# Quantium—Task-1.R

r3164224

2025-05-20

```
install.packages("data.table")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
install.packages("ggplot2")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
install.packages("ggmosaic")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
install.packages("readr")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
#### Load required libraries
library(data.table)
library(ggplot2)
library(ggmosaic)
library(readr)

transactionData <- read.csv(paste0("QVI_transaction_data.csv"))
customerData <- read.csv(paste0("QVI_purchase_behaviour.csv"))
setDT(transactionData)
setDT(customerData)

## Exploratory data analysis
#### Examine transaction data
str(transactionData)
```

```
## Classes 'data.table' and 'data.frame':   264836 obs. of  8 variables:
##  $ DATE          : int  43390 43599 43605 43329 43330 43604 43601 43601 43332 43330 ...
##  $ STORE_NBR     : int  1 1 1 2 2 4 4 4 5 7 ...
##  $ LYLTY_CARD_NBR: int  1000 1307 1343 2373 2426 4074 4149 4196 5026 7150 ...
##  $ TXN_ID        : int  1 348 383 974 1038 2982 3333 3539 4525 6900 ...
##  $ PROD_NBR      : int  5 66 61 69 108 57 16 24 42 52 ...
##  $ PROD_NAME     : chr  "Natural Chip        Compny SeaSalt175g" "CCs Nacho Cheese    175g" "Smiths C
##  $ PROD_QTY      : int  2 3 2 5 3 1 1 1 1 2 ...
##  $ TOT_SALES     : num  6 6.3 2.9 15 13.8 5.1 5.7 3.6 3.9 7.2 ...
##  - attr(*, ".internal.selfref")=<externalptr>
```

```r
#### Convert DATE column to a date format
transactionData$DATE <- as.Date(transactionData$DATE, origin = "1899-12-30")

#### Examine PROD_NAME
transactionData[, .N, PROD_NAME]
```

```
##                                      PROD_NAME     N
##                                         <char> <int>
##   1:   Natural Chip        Compny SeaSalt175g  1468
##   2:                 CCs Nacho Cheese    175g  1498
##   3:   Smiths Crinkle Cut  Chips Chicken 170g  1484
##   4:   Smiths Chip Thinly  S/Cream&Onion 175g  1473
##   5: Kettle Tortilla ChpsHny&Jlpno Chili 150g  3296
##  ---
## 110:    Red Rock Deli Chikn&Garlic Aioli 150g  1434
## 111:      RRD SR Slow Rst     Pork Belly 150g  1526
## 112:                 RRD Pc Sea Salt     165g  1431
## 113:       Smith Crinkle Cut   Bolognese 150g  1451
## 114:                 Doritos Salsa Mild  300g  1472
```

```r
#### Examine the words in PROD_NAME to see if there are any incorrect entries
#### such as products that are not chips
productWords <- data.table(unlist(strsplit(unique(transactionData[,
PROD_NAME]), " ")))
setnames(productWords, 'words')

#### Removing digits
productWords <- productWords[grepl("\\d", words) == FALSE, ]

#### Removing special characters
productWords <- productWords[grepl("[:alpha:]", words), ]

#### Let's look at the most common words by counting the number of times a word
#### appears and
#### sorting them by this frequency in order of highest to lowest frequency
productWords[, .N, words][order(-N)]
```

```
##              words     N
##             <char> <int>
##   1:        Chips    21
##   2:       Smiths    16
##   3:      Crinkle    14
##   4:       Kettle    13
##   5:       Cheese    12
##  ---
## 127: Chikn&Garlic     1
## 128:        Aioli     1
## 129:         Slow     1
## 130:        Belly     1
## 131:    Bolognese     1
```

```r
#### Remove salsa products
transactionData[, SALSA := grepl("salsa", tolower(PROD_NAME))]
transactionData <- transactionData[SALSA == FALSE, ][, SALSA := NULL]
```

```r
#### Summarise the data to check for nulls and possible outliers
summary(transactionData)
```

```
##       DATE              STORE_NBR     LYLTY_CARD_NBR        TXN_ID       
##  Min.   :2018-07-01   Min.   :  1.0   Min.   :   1000   Min.   :      1  
##  1st Qu.:2018-09-30   1st Qu.: 70.0   1st Qu.:  70015   1st Qu.:  67569  
##  Median :2018-12-30   Median :130.0   Median : 130367   Median : 135183  
##  Mean   :2018-12-30   Mean   :135.1   Mean   : 135531   Mean   : 135131  
##  3rd Qu.:2019-03-31   3rd Qu.:203.0   3rd Qu.: 203084   3rd Qu.: 202654  
##  Max.   :2019-06-30   Max.   :272.0   Max.   :2373711   Max.   :2415841  
##     PROD_NBR       PROD_NAME           PROD_QTY         TOT_SALES      
##  Min.   :  1.00   Length:246742      Min.   :  1.000   Min.   :  1.700  
##  1st Qu.: 26.00   Class :character   1st Qu.:  2.000   1st Qu.:  5.800  
##  Median : 53.00   Mode  :character   Median :  2.000   Median :  7.400  
##  Mean   : 56.35                      Mean   :  1.908   Mean   :  7.321  
##  3rd Qu.: 87.00                      3rd Qu.:  2.000   3rd Qu.:  8.800  
##  Max.   :114.00                      Max.   :200.000   Max.   :650.000  
```

```r
#### Filter the dataset to find the outlier
transactionData[PROD_QTY == 200, ]
```

```
##          DATE STORE_NBR LYLTY_CARD_NBR TXN_ID PROD_NBR
##        <Date>     <int>          <int>  <int>    <int>
## 1: 2018-08-19       226         226000 226201        4
## 2: 2019-05-20       226         226000 226210        4
##                            PROD_NAME PROD_QTY TOT_SALES
##                               <char>    <int>     <num>
## 1: Dorito Corn Chp     Supreme 380g      200       650
## 2: Dorito Corn Chp     Supreme 380g      200       650
```

```r
# Use a filter to see what other transactions that customer made.
transactionData[LYLTY_CARD_NBR == 226000, ]
```

```
##          DATE STORE_NBR LYLTY_CARD_NBR TXN_ID PROD_NBR
##        <Date>     <int>          <int>  <int>    <int>
## 1: 2018-08-19       226         226000 226201        4
## 2: 2019-05-20       226         226000 226210        4
##                            PROD_NAME PROD_QTY TOT_SALES
##                               <char>    <int>     <num>
## 1: Dorito Corn Chp     Supreme 380g      200       650
## 2: Dorito Corn Chp     Supreme 380g      200       650
```

