

Assignment2

Yifei.Peng

2021/3/16

- Setting up the dataset and environment

Exercise 1 Data Description

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this: <https://www.econometrics-with-r.org/2-2-RSATDOS.html> hotkey to add chunk: ctrl +alt +I

- Average and dispersion in product characteristics(price)

```
cat(" Table of Choice Variable ", fill=TRUE)
```

```
## Table of Choice Variable
```

```
print(table(margarine$choicePrice[,2]))
```

```
##
##      1      2      3      4      5      6      7      8      9     10
## 1766   699   243   593   315    74   319   203   225    33
```

```
##margarine$choicePrice.head(5)
```

```
#head(margarine,n =5)
```

```
#Average of Prices
```

```
cat(" Table of Average Product Characteristic ", fill=TRUE)
```

```
## Table of Average Product Characteristic
```

```
mat1 = apply(as.matrix(margarine$choicePrice[,3:12]), 2, mean)
```

```
print(mat1)
```

```
##      PPK_Stk      PBB_Stk      PFl_Stk      PHse_Stk      PGen_Stk      PImp_Stk      PSS_Tub      PPK_Tub
## 0.5184362 0.5432103 1.0150201 0.4371477 0.3452819 0.7807785 0.8250895 1.0774094
##      PFl_Tub      PHse_Tub
## 1.1893758 0.5686734
```

```
#dispersion
```

```
#summary(margarine$choicePrice[,3])
```

```
stat.desc(margarine$choicePrice[,2:12])
```

```
##
##      choice      PPK_Stk      PBB_Stk      PFl_Stk      PHse_Stk
## nbr.val      4.470000e+03 4.470000e+03 4.470000e+03 4.470000e+03 4.470000e+03
## nbr.null      0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00
## nbr.na        0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00
## min          1.000000e+00 1.900000e-01 1.900000e-01 9.500000e-01 1.900000e-01
## max          1.000000e+01 6.700000e-01 1.010000e+00 1.160000e+00 6.400000e-01
```

```

## range      9.000000e+00 4.800000e-01 8.200000e-01 2.100000e-01 4.500000e-01
## sum        1.449600e+04 2.317410e+03 2.428150e+03 4.537140e+03 1.954050e+03
## median     2.000000e+00 5.800000e-01 5.800000e-01 9.900000e-01 4.500000e-01
## mean       3.242953e+00 5.184362e-01 5.432103e-01 1.015020e+00 4.371477e-01
## SE.mean    3.869719e-02 2.251298e-03 1.799811e-03 6.415859e-04 1.777366e-03
## CI.mean.0.95 7.586564e-02 4.413658e-03 3.528520e-03 1.257826e-03 3.484517e-03
## var        6.693702e+00 2.265549e-02 1.447976e-02 1.839997e-03 1.412086e-02
## std.dev    2.587219e+00 1.505174e-01 1.203319e-01 4.289519e-02 1.188312e-01
## coef.var   7.977972e-01 2.903296e-01 2.215198e-01 4.226043e-02 2.718332e-01
##           PGen_Stk    PImp_Stk    PSS_Tub    PPk_Tub    PFl_Tub
## nbr.val    4.470000e+03 4.470000e+03 4.470000e+03 4.470000e+03 4.470000e+03
## nbr.null   0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00
## nbr.na     0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00
## min        2.500000e-01 3.300000e-01 5.000000e-01 9.800000e-01 6.900000e-01
## max        5.500000e-01 2.300000e+00 9.800000e-01 1.240000e+00 1.470000e+00
## range      3.000000e-01 1.970000e+00 4.800000e-01 2.600000e-01 7.800000e-01
## sum        1.543410e+03 3.490080e+03 3.688150e+03 4.816020e+03 5.316510e+03
## median     3.300000e-01 7.500000e-01 8.500000e-01 1.090000e+00 1.190000e+00
## mean       3.452819e-01 7.807785e-01 8.250895e-01 1.077409e+00 1.189376e+00
## SE.mean    5.259808e-04 1.714768e-03 9.155455e-04 4.446156e-04 2.102142e-04
## CI.mean.0.95 1.031183e-03 3.361794e-03 1.794922e-03 8.716666e-04 4.121239e-04
## var        1.236651e-03 1.314372e-02 3.746859e-03 8.836431e-04 1.975293e-04
## std.dev    3.516605e-02 1.146461e-01 6.121159e-02 2.972613e-02 1.405451e-02
## coef.var   1.018474e-01 1.468356e-01 7.418783e-02 2.759038e-02 1.181671e-02
##           PHse_Tub
## nbr.val    4.470000e+03
## nbr.null   0.000000e+00
## nbr.na     0.000000e+00
## min        3.300000e-01
## max        1.270000e+00
## range      9.400000e-01
## sum        2.541970e+03
## median     5.900000e-01
## mean       5.686734e-01
## SE.mean    1.083714e-03
## CI.mean.0.95 2.124616e-03
## var        5.249728e-03
## std.dev    7.245500e-02
## coef.var   1.274106e-01

