

# eggett3\_assignment6.R

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```
# Homework No. 6 - Caroline Eggett
```

```
#1a.
```

```
set.seed(53)
```

```
clustmean = read.csv("cluster mean.csv", sep=",", header = TRUE)
```

```
rownames = clustmean[,1]
```

```
clustmean = clustmean[,-1]
```

```
rownames(clustmean) = rownames
```

```
DriveExp = clustmean[,1]
```

```
Hauler = clustmean[,2]
```

```
Bad_GM = clustmean[,3]
```

```
Need_Assis = clustmean[,4]
```

```
#2a. Use the following equation to calculate the pWTP of Adaptive cruise control.
```

```
#  $pWTP = \text{BetaFeature} / -\text{BetaPrice} * 1000$ 
```

```
# Drive Experience
```

```
(DriveExp[21]/-DriveExp[26])*1000
```

```
## [1] 500
```

```
# Hauler
```

```
abs((clustmean[21,2]/-clustmean[26,2])*1000)
```

```
## [1] 1065.574
```

```
# Bad_GM
```

```
abs((clustmean[21,3]/-clustmean[26,3])*1000)
```

```
## [1] 1411.765
```

```
# Need_Assis
```

```
(clustmean[21,4]/-clustmean[26,4])*1000
```

```
## [1] 291.6667
```

*#2b. Complete the following command to calculate the pWTP of all product features and segments.  
 # (Hint: i) Create a saving space pWTP using matrix(); ii) Create a two levelssubroutines  
 # using for(), where the first subroutine calculate across clusters and  
 # the second subroutine calculate attribute for each cluster; iii) save the estimated  
 # pWTP to the corresponding cell in pWTP)*

```
pWTP = matrix(NA, ncol = 4 , nrow = 25)

for(c in 1:4){
  for(var in 1:25){
    partworth = clustmean[var, c]
    pcoeff = clustmean[nrow(clustmean), c]
    pWTP[var, c] = (partworth/-pcoeff)*1000
  }
}