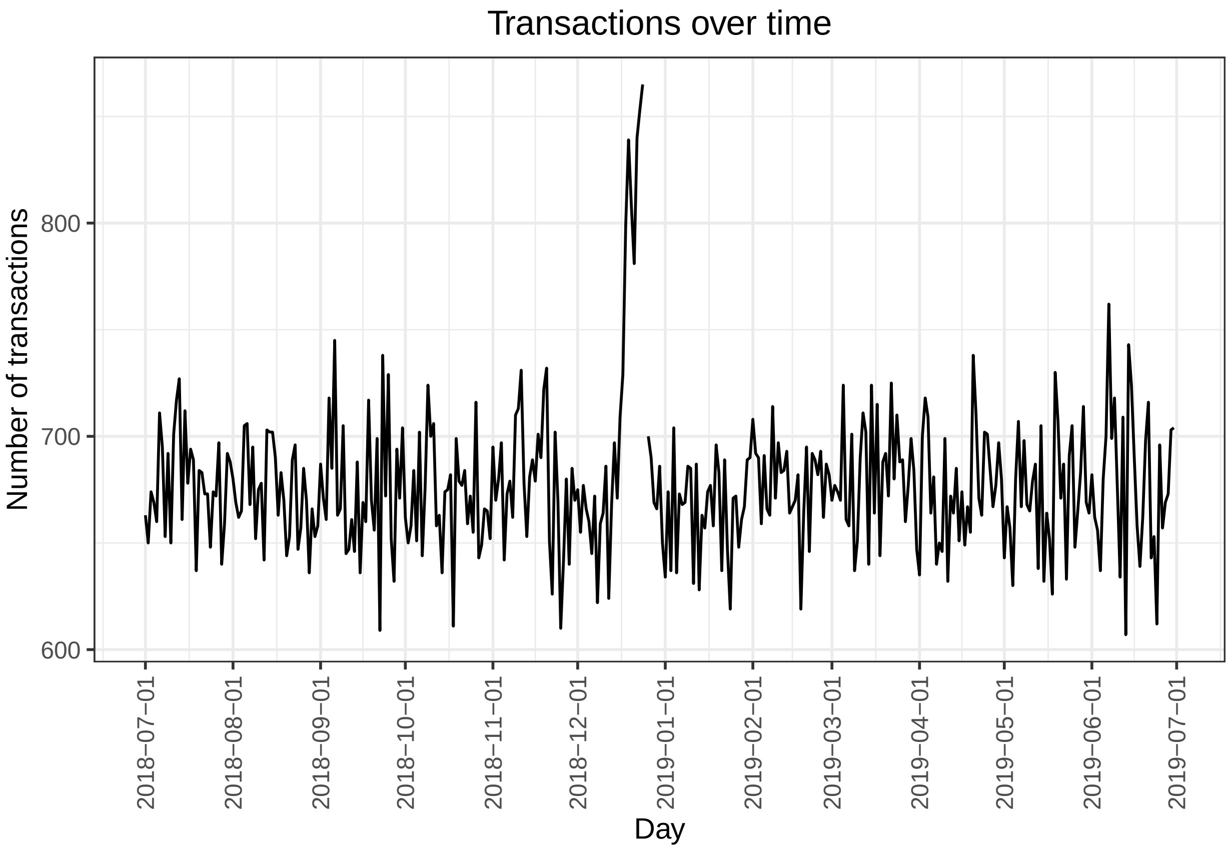
```r
#### Filter out the customer based on the loyalty card number
transactionData <- transactionData[LYLTY_CARD_NBR != 226000, ]
#### Re-examine transaction data
summary(transactionData)
```

```
##       DATE              STORE_NBR     LYLTY_CARD_NBR        TXN_ID       
##  Min.   :2018-07-01   Min.   :  1.0   Min.   :   1000   Min.   :      1  
##  1st Qu.:2018-09-30   1st Qu.: 70.0   1st Qu.:  70015   1st Qu.:  67569  
##  Median :2018-12-30   Median :130.0   Median : 130367   Median : 135182  
##  Mean   :2018-12-30   Mean   :135.1   Mean   : 135530   Mean   : 135130  
##  3rd Qu.:2019-03-31   3rd Qu.:203.0   3rd Qu.: 203083   3rd Qu.: 202652  
##  Max.   :2019-06-30   Max.   :272.0   Max.   :2373711   Max.   :2415841  
##     PROD_NBR       PROD_NAME           PROD_QTY       TOT_SALES      
##  Min.   :  1.00   Length:246740      Min.   :1.000   Min.   : 1.700  
##  1st Qu.: 26.00   Class :character   1st Qu.:2.000   1st Qu.: 5.800
##  Median : 53.00   Mode  :character   Median :2.000   Median : 7.400
##  Mean   : 56.35                      Mean   :1.906   Mean   : 7.316
##  3rd Qu.: 87.00                      3rd Qu.:2.000   3rd Qu.: 8.800
##  Max.   :114.00                      Max.   :5.000   Max.   :29.500
```