```

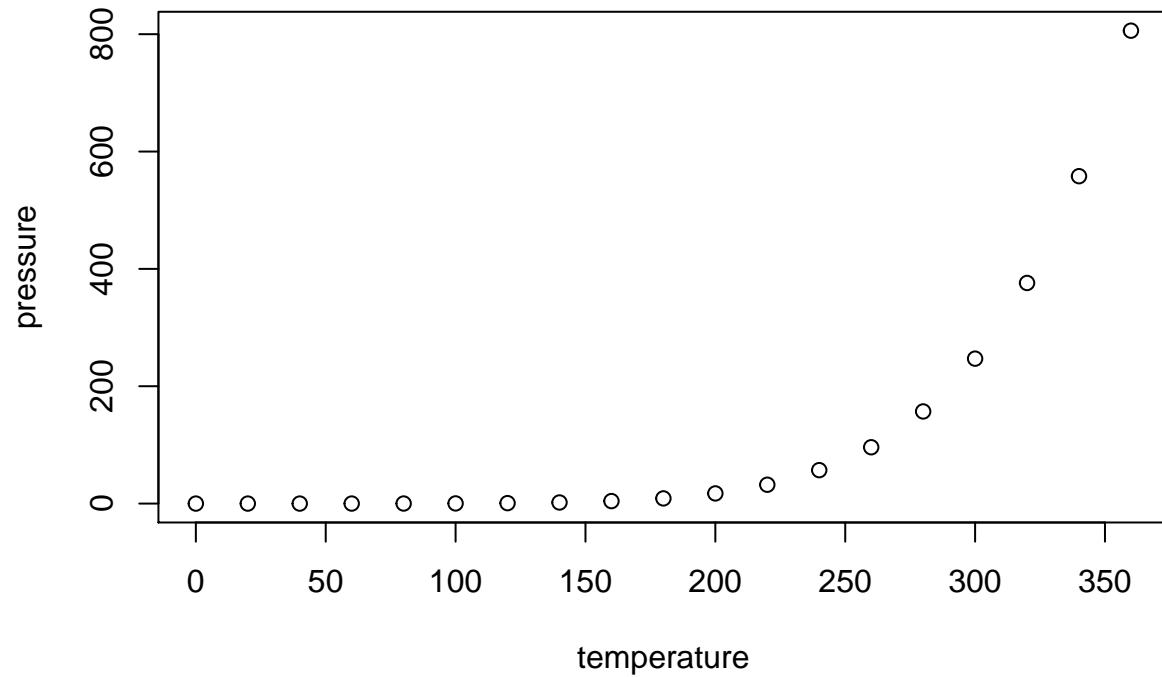
- Market share (choice frequency) and market share by product characteristics (choice frequency by price bins: below average, over average).
- Illustrate the mapping between observed attributes and choices (Which customers are choosing which products?) : see some individuals with specific characteristics choosing some products with specific attributes?make some tables..

Exercise 2 First Model

Hints:Hi professor, also, for exercise 2 and 3, do we have to build the model from scratch?If by scratch, you mean writing the likelihood.. the answer is YES

- We are interested in the effect of price on demand. Propose a model specification.
- Write the likelihood and optimize the model.
- Interpret the coefficient on price

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Exercise 3 Second Model

Exercise 4 Marginal Effects

Exercise 5 IIA