R Notebook

This is an [R Markdown](http://rmarkdown.rstudio.com) Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

library(dplyr)

## Warning: package 'dplyr' was built under R version 3.4.4

##   
## Attaching package: 'dplyr'

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

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

Cars=read.csv('C:\\Users\\R\\Music\\Automobile\_dataV5.csv')  
  
  
Cars%>% filter(price!='?')->Cars

## Warning: package 'bindrcpp' was built under R version 3.4.4

head(as.numeric(Cars$price)) # not the approporiate way!

## [1] 10 138 176 23 38 37

Cars$price=as.numeric(as.character(Cars$price))  
Cars$horsepower=as.numeric(as.character(Cars$horsepower))

## Warning: NAs introduced by coercion

Cars$peak.rpm=as.numeric(as.character(Cars$peak.rpm))

## Warning: NAs introduced by coercion

summary(Cars)

## fuel.type aspiration num.of.doors body.style drive.wheels  
## diesel: 20 std :159 ? : 2 convertible: 6 4wd: 8   
## gas :175 turbo: 36 four:113 hardtop : 8 fwd:117   
## two : 80 hatchback :63 rwd: 70   
## sedan :93   
## wagon :25   
##   
##   
## engine.location wheel.base length width   
## front:192 Min. : 86.60 Min. :144.6 Min. :61.80   
## rear : 3 1st Qu.: 94.50 1st Qu.:166.6 1st Qu.:64.10   
## Median : 97.00 Median :173.2 Median :65.50   
## Mean : 98.91 Mean :174.4 Mean :65.90   
## 3rd Qu.:102.40 3rd Qu.:183.5 3rd Qu.:66.75   
## Max. :120.90 Max. :208.1 Max. :72.00   
##   
## height curb.weight engine.type num.of.cylinders  
## Min. :48.80 Min. :1713 dohc : 12 eight: 4   
## 1st Qu.:52.00 1st Qu.:2157 dohcv: 0 five : 10   
## Median :54.10 Median :2420 l : 11 four :157   
## Mean :53.89 Mean :2557 ohc :145 six : 24   
## 3rd Qu.:55.65 3rd Qu.:2930 ohcf : 15   
## Max. :59.80 Max. :4066 ohcv : 12   
##   
## engine.size horsepower peak.rpm city.mpg   
## Min. : 79.0 Min. : 52.0 Min. :4150 Min. :14.0   
## 1st Qu.: 98.0 1st Qu.: 70.0 1st Qu.:4800 1st Qu.:20.0   
## Median :120.0 Median : 95.0 Median :5100 Median :25.0   
## Mean :127.3 Mean :102.7 Mean :5100 Mean :25.3   
## 3rd Qu.:143.0 3rd Qu.:116.0 3rd Qu.:5500 3rd Qu.:30.0   
## Max. :308.0 Max. :207.0 Max. :6600 Max. :49.0   
## NA's :2 NA's :2   
## highway.mpg price   
## Min. :16.0 Min. : 5118   
## 1st Qu.:25.0 1st Qu.: 7775   
## Median :30.0 Median :10198   
## Mean :30.8 Mean :13135   
## 3rd Qu.:34.0 3rd Qu.:16502   
## Max. :54.0 Max. :45400   
##

model<-lm(price~.,data=Cars)  
summary(model)

