 x 2  
## Memory\_1\_Type n  
## <chr> <int>  
## 1 SSD 713  
## 2 HDD 363  
## 3 Flash Storage 64  
## 4 Hybrid 10

data$Memory\_1\_Type <- relevel(factor(data$Memory\_1\_Type), 'SSD')

data %>% count(Memory\_2\_Type, sort = TRUE)

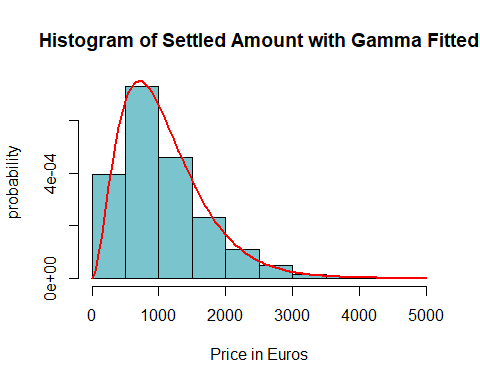
## # A tibble: 4 x 2  
## Memory\_2\_Type n  
## <chr> <int>  
## 1 "" 991  
## 2 "HDD" 153  
## 3 "SSD" 4  
## 4 "Hybrid" 2

data$Memory\_2\_Type <- relevel(factor(data$Memory\_2\_Type), '')

summary(fitdist(data$Price\_euros,"gamma"))

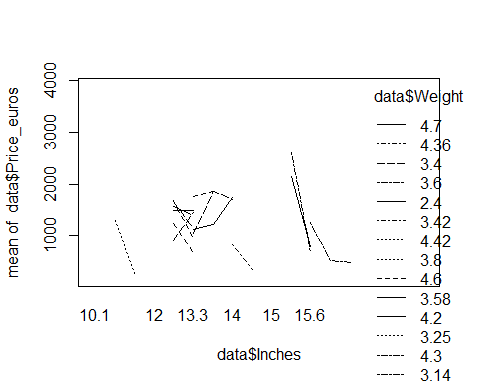
## Fitting of the distribution ' gamma ' by maximum likelihood   
## Parameters :   
## estimate Std. Error  
## shape 2.928053153 7.735577e-02  
## rate 0.002717365 6.524717e-05  
## Loglikelihood: -8901.67 AIC: 17807.34 BIC: 17817.44   
## Correlation matrix:  
## shape rate  
## shape 1.0000000 0.8014826  
## rate 0.8014826 1.0000000

h = hist(data$Price\_euros,probability = T,main = paste("Histogram of Settled Amount with Gamma Fitted"),col="cadetblue3",xlab = "Price in Euros",ylab = "probability")  
curve(dgamma(x,shape = 2.928053153 ,rate = 0.002717365),add=TRUE,lwd=2,col="red")

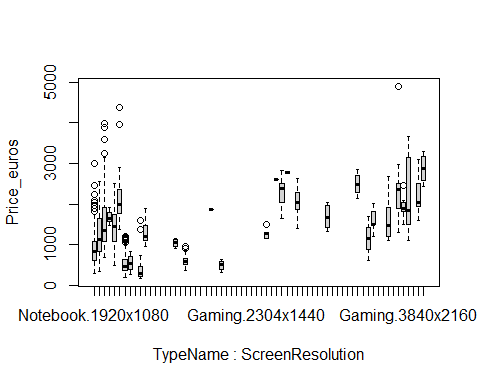


# Finding Interaction

interaction.plot(x.factor = data$Inches,   
 trace.factor = data$Weight,  
 response = data$Price\_euros)



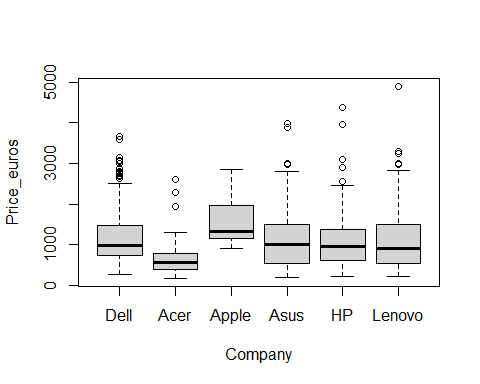
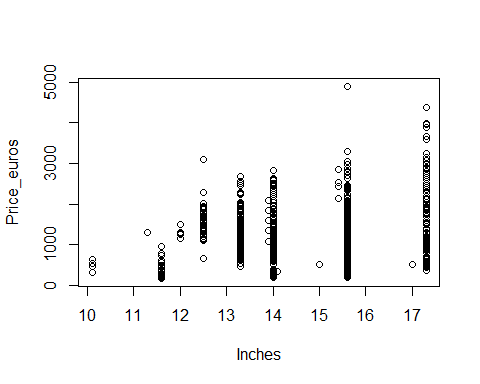
boxplot(Price\_euros ~ TypeName \* ScreenResolution, data=data)



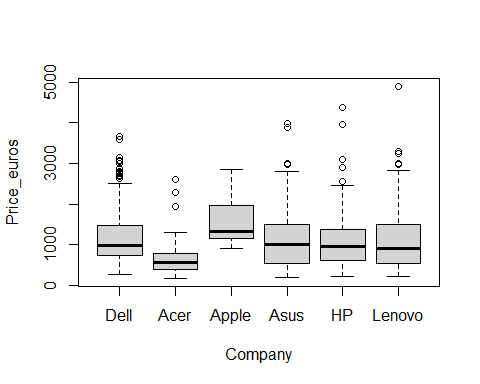
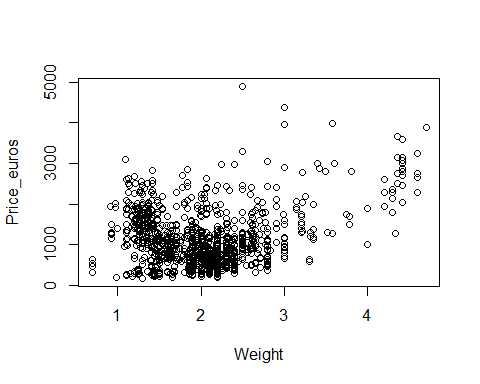
summary(aov(Price\_euros ~ TypeName\*ScreenResolution, data = data))

## Df Sum Sq Mean Sq F value Pr(>F)   
## TypeName 5 194825506 38965101 206.714 < 2e-16 \*\*\*  
## ScreenResolution 10 93600215 9360022 49.656 < 2e-16 \*\*\*  
## TypeName:ScreenResolution 13 10542994 811000 4.302 4.3e-07 \*\*\*  
## Residuals 1121 211306141 188498   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

plot(Price\_euros ~ Inches+Company, data)



plot(Price\_euros ~ Weight+Company, data)



# EDA

ks.test(data$Price\_euros,rgamma(nrow(data),shape = 2.928053153,rate = 0.002717365),alternative = "two.sided",exact = TRUE)

## Warning in ks.test(data$Price\_euros, rgamma(nrow(data), shape = 2.928053153, :  
## cannot compute correct p-values with ties

##   
## Two-sample Kolmogorov-Smirnov test  
##   
## data: data$Price\_euros and rgamma(nrow(data), shape = 2.928053153, rate = 0.002717365)  
## D = 0.033913, p-value = 0.5228  
## alternative hypothesis: two-sided

set.seed(181815)  
train\_ <- sample(seq\_len(nrow(data)), size = floor(nrow(data)\*0.8))  
train <- data[train\_, ]  
test <- data[-train\_, ]

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution +Cpu + Cpu\_Speed +  
 Cpu\_Series+Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size + Gpu\_Series+Gpu\_Type + OpSys + Weight,  
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=12415.75  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Cpu\_Speed + Cpu\_Series + Cpu\_Type + +Ram + Memory\_1\_Size +   
## Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size + Gpu\_Series +   
## Gpu\_Type + OpSys + Weight  
##   
##   
## Step: AIC=12415.75  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Cpu\_Speed + Cpu\_Series + Cpu\_Type + Ram + Memory\_1\_Size +   
## Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size + Gpu\_Series +   
## OpSys + Weight  
##   
##   
## Step: AIC=12415.75  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Cpu\_Speed + Cpu\_Series + Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Type + Memory\_2\_Size + Gpu\_Series + OpSys + Weight  
##   
##   
## Step: AIC=12415.75  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Cpu\_Speed + Ram + Memory\_1\_Size + Memory\_1\_Type + Memory\_2\_Type +   
## Memory\_2\_Size + Gpu\_Series + OpSys + Weight  
##   
##   
## Step: AIC=12415.75  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Ram + Memory\_1\_Size + Memory\_1\_Type + Memory\_2\_Type +   
## Memory\_2\_Size + Gpu\_Series + OpSys + Weight  
##   
## Df Deviance AIC  
## - Memory\_1\_Size 1 30.863 12414  
## - Memory\_2\_Size 1 30.863 12414  
## - Weight 1 30.902 12415  
## <none> 30.863 12416  
## - Memory\_2\_Type 3 31.316 12420  
## - Inches 1 31.147 12420  
## - Company 4 31.956 12432  
## - Memory\_1\_Type 3 32.143 12438  
## - ScreenResolution 6 33.816 12470  
## - Gpu\_Series 72 39.751 12471  
## - Ram 1 33.515 12473  
## - TypeName 5 33.878 12473  
## - OpSys 6 35.806 12515  
## - Cpu 70 46.713 12632  
##   
## Step: AIC=12413.75  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Ram + Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +   
## Gpu\_Series + OpSys + Weight  
##   
## Df Deviance AIC  
## - Memory\_2\_Size 1 30.863 12412  
## - Weight 1 30.902 12413  
## <none> 30.863 12414  
## + Memory\_1\_Size 1 30.863 12416  
## - Memory\_2\_Type 3 31.317 12418  
## - Inches 1 31.149 12418  
## - Company 4 31.957 12430  
## - Memory\_1\_Type 3 32.811 12452  
## - ScreenResolution 6 33.872 12469  
## - Gpu\_Series 72 39.763 12470  
## - TypeName 5 33.878 12472  
## - Ram 1 33.868 12479  
## - OpSys 6 35.807 12513  
## - Cpu 70 46.717 12630  
##   
## Step: AIC=12411.76  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Ram + Memory\_1\_Type + Memory\_2\_Type + Gpu\_Series +   
## OpSys + Weight  
##   
## Df Deviance AIC  
## - Weight 1 30.903 12411  
## <none> 30.863 12412  
## + Memory\_2\_Size 1 30.863 12414  
## + Memory\_1\_Size 1 30.863 12414  
## - Inches 1 31.150 12416  
## - Memory\_2\_Type 3 31.458 12419  
## - Company 4 31.957 12428  
## - Memory\_1\_Type 3 32.814 12450  
## - ScreenResolution 6 33.872 12468  
## - Gpu\_Series 72 39.782 12468  
## - TypeName 5 33.880 12470  
## - Ram 1 33.931 12479  
## - OpSys 6 35.808 12511  
## - Cpu 70 46.733 12629  
##   
## Step: AIC=12410.96  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Ram + Memory\_1\_Type + Memory\_2\_Type + Gpu\_Series +   
## OpSys  
##   
## Df Deviance AIC  
## <none> 30.903 12411  
## + Weight 1 30.863 12412  
## + Memory\_2\_Size 1 30.902 12413  
## + Memory\_1\_Size 1 30.903 12413  
## - Memory\_2\_Type 3 31.477 12418  
## - Inches 1 31.677 12426  
## - Company 4 32.086 12430  
## - Memory\_1\_Type 3 32.914 12450  
## - ScreenResolution 6 33.998 12469  
## - TypeName 5 34.252 12476  
## - Gpu\_Series 72 40.215 12477  
## - Ram 1 33.931 12477  
## - OpSys 6 35.817 12510  
## - Cpu 70 46.853 12630

summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Ram + Memory\_1\_Type + Memory\_2\_Type + Gpu\_Series +   
## OpSys, family = Gamma(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.69031 -0.12536 0.00000 0.08868 0.82073   
##   
## Coefficients: (27 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)  
## (Intercept) 7.034696 0.275391 25.544 < 2e-16  
## CompanyAcer -0.135506 0.035365 -3.832 0.000138  
## CompanyApple 0.340764 0.402578 0.846 0.397579  
## CompanyAsus -0.030096 0.030729 -0.979 0.327716  
## CompanyHP 0.043348 0.025843 1.677 0.093912  
## CompanyLenovo 0.006385 0.027150 0.235 0.814142  
## TypeName2 in 1 Convertible 0.146421 0.031728 4.615 4.65e-06  
## TypeNameGaming -0.141600 0.059411 -2.383 0.017410  
## TypeNameNetbook -0.026063 0.067233 -0.388 0.698388  
## TypeNameUltrabook 0.246202 0.031756 7.753 3.05e-14  
## TypeNameWorkstation 0.013455 0.158217 0.085 0.932250  
## Inches -0.042685 0.010290 -4.148 3.75e-05  
## ScreenResolution1366x768 -0.084122 0.025367 -3.316 0.000958  
## ScreenResolution1440x900 -0.061812 0.299692 -0.206 0.836651  
## ScreenResolution1600x900 0.033548 0.062442 0.537 0.591253  
## ScreenResolution1920x1200 -0.320834 0.371626 -0.863 0.388245  
## ScreenResolution2304x1440 -0.148906 0.399301 -0.373 0.709320  
## ScreenResolution2560x1440 0.385770 0.062777 6.145 1.32e-09  
## ScreenResolution2560x1600 0.263355 0.399288 0.660 0.509745  
## ScreenResolution2880x1800 0.633097 0.400929 1.579 0.114756  
## ScreenResolution3200x1800 0.040148 0.064228 0.625 0.532114  
## ScreenResolution3840x2160 0.220351 0.049836 4.422 1.13e-05  
## CpuAMD A10-Series 9620P 2.5GHz -0.027235 0.428066 -0.064 0.949287  
## CpuAMD A10-Series A10-9620P 2.5GHz -0.022841 0.264850 -0.086 0.931298  
## CpuAMD A12-Series 9700P 2.5GHz 0.066750 0.299709 0.223 0.823819  
## CpuAMD A12-Series 9720P 2.7GHz -0.028702 0.306126 -0.094 0.925327  
## CpuAMD A12-Series 9720P 3.6GHz 0.182414 0.247567 0.737 0.461466  
## CpuAMD A4-Series 7210 2.2GHz -0.357871 0.305467 -1.172 0.241762  
## CpuAMD A6-Series 7310 2GHz -0.256051 0.412639 -0.621 0.535110  
## CpuAMD A6-Series 9220 2.5GHz -0.087778 0.282082 -0.311 0.755756  
## CpuAMD A6-Series 9220 2.9GHz 0.125616 0.363718 0.345 0.729919  
## CpuAMD A6-Series A6-9220 2.5GHz -0.083925 0.282935 -0.297 0.766838  
## CpuAMD A8-Series 7410 2.2GHz -0.097230 0.286218 -0.340 0.734176  
## CpuAMD A9-Series 9410 2.9GHz -0.065519 0.263798 -0.248 0.803921  
## CpuAMD A9-Series 9420 3GHz -0.087358 0.248380 -0.352 0.725158  
## CpuAMD A9-Series A9-9420 3GHz 0.085955 0.265396 0.324 0.746126  
## CpuAMD E-Series 6110 1.5GHz -0.822024 0.377902 -2.175 0.029936  
## CpuAMD E-Series 9000 2.2GHz -0.549858 0.300851 -1.828 0.068010  
## CpuAMD E-Series 9000e 1.5GHz -0.488172 0.299600 -1.629 0.103661  
## CpuAMD E-Series E2-9000 2.2GHz -0.526117 0.301829 -1.743 0.081742  
## CpuAMD E-Series E2-9000e 1.5GHz -0.459735 0.259700 -1.770 0.077105  
## CpuAMD FX 8800P 2.1GHz 0.251913 0.307243 0.820 0.412535  
## CpuAMD FX 9830P 3GHz 0.303191 0.306406 0.990 0.322745  
## CpuAMD Ryzen 1600 3.2GHz 0.576075 0.388009 1.485 0.138059  
## CpuAMD Ryzen 1700 3GHz 0.307880 0.358223 0.859 0.390368  
## CpuIntel Atom x5-Z8350 1.44GHz -0.833387 0.370061 -2.252 0.024620  
## CpuIntel Atom x5-Z8550 1.44GHz NA NA NA NA  
## CpuIntel Celeron Dual Core 3205U 1.5GHz -0.668739 0.280599 -2.383 0.017417  
## CpuIntel Celeron Dual Core 3855U 1.6GHz -0.228042 0.315463 -0.723 0.469988  
## CpuIntel Celeron Dual Core N3050 1.6GHz -0.238941 0.259106 -0.922 0.356745  
## CpuIntel Celeron Dual Core N3060 1.60GHz -0.392815 0.361697 -1.086 0.277826  
## CpuIntel Celeron Dual Core N3060 1.6GHz -0.359197 0.287558 -1.249 0.212022  
## CpuIntel Celeron Dual Core N3350 1.1GHz 0.117642 0.345823 0.340 0.733820  
## CpuIntel Celeron Dual Core N3350 2GHz 0.278213 0.402334 0.691 0.489474  
## CpuIntel Celeron Quad Core N3160 1.6GHz -0.403944 0.335357 -1.205 0.228783  
## CpuIntel Celeron Quad Core N3450 1.1GHz 0.296269 0.375110 0.790 0.429892  
## CpuIntel Core i3 6006U 2.0GHz 0.103899 0.226757 0.458 0.646950  
## CpuIntel Core i3 6006U 2GHz 0.061833 0.220054 0.281 0.778799  
## CpuIntel Core i3 6100U 2.3GHz 0.162806 0.235515 0.691 0.489613  
## CpuIntel Core i3 7100U 2.4GHz 0.001067 0.217006 0.005 0.996079  
## CpuIntel Core i3 7130U 2.7GHz 0.063442 0.233075 0.272 0.785550  
## CpuIntel Core i5 1.3GHz 0.179095 0.298061 0.601 0.548117  
## CpuIntel Core i5 1.6GHz -0.030415 0.258129 -0.118 0.906237  
## CpuIntel Core i5 1.8GHz NA NA NA NA  
## CpuIntel Core i5 2.0GHz -0.239832 0.298061 -0.805 0.421291  
## CpuIntel Core i5 2.3GHz -0.232726 0.258129 -0.902 0.367575  
## CpuIntel Core i5 2.9GHz 0.082598 0.298061 0.277 0.781768  
## CpuIntel Core i5 3.1GHz NA NA NA NA  
## CpuIntel Core i5 6200U 2.3GHz 0.469674 0.223914 2.098 0.036289  
## CpuIntel Core i5 6300HQ 2.3GHz 0.481098 0.242796 1.981 0.047915  
## CpuIntel Core i5 6300U 2.4GHz 0.638130 0.232977 2.739 0.006314  
## CpuIntel Core i5 6440HQ 2.6GHz 0.790225 0.339939 2.325 0.020369  
## CpuIntel Core i5 7200U 2.5GHz 0.307223 0.214121 1.435 0.151773  
## CpuIntel Core i5 7200U 2.70GHz 0.220227 0.307541 0.716 0.474166  
## CpuIntel Core i5 7200U 2.7GHz 0.302132 0.301072 1.004 0.315945  
## CpuIntel Core i5 7300HQ 2.5GHz 0.536941 0.250601 2.143 0.032477  
## CpuIntel Core i5 7300U 2.6GHz 0.591594 0.223005 2.653 0.008157  
## CpuIntel Core i5 7440HQ 2.8GHz 0.481055 0.252674 1.904 0.057325  
## CpuIntel Core i5 7Y54 1.2GHz 0.493910 0.262291 1.883 0.060093  
## CpuIntel Core i5 8250U 1.6GHz 0.329415 0.219183 1.503 0.133296  
## CpuIntel Core i7 2.2GHz -0.053125 0.303765 -0.175 0.861216  
## CpuIntel Core i7 2.7GHz -0.118962 0.298061 -0.399 0.689922  
## CpuIntel Core i7 2.8GHz -0.158136 0.298061 -0.531 0.595894  
## CpuIntel Core i7 2.9GHz NA NA NA NA  
## CpuIntel Core i7 6500U 2.50GHz 0.705572 0.270735 2.606 0.009345  
## CpuIntel Core i7 6500U 2.5GHz 0.464029 0.223867 2.073 0.038545  
## CpuIntel Core i7 6600U 2.6GHz 0.518003 0.236178 2.193 0.028605  
## CpuIntel Core i7 6700HQ 2.6GHz 0.613941 0.247971 2.476 0.013519  
## CpuIntel Core i7 6820HK 2.7GHz 0.152865 0.292811 0.522 0.601788  
## CpuIntel Core i7 6820HQ 2.7GHz 0.738114 0.298863 2.470 0.013751  
## CpuIntel Core i7 7500U 2.7GHz 0.442687 0.214897 2.060 0.039756  
## CpuIntel Core i7 7560U 2.4GHz 0.315820 0.263377 1.199 0.230873  
## CpuIntel Core i7 7600U 2.8GHz 0.707851 0.226282 3.128 0.001829  
## CpuIntel Core i7 7660U 2.5GHz 0.600429 0.307105 1.955 0.050953  
## CpuIntel Core i7 7700HQ 2.7GHz 0.957344 0.328991 2.910 0.003726  
## CpuIntel Core i7 7700HQ 2.8GHz 0.635545 0.244982 2.594 0.009672  
## CpuIntel Core i7 7820HK 2.9GHz 0.598420 0.284332 2.105 0.035666  
## CpuIntel Core i7 7820HQ 2.9GHz 0.798389 0.287034 2.782 0.005551  
## CpuIntel Core i7 7Y75 1.3GHz 0.550751 0.242318 2.273 0.023328  
## CpuIntel Core i7 8550U 1.8GHz 0.431862 0.220100 1.962 0.050132  
## CpuIntel Core i7 8650U 1.9GHz 0.483637 0.320611 1.508 0.131867  
## CpuIntel Core M 1.1GHz 0.154193 0.303765 0.508 0.611883  
## CpuIntel Core M 1.2GHz 0.155912 0.303765 0.513 0.607923  
## CpuIntel Core M 6Y30 0.9GHz -0.383013 0.388223 -0.987 0.324178  
## CpuIntel Core M 6Y75 1.2GHz 0.548040 0.383084 1.431 0.152976  
## CpuIntel Core M 7Y30 1.0GHz -0.290048 0.306090 -0.948 0.343654  
## CpuIntel Core M M3-6Y30 0.9GHz -0.192838 0.433593 -0.445 0.656637  
## CpuIntel Core M m3 1.2GHz NA NA NA NA  
## CpuIntel Core M M7-6Y75 1.2GHz 0.266574 0.433525 0.615 0.538815  
## CpuIntel Pentium Dual Core 4405Y 1.5GHz -0.210023 0.436791 -0.481 0.630782  
## CpuIntel Pentium Dual Core N4200 1.1GHz 0.190269 0.353575 0.538 0.590653  
## CpuIntel Pentium Quad Core N3700 1.6GHz 0.044139 0.285191 0.155 0.877046  
## CpuIntel Pentium Quad Core N3710 1.6GHz -0.061499 0.260752 -0.236 0.813615  
## CpuIntel Pentium Quad Core N4200 1.1GHz 0.081688 0.269479 0.303 0.761875  
## CpuIntel Xeon E3-1505M V6 3GHz 0.762152 0.300884 2.533 0.011518  
## CpuIntel Xeon E3-1535M v5 2.9GHz 1.596823 0.465827 3.428 0.000643  
## Ram 0.022529 0.002709 8.317 4.48e-16  
## Memory\_1\_TypeFlash Storage -0.236205 0.058589 -4.032 6.13e-05  
## Memory\_1\_TypeHDD -0.130888 0.022148 -5.910 5.28e-09  
## Memory\_1\_TypeHybrid -0.171914 0.100536 -1.710 0.087698  
## Memory\_2\_TypeHDD 0.060780 0.035875 1.694 0.090654  
## Memory\_2\_TypeHybrid 0.741921 0.235140 3.155 0.001670  
## Memory\_2\_TypeSSD 0.012556 0.179280 0.070 0.944185  
## Gpu\_SeriesFirePro W4190M 0.193737 0.135494 1.430 0.153190  
## Gpu\_SeriesFirePro W5130M NA NA NA NA  
## Gpu\_SeriesGeForce 150MX 0.051155 0.159558 0.321 0.748602  
## Gpu\_SeriesGeForce 920 -0.193128 0.216172 -0.893 0.371941  
## Gpu\_SeriesGeForce 920M -0.216142 0.127108 -1.700 0.089474  
## Gpu\_SeriesGeForce 920MX -0.074113 0.068295 -1.085 0.278201  
## Gpu\_SeriesGeForce 930MX 0.013133 0.060186 0.218 0.827329  
## Gpu\_SeriesGeForce 940M -0.399577 0.223845 -1.785 0.074670  
## Gpu\_SeriesGeForce 940MX -0.064562 0.041373 -1.560 0.119082  
## Gpu\_SeriesGeForce 960M 0.468496 0.249545 1.877 0.060865  
## Gpu\_SeriesGeForce GT 940MX -0.053059 0.113732 -0.467 0.640977  
## Gpu\_SeriesGeForce GTX 1050 0.019949 0.131568 0.152 0.879522  
## Gpu\_SeriesGeForce GTX 1050 Ti 0.037399 0.140716 0.266 0.790489  
## Gpu\_SeriesGeForce GTX 1050M -0.023799 0.199208 -0.119 0.904939  
## Gpu\_SeriesGeForce GTX 1050Ti 0.177143 0.248691 0.712 0.476508  
## Gpu\_SeriesGeForce GTX 1060 0.320707 0.137593 2.331 0.020035  
## Gpu\_SeriesGeForce GTX 1070 0.561305 0.148245 3.786 0.000166  
## Gpu\_SeriesGeForce GTX 1070M 0.613669 0.258846 2.371 0.018011  
## Gpu\_SeriesGeForce GTX 1080 0.832921 0.221562 3.759 0.000184  
## Gpu\_SeriesGeForce GTX 940M -0.172255 0.219994 -0.783 0.433882  
## Gpu\_SeriesGeForce GTX 940MX -0.465008 0.156565 -2.970 0.003076  
## Gpu\_SeriesGeForce GTX 950M 0.010320 0.103435 0.100 0.920555  
## Gpu\_SeriesGeForce GTX 960 -0.017798 0.201022 -0.089 0.929473  
## Gpu\_SeriesGeForce GTX 960M -0.255460 0.131610 -1.941 0.052642  
## Gpu\_SeriesGeForce GTX 965M 0.156996 0.175853 0.893 0.372275  
## Gpu\_SeriesGeForce GTX 970M 0.389871 0.254050 1.535 0.125314  
## Gpu\_SeriesGeForce GTX 980M 0.409643 0.176509 2.321 0.020575  
## Gpu\_SeriesGeForce GTX1050 Ti 0.134542 0.252819 0.532 0.594774  
## Gpu\_SeriesGeForce MX130 0.089905 0.117006 0.768 0.442515  
## Gpu\_SeriesGeForce MX150 -0.066488 0.089461 -0.743 0.457598  
## Gpu\_SeriesGraphics 620 -0.211972 0.215428 -0.984 0.325464  
## Gpu\_SeriesHD Graphics -0.172366 0.115519 -1.492 0.136111  
## Gpu\_SeriesHD Graphics 400 -0.117760 0.200474 -0.587 0.557113  
## Gpu\_SeriesHD Graphics 405 -0.216634 0.170279 -1.272 0.203698  
## Gpu\_SeriesHD Graphics 500 -0.578481 0.267218 -2.165 0.030727  
## Gpu\_SeriesHD Graphics 505 -0.342918 0.184566 -1.858 0.063579  
## Gpu\_SeriesHD Graphics 510 NA NA NA NA  
## Gpu\_SeriesHD Graphics 515 0.111361 0.298061 0.374 0.708797  
## Gpu\_SeriesHD Graphics 520 -0.137646 0.057251 -2.404 0.016455  
## Gpu\_SeriesHD Graphics 530 -0.334787 0.259123 -1.292 0.196769  
## Gpu\_SeriesHD Graphics 5300 NA NA NA NA  
## Gpu\_SeriesHD Graphics 6000 NA NA NA NA  
## Gpu\_SeriesHD Graphics 615 NA NA NA NA  
## Gpu\_SeriesHD Graphics 630 -0.002618 0.148035 -0.018 0.985893  
## Gpu\_SeriesIris Graphics 540 NA NA NA NA  
## Gpu\_SeriesIris Graphics 550 NA NA NA NA  
## Gpu\_SeriesIris Plus Graphics 640 NA NA NA NA  
## Gpu\_SeriesIris Plus Graphics 650 NA NA NA NA  
## Gpu\_SeriesIris Pro Graphics NA NA NA NA  
## Gpu\_SeriesQuadro 3000M 0.174903 0.311392 0.562 0.574508  
## Gpu\_SeriesQuadro M1000M 0.217010 0.226664 0.957 0.338680  
## Gpu\_SeriesQuadro M1200 0.434479 0.187174 2.321 0.020550  
## Gpu\_SeriesQuadro M2000M -0.122660 0.309558 -0.396 0.692042  
## Gpu\_SeriesQuadro M2200 0.380525 0.233928 1.627 0.104241  
## Gpu\_SeriesQuadro M2200M 0.280302 0.244202 1.148 0.251419  
## Gpu\_SeriesQuadro M3000M 0.934917 0.283818 3.294 0.001036  
## Gpu\_SeriesQuadro M500M 0.138454 0.237728 0.582 0.560475  
## Gpu\_SeriesQuadro M520M 0.280707 0.212204 1.323 0.186313  
## Gpu\_SeriesQuadro M620 0.284398 0.231965 1.226 0.220583  
## Gpu\_SeriesQuadro M620M 0.887625 0.244873 3.625 0.000309  
## Gpu\_SeriesR4 Graphics -0.388573 0.282792 -1.374 0.169849  
## Gpu\_SeriesRadeon 520 -0.256573 0.067798 -3.784 0.000167  
## Gpu\_SeriesRadeon 530 -0.116755 0.065634 -1.779 0.075681  
## Gpu\_SeriesRadeon Pro 455 NA NA NA NA  
## Gpu\_SeriesRadeon Pro 555 NA NA NA NA  
## Gpu\_SeriesRadeon Pro 560 NA NA NA NA  
## Gpu\_SeriesRadeon R2 NA NA NA NA  
## Gpu\_SeriesRadeon R2 Graphics NA NA NA NA  
## Gpu\_SeriesRadeon R3 NA NA NA NA  
## Gpu\_SeriesRadeon R4 -0.297157 0.281835 -1.054 0.292068  
## Gpu\_SeriesRadeon R4 Graphics -0.314458 0.204146 -1.540 0.123910  
## Gpu\_SeriesRadeon R5 -0.085046 0.161244 -0.527 0.598052  
## Gpu\_SeriesRadeon R5 430 -0.166876 0.299603 -0.557 0.577707  
## Gpu\_SeriesRadeon R5 520 0.058108 0.220585 0.263 0.792296  
## Gpu\_SeriesRadeon R5 M315 -0.267484 0.225301 -1.187 0.235527  
## Gpu\_SeriesRadeon R5 M330 -0.195947 0.109674 -1.787 0.074416  
## Gpu\_SeriesRadeon R5 M420 -0.046498 0.115013 -0.404 0.686122  
## Gpu\_SeriesRadeon R5 M420X 0.005546 0.168321 0.033 0.973725  
## Gpu\_SeriesRadeon R5 M430 -0.172578 0.064254 -2.686 0.007399  
## Gpu\_SeriesRadeon R7 Graphics NA NA NA NA  
## Gpu\_SeriesRadeon R7 M360 -0.025621 0.244515 -0.105 0.916578  
## Gpu\_SeriesRadeon R7 M365X -0.134821 0.223154 -0.604 0.545926  
## Gpu\_SeriesRadeon R7 M440 NA NA NA NA  
## Gpu\_SeriesRadeon R7 M445 -0.099464 0.069226 -1.437 0.151206  
## Gpu\_SeriesRadeon R7 M460 -0.143181 0.214467 -0.668 0.504594  
## Gpu\_SeriesRadeon R7 M465 0.023134 0.221532 0.104 0.916860  
## Gpu\_SeriesRadeon R9 M385 NA NA NA NA  
## Gpu\_SeriesRadeon RX 540 0.190010 0.308927 0.615 0.538705  
## Gpu\_SeriesRadeon RX 550 0.096530 0.132677 0.728 0.467122  
## Gpu\_SeriesRadeon RX 560 NA NA NA NA  
## Gpu\_SeriesRadeon RX 580 0.493799 0.249616 1.978 0.048280  
## Gpu\_SeriesUHD Graphics 620 -0.105761 0.058205 -1.817 0.069626  
## OpSysAndroid -0.098656 0.258129 -0.382 0.702427  
## OpSysChrome OS 0.115891 0.093292 1.242 0.214548  
## OpSysLinux -0.160134 0.035862 -4.465 9.27e-06  
## OpSysMac OS X NA NA NA NA  
## OpSysmacOS NA NA NA NA  
## OpSysNo OS -0.328118 0.036587 -8.968 < 2e-16  
## OpSysWindows 10 S 0.036604 0.225169 0.163 0.870907  
## OpSysWindows 7 0.199179 0.049111 4.056 5.54e-05  
##   
## (Intercept) \*\*\*  
## CompanyAcer \*\*\*  
## CompanyApple   
## CompanyAsus   
## CompanyHP .   
## CompanyLenovo   
## TypeName2 in 1 Convertible \*\*\*  
## TypeNameGaming \*   
## TypeNameNetbook   
## TypeNameUltrabook \*\*\*  
## TypeNameWorkstation   
## Inches \*\*\*  
## ScreenResolution1366x768 \*\*\*  
## ScreenResolution1440x900   
## ScreenResolution1600x900   
## ScreenResolution1920x1200   
## ScreenResolution2304x1440   
## ScreenResolution2560x1440 \*\*\*  
## ScreenResolution2560x1600   
## ScreenResolution2880x1800   
## ScreenResolution3200x1800   
## ScreenResolution3840x2160 \*\*\*  
## CpuAMD A10-Series 9620P 2.5GHz   
## CpuAMD A10-Series A10-9620P 2.5GHz   
## CpuAMD A12-Series 9700P 2.5GHz   
## CpuAMD A12-Series 9720P 2.7GHz   
## CpuAMD A12-Series 9720P 3.6GHz   
## CpuAMD A4-Series 7210 2.2GHz   
## CpuAMD A6-Series 7310 2GHz   
## CpuAMD A6-Series 9220 2.5GHz   
## CpuAMD A6-Series 9220 2.9GHz   
## CpuAMD A6-Series A6-9220 2.5GHz   
## CpuAMD A8-Series 7410 2.2GHz   
## CpuAMD A9-Series 9410 2.9GHz   
## CpuAMD A9-Series 9420 3GHz   
## CpuAMD A9-Series A9-9420 3GHz   
## CpuAMD E-Series 6110 1.5GHz \*   
## CpuAMD E-Series 9000 2.2GHz .   
## CpuAMD E-Series 9000e 1.5GHz   
## CpuAMD E-Series E2-9000 2.2GHz .   
## CpuAMD E-Series E2-9000e 1.5GHz .   
## CpuAMD FX 8800P 2.1GHz   
## CpuAMD FX 9830P 3GHz   
## CpuAMD Ryzen 1600 3.2GHz   
## CpuAMD Ryzen 1700 3GHz   
## CpuIntel Atom x5-Z8350 1.44GHz \*   
## CpuIntel Atom x5-Z8550 1.44GHz   
## CpuIntel Celeron Dual Core 3205U 1.5GHz \*   
## CpuIntel Celeron Dual Core 3855U 1.6GHz   
## CpuIntel Celeron Dual Core N3050 1.6GHz   
## CpuIntel Celeron Dual Core N3060 1.60GHz   
## CpuIntel Celeron Dual Core N3060 1.6GHz   
## CpuIntel Celeron Dual Core N3350 1.1GHz   
## CpuIntel Celeron Dual Core N3350 2GHz   
## CpuIntel Celeron Quad Core N3160 1.6GHz   
## CpuIntel Celeron Quad Core N3450 1.1GHz   
## CpuIntel Core i3 6006U 2.0GHz   
## CpuIntel Core i3 6006U 2GHz   
## CpuIntel Core i3 6100U 2.3GHz   
## CpuIntel Core i3 7100U 2.4GHz   
## CpuIntel Core i3 7130U 2.7GHz   
## CpuIntel Core i5 1.3GHz   
## CpuIntel Core i5 1.6GHz   
## CpuIntel Core i5 1.8GHz   
## CpuIntel Core i5 2.0GHz   
## CpuIntel Core i5 2.3GHz   
## CpuIntel Core i5 2.9GHz   
## CpuIntel Core i5 3.1GHz   
## CpuIntel Core i5 6200U 2.3GHz \*   
## CpuIntel Core i5 6300HQ 2.3GHz \*   
## CpuIntel Core i5 6300U 2.4GHz \*\*   
## CpuIntel Core i5 6440HQ 2.6GHz \*   
## CpuIntel Core i5 7200U 2.5GHz   
## CpuIntel Core i5 7200U 2.70GHz   
## CpuIntel Core i5 7200U 2.7GHz   
## CpuIntel Core i5 7300HQ 2.5GHz \*   
## CpuIntel Core i5 7300U 2.6GHz \*\*   
## CpuIntel Core i5 7440HQ 2.8GHz .   
## CpuIntel Core i5 7Y54 1.2GHz .   
## CpuIntel Core i5 8250U 1.6GHz   
## CpuIntel Core i7 2.2GHz   
## CpuIntel Core i7 2.7GHz   
## CpuIntel Core i7 2.8GHz   
## CpuIntel Core i7 2.9GHz   
## CpuIntel Core i7 6500U 2.50GHz \*\*   
## CpuIntel Core i7 6500U 2.5GHz \*   
## CpuIntel Core i7 6600U 2.6GHz \*   
## CpuIntel Core i7 6700HQ 2.6GHz \*   
## CpuIntel Core i7 6820HK 2.7GHz   
## CpuIntel Core i7 6820HQ 2.7GHz \*   
## CpuIntel Core i7 7500U 2.7GHz \*   
## CpuIntel Core i7 7560U 2.4GHz   
## CpuIntel Core i7 7600U 2.8GHz \*\*   
## CpuIntel Core i7 7660U 2.5GHz .   
## CpuIntel Core i7 7700HQ 2.7GHz \*\*   
## CpuIntel Core i7 7700HQ 2.8GHz \*\*   
## CpuIntel Core i7 7820HK 2.9GHz \*   
## CpuIntel Core i7 7820HQ 2.9GHz \*\*   
## CpuIntel Core i7 7Y75 1.3GHz \*   
## CpuIntel Core i7 8550U 1.8GHz .   
## CpuIntel Core i7 8650U 1.9GHz   
## CpuIntel Core M 1.1GHz   
## CpuIntel Core M 1.2GHz   
## CpuIntel Core M 6Y30 0.9GHz   
## CpuIntel Core M 6Y75 1.2GHz   
## CpuIntel Core M 7Y30 1.0GHz   
## CpuIntel Core M M3-6Y30 0.9GHz   
## CpuIntel Core M m3 1.2GHz   
## CpuIntel Core M M7-6Y75 1.2GHz   
## CpuIntel Pentium Dual Core 4405Y 1.5GHz   
## CpuIntel Pentium Dual Core N4200 1.1GHz   
## CpuIntel Pentium Quad Core N3700 1.6GHz   
## CpuIntel Pentium Quad Core N3710 1.6GHz   
## CpuIntel Pentium Quad Core N4200 1.1GHz   
## CpuIntel Xeon E3-1505M V6 3GHz \*   
## CpuIntel Xeon E3-1535M v5 2.9GHz \*\*\*  
## Ram \*\*\*  
## Memory\_1\_TypeFlash Storage \*\*\*  
## Memory\_1\_TypeHDD \*\*\*  
## Memory\_1\_TypeHybrid .   
## Memory\_2\_TypeHDD .   
## Memory\_2\_TypeHybrid \*\*   
## Memory\_2\_TypeSSD   
## Gpu\_SeriesFirePro W4190M   
## Gpu\_SeriesFirePro W5130M   
## Gpu\_SeriesGeForce 150MX   
## Gpu\_SeriesGeForce 920   
## Gpu\_SeriesGeForce 920M .   
## Gpu\_SeriesGeForce 920MX   
## Gpu\_SeriesGeForce 930MX   
## Gpu\_SeriesGeForce 940M .   
## Gpu\_SeriesGeForce 940MX   
## Gpu\_SeriesGeForce 960M .   
## Gpu\_SeriesGeForce GT 940MX   
## Gpu\_SeriesGeForce GTX 1050   
## Gpu\_SeriesGeForce GTX 1050 Ti   
## Gpu\_SeriesGeForce GTX 1050M   
## Gpu\_SeriesGeForce GTX 1050Ti   
## Gpu\_SeriesGeForce GTX 1060 \*   
## Gpu\_SeriesGeForce GTX 1070 \*\*\*  
## Gpu\_SeriesGeForce GTX 1070M \*   
## Gpu\_SeriesGeForce GTX 1080 \*\*\*  
## Gpu\_SeriesGeForce GTX 940M   
## Gpu\_SeriesGeForce GTX 940MX \*\*   
## Gpu\_SeriesGeForce GTX 950M   
## Gpu\_SeriesGeForce GTX 960   
## Gpu\_SeriesGeForce GTX 960M .   
## Gpu\_SeriesGeForce GTX 965M   
## Gpu\_SeriesGeForce GTX 970M   
## Gpu\_SeriesGeForce GTX 980M \*   
## Gpu\_SeriesGeForce GTX1050 Ti   
## Gpu\_SeriesGeForce MX130   
## Gpu\_SeriesGeForce MX150   
## Gpu\_SeriesGraphics 620   
## Gpu\_SeriesHD Graphics   
## Gpu\_SeriesHD Graphics 400   
## Gpu\_SeriesHD Graphics 405   
## Gpu\_SeriesHD Graphics 500 \*   
## Gpu\_SeriesHD Graphics 505 .   
## Gpu\_SeriesHD Graphics 510   
## Gpu\_SeriesHD Graphics 515   
## Gpu\_SeriesHD Graphics 520 \*   
## Gpu\_SeriesHD Graphics 530   
## Gpu\_SeriesHD Graphics 5300   
## Gpu\_SeriesHD Graphics 6000   
## Gpu\_SeriesHD Graphics 615   
## Gpu\_SeriesHD Graphics 630   
## Gpu\_SeriesIris Graphics 540   
## Gpu\_SeriesIris Graphics 550   
## Gpu\_SeriesIris Plus Graphics 640   
## Gpu\_SeriesIris Plus Graphics 650   
## Gpu\_SeriesIris Pro Graphics   
## Gpu\_SeriesQuadro 3000M   
## Gpu\_SeriesQuadro M1000M   
## Gpu\_SeriesQuadro M1200 \*   
## Gpu\_SeriesQuadro M2000M   
## Gpu\_SeriesQuadro M2200   
## Gpu\_SeriesQuadro M2200M   
## Gpu\_SeriesQuadro M3000M \*\*   
## Gpu\_SeriesQuadro M500M   
## Gpu\_SeriesQuadro M520M   
## Gpu\_SeriesQuadro M620   
## Gpu\_SeriesQuadro M620M \*\*\*  
## Gpu\_SeriesR4 Graphics   
## Gpu\_SeriesRadeon 520 \*\*\*  
## Gpu\_SeriesRadeon 530 .   
## Gpu\_SeriesRadeon Pro 455   
## Gpu\_SeriesRadeon Pro 555   
## Gpu\_SeriesRadeon Pro 560   
## Gpu\_SeriesRadeon R2   
## Gpu\_SeriesRadeon R2 Graphics   
## Gpu\_SeriesRadeon R3   
## Gpu\_SeriesRadeon R4   
## Gpu\_SeriesRadeon R4 Graphics   
## Gpu\_SeriesRadeon R5   
## Gpu\_SeriesRadeon R5 430   
## Gpu\_SeriesRadeon R5 520   
## Gpu\_SeriesRadeon R5 M315   
## Gpu\_SeriesRadeon R5 M330 .   
## Gpu\_SeriesRadeon R5 M420   
## Gpu\_SeriesRadeon R5 M420X   
## Gpu\_SeriesRadeon R5 M430 \*\*   
## Gpu\_SeriesRadeon R7 Graphics   
## Gpu\_SeriesRadeon R7 M360   
## Gpu\_SeriesRadeon R7 M365X   
## Gpu\_SeriesRadeon R7 M440   
## Gpu\_SeriesRadeon R7 M445   
## Gpu\_SeriesRadeon R7 M460   
## Gpu\_SeriesRadeon R7 M465   
## Gpu\_SeriesRadeon R9 M385   
## Gpu\_SeriesRadeon RX 540   
## Gpu\_SeriesRadeon RX 550   
## Gpu\_SeriesRadeon RX 560   
## Gpu\_SeriesRadeon RX 580 \*   
## Gpu\_SeriesUHD Graphics 620 .   
## OpSysAndroid   
## OpSysChrome OS   
## OpSysLinux \*\*\*  
## OpSysMac OS X   
## OpSysmacOS   
## OpSysNo OS \*\*\*  
## OpSysWindows 10 S   
## OpSysWindows 7 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.04442027)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 30.903 on 724 degrees of freedom  
## AIC: 12411  
##   
## Number of Fisher Scoring iterations: 6