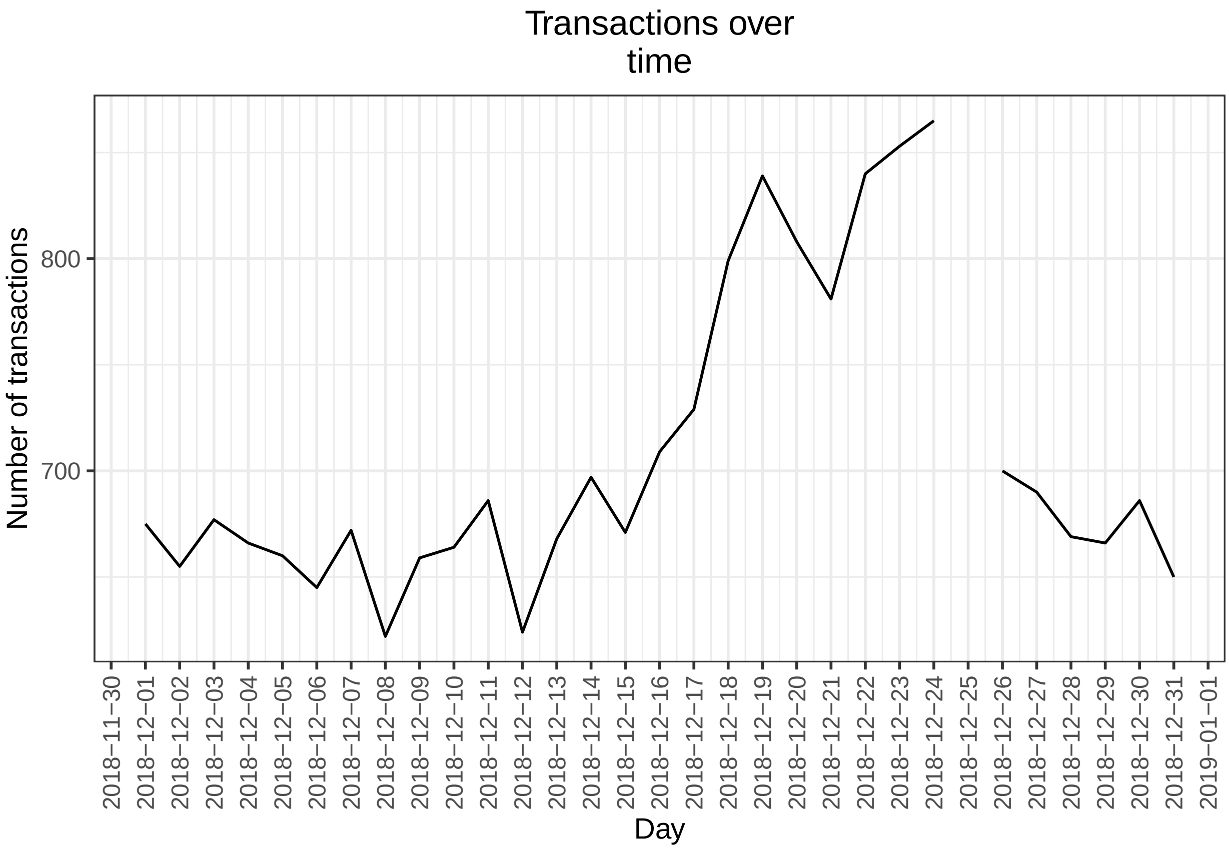
```
#### Count the number of transactions by date
transactionData[, .N, by = DATE]
```

```
##            DATE     N
##          <Date> <int>
##   1: 2018-10-17   682
##   2: 2019-05-14   705
##   3: 2019-05-20   707
##   4: 2018-08-17   663
##   5: 2018-08-18   683
##  ---
## 360: 2018-12-08   622
## 361: 2019-01-30   689
## 362: 2019-02-09   671
## 363: 2018-08-31   658
## 364: 2019-02-12   684
```

```
#### Create a sequence of dates and join this the count of transactions by date
allDates <- data.table(seq(as.Date("2018/07/01"), as.Date("2019/06/30"), by =
"day"))
setnames(allDates, "DATE")
transactions_by_day <- merge(allDates, transactionData[, .N, by = DATE], all.x
= TRUE)

#### Setting plot themes to format graphs
theme_set(theme_bw())
theme_update(plot.title = element_text(hjust = 0.5))

#### Plot transactions over time
ggplot(transactions_by_day, aes(x = DATE, y = N)) +
geom_line() +
labs(x = "Day", y = "Number of transactions", title = "Transactions over time")+
scale_x_date(breaks = "1 month") +
theme(axis.text.x = element_text(angle = 90, vjust = 0.5))
```



