Supermarket

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SUPERMAKET ANALYSIS

CONTEXT

Carrefour is a retail-focused global corporation based in France. It has operations in a number of countries, including the United Arab Emirates, Australia, Brazil, and, closer to home, Kenya.

As a data analyst at Carrefour Kenya, I'm now working on a project to tell the marketing department about the most effective marketing methods for generating the greatest sales (total price including tax).

EXPERIMENTAL DESIGN

The project is separated into four sections, each of which examines a recent marketing dataset using a variety of unsupervised learning approaches before making suggestions based on your findings.

Part 1: Reducing Dimensionality

PCA is used to reduce the dataset to a low-dimensional dataset in this section of the research.

Part 2: Choosing Features

This part calls on you to apply unsupervised learning methods to perform feature selection.

Association Rules (Part 3)

This section will require you to develop association rules in order to identify relationships between variables in the dataset.

Part 4: Detecting Anomalies

We will check if there are any.

Load data

```
# Loading our data
supermarket = read.csv("http://bit.ly/CarreFourDataset")
```

```
# Viewing the top of our data
head(supermarket)
```

```
##    Invoice.ID Branch Customer.type Gender           Product.line Unit.price
## 1 750-67-8428      A        Member Female      Health and beauty      74.69
## 2 226-31-3081      C        Normal Female Electronic accessories      15.28
## 3 631-41-3108      A        Normal   Male     Home and lifestyle      46.33
## 4 123-19-1176      A        Member   Male      Health and beauty      58.22
## 5 373-73-7910      A        Normal   Male      Sports and travel      86.31
## 6 699-14-3026      C        Normal   Male Electronic accessories      85.39
##   Quantity     Tax      Date  Time     Payment   cogs gross.margin.percentage
## 1        7 26.1415  1/5/2019 13:08     Ewallet 522.83                4.761905
## 2        5  3.8200  3/8/2019 10:29        Cash  76.40                4.761905
## 3        7 16.2155  3/3/2019 13:23 Credit card 324.31                4.761905
## 4        8 23.2880 1/27/2019 20:33     Ewallet 465.76                4.761905
## 5        7 30.2085  2/8/2019 10:37     Ewallet 604.17                4.761905
## 6        7 29.8865 3/25/2019 18:30     Ewallet 597.73                4.761905
##   gross.income Rating    Total
## 1      26.1415    9.1 548.9715
## 2       3.8200    9.6  80.2200
## 3      16.2155    7.4 340.5255
## 4      23.2880    8.4 489.0480
## 5      30.2085    5.3 634.3785
## 6      29.8865    4.1 627.6165
```

```
# Viewing the bottom of our data
tail(supermarket)
```

```
##       Invoice.ID Branch Customer.type Gender           Product.line Unit.price
## 995  652-49-6720      C        Member Female Electronic accessories      60.95
## 996  233-67-5758      C        Normal   Male      Health and beauty      40.35
## 997  303-96-2227      B        Normal Female     Home and lifestyle      97.38
## 998  727-02-1313      A        Member   Male     Food and beverages      31.84
## 999  347-56-2442      A        Normal   Male     Home and lifestyle      65.82
## 1000 849-09-3807      A        Member Female    Fashion accessories      88.34
##      Quantity     Tax      Date  Time Payment   cogs gross.margin.percentage
## 995         1  3.0475 2/18/2019 11:40 Ewallet  60.95                4.761905
## 996         1  2.0175 1/29/2019 13:46 Ewallet  40.35                4.761905
## 997        10 48.6900  3/2/2019 17:16 Ewallet 973.80                4.761905
## 998         1  1.5920  2/9/2019 13:22    Cash  31.84                4.761905
## 999         1  3.2910 2/22/2019 15:33    Cash  65.82                4.761905
## 1000        7 30.9190 2/18/2019 13:28    Cash 618.38                4.761905
##      gross.income Rating     Total
## 995        3.0475    5.9   63.9975
## 996        2.0175    6.2   42.3675
## 997       48.6900    4.4 1022.4900
## 998        1.5920    7.7   33.4320
## 999        3.2910    4.1   69.1110
## 1000      30.9190    6.6  649.2990
```

```
# checking the shape of our data
dim(supermarket)
```

```
## [1] 1000   16
```