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution + Cpu\_Speed +  
 Cpu\_Series+Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +Gpu\_Type + OpSys + Weight,  
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=12485.43  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Series + Cpu\_Type + +Ram + Memory\_1\_Size +   
## Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size + Gpu\_Type +   
## OpSys + Weight  
##   
##   
## Step: AIC=12485.43  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Series + Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Type + Memory\_2\_Size + Gpu\_Type + OpSys + Weight  
##   
## Df Deviance AIC  
## - Memory\_1\_Size 1 39.982 12483  
## - Memory\_2\_Size 1 39.986 12484  
## - Cpu\_Speed 1 40.053 12485  
## - Memory\_2\_Type 3 40.278 12485  
## <none> 39.981 12485  
## - Gpu\_Type 2 40.193 12486  
## - Weight 1 40.628 12496  
## - Inches 1 40.742 12498  
## - Memory\_1\_Type 3 41.383 12506  
## - Company 4 41.623 12509  
## - ScreenResolution 8 43.234 12532  
## - TypeName 5 45.133 12574  
## - Ram 1 44.834 12576  
## - OpSys 7 46.682 12599  
## - Cpu\_Series 72 66.666 12850  
##   
## Step: AIC=12483.45  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Series + Ram + Memory\_1\_Type + Memory\_2\_Type +   
## Memory\_2\_Size + Gpu\_Type + OpSys + Weight  
##   
## Df Deviance AIC  
## - Memory\_2\_Size 1 39.987 12482  
## - Cpu\_Speed 1 40.054 12483  
## - Memory\_2\_Type 3 40.279 12483  
## <none> 39.982 12483  
## - Gpu\_Type 2 40.200 12484  
## + Memory\_1\_Size 1 39.981 12485  
## - Weight 1 40.634 12494  
## - Inches 1 40.750 12496  
## - Company 4 41.623 12507  
## - Memory\_1\_Type 3 42.468 12525  
## - ScreenResolution 8 43.274 12530  
## - TypeName 5 45.135 12572  
## - Ram 1 45.511 12587  
## - OpSys 7 46.683 12597  
## - Cpu\_Series 72 66.679 12849  
##   
## Step: AIC=12481.56  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Series + Ram + Memory\_1\_Type + Memory\_2\_Type +   
## Gpu\_Type + OpSys + Weight  
##   
## Df Deviance AIC  
## - Cpu\_Speed 1 40.059 12481  
## <none> 39.987 12482  
## - Gpu\_Type 2 40.218 12482  
## + Memory\_2\_Size 1 39.982 12484  
## + Memory\_1\_Size 1 39.986 12484  
## - Memory\_2\_Type 3 40.434 12484  
## - Weight 1 40.645 12492  
## - Inches 1 40.756 12494  
## - Company 4 41.633 12505  
## - Memory\_1\_Type 3 42.485 12523  
## - ScreenResolution 8 43.281 12529  
## - TypeName 5 45.138 12570  
## - Ram 1 45.532 12586  
## - OpSys 7 46.695 12596  
## - Cpu\_Series 72 66.689 12848  
##   
## Step: AIC=12481.22  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Series + Ram + Memory\_1\_Type + Memory\_2\_Type + Gpu\_Type +   
## OpSys + Weight  
##   
## Df Deviance AIC  
## <none> 40.059 12481  
## - Gpu\_Type 2 40.287 12482  
## + Cpu\_Speed 1 39.987 12482  
## + Memory\_2\_Size 1 40.054 12483  
## + Memory\_1\_Size 1 40.058 12483  
## - Memory\_2\_Type 3 40.511 12484  
## - Weight 1 40.703 12492  
## - Inches 1 40.818 12494  
## - Company 4 41.683 12504  
## - Memory\_1\_Type 3 42.568 12523  
## - ScreenResolution 8 43.383 12529  
## - TypeName 5 45.215 12570  
## - Ram 1 45.633 12586  
## - OpSys 7 46.798 12596  
## - Cpu\_Series 72 74.109 12988

summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Series + Ram + Memory\_1\_Type + Memory\_2\_Type + Gpu\_Type +   
## OpSys + Weight, family = Gamma(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.64741 -0.15293 -0.02426 0.11431 0.83457   
##   
## Coefficients: (4 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 7.200643 0.172387 41.770 < 2e-16 \*\*\*  
## CompanyAcer -0.129274 0.034593 -3.737 0.000199 \*\*\*  
## CompanyApple -0.061496 0.443681 -0.139 0.889798   
## CompanyAsus -0.012651 0.031245 -0.405 0.685647   
## CompanyHP 0.064030 0.025001 2.561 0.010614 \*   
## CompanyLenovo 0.012045 0.026336 0.457 0.647529   
## TypeName2 in 1 Convertible 0.158864 0.032792 4.845 1.52e-06 \*\*\*  
## TypeNameGaming -0.110377 0.052819 -2.090 0.036956 \*   
## TypeNameNetbook 0.002958 0.071017 0.042 0.966786   
## TypeNameUltrabook 0.265270 0.033137 8.005 4.14e-15 \*\*\*  
## TypeNameWorkstation 0.289199 0.065852 4.392 1.27e-05 \*\*\*  
## Inches -0.050923 0.013610 -3.742 0.000196 \*\*\*  
## ScreenResolution1366x768 -0.080639 0.026069 -3.093 0.002047 \*\*   
## ScreenResolution1440x900 -0.107681 0.296812 -0.363 0.716856   
## ScreenResolution1600x900 -0.046262 0.062713 -0.738 0.460922   
## ScreenResolution1920x1200 -0.649312 0.240229 -2.703 0.007018 \*\*   
## ScreenResolution2304x1440 0.026820 0.378704 0.071 0.943558   
## ScreenResolution2560x1440 0.399753 0.067242 5.945 4.11e-09 \*\*\*  
## ScreenResolution2560x1600 0.107645 0.318965 0.337 0.735841   
## ScreenResolution2880x1800 0.672436 0.440180 1.528 0.126993   
## ScreenResolution3200x1800 0.062083 0.069097 0.898 0.369189   
## ScreenResolution3840x2160 0.194447 0.047428 4.100 4.55e-05 \*\*\*  
## Cpu\_SeriesA10-Series 9600P -0.343476 0.166695 -2.061 0.039670 \*   
## Cpu\_SeriesA10-Series 9620P -0.078842 0.234201 -0.337 0.736474   
## Cpu\_SeriesA10-Series A10-9620P -0.405320 0.166531 -2.434 0.015153 \*   
## Cpu\_SeriesA12-Series 9700P -0.172171 0.232726 -0.740 0.459637   
## Cpu\_SeriesA12-Series 9720P -0.201341 0.100678 -2.000 0.045851 \*   
## Cpu\_SeriesA4-Series 7210 -0.545026 0.238613 -2.284 0.022622 \*   
## Cpu\_SeriesA6-Series 7310 -0.772291 0.233052 -3.314 0.000961 \*\*\*  
## Cpu\_SeriesA6-Series 9220 -0.562445 0.100475 -5.598 2.97e-08 \*\*\*  
## Cpu\_SeriesA6-Series A6-9220 -0.594561 0.166758 -3.565 0.000385 \*\*\*  
## Cpu\_SeriesA8-Series 7410 -0.417634 0.122848 -3.400 0.000708 \*\*\*  
## Cpu\_SeriesA9-Series 9410 -0.259147 0.167765 -1.545 0.122809   
## Cpu\_SeriesA9-Series 9420 -0.410830 0.085725 -4.792 1.96e-06 \*\*\*  
## Cpu\_SeriesA9-Series A9-9420 -0.340471 0.166731 -2.042 0.041471 \*   
## Cpu\_SeriesAtom x5-Z8350 -1.201987 0.246554 -4.875 1.31e-06 \*\*\*  
## Cpu\_SeriesAtom x5-Z8550 NA NA NA NA   
## Cpu\_SeriesCeleron Dual Core 3205U -1.128175 0.152156 -7.415 3.08e-13 \*\*\*  
## Cpu\_SeriesCeleron Dual Core 3855U -0.473018 0.251079 -1.884 0.059932 .   
## Cpu\_SeriesCeleron Dual Core N3050 -0.688347 0.100009 -6.883 1.18e-11 \*\*\*  
## Cpu\_SeriesCeleron Dual Core N3060 -0.750106 0.071335 -10.515 < 2e-16 \*\*\*  
## Cpu\_SeriesCeleron Dual Core N3350 -0.725650 0.061236 -11.850 < 2e-16 \*\*\*  
## Cpu\_SeriesCeleron Quad Core N3160 -0.769335 0.190310 -4.043 5.79e-05 \*\*\*  
## Cpu\_SeriesCeleron Quad Core N3450 -0.565414 0.169405 -3.338 0.000883 \*\*\*  
## Cpu\_SeriesCore i3 6006U -0.306214 0.036769 -8.328 3.50e-16 \*\*\*  
## Cpu\_SeriesCore i3 6100U -0.265806 0.091360 -2.909 0.003720 \*\*   
## Cpu\_SeriesCore i3 7100U -0.291586 0.047583 -6.128 1.39e-09 \*\*\*  
## Cpu\_SeriesCore i3 7130U -0.183583 0.090678 -2.025 0.043239 \*   
## Cpu\_SeriesCore i5 0.179095 0.323478 0.554 0.579968   
## Cpu\_SeriesCore i5 6200U 0.024098 0.042462 0.568 0.570510   
## Cpu\_SeriesCore i5 6300HQ 0.264280 0.092182 2.867 0.004252 \*\*   
## Cpu\_SeriesCore i5 6300U 0.210995 0.081316 2.595 0.009637 \*\*   
## Cpu\_SeriesCore i5 6440HQ 0.279365 0.241087 1.159 0.246891   
## Cpu\_SeriesCore i5 7300HQ 0.271681 0.068739 3.952 8.41e-05 \*\*\*  
## Cpu\_SeriesCore i5 7300U 0.332500 0.070345 4.727 2.69e-06 \*\*\*  
## Cpu\_SeriesCore i5 7440HQ 0.253131 0.137268 1.844 0.065539 .   
## Cpu\_SeriesCore i5 7Y54 0.250418 0.165472 1.513 0.130579   
## Cpu\_SeriesCore i5 8250U -0.032918 0.037060 -0.888 0.374676   
## Cpu\_SeriesCore i7 NA NA NA NA   
## Cpu\_SeriesCore i7 6500U 0.057286 0.047827 1.198 0.231354   
## Cpu\_SeriesCore i7 6600U 0.083959 0.085890 0.978 0.328604   
## Cpu\_SeriesCore i7 6700HQ 0.276314 0.067360 4.102 4.51e-05 \*\*\*  
## Cpu\_SeriesCore i7 6820HK 0.149735 0.165210 0.906 0.365032   
## Cpu\_SeriesCore i7 6820HQ 0.403002 0.116563 3.457 0.000574 \*\*\*  
## Cpu\_SeriesCore i7 7500U 0.128431 0.032854 3.909 0.000100 \*\*\*  
## Cpu\_SeriesCore i7 7560U 0.056087 0.167839 0.334 0.738337   
## Cpu\_SeriesCore i7 7600U 0.373567 0.078906 4.734 2.59e-06 \*\*\*  
## Cpu\_SeriesCore i7 7660U 0.281237 0.240027 1.172 0.241668   
## Cpu\_SeriesCore i7 7700HQ 0.428370 0.053997 7.933 7.10e-15 \*\*\*  
## Cpu\_SeriesCore i7 7820HK 0.724919 0.133404 5.434 7.30e-08 \*\*\*  
## Cpu\_SeriesCore i7 7820HQ 0.559003 0.123115 4.540 6.47e-06 \*\*\*  
## Cpu\_SeriesCore i7 7Y75 0.277538 0.125351 2.214 0.027100 \*   
## Cpu\_SeriesCore i7 8550U 0.053954 0.041959 1.286 0.198861   
## Cpu\_SeriesCore i7 8650U 0.106801 0.248353 0.430 0.667285   
## Cpu\_SeriesCore M 0.230078 0.328288 0.701 0.483604   
## Cpu\_SeriesCore M 6Y30 -0.534927 0.137943 -3.878 0.000114 \*\*\*  
## Cpu\_SeriesCore M 6Y75 0.402245 0.123183 3.265 0.001139 \*\*   
## Cpu\_SeriesCore M 7Y30 -0.546212 0.233966 -2.335 0.019809 \*   
## Cpu\_SeriesCore M m3 NA NA NA NA   
## Cpu\_SeriesCore M M3-6Y30 -0.326996 0.250941 -1.303 0.192919   
## Cpu\_SeriesCore M M7-6Y75 0.111526 0.250868 0.445 0.656757   
## Cpu\_SeriesE-Series 6110 -1.001716 0.337903 -2.965 0.003121 \*\*   
## Cpu\_SeriesE-Series 9000 -0.770012 0.233053 -3.304 0.000995 \*\*\*  
## Cpu\_SeriesE-Series 9000e -0.712632 0.232550 -3.064 0.002253 \*\*   
## Cpu\_SeriesE-Series E2-9000 -0.759836 0.233507 -3.254 0.001185 \*\*   
## Cpu\_SeriesE-Series E2-9000e -0.664318 0.167106 -3.975 7.65e-05 \*\*\*  
## Cpu\_SeriesFX 8800P -0.110008 0.237818 -0.463 0.643795   
## Cpu\_SeriesFX 9830P -0.004169 0.239088 -0.017 0.986092   
## Cpu\_SeriesPentium Dual Core 4405Y -0.359965 0.259593 -1.387 0.165930   
## Cpu\_SeriesPentium Dual Core N4200 -0.463641 0.231430 -2.003 0.045470 \*   
## Cpu\_SeriesPentium Quad Core N3700 -0.392568 0.165312 -2.375 0.017795 \*   
## Cpu\_SeriesPentium Quad Core N3710 -0.523574 0.077501 -6.756 2.72e-11 \*\*\*  
## Cpu\_SeriesPentium Quad Core N4200 -0.517956 0.077073 -6.720 3.42e-11 \*\*\*  
## Cpu\_SeriesRyzen 1600 0.676940 0.237559 2.850 0.004489 \*\*   
## Cpu\_SeriesRyzen 1700 0.388116 0.173652 2.235 0.025688 \*   
## Cpu\_SeriesXeon E3-1505M V6 0.493530 0.184231 2.679 0.007537 \*\*   
## Cpu\_SeriesXeon E3-1535M v5 0.725696 0.243652 2.978 0.002984 \*\*   
## Ram 0.027752 0.002692 10.307 < 2e-16 \*\*\*  
## Memory\_1\_TypeFlash Storage -0.221171 0.061059 -3.622 0.000310 \*\*\*  
## Memory\_1\_TypeHDD -0.144451 0.023073 -6.261 6.21e-10 \*\*\*  
## Memory\_1\_TypeHybrid -0.216841 0.097820 -2.217 0.026919 \*   
## Memory\_2\_TypeHDD 0.066423 0.034387 1.932 0.053757 .   
## Memory\_2\_TypeHybrid 0.505451 0.221292 2.284 0.022624 \*   
## Memory\_2\_TypeSSD -0.037151 0.183060 -0.203 0.839231   
## Gpu\_TypeAMD -0.069516 0.033020 -2.105 0.035578 \*   
## Gpu\_TypeNvidia -0.024419 0.028802 -0.848 0.396789   
## OpSysAndroid -0.098656 0.280140 -0.352 0.724805   
## OpSysChrome OS 0.104025 0.098321 1.058 0.290363   
## OpSysLinux -0.198353 0.036647 -5.413 8.19e-08 \*\*\*  
## OpSysMac OS X -0.051852 0.195905 -0.265 0.791322   
## OpSysmacOS NA NA NA NA   
## OpSysNo OS -0.336736 0.037970 -8.868 < 2e-16 \*\*\*  
## OpSysWindows 10 S 0.016554 0.243707 0.068 0.945860   
## OpSysWindows 7 0.247150 0.046577 5.306 1.45e-07 \*\*\*  
## Weight 0.107164 0.031929 3.356 0.000827 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.052319)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 40.059 on 809 degrees of freedom  
## AIC: 12481  
##   
## Number of Fisher Scoring iterations: 6

