Logistics data analysis using R programming
[202102-LSB5019-001]

Assignment 4

QIA WANG
(91219618)

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#1) Load the price index .csv file attached via this assignment##########################

```
destfile<- "D:\\One\\OneDrive\\My research\\5th semester\\R\\Assignment 4\\food-price-index-September-2021-index-numbers-csv-tables.csv"
pricedata<- read.csv(destfile) #load the file
```

#2) Use 4 methods that you learned in the last two sessions to manipulate the dataset####

```
#2.1: read the data file and overview its content (library(data.table))
head(pricedata,n=3) # check the first 3 rows
```

```
##   Series_reference  Period Data_value STATUS   UNITS
## 1     CPIM.SAP0100 2006.06       3.11  FINAL Dollars
## 2     CPIM.SAP0100 2006.07       2.78  FINAL Dollars
## 3     CPIM.SAP0100 2006.08       2.43  FINAL Dollars
##                       Subject
## 1 Consumers Price Index - CPI
## 2 Consumers Price Index - CPI
## 3 Consumers Price Index - CPI
##                                                                 Group
```

```
## 1 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 2 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 3 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##   Series_title_1
## 1   Oranges, 1kg
## 2   Oranges, 1kg
## 3   Oranges, 1kg
```

```
tail(pricedata,n=10)# check the last 10 rows
```

```
##       Series_reference  Period Data_value STATUS   UNITS
## 25954     CPIM.SAP0269 2020.12       3.08  FINAL Dollars
## 25955     CPIM.SAP0269 2021.01       3.10  FINAL Dollars
## 25956     CPIM.SAP0269 2021.02       3.09  FINAL Dollars
## 25957     CPIM.SAP0269 2021.03       3.10  FINAL Dollars
## 25958     CPIM.SAP0269 2021.04       3.08  FINAL Dollars
## 25959     CPIM.SAP0269 2021.05       3.12  FINAL Dollars
## 25960     CPIM.SAP0269 2021.06       3.16  FINAL Dollars
## 25961     CPIM.SAP0269 2021.07       3.10  FINAL Dollars
## 25962     CPIM.SAP0269 2021.08       3.13  FINAL Dollars
## 25963     CPIM.SAP0269 2021.09       3.16  FINAL Dollars
##                          Subject
## 25954 Consumers Price Index - CPI
## 25955 Consumers Price Index - CPI
## 25956 Consumers Price Index - CPI
## 25957 Consumers Price Index - CPI
## 25958 Consumers Price Index - CPI
## 25959 Consumers Price Index - CPI
## 25960 Consumers Price Index - CPI
## 25961 Consumers Price Index - CPI
## 25962 Consumers Price Index - CPI
## 25963 Consumers Price Index - CPI
##                                                                        Group
## 25954 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25955 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25956 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25957 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25958 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
```

