Car Price Prediction

Jiachen_Liu and Thinh_Nguyen

4/15/2021

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.0.5
```

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.0.5
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v tibble  3.1.0     v dplyr   1.0.5
## v tidyr   1.1.3     v stringr 1.4.0
## v readr   1.4.0     v forcats 0.5.1
## v purrr   0.3.4
```

```
## Warning: package 'tidyr' was built under R version 4.0.5
```

```
## Warning: package 'readr' was built under R version 4.0.5
```

```
## Warning: package 'purrr' was built under R version 4.0.5
```

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

```
## Warning: package 'forcats' was built under R version 4.0.5
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(dplyr)
```

EDA

```
car = read.csv('raw_data.csv')
```

```
head(car)
```

```
##   X model year price transmission mileage fuelType tax  mpg engineSize brand
## 1 0    A1 2017 12500       Manual   15735   Petrol 150 55.4        1.4  audi
## 2 1    A6 2016 16500    Automatic   36203   Diesel  20 64.2        2.0  audi
## 3 2    A1 2016 11000       Manual   29946   Petrol  30 55.4        1.4  audi
## 4 3    A4 2017 16800    Automatic   25952   Diesel 145 67.3        2.0  audi
## 5 4    A3 2019 17300       Manual    1998   Petrol 145 49.6        1.0  audi
## 6 5    A1 2016 13900    Automatic   32260   Petrol  30 58.9        1.4  audi
```

```
## choose subset of bmw data
bmw = car[which( car$brand == 'bmw' ),]
bmw = subset(bmw,select = -1 )
head(bmw)
```

```
##          model year price transmission mileage fuelType tax  mpg engineSize
## 10669  5 Series 2014 11200    Automatic   67068   Diesel 125 57.6        2.0
## 10670  6 Series 2018 27000    Automatic   14827   Petrol 145 42.8        2.0
## 10671  5 Series 2016 16000    Automatic   62794   Diesel 160 51.4        3.0
## 10672  1 Series 2017 12750    Automatic   26676   Diesel 145 72.4        1.5
## 10673  7 Series 2014 14500    Automatic   39554   Diesel 160 50.4        3.0
## 10674  5 Series 2016 14900    Automatic   35309   Diesel 125 60.1        2.0
##       brand
## 10669   bmw
## 10670   bmw
## 10671   bmw
## 10672   bmw
## 10673   bmw
## 10674   bmw
```

```
## summary of bmw data
summary(bmw)
```

```
##     model                year          price        transmission
##  Length:10781       Min.   :1996   Min.   :  1200   Length:10781
##  Class :character   1st Qu.:2016   1st Qu.: 14950   Class :character
##  Mode  :character   Median :2017   Median : 20462   Mode  :character
##                     Mean   :2017   Mean   : 22733
##                     3rd Qu.:2019   3rd Qu.: 27940
##                     Max.   :2020   Max.   :123456
##     mileage         fuelType              tax             mpg
##  Min.   :     1   Length:10781       Min.   :  0.0   Min.   :  5.5
##  1st Qu.:  5529   Class :character   1st Qu.:135.0   1st Qu.: 45.6
##  Median : 18347   Mode  :character   Median :145.0   Median : 53.3
##  Mean   : 25497                      Mean   :131.7   Mean   : 56.4
##  3rd Qu.: 38206                      3rd Qu.:145.0   3rd Qu.: 62.8
##  Max.   :214000                      Max.   :580.0   Max.   :470.8
##    engineSize       brand
##  Min.   :0.000   Length:10781
##  1st Qu.:2.000   Class :character
##  Median :2.000   Mode  :character
##  Mean   :2.168
##  3rd Qu.:2.000
##  Max.   :6.600
```

```
## check missing value for each column
library(mice)
```

```
## Warning: package 'mice' was built under R version 4.0.5
```

```
##
## Attaching package: 'mice'
```

```
## The following object is masked from 'package:stats':
##
##     filter
```

```
## The following objects are masked from 'package:base':
##
##     cbind, rbind
```

```
library(VIM)
```

```
## Warning: package 'VIM' was built under R version 4.0.5
```

```
## Loading required package: colorspace
```

```
## Warning: package 'colorspace' was built under R version 4.0.5
```

```
## Loading required package: grid
```

```
## VIM is ready to use.
```

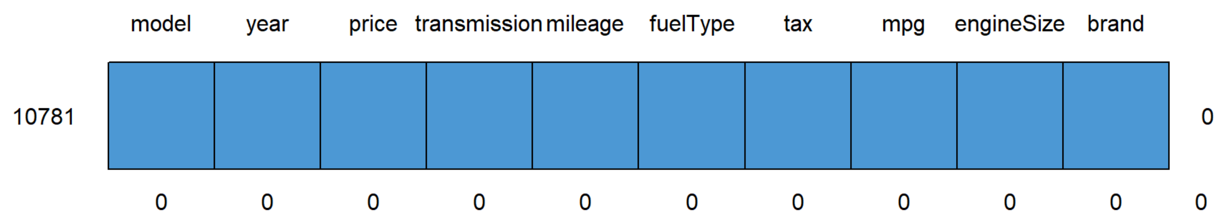
```
## Suggestions and bug-reports can be submitted at: https://github.com/statistikat/VIM/issues
```

```
##
## Attaching package: 'VIM'
```

```
## The following object is masked from 'package:datasets':
##
##     sleep
```

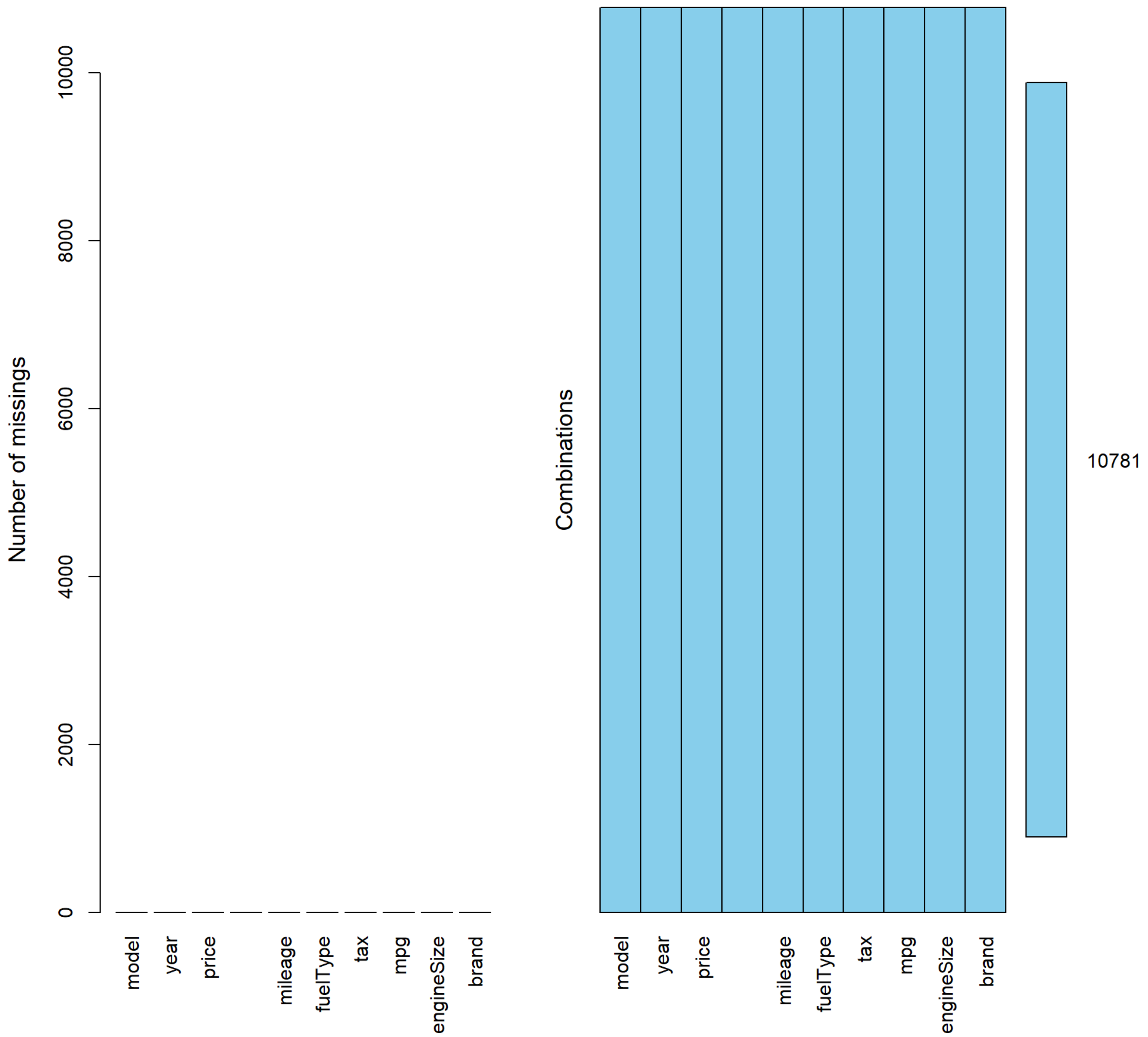
```
md.pattern(bmw)
```

```
##  /\     /\
## {  `---'  }
## {  O   O  }
## ==>  V <==  No need for mice. This data set is completely observed.
##  \  \|/  /
##   `-----'
```




```
##       model year price transmission mileage fuelType tax mpg engineSize brand
## 10781     1    1     1            1       1        1   1   1          1     1 0
##           0    0     0            0       0        0   0   0          0     0 0
```

```
aggr(bmw, prop=FALSE, numbers=TRUE)
```

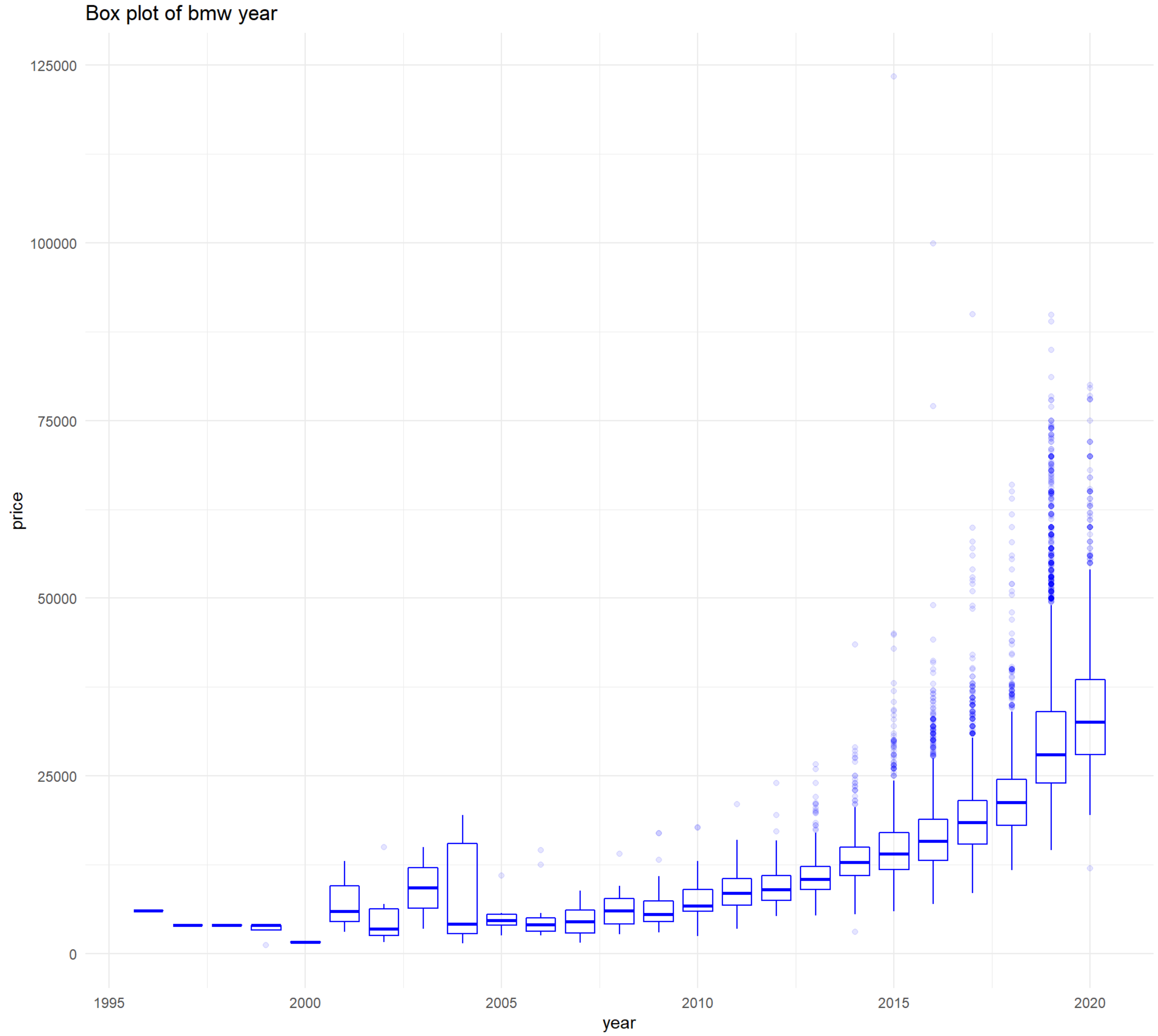



```
colnames(bmw)
```

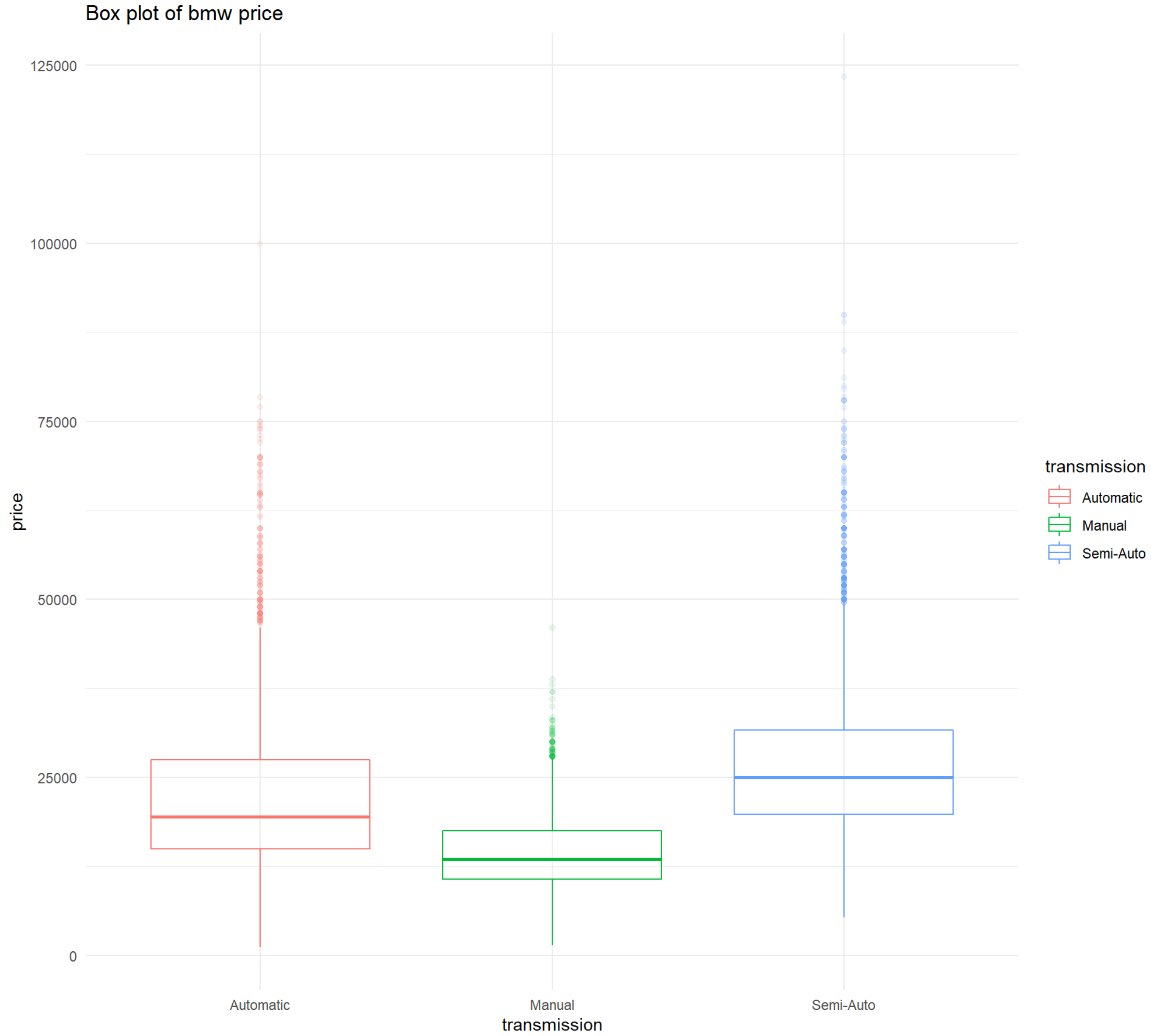
```
##  [1] "model"        "year"         "price"        "transmission" "mileage"
##  [6] "fuelType"     "tax"          "mpg"          "engineSize"   "brand"
```