Our data has 1000 observations and 16 variables.

```
# checking the structure of our data
str(supermarket)
```

```
## 'data.frame':    1000 obs. of  16 variables:
##  $ Invoice.ID            : chr  "750-67-8428" "226-31-3081" "631-41-3108" "123-19-1176" ...
##  $ Branch                : chr  "A" "C" "A" "A" ...
##  $ Customer.type         : chr  "Member" "Normal" "Normal" "Member" ...
##  $ Gender                : chr  "Female" "Female" "Male" "Male" ...
##  $ Product.line          : chr  "Health and beauty" "Electronic accessories" "Home and lifestyle" "
##  $ Unit.price            : num  74.7 15.3 46.3 58.2 86.3 ...
##  $ Quantity              : int  7 5 7 8 7 7 6 10 2 3 ...
##  $ Tax                   : num  26.14 3.82 16.22 23.29 30.21 ...
##  $ Date                  : chr  "1/5/2019" "3/8/2019" "3/3/2019" "1/27/2019" ...
##  $ Time                  : chr  "13:08" "10:29" "13:23" "20:33" ...
##  $ Payment               : chr  "Ewallet" "Cash" "Credit card" "Ewallet" ...
##  $ cogs                  : num  522.8 76.4 324.3 465.8 604.2 ...
##  $ gross.margin.percentage: num  4.76 4.76 4.76 4.76 4.76 ...
##  $ gross.income          : num  26.14 3.82 16.22 23.29 30.21 ...
##  $ Rating                : num  9.1 9.6 7.4 8.4 5.3 4.1 5.8 8 7.2 5.9 ...
##  $ Total                 : num  549 80.2 340.5 489 634.4 ...
```

Our data has 16 character variables and 8 numerical variables.

Data cleaning

```
# checking for missing values
colSums(is.na(supermarket))
```

```
##              Invoice.ID                  Branch           Customer.type
##                       0                       0                       0
##                  Gender           Product.line             Unit.price
##                       0                       0                       0
##                Quantity                     Tax                    Date
##                       0                       0                       0
##                    Time                 Payment                    cogs
##                       0                       0                       0
## gross.margin.percentage            gross.income                  Rating
##                       0                       0                       0
##                   Total
##                       0
```

Our dataset ha no missing values.

```
# checking for duplicate values
colSums(supermarket[duplicated(supermarket),])
```

```
##              Invoice.ID                  Branch           Customer.type
##                       0                       0                       0
##                  Gender           Product.line             Unit.price
##                       0                       0                       0
```

```
##                Quantity                     Tax                    Date
##                       0                       0                       0
##                    Time                 Payment                    cogs
##                       0                       0                       0
## gross.margin.percentage            gross.income                  Rating
##                       0                       0                       0
##                   Total
##                       0
```

Our data set has no duplicate values.

```
# lower case of the column names
names(supermarket) <- tolower(names(supermarket))
names(supermarket)
```

```
##  [1] "invoice.id"              "branch"
##  [3] "customer.type"           "gender"
##  [5] "product.line"            "unit.price"
##  [7] "quantity"                "tax"
##  [9] "date"                    "time"
## [11] "payment"                 "cogs"
## [13] "gross.margin.percentage" "gross.income"
## [15] "rating"                  "total"
```