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution + Cpu\_Speed +Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +Gpu\_Type + OpSys + Weight,  
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=12759.25  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + +Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Type + Memory\_2\_Size + Gpu\_Type + OpSys + Weight  
##   
## Df Deviance AIC  
## - Memory\_2\_Type 3 62.717 12755  
## - Memory\_2\_Size 1 62.580 12757  
## - Memory\_1\_Size 1 62.586 12757  
## <none> 62.571 12759  
## - Gpu\_Type 2 62.958 12760  
## - Weight 1 62.864 12761  
## - Inches 1 63.352 12767  
## - Company 4 66.118 12797  
## - Memory\_1\_Type 3 66.281 12802  
## - Cpu\_Type 1 66.666 12811  
## - ScreenResolution 10 70.451 12842  
## - TypeName 5 71.845 12870  
## - OpSys 7 72.635 12876  
## - Cpu\_Speed 1 72.140 12882  
## - Ram 1 73.443 12899  
##   
## Step: AIC=12755.41  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Size + Gpu\_Type + OpSys + Weight  
##   
## Df Deviance AIC  
## - Memory\_1\_Size 1 62.735 12754  
## <none> 62.717 12755  
## - Gpu\_Type 2 63.135 12757  
## - Memory\_2\_Size 1 63.046 12758  
## - Weight 1 63.101 12758  
## + Memory\_2\_Type 3 62.571 12760  
## - Inches 1 63.536 12764  
## - Company 4 66.308 12794  
## - Memory\_1\_Type 3 66.451 12798  
## - Cpu\_Type 1 66.743 12806  
## - ScreenResolution 10 70.615 12839  
## - TypeName 5 72.026 12867  
## - OpSys 7 72.802 12873  
## - Cpu\_Speed 1 72.380 12880  
## - Ram 1 73.727 12897  
##   
## Step: AIC=12753.69  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Type + Memory\_2\_Size +   
## Gpu\_Type + OpSys + Weight  
##   
## Df Deviance AIC  
## <none> 62.735 12754  
## - Gpu\_Type 2 63.147 12755  
## + Memory\_1\_Size 1 62.717 12755  
## - Memory\_2\_Size 1 63.112 12757  
## - Weight 1 63.139 12757  
## + Memory\_2\_Type 3 62.586 12758  
## - Inches 1 63.579 12763  
## - Company 4 66.331 12793  
## - Cpu\_Type 1 66.758 12804  
## - Memory\_1\_Type 3 67.799 12814  
## - ScreenResolution 10 70.663 12837  
## - TypeName 5 72.078 12866  
## - OpSys 7 72.876 12872  
## - Cpu\_Speed 1 72.383 12878  
## - Ram 1 75.195 12914

summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Type + Memory\_2\_Size +   
## Gpu\_Type + OpSys + Weight, family = Gamma(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.81023 -0.20072 -0.03811 0.13668 1.14149   
##   
## Coefficients: (1 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.621e+00 2.049e-01 32.309 < 2e-16 \*\*\*  
## CompanyAcer -1.935e-01 3.906e-02 -4.955 8.68e-07 \*\*\*  
## CompanyApple 2.795e-01 3.290e-01 0.850 0.39573   
## CompanyAsus -8.177e-02 3.394e-02 -2.409 0.01619 \*   
## CompanyHP 5.537e-02 2.838e-02 1.951 0.05136 .   
## CompanyLenovo -3.791e-02 2.938e-02 -1.290 0.19724   
## TypeName2 in 1 Convertible 2.297e-01 3.739e-02 6.144 1.22e-09 \*\*\*  
## TypeNameGaming 8.468e-02 4.532e-02 1.869 0.06202 .   
## TypeNameNetbook -1.275e-03 7.608e-02 -0.017 0.98663   
## TypeNameUltrabook 2.951e-01 3.695e-02 7.987 4.31e-15 \*\*\*  
## TypeNameWorkstation 4.446e-01 6.483e-02 6.859 1.31e-11 \*\*\*  
## Inches -5.015e-02 1.534e-02 -3.270 0.00112 \*\*   
## ScreenResolution1366x768 -2.210e-01 2.808e-02 -7.870 1.03e-14 \*\*\*  
## ScreenResolution1440x900 -1.162e-01 3.433e-01 -0.338 0.73519   
## ScreenResolution1600x900 -1.703e-01 7.122e-02 -2.390 0.01704 \*   
## ScreenResolution1920x1200 -3.001e-01 2.858e-01 -1.050 0.29390   
## ScreenResolution2304x1440 -1.215e-02 3.127e-01 -0.039 0.96900   
## ScreenResolution2560x1440 3.137e-01 7.398e-02 4.240 2.47e-05 \*\*\*  
## ScreenResolution2560x1600 -2.010e-01 3.501e-01 -0.574 0.56599   
## ScreenResolution2880x1800 3.184e-02 3.396e-01 0.094 0.92531   
## ScreenResolution3200x1800 1.367e-01 7.404e-02 1.846 0.06525 .   
## ScreenResolution3840x2160 2.541e-01 5.436e-02 4.674 3.42e-06 \*\*\*  
## Cpu\_Speed 2.560e-01 2.276e-02 11.246 < 2e-16 \*\*\*  
## Cpu\_TypeAMD -4.009e-01 5.445e-02 -7.363 4.14e-13 \*\*\*  
## Ram 3.766e-02 2.916e-03 12.914 < 2e-16 \*\*\*  
## Memory\_1\_TypeFlash Storage -4.044e-01 6.027e-02 -6.710 3.47e-11 \*\*\*  
## Memory\_1\_TypeHDD -1.558e-01 2.661e-02 -5.853 6.80e-09 \*\*\*  
## Memory\_1\_TypeHybrid -2.243e-01 9.547e-02 -2.349 0.01903 \*   
## Memory\_2\_Size 7.329e-05 3.250e-05 2.255 0.02436 \*   
## Gpu\_TypeAMD -2.002e-02 3.792e-02 -0.528 0.59771   
## Gpu\_TypeNvidia 6.210e-02 3.114e-02 1.994 0.04644 \*   
## OpSysAndroid -9.866e-02 3.389e-01 -0.291 0.77102   
## OpSysChrome OS -8.331e-02 7.878e-02 -1.057 0.29057   
## OpSysLinux -2.245e-01 4.300e-02 -5.222 2.21e-07 \*\*\*  
## OpSysMac OS X 2.377e-01 1.770e-01 1.343 0.17964   
## OpSysmacOS NA NA NA NA   
## OpSysNo OS -3.820e-01 4.455e-02 -8.574 < 2e-16 \*\*\*  
## OpSysWindows 10 S -1.180e-01 2.030e-01 -0.581 0.56119   
## OpSysWindows 7 2.739e-01 4.847e-02 5.651 2.15e-08 \*\*\*  
## Weight 7.372e-02 3.384e-02 2.179 0.02962 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.07655801)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 62.735 on 881 degrees of freedom  
## AIC: 12754  
##   
## Number of Fisher Scoring iterations: 5

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution + Cpu\_Speed +Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +Gpu\_Type + Weight,  
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=12884.14  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + +Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Type + Memory\_2\_Size + Gpu\_Type + Weight  
##   
## Df Deviance AIC  
## - Memory\_2\_Type 3 72.802 12880  
## - Memory\_2\_Size 1 72.647 12882  
## - Memory\_1\_Size 1 72.699 12883  
## <none> 72.635 12884  
## - Gpu\_Type 2 73.006 12884  
## - Weight 1 73.296 12890  
## - Inches 1 74.075 12898  
## - Cpu\_Type 1 76.183 12922  
## - Company 5 78.362 12939  
## - Memory\_1\_Type 3 78.124 12940  
## - ScreenResolution 10 82.061 12971  
## - Cpu\_Speed 1 83.018 13000  
## - TypeName 5 84.876 13013  
## - Ram 1 84.312 13014  
##   
## Step: AIC=12880.28  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Size + Gpu\_Type + Weight  
##   
## Df Deviance AIC  
## - Memory\_1\_Size 1 72.876 12879  
## <none> 72.802 12880  
## - Gpu\_Type 2 73.222 12881  
## - Memory\_2\_Size 1 73.165 12882  
## + Memory\_2\_Type 3 72.635 12884  
## - Weight 1 73.613 12888  
## - Inches 1 74.305 12895  
## - Cpu\_Type 1 76.280 12918  
## - Company 5 78.562 12936  
## - Memory\_1\_Type 3 78.322 12937  
## - ScreenResolution 10 82.251 12968  
## - Cpu\_Speed 1 83.297 12998  
## - TypeName 5 85.029 13009  
## - Ram 1 84.616 13013  
##   
## Step: AIC=12879.22  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Type + Memory\_2\_Size +   
## Gpu\_Type + Weight  
##   
## Df Deviance AIC  
## <none> 72.876 12879  
## - Gpu\_Type 2 73.300 12880  
## + Memory\_1\_Size 1 72.802 12880  
## - Memory\_2\_Size 1 73.326 12882  
## + Memory\_2\_Type 3 72.699 12883  
## - Weight 1 73.745 12887  
## - Inches 1 74.452 12895  
## - Cpu\_Type 1 76.353 12917  
## - Company 5 78.634 12935  
## - Memory\_1\_Type 3 80.235 12957  
## - ScreenResolution 10 82.272 12966  
## - Cpu\_Speed 1 83.334 12996  
## - TypeName 5 85.194 13009  
## - Ram 1 85.884 13025

summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Type + Memory\_2\_Size +   
## Gpu\_Type + Weight, family = Gamma(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.86105 -0.22684 -0.04158 0.13677 1.18848   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.787e+00 2.175e-01 31.208 < 2e-16 \*\*\*  
## CompanyAcer -1.996e-01 4.134e-02 -4.829 1.62e-06 \*\*\*  
## CompanyApple 5.000e-01 3.038e-01 1.646 0.10017   
## CompanyAsus -8.332e-02 3.624e-02 -2.299 0.02171 \*   
## CompanyHP 8.336e-02 2.972e-02 2.805 0.00514 \*\*   
## CompanyLenovo -6.769e-02 3.018e-02 -2.243 0.02515 \*   
## TypeName2 in 1 Convertible 2.341e-01 3.985e-02 5.874 6.00e-09 \*\*\*  
## TypeNameGaming 5.744e-02 4.850e-02 1.184 0.23660   
## TypeNameNetbook -1.482e-02 8.069e-02 -0.184 0.85427   
## TypeNameUltrabook 3.265e-01 3.943e-02 8.281 4.48e-16 \*\*\*  
## TypeNameWorkstation 5.215e-01 6.861e-02 7.601 7.47e-14 \*\*\*  
## Inches -6.744e-02 1.625e-02 -4.149 3.65e-05 \*\*\*  
## ScreenResolution1366x768 -2.415e-01 2.989e-02 -8.079 2.12e-15 \*\*\*  
## ScreenResolution1440x900 -2.839e-01 3.446e-01 -0.824 0.41021   
## ScreenResolution1600x900 -1.294e-01 7.610e-02 -1.701 0.08938 .   
## ScreenResolution1920x1200 -3.571e-01 1.847e-01 -1.933 0.05355 .   
## ScreenResolution2304x1440 -1.087e-01 3.274e-01 -0.332 0.74002   
## ScreenResolution2560x1440 3.274e-01 7.925e-02 4.131 3.95e-05 \*\*\*  
## ScreenResolution2560x1600 -4.659e-01 3.297e-01 -1.413 0.15792   
## ScreenResolution2880x1800 -1.272e-01 3.379e-01 -0.376 0.70665   
## ScreenResolution3200x1800 8.754e-02 7.914e-02 1.106 0.26894   
## ScreenResolution3840x2160 2.655e-01 5.829e-02 4.556 5.95e-06 \*\*\*  
## Cpu\_Speed 2.662e-01 2.430e-02 10.951 < 2e-16 \*\*\*  
## Cpu\_TypeAMD -3.650e-01 5.733e-02 -6.367 3.10e-10 \*\*\*  
## Ram 3.840e-02 3.120e-03 12.308 < 2e-16 \*\*\*  
## Memory\_1\_TypeFlash Storage -4.185e-01 5.694e-02 -7.349 4.52e-13 \*\*\*  
## Memory\_1\_TypeHDD -1.935e-01 2.826e-02 -6.848 1.40e-11 \*\*\*  
## Memory\_1\_TypeHybrid -1.286e-01 1.019e-01 -1.262 0.20740   
## Memory\_2\_Size 8.005e-05 3.474e-05 2.304 0.02143 \*   
## Gpu\_TypeAMD -4.967e-02 4.000e-02 -1.242 0.21456   
## Gpu\_TypeNvidia 4.461e-02 3.333e-02 1.339 0.18106   
## Weight 1.070e-01 3.605e-02 2.968 0.00308 \*\*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.08805611)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 72.876 on 888 degrees of freedom  
## AIC: 12879  
##   
## Number of Fisher Scoring iterations: 6