colnames(pWTP) = c("Driv Exp", "Hauler", "Bad_GM", "Need_Assis")
rownames(pWTP) = rownames[1:25]
pWTP
```

	Driv Exp	Hauler	Bad_GM
## Toyota.RAV4	15710.5263	18049.18033	24264.70588
## Ford.Escape	12421.0526	17131.14754	22470.58824
## Honda.CR.V	15342.1053	18459.01639	23235.29412
## Nissan.Rogue	13000.0000	15852.45902	21117.64706
## Chevrolet.Equinox	12236.8421	16147.54098	22264.70588
## HC2226	473.6842	950.81967	2000.00000
## HC2228	947.3684	2213.11475	2941.17647
## HC2430	2210.5263	2409.83607	2823.52941
## HC3040	3710.5263	4262.29508	4147.05882
## Drive.Train	-2578.9474	-2278.68852	-2676.47059
## Power.moonroof.sunroof	2000.0000	163.93443	1382.35294
## Dual.zone.temperature.control	2184.2105	934.42623	2529.41176
## Premium.stereo	1763.1579	2065.57377	3088.23529
## Power.folding.outside.mirrors	1657.8947	1278.68852	2676.47059
## Carpeted.floor.mats	1078.9474	-98.36066	-1235.29412
## Forward.collision.warning	1394.7368	-557.37705	-2294.11765
## Rear.corss.traffic.collision.warning	1973.6842	1803.27869	2941.17647
## Rear.obstacle.warning	3026.3158	2344.26230	3000.00000
## Lane.departure.alert	1710.5263	1278.68852	58.82353
## Surround.view.monitor	1210.5263	213.11475	4558.82353
## Adaptive.cruise.control	500.0000	-1065.57377	-1411.76471
## Forward.collision.avoidance	2184.2105	2327.86885	2705.88235
## Reverse.collision.avoidancy	2105.2632	1737.70492	4294.11765
## Lane.keep.assist	2052.6316	819.67213	-294.11765
## Automatic..parking	2394.7368	1032.78689	3794.11765
##	Need_Assis		
## Toyota.RAV4	17791.6667		
## Ford.Escape	15479.1667		
## Honda.CR.V	19604.1667		
## Nissan.Rogue	16145.8333		
## Chevrolet.Equinox	17291.6667		
## HC2226	666.6667		
## HC2228	2750.0000		

## HC2430	1708.3333
## HC3040	3395.8333
## Drive.Train	-1833.3333
## Power.moonroof.sunroof	333.3333
## Dual.zone.temperature.control	500.0000
## Premium.stereo	3166.6667
## Power.folding.outside.mirrors	1125.0000
## Carpeted.floor.mats	187.5000
## Forward.collision.warning	62.5000
## Rear.corss.traffic.collision.warning	1979.1667
## Rear.obstacle.warning	1729.1667
## Lane.departure.alert	166.6667
## Surround.view.monitor	1791.6667
## Adaptive.cruise.control	291.6667
## Forward.collision.avoidance	2250.0000
## Reverse.collision.avoidancy	500.0000
## Lane.keep.assist	708.3333
## Automatic..parking	1437.5000

*#3. This question explores the identification of target segment for your assigned brand.  
# 3a. Based on your analysis results from question 2b.) and a comparison of the pWTP  
# of brands across segments.*

*# 3ai. Order the four segments in terms of their profitability of your assigned  
# brand. Which segment is the most profitable segment?*

*# My Brand was the Ford Escape. The ranking is as follows:  
# 1. Bad\_GM  
# 2. Hauler  
# 3. Need\_Assis  
# 4. Driv Exp*

*# 3aii. Order the four segments in terms of their profitability of other brands,  
# respectively. Which segment is the most profitable segment for your  
# competitors, respectively?*

*# Driv Exp: Toyota.RAV4 has the highest profitability.  
# Hauler: Honda CR.V has the highest profitability.  
# Bad\_GM: Toyota RAV4 has the highest profitability.  
# Need\_Assis: Honda CR.V has the highest profitability.*

*# 3aiii. For each segment, compare the profitability of your assigned brand and  
# the other brand. In which segment does your assigned brand have more  
# advantage for competition?*

*# Based on the other brand's profitabilities, the Ford Escape seems to be #3 in  
# Hauler and Bad\_GM, therefore I think Ford will have a higher advantage in these  
# two segments.*

*# 3b. Based on your analysis results of Assignment#3, which segment is the target  
# segment of your assigned brand.*

*# I think the Hauler segment is the garget segment from Assignment #3.  
# If you look at Ford's slogan, "Shaking Up the Segment with*

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# Versatility and Capability," it reads that Ford is allow their customers to be
# able to take their vehicles off-road, haul more things, make it a vehicle that
# can do basically anything.

# 3c. Combining your answer from a.) and b.), which segment should your assigned
# brand target?

# I think the Hauler segment is the target segment for a Ford Escape since it
# is in the top 3 by roughly ~$1,000 more than the next brand below them.
# Furthermore, I the price difference from the top brand (Honda) and Ford is roughly
# ~$1,5000.

#4a.Copy the following command to create a variable Base that simulate a basic
# condition market that assumes all brands offer an SUV with mpg 30/40, AWD,
# all package features, and is priced at $25,000
Base=rbind(c(1,0,0,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
           # different brands, HC30/40, AWD, $25(,000)
           c(0,1,0,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
           c(0,0,1,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
           c(0,0,0,1,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
           c(0,0,0,0,1, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
           c(rep(0,26)))

# #4b. Copy the following command to create a variable Scen_Ford_ACC that simulate a
# comparison condition market for Ford Escape that assumes to be mpg 30/40,
# AWD, all package features except Adaptive cruise control, and is priced at
# $25,000.
Scen_Ford_ACC=rbind(c(1,0,0,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
                    c(0,1,0,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 0,1,1,1,1, 25),
                    # different brands, HC30/40, AWD, $25(,000)
                    c(0,0,1,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
                    c(0,0,0,1,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
                    c(0,0,0,0,1, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
                    c(rep(0,26)))

#4c. Create a variable xb_base that calculate the attainable utility of basic condition
# market (i.e., Base) using the following equation.
xb_base = sum(exp(Base %*% Hauler))

#4d. Create a variable xb_scen that calculate the attainable utility of comparison
# condition market (i.e., Scen_Ford_ACC) using the following equation.
xb_scen = sum(exp(Scen_Ford_ACC %*% Hauler))

#4e.Use the following equation to calculate the tWTP of Adaptive cruise control for
# Ford Escape.
tWTP = (log(xb_base)-log(xb_scen))/(-Hauler[26])*1000
print(tWTP)

## [1] -232.5428

#4f. Please interpret the tWTP of the Adaptive cruise control for the Ford Escape to
# guide their pricing strategy.