Exploary Data Analysis

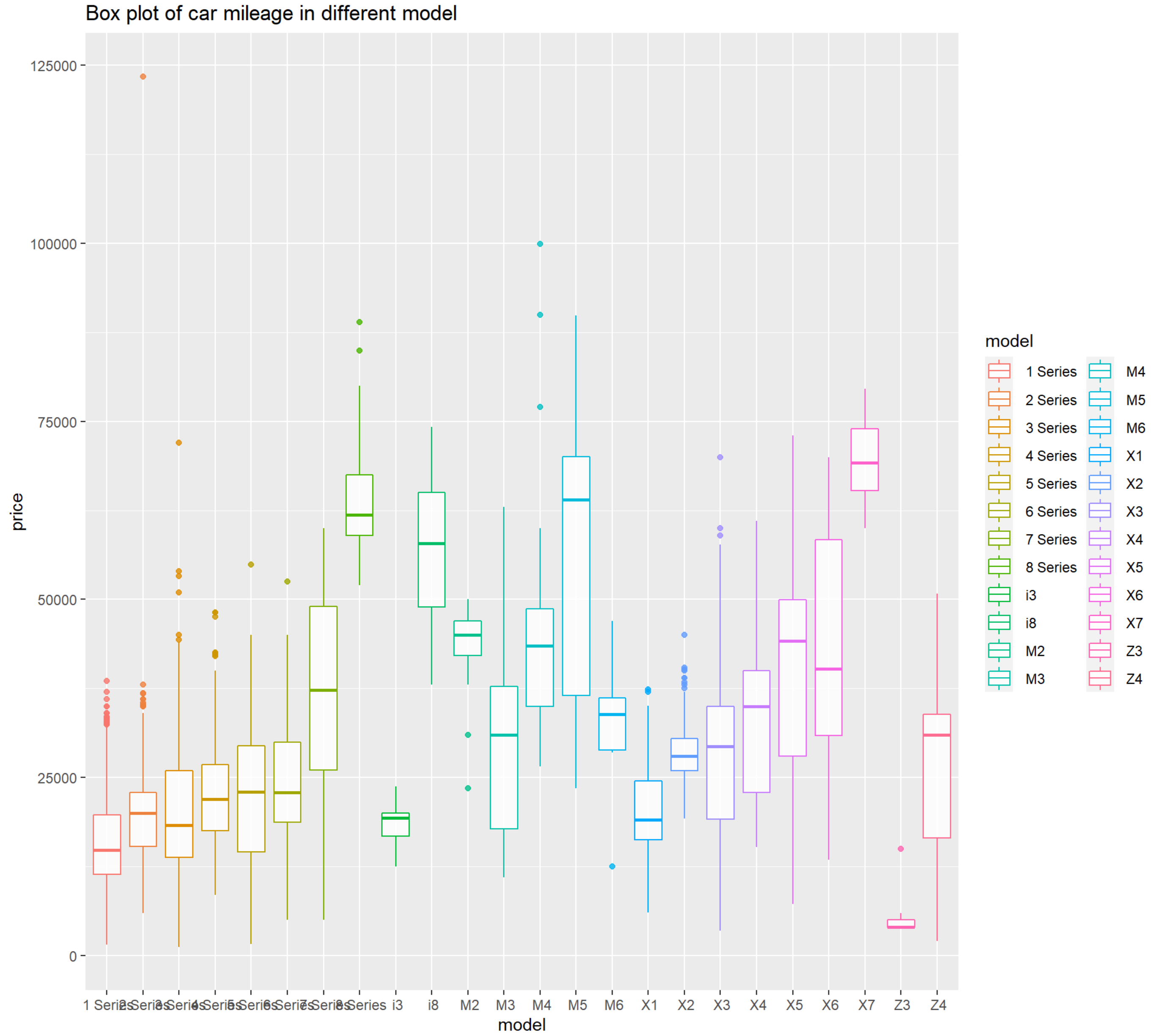
```
# box plot for the bmw year
ggplot(data = bmw, aes( x = year, y = price, group =year ) ) + geom_boxplot(color = "blue",alph
a = 0.1 ) + ggtitle("Box plot of bmw year")+ theme_minimal()
```




```
# box plot of bmw  price
ggplot(data = bmw, aes(x = transmission, y = price )) + geom_boxplot( aes(color = transmissio
n), alpha = 0.1) + ggtitle("Box plot of bmw price")+ theme_minimal()
```

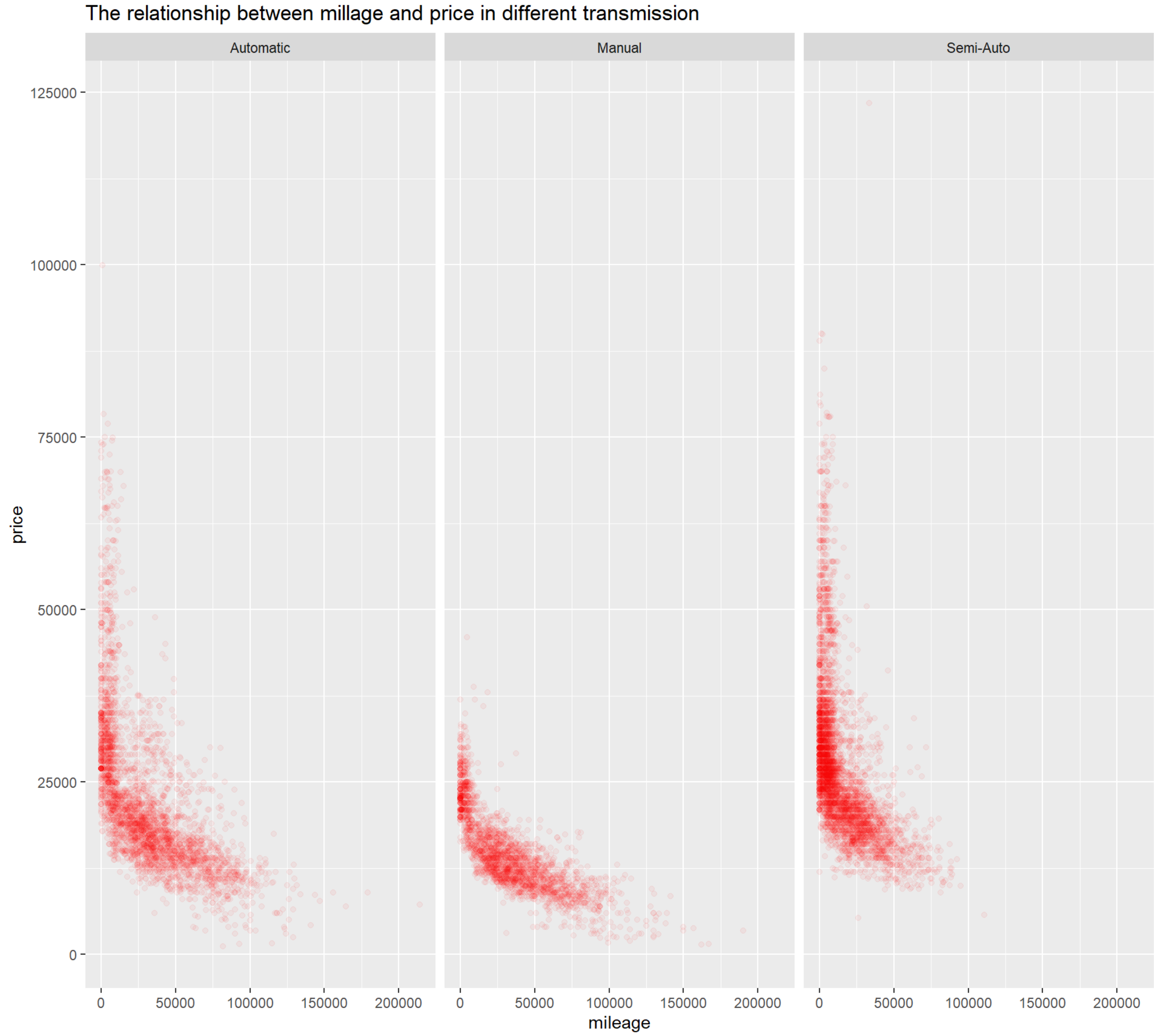



```
# boxplot for car model
ggplot(data = bmw, aes( y = price, x = model, group = model ) ) + geom_boxplot( aes(color = mod
el), alpha =0.8 ) + ggtitle("Box plot of car mileage in different model")
```

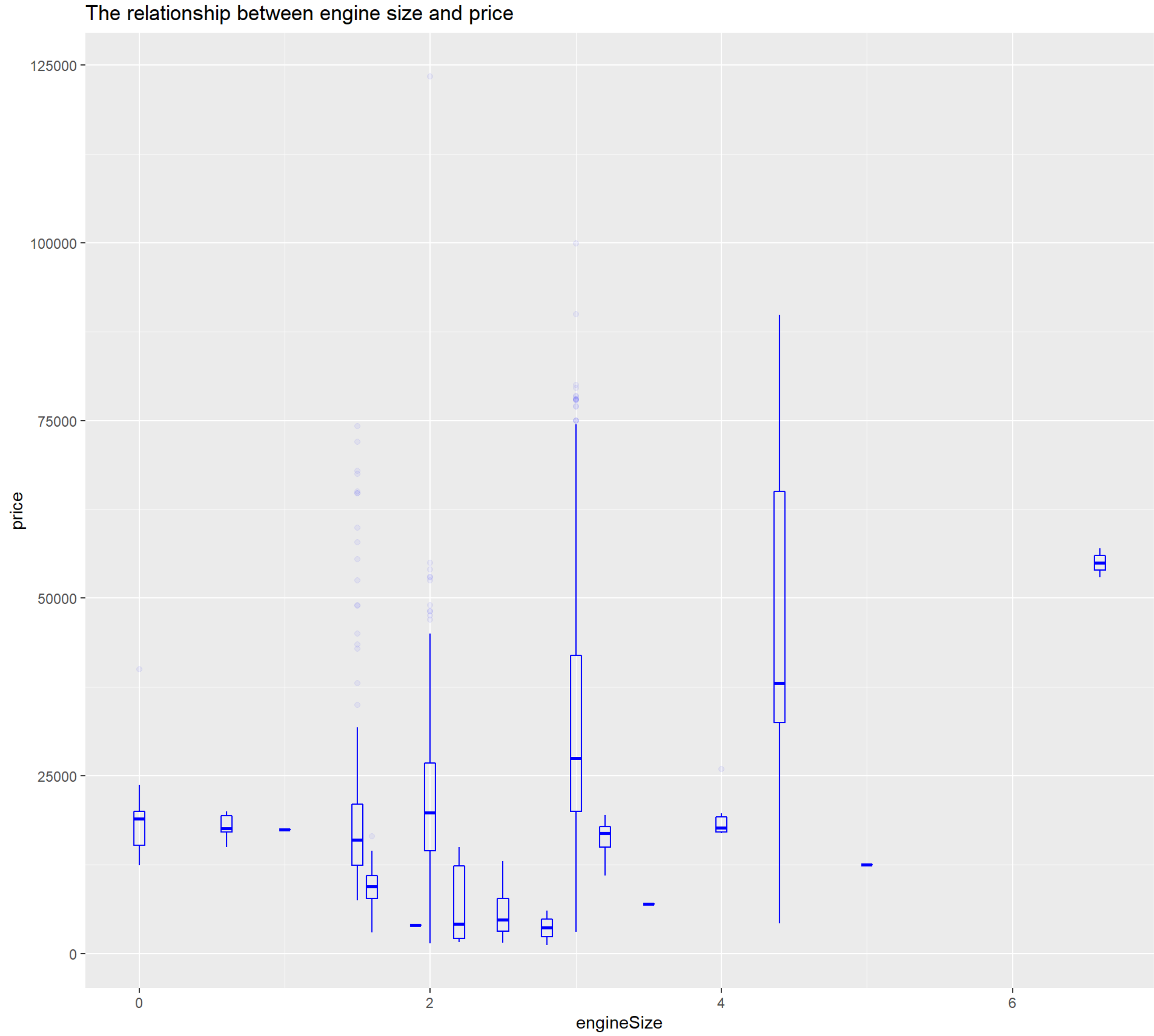



```
# scatter plot of millage and price

ggplot(data = bmw, aes(x = mileage , y = price)) + geom_point(color ="red", alpha= 0.05) + ggti
tle("The relationship between millage and price in different transmission")+ facet_wrap(~ trans
mission)
```