```
## 25959 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25960 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25961 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25962 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 25963 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##                  Series_title_1
## 25954 Chewing gum, packet, each
## 25955 Chewing gum, packet, each
## 25956 Chewing gum, packet, each
## 25957 Chewing gum, packet, each
## 25958 Chewing gum, packet, each
## 25959 Chewing gum, packet, each
## 25960 Chewing gum, packet, each
## 25961 Chewing gum, packet, each
## 25962 Chewing gum, packet, each
## 25963 Chewing gum, packet, each
```

```
summary(pricedata) # summary of the object
```

```
##  Series_reference       Period       Data_value        STATUS
##  Length:25963       Min.   :2006   Min.   : 0.900   Length:25963
##  Class :character   1st Qu.:2010   1st Qu.: 2.640   Class :character
##  Mode  :character   Median :2014   Median : 3.660   Mode  :character
##                     Mean   :2014   Mean   : 5.432
##                     3rd Qu.:2018   3rd Qu.: 6.160
##                     Max.   :2021   Max.   :37.960
##                                    NA's   :82
##     UNITS              Subject             Group           Series_title_1
##  Length:25963       Length:25963       Length:25963       Length:25963
##  Class :character   Class :character   Class :character   Class :character
##  Mode  :character   Mode  :character   Mode  :character   Mode  :character
##
##
##
##
```

```
dim(pricedata) # check the dimension
```

```
## [1] 25963     8
```

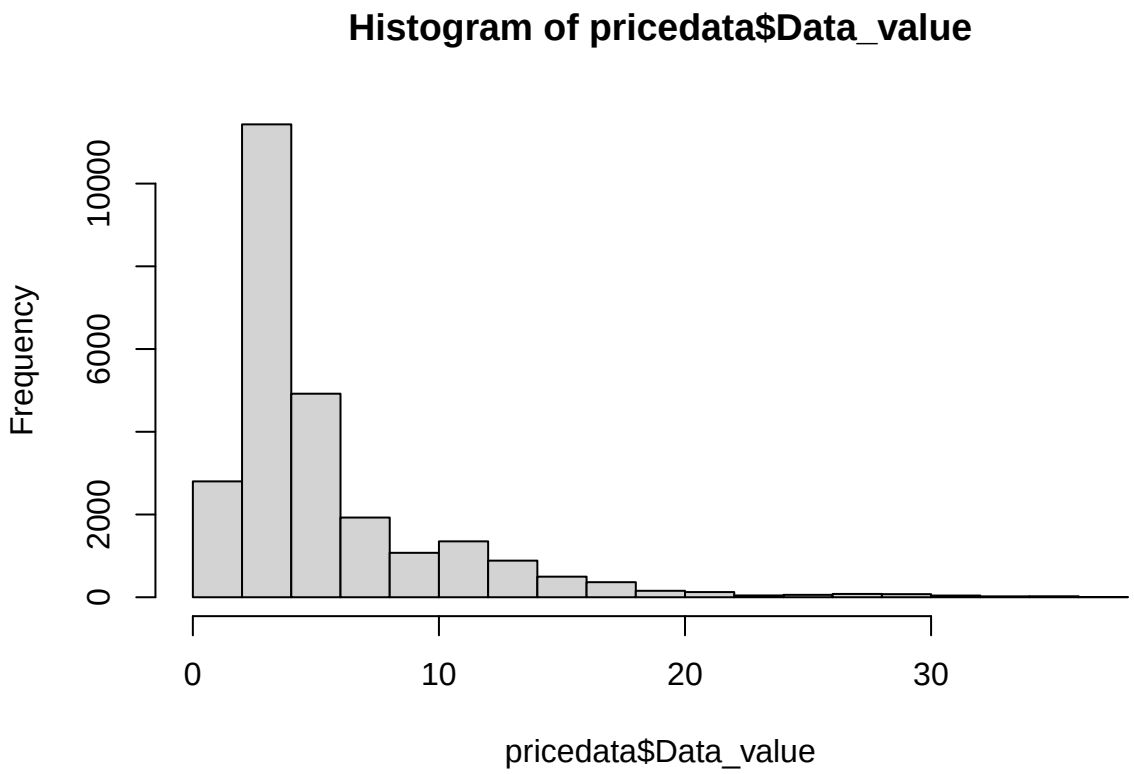
```r
names(pricedata) # check the object names
```

```
## [1] "Series_reference" "Period"           "Data_value"       "STATUS"
## [5] "UNITS"            "Subject"          "Group"            "Series_title_1"
```

```r
str(pricedata)# the structure
```

```
## 'data.frame':    25963 obs. of  8 variables:
##  $ Series_reference: chr  "CPIM.SAP0100" "CPIM.SAP0100" "CPIM.SAP0100" "CPIM.SAP0100" ...
##  $ Period          : num  2006 2006 2006 2006 2006 ...
##  $ Data_value      : num  3.11 2.78 2.43 2.42 3.04 3.24 3.27 3.18 3.74 4.21 ...
##  $ STATUS          : chr  "FINAL" "FINAL" "FINAL" "FINAL" ...
##  $ UNITS           : chr  "Dollars" "Dollars" "Dollars" "Dollars" ...
##  $ Subject         : chr  "Consumers Price Index - CPI" "Consumers Price Index - CPI" "Consumers Price Index - CPI" "Consumers Price In
##  $ Group           : chr  "Food Price Index Selected Monthly Weighted Average Prices for New Zealand" "Food Price Index Selected Monthl