```

```

# The absolute value of this number ($232.54) is the amount that someone is willing
# to pay for the additional of adaptive cruise control for a Ford Escape.

#5b. Create a variable xb_ford_base that calculate the attainable utility of the Ford
# Escape in the basic condition market condition (i.e., Base) using the following
# equation. (Hint: use Base %*% Hauler to calculate the attainable utility for all
# brands)
xb_ford_base = Base %*% Hauler

#5c. Create a variable Mktshare_ford_base that calculate the market share of the Ford
# Escape in the basic condition market condition using the following equation.
# (Hint: use Base %*% Hauler to calculate the attainable utility for all brands)
Mktshare_ford_base = exp(xb_ford_base[2])/sum(exp(xb_ford_base))

#5d. Create a variable xb_ford_scen that calculate the attainable utility of the Ford
# Escape in the comparison condition market (i.e., Scen_Ford_ACC) using the
# following equation. (Hint: use Scen_Ford_ACC %*% Hauler to calculate the
# attainable utility for all brands)
xb_ford_scen = Scen_Ford_ACC %*% Hauler

#5e. Create a variable Mktshare_ford_scen that calculate the market share of the Ford
# Escape in the comparison condition market using the following equation. (Hint:
# use Scen_Ford_ACC %*% Hauler to calculate the attainable utility for all
# brands)
Mktshare_ford_scen = exp(xb_ford_scen[2])/sum(exp(xb_ford_scen))

#5f. Take the answers from question c.) and f.) and calculate the change of market
# share for the Ford Escape if the Adaptive cruise control is not available for the
# vehicle using the following equation.
Mktshare_ford_scen - Mktshare_ford_base # 11.02347 change

```

```
## [1] 0.1102347
```

```

#5g. Please interpret the WTB of Adaptive cruise control for the Ford Escape to guide
# their strategy.

```

```

# It appears that by having the ability for a customer to add adaptive cruise
# control, it creates a 11.02% gain in market share. With that, Ford should price
# their product with adaptive cruise control around $232 (this is the price that
# customers are willing to pay for this feature).

```

```

#6 Create bundle.
# Ford without Power Sunroof + Dual Zone Temperature Control + Premium Stereo
# and Carpeted Floor Mats
# (mimic Ford Premium Luxury Items)

```

```

Scen_Ford_bundle1=
  rbind(c(1,0,0,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
        c(0,1,0,0,0, 0,0,0,1, 0, 0,0,0,0,0, 1,1,1,1,1, 1,1,1,1,1, 25),
        c(0,0,1,0,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
        c(0,0,0,1,0, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
        c(0,0,0,0,1, 0,0,0,1, 0, 1,1,1,1,1, 1,1,1,1,1, 1,1,1,1,1, 25),
        c(rep(0,26))

```

```
)

xb_scen_bundle = sum(exp(Scen_Ford_bundle1 %*% Hauler))

tWTP = (log(xb_base)-log(xb_scen_bundle))/(-Hauler[26])*1000
print(tWTP)
```

```
## [1] 275.5212
```

```
# The tWTP is $275.52
```

```
xb_ford_scen_bundle = Scen_Ford_bundle1 %*% Hauler
Mktshare_ford_scen_bundle = exp(xb_ford_scen[2])/sum(exp(xb_ford_scen_bundle))
Mktshare_ford_scen_bundle - Mktshare_ford_base
```

```
## [1] 0.2107636
```

```
# The increase in market share is 21.08%
```

```
# This means by pricing the premium luxury Ford Escape package at $275.12, the
# market share will increase by 21.08% (since customers will pay this value for
# this enhancement in features for a Ford Escape).
```