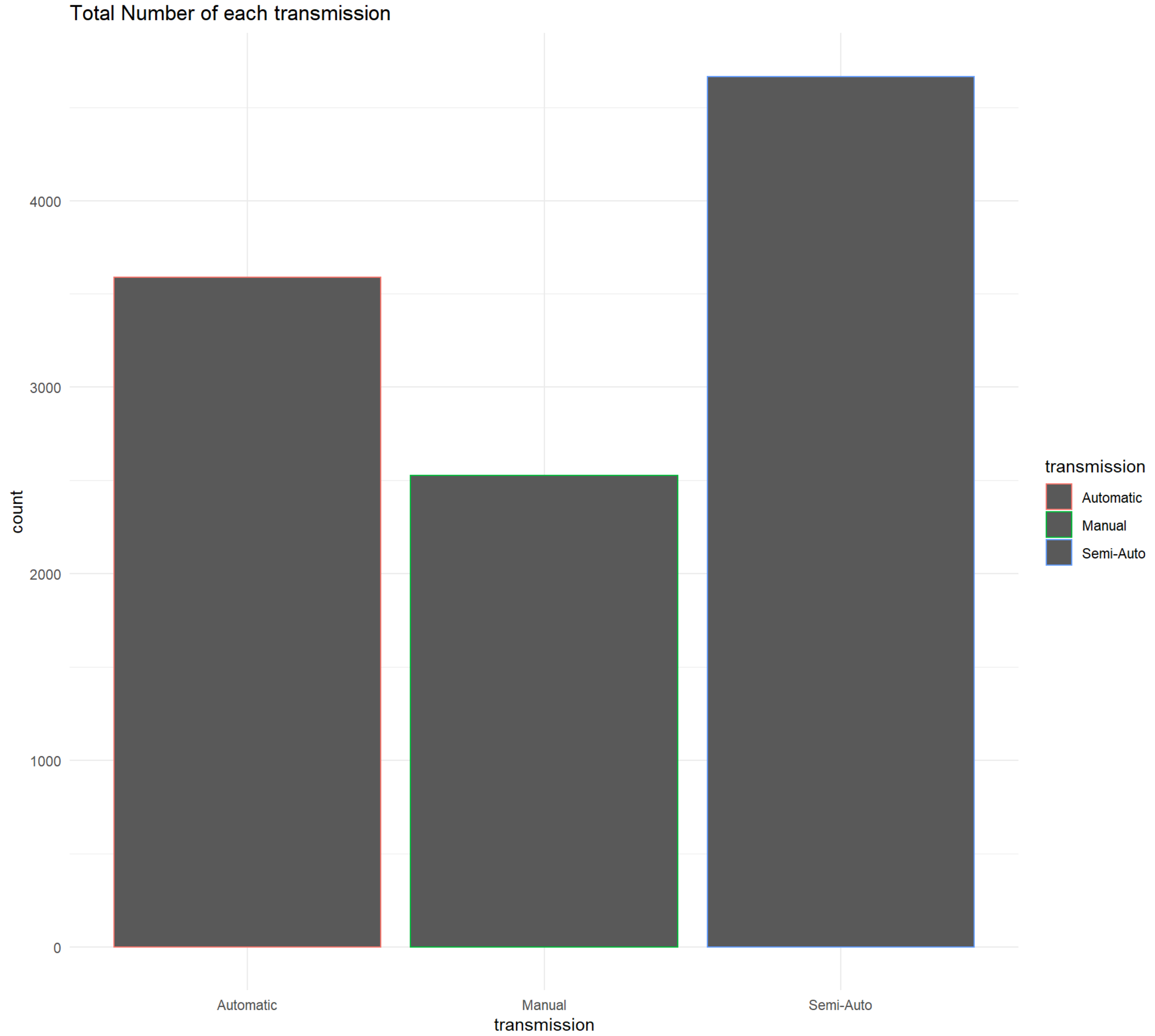



```
#scatter plot for car mpg and price
ggplot(data = bmw, aes(x = engineSize , y = price , group = engineSize)) + geom_boxplot(color =
"blue", alpha= 0.05) + ggtitle("The relationship between engine size and price")
```




```
ggplot(data = bmw[which(bmw$year>2014),], aes(x = mileage , y = price)) + geom_point(color ="red", alpha= 0.05) + ggtitle("The relationship between millage and price in different transmission")+ facet_wrap(~ year  )
```


```
# bar plot of "Total Number of each transmission"
ggplot( data = bmw , aes(x = transmission ), color = "red" ) + geom_bar(aes(color = transmissio
n)) + ggtitle( "Total Number of each transmission")+ theme_minimal()
```



Feature Engineering

encoding categrical data

```
# Feature Engineering
library(caret)
```

```
## Warning: package 'caret' was built under R version 4.0.5
```

```
## Loading required package: lattice
```

```
##
## Attaching package: 'caret'
```

```
## The following object is masked from 'package:purrr':
##
##     lift
```

```
library(psych)
```

```
## Warning: package 'psych' was built under R version 4.0.5
```

```
##
## Attaching package: 'psych'
```

```
## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha
```

```
library(fastDummies)
```

```
## Warning: package 'fastDummies' was built under R version 4.0.5
```

```
bmw_data  = dummy_cols(bmw, select_columns =c('year','model','transmission','fuelType','engineS
ize' ) )
head(bmw_data)
```

```
##       model year price transmission mileage fuelType tax  mpg engineSize brand
## 1  5 Series 2014 11200    Automatic   67068   Diesel 125 57.6        2.0   bmw
## 2  6 Series 2018 27000    Automatic   14827   Petrol 145 42.8        2.0   bmw
## 3  5 Series 2016 16000    Automatic   62794   Diesel 160 51.4        3.0   bmw
## 4  1 Series 2017 12750    Automatic   26676   Diesel 145 72.4        1.5   bmw
## 5  7 Series 2014 14500    Automatic   39554   Diesel 160 50.4        3.0   bmw
## 6  5 Series 2016 14900    Automatic   35309   Diesel 125 60.1        2.0   bmw
##   year_1996 year_1997 year_1998 year_1999 year_2000 year_2001 year_2002
## 1         0         0         0         0         0         0         0
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         0
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         0         0         0
## 6         0         0         0         0         0         0         0
##   year_2003 year_2004 year_2005 year_2006 year_2007 year_2008 year_2009
## 1         0         0         0         0         0         0         0
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         0
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         0         0         0
## 6         0         0         0         0         0         0         0
##   year_2010 year_2011 year_2012 year_2013 year_2014 year_2015 year_2016
## 1         0         0         0         0         1         0         0
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         1
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         1         0         0
## 6         0         0         0         0         0         0         1
##   year_2017 year_2018 year_2019 year_2020 model_ 1 Series model_ 2 Series
## 1         0         0         0         0               0               0
## 2         0         1         0         0               0               0
## 3         0         0         0         0               0               0
## 4         1         0         0         0               1               0
## 5         0         0         0         0               0               0
## 6         0         0         0         0               0               0
##   model_ 3 Series model_ 4 Series model_ 5 Series model_ 6 Series
## 1               0               0               1               0
## 2               0               0               0               1
## 3               0               0               1               0
## 4               0               0               0               0
## 5               0               0               0               0
## 6               0               0               1               0
##   model_ 7 Series model_ 8 Series model_ i3 model_ i8 model_ M2 model_ M3
## 1               0               0         0         0         0         0
## 2               0               0         0         0         0         0
## 3               0               0         0         0         0         0
## 4               0               0         0         0         0         0
## 5               1               0         0         0         0         0
## 6               0               0         0         0         0         0
##   model_ M4 model_ M5 model_ M6 model_ X1 model_ X2 model_ X3 model_ X4
## 1         0         0         0         0         0         0         0
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         0
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         0         0         0
## 6         0         0         0         0         0         0         0
##   model_ X5 model_ X6 model_ X7 model_ Z3 model_ Z4 transmission_Automatic
```

```
## 1          0          0          0          0          0                   1
## 2          0          0          0          0          0                   1
## 3          0          0          0          0          0                   1
## 4          0          0          0          0          0                   1
## 5          0          0          0          0          0                   1
## 6          0          0          0          0          0                   1
##   transmission_Manual transmission_Semi-Auto fuelType_Diesel fuelType_Electric
## 1                   0                      0               1                 0
## 2                   0                      0               0                 0
## 3                   0                      0               1                 0
## 4                   0                      0               1                 0
## 5                   0                      0               1                 0
## 6                   0                      0               1                 0
##   fuelType_Hybrid fuelType_Other fuelType_Petrol engineSize_0 engineSize_0.6
## 1               0              0               0            0              0
## 2               0              0               1            0              0
## 3               0              0               0            0              0
## 4               0              0               0            0              0
## 5               0              0               0            0              0
## 6               0              0               0            0              0
##   engineSize_1 engineSize_1.5 engineSize_1.6 engineSize_1.9 engineSize_2
## 1            0              0              0              0            1
## 2            0              0              0              0            1
## 3            0              0              0              0            0
## 4            0              1              0              0            0
## 5            0              0              0              0            0
## 6            0              0              0              0            1
##   engineSize_2.2 engineSize_2.5 engineSize_2.8 engineSize_3 engineSize_3.2
## 1              0              0              0            0              0
## 2              0              0              0            0              0
## 3              0              0              0            1              0
## 4              0              0              0            0              0
## 5              0              0              0            1              0
## 6              0              0              0            0              0
##   engineSize_3.5 engineSize_4 engineSize_4.4 engineSize_5 engineSize_6.6
## 1              0            0              0            0              0
## 2              0            0              0            0              0
## 3              0            0              0            0              0
## 4              0            0              0            0              0
## 5              0            0              0            0              0
## 6              0            0              0            0              0
```

```
bmw_df = subset(bmw_data ,select =c(-year,-model, -transmission, - fuelType, -brand , -engineSi
ze) )
head(bmw_df)
```

```
##   price mileage tax  mpg year_1996 year_1997 year_1998 year_1999 year_2000
## 1 11200   67068 125 57.6         0         0         0         0         0
## 2 27000   14827 145 42.8         0         0         0         0         0
## 3 16000   62794 160 51.4         0         0         0         0         0
## 4 12750   26676 145 72.4         0         0         0         0         0
## 5 14500   39554 160 50.4         0         0         0         0         0
## 6 14900   35309 125 60.1         0         0         0         0         0
##   year_2001 year_2002 year_2003 year_2004 year_2005 year_2006 year_2007
## 1         0         0         0         0         0         0         0
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         0
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         0         0         0
## 6         0         0         0         0         0         0         0
##   year_2008 year_2009 year_2010 year_2011 year_2012 year_2013 year_2014
## 1         0         0         0         0         0         0         1
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         0
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         0         0         1
## 6         0         0         0         0         0         0         0
##   year_2015 year_2016 year_2017 year_2018 year_2019 year_2020 model_ 1 Series
## 1         0         0         0         0         0         0               0
## 2         0         0         0         1         0         0               0
## 3         0         1         0         0         0         0               0
## 4         0         0         1         0         0         0               1
## 5         0         0         0         0         0         0               0
## 6         0         1         0         0         0         0               0
##   model_ 2 Series model_ 3 Series model_ 4 Series model_ 5 Series
## 1               0               0               0               1
## 2               0               0               0               0
## 3               0               0               0               1
## 4               0               0               0               0
## 5               0               0               0               0
## 6               0               0               0               1
##   model_ 6 Series model_ 7 Series model_ 8 Series model_ i3 model_ i8 model_ M2
## 1               0               0               0         0         0         0
## 2               1               0               0         0         0         0
## 3               0               0               0         0         0         0
## 4               0               0               0         0         0         0
## 5               0               1               0         0         0         0
## 6               0               0               0         0         0         0
##   model_ M3 model_ M4 model_ M5 model_ M6 model_ X1 model_ X2 model_ X3
## 1         0         0         0         0         0         0         0
## 2         0         0         0         0         0         0         0
## 3         0         0         0         0         0         0         0
## 4         0         0         0         0         0         0         0
## 5         0         0         0         0         0         0         0
## 6         0         0         0         0         0         0         0
##   model_ X4 model_ X5 model_ X6 model_ X7 model_ Z3 model_ Z4
## 1         0         0         0         0         0         0
## 2         0         0         0         0         0         0
## 3         0         0         0         0         0         0
## 4         0         0         0         0         0         0
## 5         0         0         0         0         0         0
## 6         0         0         0         0         0         0
##   transmission_Automatic transmission_Manual transmission_Semi-Auto
```

```
## 1                    1                0                 0
## 2                    1                0                 0
## 3                    1                0                 0
## 4                    1                0                 0
## 5                    1                0                 0
## 6                    1                0                 0
##   fuelType_Diesel fuelType_Electric fuelType_Hybrid fuelType_Other
## 1               1                 0               0              0
## 2               0                 0               0              0
## 3               1                 0               0              0
## 4               1                 0               0              0
## 5               1                 0               0              0
## 6               1                 0               0              0
##   fuelType_Petrol engineSize_0 engineSize_0.6 engineSize_1 engineSize_1.5
## 1               0            0              0            0              0
## 2               1            0              0            0              0
## 3               0            0              0            0              0
## 4               0            0              0            0              1
## 5               0            0              0            0              0
## 6               0            0              0            0              0
##   engineSize_1.6 engineSize_1.9 engineSize_2 engineSize_2.2 engineSize_2.5
## 1              0              0            1              0              0
## 2              0              0            1              0              0
## 3              0              0            0              0              0
## 4              0              0            0              0              0
## 5              0              0            0              0              0
## 6              0              0            1              0              0
##   engineSize_2.8 engineSize_3 engineSize_3.2 engineSize_3.5 engineSize_4
## 1              0            0              0              0            0
## 2              0            0              0              0            0
## 3              0            1              0              0            0
## 4              0            0              0              0            0
## 5              0            1              0              0            0
## 6              0            0              0              0            0
##   engineSize_4.4 engineSize_5 engineSize_6.6
## 1              0            0              0
## 2              0            0              0
## 3              0            0              0
## 4              0            0              0
## 5              0            0              0
## 6              0            0              0
```