Our column names have been lowered for easier manipulation.

```
# checking for outliers
# detect outliers by use ofsome descriptive statistics,
# and in particular with the minimum and maximum.
summary(supermarket)
```

```
##   invoice.id           branch           customer.type        gender
##  Length:1000        Length:1000        Length:1000        Length:1000
##  Class :character   Class :character   Class :character   Class :character
##  Mode  :character   Mode  :character   Mode  :character   Mode  :character
##
##
##
##  product.line         unit.price       quantity          tax
##  Length:1000        Min.   :10.08   Min.   : 1.00   Min.   : 0.5085
##  Class :character   1st Qu.:32.88   1st Qu.: 3.00   1st Qu.: 5.9249
##  Mode  :character   Median :55.23   Median : 5.00   Median :12.0880
##                     Mean   :55.67   Mean   : 5.51   Mean   :15.3794
##                     3rd Qu.:77.94   3rd Qu.: 8.00   3rd Qu.:22.4453
##                     Max.   :99.96   Max.   :10.00   Max.   :49.6500
##      date               time             payment              cogs
##  Length:1000        Length:1000        Length:1000        Min.   : 10.17
##  Class :character   Class :character   Class :character   1st Qu.:118.50
##  Mode  :character   Mode  :character   Mode  :character   Median :241.76
##                                                           Mean   :307.59
##                                                           3rd Qu.:448.90
##                                                           Max.   :993.00
```

```
##  gross.margin.percentage  gross.income         rating           total
##  Min.   :4.762           Min.   : 0.5085   Min.   : 4.000   Min.   :  10.68
##  1st Qu.:4.762           1st Qu.: 5.9249   1st Qu.: 5.500   1st Qu.: 124.42
##  Median :4.762           Median :12.0880   Median : 7.000   Median : 253.85
##  Mean   :4.762           Mean   :15.3794   Mean   : 6.973   Mean   : 322.97
##  3rd Qu.:4.762           3rd Qu.:22.4453   3rd Qu.: 8.500   3rd Qu.: 471.35
##  Max.   :4.762           Max.   :49.6500   Max.   :10.000   Max.   :1042.65
```

According to the summary data, no outliers are present. We will, however, continue to look into the matter in order to assess and confirm our findings.

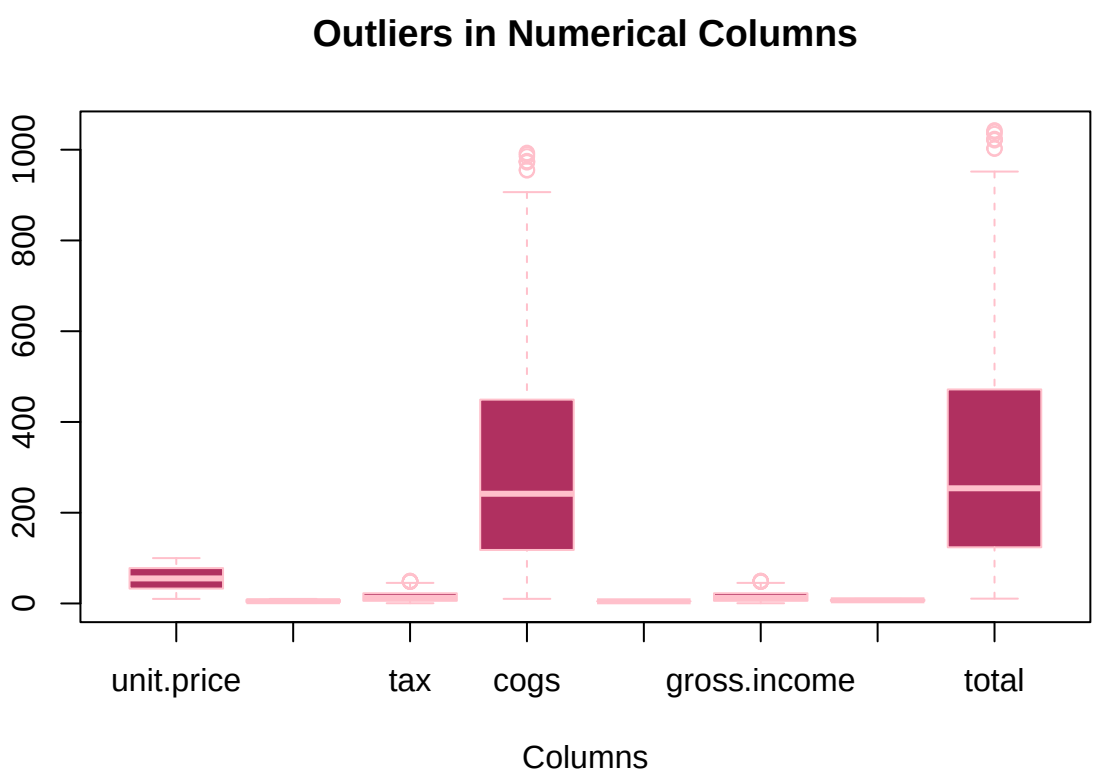
```
# checking for outliers
# load tidy verse
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.4     v dplyr   1.0.7
## v tidyr   1.1.3     v stringr 1.4.0
## v readr   2.0.1     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
num <- select_if(supermarket, is.numeric)# selecting numerical columns only
boxplot(num,
main = "Outliers in Numerical Columns",
xlab = "Columns",
col = "maroon",
border = "pink")
```