model2 =step(glm(Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys  
 + Inches + ScreenResolution  
 + Ram + Gpu\_Type + Memory\_1\_Size + Memory\_2\_Size + Memory\_1\_Type + Memory\_2\_Type,   
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=12892.48  
## Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys + Inches +   
## ScreenResolution + Ram + Gpu\_Type + Memory\_1\_Size + Memory\_2\_Size +   
## Memory\_1\_Type + Memory\_2\_Type  
##   
## Df Deviance AIC  
## - Memory\_2\_Type 3 72.850 12890  
## - Memory\_1\_Size 1 72.513 12891  
## - Memory\_2\_Size 1 72.606 12892  
## <none> 72.506 12892  
## - Inches 1 73.151 12898  
## - Gpu\_Type 2 73.828 12903  
## - Cpu\_Type 1 74.509 12913  
## - Company 4 76.869 12933  
## - Memory\_1\_Type 3 78.505 12953  
## - ScreenResolution 10 81.105 12968  
## - OpSys 7 83.805 13004  
## - TypeName 5 83.487 13004  
## - Ram 1 88.511 13068  
##   
## Step: AIC=12890.9  
## Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys + Inches +   
## ScreenResolution + Ram + Gpu\_Type + Memory\_1\_Size + Memory\_2\_Size +   
## Memory\_1\_Type  
##   
## Df Deviance AIC  
## - Memory\_1\_Size 1 72.864 12889  
## <none> 72.850 12891  
## - Memory\_2\_Size 1 73.035 12891  
## + Memory\_2\_Type 3 72.506 12893  
## - Inches 1 73.446 12896  
## - Gpu\_Type 2 74.314 12903  
## - Cpu\_Type 1 74.766 12910  
## - Company 4 77.287 12932  
## - Memory\_1\_Type 3 78.854 12952  
## - ScreenResolution 10 81.469 12967  
## - OpSys 7 84.249 13004  
## - TypeName 5 83.954 13004  
## - Ram 1 89.130 13070  
##   
## Step: AIC=12889.08  
## Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys + Inches +   
## ScreenResolution + Ram + Gpu\_Type + Memory\_2\_Size + Memory\_1\_Type  
##   
## Df Deviance AIC  
## <none> 72.864 12889  
## - Memory\_2\_Size 1 73.080 12890  
## + Memory\_1\_Size 1 72.850 12891  
## + Memory\_2\_Type 3 72.513 12891  
## - Inches 1 73.465 12894  
## - Gpu\_Type 2 74.319 12901  
## - Cpu\_Type 1 74.783 12908  
## - Company 4 77.297 12930  
## - Memory\_1\_Type 3 80.041 12963  
## - ScreenResolution 10 81.538 12966  
## - OpSys 7 84.332 13003  
## - TypeName 5 84.059 13004  
## - Ram 1 91.417 13094

summary(model2)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys +   
## Inches + ScreenResolution + Ram + Gpu\_Type + Memory\_2\_Size +   
## Memory\_1\_Type, family = Gamma(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.8533 -0.2117 -0.0450 0.1437 1.3199   
##   
## Coefficients: (1 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 7.041e+00 1.910e-01 36.867 < 2e-16 \*\*\*  
## CompanyAcer -2.136e-01 4.209e-02 -5.075 4.72e-07 \*\*\*  
## CompanyApple 2.560e-01 3.563e-01 0.718 0.472698   
## CompanyAsus -1.100e-01 3.620e-02 -3.039 0.002440 \*\*   
## CompanyHP 5.748e-02 3.058e-02 1.880 0.060481 .   
## CompanyLenovo -1.140e-02 3.177e-02 -0.359 0.719856   
## TypeName2 in 1 Convertible 1.811e-01 4.036e-02 4.486 8.20e-06 \*\*\*  
## TypeNameGaming 1.993e-01 4.443e-02 4.487 8.17e-06 \*\*\*  
## TypeNameNetbook -4.403e-02 8.158e-02 -0.540 0.589522   
## TypeNameUltrabook 2.846e-01 3.960e-02 7.187 1.40e-12 \*\*\*  
## TypeNameWorkstation 5.407e-01 6.966e-02 7.762 2.30e-14 \*\*\*  
## Cpu\_TypeAMD -2.687e-01 5.765e-02 -4.661 3.63e-06 \*\*\*  
## OpSysAndroid -9.866e-02 3.671e-01 -0.269 0.788213   
## OpSysChrome OS -1.000e-01 8.527e-02 -1.173 0.241071   
## OpSysLinux -2.038e-01 4.656e-02 -4.378 1.34e-05 \*\*\*  
## OpSysMac OS X 2.704e-01 1.918e-01 1.410 0.158867   
## OpSysmacOS NA NA NA NA   
## OpSysNo OS -4.120e-01 4.815e-02 -8.555 < 2e-16 \*\*\*  
## OpSysWindows 10 S -2.538e-01 2.194e-01 -1.157 0.247664   
## OpSysWindows 7 2.979e-01 5.228e-02 5.698 1.65e-08 \*\*\*  
## Inches -3.303e-02 1.282e-02 -2.577 0.010120 \*   
## ScreenResolution1366x768 -2.343e-01 3.006e-02 -7.795 1.82e-14 \*\*\*  
## ScreenResolution1440x900 -1.031e-01 3.719e-01 -0.277 0.781703   
## ScreenResolution1600x900 -1.844e-01 7.704e-02 -2.394 0.016876 \*   
## ScreenResolution1920x1200 -3.367e-01 3.094e-01 -1.088 0.276818   
## ScreenResolution2304x1440 -2.166e-01 3.381e-01 -0.641 0.521996   
## ScreenResolution2560x1440 3.666e-01 7.984e-02 4.592 5.04e-06 \*\*\*  
## ScreenResolution2560x1600 -1.093e-01 3.792e-01 -0.288 0.773160   
## ScreenResolution2880x1800 1.409e-01 3.673e-01 0.384 0.701271   
## ScreenResolution3200x1800 8.754e-02 8.010e-02 1.093 0.274763   
## ScreenResolution3840x2160 2.069e-01 5.876e-02 3.521 0.000452 \*\*\*  
## Ram 4.375e-02 3.004e-03 14.564 < 2e-16 \*\*\*  
## Gpu\_TypeAMD -3.632e-02 4.108e-02 -0.884 0.376870   
## Gpu\_TypeNvidia 1.148e-01 3.330e-02 3.449 0.000590 \*\*\*  
## Memory\_2\_Size 5.540e-05 3.491e-05 1.587 0.112849   
## Memory\_1\_TypeFlash Storage -5.434e-01 6.374e-02 -8.525 < 2e-16 \*\*\*  
## Memory\_1\_TypeHDD -1.534e-01 2.863e-02 -5.357 1.08e-07 \*\*\*  
## Memory\_1\_TypeHybrid -2.036e-01 1.034e-01 -1.970 0.049135 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.0898622)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 72.864 on 883 degrees of freedom  
## AIC: 12889  
##   
## Number of Fisher Scoring iterations: 5

model4 =step(glm(Price\_euros ~ Company + TypeName  
 + Inches + ScreenResolution +TypeName\*ScreenResolution  
 +Ram + Gpu\_Type + Memory\_1 ,  
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=12962.6  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## TypeName \* ScreenResolution + Ram + Gpu\_Type + Memory\_1  
##   
## Df Deviance AIC  
## - TypeName:ScreenResolution 11 77.401 12961  
## <none> 75.532 12963  
## - Inches 1 76.139 12967  
## - Gpu\_Type 2 78.956 12995  
## - Company 5 80.965 13011  
## - Ram 1 87.751 13092  
## - Memory\_1 21 93.674 13115  
##   
## Step: AIC=12963.4  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Ram + Gpu\_Type + Memory\_1

summary(model4)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Ram + Gpu\_Type + Memory\_1, family = Gamma(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.81705 -0.21997 -0.04019 0.14754 1.30950   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.884306 0.222704 30.912 < 2e-16 \*\*\*  
## CompanyAcer -0.248661 0.042103 -5.906 5.02e-09 \*\*\*  
## CompanyApple -0.097823 0.353949 -0.276 0.782325   
## CompanyAsus -0.140227 0.036311 -3.862 0.000121 \*\*\*  
## CompanyHP 0.034274 0.029764 1.152 0.249839   
## CompanyLenovo -0.087356 0.030668 -2.848 0.004496 \*\*   
## TypeName2 in 1 Convertible 0.169986 0.041414 4.105 4.43e-05 \*\*\*  
## TypeNameGaming 0.236433 0.044158 5.354 1.10e-07 \*\*\*  
## TypeNameNetbook 0.065535 0.086321 0.759 0.447933   
## TypeNameUltrabook 0.260152 0.041061 6.336 3.78e-10 \*\*\*  
## TypeNameWorkstation 0.573295 0.071736 7.992 4.19e-15 \*\*\*  
## Inches -0.036182 0.013031 -2.777 0.005610 \*\*   
## ScreenResolution1366x768 -0.238738 0.031622 -7.550 1.10e-13 \*\*\*  
## ScreenResolution1440x900 -0.171653 0.364962 -0.470 0.638237   
## ScreenResolution1600x900 -0.103410 0.078853 -1.311 0.190057   
## ScreenResolution1920x1200 -0.394277 0.212669 -1.854 0.064084 .   
## ScreenResolution2304x1440 -0.082703 0.354484 -0.233 0.815580   
## ScreenResolution2560x1440 0.369572 0.082479 4.481 8.42e-06 \*\*\*  
## ScreenResolution2560x1600 0.210015 0.378617 0.555 0.579249   
## ScreenResolution2880x1800 0.431062 0.370394 1.164 0.244826   
## ScreenResolution3200x1800 0.025705 0.081783 0.314 0.753361   
## ScreenResolution3840x2160 0.164929 0.063695 2.589 0.009776 \*\*   
## Ram 0.041069 0.003527 11.646 < 2e-16 \*\*\*  
## Gpu\_TypeAMD -0.105161 0.034097 -3.084 0.002106 \*\*   
## Gpu\_TypeNvidia 0.135870 0.034439 3.945 8.61e-05 \*\*\*  
## Memory\_1128GB Flash Storage -0.018570 0.225739 -0.082 0.934458   
## Memory\_1128GB HDD -0.128067 0.327828 -0.391 0.696149   
## Memory\_1128GB SSD 0.136552 0.113483 1.203 0.229194   
## Memory\_116GB Flash Storage -0.399528 0.180079 -2.219 0.026769 \*   
## Memory\_116GB SSD -0.685516 0.213147 -3.216 0.001347 \*\*   
## Memory\_1180GB SSD 0.303261 0.190375 1.593 0.111530   
## Memory\_11TB HDD -0.009537 0.112827 -0.085 0.932659   
## Memory\_11TB SSD 0.356058 0.156010 2.282 0.022712 \*   
## Memory\_1240GB SSD 0.819221 0.334299 2.451 0.014458 \*   
## Memory\_1256GB Flash Storage 0.313430 0.204366 1.534 0.125474   
## Memory\_1256GB SSD 0.294371 0.111232 2.646 0.008280 \*\*   
## Memory\_12TB HDD -0.098946 0.137540 -0.719 0.472090   
## Memory\_132GB Flash Storage -0.496763 0.132819 -3.740 0.000196 \*\*\*  
## Memory\_132GB SSD -0.965812 0.338010 -2.857 0.004373 \*\*   
## Memory\_1500GB HDD 0.101075 0.116065 0.871 0.384076   
## Memory\_1508GB Hybrid 0.693815 0.327442 2.119 0.034381 \*   
## Memory\_1512GB Flash Storage 0.202177 0.370513 0.546 0.585433   
## Memory\_1512GB SSD 0.348017 0.117821 2.954 0.003223 \*\*   
## Memory\_164GB Flash Storage -0.264473 0.157672 -1.677 0.093829 .   
## Memory\_164GB SSD -0.430321 0.329096 -1.308 0.191358   
## Memory\_18GB SSD 0.326384 0.332775 0.981 0.326965   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.09386898)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 77.401 on 874 degrees of freedom  
## AIC: 12963  
##   
## Number of Fisher Scoring iterations: 5

model3 =step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution  
 +Ram +Gpu\_Type,  
 family = Gamma(link ="log"),  
 data=train),direction ="both",trace = TRUE)

## Start: AIC=13139.6  
## Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Ram + Gpu\_Type  
##   
## Df Deviance AIC  
## <none> 97.757 13140  
## - Inches 1 98.308 13142  
## - Gpu\_Type 2 101.799 13170  
## - Company 5 106.639 13205  
## - TypeName 5 113.822 13266  
## - ScreenResolution 10 119.023 13300  
## - Ram 1 125.803 13376

summary(model3)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Ram + Gpu\_Type, family = Gamma(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.89647 -0.26880 -0.05511 0.15716 1.45610   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.906687 0.205349 33.634 < 2e-16 \*\*\*  
## CompanyAcer -0.295679 0.046044 -6.422 2.19e-10 \*\*\*  
## CompanyApple 0.101880 0.347815 0.293 0.769654   
## CompanyAsus -0.172857 0.039602 -4.365 1.42e-05 \*\*\*  
## CompanyHP 0.056324 0.033025 1.706 0.088448 .   
## CompanyLenovo -0.074227 0.033643 -2.206 0.027614 \*   
## TypeName2 in 1 Convertible 0.194080 0.045822 4.236 2.52e-05 \*\*\*  
## TypeNameGaming 0.208858 0.047514 4.396 1.24e-05 \*\*\*  
## TypeNameNetbook -0.036438 0.091656 -0.398 0.691057   
## TypeNameUltrabook 0.360655 0.044480 8.108 1.68e-15 \*\*\*  
## TypeNameWorkstation 0.598216 0.077752 7.694 3.76e-14 \*\*\*  
## Inches -0.029656 0.013606 -2.180 0.029551 \*   
## ScreenResolution1366x768 -0.370011 0.031415 -11.778 < 2e-16 \*\*\*  
## ScreenResolution1440x900 -0.470043 0.398267 -1.180 0.238225   
## ScreenResolution1600x900 -0.237093 0.087220 -2.718 0.006688 \*\*   
## ScreenResolution1920x1200 -0.830681 0.208132 -3.991 7.11e-05 \*\*\*  
## ScreenResolution2304x1440 -0.280050 0.377432 -0.742 0.458289   
## ScreenResolution2560x1440 0.381096 0.091338 4.172 3.31e-05 \*\*\*  
## ScreenResolution2560x1600 -0.013461 0.378018 -0.036 0.971601   
## ScreenResolution2880x1800 0.186898 0.388808 0.481 0.630852   
## ScreenResolution3200x1800 -0.010376 0.091262 -0.114 0.909509   
## ScreenResolution3840x2160 0.222299 0.067079 3.314 0.000957 \*\*\*  
## Ram 0.052672 0.003337 15.786 < 2e-16 \*\*\*  
## Gpu\_TypeAMD -0.151144 0.037363 -4.045 5.68e-05 \*\*\*  
## Gpu\_TypeNvidia 0.091597 0.038028 2.409 0.016213 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for Gamma family taken to be 0.1178936)  
##   
## Null deviance: 326.824 on 919 degrees of freedom  
## Residual deviance: 97.757 on 895 degrees of freedom  
## AIC: 13140  
##   
## Number of Fisher Scoring iterations: 5

# Predict

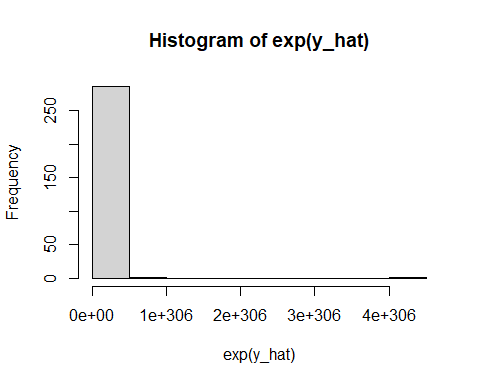
y\_hat <- exp(predict(model1, train))  
mape(train$Price\_euros,y\_hat)

## [1] 0.238723

mean(abs((train$Price\_euros-y\_hat)/y\_hat)) \* 100

## [1] 22.40335

hist(exp(y\_hat))



anova(model4, test="Chisq")

## Analysis of Deviance Table  
##   
## Model: Gamma, link: log  
##   
## Response: Price\_euros  
##   
## Terms added sequentially (first to last)  
##   
##   
## Df Deviance Resid. Df Resid. Dev Pr(>Chi)   
## NULL 919 326.82   
## Company 5 23.538 914 303.29 < 2.2e-16 \*\*\*  
## TypeName 5 112.015 909 191.27 < 2.2e-16 \*\*\*  
## Inches 1 1.351 908 189.92 0.0001481 \*\*\*  
## ScreenResolution 10 58.825 898 131.09 < 2.2e-16 \*\*\*  
## Ram 1 29.295 897 101.80 < 2.2e-16 \*\*\*  
## Gpu\_Type 2 4.042 895 97.76 4.457e-10 \*\*\*  
## Memory\_1 21 20.356 874 77.40 < 2.2e-16 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

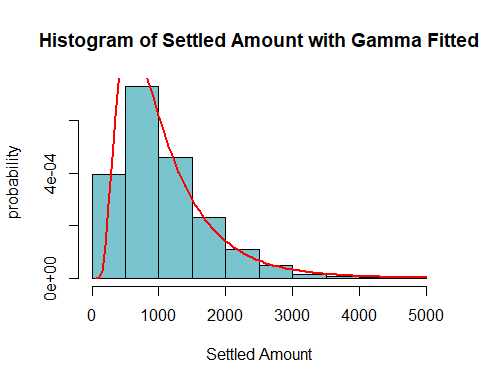
# Inv Normal

summary(fitdist(data$Price\_euros,"invgauss",lower=c(0,0)  
,start = list(mean = mean(data$Price\_euros), shape = sd(data$Price\_euros))))

## Warning in checkparamlist(arg\_startfix$start.arg, arg\_startfix$fix.arg, :  
## Some parameter names have no starting/fixed value but have a default value:  
## dispersion.