Normalize data and prepare for PCA

```
bmw_scale = as.data.frame(scale(bmw_df[  , -2]))
head(bmw_scale)
```

```
##        price        tax         mpg   year_1996   year_1997   year_1998
## 1 -1.0103263 -0.1089577  0.03832423 -0.00963098 -0.00963098 -0.00963098
## 2  0.3737533  0.2161887 -0.43396157 -0.00963098 -0.00963098 -0.00963098
## 3 -0.5898465  0.4600485 -0.15952523 -0.00963098 -0.00963098 -0.00963098
## 4 -0.8745464  0.2161887  0.51061002 -0.00963098 -0.00963098 -0.00963098
## 5 -0.7212464  0.4600485 -0.19143643 -0.00963098 -0.00963098 -0.00963098
## 6 -0.6862064 -0.1089577  0.11810223 -0.00963098 -0.00963098 -0.00963098
##     year_1999   year_2000   year_2001   year_2002   year_2003   year_2004
## 1 -0.01926464 -0.01362089 -0.01668289 -0.02359646 -0.01362089 -0.03337973
## 2 -0.01926464 -0.01362089 -0.01668289 -0.02359646 -0.01362089 -0.03337973
## 3 -0.01926464 -0.01362089 -0.01668289 -0.02359646 -0.01362089 -0.03337973
## 4 -0.01926464 -0.01362089 -0.01668289 -0.02359646 -0.01362089 -0.03337973
## 5 -0.01926464 -0.01362089 -0.01668289 -0.02359646 -0.01362089 -0.03337973
## 6 -0.01926464 -0.01362089 -0.01668289 -0.02359646 -0.01362089 -0.03337973
##     year_2005   year_2006   year_2007   year_2008   year_2009   year_2010
## 1 -0.02359646 -0.03605758 -0.03855075 -0.04623576 -0.05282215 -0.06178309
## 2 -0.02359646 -0.03605758 -0.03855075 -0.04623576 -0.05282215 -0.06178309
## 3 -0.02359646 -0.03605758 -0.03855075 -0.04623576 -0.05282215 -0.06178309
## 4 -0.02359646 -0.03605758 -0.03855075 -0.04623576 -0.05282215 -0.06178309
## 5 -0.02359646 -0.03605758 -0.03855075 -0.04623576 -0.05282215 -0.06178309
## 6 -0.02359646 -0.03605758 -0.03855075 -0.04623576 -0.05282215 -0.06178309
##     year_2011  year_2012  year_2013  year_2014  year_2015 year_2016 year_2017
## 1 -0.06893902 -0.1056414 -0.1850533  4.5295760 -0.3057939 -0.459853 -0.435819
## 2 -0.06893902 -0.1056414 -0.1850533 -0.2207507 -0.3057939 -0.459853 -0.435819
## 3 -0.06893902 -0.1056414 -0.1850533 -0.2207507 -0.3057939  2.174406 -0.435819
## 4 -0.06893902 -0.1056414 -0.1850533 -0.2207507 -0.3057939 -0.459853  2.294318
## 5 -0.06893902 -0.1056414 -0.1850533  4.5295760 -0.3057939 -0.459853 -0.435819
## 6 -0.06893902 -0.1056414 -0.1850533 -0.2207507 -0.3057939  2.174406 -0.435819
##    year_2018  year_2019  year_2020 model_ 1 Series model_ 2 Series
## 1 -0.2921713 -0.6910967 -0.2700798      -0.4726781      -0.3586812
## 2  3.4223321 -0.6910967 -0.2700798      -0.4726781      -0.3586812
## 3 -0.2921713 -0.6910967 -0.2700798      -0.4726781      -0.3586812
## 4 -0.2921713 -0.6910967 -0.2700798       2.1154085      -0.3586812
## 5 -0.2921713 -0.6910967 -0.2700798      -0.4726781      -0.3586812
## 6 -0.2921713 -0.6910967 -0.2700798      -0.4726781      -0.3586812
##   model_ 3 Series model_ 4 Series model_ 5 Series model_ 6 Series
## 1      -0.5412659      -0.3188517       3.0345389      -0.1005885
## 2      -0.5412659      -0.3188517      -0.3295088       9.9405688
## 3      -0.5412659      -0.3188517       3.0345389      -0.1005885
## 4      -0.5412659      -0.3188517      -0.3295088      -0.1005885
## 5      -0.5412659      -0.3188517      -0.3295088      -0.1005885
## 6      -0.5412659      -0.3188517       3.0345389      -0.1005885
##   model_ 7 Series model_ 8 Series   model_ i3   model_ i8   model_ M2
## 1     -0.09964347     -0.06025174 -0.06327795 -0.03973905 -0.04417569
## 2     -0.09964347     -0.06025174 -0.06327795 -0.03973905 -0.04417569
## 3     -0.09964347     -0.06025174 -0.06327795 -0.03973905 -0.04417569
## 4     -0.09964347     -0.06025174 -0.06327795 -0.03973905 -0.04417569
## 5     10.03484957     -0.06025174 -0.06327795 -0.03973905 -0.04417569
## 6     -0.09964347     -0.06025174 -0.06327795 -0.03973905 -0.04417569
##    model_ M3  model_ M4  model_ M5   model_ M6  model_ X1  model_ X2  model_ X3
## 1 -0.0501045 -0.1083023 -0.0519319 -0.02724937 -0.2838624 -0.1656633 -0.2320694
## 2 -0.0501045 -0.1083023 -0.0519319 -0.02724937 -0.2838624 -0.1656633 -0.2320694
## 3 -0.0501045 -0.1083023 -0.0519319 -0.02724937 -0.2838624 -0.1656633 -0.2320694
## 4 -0.0501045 -0.1083023 -0.0519319 -0.02724937 -0.2838624 -0.1656633 -0.2320694
## 5 -0.0501045 -0.1083023 -0.0519319 -0.02724937 -0.2838624 -0.1656633 -0.2320694
## 6 -0.0501045 -0.1083023 -0.0519319 -0.02724937 -0.2838624 -0.1656633 -0.2320694
##    model_ X4 model_ X5   model_ X6   model_ X7   model_ Z3  model_ Z4
```

```
## 1 -0.1299309 -0.213015 -0.09964347 -0.07160483 -0.02548827 -0.1005885
## 2 -0.1299309 -0.213015 -0.09964347 -0.07160483 -0.02548827 -0.1005885
## 3 -0.1299309 -0.213015 -0.09964347 -0.07160483 -0.02548827 -0.1005885
## 4 -0.1299309 -0.213015 -0.09964347 -0.07160483 -0.02548827 -0.1005885
## 5 -0.1299309 -0.213015 -0.09964347 -0.07160483 -0.02548827 -0.1005885
## 6 -0.1299309 -0.213015 -0.09964347 -0.07160483 -0.02548827 -0.1005885
##   transmission_Automatic transmission_Manual transmission_Semi-Auto
## 1               1.415822          -0.5532867             -0.8734821
## 2               1.415822          -0.5532867             -0.8734821
## 3               1.415822          -0.5532867             -0.8734821
## 4               1.415822          -0.5532867             -0.8734821
## 5               1.415822          -0.5532867             -0.8734821
## 6               1.415822          -0.5532867             -0.8734821
##   fuelType_Diesel fuelType_Electric fuelType_Hybrid fuelType_Other
## 1       0.7308732       -0.01668289      -0.1685952    -0.05787992
## 2      -1.3680995       -0.01668289      -0.1685952    -0.05787992
## 3       0.7308732       -0.01668289      -0.1685952    -0.05787992
## 4       0.7308732       -0.01668289      -0.1685952    -0.05787992
## 5       0.7308732       -0.01668289      -0.1685952    -0.05787992
## 6       0.7308732       -0.01668289      -0.1685952    -0.05787992
##   fuelType_Petrol engineSize_0 engineSize_0.6 engineSize_1 engineSize_1.5
## 1      -0.6811542    -0.066168    -0.02548827  -0.00963098     -0.3962239
## 2       1.4679601    -0.066168    -0.02548827  -0.00963098     -0.3962239
## 3      -0.6811542    -0.066168    -0.02548827  -0.00963098     -0.3962239
## 4      -0.6811542    -0.066168    -0.02548827  -0.00963098      2.5235915
## 5      -0.6811542    -0.066168    -0.02548827  -0.00963098     -0.3962239
## 6      -0.6811542    -0.066168    -0.02548827  -0.00963098     -0.3962239
##   engineSize_1.6 engineSize_1.9 engineSize_2 engineSize_2.2 engineSize_2.5
## 1     -0.1010579    -0.02153952    0.7997728    -0.02359646    -0.03605758
## 2     -0.1010579    -0.02153952    0.7997728    -0.02359646    -0.03605758
## 3     -0.1010579    -0.02153952   -1.2502392    -0.02359646    -0.03605758
## 4     -0.1010579    -0.02153952   -1.2502392    -0.02359646    -0.03605758
## 5     -0.1010579    -0.02153952   -1.2502392    -0.02359646    -0.03605758
## 6     -0.1010579    -0.02153952    0.7997728    -0.02359646    -0.03605758
##   engineSize_2.8 engineSize_3 engineSize_3.2 engineSize_3.5 engineSize_4
## 1    -0.01362089    -0.543414    -0.02153952    -0.00963098  -0.02359646
## 2    -0.01362089    -0.543414    -0.02153952    -0.00963098  -0.02359646
## 3    -0.01362089     1.840047    -0.02153952    -0.00963098  -0.02359646
## 4    -0.01362089    -0.543414    -0.02153952    -0.00963098  -0.02359646
## 5    -0.01362089     1.840047    -0.02153952    -0.00963098  -0.02359646
## 6    -0.01362089    -0.543414    -0.02153952    -0.00963098  -0.02359646
##   engineSize_4.4 engineSize_5 engineSize_6.6
## 1     -0.0859134  -0.00963098    -0.01362089
## 2     -0.0859134  -0.00963098    -0.01362089
## 3     -0.0859134  -0.00963098    -0.01362089
## 4     -0.0859134  -0.00963098    -0.01362089
## 5     -0.0859134  -0.00963098    -0.01362089
## 6     -0.0859134  -0.00963098    -0.01362089
```

Apply PCA on scale data set and choose apporiate number of components

```
fa.parallel(bmw_scale,fa = "pc",n.iter = 100,show.legend = TRUE )
```

```
## Warning in cor.smooth(R): Matrix was not positive definite, smoothing was done
```

```
## In smc, smcs < 0 were set to .0
```

```
## Warning in cor.smooth(R): Matrix was not positive definite, smoothing was done
```

```
## In smc, smcs < 0 were set to .0
```

```
## Warning in cor.smooth(R): Matrix was not positive definite, smoothing was done
```

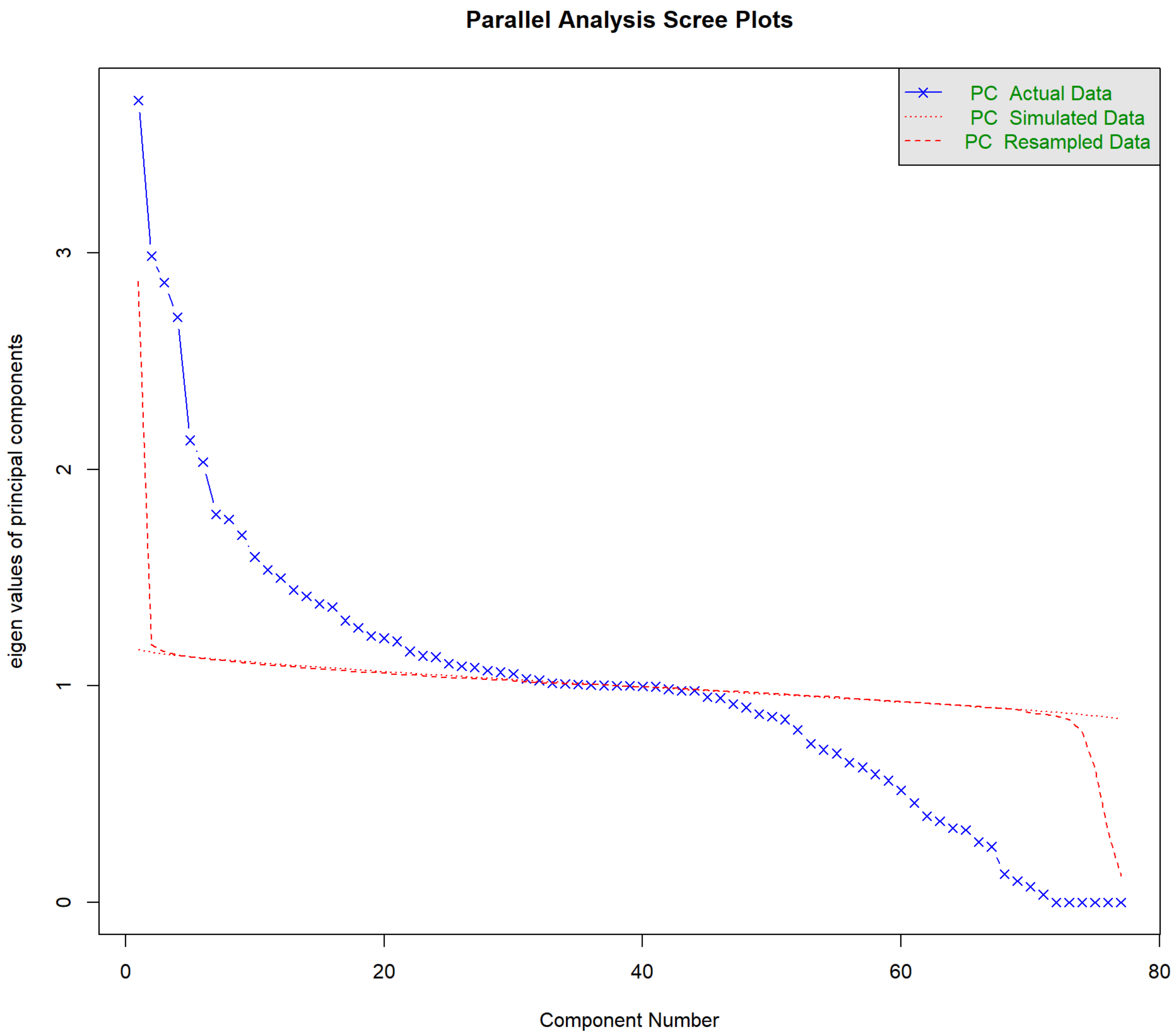
```
## In smc, smcs < 0 were set to .0
```

```
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
```

```
## Warning in fa.stats(r = r, f = f, phi = phi, n.obs = n.obs, np.obs = np.obs, :
## The estimated weights for the factor scores are probably incorrect. Try a
## different factor score estimation method.
```

```
## In factor.scores, the correlation matrix is singular, an approximation is used
```

```
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
```




```
## Parallel analysis suggests that the number of factors =  NA  and the number of components =
31
```

Choose components number is 31 and create pca data frame for modeling part

```
# From the result from above , we choose components number = 31
pc = principal(bmw_scale, nfactors = 31 , rotate = "none", scores = TRUE )
```

```
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
```

```
## Warning in principal(bmw_scale, nfactors = 31, rotate = "none", scores = TRUE):
## The matrix is not positive semi-definite, scores found from Structure loadings
```

```
pca_df = cbind(bmw_df$price , as.data.frame(pc$scores))%>%
rename(price = "bmw_df$price")
head(pca_df)
```

```
##   price        PC1         PC2         PC3        PC4      PC5        PC6
## 1 11200 -2.7592364  1.14913095 -2.17292034  1.8709779 1.528301  0.9079794
## 2 27000  1.8180832 -0.09179234  0.97774878 -0.3148008 1.469252  0.8083152
## 3 16000 -0.3554297  1.50818980 -0.49584106  1.1338361 3.542515 -1.2293824
## 4 12750 -2.8365247 -2.07815817  0.85636937 -1.5179296 2.209667 -1.8333380
## 5 14500  1.1362679  1.72564242 -0.07781286  1.0412928 5.138287 -1.9136126
## 6 14900 -2.8138309  1.24804691 -1.83579681  1.6176241 1.191650  0.3376283
##             PC7         PC8          PC9       PC10       PC11        PC12
## 1  1.404097573  0.11109876 -0.062077428 -0.4826857 -0.2559175 -1.46104486
## 2  1.717857184  0.05421004 -0.201203966 -0.4117159 -1.7307477 -1.68791863
## 3  0.370981885  0.11795142  0.415964489 -0.8518581  0.3202836 -0.84255909
## 4 -0.006346546  0.02009673  0.048072346 -0.6488114  0.3539405  0.17301404
## 5  0.488422758 -0.17308463 -0.014521616  0.4829784 -0.9139513 -0.04204794
## 6  0.949574275  0.14690256 -0.009503119 -1.1888732  0.7980028 -1.15387691
##           PC13        PC14       PC15       PC16       PC17        PC18
## 1  0.24706139 -0.82797749  0.6267995  0.2042523 -1.0983395 -1.28641995
## 2 -0.28306846 -0.51480055 -2.0682258 -1.2563315 -1.6360491 -0.83127773
## 3  0.83413058 -0.14498030 -1.0706652 -0.5137191 -0.4426571  0.12430718
## 4  0.35106059  0.57869243 -0.5152109 -0.6336214  0.6115357 -1.64518090
## 5 -0.03380889 -0.78270925 -0.2302812  0.7905958  0.4208583 -1.94746398
## 6  0.75767803  0.01422884 -0.7737714 -0.4680817 -0.4709486  0.02817485
##           PC19        PC20       PC21        PC22       PC23        PC24
## 1  1.51904313  1.15983450 -0.7161846  1.16334234  0.4486476  0.38729159
## 2 -0.02182948 -0.53745825 -0.7506409 -0.20492583 -1.2182768  0.42077202
## 3  2.04968743  0.05289594 -0.4673725  0.12815320  0.5040385  1.08139440
## 4 -0.56399172  1.33375052  0.5212263  0.72865970 -0.5628010  0.05652515
## 5 -0.58184264  1.26007340  0.6492400  0.09520865  6.6620116 -1.69850285
## 6  2.23948558  0.12569335 -0.2512388  0.22205700  0.5757520  1.01389160
##         PC25       PC26      PC27       PC28       PC29       PC30       PC31
## 1  1.0650357 -0.2243290 1.3161403 -1.0915712 -1.4546581 -2.0956721 -2.1178922
## 2  2.9718762  0.6885659 2.4730448  4.8611117  2.3895521 -0.3418099 -0.1963465
## 3  1.1278403 -1.3599156 0.2982725 -0.9989323  0.3476459  0.2224365 -0.1649775
## 4 -1.0825040  0.1737113 0.1697216  0.1161050  0.8100524 -0.2007155 -0.2315985
## 5  2.4841038  1.8972341 0.3454195 -0.3095847 -1.7226081 -2.0659016 -1.4300980
## 6  0.9881169 -1.2213456 0.2713121 -0.8767083  0.3682526  0.3418935 -0.2304752
```

Split dataset as train and test data set

```
# split train and test data , which 80% train data and 20% test data
library(caTools)
```

```
## Warning: package 'caTools' was built under R version 4.0.5
```

```
pca_split_data = sample.split(pca_df,SplitRatio = 0.8)
pca_train_data = subset(pca_df,pca_split_data==TRUE)
pca_test_data = subset( pca_df,pca_split_data ==FALSE)
```