There are some outliers on cogs,Total column,Tax and Ratings.

```
# Tax and gross income columns seem to have the same values
# Let's confirm this
all(supermarket$tax == supermarket$gross.income)
```

```
## [1] TRUE
```

The two columns have equal values.

- Gross income includes all income you receive that isn't explicitly exempt from taxation.
- Taxable income is the portion of your gross income that's actually subject to taxation.
- We can see from the data that the tax column is important because when we add our tax to the cost of goods sold (i.e. the cogs column), we get the final price shown in the Total column. The gross income column is another name for the total column.
- We will therefore drop the gross income column.

```
# Removing gross income column
supermarket <- supermarket[-c(14)]
```

```
# Lets check the columns
names(supermarket)
```

```
##  [1] "invoice.id"              "branch"
##  [3] "customer.type"           "gender"
##  [5] "product.line"            "unit.price"
##  [7] "quantity"                "tax"
##  [9] "date"                    "time"
## [11] "payment"                 "cogs"
## [13] "gross.margin.percentage" "rating"
## [15] "total"
```

```
# gross income has been removed
```

We change some of the columns with the character datatype to numerical datatype

```
supermarket$branch <- as.integer(as.factor(supermarket$branch))
supermarket$customer.type <- as.integer(as.factor(supermarket$customer.type))
supermarket$gender <- as.integer(as.factor(supermarket$gender))
supermarket$product.line <-as.integer(as.factor(supermarket$product.line))
supermarket$payment <-as.integer(as.factor(supermarket$payment))
```

```
# checking to see if our variables have been converted
str(supermarket)
```

```
## 'data.frame':    1000 obs. of  15 variables:
##  $ invoice.id             : chr  "750-67-8428" "226-31-3081" "631-41-3108" "123-19-1176" ...
##  $ branch                 : int  1 3 1 1 1 3 1 3 1 2 ...
##  $ customer.type          : int  1 2 2 1 2 2 1 2 1 1 ...
##  $ gender                 : int  1 1 2 2 2 2 1 1 1 1 ...
##  $ product.line           : int  4 1 5 4 6 1 1 5 4 3 ...
##  $ unit.price             : num  74.7 15.3 46.3 58.2 86.3 ...
##  $ quantity               : int  7 5 7 8 7 7 6 10 2 3 ...
##  $ tax                    : num  26.14 3.82 16.22 23.29 30.21 ...
##  $ date                   : chr  "1/5/2019" "3/8/2019" "3/3/2019" "1/27/2019" ...
##  $ time                   : chr  "13:08" "10:29" "13:23" "20:33" ...
##  $ payment                : int  3 1 2 3 3 3 3 3 2 2 ...
##  $ cogs                   : num  522.8 76.4 324.3 465.8 604.2 ...
##  $ gross.margin.percentage: num  4.76 4.76 4.76 4.76 4.76 ...
##  $ rating                 : num  9.1 9.6 7.4 8.4 5.3 4.1 5.8 8 7.2 5.9 ...
##  $ total                  : num  549 80.2 340.5 489 634.4 ...
```

```
# checking for correlation of our variables
data.num<-select_if(supermarket,is.numeric)
data.num
```

```
##      branch customer.type gender product.line unit.price quantity     tax
## 1         1             1      1            4      74.69        7 26.1415
## 2         3             2      1            1      15.28        5  3.8200
## 3         1             2      2            5      46.33        7 16.2155
## 4         1             1      2            4      58.22        8 23.2880
## 5         1             2      2            6      86.31        7 30.2085
## 6         3             2      2            1      85.39        7 29.8865
## 7         1             1      1            1      68.84        6 20.6520
## 8         3             2      1            5      73.56       10 36.7800
```

```
## 9        1        1      1        4     36.26        2  3.6260
## 10       2        1      1        3     54.84        3  8.2260
## 11       2        1      1        2     14.48        4  2.8960
## 12       2        1      2        1     25.51        4  5.1020
## 13       1        2      1        1     46.95        5 11.7375
## 14       1        2      2        3     43.19       10 21.5950
## 15       1        2      1        4     71.38       10 35.6900
## 16       2        1      1        6     93.72        6 28.1160
## 17       1        1      1        4     68.93        7 24.1255
## 18       1        2      2        6     72.61        6 21.7830
## 19       1        2      2        3     54.67        3  8.2005
## 20       2        2      