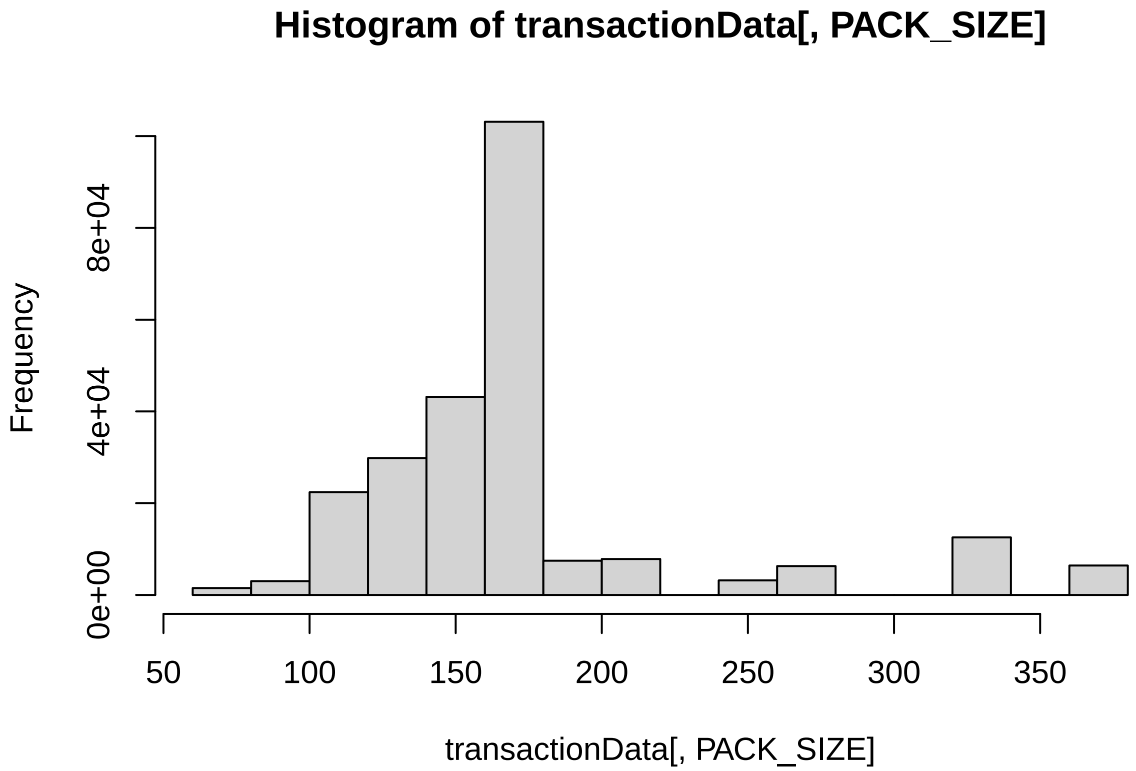
```
#### Filter to December and look at individual days
ggplot(transactions_by_day[month(DATE) == 12, ], aes(x = DATE, y = N)) +
geom_line() +
labs(x = "Day", y = "Number of transactions", title = "Transactions over
time") +
scale_x_date(breaks = "1 day") +
theme(axis.text.x = element_text(angle = 90, vjust = 0.5))
```



```r
#### Pack size
#### We can work this out by taking the digits that are in PROD_NAME
transactionData[, PACK_SIZE := parse_number(PROD_NAME)]

#### Always check your output
#### Let's check if the pack sizes look sensible
transactionData[, .N, PACK_SIZE][order(PACK_SIZE)]
```

```
##     PACK_SIZE     N
##         <num> <int>
##  1:        70  1507
##  2:        90  3008
##  3:       110 22387
##  4:       125  1454
##  5:       134 25102
##  6:       135  3257
##  7:       150 40203
##  8:       160  2970
##  9:       165 15297
## 10:       170 19983
## 11:       175 66390
## 12:       180  1468
## 13:       190  2995
## 14:       200  4473
## 15:       210  6272
## 16:       220  1564
## 17:       250  3169
## 18:       270  6285
## 19:       330 12540
## 20:       380  6416
##     PACK_SIZE     N
```

```
#### Let's plot a histogram of PACK_SIZE since we know that it is a categorical
#### variable and not a continuous variable even though it is numeric.
hist(transactionData[, PACK_SIZE])
```



```
#### Brands
transactionData[, BRAND := toupper(substr(PROD_NAME, 1, regexpr(pattern = ' ',
PROD_NAME) - 1))]
#### Checking brands
transactionData[, .N, by = BRAND][order(-N)]
```

```
##          BRAND     N
##         <char> <int>
##   1:    KETTLE 41288
##   2:    SMITHS 27390
##   3:  PRINGLES 25102
##   4:   DORITOS 22041
##   5:     THINS 14075
##   6:       RRD 11894
##   7: INFUZIONS 11057
##   8:        WW 10320
##   9:      COBS  9693
##  10:  TOSTITOS  9471
##  11:  TWISTIES  9454
##  12:  TYRRELLS  6442
##  13:     GRAIN  6272
##  14:   NATURAL  6050
## 15:   CHEEZELS  4603
## 16:        CCS  4551
## 17:        RED  4427
## 18:     DORITO  3183
## 19:     INFZNS  3144
## 20:      SMITH  2963
## 21:    CHEETOS  2927
## 22:      SNBTS  1576
## 23:     BURGER  1564
## 24: WOOLWORTHS  1516
## 25:    GRNWVES  1468
## 26:   SUNBITES  1432
## 27:        NCC  1419
## 28:     FRENCH  1418
##          BRAND     N
```

```
#### Clean brand names
transactionData[BRAND == "RED", BRAND := "RRD"]
transactionData[BRAND == "SNBTS", BRAND := "SUNBITES"]
transactionData[BRAND == "INFZNS", BRAND := "INFUZIONS"]
transactionData[BRAND == "WW", BRAND := "WOOLWORTHS"]
transactionData[BRAND == "SMITH", BRAND := "SMITHS"]
transactionData[BRAND == "NCC", BRAND := "NATURAL"]
transactionData[BRAND == "DORITO", BRAND := "DORITOS"]
transactionData[BRAND == "GRAIN", BRAND := "GRNWVES"]

#### Check again
transactionData[, .N, by = BRAND][order(BRAND)]
```

```
##          BRAND     N
##         <char> <int>
##  1:     BURGER  1564
##  2:        CCS  4551
##  3:    CHEETOS  2927
##  4:   CHEEZELS  4603
##  5:       COBS  9693
##  6:    DORITOS 25224
##  7:     FRENCH  1418
##  8:    GRNWVES  7740
##  9:  INFUZIONS 14201
## 10:     KETTLE 41288
## 11:    NATURAL  7469
## 12:   PRINGLES 25102
## 13:        RRD 16321
## 14:     SMITHS 30353
## 15:   SUNBITES  3008
## 16:      THINS 14075
## 17:   TOSTITOS  9471
## 18:   TWISTIES  9454
## 19:   TYRRELLS  6442
## 20: WOOLWORTHS 11836
##          BRAND     N
```

```
#### Examining customer data
str(customerData)
```

```
## Classes 'data.table' and 'data.frame':   72637 obs. of  3 variables:
##  $ LYLTY_CARD_NBR  : int  1000 1002 1003 1004 1005 1007 1009 1010 1011 1012 ...
##  $ LIFESTAGE       : chr  "YOUNG SINGLES/COUPLES" "YOUNG SINGLES/COUPLES" "YOUNG FAMILIES" "OLDER SI
##  $ PREMIUM_CUSTOMER: chr  "Premium" "Mainstream" "Budget" "Mainstream" ...
##  - attr(*, ".internal.selfref")=<externalptr>
```

```
summary(customerData)
```

```
##  LYLTY_CARD_NBR     LIFESTAGE          PREMIUM_CUSTOMER
##  Min.   :   1000   Length:72637       Length:72637
##  1st Qu.:  66202   Class :character   Class :character
##  Median : 134040   Mode  :character   Mode  :character
##  Mean   : 136186
##  3rd Qu.: 203375
##  Max.   :2373711
```

```
#### Examining the values of life stage and premium_customer
customerData[, .N, by = LIFESTAGE][order(-N)]
```

```
##                 LIFESTAGE     N
##                    <char> <int>
## 1:               RETIREES 14805
## 2:  OLDER SINGLES/COUPLES 14609
## 3:  YOUNG SINGLES/COUPLES 14441
## 4:         OLDER FAMILIES  9780
## 5:         YOUNG FAMILIES  9178
## 6: MIDAGE SINGLES/COUPLES  7275
## 7:           NEW FAMILIES  2549
```

```
customerData[, .N, by = PREMIUM_CUSTOMER][order(-N)]
```

```
##    PREMIUM_CUSTOMER     N
##              <char> <int>
## 1:       Mainstream 29245
## 2:           Budget 24470
## 3:          Premium 18922
```

```
#### Merge transaction data to customer data
data <- merge(transactionData, customerData, all.x = TRUE)
data[is.null(LIFESTAGE), .N]
```