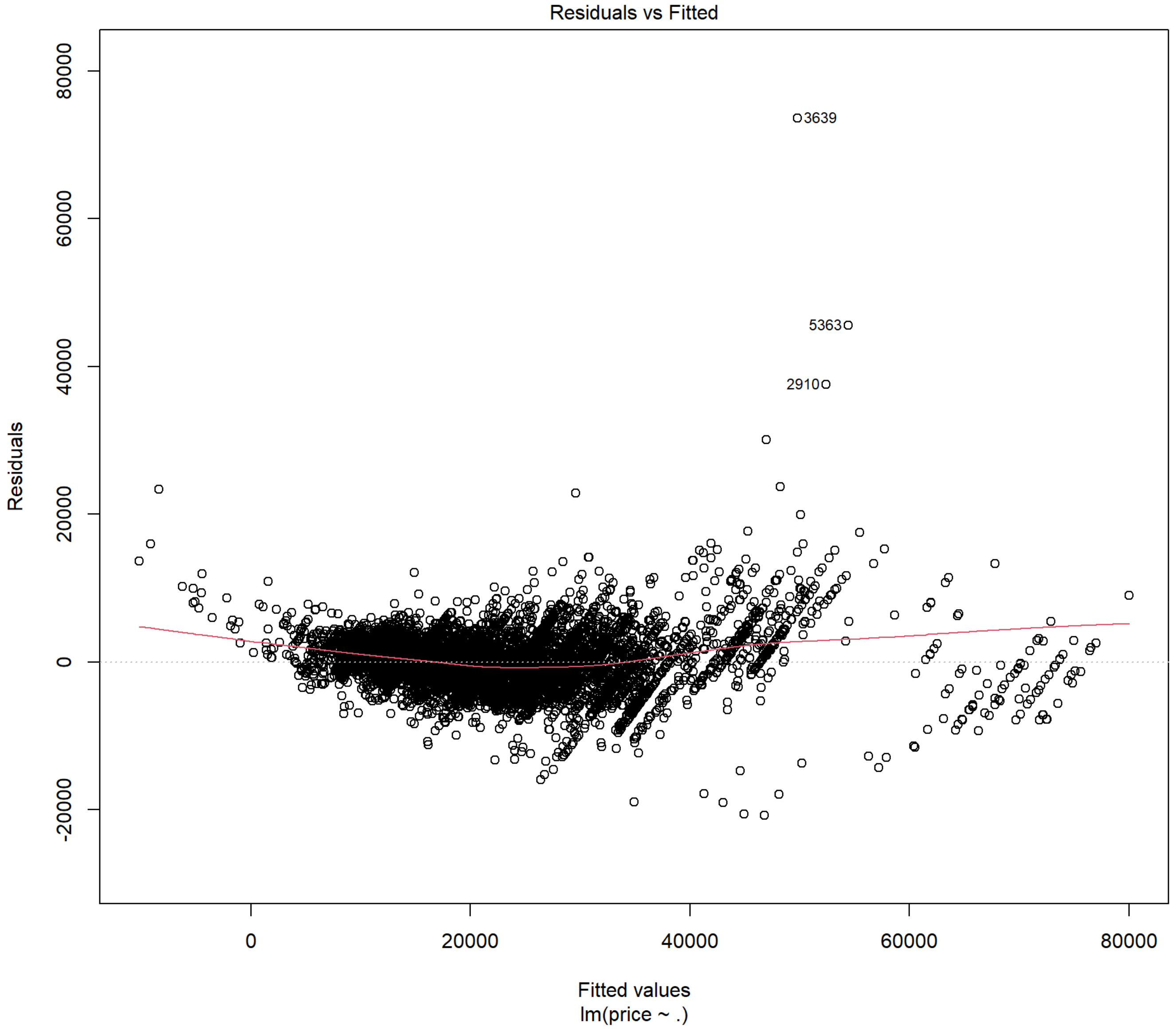
implementing model

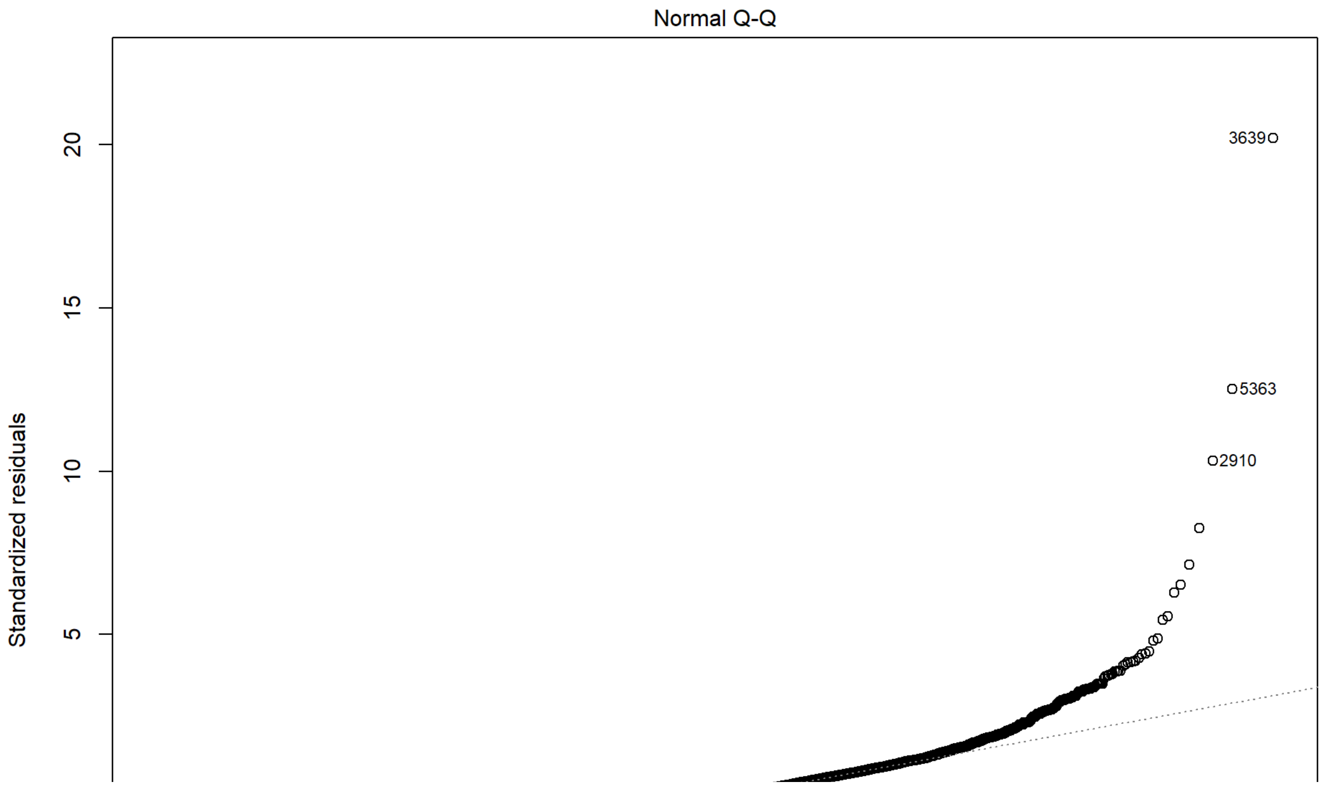
linear regression with PCA

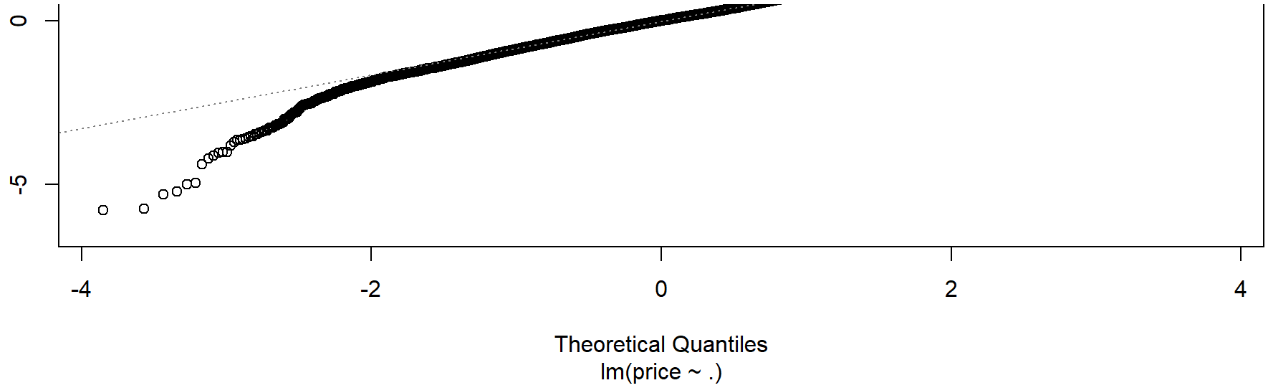
```
## linear regression
linear = lm(price ~. , data = pca_train_data)
summary(linear)
```

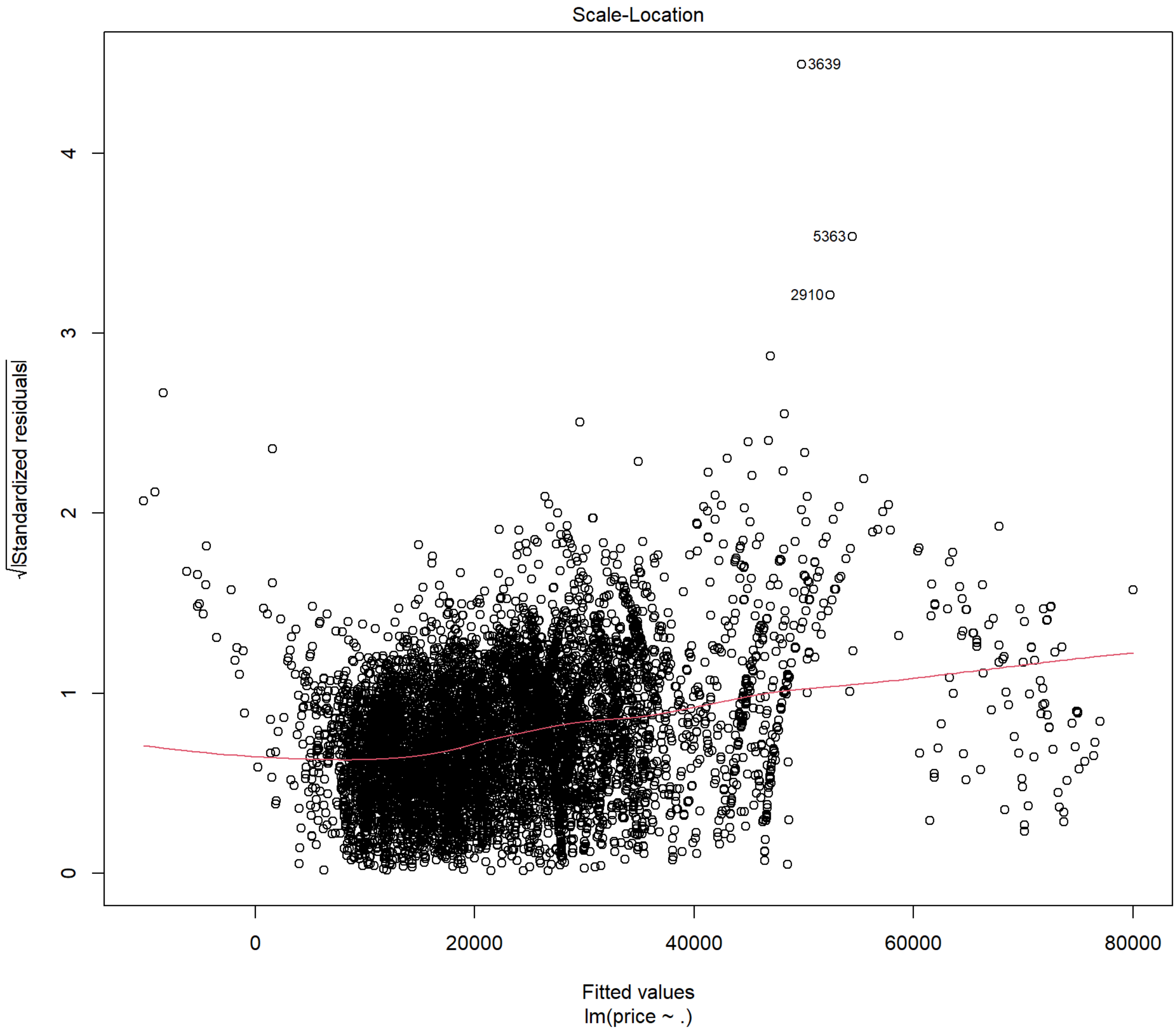
```
##
## Call:
## lm(formula = price ~ ., data = pca_train_data)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -20769  -2077     31   1956  73628
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 22737.80      39.77 571.682  < 2e-16 ***
## PC1          2124.82      10.83 196.247  < 2e-16 ***
## PC2          1766.52      13.43 131.515  < 2e-16 ***
## PC3           868.48      14.30  60.747  < 2e-16 ***
## PC4            55.16      14.62   3.772 0.000163 ***
## PC5          -676.06      18.69 -36.164  < 2e-16 ***
## PC6          -953.21      19.79 -48.164  < 2e-16 ***
## PC7          -648.42      21.97 -29.510  < 2e-16 ***
## PC8           -34.48      20.54  -1.678 0.093343 .
## PC9          -189.38      23.40  -8.093 6.62e-16 ***
## PC10         -489.52      40.16 -12.189  < 2e-16 ***
## PC11         1382.27      27.53  50.219  < 2e-16 ***
## PC12          319.12      30.81  10.359  < 2e-16 ***
## PC13          -50.47      26.20  -1.926 0.054140 .
## PC14          103.12      29.97   3.440 0.000584 ***
## PC15          900.41      29.68  30.341  < 2e-16 ***
## PC16          600.78      29.73  20.206  < 2e-16 ***
## PC17          226.99      30.58   7.423 1.26e-13 ***
## PC18          619.40      32.29  19.185  < 2e-16 ***
## PC19          544.67      32.32  16.850  < 2e-16 ***
## PC20          365.94      34.76  10.529  < 2e-16 ***
## PC21         1293.34      33.67  38.409  < 2e-16 ***
## PC22         -145.73      33.92  -4.297 1.75e-05 ***
## PC23           42.33      37.66   1.124 0.261097
## PC24          143.17      35.54   4.028 5.66e-05 ***
## PC25        -1039.04      36.20 -28.704  < 2e-16 ***
## PC26          686.64      36.51  18.805  < 2e-16 ***
## PC27          -11.53      36.66  -0.315 0.753064
## PC28          180.31      36.96   4.879 1.09e-06 ***
## PC29          -95.96      37.13  -2.584 0.009773 **
## PC30          569.36      37.91  15.019  < 2e-16 ***
## PC31         -330.95      37.44  -8.839  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3649 on 8390 degrees of freedom
## Multiple R-squared:  0.897,  Adjusted R-squared:  0.8966
## F-statistic:  2356 on 31 and 8390 DF,  p-value: < 2.2e-16
```