## Fitting of the distribution ' invgauss ' by maximum likelihood   
## Parameters :   
## estimate Std. Error  
## mean 1077.554 NA  
## shape 2433.434 NA  
## Loglikelihood: -8882.094 AIC: 17768.19 BIC: 17778.28   
## Correlation matrix:  
## [1] NA

h = hist(data$Price\_euros,probability = T,main = paste("Histogram of Settled Amount with Gamma Fitted"),col="cadetblue3",xlab = "Settled Amount",ylab = "probability")  
curve(dinvGauss(x,nu = 1077.554, #Mean  
 lambda = 2433.434 ), #Shape  
 add=TRUE,  
 lwd=2,  
 col="red")



ks.test(data$Price\_euros,rinvgauss(nrow(data),mean = 1077.554,shape = 2433.434, dispersion = 1/2433.434),alternative = "two.sided",exact = TRUE)

## Warning in ks.test(data$Price\_euros, rinvgauss(nrow(data), mean = 1077.554, :  
## cannot compute correct p-values with ties

##   
## Two-sample Kolmogorov-Smirnov test  
##   
## data: data$Price\_euros and rinvgauss(nrow(data), mean = 1077.554, shape = 2433.434, dispersion = 1/2433.434)  
## D = 0.042609, p-value = 0.2474  
## alternative hypothesis: two-sided

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution +Cpu + Cpu\_Speed +  
 Cpu\_Series+Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size + Gpu\_Series+Gpu\_Type + OpSys + Weight,  
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu + Ram + Memory\_1\_Size + Memory\_1\_Type + Memory\_2\_Type +   
## Memory\_2\_Size + OpSys + Weight, family = inverse.gaussian(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.024695 -0.004852 -0.000795 0.003379 0.032750   
##   
## Coefficients: (7 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)  
## (Intercept) 6.875e+00 2.210e-01 31.115 < 2e-16  
## CompanyAcer -1.035e-01 2.985e-02 -3.468 0.000554  
## CompanyApple 4.961e-01 4.110e-01 1.207 0.227797  
## CompanyAsus -1.250e-02 2.968e-02 -0.421 0.673787  
## CompanyHP 6.222e-02 2.540e-02 2.450 0.014517  
## CompanyLenovo -8.774e-03 2.631e-02 -0.333 0.738862  
## TypeName2 in 1 Convertible 1.456e-01 3.508e-02 4.152 3.66e-05  
## TypeNameGaming -9.197e-02 6.722e-02 -1.368 0.171623  
## TypeNameNetbook -1.458e-01 5.780e-02 -2.522 0.011865  
## TypeNameUltrabook 2.792e-01 3.881e-02 7.194 1.46e-12  
## TypeNameWorkstation 3.107e-01 1.002e-01 3.100 0.002002  
## Inches -5.255e-02 1.430e-02 -3.674 0.000255  
## ScreenResolution1366x768 -8.786e-02 2.265e-02 -3.879 0.000114  
## ScreenResolution1440x900 -1.147e-01 3.442e-01 -0.333 0.739084  
## ScreenResolution1600x900 -1.916e-02 5.466e-02 -0.351 0.725987  
## ScreenResolution1920x1200 -2.270e-01 2.216e-01 -1.025 0.305895  
## ScreenResolution2304x1440 -2.115e-01 4.761e-01 -0.444 0.656972  
## ScreenResolution2560x1440 4.581e-01 1.066e-01 4.299 1.93e-05  
## ScreenResolution2560x1600 1.749e-01 5.089e-01 0.344 0.731188  
## ScreenResolution2880x1800 4.527e-01 5.694e-01 0.795 0.426778  
## ScreenResolution3200x1800 6.454e-02 9.121e-02 0.708 0.479402  
## ScreenResolution3840x2160 2.116e-01 7.072e-02 2.992 0.002855  
## CpuAMD A10-Series 9620P 2.5GHz 1.875e-01 2.293e-01 0.818 0.413687  
## CpuAMD A10-Series A10-9620P 2.5GHz -1.012e-01 1.862e-01 -0.544 0.586890  
## CpuAMD A12-Series 9700P 2.5GHz 1.675e-01 2.345e-01 0.714 0.475320  
## CpuAMD A12-Series 9720P 2.7GHz 6.329e-02 1.871e-01 0.338 0.735245  
## CpuAMD A12-Series 9720P 3.6GHz 1.282e-01 1.665e-01 0.770 0.441655  
## CpuAMD A4-Series 7210 2.2GHz -2.543e-01 2.074e-01 -1.226 0.220646  
## CpuAMD A6-Series 7310 2GHz -4.629e-01 1.894e-01 -2.444 0.014740  
## CpuAMD A6-Series 9220 2.5GHz -2.883e-01 1.479e-01 -1.950 0.051527  
## CpuAMD A6-Series 9220 2.9GHz -1.278e-01 1.932e-01 -0.662 0.508336  
## CpuAMD A6-Series A6-9220 2.5GHz -2.886e-01 1.772e-01 -1.628 0.103846  
## CpuAMD A8-Series 7410 2.2GHz -1.313e-01 1.563e-01 -0.840 0.400980  
## CpuAMD A9-Series 9410 2.9GHz 3.538e-02 1.958e-01 0.181 0.856650  
## CpuAMD A9-Series 9420 3GHz -9.961e-02 1.422e-01 -0.701 0.483795  
## CpuAMD A9-Series A9-9420 3GHz -3.719e-02 1.922e-01 -0.194 0.846597  
## CpuAMD E-Series 6110 1.5GHz -8.621e-01 2.432e-01 -3.545 0.000415  
## CpuAMD E-Series 9000 2.2GHz -4.604e-01 1.895e-01 -2.429 0.015360  
## CpuAMD E-Series 9000e 1.5GHz -4.242e-01 1.940e-01 -2.186 0.029087  
## CpuAMD E-Series E2-9000 2.2GHz -4.194e-01 1.971e-01 -2.128 0.033624  
## CpuAMD E-Series E2-9000e 1.5GHz -3.910e-01 1.645e-01 -2.376 0.017721  
## CpuAMD FX 8800P 2.1GHz 1.614e-01 2.858e-01 0.565 0.572547  
## CpuAMD FX 9830P 3GHz 2.675e-01 2.519e-01 1.062 0.288728  
## CpuAMD Ryzen 1600 3.2GHz 9.762e-01 3.504e-01 2.786 0.005463  
## CpuAMD Ryzen 1700 3GHz 6.722e-01 2.522e-01 2.666 0.007842  
## CpuIntel Atom x5-Z8350 1.44GHz -6.400e-01 1.820e-01 -3.516 0.000463  
## CpuIntel Atom x5-Z8550 1.44GHz NA NA NA NA  
## CpuIntel Celeron Dual Core 3205U 1.5GHz -7.644e-01 1.592e-01 -4.800 1.89e-06  
## CpuIntel Celeron Dual Core 3855U 1.6GHz -9.718e-02 2.231e-01 -0.436 0.663185  
## CpuIntel Celeron Dual Core N3050 1.6GHz -3.130e-01 1.452e-01 -2.155 0.031456  
## CpuIntel Celeron Dual Core N3060 1.60GHz -4.019e-01 1.928e-01 -2.085 0.037400  
## CpuIntel Celeron Dual Core N3060 1.6GHz -3.322e-01 1.393e-01 -2.385 0.017319  
## CpuIntel Celeron Dual Core N3350 1.1GHz -3.309e-01 1.370e-01 -2.416 0.015927  
## CpuIntel Celeron Dual Core N3350 2GHz -2.494e-01 1.962e-01 -1.271 0.203993  
## CpuIntel Celeron Quad Core N3160 1.6GHz -4.124e-01 1.797e-01 -2.295 0.022009  
## CpuIntel Celeron Quad Core N3450 1.1GHz -1.121e-01 1.757e-01 -0.638 0.523834  
## CpuIntel Core i3 6006U 2.0GHz 1.048e-01 1.390e-01 0.754 0.450874  
## CpuIntel Core i3 6006U 2GHz 3.541e-02 1.330e-01 0.266 0.790181  
## CpuIntel Core i3 6100U 2.3GHz 7.510e-02 1.530e-01 0.491 0.623741  
## CpuIntel Core i3 7100U 2.4GHz 7.085e-02 1.351e-01 0.524 0.600124  
## CpuIntel Core i3 7130U 2.7GHz 1.771e-01 1.480e-01 1.197 0.231743  
## CpuIntel Core i5 1.3GHz 1.914e-01 4.081e-01 0.469 0.639244  
## CpuIntel Core i5 1.6GHz -2.899e-02 3.014e-01 -0.096 0.923388  
## CpuIntel Core i5 1.8GHz NA NA NA NA  
## CpuIntel Core i5 2.0GHz -2.398e-01 4.399e-01 -0.545 0.585756  
## CpuIntel Core i5 2.3GHz -2.354e-01 3.889e-01 -0.605 0.545131  
## CpuIntel Core i5 2.9GHz 9.488e-02 4.754e-01 0.200 0.841861  
## CpuIntel Core i5 3.1GHz NA NA NA NA  
## CpuIntel Core i5 6200U 2.3GHz 3.798e-01 1.367e-01 2.778 0.005595  
## CpuIntel Core i5 6300HQ 2.3GHz 5.940e-01 1.623e-01 3.659 0.000270  
## CpuIntel Core i5 6300U 2.4GHz 5.859e-01 1.645e-01 3.562 0.000390  
## CpuIntel Core i5 6440HQ 2.6GHz 5.183e-01 3.323e-01 1.560 0.119163  
## CpuIntel Core i5 7200U 2.5GHz 3.416e-01 1.318e-01 2.592 0.009719  
## CpuIntel Core i5 7200U 2.70GHz 2.649e-01 2.782e-01 0.952 0.341259  
## CpuIntel Core i5 7200U 2.7GHz 3.456e-01 2.901e-01 1.191 0.233944  
## CpuIntel Core i5 7300HQ 2.5GHz 5.887e-01 1.507e-01 3.906 0.000102  
## CpuIntel Core i5 7300U 2.6GHz 7.017e-01 1.548e-01 4.532 6.73e-06  
## CpuIntel Core i5 7440HQ 2.8GHz 5.985e-01 2.036e-01 2.940 0.003376  
## CpuIntel Core i5 7Y54 1.2GHz 5.899e-01 2.494e-01 2.365 0.018246  
## CpuIntel Core i5 8250U 1.6GHz 2.998e-01 1.338e-01 2.241 0.025314  
## CpuIntel Core i7 2.2GHz -4.816e-02 5.495e-01 -0.088 0.930179  
## CpuIntel Core i7 2.7GHz -1.190e-01 5.692e-01 -0.209 0.834496  
## CpuIntel Core i7 2.8GHz -1.704e-01 5.641e-01 -0.302 0.762647  
## CpuIntel Core i7 2.9GHz NA NA NA NA  
## CpuIntel Core i7 6500U 2.50GHz 6.667e-01 2.783e-01 2.396 0.016812  
## CpuIntel Core i7 6500U 2.5GHz 3.760e-01 1.391e-01 2.703 0.007016  
## CpuIntel Core i7 6600U 2.6GHz 4.314e-01 1.778e-01 2.427 0.015458  
## CpuIntel Core i7 6700HQ 2.6GHz 5.780e-01 1.513e-01 3.820 0.000144  
## CpuIntel Core i7 6820HK 2.7GHz 3.856e-01 2.792e-01 1.381 0.167724  
## CpuIntel Core i7 6820HQ 2.7GHz 7.120e-01 2.264e-01 3.145 0.001722  
## CpuIntel Core i7 7500U 2.7GHz 4.609e-01 1.331e-01 3.464 0.000560  
## CpuIntel Core i7 7560U 2.4GHz 3.839e-01 2.476e-01 1.550 0.121466  
## CpuIntel Core i7 7600U 2.8GHz 7.252e-01 1.707e-01 4.248 2.41e-05  
## CpuIntel Core i7 7660U 2.5GHz 5.767e-01 4.005e-01 1.440 0.150258  
## CpuIntel Core i7 7700HQ 2.7GHz 1.157e+00 3.786e-01 3.055 0.002322  
## CpuIntel Core i7 7700HQ 2.8GHz 7.366e-01 1.436e-01 5.130 3.64e-07  
## CpuIntel Core i7 7820HK 2.9GHz 1.078e+00 2.683e-01 4.018 6.42e-05  
## CpuIntel Core i7 7820HQ 2.9GHz 9.294e-01 2.300e-01 4.040 5.86e-05  
## CpuIntel Core i7 7Y75 1.3GHz 6.177e-01 2.133e-01 2.896 0.003880  
## CpuIntel Core i7 8550U 1.8GHz 3.920e-01 1.369e-01 2.864 0.004292  
## CpuIntel Core i7 8650U 1.9GHz 3.159e-01 3.435e-01 0.920 0.358090  
## CpuIntel Core M 1.1GHz 2.467e-01 3.384e-01 0.729 0.466113  
## CpuIntel Core M 1.2GHz 2.035e-01 3.841e-01 0.530 0.596432  
## CpuIntel Core M 6Y30 0.9GHz -1.954e-01 1.823e-01 -1.072 0.284020  
## CpuIntel Core M 6Y75 1.2GHz 8.448e-01 2.331e-01 3.624 0.000309  
## CpuIntel Core M 7Y30 1.0GHz -1.675e-01 2.367e-01 -0.708 0.479213  
## CpuIntel Core M M3-6Y30 0.9GHz 2.959e-02 2.499e-01 0.118 0.905769  
## CpuIntel Core M m3 1.2GHz NA NA NA NA  
## CpuIntel Core M M7-6Y75 1.2GHz 4.463e-01 3.035e-01 1.471 0.141802  
## CpuIntel Pentium Dual Core 4405Y 1.5GHz -1.544e-02 2.582e-01 -0.060 0.952347  
## CpuIntel Pentium Dual Core N4200 1.1GHz -1.079e-01 2.303e-01 -0.469 0.639498  
## CpuIntel Pentium Quad Core N3700 1.6GHz -2.286e-02 1.754e-01 -0.130 0.896383  
## CpuIntel Pentium Quad Core N3710 1.6GHz -1.283e-01 1.407e-01 -0.912 0.362179  
## CpuIntel Pentium Quad Core N4200 1.1GHz -1.266e-01 1.404e-01 -0.902 0.367327  
## CpuIntel Xeon E3-1505M V6 3GHz 8.798e-01 3.232e-01 2.722 0.006632  
## CpuIntel Xeon E3-1535M v5 2.9GHz 1.013e+00 5.418e-01 1.870 0.061895  
## Ram 3.320e-02 3.672e-03 9.041 < 2e-16  
## Memory\_1\_Size -4.797e-05 3.581e-05 -1.340 0.180776  
## Memory\_1\_TypeFlash Storage -2.715e-01 4.144e-02 -6.552 1.02e-10  
## Memory\_1\_TypeHDD -9.580e-02 3.285e-02 -2.916 0.003644  
## Memory\_1\_TypeHybrid -1.685e-01 1.047e-01 -1.609 0.107964  
## Memory\_2\_TypeHDD 1.437e-01 1.160e-01 1.239 0.215619  
## Memory\_2\_TypeHybrid 7.104e-01 3.982e-01 1.784 0.074806  
## Memory\_2\_TypeSSD 1.049e-01 2.397e-01 0.437 0.661868  
## Memory\_2\_Size -7.276e-05 9.647e-05 -0.754 0.450962  
## OpSysAndroid -9.866e-02 2.044e-01 -0.483 0.629514  
## OpSysChrome OS 1.635e-01 6.493e-02 2.517 0.012020  
## OpSysLinux -2.112e-01 3.025e-02 -6.981 6.20e-12  
## OpSysMac OS X NA NA NA NA  
## OpSysmacOS NA NA NA NA  
## OpSysNo OS -2.997e-01 3.060e-02 -9.793 < 2e-16  
## OpSysWindows 10 S 1.791e-01 1.541e-01 1.162 0.245415  
## OpSysWindows 7 2.581e-01 5.758e-02 4.482 8.49e-06  
## Weight 8.600e-02 3.841e-02 2.239 0.025457  
##   
## (Intercept) \*\*\*  
## CompanyAcer \*\*\*  
## CompanyApple   
## CompanyAsus   
## CompanyHP \*   
## CompanyLenovo   
## TypeName2 in 1 Convertible \*\*\*  
## TypeNameGaming   
## TypeNameNetbook \*   
## TypeNameUltrabook \*\*\*  
## TypeNameWorkstation \*\*   
## Inches \*\*\*  
## ScreenResolution1366x768 \*\*\*  
## ScreenResolution1440x900   
## ScreenResolution1600x900   
## ScreenResolution1920x1200   
## ScreenResolution2304x1440   
## ScreenResolution2560x1440 \*\*\*  
## ScreenResolution2560x1600   
## ScreenResolution2880x1800   
## ScreenResolution3200x1800   
## ScreenResolution3840x2160 \*\*   
## CpuAMD A10-Series 9620P 2.5GHz   
## CpuAMD A10-Series A10-9620P 2.5GHz   
## CpuAMD A12-Series 9700P 2.5GHz   
## CpuAMD A12-Series 9720P 2.7GHz   
## CpuAMD A12-Series 9720P 3.6GHz   
## CpuAMD A4-Series 7210 2.2GHz   
## CpuAMD A6-Series 7310 2GHz \*   
## CpuAMD A6-Series 9220 2.5GHz .   
## CpuAMD A6-Series 9220 2.9GHz   
## CpuAMD A6-Series A6-9220 2.5GHz   
## CpuAMD A8-Series 7410 2.2GHz   
## CpuAMD A9-Series 9410 2.9GHz   
## CpuAMD A9-Series 9420 3GHz   
## CpuAMD A9-Series A9-9420 3GHz   
## CpuAMD E-Series 6110 1.5GHz \*\*\*  
## CpuAMD E-Series 9000 2.2GHz \*   
## CpuAMD E-Series 9000e 1.5GHz \*   
## CpuAMD E-Series E2-9000 2.2GHz \*   
## CpuAMD E-Series E2-9000e 1.5GHz \*   
## CpuAMD FX 8800P 2.1GHz   
## CpuAMD FX 9830P 3GHz   
## CpuAMD Ryzen 1600 3.2GHz \*\*   
## CpuAMD Ryzen 1700 3GHz \*\*   
## CpuIntel Atom x5-Z8350 1.44GHz \*\*\*  
## CpuIntel Atom x5-Z8550 1.44GHz   
## CpuIntel Celeron Dual Core 3205U 1.5GHz \*\*\*  
## CpuIntel Celeron Dual Core 3855U 1.6GHz   
## CpuIntel Celeron Dual Core N3050 1.6GHz \*   
## CpuIntel Celeron Dual Core N3060 1.60GHz \*   
## CpuIntel Celeron Dual Core N3060 1.6GHz \*   
## CpuIntel Celeron Dual Core N3350 1.1GHz \*   
## CpuIntel Celeron Dual Core N3350 2GHz   
## CpuIntel Celeron Quad Core N3160 1.6GHz \*   
## CpuIntel Celeron Quad Core N3450 1.1GHz   
## CpuIntel Core i3 6006U 2.0GHz   
## CpuIntel Core i3 6006U 2GHz   
## CpuIntel Core i3 6100U 2.3GHz   
## CpuIntel Core i3 7100U 2.4GHz   
## CpuIntel Core i3 7130U 2.7GHz   
## CpuIntel Core i5 1.3GHz   
## CpuIntel Core i5 1.6GHz   
## CpuIntel Core i5 1.8GHz   
## CpuIntel Core i5 2.0GHz   
## CpuIntel Core i5 2.3GHz   
## CpuIntel Core i5 2.9GHz   
## CpuIntel Core i5 3.1GHz   
## CpuIntel Core i5 6200U 2.3GHz \*\*   
## CpuIntel Core i5 6300HQ 2.3GHz \*\*\*  
## CpuIntel Core i5 6300U 2.4GHz \*\*\*  
## CpuIntel Core i5 6440HQ 2.6GHz   
## CpuIntel Core i5 7200U 2.5GHz \*\*   
## CpuIntel Core i5 7200U 2.70GHz   
## CpuIntel Core i5 7200U 2.7GHz   
## CpuIntel Core i5 7300HQ 2.5GHz \*\*\*  
## CpuIntel Core i5 7300U 2.6GHz \*\*\*  
## CpuIntel Core i5 7440HQ 2.8GHz \*\*   
## CpuIntel Core i5 7Y54 1.2GHz \*   
## CpuIntel Core i5 8250U 1.6GHz \*   
## CpuIntel Core i7 2.2GHz   
## CpuIntel Core i7 2.7GHz   
## CpuIntel Core i7 2.8GHz   
## CpuIntel Core i7 2.9GHz   
## CpuIntel Core i7 6500U 2.50GHz \*   
## CpuIntel Core i7 6500U 2.5GHz \*\*   
## CpuIntel Core i7 6600U 2.6GHz \*   
## CpuIntel Core i7 6700HQ 2.6GHz \*\*\*  
## CpuIntel Core i7 6820HK 2.7GHz   
## CpuIntel Core i7 6820HQ 2.7GHz \*\*   
## CpuIntel Core i7 7500U 2.7GHz \*\*\*  
## CpuIntel Core i7 7560U 2.4GHz   
## CpuIntel Core i7 7600U 2.8GHz \*\*\*  
## CpuIntel Core i7 7660U 2.5GHz   
## CpuIntel Core i7 7700HQ 2.7GHz \*\*   
## CpuIntel Core i7 7700HQ 2.8GHz \*\*\*  
## CpuIntel Core i7 7820HK 2.9GHz \*\*\*  
## CpuIntel Core i7 7820HQ 2.9GHz \*\*\*  
## CpuIntel Core i7 7Y75 1.3GHz \*\*   
## CpuIntel Core i7 8550U 1.8GHz \*\*   
## CpuIntel Core i7 8650U 1.9GHz   
## CpuIntel Core M 1.1GHz   
## CpuIntel Core M 1.2GHz   
## CpuIntel Core M 6Y30 0.9GHz   
## CpuIntel Core M 6Y75 1.2GHz \*\*\*  
## CpuIntel Core M 7Y30 1.0GHz   
## CpuIntel Core M M3-6Y30 0.9GHz   
## CpuIntel Core M m3 1.2GHz   
## CpuIntel Core M M7-6Y75 1.2GHz   
## CpuIntel Pentium Dual Core 4405Y 1.5GHz   
## CpuIntel Pentium Dual Core N4200 1.1GHz   
## CpuIntel Pentium Quad Core N3700 1.6GHz   
## CpuIntel Pentium Quad Core N3710 1.6GHz   
## CpuIntel Pentium Quad Core N4200 1.1GHz   
## CpuIntel Xeon E3-1505M V6 3GHz \*\*   
## CpuIntel Xeon E3-1535M v5 2.9GHz .   
## Ram \*\*\*  
## Memory\_1\_Size   
## Memory\_1\_TypeFlash Storage \*\*\*  
## Memory\_1\_TypeHDD \*\*   
## Memory\_1\_TypeHybrid   
## Memory\_2\_TypeHDD   
## Memory\_2\_TypeHybrid .   
## Memory\_2\_TypeSSD   
## Memory\_2\_Size   
## OpSysAndroid   
## OpSysChrome OS \*   
## OpSysLinux \*\*\*  
## OpSysMac OS X   
## OpSysmacOS   
## OpSysNo OS \*\*\*  
## OpSysWindows 10 S   
## OpSysWindows 7 \*\*\*  
## Weight \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 6.004364e-05)  
##   
## Null deviance: 0.369289 on 919 degrees of freedom  
## Residual deviance: 0.043814 on 793 degrees of freedom  
## AIC: 12495  
##   
## Number of Fisher Scoring iterations: 9

