2021-11-04

#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

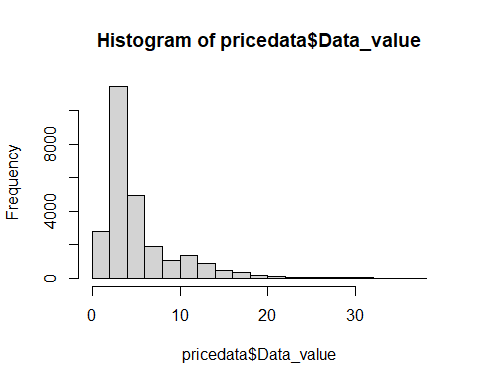
names(pricedata) # check the object names

## [1] "Series\_reference" "Period" "Data\_value" "STATUS"   
## [5] "UNITS" "Subject" "Group" "Series\_title\_1"

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 Index - CPI" ...  
## $ Group : chr "Food Price Index Selected Monthly Weighted Average Prices for New Zealand" "Food Price Index Selected Monthly Weighted Average Prices for New Zealand" "Food Price Index Selected Monthly Weighted Average Prices for New Zealand" "Food Price Index Selected Monthly Weighted Average Prices for New Zealand" ...  
## $ Series\_title\_1 : chr "Oranges, 1kg" "Oranges, 1kg" "Oranges, 1kg" "Oranges, 1kg" ...

#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

#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

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

## [1] 25881 8

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

## [1] 25881 8

#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

#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

#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

#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

# 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

# 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

# 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

# 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####

#Method 1:  
price1<-data.frame() # create a empty dataframe  
n=1  
fac<-factor(newdata2$Series\_title\_1,ordered=TRUE) # extract the factor names  
while (n<=length(levels(fac))){  
 fac1<-newdata2[(newdata2$Series\_title\_1 %in% c(levels(fac)[n])),] # search the factor names in Series\_title\_1 one by one  
 x <- list(fac1$Data\_value) # save the search results into x  
 price1<-rbind(c(levels(fac)[n],sapply(x, FUN = mean)),price1) #using sapply to calculate the average price, then using rbind to save the product name and its price into dataframe price1  
 n=n+1  
}  
names(price1)<-c("Product","Average Price") # set the columns names  
price1 # display the final results