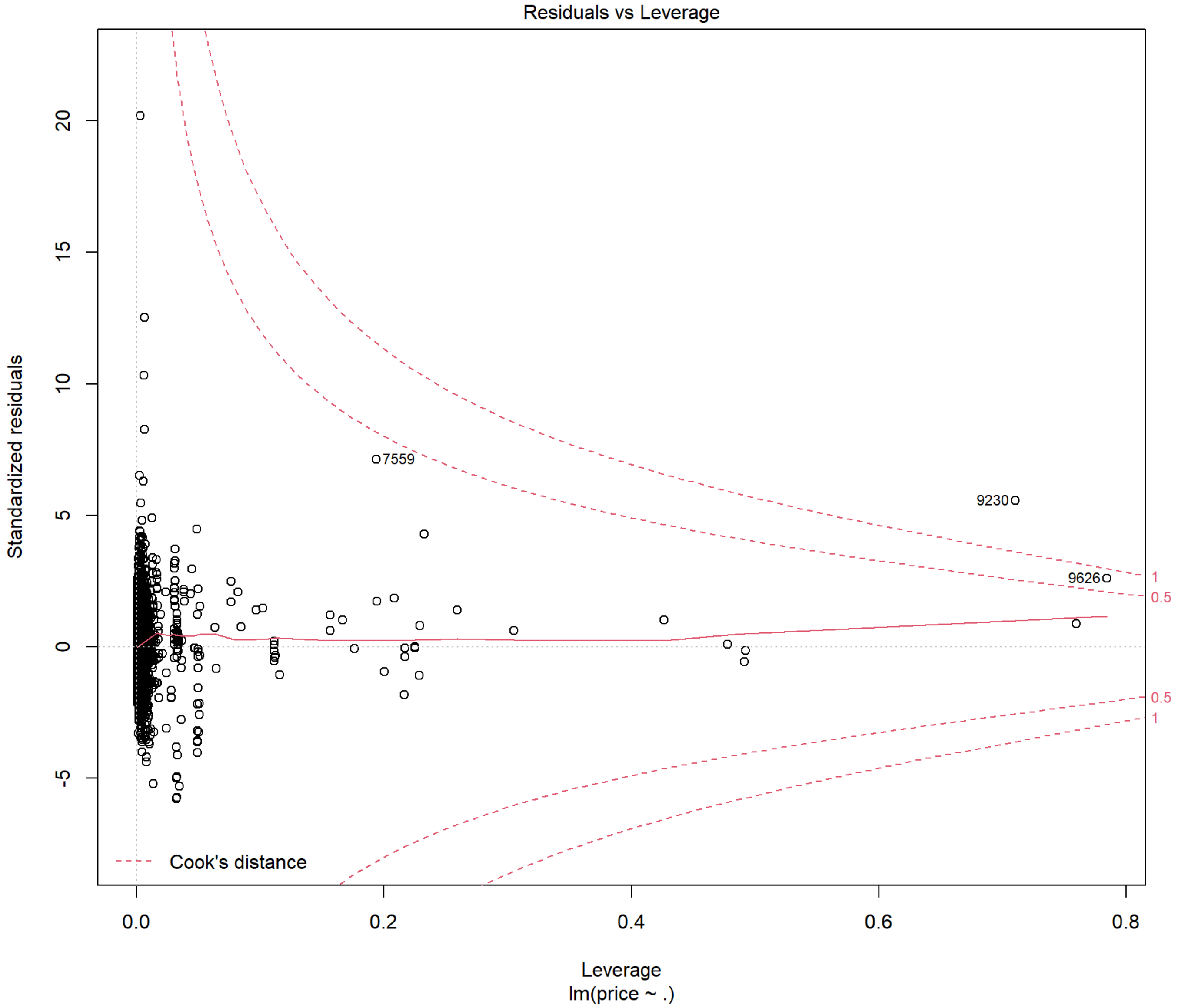
```
plot(linear)
```


Residuals vs Fitted
Residuals
Fitted values
lm(price ~ .)
3639
5363
2910
80000
60000
40000
20000
0
-20000
0
20000
40000
60000
80000


Normal Q-Q
Standardized residuals
3639
5363
2910
20
15
10
5


0
-5
-4
-2
0
2
4
Theoretical Quantiles
lm(price ~ .)


Scale-Location
3639
5363
2910
0
1
2
3
4
√|Standardized residuals|
0
20000
40000
60000
80000
Fitted values
lm(price ~ .)

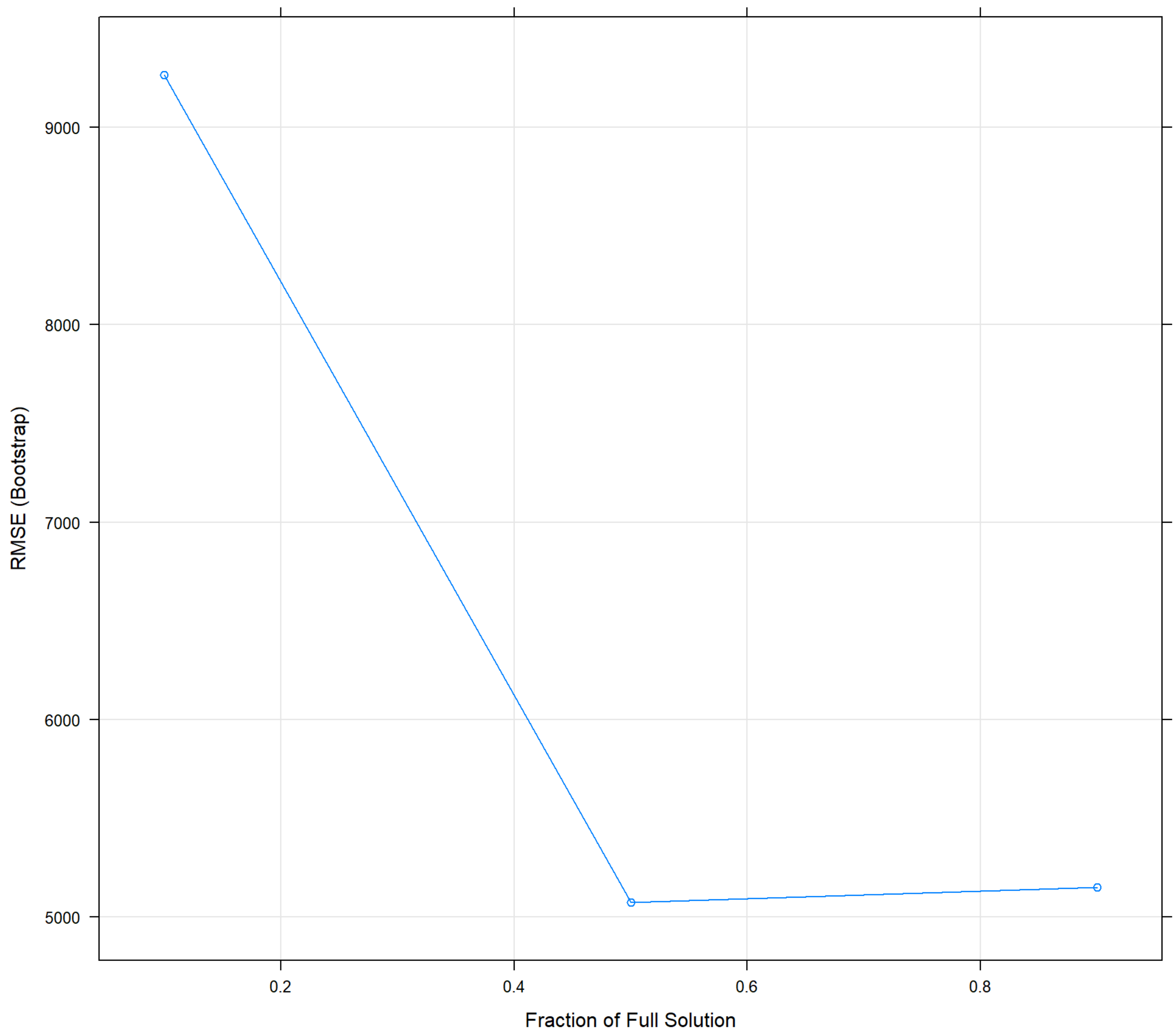


Lasso Regression with PCA

```
## Lasso Regression
lasso_pca <- train(price ~ . ,
                   data = pca_train_data,
                   method = "lasso")
lasso_pca
```

```
## The lasso
##
## 8422 samples
##   31 predictor
##
## No pre-processing
## Resampling: Bootstrapped (25 reps)
## Summary of sample sizes: 8422, 8422, 8422, 8422, 8422, 8422, ...
## Resampling results across tuning parameters:
##
##   fraction  RMSE      Rsquared   MAE
##   0.1       9266.520  0.5580142  6736.382
##   0.5       5073.275  0.8236085  3533.407
##   0.9       5151.493  0.8585858  2688.957
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was fraction = 0.5.
```

```
plot(lasso_pca)
```

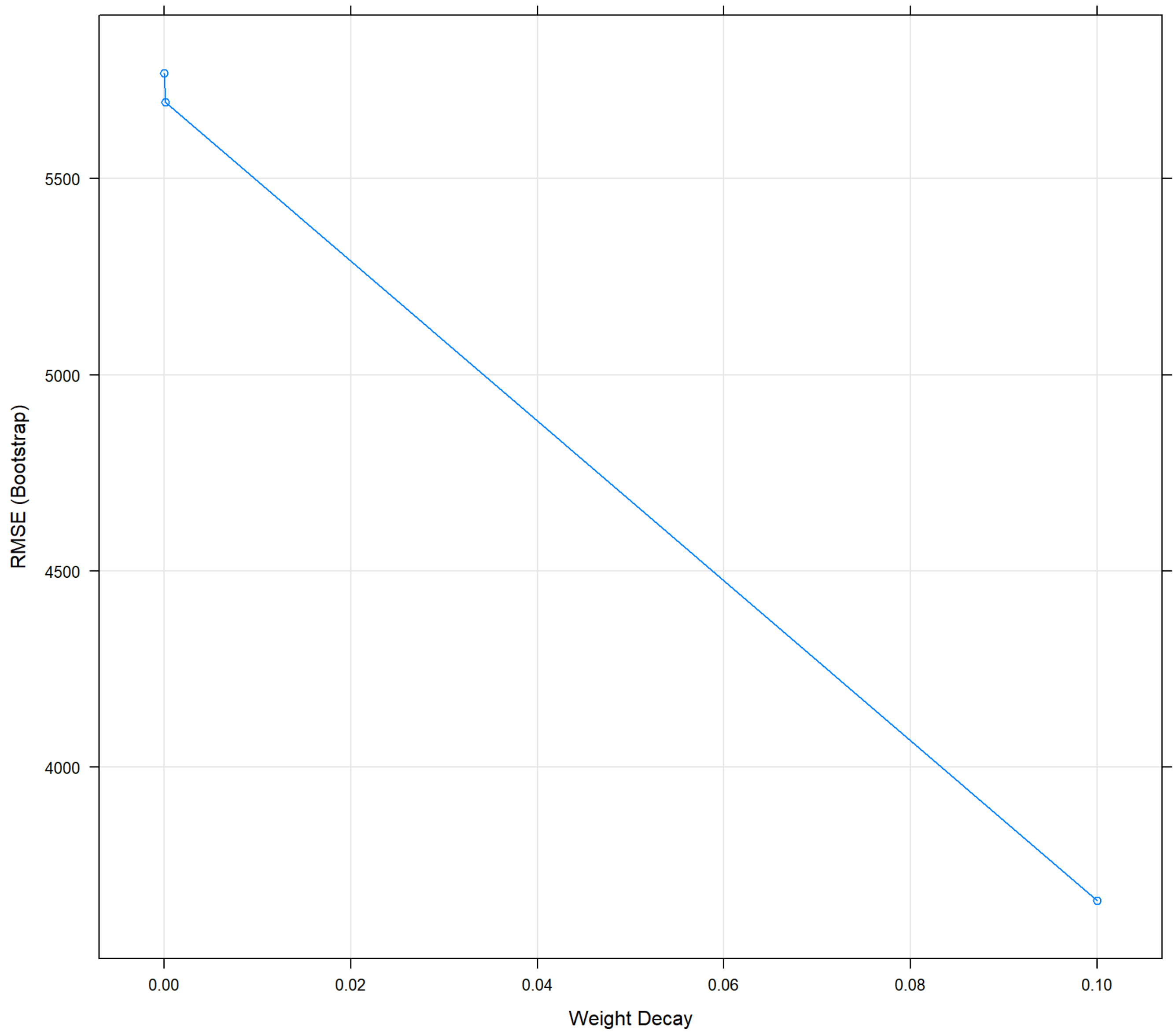


Ridge Regression with PCA

```
## ridge regression
ridge_pca <- train(price ~ . ,
                data = pca_train_data,
                method = "ridge")
ridge_pca
```

```
## Ridge Regression
##
## 8422 samples
##   31 predictor
##
## No pre-processing
## Resampling: Bootstrapped (25 reps)
## Summary of sample sizes: 8422, 8422, 8422, 8422, 8422, 8422, ...
## Resampling results across tuning parameters:
##
##   lambda  RMSE      Rsquared   MAE
##   0e+00   5769.355  0.8297025  2678.747
##   1e-04   5695.735  0.8303368  2676.700
##   1e-01   3659.588  0.8951695  2613.910
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was lambda = 0.1.
```

```
plot(ridge_pca)
```

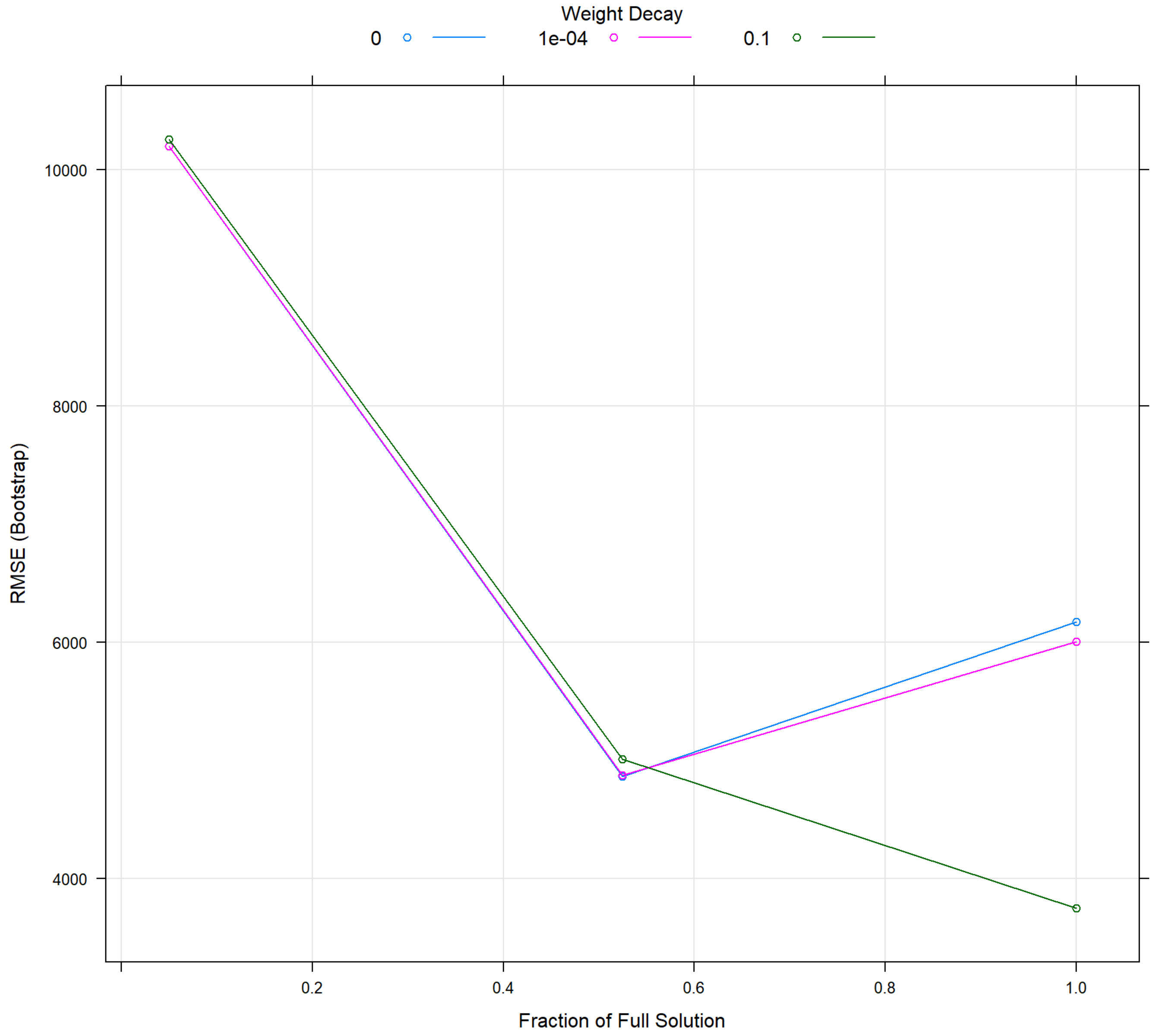


Elasticnet with PCA

```
## Elasticnet
enet_pca <- train(price ~ . ,
                data = pca_train_data,
                method = "enet")
enet_pca
```

```
## Elasticnet
##
## 8422 samples
##   31 predictor
##
## No pre-processing
## Resampling: Bootstrapped (25 reps)
## Summary of sample sizes: 8422, 8422, 8422, 8422, 8422, 8422, ...
## Resampling results across tuning parameters:
##
##   lambda  fraction  RMSE       Rsquared   MAE
##   0e+00   0.050     10198.447  0.4622664  7482.738
##   0e+00   0.525      4867.566  0.8348269  3395.957
##   0e+00   1.000      6172.367  0.8051181  2732.327
##   1e-04   0.050     10202.661  0.4613966  7486.154
##   1e-04   0.525      4874.250  0.8345093  3400.482
##   1e-04   1.000      6009.335  0.8067995  2725.737
##   1e-01   0.050     10260.675  0.4600051  7532.487
##   1e-01   0.525      5011.316  0.8272891  3490.770
##   1e-01   1.000      3749.853  0.8907413  2629.293
##
## RMSE was used to select the optimal model using the smallest value.
## The final values used for the model were fraction = 1 and lambda = 0.1.
```

```
plot(enet_pca)
```