##  $ Series_title_1  : chr  "Oranges, 1kg" "Oranges, 1kg" "Oranges, 1kg" "Oranges, 1kg" ...
```

```r
#attributes(pricedata)# object's attributes
hist(pricedata$Data_value)# Use a histogram to display data distribution
```




```
table(pricedata$Data_value)[1:5] # Frequency of occurrence of the first 5 values
```

```
##
##  0.9 0.91 0.93 0.94 0.95
##    1    1    1    1    4
```

```
is.factor(pricedata$Series_title_1) # Determine whether it is factor data
```

```
## [1] FALSE
```

```r
#as.factor(pricedata$Series_title_1) # Convert to factor data

#2.2: Remove the missing data
colSums(is.na(pricedata))
```

```
## Series_reference           Period       Data_value           STATUS
##                0                0               82                0
##            UNITS          Subject            Group   Series_title_1
##                0                0                0                0
```

```r
#2.2.1 Method 1: na.omit()
good1<-na.omit(pricedata)
dim(good1)
```

```
## [1] 25881     8
```

```r
#2.2.2 Method 2: complete.cases()
good2<-pricedata[complete.cases(pricedata),]
dim(good2)
```

```
## [1] 25881     8
```

```r
#2.2.3 Method 3: is.na()
badrow<-which(rowSums(is.na(pricedata))>0) # Find the rows with missing values in the table "pricedata"
bad<-pricedata[badrow,] # Save these rows with missing values in a table "bad"
good3<-pricedata[-badrow,] # Save rows without missing values in the original table
dim(good3)
```

```
## [1] 25881     8
```

```r
#2.3: Modify table
#2.3.1 Change the factor name
names(good3)[1]<-"reference" # Change the factor name through the names() function
names(good3)[1]<-"Series_reference" #Change it back
```

```
#2.3.2 Sorting
sordata<-sort(good1$Data_value,decreasing=TRUE)
head(sordata)
```

```
## [1] 37.96 37.49 36.91 36.38 36.14 36.11
```

```
#2.3.3 Ordering
#Method 1: order
ordata<-good1[order(good1$Series_reference,good1$Data_value),]
head(ordata)
```

```
##     Series_reference  Period Data_value STATUS   UNITS
## 63      CPIM.SAP0100 2011.08       2.36  FINAL Dollars
## 99      CPIM.SAP0100 2014.08       2.36  FINAL Dollars
## 4       CPIM.SAP0100 2006.09       2.42  FINAL Dollars
## 3       CPIM.SAP0100 2006.08       2.43  FINAL Dollars
## 100     CPIM.SAP0100 2014.09       2.43  FINAL Dollars
## 16      CPIM.SAP0100 2007.09       2.47  FINAL Dollars
##                         Subject
## 63  Consumers Price Index - CPI
## 99  Consumers Price Index - CPI
## 4   Consumers Price Index - CPI
## 3   Consumers Price Index - CPI
## 100 Consumers Price Index - CPI
## 16  Consumers Price Index - CPI
##                                                                    Group
## 63  Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 99  Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 4   Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 3   Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 100 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 16  Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##     Series_title_1
## 63    Oranges, 1kg
## 99    Oranges, 1kg
## 4     Oranges, 1kg
## 3     Oranges, 1kg
## 100   Oranges, 1kg
```

```
## 16    Oranges, 1kg
```

```
#Method 2: library(plyr)
library(plyr)
head(arrange(good1,Series_reference))
```

```
##   Series_reference  Period Data_value STATUS   UNITS
## 1     CPIM.SAP0100 2006.06       3.11  FINAL Dollars
## 2     CPIM.SAP0100 2006.07       2.78  FINAL Dollars
## 3     CPIM.SAP0100 2006.08       2.43  FINAL Dollars
## 4     CPIM.SAP0100 2006.09       2.42  FINAL Dollars
## 5     CPIM.SAP0100 2006.10       3.04  FINAL Dollars
## 6     CPIM.SAP0100 2006.11       3.24  FINAL Dollars
##                       Subject
## 1 Consumers Price Index - CPI
## 2 Consumers Price Index - CPI
## 3 Consumers Price Index - CPI
## 4 Consumers Price Index - CPI
## 5 Consumers Price Index - CPI
## 6 Consumers Price Index - CPI
##                                                                    Group
## 1 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 2 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 3 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 4 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 5 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 6 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##   Series_title_1
## 1   Oranges, 1kg
## 2   Oranges, 1kg
## 3   Oranges, 1kg
## 4   Oranges, 1kg
## 5   Oranges, 1kg
## 6   Oranges, 1kg
```

```
#2.3.4 Adding new column
#Method 1
newdata<-transform(good1,price=(Data_value*100))# Add new column named "price"
head(newdata,n=3)
```

```