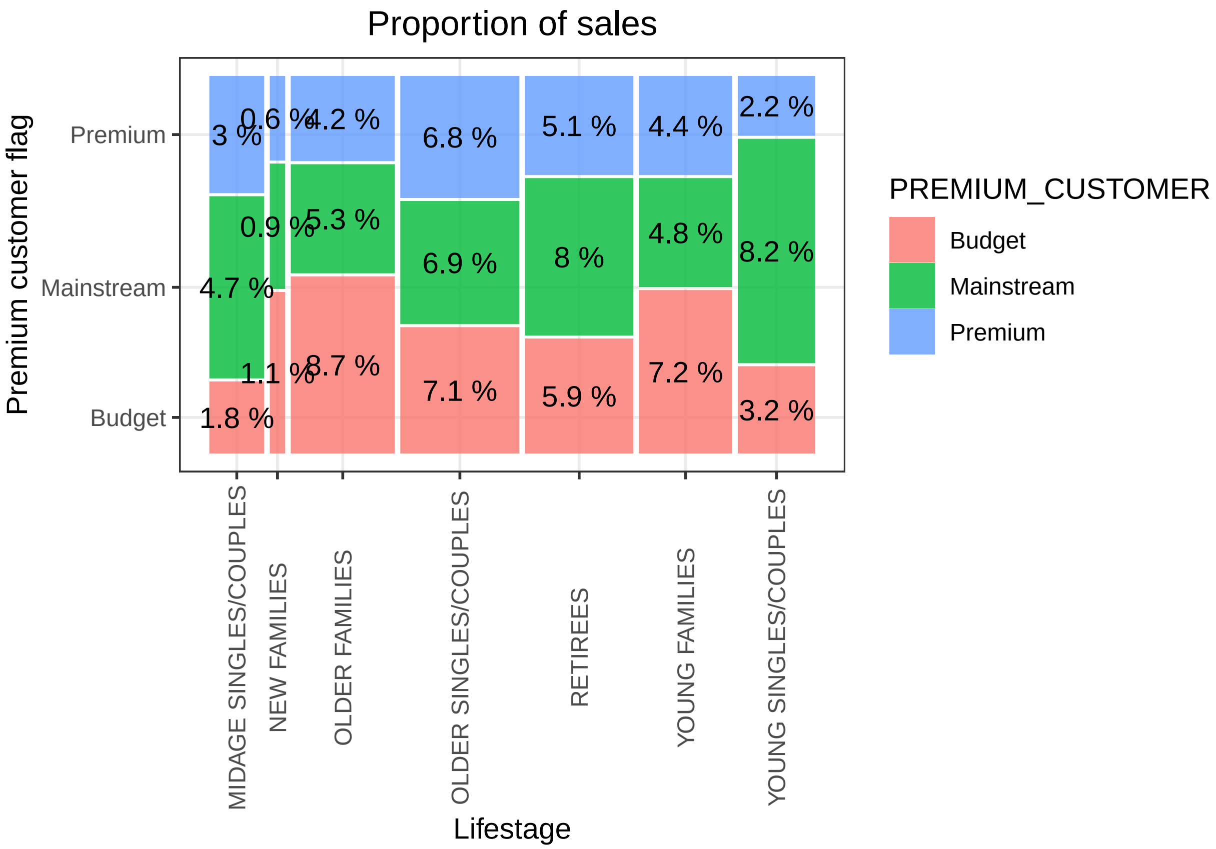
```
## [1] 0
```

```
data[is.null(PREMIUM_CUSTOMER), .N]
```