1        5     40.30        2  4.0300
## 21       3        1      2        1     86.04        5 21.5100
## 22       2        2      2        4     87.98        3 13.1970
## 23       2        2      2        5     33.20        2  3.3200
## 24       1        2      2        1     34.56        5  8.6400
## 25       1        1      2        6     88.63        3 13.2945
## 26       1        1      1        5     52.59        8 21.0360
## 27       2        2      2        2     33.52        1  1.6760
## 28       1        2      1        2     87.67        2  8.7670
## 29       2        2      1        3     88.36        5 22.0900
## 30       1        2      2        4     24.89        9 11.2005
## 31       2        2      2        2     94.13        5 23.5325
## 32       2        1      2        6     78.07        9 35.1315
## 33       2        2      2        6     83.78        8 33.5120
## 34       1        2      2        4     96.58        2  9.6580
## 35       3        1      1        3     99.42        4 19.8840
## 36       3        1      1        6     68.12        1  3.4060
## 37       1        1      2        6     62.62        5 15.6550
## 38       1        2      1        1     60.88        9 27.3960
## 39       3        2      1        4     54.92        8 21.9680
## 40       2        1      2        5     30.12        8 12.0480
## 41       2        1      1        5     86.72        1  4.3360
## 42       3        1      2        5     56.11        2  5.6110
## 43       2        1      1        6     69.12        6 20.7360
## 44       3        1      1        3     98.70        8 39.4800
## 45       3        1      2        4     15.37        2  1.5370
## 46       2        1      1        1     93.96        4 18.7920
## 47       2        1      2        4     56.69        9 25.5105
## 48       2        1      1        3     20.01        9  9.0045
## 49       2        1      2        1     18.93        6  5.6790
## 50       3        1      1        2     82.63       10 41.3150
## 51       3        1      2        3     91.40        7 31.9900
## 52       1        1      1        3     44.59        5 11.1475
## 53       2        1      1        2     17.87        4  3.5740
## 54       3        1      2        2     15.43        1  0.7715
## 55       2        2      2        5     16.16        2  1.6160
## 56       3        2      1        1     85.98        8 34.3920
## 57       1        1      2        5     44.34        2  4.4340
## 58       1        2      2        4     89.60        8 35.8400
## 59       1        1      1        5     72.35       10 36.1750
## 60       3        2      2        1     30.61        6  9.1830
## 61       3        1      1        6     24.74        3  3.7110
## 62       3        2      2        5     55.73        6 16.7190
```

```
## 63       2       1       1       6      55.07       9 24.7815
## 64       1       1       2       6      15.81      10  7.9050
## 65       2       1       2       4      75.74       4 15.1480
## 66       1       1       2       4      15.87      10  7.9350
## 67       3       2       1       4      33.47       2  3.3470
## 68       2       1       1       2      97.61       6 29.2830
## 69       1       2       2       6      78.77      10 39.3850
## 70       1       1       1       4      18.33       1  0.9165
## 71       3       2       2       3      89.48      10 44.7400
## 72       3       2       2       2      62.12      10 31.0600
## 73       2       1       1       3      48.52       3  7.2780
## 74       3       2       1       1      75.91       6 22.7730
## 75       1       2       2       5      74.67       9 33.6015
## 76       3       2       1       1      41.65      10 20.8250
## 77       3       1       2       2      49.04       9 22.0680
## 78       1       1       1       2      20.01       9  9.0045
## 79       3       1       1       3      78.31      10 39.1550
## 80       3       2       1       4      20.38       5  5.0950
## 81       3       2       1       4      99.19       6 29.7570
## 82       2       2       1       3      96.68       3 14.5020
## 83       3       2       2       3      19.25       8  7.7000
## 84       3       1       1       3      80.36       4 16.0720
## 85       3       1       2       6      48.91       5 12.2275
## 86       3       2       1       6      83.06       7 29.0710
## 87       3       