##   Series_reference  Period Data_value STATUS   UNITS
## 1     CPIM.SAP0100 2006.06       3.11  FINAL Dollars
## 2     CPIM.SAP0100 2006.07       2.78  FINAL Dollars
## 3     CPIM.SAP0100 2006.08       2.43  FINAL Dollars
##                       Subject
## 1 Consumers Price Index - CPI
## 2 Consumers Price Index - CPI
## 3 Consumers Price Index - CPI
##                                                                  Group
## 1 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 2 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 3 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##   Series_title_1 price
## 1   Oranges, 1kg   311
## 2   Oranges, 1kg   278
## 3   Oranges, 1kg   243
```

```
#Method 2:
ID<-1:25881
df<-data.frame(ID,good3)# Add serial number column
head(df,n=3)
```

```
##   ID Series_reference  Period Data_value STATUS   UNITS
## 1  1     CPIM.SAP0100 2006.06       3.11  FINAL Dollars
## 2  2     CPIM.SAP0100 2006.07       2.78  FINAL Dollars
## 3  3     CPIM.SAP0100 2006.08       2.43  FINAL Dollars
##                       Subject
## 1 Consumers Price Index - CPI
## 2 Consumers Price Index - CPI
## 3 Consumers Price Index - CPI
##                                                                  Group
## 1 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 2 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 3 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##   Series_title_1
## 1   Oranges, 1kg
## 2   Oranges, 1kg
## 3   Oranges, 1kg
```

```r
#2.4: Subsetting the data set
#2.4.1 Remove the unwanted columns
newdata1<- good3[,-c(4:7)]# Remove columns with unique values
head(newdata1,n=3)
```

```
##   Series_reference  Period Data_value Series_title_1
## 1     CPIM.SAP0100 2006.06       3.11   Oranges, 1kg
## 2     CPIM.SAP0100 2006.07       2.78   Oranges, 1kg
## 3     CPIM.SAP0100 2006.08       2.43   Oranges, 1kg
```

```r
#2.4.2 Select the desired column with conditions
# Method 1: Designated columns
newdata2<-good3[,c(1:3,8)]#Specify columns 1 to 3 and column 8
head(newdata2,n=3)
```

```
##   Series_reference  Period Data_value Series_title_1
## 1     CPIM.SAP0100 2006.06       3.11   Oranges, 1kg
## 2     CPIM.SAP0100 2006.07       2.78   Oranges, 1kg
## 3     CPIM.SAP0100 2006.08       2.43   Oranges, 1kg
```

```r
# Method 2: Column containing key information
Olives<-pricedata[pricedata$Series_title_1=="Olives, jar, 400g",] # All rows where Series_reference is "Olives, jar, 400g"
head(Olives,n=2)
```

```
##       Series_reference  Period Data_value STATUS   UNITS
## 24604     CPIM.SAP0261 2017.10       4.41  FINAL Dollars
## 24605     CPIM.SAP0261 2017.11       4.48  FINAL Dollars
##                           Subject
## 24604 Consumers Price Index - CPI
## 24605 Consumers Price Index - CPI
##                                                                    Group
## 24604 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 24605 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##          Series_title_1
## 24604 Olives, jar, 400g
## 24605 Olives, jar, 400g
```

```r
# Method 3: The column containing the specified value
ndata<-newdata[newdata$price<=50 | newdata$price>=500,]#Columns less than or equal to 50, or greater than or equal to 500
head(ndata,n=2)
```

```
##     Series_reference  Period Data_value STATUS   UNITS
## 496     CPIM.SAP0102 2017.01       5.04  FINAL Dollars
## 561     CPIM.SAP0103 2007.02       5.28  FINAL Dollars
##                         Subject
## 496 Consumers Price Index - CPI
## 561 Consumers Price Index - CPI
##                                                                    Group
## 496 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 561 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##     Series_title_1 price
## 496    Apples, 1kg   504
## 561 Kiwifruit, 1kg   528
```

```r
# Method 4: The column containing the specified charactors
ndata<-good3[good3$Period %in% c("2021.09"),] # %in%
head(ndata,n=2)
```

```
##     Series_reference  Period Data_value STATUS   UNITS
## 184     CPIM.SAP0100 2021.09       3.49  FINAL Dollars
## 368     CPIM.SAP0101 2021.09       2.92  FINAL Dollars
##                         Subject
## 184 Consumers Price Index - CPI
## 368 Consumers Price Index - CPI
##                                                                    Group
## 184 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
## 368 Food Price Index Selected Monthly Weighted Average Prices for New Zealand
##     Series_title_1
## 184   Oranges, 1kg
## 368   Bananas, 1kg
```

```r
# Method 5: Casting data frames:library(reshape2)
library(reshape2)
newdata3<-dcast(good3,Data_value~Series_reference)
```