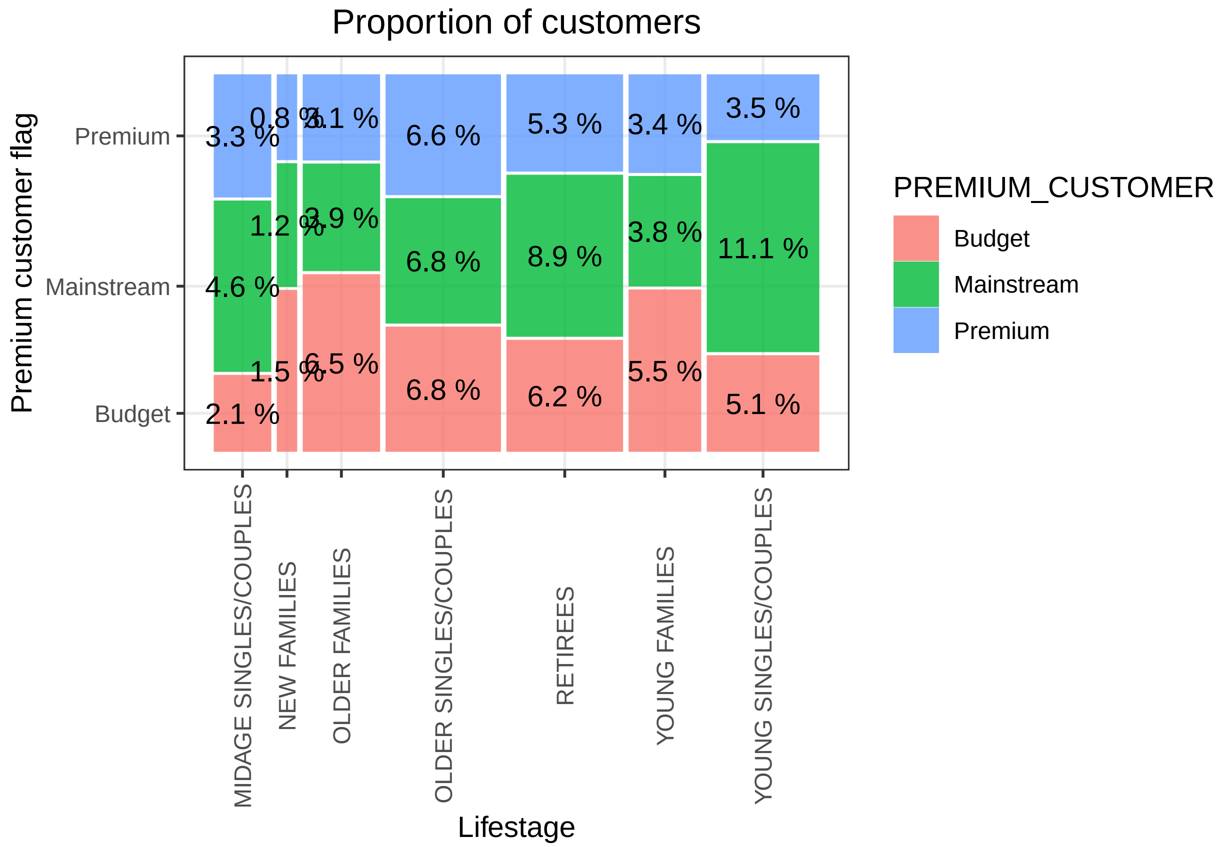
```
## [1] 0
```

```
# fwrite(data, paste0(filePath,"QVI_data.csv")) - to save dataset for task 2

## Data analysis on customer segments

#### Total sales by LIFESTAGE and PREMIUM_CUSTOMER
sales <- data[, .(SALES = sum(TOT_SALES)), .(LIFESTAGE, PREMIUM_CUSTOMER)]

#### Create plot
p <- ggplot(data = sales) +
geom_mosaic(aes(weight = SALES, x = product(PREMIUM_CUSTOMER,LIFESTAGE),
fill=PREMIUM_CUSTOMER))+
labs(x = "Lifestage", y = "Premium customer flag",
title = "Proportion of sales") +
theme(axis.text.x = element_text(angle = 90, vjust = 0.5))

####Plot and label with proportion of sales
p + geom_text(data = ggplot_build(p)$data[[1]], aes(x = (xmin + xmax)/2,y=
(ymin + ymax)/2, label = as.character(paste(round(.wt/sum(.wt),3)*100, '%'))))
```