2       2       2      76.52       5 19.1300
## 88       1       1       2       3      49.38       7 17.2830
## 89       1       2       2       6      42.47       1  2.1235
## 90       2       2       1       4      76.99       6 23.0970
## 91       3       1       1       5      47.38       4  9.4760
## 92       3       2       1       6      44.86      10 22.4300
## 93       1       1       1       6      21.98       7  7.6930
## 94       2       1       2       4      64.36       9 28.9620
## 95       3       2       2       4      89.75       1  4.4875
## 96       1       2       2       1      97.16       1  4.8580
## 97       2       2       2       4      87.87      10 43.9350
## 98       3       2       1       1      12.45       6  3.7350
## 99       1       2       2       3      52.75       3  7.9125
## 100      2       2       2       5      82.70       6 24.8100
## 101      3       1       2       2      48.71       1  2.4355
## 102      3       2       2       2      78.55       9 35.3475
## 103      3       2       1       1      23.07       9 10.3815
## 104      1       2       2       3      58.26       6 17.4780
## 105      2       2       2       4      30.35       7 10.6225
## 106      1       1       2       1      88.67      10 44.3350
## 107      3       2       2       2      27.38       6  8.2140
## 108      1       2       2       6      62.13       6 18.6390
## 109      3       2       1       3      33.98       9 15.2910
## 110      3       1       2       1      81.97      10 40.9850
## 111      2       1       1       6      16.49       2  1.6490
## 112      3       1       1       4      98.21       3 14.7315
## 113      2       2       1       2      72.84       7 25.4940
## 114      1       1       2       5      58.07       9 26.1315
## 115      3       1       1       5      80.79       9 36.3555
## 116      3       2       1       2      27.02       3  4.0530
```

```
## 117      2            1      2            2      21.94       5  5.4850
## 118      2            1      2            2      51.36       1  2.5680
## 119      1            2      1            3      10.96      10  5.4800
## 120      2            2      2            5      53.44       2  5.3440
## 121      1            2      1            1      99.56       8 39.8240
## 122      3            1      2            6      57.12       7 19.9920
## 123      2            1      2            6      99.96       9 44.9820
## 124      3            1      2            5      63.91       8 25.5640
## 125      2            1      1            2      56.47       8 22.5880
## 126      1            2      1            5      93.69       7 32.7915
## 127      1            2      1            6      32.25       5  8.0625
## 128      3            2      1            2      31.73       9 14.2785
## 129      3            1      1            3      68.54       8 27.4160
## 130      2            2      1            6      90.28       9 40.6260
## 131      2            2      1            2      39.62       7 13.8670
## 132      1            1      1            6      92.13       6 27.6390
## 133      2            2      1            6      34.84       4  6.9680
## 134      2            1      2            1      87.45       6 26.2350
## 135      3            2      1            4      81.30       6 24.3900
## 136      3            2      2            2      90.22       3 13.5330
## 137      1            2      1            1      26.31       5  6.5775
## 138      1            1      1            5      34.42       6 10.3260
## 139      2            2      2            6      51.91      10 25.9550
## 140      1            2      2            6      72.50       8 29.0000
## 141      3            1      1            6      89.80      10 44.9000
## 142      3            1      2            4      90.50      10 45.2500
## 143      3            1      1            4      68.60      10 34.3000
## 144      3            1      1            3      30.41       1  1.5205
## 145      1            2      1            5      77.95       6 23.3850
## 146      3            2      1            4      46.26       6 13.8780
## 147      1            1      1            2      30.14      10 15.0700
## 148      3            2      2            4      66.14       4 13.2280
## 149      2            1      2            5      71.86       8 28.7440
## 150      