```
## Using Series_title_1 as value column: use value.var to override.

## Aggregation function missing: defaulting to length
```

```
head(newdata3,n=1)
```

```
##   Data_value CPIM.SAP0100 CPIM.SAP0101 CPIM.SAP0102 CPIM.SAP0103 CPIM.SAP0104
## 1        0.9            0            0            0            0            0
##   CPIM.SAP0105 CPIM.SAP0106 CPIM.SAP0107 CPIM.SAP0108 CPIM.SAP0109 CPIM.SAP0110
## 1            0            0            0            0            0            0
##   CPIM.SAP0111 CPIM.SAP0112 CPIM.SAP0113 CPIM.SAP0114 CPIM.SAP0115 CPIM.SAP0116
## 1            0            0            0            0            0            0
##   CPIM.SAP0117 CPIM.SAP0118 CPIM.SAP0120 CPIM.SAP0121 CPIM.SAP0123 CPIM.SAP0124
## 1            0            0            0            0            0            0
##   CPIM.SAP0125 CPIM.SAP0126 CPIM.SAP0127 CPIM.SAP0128 CPIM.SAP0129 CPIM.SAP0130
## 1            0            0            0            0            0            0
##   CPIM.SAP0131 CPIM.SAP0132 CPIM.SAP0134 CPIM.SAP0136 CPIM.SAP0137 CPIM.SAP0138
## 1            0            0            0            0            0            0
##   CPIM.SAP0139 CPIM.SAP0140 CPIM.SAP0142 CPIM.SAP0143 CPIM.SAP0144 CPIM.SAP0145
## 1            0            0            0            0            0            0
##   CPIM.SAP0146 CPIM.SAP0147 CPIM.SAP0148 CPIM.SAP0149 CPIM.SAP0151 CPIM.SAP0152
## 1            0            0            0            0            0            0
##   CPIM.SAP0153 CPIM.SAP0154 CPIM.SAP0155 CPIM.SAP0156 CPIM.SAP0157 CPIM.SAP0158
## 1            1            0            0            0            0            0
##   CPIM.SAP0159 CPIM.SAP0160 CPIM.SAP0161 CPIM.SAP0162 CPIM.SAP0164 CPIM.SAP0165
## 1            0            0            0            0            0            0
##   CPIM.SAP0166 CPIM.SAP0167 CPIM.SAP0168 CPIM.SAP0169 CPIM.SAP0170 CPIM.SAP0172
## 1            0            0            0            0            0            0
##   CPIM.SAP0173 CPIM.SAP0174 CPIM.SAP0176 CPIM.SAP0177 CPIM.SAP0178 CPIM.SAP0179
## 1            0            0            0            0            0            0
##   CPIM.SAP0180 CPIM.SAP0181 CPIM.SAP0182 CPIM.SAP0183 CPIM.SAP0184 CPIM.SAP0185
## 1            0            0            0            0            0            0
##   CPIM.SAP0186 CPIM.SAP0187 CPIM.SAP0188 CPIM.SAP0189 CPIM.SAP0190 CPIM.SAP0191
## 1            0            0            0            0            0            0
##   CPIM.SAP0192 CPIM.SAP0193 CPIM.SAP0194 CPIM.SAP0195 CPIM.SAP0197 CPIM.SAP0198
## 1            0            0            0            0            0            0
##   CPIM.SAP0199 CPIM.SAP0200 CPIM.SAP0201 CPIM.SAP0202 CPIM.SAP0203 CPIM.SAP0204
## 1            0            0            0            0            0            0
```

```
##   CPIM.SAP0205 CPIM.SAP0207 CPIM.SAP0208 CPIM.SAP0209 CPIM.SAP0210 CPIM.SAP0211
## 1            0            0            0            0            0            0
##   CPIM.SAP0212 CPIM.SAP0213 CPIM.SAP0214 CPIM.SAP0215 CPIM.SAP0216 CPIM.SAP0217
## 1            0            0            0            0            0            0
##   CPIM.SAP0219 CPIM.SAP0220 CPIM.SAP0221 CPIM.SAP0222 CPIM.SAP0223 CPIM.SAP0224
## 1            0            0            0            0            0            0
##   CPIM.SAP0225 CPIM.SAP0226 CPIM.SAP0227 CPIM.SAP0228 CPIM.SAP0229 CPIM.SAP0230
## 1            0            0            0            0            0            0
##   CPIM.SAP0231 CPIM.SAP0232 CPIM.SAP0233 CPIM.SAP0234 CPIM.SAP0235 CPIM.SAP0236
## 1            0            0            0            0            0            0
##   CPIM.SAP0238 CPIM.SAP0239 CPIM.SAP0240 CPIM.SAP0241 CPIM.SAP0242 CPIM.SAP0243
## 1            0            0            0            0            0            0
##   CPIM.SAP0244 CPIM.SAP0245 CPIM.SAP0246 CPIM.SAP0247 CPIM.SAP0248 CPIM.SAP0249
## 1            0            0            0            0            0            0
##   CPIM.SAP0251 CPIM.SAP0252 CPIM.SAP0253 CPIM.SAP0254 CPIM.SAP0256 CPIM.SAP0257
## 1            0            0            0            0            0            0
##   CPIM.SAP0258 CPIM.SAP0259 CPIM.SAP0260 CPIM.SAP0261 CPIM.SAP0262 CPIM.SAP0263
## 1            0            0            0            0            0            0
##   CPIM.SAP0264 CPIM.SAP0265 CPIM.SAP0266 CPIM.SAP0267 CPIM.SAP0268 CPIM.SAP0269
## 1            0            0            0            0            0            0
```

#3)Use the factor function for column "Series_title_1" and get the average for each product using the price values in column "Data_value" by sapply function####

```
splitmean <- function(newdata2) {
  s <- split( newdata2, newdata2$Series_title_1)
  sapply( s, function(x) mean(x$Data_value) )
}
splitmean(newdata2)
```

```
##                                          Apples, 1kg
##                                             2.837609
##                                 Apricots, dried, 100g
##                                             2.193089
##                                        Avocado, 1kg
##                                             9.789261
##                                      Baby food, 110g
##                                             1.096648
```

```