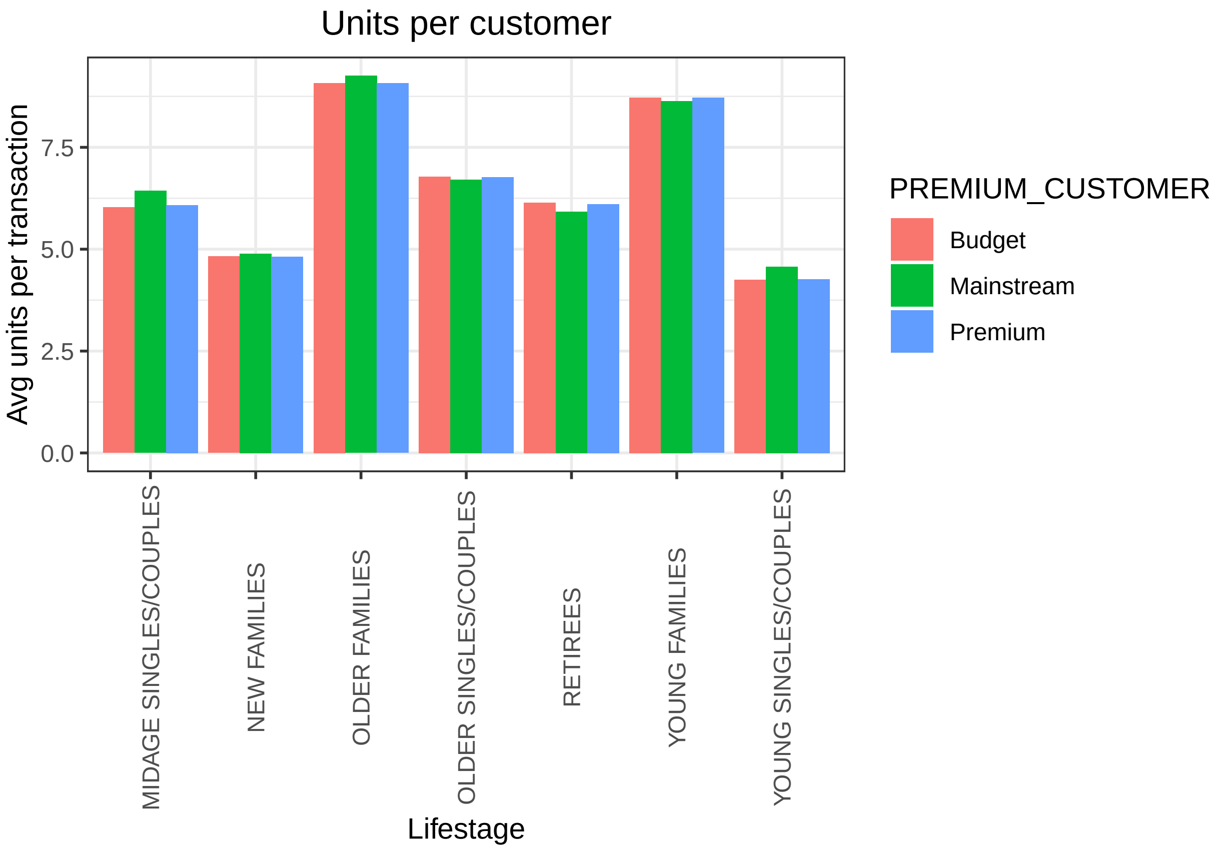
```
## Warning: The `scale_name` argument of `continuous_scale()` is deprecated as of ggplot2
## 3.5.0.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

## Warning: The `trans` argument of `continuous_scale()` is deprecated as of ggplot2 3.5.0.
## i Please use the `transform` argument instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

## Warning: `unite_()` was deprecated in tidyr 1.2.0.
## i Please use `unite()` instead.
## i The deprecated feature was likely used in the ggmosaic package.
##   Please report the issue at <https://github.com/haleyjeppson/ggmosaic>.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```



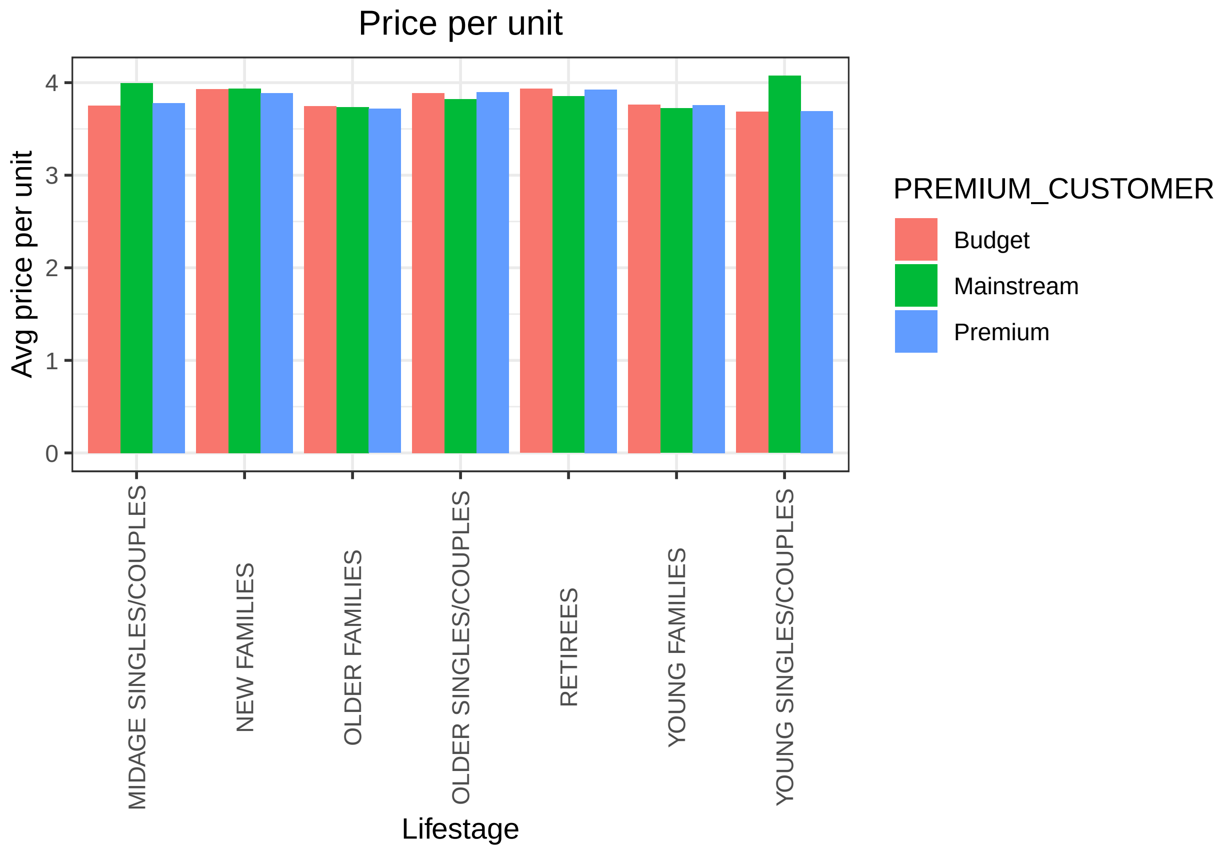
```
#### Number of customers by LIFESTAGE and PREMIUM_CUSTOMER
customers <- data[, .(CUSTOMERS = uniqueN(LYLTY_CARD_NBR)), .(LIFESTAGE,
PREMIUM_CUSTOMER)][order(-CUSTOMERS)]

### Create plot
p <- ggplot(data = customers) +
geom_mosaic(aes(weight = CUSTOMERS, x = product(PREMIUM_CUSTOMER, LIFESTAGE),
fill = PREMIUM_CUSTOMER))+
labs(x = "Lifestage", y = "Premium customer flag",
title = "Proportion of customers") +
theme(axis.text.x = element_text(angle=90, vjust=0.5))

####Plot and label with proportion of customers
p + geom_text(data= ggplot_build(p)$data[[1]], aes(x = (xmin + xmax)/2,y=
(ymin + ymax)/2, label = as.character(paste(round(.wt/sum(.wt),3)*100, '%'))))
```



```
#### Average number of units per customer by LIFESTAGE and PREMIUM_CUSTOMER
avg_units <- data[, .(AVG = sum(PROD_QTY)/uniqueN(LYLTY_CARD_NBR)),
.(LIFESTAGE, PREMIUM_CUSTOMER)][order(-AVG)]

#### Create plot
ggplot(data = avg_units, aes(weight = AVG, x = LIFESTAGE, fill = PREMIUM_CUSTOMER))+
geom_bar(position = position_dodge()) +
labs(x = "Lifestage", y = "Avg units per transaction", title ="Units per customer") +
theme(axis.text.x = element_text(angle=90,vjust=0.5))
```



```
#### Average price per unit by LIFESTAGE and PREMIUM_CUSTOMER
avg_price <- data[, .(AVG = sum(TOT_SALES)/sum(PROD_QTY)),
.(LIFESTAGE, PREMIUM_CUSTOMER)][order(-AVG)]