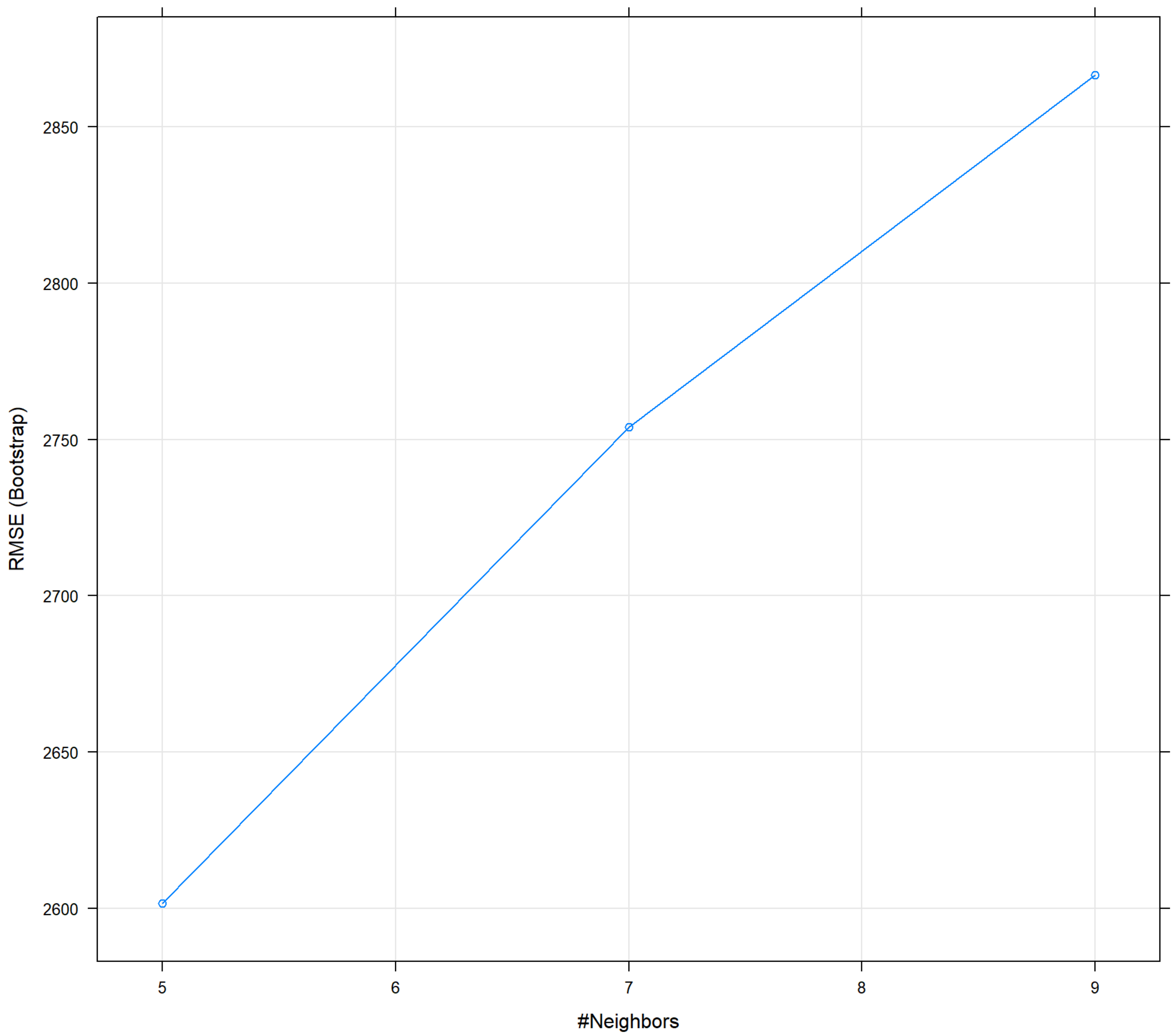


KNN regression with PCA

```
## KNN regression
knn_pca <- train(price ~ . ,
                data = pca_train_data,
                method = "knn")
knn_pca
```

```
## k-Nearest Neighbors
##
## 8422 samples
##   31 predictor
##
## No pre-processing
## Resampling: Bootstrapped (25 reps)
## Summary of sample sizes: 8422, 8422, 8422, 8422, 8422, 8422, ...
## Resampling results across tuning parameters:
##
##   k  RMSE      Rsquared   MAE
##   5  2601.653  0.9470779  1231.675
##   7  2753.984  0.9408119  1348.401
##   9  2866.505  0.9359094  1446.883
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was k = 5.
```

```
plot(knn_pca)
```



XGBoost with PCA

```
## xgboost
xgboost_pca<- train(price ~ . ,
                data = pca_train_data,
                method = "xgbTree")
```

```
## [01:32:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:32:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:32:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:33:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:33:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:33:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:33:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:34:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:34:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:34:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:34:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:34:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:35:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:35:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:35:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:35:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:35:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:36:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:36:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:36:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:36:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:36:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:37:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:37:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:37:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:37:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:37:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:38:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:38:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:38:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:38:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:38:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:39:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:39:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:39:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:51] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:52] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:53] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:54] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:55] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:56] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:57] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:58] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:39:59] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:00] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:01] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:40:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:02] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:03] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:04] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:05] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:06] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:07] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:08] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:09] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:10] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:11] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:12] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:13] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:14] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:15] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:16] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:40:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:17] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:18] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:19] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:20] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:21] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:22] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:23] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:24] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:25] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:26] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:27] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:28] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:29] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:30] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:31] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:40:32] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:33] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:34] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:35] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:36] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:37] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:38] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:39] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:40] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:41] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:42] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:43] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:44] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:45] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:46] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:47] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:48] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
```

```
eprecated in favor of reg:squarederror.
## [01:40:49] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
## [01:40:50] WARNING: amalgamation/../src/objective/regression_obj.cu:170: reg:linear is now d
eprecated in favor of reg:squarederror.
```

```
xgboost_pca
```

```
## eXtreme Gradient Boosting
##
## 8422 samples
##   31 predictor
##
## No pre-processing
## Resampling: Bootstrapped (25 reps)
## Summary of sample sizes: 8422, 8422, 8422, 8422, 8422, 8422, ...
## Resampling results across tuning parameters:
##
##   eta  max_depth  colsample_bytree  subsample  nrounds  RMSE      Rsquared
##   0.3  1          0.6               0.50        50      4000.314  0.8814553
##   0.3  1          0.6               0.50       100      3455.125  0.9093303
##   0.3  1          0.6               0.50       150      3226.293  0.9205794
##   0.3  1          0.6               0.75        50      3991.132  0.8826993
##   0.3  1          0.6               0.75       100      3451.972  0.9099624
##   0.3  1          0.6               0.75       150      3223.180  0.9209560
##   0.3  1          0.6               1.00        50      4000.677  0.8823141
##   0.3  1          0.6               1.00       100      3471.295  0.9090026
##   0.3  1          0.6               1.00       150      3248.282  0.9197856
##   0.3  1          0.8               0.50        50      3931.094  0.8856262
##   0.3  1          0.8               0.50       100      3413.038  0.9115041
##   0.3  1          0.8               0.50       150      3201.082  0.9218638
##   0.3  1          0.8               0.75        50      3909.941  0.8876948
##   0.3  1          0.8               0.75       100      3400.621  0.9123729
##   0.3  1          0.8               0.75       150      3187.636  0.9225545
##   0.3  1          0.8               1.00        50      3952.974  0.8854365
##   0.3  1          0.8               1.00       100      3435.826  0.9108969
##   0.3  1          0.8               1.00       150      3214.600  0.9214072
##   0.3  2          0.6               0.50        50      3160.332  0.9237883
##   0.3  2          0.6               0.50       100      2771.427  0.9411186
##   0.3  2          0.6               0.50       150      2583.284  0.9487897
##   0.3  2          0.6               0.75        50      3149.901  0.9244698
##   0.3  2          0.6               0.75       100      2745.525  0.9423036
##   0.3  2          0.6               0.75       150      2558.333  0.9498450
##   0.3  2          0.6               1.00        50      3124.366  0.9257031
##   0.3  2          0.6               1.00       100      2749.328  0.9421131
##   0.3  2          0.6               1.00       150      2565.262  0.9494999
##   0.3  2          0.8               0.50        50      3067.798  0.9282311
##   0.3  2          0.8               0.50       100      2705.059  0.9439552
##   0.3  2          0.8               0.50       150      2521.339  0.9512095
##   0.3  2          0.8               0.75        50      3068.857  0.9282807
##   0.3  2          0.8               0.75       100      2695.007  0.9444175
##   0.3  2          0.8               0.75       150      2511.684  0.9516162
##   0.3  2          0.8               1.00        50      3064.210  0.9284703
##   0.3  2          0.8               1.00       100      2696.732  0.9443346
##   0.3  2          0.8               1.00       150      2520.406  0.9512924
##   0.3  3          0.6               0.50        50      2739.017  0.9425005
##   0.3  3          0.6               0.50       100      2418.999  0.9550465
##   0.3  3          0.6               0.50       150      2260.642  0.9606662
##   0.3  3          0.6               0.75        50      2672.999  0.9453732
##   0.3  3          0.6               0.75       100      2356.553  0.9573862
##   0.3  3          0.6               0.75       150      2210.628  0.9624330
##   0.3  3          0.6               1.00        50      2688.899  0.9447360
##   0.3  3          0.6               1.00       100      2371.003  0.9568787
##   0.3  3          0.6               1.00       150      2223.311  0.9620247
##   0.3  3          0.8               0.50        50      2672.577  0.9452045
```

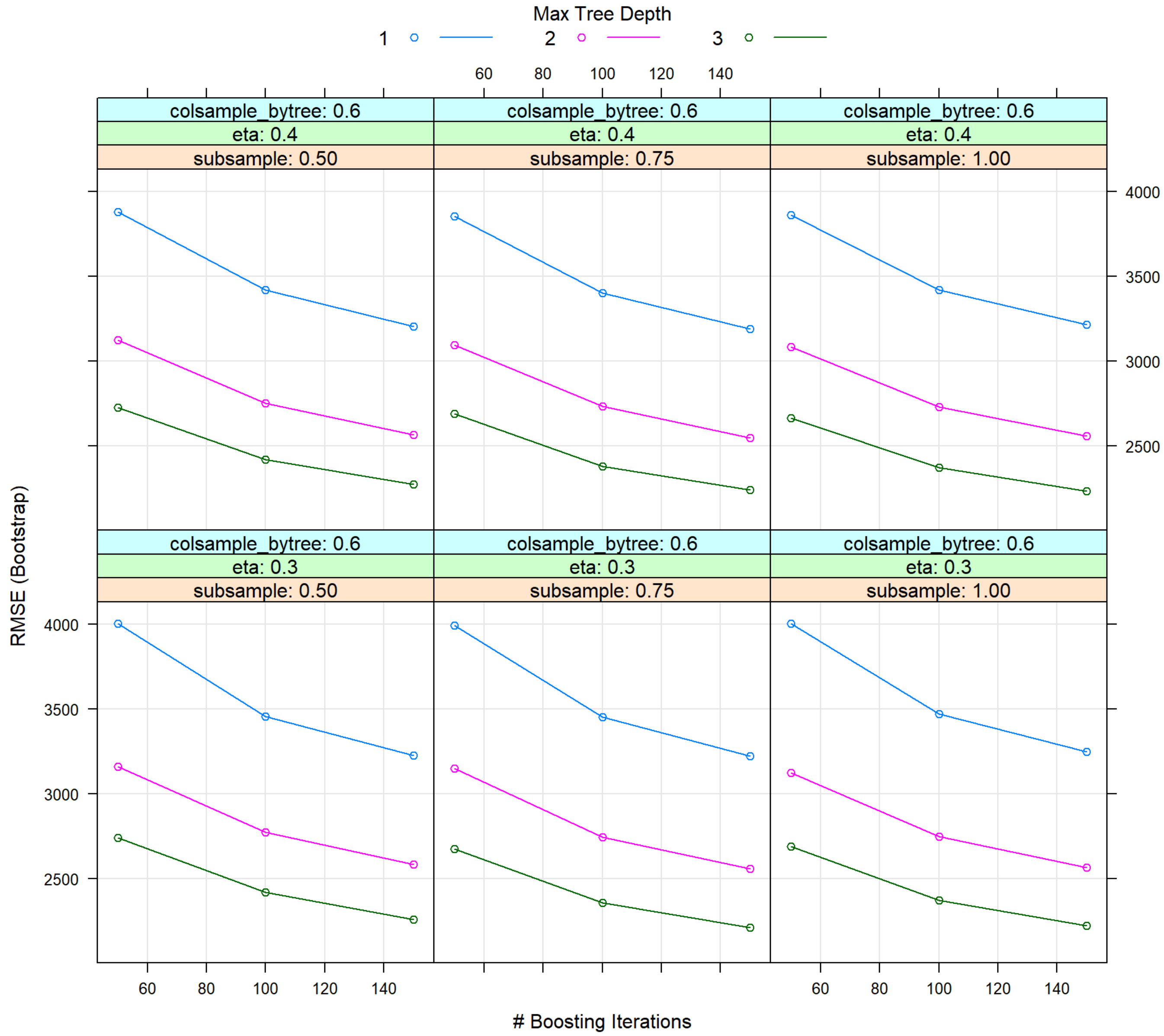
```
##    0.3  3          0.8          0.50       100        2369.483  0.9567580
##    0.3  3          0.8          0.50       150        2224.292  0.9617979
##    0.3  3          0.8          0.75        50        2603.437  0.9481051
##    0.3  3          0.8          0.75       100        2300.576  0.9593708
##    0.3  3          0.8          0.75       150        2154.787  0.9642752
##    0.3  3          0.8          1.00        50        2599.214  0.9482755
##    0.3  3          0.8          1.00       100        2300.546  0.9593499
##    0.3  3          0.8          1.00       150        2157.883  0.9641697
##    0.4  1          0.6          0.50        50        3877.630  0.8857341
##    0.4  1          0.6          0.50       100        3418.725  0.9106084
##    0.4  1          0.6          0.50       150        3203.659  0.9213972
##    0.4  1          0.6          0.75        50        3853.192  0.8877139
##    0.4  1          0.6          0.75       100        3400.845  0.9116940
##    0.4  1          0.6          0.75       150        3187.859  0.9223218
##    0.4  1          0.6          1.00        50        3860.475  0.8872869
##    0.4  1          0.6          1.00       100        3418.849  0.9108055
##    0.4  1          0.6          1.00       150        3215.040  0.9209766
##    0.4  1          0.8          0.50        50        3785.447  0.8912139
##    0.4  1          0.8          0.50       100        3357.863  0.9138576
##    0.4  1          0.8          0.50       150        3154.579  0.9239156
##    0.4  1          0.8          0.75        50        3788.590  0.8914286
##    0.4  1          0.8          0.75       100        3364.159  0.9135638
##    0.4  1          0.8          0.75       150        3166.043  0.9233151
##    0.4  1          0.8          1.00        50        3785.996  0.8917166
##    0.4  1          0.8          1.00       100        3368.930  0.9134391
##    0.4  1          0.8          1.00       150        3172.361  0.9231180
##    0.4  2          0.6          0.50        50        3124.975  0.9251930
##    0.4  2          0.6          0.50       100        2750.979  0.9419818
##    0.4  2          0.6          0.50       150        2564.426  0.9495024
##    0.4  2          0.6          0.75        50        3093.382  0.9267050
##    0.4  2          0.6          0.75       100        2734.842  0.9426101
##    0.4  2          0.6          0.75       150        2545.865  0.9502124
##    0.4  2          0.6          1.00        50        3084.982  0.9269206
##    0.4  2          0.6          1.00       100        2729.117  0.9426885
##    0.4  2          0.6          1.00       150        2558.090  0.9495869
##    0.4  2          0.8          0.50        50        3045.990  0.9289865
##    0.4  2          0.8          0.50       100        2696.624  0.9442211
##    0.4  2          0.8          0.50       150        2503.150  0.9518984
##    0.4  2          0.8          0.75        50        3023.714  0.9299916
##    0.4  2          0.8          0.75       100        2670.428  0.9453214
##    0.4  2          0.8          0.75       150        2480.137  0.9527555
##    0.4  2          0.8          1.00        50        3019.847  0.9302364
##    0.4  2          0.8          1.00       100        2663.763  0.9455966
##    0.4  2          0.8          1.00       150        2487.186  0.9524967
##    0.4  3          0.6          0.50        50        2724.786  0.9429382
##    0.4  3          0.6          0.50       100        2418.820  0.9549461
##    0.4  3          0.6          0.50       150        2275.699  0.9600475
##    0.4  3          0.6          0.75        50        2691.390  0.9445324
##    0.4  3          0.6          0.75       100        2380.697  0.9565507
##    0.4  3          0.6          0.75       150        2240.595  0.9614770
##    0.4  3          0.6          1.00        50        2665.395  0.9454794
##    0.4  3          0.6          1.00       100        2374.388  0.9566143
##    0.4  3          0.6          1.00       150        2232.598  0.9615750
##    0.4  3          0.8          0.50        50        2649.201  0.9461128
##    0.4  3          0.8          0.50       100        2366.767  0.9568566
##    0.4  3          0.8          0.50       150        2230.412  0.9615915
##    0.4  3          0.8          0.75        50        2591.729  0.9484363
##    0.4  3          0.8          0.75       100        2311.249  0.9588582
```