##              Bacon - middle rashers (supermarket only), 700g
##                                                    12.004432
##                                                Bananas, 1kg
##                                                    2.740761
##                                                  Beans, 1kg
##                                                   12.858864
##                                             Beef - mince, 1kg
##                                                   12.698913
##                                       Beef steak - blade, 1kg
##                                                   15.687935
##                          Beef steak - porterhouse/sirloin, 1kg
##                                                   26.263859
##                                        Berries, frozen, 500g
##                                                    6.499837
##                                     Biscuits - chocolate, 200g
##                                                    2.831957
##     Biscuits, plain (eg arrowroot, ginger, malt, wine), 250g
##                                                    2.216989
##                                Biscuits, savoury, crackers 250g
##                                                    3.160625
##                                         Bottled water, 750ml
##                                                    2.029946
##                                Bread - white sliced loaf, 600g
##                                                    1.323261
##                                Bread rolls, filled, hot, each
##                                                    6.276229
##                             Bread rolls, hamburger buns, 6 pack
##                                                    2.784489
##                                       Breakfast biscuits, 1kg
##                                                    5.623913
##                                Breakfast drink, 250ml, 6 pack
##                                                    7.712874
##                                                Broccoli, 1kg
##                                                    5.917120
##                  Burger, with or without accompaniments, each
##                                                    4.597600
##                                       Butter - salted, 500g
##                                                    3.978261
##                                                 Cabbage, 1kg
```

```
##                                                 1.976848
##                                 Cakes and biscuits, takeaway
##                                                 3.634114
##                               Capsicums, green, else red, 1kg
##                                                12.769602
##                                               Carrots, 1kg
##                                                 2.136304
##                                             Cauliflower, 1kg
##                                                 3.427273
##                                              Celery, 1kg
##                                                 3.319659
##                Cheese - mild cheddar (supermarket only), 1kg
##                                                 9.102391
##                                      Cheese, camembert, 125g
##                                                 4.276818
##                                Cheese, processed slices, 250g
##                                                 3.500227
##                                     Chewing gum, packet, each
##                                                 2.724188
##                                           Chicken breast, 1kg
##                                                13.958409
##                                  Chicken nuggets, frozen, 1kg
##                                                11.063252
##  Chicken pieces (excluding breast), boneless or bone in, 1kg
##                                                 8.147471
##          Chicken, cooked, whole, No. 15 - Cheapest Available
##                                                11.575975
##          Chicken, whole, frozen, No. 15 - Cheapest Available
##                                                 8.099318
##             Chilled fruit juice or smoothies, 1 to 1.5 litre
##                                                 4.586352
##                   Chocolate - block (supermarket only), 250g
##                                                 3.960435
##           Chocolate blocks, convenience stores, 100g to 250g
##                                                 4.534261
##                                 Chocolate novelty bars, 50g
##                                                 1.425455
##                               Chocolate, boxed, loose, 250g
##                                                 8.467670
```

```
##                                  Coffee - instant, 100g
##                                               5.550380
##                                    Coffee, ground, 200g
##                                               6.314716
##                                   Coffee, takeway, each
##                                               3.575086
##                                  Cookie, takeaway, each
##                                               1.876686
##                                       Corn flakes, 500g
##                                               3.386477
##                  Corned beef, fresh, chilled or frozen, 1kg
##                                               9.553920
##                                     Courgettes, 1kg
##                                               8.753636
##                           Cream, 300ml - Cheapest Available
##                                               2.233693
##                                      Cucumber, 1kg
##                                               7.793807
##                                  Dessert, frozen, 500g
##                                               6.350629
##                        Dried mixed herbs, 10g to 15g
##                                               2.363587
##                  Dried pasta, spaghetti or other type, 500g
##                                               1.884151
##                           Drinking chocolate, 300g
##                                               3.927443
##                                        Eggs, dozen
##                                               3.730870
##                           Eggs, free range, 6 pack
##                                               4.710252
##                     Fish and chips, One fish/chips
##                                               5.948579
##           Fish fillets, frozen, multipack, 500g
##                                               7.324545
##                  Flat bread - pita, tortilla, or other type
##                                               4.134228
##             Flour - white (supermarket only), 1.5kg
##                                               1.942935
##                                     Fresh fish, 1kg
```