1            2      2            4      32.46       8 12.9840
## 151      2            1      1            2      91.54       4 18.3080
## 152      3            1      2            6      34.56       7 12.0960
## 153      1            2      2            2      83.24       9 37.4580
## 154      3            2      1            3      16.48       6  4.9440
## 155      3            2      1            6      80.97       8 32.3880
## 156      1            1      2            3      92.29       5 23.0725
## 157      2            1      2            1      72.17       1  3.6085
## 158      2            2      2            5      50.28       5 12.5700
## 159      2            1      2            4      97.22       9 43.7490
## 160      2            2      2            6      93.39       6 28.0170
## 161      3            2      1            3      43.18       8 17.2720
## 162      1            2      2            6      63.69       1  3.1845
## 163      1            2      2            3      45.79       7 16.0265
## 164      3            2      2            6      76.40       2  7.6400
## 165      2            2      2            3      39.90      10 19.9500
## 166      2            1      2            4      42.57       8 17.0280
## 167      3            2      2            5      95.58      10 47.7900
## 168      1            2      2            2      98.98      10 49.4900
## 169      1            2      2            3      51.28       6 15.3840
## 170      1            1      2            6      69.52       7 24.3320
```

```
## 171      1      2      2      4     70.01      5 17.5025
## 172      2      1      2      3     80.05      5 20.0125
## 173      3      2      2      1     20.85      8  8.3400
## 174      2      1      2      1     52.89      6 15.8670
## 175      2      2      2      3     19.79      8  7.9160
## 176      1      1      2      5     33.84      9 15.2280
## 177      1      1      2      3     22.17      8  8.8680
## 178      3      2      1      2     22.51      7  7.8785
## 179      1      2      2      3     73.88      6 22.1640
## 180      3      1      2      4     86.80      3 13.0200
## 181      3      2      2      2     64.26      7 22.4910
## 182      3      1      2      3     38.47      8 15.3880
## 183      1      1      2      6     15.50     10  7.7500
## 184      3      2      2      4     34.31      8 13.7240
## 185      1      2      1      6     12.34      7  4.3190
## 186      2      1      2      3     18.08      3  2.7120
## 187      2      1      1      5     94.49      8 37.7960
## 188      2      1      2      5     46.47      4  9.2940
## 189      1      2      2      5     74.07      1  3.7035
## 190      3      2      1      5     69.81      4 13.9620
## 191      2      2      1      5     77.04      3 11.5560
## 192      2      2      1      2     73.52      2  7.3520
## 193      3      2      1      3     87.80      9 39.5100
## 194      2      2      2      5     25.55      4  5.1100
## 195      1      2      2      1     32.71      5  8.1775
## 196      3      1      1      2     74.29      1  3.7145
## 197      3      1      2      4     43.70      2  4.3700
## 198      1      2      1      5     25.29      1  1.2645
## 199      3      2      2      4     41.50      4  8.3000
## 200      3      1      1      3     71.39      5 17.8475
## 201      3      1      1      6     19.15      6  5.7450
## 202      2      1      1      1     57.49      4 11.4980
## 203      3      2      2      1     61.41      7 21.4935
## 204      2      1      2      4     25.90     10 12.9500
## 205      2      1      2      5     17.77      5  4.4425
## 206      1      2      1      4     23.03      9 10.3635
## 207      3      1      1      1     66.65      9 29.9925
## 208      3      1      1      5     28.53     10 14.2650
## 209      2      2      1      2     30.37      3  4.5555
## 210      2      2      1      1     99.73      9 44.8785
## 211      1      2      2      1     26.23      9 11.8035
## 212      3      2      1      3     93.26      9 41.9670
## 213      2      2      2      5     92.36      5 23.0900
## 214      2      2      2      6     46.42      3  6.9630
## 215      2      1      1      6     29.61      7 10.3635
## 216      1      2      2      5     18.28      1  0.9140
## 217      2      2      1      6     24.77      5  6.1925
## 218      1      1      1      1     94.64      3 14.1960
## 219      2      2      2      2     94.87      8 37.9480
## 220      2      2      1      3     57.34      3  8.6010
## 221      2      2      2      1     45.35      6 13.6050
## 222      2      2      2      3     62.08      7 21.7280
## 223      3      2      2      1     11.81      5  2.9525
## 224      3      1      1      2     12.54      1  0.6270
```