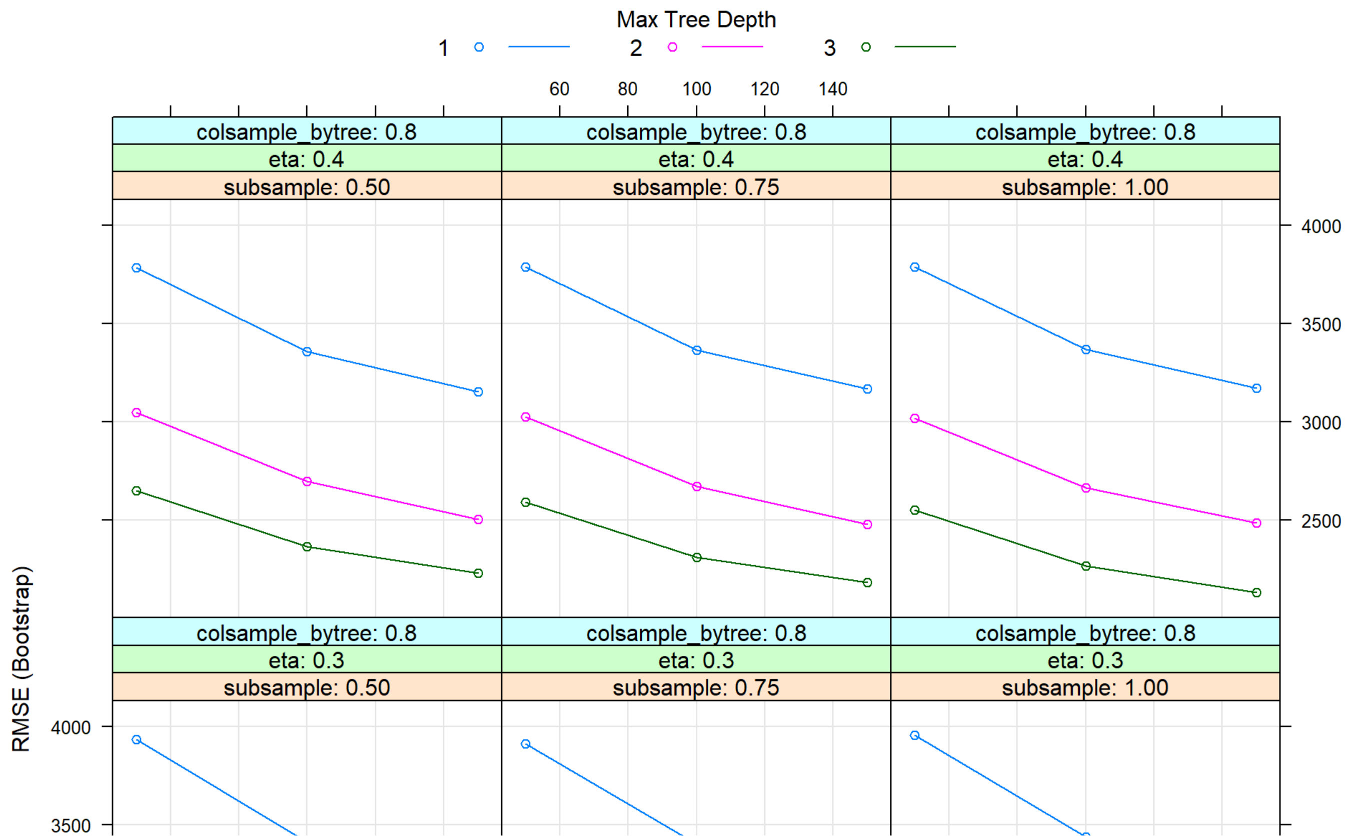
```
##    0.4  3          0.8           0.75       150      2184.521  0.9631652
##    0.4  3          0.8           1.00        50      2552.596  0.9499950
##    0.4  3          0.8           1.00       100      2265.974  0.9605302
##    0.4  3          0.8           1.00       150      2133.722  0.9649395
##    MAE
##    2731.191
##    2331.978
##    2161.434
##    2725.369
##    2328.208
##    2156.664
##    2716.496
##    2326.513
##    2158.342
##    2692.286
##    2309.899
##    2146.894
##    2650.725
##    2280.243
##    2118.513
##    2673.842
##    2292.994
##    2131.055
##    2123.558
##    1818.563
##    1665.808
##    2110.962
##    1804.210
##    1647.656
##    2087.112
##    1789.867
##    1637.275
##    2054.750
##    1774.613
##    1627.876
##    2060.680
##    1772.835
##    1618.163
##    2042.768
##    1757.318
##    1609.105
##    1789.820
##    1526.156
##    1375.814
##    1737.375
##    1471.830
##    1331.762
##    1737.656
##    1468.109
##    1328.888
##    1732.734
##    1477.260
##    1338.168
##    1701.113
##    1443.787
##    1303.303
##    1679.860
##    1423.908
```

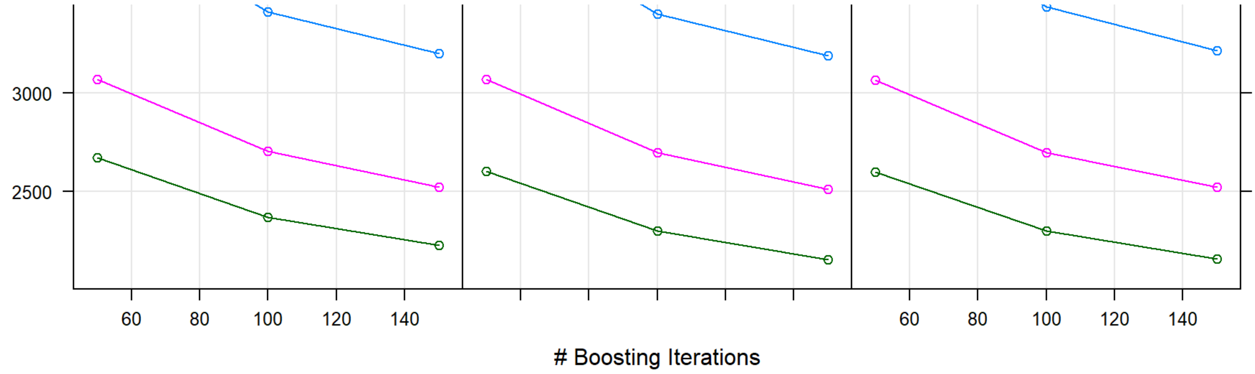
```
##    1289.677
##    2665.204
##    2328.315
##    2164.567
##    2641.356
##    2300.574
##    2137.957
##    2622.489
##    2294.335
##    2139.198
##    2599.069
##    2274.807
##    2117.690
##    2575.368
##    2258.177
##    2104.808
##    2570.391
##    2257.056
##    2110.593
##    2107.425
##    1806.807
##    1646.232
##    2062.853
##    1771.151
##    1610.460
##    2060.860
##    1757.618
##    1604.168
##    2047.645
##    1768.827
##    1609.973
##    2020.215
##    1731.288
##    1571.416
##    2015.756
##    1723.474
##    1568.109
##    1758.620
##    1491.499
##    1348.936
##    1735.540
##    1462.506
##    1318.805
##    1712.339
##    1446.298
##    1304.778
##    1720.370
##    1459.392
##    1323.781
##    1666.442
##    1414.754
##    1275.816
##    1644.426
##    1386.288
##    1254.251
## 
## Tuning parameter 'gamma' was held constant at a value of 0
## Tuning
```

```
##  parameter 'min_child_weight' was held constant at a value of 1
## RMSE was used to select the optimal model using the smallest value.
## The final values used for the model were nrounds = 150, max_depth = 3, eta
##  = 0.4, gamma = 0, colsample_bytree = 0.8, min_child_weight = 1 and subsample
##  = 1.
```

```
plot(xgboost_pca)
```


Max Tree Depth
1
2
3
colsample_bytree: 0.6
eta: 0.4
subsample: 0.50
subsample: 0.75
subsample: 1.00
eta: 0.3
RMSE (Bootstrap)
Boosting Iterations
60
80
100
120
140
2500
3000
3500
4000


Max Tree Depth
1
2
3
colsample_bytree: 0.8
eta: 0.4
subsample: 0.50
subsample: 0.75
subsample: 1.00
eta: 0.3
RMSE (Bootstrap)
60
80
100
120
140
2500
3000
3500
4000



Model Evaluation

Linear Regression on test set

```
## RMSE, R2 and MAE in test data set of Linear Regression
linear_pca_pred <- predict(linear, pca_test_data)
as.table(postResample(pred = linear_pca_pred, obs = pca_test_data$price))
```

```
##          RMSE     Rsquared          MAE
## 3535.5402315    0.9081011 2583.9095914
```

```
ggplot() + geom_point(aes(x = pca_test_data$price , y = linear_pca_pred), color = "red" ,alpha
 =0.2) + xlab("True_Price") + ylab("Pred_Price") + ggtitle("The scatter plot of true price and
 predict price(Linear Regression)")+geom_abline (slope= 1, color = "blue")
```

Lasso Regression on test set

```
## RMSE, R2 and MAE in test data set of Linear Regression
lasso_pca_pred <- predict(lasso_pca, pca_test_data)
as.table(postResample(pred = lasso_pca_pred, obs = pca_test_data$price))
```

```
##          RMSE     Rsquared          MAE
## 5256.0043747    0.8292439 3593.1494320
```

```
ggplot() + geom_point(aes(x = pca_test_data$price , y = lasso_pca_pred), color = "red" ,alpha =
0.2) + xlab("True_Price") + ylab("Pred_Price") + ggtitle("The scatter plot of true price and pr
edict price(Lasso Regression)")+geom_abline (slope= 1, color = "blue")
```

Ridge Regression on test set

```
## RMSE, R2 and MAE in test data set of Ridge Regression
ridge_pca_pred <- predict(ridge_pca, pca_test_data)
as.table(postResample(pred = ridge_pca_pred, obs = pca_test_data$price))
```

```
##          RMSE     Rsquared          MAE
## 3521.6345848    0.9088323 2578.9292709
```

```
ggplot() + geom_point(aes(x = pca_test_data$price , y = ridge_pca_pred), color = "red" ,alpha =
0.2) + xlab("True_Price") + ylab("Pred_Price") + ggtitle("The scatter plot of true price and pr
edict price(Ridge Regression)")+geom_abline (slope= 1, color = "blue")
```

Elasticnet on test set

```
## RMSE, R2 and MAE in test data set of Elastic net
enet_pca_pred <- predict(enet_pca, pca_test_data)
as.table(postResample(pred = enet_pca_pred, obs = pca_test_data$price))
```

```
##         RMSE     Rsquared          MAE
## 3521.6345848    0.9088323 2578.9292709
```

```
ggplot() + geom_point(aes(x = pca_test_data$price , y = enet_pca_pred), color = "red" ,alpha =
0.2) + xlab("True_Price") + ylab("Pred_Price") + ggtitle("The scatter plot of true price and pr
edict price(Elastic net Regression)")+geom_abline (slope= 1, color = "blue")
```

KNN Regression on test set

```
## RMSE, R2 and MAE in test data set
knn_pca_pred <- predict(knn_pca, pca_test_data)
as.table(postResample(pred = knn_pca_pred, obs = pca_test_data$price))
```

```
##          RMSE      Rsquared           MAE
## 2107.9561276     0.9675403  1056.1253734
```

```
ggplot() + geom_point(aes(x = pca_test_data$price , y = knn_pca_pred), color = "red" ,alpha =0.
2) + xlab("True_Price") + ylab("Pred_Price") + ggtitle("The scatter plot of true price and pred
ict price(KNN Regression)")+geom_abline (slope= 1, color = "blue")
```

XGboost on test set

```
## xgboost evaluation
xgboost_pca_pred <- predict(xgboost_pca, pca_test_data)
as.table(postResample(pred = xgboost_pca_pred, obs = pca_test_data$price))
```

```
##          RMSE     Rsquared          MAE
## 1848.3558484    0.9749145 1179.9157517
```

```
ggplot() + geom_point(aes(x = pca_test_data$price , y = xgboost_pca_pred), color = "red" ,alpha
=0.2) + xlab("True_Price") + ylab("Pred_Price") + ggtitle("The scatter plot of true price and p
redict price(XGBoost)")+geom_abline (slope= 1, color = "Blue")
```


The scatter plot of true price and predict price(XGBoost)
Pred_Price
True_Price
0
20000
40000
60000
80000
0
25000
50000
75000