```
##                                                 29.396534
##                                 Fresh herbs, packaged, chilled
##                                                 3.793958
##            Fresh pasta, tortellini or other filled type, 300g
##                                                 4.591384
##                    Fried and other takeaway chicken, 5 pieces
##                                                 11.338743
##             Fruit flavoured drink powder, multipack of 3 to 5
##                                                 1.255562
##         Fruit juice - apple based (supermarket only), 3 litre
##                                                 4.176774
##                                       Grapes, green or red
##                                                 7.479830
##                                    Ham, sliced or shaved, 1kg
##                                                 13.677609
##                                  Honey, clover, creamed, 500g
##                                                 7.062500
##                                        Hot chips, hot wedges
##                                                 2.974971
##                                           Hummus dip, 200g
##                                                 3.745786
##                                  Ice block, water based, each
##                                                 2.128977
##                           Ice cream bought in bulk, 2 litres
##                                                 5.588182
##                    Ice cream novelty, chocolate coated, each
##                                                 3.182784
##                                       Infant formula, 900g
##                                                 19.292955
##                                                 Jam, 375g
##                                                 2.614830
##                                             Kiwifruit, 1kg
##                                                 3.737826
##                                               Kumara, 1kg
##                                                 5.290057
##                                          Lamb - chops, 1kg
##                                                 14.218750
##                                              Lettuce, 1kg
##                                                 4.397772
```

```
##                                              Mandarins, 1kg
##                                                  5.262159
##                                 Margarine/table spread, 500g
##                                                  2.339837
##                                           Mayonnaise, 380ml
##                                                  3.326304
##                                       Meat pie - hot, each
##                                                  3.701093
##         Meat pies, chilled, 6 or 8 pack - Cheapest Available
##                                                  6.068693
##                         Milk - standard homogenised, 2 litres
##                                                  3.386141
##                               Milk, calcium enriched, 2 litres
##                                                  5.106477
##                                  Mixed vegetables, frozen, 1kg
##                                                  3.405341
##                               Muesli, natural or toasted, 750g
##                                                  5.286080
##                                       Muesli/cereal bars, 200g
##                                                  2.947547
##                                              Mushrooms, 1kg
##                                                  11.033315
##                                           Mussels, live, 1kg
##                                                  3.902670
##                                       Mussels, marinated, 375g
##                                                  5.905852
##          Olive oil, pure, not extra virgin or light, 1 litre
##                                                  11.870000
##                                           Olives, jar, 400g
##                                                  4.353958
##                                                Onions, 1kg
##                                                  2.081477
##  Orange juice, not apple based, 1 litre - Cheapest Available
##                                                  2.667154
##                                               Oranges, 1kg
##                                                  3.384837
##                                    Packaged cake slice, 300g
##                                                  3.557670
##                           Packaged meal, pasta and sauce, 130g
```

```
