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*.

```
mall=read.csv('Mall_choice_data.csv')
library(mlogit)
```

```
## Warning: package 'mlogit' was built under R version 4.0.0
```

```
## Loading required package: Formula
```

```
## Warning: package 'Formula' was built under R version 4.0.0
```

```
## Loading required package: zoo
```

```
## Warning: package 'zoo' was built under R version 4.0.0
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
## Loading required package: lmtest
```

```
## Warning: package 'lmtest' was built under R version 4.0.0
```

```
mall=read.csv('Mall_choice_data.csv')

library(mlogit)

mall.long = mlogit.data(mall, shape="long",
choice="choice", alt.levels=c("1", "2", "3", "4", "0"))
```

```
mall.ml = mlogit(choice ~ discount + targeting + distance|income + gender,
mall.long, reflevel="0")
summary(mall.ml)
```

```
##
## Call:
## mlogit(formula = choice ~ discount + targeting + distance | income +
##     gender, data = mall.long, reflevel = "0", method = "nr")
##
## Frequencies of alternatives:
##        0        1        2        3        4
## 0.096333 0.077167 0.056000 0.702167 0.068333
##
## nr method
## 7 iterations, 0h:0m:1s
## g'(-H)^-1g = 5.63E-06
## successive function values within tolerance limits
##
## Coefficients :
##                 Estimate Std. Error  z-value  Pr(>|z|)
## 1:(intercept)  0.1548464  0.1762449   0.8786 0.3796256
## 2:(intercept)  0.0686527  0.1922489   0.3571 0.7210146
## 3:(intercept) -0.0172371  0.1461854  -0.1179 0.9061371
## 4:(intercept) -0.0781281  0.1794617  -0.4353 0.6633107
## discount       0.0119388  0.0234668   0.5088 0.6109264
## targeting     -0.0439666  0.0515320  -0.8532 0.3935541
## distance      -0.3082658  0.0109871 -28.0572 < 2.2e-16 ***
## 1:income       0.0224171  0.0035096   6.3873 1.688e-10 ***
## 2:income       0.0140587  0.0039951   3.5190 0.0004332 ***
## 3:income       0.0643959  0.0029682  21.6953 < 2.2e-16 ***
## 4:income       0.0255071  0.0035097   7.2675 3.662e-13 ***
## 1:gender      -0.3524477  0.1277475  -2.7589 0.0057989 **
## 2:gender      -0.1647543  0.1395807  -1.1804 0.2378602
## 3:gender      -0.2403537  0.1003414  -2.3954 0.0166041 *
## 4:gender      -0.1788938  0.1320296  -1.3550 0.1754327
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Log-Likelihood: -4638.1
## McFadden R^2:  0.23927
## Likelihood ratio test : chisq = 2917.7 (p.value = < 2.22e-16)
```

```
soda = read.csv("Soda_choice_data.csv", header=T)
soda.ms = soda[soda$ProductID!=0,]
soda0 = soda$MarketShare[soda$ProductID==0]
soda0 = matrix(soda0, length(soda0), 11)
soda.ms$logMktShrRatio = log(soda.ms$MarketShare/as.vector(t(soda0)))
```

```
View(soda.ms)
soda.ms$Brand=as.factor(soda.ms$Brand)
str(soda.ms)
```

```
## 'data.frame':    572 obs. of  8 variables:
##  $ MarketShare   : num  0.076 0.076 0.182 0.144 0.048 0.056 0.082 0.12 0.012 0.03 ...
##  $ ProductID     : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Week          : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ Brand         : Factor w/ 3 levels "1","2","3": 1 1 1 1 2 2 2 2 3 3 ...
##  $ Sugar         : int  4 3 1 0 5 2 1 0 4 2 ...
##  $ Caffeine      : int  1 1 1 0 1 0 0 1 0 1 ...
##  $ Promotion     : num  0 0 0 0 0 0.3 0 0.2 0 0 ...
##  $ logMktShrRatio: num  -0.5819 -0.5819 0.2914 0.0572 -1.0415 ...
```

```
lm1=lm(logMktShrRatio~ Brand+Sugar+Caffeine+Promotion,data=soda.ms)
summary(lm1)
```

```
##
## Call:
## lm(formula = logMktShrRatio ~ Brand + Sugar + Caffeine + Promotion,
##     data = soda.ms)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.87794 -0.16685  0.00523  0.15381  0.81263
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.176114   0.025637  -6.869  1.7e-11 ***
## Brand2      -0.213095   0.024634  -8.650  < 2e-16 ***
## Brand3      -1.021559   0.027662 -36.930  < 2e-16 ***
## Sugar       -0.200594   0.006366 -31.508  < 2e-16 ***
## Caffeine     0.284706   0.023169  12.288  < 2e-16 ***
## Promotion    0.157844   0.072373   2.181   0.0296 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2441 on 566 degrees of freedom
## Multiple R-squared:  0.8435, Adjusted R-squared:  0.8422
## F-statistic: 610.3 on 5 and 566 DF,  p-value: < 2.2e-16
```

```
AIC(lm1)
```

```
## [1] 18.08829
```

```
BIC(lm1)
```

```
## [1] 48.53226
```

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.