## Product  
## 1 Yoghurt - flavoured, 150g pottle (supermarket only), pk of 6  
## 2 Wholegrain bread, sliced, 700g  
## 3 Wheatmeal bread, sliced, 700g  
## 4 Vinegar, 750ml  
## 5 Two minute noodles, multipack,5  
## 6 Tuna - canned (supermarket only), 185g  
## 7 Tomatoes, canned, 400g  
## 8 Tomatoes, 1kg  
## 9 Tomato sauce - canned, 560g  
## 10 Tea, takeaway  
## 11 Tea bags, flavoured or herbal, box of 25  
## 12 Tea bags (supermarket only), box of 100  
## 13 Takeaway muffins and buns, each  
## 14 Sweets, 200g  
## 15 Sultanas (supermarket only), 375g  
## 16 Sugar - white, 1.5kg  
## 17 Sports energy drinks, 350ml  
## 18 Sports energy drinks, 250ml  
## 19 Spaghetti - canned, 420g  
## 20 Soy sauce, 300ml  
## 21 Soy milk, unflavoured, 1 litre  
## 22 Soup, canned, 500g  
## 23 Soft drinks, poured  
## 24 Soft drinks, 600ml  
## 25 Soft drink, 1.5 litres  
## 26 Sausages, 1kg  
## 27 Sandwich, fresh or toasted  
## 28 Salmon, imported, pink, canned, unflavoured, 210g  
## 29 Salami, 100g  
## 30 Salad, takeaway, vegetable, 1kg  
## 31 Salad, leaf, packaged, 150g  
## 32 Roasting pork, fresh, chilled or frozen, 1kg  
## 33 Roasting lamb and hogget, fresh, chilled or frozen, 1kg  
## 34 Rice - long grain, white (supermarket only), 1kg  
## 35 Pumpkin, 1kg  
## 36 Prepared meals, frozen, 340g  
## 37 Prawns, frozen, 700g  
## 38 Potatoes, 1kg  
## 39 Potato fries, frozen, 1kg  
## 40 Potato crisps, 150g  
## 41 Pork - loin chops, 1kg  
## 42 Pizza, takeaway  
## 43 Pizza, fresh or frozen, with any standard topping, each  
## 44 Pineapple, pieces, in juice or syrup, canned, 425g  
## 45 Pineapple, 1kg  
## 46 Peas - frozen (supermarket only), 1kg  
## 47 Pears, 1kg  
## 48 Peanuts, blanched, salted, 250g  
## 49 Peanut butter, not salt free, 375g  
## 50 Peaches - canned (supermarket only), 410g  
## 51 Pastry, frozen sheets, puff or flaky, 800g  
## 52 Pasta sauces, tomato based, 500g  
## 53 Parsnips, 1kg  
## 54 Packaged meal, pasta and sauce, 130g  
## 55 Packaged cake slice, 300g  
## 56 Oranges, 1kg  
## 57 Orange juice, not apple based, 1 litre - Cheapest Available  
## 58 Onions, 1kg  
## 59 Olives, jar, 400g  
## 60 Olive oil, pure, not extra virgin or light, 1 litre  
## 61 Mussels, marinated, 375g  
## 62 Mussels, live, 1kg  
## 63 Mushrooms, 1kg  
## 64 Muesli/cereal bars, 200g  
## 65 Muesli, natural or toasted, 750g  
## 66 Mixed vegetables, frozen, 1kg  
## 67 Milk, calcium enriched, 2 litres  
## 68 Milk - standard homogenised, 2 litres  
## 69 Meat pies, chilled, 6 or 8 pack - Cheapest Available  
## 70 Meat pie - hot, each  
## 71 Mayonnaise, 380ml  
## 72 Margarine/table spread, 500g  
## 73 Mandarins, 1kg  
## 74 Lettuce, 1kg  
## 75 Lamb - chops, 1kg  
## 76 Kumara, 1kg  
## 77 Kiwifruit, 1kg  
## 78 Jam, 375g  
## 79 Infant formula, 900g  
## 80 Ice cream novelty, chocolate coated, each  
## 81 Ice cream bought in bulk, 2 litres  
## 82 Ice block, water based, each  
## 83 Hummus dip, 200g  
## 84 Hot chips, hot wedges  
## 85 Honey, clover, creamed, 500g  
## 86 Ham, sliced or shaved, 1kg  
## 87 Grapes, green or red  
## 88 Fruit juice - apple based (supermarket only), 3 litre  
## 89 Fruit flavoured drink powder, multipack of 3 to 5  
## 90 Fried and other takeaway chicken, 5 pieces  
## 91 Fresh pasta, tortellini or other filled type, 