#### Create plot
ggplot(data = avg_price,
aes(weight = AVG, x = LIFESTAGE, fill = PREMIUM_CUSTOMER)) +
geom_bar(position = position_dodge()) +
labs(x = "Lifestage", y = "Avg price per unit", title = "Price per unit") +
theme(axis.text.x = element_text(angle = 90, vjust = 0.5))
```



```
#### Perform an independent t-test between mainstream vs premium and budget
#### mid age and young singles and couples
pricePerUnit <- data[, price := TOT_SALES/PROD_QTY]
t.test(data[LIFESTAGE %in% c("YOUNG SINGLES/COUPLES", "MIDAGE SINGLES/COUPLES")
& PREMIUM_CUSTOMER == "Mainstream", price]
, data[LIFESTAGE %in% c("YOUNG SINGLES/COUPLES", "MIDAGE SINGLES/COUPLES")
& PREMIUM_CUSTOMER != "Mainstream", price], alternative = "greater")
```

```
##
##  Welch Two Sample t-test
##
## data:  data[LIFESTAGE %in% c("YOUNG SINGLES/COUPLES", "MIDAGE SINGLES/COUPLES") & PREMIUM_CUSTOMER ==
## t = 37.624, df = 54791, p-value < 2.2e-16
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  0.3187234       Inf
## sample estimates:
## mean of x mean of y
##  4.039786  3.706491
```

```
#### Deep dive into Mainstream, young singles/couples
segment1 <- data[LIFESTAGE == "YOUNG SINGLES/COUPLES" &
PREMIUM_CUSTOMER == "Mainstream",]
other <- data[!(LIFESTAGE == "YOUNG SINGLES/COUPLES" &
PREMIUM_CUSTOMER == "Mainstream"),]

#### Brand affinity compared to the rest of the population
quantity_segment1 <- segment1[, sum(PROD_QTY)]
```

```
quantity_other <- other[, sum(PROD_QTY)]
quantity_segment1_by_brand <- segment1[,
.(targetSegment = sum(PROD_QTY)/quantity_segment1), by = BRAND]
quantity_other_by_brand <- other[,
.(other = sum(PROD_QTY)/quantity_other), by = BRAND]
brand_proportions <- merge(quantity_segment1_by_brand,
quantity_other_by_brand)[, affinityToBrand := targetSegment/other]
brand_proportions[order(-affinityToBrand)]
```

```
##          BRAND targetSegment       other affinityToBrand
##         <char>         <num>       <num>           <num>
##  1:   TYRRELLS   0.031552795 0.025692464       1.2280953
##  2:   TWISTIES   0.046183575 0.037876520       1.2193194
##  3:    DORITOS   0.122760524 0.101074684       1.2145526
##  4:     KETTLE   0.197984817 0.165553442       1.1958967
##  5:   TOSTITOS   0.045410628 0.037977861       1.1957131
##  6:   PRINGLES   0.119420290 0.100634769       1.1866703
##  7:       COBS   0.044637681 0.039048861       1.1431238
##  8:  INFUZIONS   0.064679089 0.057064679       1.1334347
##  9:      THINS   0.060372671 0.056986370       1.0594230
## 10:    GRNWVES   0.032712215 0.031187957       1.0488733
## 11:   CHEEZELS   0.017971014 0.018646902       0.9637534
## 12:     SMITHS   0.096369910 0.124583692       0.7735355
## 13:     FRENCH   0.003947550 0.005758060       0.6855694
## 14:    CHEETOS   0.008033126 0.012066591       0.6657329
## 15:        RRD   0.043809524 0.067493678       0.6490908
## 16:    NATURAL   0.019599724 0.030853989       0.6352412
## 17:        CCS   0.011180124 0.018895650       0.5916771
## 18:   SUNBITES   0.006349206 0.012580210       0.5046980
## 19: WOOLWORTHS   0.024099379 0.049427188       0.4875733
## 20:     BURGER   0.002926156 0.006596434       0.4435967
##          BRAND targetSegment       other affinityToBrand
```

```
#### Preferred pack size compared to the rest of the population
quantity_segment1_by_pack <- segment1[,
.(targetSegment = sum(PROD_QTY)/quantity_segment1), by = PACK_SIZE]
quantity_other_by_pack <- other[,
.(other = sum(PROD_QTY)/quantity_other), by = PACK_SIZE]
pack_proportions <- merge(quantity_segment1_by_pack, quantity_other_by_pack)[,
affinityToPack := targetSegment/other]
pack_proportions[order(-affinityToPack)]
```

```
##     PACK_SIZE targetSegment       other affinityToPack
##         <num>         <num>       <num>          <num>
##  1:       270   0.031828847 0.025095929      1.2682873
##  2:       380   0.032160110 0.025584213      1.2570295
##  3:       330   0.061283644 0.050161917      1.2217166
##  4:       134   0.119420290 0.100634769      1.1866703
##  5:       110   0.106280193 0.089791190      1.1836372
##  6:       210   0.029123533 0.025121265      1.1593180
##  7:       135   0.014768806 0.013075403      1.1295106
##  8:       250   0.014354727 0.012780590      1.1231662
##  9:       170   0.080772947 0.080985964      0.9973697
## 10:       150   0.157598344 0.163420656      0.9643722
## 11:       175   0.254989648 0.270006956      0.9443818
## 12:       165   0.055652174 0.062267662      0.8937572
## 13:       190   0.007481021 0.012442016      0.6012708
## 14:       180   0.003588682 0.006066692      0.5915385
## 15:       160   0.006404417 0.012372920      0.5176157
## 16:        90   0.006349206 0.012580210      0.5046980
## 17:       125   0.003008972 0.006036750      0.4984423
## 18:       200   0.008971705 0.018656115      0.4808989
## 19:        70   0.003036577 0.006322350      0.4802924
## 20:       220   0.002926156 0.006596434      0.4435967
##     PACK_SIZE targetSegment       other affinityToPack
```

```
data[PACK_SIZE == 270, unique(PROD_NAME)]
```

```
## [1] "Twisties Cheese     270g" "Twisties Chicken270g"
```