##                                                 2.556648
##                                               Parsnips, 1kg
##                                                 5.718864
##                                 Pasta sauces, tomato based, 500g
##                                                 2.993580
##                       Pastry, frozen sheets, puff or flaky, 800g
##                                                 5.099716
##                        Peaches - canned (supermarket only), 410g
##                                                 1.607228
##                               Peanut butter, not salt free, 375g
##                                                 2.851848
##                                  Peanuts, blanched, salted, 250g
##                                                 3.379783
##                                               Pears, 1kg
##                                                 3.777386
##                           Peas - frozen (supermarket only), 1kg
##                                                 2.512989
##                                             Pineapple, 1kg
##                                                 3.277673
##          Pineapple, pieces, in juice or syrup, canned, 425g
##                                                 1.776420
##     Pizza, fresh or frozen, with any standard topping, each
##                                                 5.487826
##                                             Pizza, takeaway
##                                                13.467771
##                                       Pork - loin chops, 1kg
##                                                15.808587
##                                          Potato crisps, 150g
##                                                 1.836532
##                                     Potato fries, frozen, 1kg
##                                                 3.356477
##                                              Potatoes, 1kg
##                                                 1.749457
##                                        Prawns, frozen, 700g
##                                                17.330575
##                                  Prepared meals, frozen, 340g
##                                                 5.577330
##                                               Pumpkin, 1kg
##                                                 2.629261
```

```
##             Rice - long grain, white (supermarket only), 1kg
##                                                    2.417826
##     Roasting lamb and hogget, fresh, chilled or frozen, 1kg
##                                                   15.044318
##                Roasting pork, fresh, chilled or frozen, 1kg
##                                                   10.353750
##                                  Salad, leaf, packaged, 150g
##                                                    4.551954
##                               Salad, takeaway, vegetable, 1kg
##                                                   10.227045
##                                                Salami, 100g
##                                                    3.330852
##           Salmon, imported, pink, canned, unflavoured, 210g
##                                                    3.058239
##                                   Sandwich, fresh or toasted
##                                                    4.238579
##                                               Sausages, 1kg
##                                                    8.860217
##                                   Soft drink, 1.5 litres
##                                                    2.410815
##                                      Soft drinks, 600ml
##                                                    3.550057
##                                    Soft drinks, poured
##                                                    2.709829
##                                     Soup, canned, 500g
##                                                    3.100966
##                                Soy milk, unflavoured, 1 litre
##                                                    3.319937
##                                       Soy sauce, 300ml
##                                                    2.421477
##                                  Spaghetti - canned, 420g
##                                                    1.528207
##                                  Sports energy drinks, 250ml
##                                                    2.008161
##                                  Sports energy drinks, 350ml
##                                                    3.386667
##                                        Sugar - white, 1.5kg
##                                                    2.572935
##                              Sultanas (supermarket only), 375g
```

```
##                                                 2.132120
##                                               Sweets, 200g
##                                                 2.898295
##                                 Takeaway muffins and buns, each
##                                                 3.324457
##                          Tea bags (supermarket only), box of 100
##                                                 4.466739
##                        Tea bags, flavoured or herbal, box of 25
##                                                 3.114792
##                                               Tea, takeaway
##                                                 3.066514
##                                    Tomato sauce - canned, 560g
##                                                 2.987500
##                                               Tomatoes, 1kg
##                                                 6.223043
##                                      Tomatoes, canned, 400g
##                                                 1.303125
##                           Tuna - canned (supermarket only), 185g
##                                                 2.434891
##                                 Two minute noodles, multipack,5
##                                                 2.472903
##                                              Vinegar, 750ml
##                                                 2.468523
##                                  Wheatmeal bread, sliced, 700g
##                                                 2.858125
##                                 Wholegrain bread, sliced, 700g
##                                                 3.472216
## Yoghurt - flavoured, 150g pottle (supermarket only), pk of 6
##                                                 4.900272
```

#4) Push the r file into your GitHub like before and submit your GitHub link like prior assignments####

When you read this, I have finished uploading.

Thanks for your patience!

THE END