300g  
## 92 Fresh herbs, packaged, chilled  
## 93 Fresh fish, 1kg  
## 94 Flour - white (supermarket only), 1.5kg  
## 95 Flat bread - pita, tortilla, or other type  
## 96 Fish fillets, frozen, multipack, 500g  
## 97 Fish and chips, One fish/chips  
## 98 Eggs, free range, 6 pack  
## 99 Eggs, dozen  
## 100 Drinking chocolate, 300g  
## 101 Dried pasta, spaghetti or other type, 500g  
## 102 Dried mixed herbs, 10g to 15g  
## 103 Dessert, frozen, 500g  
## 104 Cucumber, 1kg  
## 105 Cream, 300ml - Cheapest Available  
## 106 Courgettes, 1kg  
## 107 Corned beef, fresh, chilled or frozen, 1kg  
## 108 Corn flakes, 500g  
## 109 Cookie, takeaway, each  
## 110 Coffee, takeway, each  
## 111 Coffee, ground, 200g  
## 112 Coffee - instant, 100g  
## 113 Chocolate, boxed, loose, 250g  
## 114 Chocolate novelty bars, 50g  
## 115 Chocolate blocks, convenience stores, 100g to 250g  
## 116 Chocolate - block (supermarket only), 250g  
## 117 Chilled fruit juice or smoothies, 1 to 1.5 litre  
## 118 Chicken, whole, frozen, No. 15 - Cheapest Available  
## 119 Chicken, cooked, whole, No. 15 - Cheapest Available  
## 120 Chicken pieces (excluding breast), boneless or bone in, 1kg  
## 121 Chicken nuggets, frozen, 1kg  
## 122 Chicken breast, 1kg  
## 123 Chewing gum, packet, each  
## 124 Cheese, processed slices, 250g  
## 125 Cheese, camembert, 125g  
## 126 Cheese - mild cheddar (supermarket only), 1kg  
## 127 Celery, 1kg  
## 128 Cauliflower, 1kg  
## 129 Carrots, 1kg  
## 130 Capsicums, green, else red, 1kg  
## 131 Cakes and biscuits, takeaway  
## 132 Cabbage, 1kg  
## 133 Butter - salted, 500g  
## 134 Burger, with or without accompaniments, each  
## 135 Broccoli, 1kg  
## 136 Breakfast drink, 250ml, 6 pack  
## 137 Breakfast biscuits, 1kg  
## 138 Bread rolls, hamburger buns, 6 pack  
## 139 Bread rolls, filled, hot, each  
## 140 Bread - white sliced loaf, 600g  
## 141 Bottled water, 750ml  
## 142 Biscuits, savoury, crackers 250g  
## 143 Biscuits, plain (eg arrowroot, ginger, malt, wine), 250g  
## 144 Biscuits - chocolate, 200g  
## 145 Berries, frozen, 500g  
## 146 Beef steak - porterhouse/sirloin, 1kg  
## 147 Beef steak - blade, 1kg  
## 148 Beef - mince, 1kg  
## 149 Beans, 1kg  
## 150 Bananas, 1kg  
## 151 Bacon - middle rashers (supermarket only), 700g  
## 152 Baby food, 110g  
## 153 Avocado, 1kg  
## 154 Apricots, dried, 100g  
## 155 Apples, 1kg  
## Average Price  
## 1 4.90027173913044  
## 2 3.47221590909091  
## 3 2.858125  
## 4 2.46852272727273  
## 5 2.47290322580645  
## 6 2.43489130434783  
## 7 1.303125  
## 8 6.22304347826087  
## 9 2.9875  
## 10 3.06651428571429  
## 11 3.11479166666667  
## 12 4.46673913043478  
## 13 3.32445714285714  
## 14 2.89829545454545  
## 15 2.13211956521739  
## 16 2.5729347826087  
## 17 3.38666666666667  
## 18 2.00816091954023  
## 19 1.52820652173913  
## 20 2.42147727272727  
## 21 3.31993710691824  
## 22 3.10096590909091  
## 23 2.70982857142857  
## 24 3.55005681818182  
## 25 2.4108152173913  
## 26 8.86021739130435  
## 27 4.23857923497268  
## 28 3.05823863636364  
## 29 3.33085227272727  
## 30 10.2270454545455  
## 31 4.55195402298851  
## 32 10.35375  
## 33 15.0443181818182  
## 34 2.41782608695652  
## 35 2.62926136363636  
## 36 5.57732954545455  
## 37 17.3305747126437  
## 38 1.74945652173913  