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution + Cpu\_Speed +  
 Cpu\_Series+Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +Gpu\_Type + OpSys + Weight,  
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Series + Ram + Memory\_1\_Type + Memory\_2\_Size + OpSys +   
## Weight, family = inverse.gaussian(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.024686 -0.005094 -0.001064 0.003442 0.033015   
##   
## Coefficients: (4 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 7.258e+00 1.723e-01 42.133 < 2e-16 \*\*\*  
## CompanyAcer -1.012e-01 2.907e-02 -3.482 0.000525 \*\*\*  
## CompanyApple -6.793e-02 5.332e-01 -0.127 0.898662   
## CompanyAsus -1.099e-02 2.904e-02 -0.378 0.705208   
## CompanyHP 5.888e-02 2.480e-02 2.374 0.017831 \*   
## CompanyLenovo -7.601e-03 2.586e-02 -0.294 0.768852   
## TypeName2 in 1 Convertible 1.458e-01 3.458e-02 4.217 2.75e-05 \*\*\*  
## TypeNameGaming -9.401e-02 6.491e-02 -1.448 0.147906   
## TypeNameNetbook -1.424e-01 5.671e-02 -2.511 0.012242 \*   
## TypeNameUltrabook 2.828e-01 3.850e-02 7.345 5.02e-13 \*\*\*  
## TypeNameWorkstation 3.006e-01 9.946e-02 3.022 0.002586 \*\*   
## Inches -5.755e-02 1.398e-02 -4.118 4.22e-05 \*\*\*  
## ScreenResolution1366x768 -8.187e-02 2.221e-02 -3.685 0.000244 \*\*\*  
## ScreenResolution1440x900 -7.895e-02 3.236e-01 -0.244 0.807337   
## ScreenResolution1600x900 -1.035e-02 5.413e-02 -0.191 0.848366   
## ScreenResolution1920x1200 -5.706e-01 1.781e-01 -3.203 0.001413 \*\*   
## ScreenResolution2304x1440 1.325e-02 4.560e-01 0.029 0.976834   
## ScreenResolution2560x1440 4.295e-01 1.049e-01 4.093 4.69e-05 \*\*\*  
## ScreenResolution2560x1600 1.046e-01 3.704e-01 0.282 0.777637   
## ScreenResolution2880x1800 6.076e-01 5.394e-01 1.126 0.260321   
## ScreenResolution3200x1800 6.195e-02 9.065e-02 0.683 0.494589   
## ScreenResolution3840x2160 2.065e-01 7.024e-02 2.940 0.003374 \*\*   
## Cpu\_SeriesA10-Series 9600P -3.747e-01 1.293e-01 -2.899 0.003844 \*\*   
## Cpu\_SeriesA10-Series 9620P -1.636e-01 1.886e-01 -0.867 0.385931   
## Cpu\_SeriesA10-Series A10-9620P -4.263e-01 1.336e-01 -3.191 0.001472 \*\*   
## Cpu\_SeriesA12-Series 9700P -2.245e-01 1.957e-01 -1.147 0.251807   
## Cpu\_SeriesA12-Series 9720P -2.502e-01 8.540e-02 -2.930 0.003485 \*\*   
## Cpu\_SeriesA4-Series 7210 -5.911e-01 1.592e-01 -3.713 0.000219 \*\*\*  
## Cpu\_SeriesA6-Series 7310 -7.951e-01 1.368e-01 -5.813 8.81e-09 \*\*\*  
## Cpu\_SeriesA6-Series 9220 -5.808e-01 6.601e-02 -8.799 < 2e-16 \*\*\*  
## Cpu\_SeriesA6-Series A6-9220 -6.239e-01 1.206e-01 -5.172 2.91e-07 \*\*\*  
## Cpu\_SeriesA8-Series 7410 -4.771e-01 8.636e-02 -5.524 4.46e-08 \*\*\*  
## Cpu\_SeriesA9-Series 9410 -2.903e-01 1.474e-01 -1.970 0.049146 \*   
## Cpu\_SeriesA9-Series 9420 -4.465e-01 6.018e-02 -7.420 2.96e-13 \*\*\*  
## Cpu\_SeriesA9-Series A9-9420 -3.622e-01 1.422e-01 -2.547 0.011051 \*   
## Cpu\_SeriesAtom x5-Z8350 -9.927e-01 1.254e-01 -7.916 8.00e-15 \*\*\*  
## Cpu\_SeriesAtom x5-Z8550 NA NA NA NA   
## Cpu\_SeriesCeleron Dual Core 3205U -1.104e+00 9.083e-02 -12.150 < 2e-16 \*\*\*  
## Cpu\_SeriesCeleron Dual Core 3855U -4.370e-01 1.800e-01 -2.428 0.015398 \*   
## Cpu\_SeriesCeleron Dual Core N3050 -6.499e-01 6.378e-02 -10.190 < 2e-16 \*\*\*  
## Cpu\_SeriesCeleron Dual Core N3060 -6.782e-01 4.658e-02 -14.561 < 2e-16 \*\*\*  
## Cpu\_SeriesCeleron Dual Core N3350 -6.748e-01 4.159e-02 -16.225 < 2e-16 \*\*\*  
## Cpu\_SeriesCeleron Quad Core N3160 -7.541e-01 1.224e-01 -6.159 1.15e-09 \*\*\*  
## Cpu\_SeriesCeleron Quad Core N3450 -4.633e-01 1.177e-01 -3.937 8.95e-05 \*\*\*  
## Cpu\_SeriesCore i3 6006U -2.932e-01 3.020e-02 -9.711 < 2e-16 \*\*\*  
## Cpu\_SeriesCore i3 6100U -2.622e-01 7.993e-02 -3.281 0.001079 \*\*   
## Cpu\_SeriesCore i3 7100U -2.723e-01 4.035e-02 -6.750 2.82e-11 \*\*\*  
## Cpu\_SeriesCore i3 7130U -1.743e-01 7.398e-02 -2.357 0.018672 \*   
## Cpu\_SeriesCore i5 1.791e-01 4.060e-01 0.441 0.659262   
## Cpu\_SeriesCore i5 6200U 4.345e-02 4.257e-02 1.020 0.307798   
## Cpu\_SeriesCore i5 6300HQ 2.570e-01 9.981e-02 2.575 0.010188 \*   
## Cpu\_SeriesCore i5 6300U 2.516e-01 9.993e-02 2.518 0.011992 \*   
## Cpu\_SeriesCore i5 6440HQ 2.101e-01 3.036e-01 0.692 0.489093   
## Cpu\_SeriesCore i5 7300HQ 2.603e-01 7.713e-02 3.374 0.000775 \*\*\*  
## Cpu\_SeriesCore i5 7300U 3.701e-01 8.182e-02 4.524 6.99e-06 \*\*\*  
## Cpu\_SeriesCore i5 7440HQ 2.587e-01 1.549e-01 1.670 0.095361 .   
## Cpu\_SeriesCore i5 7Y54 2.545e-01 2.111e-01 1.206 0.228345   
## Cpu\_SeriesCore i5 8250U -3.635e-02 3.663e-02 -0.992 0.321264   
## Cpu\_SeriesCore i7 NA NA NA NA   
## Cpu\_SeriesCore i7 6500U 5.537e-02 5.160e-02 1.073 0.283551   
## Cpu\_SeriesCore i7 6600U 9.758e-02 1.217e-01 0.802 0.422859   
## Cpu\_SeriesCore i7 6700HQ 2.499e-01 8.135e-02 3.072 0.002196 \*\*   
## Cpu\_SeriesCore i7 6820HK 3.596e-01 2.003e-01 1.795 0.073021 .   
## Cpu\_SeriesCore i7 6820HQ 3.902e-01 1.848e-01 2.112 0.034999 \*   
## Cpu\_SeriesCore i7 7500U 1.206e-01 3.405e-02 3.540 0.000422 \*\*\*  
## Cpu\_SeriesCore i7 7560U 4.707e-02 2.095e-01 0.225 0.822309   
## Cpu\_SeriesCore i7 7600U 3.832e-01 1.108e-01 3.458 0.000573 \*\*\*  
## Cpu\_SeriesCore i7 7660U 2.429e-01 3.769e-01 0.645 0.519379   
## Cpu\_SeriesCore i7 7700HQ 4.140e-01 6.350e-02 6.520 1.23e-10 \*\*\*  
## Cpu\_SeriesCore i7 7820HK 7.481e-01 2.342e-01 3.194 0.001458 \*\*   
## Cpu\_SeriesCore i7 7820HQ 5.871e-01 1.906e-01 3.080 0.002137 \*\*   
## Cpu\_SeriesCore i7 7Y75 2.827e-01 1.668e-01 1.695 0.090518 .   
## Cpu\_SeriesCore i7 8550U 4.514e-02 4.519e-02 0.999 0.318154   
## Cpu\_SeriesCore i7 8650U 5.345e-02 2.119e-01 0.252 0.800960   
## Cpu\_SeriesCore M 2.300e-01 3.994e-01 0.576 0.564846   
## Cpu\_SeriesCore M 6Y30 -5.468e-01 1.278e-01 -4.280 2.10e-05 \*\*\*  
## Cpu\_SeriesCore M 6Y75 5.036e-01 1.931e-01 2.608 0.009276 \*\*   
## Cpu\_SeriesCore M 7Y30 -5.207e-01 1.951e-01 -2.669 0.007768 \*\*   
## Cpu\_SeriesCore M m3 NA NA NA NA   
## Cpu\_SeriesCore M M3-6Y30 -3.069e-01 2.121e-01 -1.447 0.148381   
## Cpu\_SeriesCore M M7-6Y75 1.173e-01 2.722e-01 0.431 0.666674   
## Cpu\_SeriesE-Series 6110 -1.196e+00 2.033e-01 -5.882 5.91e-09 \*\*\*  
## Cpu\_SeriesE-Series 9000 -7.928e-01 1.370e-01 -5.787 1.02e-08 \*\*\*  
## Cpu\_SeriesE-Series 9000e -7.503e-01 1.430e-01 -5.246 1.98e-07 \*\*\*  
## Cpu\_SeriesE-Series E2-9000 -7.672e-01 1.480e-01 -5.184 2.75e-07 \*\*\*  
## Cpu\_SeriesE-Series E2-9000e -7.120e-01 9.833e-02 -7.241 1.03e-12 \*\*\*  
## Cpu\_SeriesFX 8800P -1.595e-01 2.538e-01 -0.628 0.529874   
## Cpu\_SeriesFX 9830P -7.910e-02 2.158e-01 -0.367 0.714059   
## Cpu\_SeriesPentium Dual Core 4405Y -3.403e-01 2.228e-01 -1.528 0.127024   
## Cpu\_SeriesPentium Dual Core N4200 -4.392e-01 1.887e-01 -2.327 0.020201 \*   
## Cpu\_SeriesPentium Quad Core N3700 -3.570e-01 1.152e-01 -3.099 0.002006 \*\*   
## Cpu\_SeriesPentium Quad Core N3710 -4.816e-01 5.607e-02 -8.588 < 2e-16 \*\*\*  
## Cpu\_SeriesPentium Quad Core N4200 -4.801e-01 5.584e-02 -8.597 < 2e-16 \*\*\*  
## Cpu\_SeriesRyzen 1600 6.491e-01 3.249e-01 1.998 0.046091 \*   
## Cpu\_SeriesRyzen 1700 3.510e-01 2.162e-01 1.623 0.104895   
## Cpu\_SeriesXeon E3-1505M V6 5.773e-01 2.940e-01 1.964 0.049882 \*   
## Cpu\_SeriesXeon E3-1535M v5 6.954e-01 5.238e-01 1.328 0.184640   
## Ram 3.134e-02 3.404e-03 9.205 < 2e-16 \*\*\*  
## Memory\_1\_TypeFlash Storage -2.689e-01 4.064e-02 -6.617 6.65e-11 \*\*\*  
## Memory\_1\_TypeHDD -1.290e-01 2.086e-02 -6.186 9.77e-10 \*\*\*  
## Memory\_1\_TypeHybrid -2.166e-01 1.008e-01 -2.150 0.031880 \*   
## Memory\_2\_Size 4.812e-05 3.162e-05 1.522 0.128412   
## OpSysAndroid -9.866e-02 2.034e-01 -0.485 0.627844   
## OpSysChrome OS 1.595e-01 6.435e-02 2.478 0.013407 \*   
## OpSysLinux -2.062e-01 2.937e-02 -7.023 4.57e-12 \*\*\*  
## OpSysMac OS X -4.049e-03 2.450e-01 -0.017 0.986814   
## OpSysmacOS NA NA NA NA   
## OpSysNo OS -3.004e-01 2.986e-02 -10.059 < 2e-16 \*\*\*  
## OpSysWindows 10 S 1.688e-01 1.531e-01 1.103 0.270451   
## OpSysWindows 7 2.598e-01 5.714e-02 4.546 6.30e-06 \*\*\*  
## Weight 1.028e-01 3.683e-02 2.791 0.005371 \*\*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 5.946312e-05)  
##   
## Null deviance: 0.369289 on 919 degrees of freedom  
## Residual deviance: 0.044644 on 813 degrees of freedom  
## AIC: 12473  
##   
## Number of Fisher Scoring iterations: 9