##   
## Call:  
## lm(formula = price ~ ., data = Cars)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -6269.0 -1234.2 -53.1 1084.9 11220.6   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -5.616e+04 1.520e+04 -3.693 0.000301 \*\*\*  
## fuel.typegas -7.301e+02 1.159e+03 -0.630 0.529545   
## aspirationturbo 1.265e+03 8.735e+02 1.448 0.149534   
## num.of.doorsfour 6.248e+02 1.751e+03 0.357 0.721733   
## num.of.doorstwo 8.801e+02 1.816e+03 0.485 0.628535   
## body.stylehardtop -4.177e+03 1.451e+03 -2.879 0.004521 \*\*   
## body.stylehatchback -3.924e+03 1.273e+03 -3.084 0.002400 \*\*   
## body.stylesedan -3.266e+03 1.409e+03 -2.317 0.021722 \*   
## body.stylewagon -4.654e+03 1.537e+03 -3.028 0.002861 \*\*   
## drive.wheelsfwd -7.892e+02 1.173e+03 -0.673 0.501958   
## drive.wheelsrwd 1.066e+03 1.285e+03 0.830 0.407971   
## engine.locationrear 6.729e+03 2.565e+03 2.624 0.009519 \*\*   
## wheel.base 3.278e+01 9.854e+01 0.333 0.739852   
## length -2.535e+01 5.183e+01 -0.489 0.625410   
## width 6.361e+02 2.544e+02 2.500 0.013403 \*   
## height 2.487e+02 1.300e+02 1.913 0.057500 .   
## curb.weight 3.780e+00 1.792e+00 2.109 0.036457 \*   
## engine.typel -4.116e+01 1.468e+03 -0.028 0.977661   
## engine.typeohc 2.673e+03 9.455e+02 2.827 0.005291 \*\*   
## engine.typeohcf 3.328e+03 1.325e+03 2.511 0.013001 \*   
## engine.typeohcv -5.092e+03 1.286e+03 -3.959 0.000112 \*\*\*  
## num.of.cylindersfive -1.399e+04 2.473e+03 -5.656 6.75e-08 \*\*\*  
## num.of.cylindersfour -1.664e+04 2.553e+03 -6.516 8.48e-10 \*\*\*  
## num.of.cylinderssix -1.115e+04 2.088e+03 -5.338 3.09e-07 \*\*\*  
## engine.size 6.352e+01 2.120e+01 2.997 0.003151 \*\*   
## horsepower 1.290e+01 2.265e+01 0.570 0.569614   
## peak.rpm 1.994e+00 6.052e-01 3.294 0.001210 \*\*   
## city.mpg -2.936e+02 1.543e+02 -1.903 0.058818 .   
## highway.mpg 3.310e+02 1.445e+02 2.290 0.023281 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 2379 on 164 degrees of freedom  
## (2 observations deleted due to missingness)  
## Multiple R-squared: 0.9227, Adjusted R-squared: 0.9095   
## F-statistic: 69.89 on 28 and 164 DF, p-value: < 2.2e-16

anova(model)

## Analysis of Variance Table  
##   
## Response: price  
## Df Sum Sq Mean Sq F value Pr(>F)   
## fuel.type 1 158592758 158592758 28.0134 3.817e-07 \*\*\*  
## aspiration 1 284046081 284046081 50.1731 3.938e-11 \*\*\*  
## num.of.doors 2 75555741 37777870 6.6730 0.001636 \*\*   
## body.style 4 2017780288 504445072 89.1037 < 2.2e-16 \*\*\*  
## drive.wheels 2 3248868809 1624434405 286.9353 < 2.2e-16 \*\*\*  
## engine.location 1 492514240 492514240 86.9963 < 2.2e-16 \*\*\*  
## wheel.base 1 2042106096 2042106096 360.7116 < 2.2e-16 \*\*\*  
## length 1 476807940 476807940 84.2219 < 2.2e-16 \*\*\*  
## width 1 640680199 640680199 113.1678 < 2.2e-16 \*\*\*  
## height 1 17974335 17974335 3.1749 0.076627 .   
## curb.weight 1 604965968 604965968 106.8594 < 2.2e-16 \*\*\*  
## engine.type 4 387935165 96983791 17.1309 9.283e-12 \*\*\*  
## num.of.cylinders 3 469373301 156457767 27.6362 1.617e-14 \*\*\*  
## engine.size 1 49463277 49463277 8.7370 0.003578 \*\*   
## horsepower 1 33404587 33404587 5.9005 0.016217 \*   
## peak.rpm 1 48811291 48811291 8.6219 0.003799 \*\*   
## city.mpg 1 104338 104338 0.0184 0.892180   
## highway.mpg 1 29694875 29694875 5.2452 0.023281 \*   
## Residuals 164 928457647 5661327   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Ctrl+Alt+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Ctrl+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.