## 39 3.35647727272727  
## 40 1.83653225806452  
## 41 15.8085869565217  
## 42 13.4677714285714  
## 43 5.48782608695652  
## 44 1.77642045454545  
## 45 3.27767295597484  
## 46 2.51298913043478  
## 47 3.77738636363636  
## 48 3.37978260869565  
## 49 2.85184782608696  
## 50 1.60722826086957  
## 51 5.09971590909091  
## 52 2.99357954545455  
## 53 5.71886363636364  
## 54 2.55664772727273  
## 55 3.55767045454545  
## 56 3.38483695652174  
## 57 2.66715447154472  
## 58 2.08147727272727  
## 59 4.35395833333333  
## 60 11.87  
## 61 5.90585227272727  
## 62 3.90267045454545  
## 63 11.0333152173913  
## 64 2.94754716981132  
## 65 5.28607954545455  
## 66 3.40534090909091  
## 67 5.10647727272727  
## 68 3.38614130434783  
## 69 6.06869318181818  
## 70 3.70109289617486  
## 71 3.32630434782609  
## 72 2.33983695652174  
## 73 5.26215909090909  
## 74 4.39777173913043  
## 75 14.21875  
## 76 5.29005681818182  
## 77 3.73782608695652  
## 78 2.61482954545455  
## 79 19.2929545454545  
## 80 3.18278409090909  
## 81 5.58818181818182  
## 82 2.12897727272727  
## 83 3.74578616352201  
## 84 2.97497142857143  
## 85 7.0625  
## 86 13.6776086956522  
## 87 7.47982954545455  
## 88 4.17677419354839  
## 89 1.2555625  
## 90 11.3387428571429  
## 91 4.59138364779874  
## 92 3.79395833333333  
## 93 29.3965340909091  
## 94 1.9429347826087  
## 95 4.13422764227642  
## 96 7.32454545454545  
## 97 5.94857923497268  
## 98 4.71025157232704  
## 99 3.73086956521739  
## 100 3.92744318181818  
## 101 1.88415094339623  
## 102 2.36358695652174  
## 103 6.35062893081761  
## 104 7.79380681818182  
## 105 2.23369318181818  
## 106 8.75363636363636  
## 107 9.55392045454546  
## 108 3.38647727272727  
## 109 1.87668571428571  
## 110 3.57508571428571  
## 111 6.31471590909091  
## 112 5.55038043478261  
## 113 8.46767045454545  
## 114 1.42545454545455  
## 115 4.53426136363636  
## 116 3.9604347826087  
## 117 4.58635220125786  
## 118 8.09931818181818  
## 119 11.5759748427673  
## 120 8.14747126436782  
## 121 11.0632520325203  
## 122 13.9584090909091  
## 123 2.7241875  
## 124 3.50022727272727  
## 125 4.27681818181818  
## 126 9.10239130434783  
## 127 3.31965909090909  
## 128 3.42727272727273  
## 129 2.13630434782609  
## 130 12.7696022727273  
## 131 3.63411428571429  
## 132 1.97684782608696  
## 133 3.97826086956522  
## 134 4.5976  
## 135 5.91711956521739  
## 136 7.71287356321839  
## 137 5.62391304347826  
## 138 2.78448863636364  
## 139 6.27622857142857  
## 140 1.32326086956522  
## 141 2.02994565217391  
## 142 3.160625  
## 143 2.21698863636364  
## 144 2.83195652173913  
## 145 6.49983739837398  
## 146 26.2638586956522  
## 147 15.6879347826087  
## 148 12.6989130434783  
## 149 12.8588636363636  
## 150 2.74076086956522  
## 151 12.0044318181818  
## 152 1.09664772727273  
## 153 9.78926136363636  
## 154 2.19308943089431  
## 155 2.83760869565217

#Method 2:  
splitmean <- function(newdata2) { #build a function by split and sapply function  
 s <- split( newdata2, newdata2$Series\_title\_1) # split the data by Series\_title\_1  
 sapply( s, function(x) mean(x$Data\_value) )# calculate the average price  
}  
price<-splitmean(newdata2) # call the function  
price # display the final results

## 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