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution + Cpu\_Speed +Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +Gpu\_Type + OpSys + Weight,  
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Size + Gpu\_Type + OpSys + Weight, family = inverse.gaussian(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.043515 -0.006542 -0.001748 0.003831 0.037255   
##   
## Coefficients: (1 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.654e+00 2.112e-01 31.503 < 2e-16 \*\*\*  
## CompanyAcer -1.797e-01 3.498e-02 -5.137 3.43e-07 \*\*\*  
## CompanyApple 3.116e-01 3.705e-01 0.841 0.400508   
## CompanyAsus -9.054e-02 3.421e-02 -2.646 0.008282 \*\*   
## CompanyHP 5.030e-02 2.973e-02 1.692 0.091008 .   
## CompanyLenovo -6.109e-02 3.075e-02 -1.987 0.047254 \*   
## TypeName2 in 1 Convertible 2.399e-01 4.151e-02 5.779 1.04e-08 \*\*\*  
## TypeNameGaming 5.006e-02 5.212e-02 0.961 0.337007   
## TypeNameNetbook -1.202e-01 6.189e-02 -1.942 0.052494 .   
## TypeNameUltrabook 2.934e-01 4.400e-02 6.667 4.60e-11 \*\*\*  
## TypeNameWorkstation 4.138e-01 9.985e-02 4.144 3.74e-05 \*\*\*  
## Inches -6.200e-02 1.626e-02 -3.814 0.000146 \*\*\*  
## ScreenResolution1366x768 -1.981e-01 2.472e-02 -8.014 3.51e-15 \*\*\*  
## ScreenResolution1440x900 -1.234e-01 3.783e-01 -0.326 0.744323   
## ScreenResolution1600x900 -1.099e-01 6.171e-02 -1.781 0.075328 .   
## ScreenResolution1920x1200 -2.632e-01 2.157e-01 -1.220 0.222722   
## ScreenResolution2304x1440 -2.870e-02 3.405e-01 -0.084 0.932839   
## ScreenResolution2560x1440 3.084e-01 1.204e-01 2.561 0.010606 \*   
## ScreenResolution2560x1600 -2.467e-01 4.051e-01 -0.609 0.542618   
## ScreenResolution2880x1800 -1.086e-01 4.100e-01 -0.265 0.791258   
## ScreenResolution3200x1800 1.631e-01 9.697e-02 1.682 0.092924 .   
## ScreenResolution3840x2160 2.816e-01 8.609e-02 3.271 0.001114 \*\*   
## Cpu\_Speed 2.797e-01 2.061e-02 13.573 < 2e-16 \*\*\*  
## Cpu\_TypeAMD -4.174e-01 4.791e-02 -8.713 < 2e-16 \*\*\*  
## Ram 5.175e-02 4.061e-03 12.743 < 2e-16 \*\*\*  
## Memory\_1\_Size -5.969e-05 3.978e-05 -1.501 0.133827   
## Memory\_1\_TypeFlash Storage -4.200e-01 4.454e-02 -9.430 < 2e-16 \*\*\*  
## Memory\_1\_TypeHDD -8.413e-02 3.698e-02 -2.275 0.023138 \*   
## Memory\_1\_TypeHybrid -1.679e-01 9.535e-02 -1.761 0.078566 .   
## Memory\_2\_Size 8.461e-05 3.817e-05 2.217 0.026911 \*   
## Gpu\_TypeAMD 2.429e-02 3.685e-02 0.659 0.510066   
## Gpu\_TypeNvidia 1.007e-01 3.143e-02 3.204 0.001405 \*\*   
## OpSysAndroid -9.866e-02 2.499e-01 -0.395 0.693057   
## OpSysChrome OS -2.554e-02 5.416e-02 -0.471 0.637402   
## OpSysLinux -2.330e-01 3.514e-02 -6.630 5.84e-11 \*\*\*  
## OpSysMac OS X 2.385e-01 2.223e-01 1.073 0.283658   
## OpSysmacOS NA NA NA NA   
## OpSysNo OS -3.428e-01 3.520e-02 -9.738 < 2e-16 \*\*\*  
## OpSysWindows 10 S -5.520e-03 1.258e-01 -0.044 0.965018   
## OpSysWindows 7 3.092e-01 6.246e-02 4.951 8.84e-07 \*\*\*  
## Weight 6.175e-02 4.128e-02 1.496 0.134987   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 8.970111e-05)  
##   
## Null deviance: 0.369289 on 919 degrees of freedom  
## Residual deviance: 0.073311 on 880 degrees of freedom  
## AIC: 12795  
##   
## Number of Fisher Scoring iterations: 9

model1=step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution + Cpu\_Speed +Cpu\_Type +   
 +Ram + Memory\_1\_Size+Memory\_1\_Type + Memory\_2\_Type + Memory\_2\_Size +Gpu\_Type + Weight,  
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model1)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Cpu\_Speed + Cpu\_Type + Ram + Memory\_1\_Size + Memory\_1\_Type +   
## Memory\_2\_Size + Gpu\_Type + Weight, family = inverse.gaussian(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.044328 -0.007930 -0.001835 0.004371 0.036336   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.908e+00 2.238e-01 30.861 < 2e-16 \*\*\*  
## CompanyAcer -1.855e-01 3.712e-02 -4.998 6.98e-07 \*\*\*  
## CompanyApple 5.144e-01 3.221e-01 1.597 0.11061   
## CompanyAsus -8.429e-02 3.676e-02 -2.293 0.02210 \*   
## CompanyHP 7.811e-02 3.115e-02 2.508 0.01232 \*   
## CompanyLenovo -9.731e-02 3.131e-02 -3.108 0.00194 \*\*   
## TypeName2 in 1 Convertible 2.340e-01 4.413e-02 5.303 1.44e-07 \*\*\*  
## TypeNameGaming 1.056e-02 5.641e-02 0.187 0.85161   
## TypeNameNetbook -1.371e-01 6.597e-02 -2.078 0.03802 \*   
## TypeNameUltrabook 3.191e-01 4.724e-02 6.754 2.60e-11 \*\*\*  
## TypeNameWorkstation 4.846e-01 1.072e-01 4.520 7.03e-06 \*\*\*  
## Inches -8.670e-02 1.723e-02 -5.032 5.87e-07 \*\*\*  
## ScreenResolution1366x768 -2.250e-01 2.660e-02 -8.456 < 2e-16 \*\*\*  
## ScreenResolution1440x900 -3.018e-01 3.697e-01 -0.816 0.41458   
## ScreenResolution1600x900 -5.850e-02 6.631e-02 -0.882 0.37787   
## ScreenResolution1920x1200 -3.452e-01 1.387e-01 -2.489 0.01301 \*   
## ScreenResolution2304x1440 -9.541e-02 3.581e-01 -0.266 0.78995   
## ScreenResolution2560x1440 3.338e-01 1.299e-01 2.569 0.01036 \*   
## ScreenResolution2560x1600 -5.003e-01 3.672e-01 -1.363 0.17335   
## ScreenResolution2880x1800 -2.271e-01 4.131e-01 -0.550 0.58264   
## ScreenResolution3200x1800 1.211e-01 1.049e-01 1.154 0.24874   
## ScreenResolution3840x2160 2.894e-01 9.289e-02 3.115 0.00190 \*\*   
## Cpu\_Speed 2.911e-01 2.224e-02 13.091 < 2e-16 \*\*\*  
## Cpu\_TypeAMD -3.782e-01 5.064e-02 -7.469 1.94e-13 \*\*\*  
## Ram 5.360e-02 4.391e-03 12.208 < 2e-16 \*\*\*  
## Memory\_1\_Size -9.036e-05 4.296e-05 -2.103 0.03571 \*   
## Memory\_1\_TypeFlash Storage -4.201e-01 4.455e-02 -9.429 < 2e-16 \*\*\*  
## Memory\_1\_TypeHDD -1.083e-01 3.991e-02 -2.714 0.00678 \*\*   
## Memory\_1\_TypeHybrid -1.200e-02 1.041e-01 -0.115 0.90825   
## Memory\_2\_Size 7.980e-05 4.124e-05 1.935 0.05328 .   
## Gpu\_TypeAMD 1.284e-03 3.933e-02 0.033 0.97397   
## Gpu\_TypeNvidia 8.963e-02 3.414e-02 2.625 0.00881 \*\*   
## Weight 1.094e-01 4.428e-02 2.471 0.01367 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 0.0001041754)  
##   
## Null deviance: 0.369289 on 919 degrees of freedom  
## Residual deviance: 0.086531 on 887 degrees of freedom  
## AIC: 12933  
##   
## Number of Fisher Scoring iterations: 8

model2 =step(glm(Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys  
 + Inches + ScreenResolution  
 + Ram + Gpu\_Type + Memory\_1\_Size + Memory\_2\_Size + Memory\_1\_Type + Memory\_2\_Type,   
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model2)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Cpu\_Type + OpSys +   
## Inches + ScreenResolution + Ram + Gpu\_Type + Memory\_2\_Size +   
## Memory\_1\_Type, family = inverse.gaussian(link = "log"), data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.047368 -0.007091 -0.001616 0.004023 0.038772   
##   
## Coefficients: (1 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 7.206e+00 2.066e-01 34.884 < 2e-16 \*\*\*  
## CompanyAcer -1.983e-01 3.886e-02 -5.103 4.10e-07 \*\*\*  
## CompanyApple 2.557e-01 4.157e-01 0.615 0.538677   
## CompanyAsus -1.356e-01 3.789e-02 -3.579 0.000364 \*\*\*  
## CompanyHP 4.924e-02 3.291e-02 1.496 0.134950   
## CompanyLenovo -4.188e-02 3.444e-02 -1.216 0.224293   
## TypeName2 in 1 Convertible 1.607e-01 4.542e-02 3.539 0.000423 \*\*\*  
## TypeNameGaming 1.838e-01 5.359e-02 3.429 0.000633 \*\*\*  
## TypeNameNetbook -1.900e-01 6.792e-02 -2.797 0.005271 \*\*   
## TypeNameUltrabook 2.866e-01 4.856e-02 5.902 5.11e-09 \*\*\*  
## TypeNameWorkstation 5.688e-01 1.122e-01 5.072 4.80e-07 \*\*\*  
## Cpu\_TypeAMD -2.779e-01 5.198e-02 -5.346 1.15e-07 \*\*\*  
## OpSysAndroid -9.866e-02 2.784e-01 -0.354 0.723168   
## OpSysChrome OS 1.950e-02 6.138e-02 0.318 0.750859   
## OpSysLinux -2.197e-01 3.957e-02 -5.551 3.76e-08 \*\*\*  
## OpSysMac OS X 3.023e-01 2.528e-01 1.195 0.232241   
## OpSysmacOS NA NA NA NA   
## OpSysNo OS -3.762e-01 3.939e-02 -9.550 < 2e-16 \*\*\*  
## OpSysWindows 10 S -6.535e-02 1.436e-01 -0.455 0.649212   
## OpSysWindows 7 3.468e-01 6.948e-02 4.991 7.22e-07 \*\*\*  
## Inches -5.255e-02 1.359e-02 -3.867 0.000118 \*\*\*  
## ScreenResolution1366x768 -2.050e-01 2.731e-02 -7.508 1.47e-13 \*\*\*  
## ScreenResolution1440x900 -5.705e-02 4.262e-01 -0.134 0.893526   
## ScreenResolution1600x900 -1.251e-01 6.859e-02 -1.824 0.068467 .   
## ScreenResolution1920x1200 -2.523e-01 2.405e-01 -1.049 0.294369   
## ScreenResolution2304x1440 -2.381e-01 3.782e-01 -0.630 0.529064   
## ScreenResolution2560x1440 3.789e-01 1.349e-01 2.809 0.005083 \*\*   
## ScreenResolution2560x1600 -1.352e-01 4.545e-01 -0.297 0.766227   
## ScreenResolution2880x1800 2.526e-02 4.582e-01 0.055 0.956041   
## ScreenResolution3200x1800 7.330e-02 1.060e-01 0.691 0.489517   
## ScreenResolution3840x2160 1.886e-01 9.465e-02 1.992 0.046663 \*   
## Ram 5.861e-02 4.182e-03 14.015 < 2e-16 \*\*\*  
## Gpu\_TypeAMD -1.318e-03 4.045e-02 -0.033 0.974018   
## Gpu\_TypeNvidia 1.436e-01 3.431e-02 4.187 3.11e-05 \*\*\*  
## Memory\_2\_Size 7.454e-05 4.205e-05 1.773 0.076617 .   
## Memory\_1\_TypeFlash Storage -6.041e-01 4.896e-02 -12.340 < 2e-16 \*\*\*  
## Memory\_1\_TypeHDD -1.193e-01 2.741e-02 -4.352 1.51e-05 \*\*\*  
## Memory\_1\_TypeHybrid -1.804e-01 1.011e-01 -1.784 0.074774 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 0.0001113771)  
##   
## Null deviance: 0.369289 on 919 degrees of freedom  
## Residual deviance: 0.089877 on 883 degrees of freedom  
## AIC: 12976  
##   
## Number of Fisher Scoring iterations: 9

model4 =step(glm(Price\_euros ~ Company + TypeName  
 + Inches + ScreenResolution +TypeName\*ScreenResolution  
 +Ram + Gpu\_Type + Memory\_1 ,  
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model4)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Ram + Gpu\_Type + Memory\_1, family = inverse.gaussian(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.034794 -0.007696 -0.001589 0.004530 0.038301   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 7.191868 0.233372 30.817 < 2e-16 \*\*\*  
## CompanyAcer -0.250275 0.037693 -6.640 5.51e-11 \*\*\*  
## CompanyApple -0.161202 0.395306 -0.408 0.683528   
## CompanyAsus -0.186703 0.036940 -5.054 5.26e-07 \*\*\*  
## CompanyHP 0.016702 0.030954 0.540 0.589643   
## CompanyLenovo -0.146893 0.031654 -4.641 4.01e-06 \*\*\*  
## TypeName2 in 1 Convertible 0.155929 0.045527 3.425 0.000643 \*\*\*  
## TypeNameGaming 0.228394 0.052872 4.320 1.74e-05 \*\*\*  
## TypeNameNetbook -0.092740 0.070359 -1.318 0.187818   
## TypeNameUltrabook 0.232382 0.049682 4.677 3.36e-06 \*\*\*  
## TypeNameWorkstation 0.590337 0.115006 5.133 3.51e-07 \*\*\*  
## Inches -0.060066 0.013620 -4.410 1.16e-05 \*\*\*  
## ScreenResolution1366x768 -0.214101 0.028081 -7.624 6.38e-14 \*\*\*  
## ScreenResolution1440x900 -0.107837 0.398743 -0.270 0.786884   
## ScreenResolution1600x900 -0.026400 0.069253 -0.381 0.703142   
## ScreenResolution1920x1200 -0.298964 0.159157 -1.878 0.060655 .   
## ScreenResolution2304x1440 -0.098417 0.396183 -0.248 0.803874   
## ScreenResolution2560x1440 0.382244 0.136621 2.798 0.005258 \*\*   
## ScreenResolution2560x1600 0.236176 0.436993 0.540 0.589020   
## ScreenResolution2880x1800 0.364380 0.457677 0.796 0.426160   
## ScreenResolution3200x1800 0.029634 0.106682 0.278 0.781248   
## ScreenResolution3840x2160 0.139174 0.098444 1.414 0.157796   
## Ram 0.055474 0.004684 11.842 < 2e-16 \*\*\*  
## Gpu\_TypeAMD -0.076642 0.030796 -2.489 0.013007 \*   
## Gpu\_TypeNvidia 0.179364 0.035321 5.078 4.66e-07 \*\*\*  
## Memory\_1128GB Flash Storage -0.126219 0.186450 -0.677 0.498612   
## Memory\_1128GB HDD -0.131799 0.280734 -0.469 0.638843   
## Memory\_1128GB SSD 0.091129 0.109631 0.831 0.406066   
## Memory\_116GB Flash Storage -0.372506 0.142957 -2.606 0.009324 \*\*   
## Memory\_116GB SSD -0.649195 0.144759 -4.485 8.28e-06 \*\*\*  
## Memory\_1180GB SSD 0.290390 0.200937 1.445 0.148764   
## Memory\_11TB HDD -0.050326 0.108347 -0.464 0.642414   
## Memory\_11TB SSD 0.297782 0.217627 1.368 0.171565   
## Memory\_1240GB SSD 0.766069 0.609673 1.257 0.209261   
## Memory\_1256GB Flash Storage 0.291818 0.240715 1.212 0.225728   
## Memory\_1256GB SSD 0.246458 0.107636 2.290 0.022275 \*   
## Memory\_12TB HDD -0.156220 0.127612 -1.224 0.221213   
## Memory\_132GB Flash Storage -0.508028 0.118915 -4.272 2.15e-05 \*\*\*  
## Memory\_132GB SSD -0.889875 0.190497 -4.671 3.46e-06 \*\*\*  
## Memory\_1500GB HDD 0.071249 0.110822 0.643 0.520447   
## Memory\_1508GB Hybrid 0.697912 0.353362 1.975 0.048576 \*   
## Memory\_1512GB Flash Storage 0.172849 0.436942 0.396 0.692506   
## Memory\_1512GB SSD 0.319542 0.120295 2.656 0.008044 \*\*   
## Memory\_164GB Flash Storage -0.410143 0.135008 -3.038 0.002453 \*\*   
## Memory\_164GB SSD -0.467804 0.211067 -2.216 0.026923 \*   
## Memory\_18GB SSD 0.233213 0.526037 0.443 0.657629   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 0.000112354)  
##   
## Null deviance: 0.369289 on 919 degrees of freedom  
## Residual deviance: 0.093162 on 874 degrees of freedom  
## AIC: 13027  
##   
## Number of Fisher Scoring iterations: 8

model3 =step(glm(Price\_euros ~ Company + TypeName + Inches + ScreenResolution  
 +Ram +Gpu\_Type,  
 family = inverse.gaussian(link ="log"),  
 data=train),direction ="both",trace = F)  
summary(model3)

##   
## Call:  
## glm(formula = Price\_euros ~ Company + TypeName + Inches + ScreenResolution +   
## Ram + Gpu\_Type, family = inverse.gaussian(link = "log"),   
## data = train)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -0.038716 -0.009322 -0.002358 0.004854 0.050026   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 6.829084 0.218701 31.226 < 2e-16 \*\*\*  
## CompanyAcer -0.315635 0.042191 -7.481 1.76e-13 \*\*\*  
## CompanyApple 0.087059 0.387393 0.225 0.822240   
## CompanyAsus -0.239202 0.041520 -5.761 1.15e-08 \*\*\*  
## CompanyHP 0.053193 0.035919 1.481 0.138984   
## CompanyLenovo -0.126437 0.036210 -3.492 0.000503 \*\*\*  
## TypeName2 in 1 Convertible 0.174199 0.052709 3.305 0.000988 \*\*\*  
## TypeNameGaming 0.185414 0.059699 3.106 0.001957 \*\*   
## TypeNameNetbook -0.160121 0.080920 -1.979 0.048150 \*   
## TypeNameUltrabook 0.363199 0.055647 6.527 1.12e-10 \*\*\*  
## TypeNameWorkstation 0.549825 0.127889 4.299 1.90e-05 \*\*\*  
## Inches -0.033694 0.014258 -2.363 0.018333 \*   
## ScreenResolution1366x768 -0.314694 0.030002 -10.489 < 2e-16 \*\*\*  
## ScreenResolution1440x900 -0.489265 0.446061 -1.097 0.272998   
## ScreenResolution1600x900 -0.174513 0.079935 -2.183 0.029282 \*   
## ScreenResolution1920x1200 -0.721607 0.165980 -4.348 1.53e-05 \*\*\*  
## ScreenResolution2304x1440 -0.304522 0.431034 -0.706 0.480067   
## ScreenResolution2560x1440 0.401565 0.159389 2.519 0.011928 \*   
## ScreenResolution2560x1600 -0.032683 0.442993 -0.074 0.941203   
## ScreenResolution2880x1800 0.011060 0.497105 0.022 0.982255   
## ScreenResolution3200x1800 -0.032776 0.125192 -0.262 0.793534   
## ScreenResolution3840x2160 0.207202 0.111481 1.859 0.063407 .   
## Ram 0.073023 0.004855 15.041 < 2e-16 \*\*\*  
## Gpu\_TypeAMD -0.138766 0.034920 -3.974 7.64e-05 \*\*\*  
## Gpu\_TypeNvidia 0.113392 0.040694 2.786 0.005441 \*\*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for inverse.gaussian family taken to be 0.0001521446)  
##   
## Null deviance: 0.36929 on 919 degrees of freedom  
## Residual deviance: 0.12588 on 895 degrees of freedom  
## AIC: 13262  
##   
## Number of Fisher Scoring iterations: 8

# Predict

y\_hat <- exp(predict(model1, train))  
mape(train$Price\_euros,y\_hat)

## [1] 0.2468475

mean(abs((train$Price\_euros-y\_hat)/y\_hat)) \* 100

## [1] 22.71348

hist(exp(y\_hat))