```
## 225      1      2      2      3     43.25      2  4.3250
## 226      3      1      1      6     87.16      2  8.7160
## 227      2      1      2      4     69.37      9 31.2165
## 228      3      1      2      1     37.06      4  7.4120
## 229      2      1      1      1     90.70      6 27.2100
## 230      1      2      1      5     63.42      8 25.3680
## 231      2      2      1      2     81.37      2  8.1370
## 232      2      1      1      1     10.59      3  1.5885
## 233      2      2      1      4     84.09      9 37.8405
## 234      2      1      2      2     73.82      4 14.7640
## 235      1      1      2      4     51.94     10 25.9700
## 236      1      2      1      6     93.14      2  9.3140
## 237      3      2      2      4     17.41      5  4.3525
## 238      3      1      1      2     44.22      5 11.0550
## 239      2      1      1      1     13.22      5  3.3050
## 240      1      2      2      2     89.69      1  4.4845
## 241      1      2      2      3     24.94      9 11.2230
## 242      1      2      2      4     59.77      2  5.9770
## 243      3      1      2      2     93.20      2  9.3200
## 244      1      1      2      5     62.65      4 12.5300
## 245      2      2      2      5     93.87      8 37.5480
## 246      1      1      2      5     47.59      8 19.0360
## 247      2      1      1      1     81.40      3 12.2100
## 248      1      1      2      2     17.94      5  4.4850
## 249      1      1      2      1     77.72      4 15.5440
## 250      2      2      2      3     73.06      7 25.5710
## 251      2      1      2      3     46.55      9 20.9475
## 252      3      1      2      2     35.19     10 17.5950
## 253      3      2      1      6     14.39      2  1.4390
## 254      1      2      2      5     23.75      4  4.7500
## 255      1      1      2      5     58.90      8 23.5600
## 256      2      1      2      2     32.62      4  6.5240
## 257      1      1      2      1     66.35      1  3.3175
## 258      1      1      2      5     25.91      6  7.7730
## 259      1      1      2      1     32.25      4  6.4500
## 260      3      1      2      1     65.94      4 13.1880
## 261      1      2      1      1     75.06      9 33.7770
## 262      3      2      1      2     16.45      4  3.2900
## 263      2      1      1      2     38.30      4  7.6600
## 264      1      1      1      6     22.24     10 11.1200
## 265      2      2      2      6     54.45      1  2.7225
## 266      1      1      1      6     98.40      7 34.4400
## 267      3      2      2      5     35.47      4  7.0940
## 268      2      1      1      3     74.60     10 37.3000
## 269      1      1      2      5     70.74      4 14.1480
## 270      1      1      1      5     35.54     10 17.7700
## 271      2      2      1      6     67.43      5 16.8575
## 272      3      1      1      4     21.12      2  2.1120
## 273      1      1      1      5     21.54      9  9.6930
## 274      1      2      1      5     12.03      2  1.2030
## 275      2      2      1      4     99.71      6 29.9130
## 276      2      2      2      2     47.97      7 16.7895
## 277      3      1      1      5     21.82     10 10.9100
## 278      3      2      1      2     95.42      4 19.0840
```

```
## 279      3            1      2            2      70.99       10 35.4950
## 280      1            1      2            6      44.02       10 22.0100
## 281      1            2      1            5      69.96        8 27.9840
## 282      3            2      2            5      37.00        1  1.8500
## 283      1            2      1            6      15.34        1  0.7670
## 284      1            1      2            4      99.83        6 29.9490
## 285      1            1      1            4      47.67        4  9.5340
## 286      2            2      2            4      66.68        5 16.6700
## 287      3            1      2            5      74.86        1  3.7430
## 288      3            2      1            6      23.75        9 10.6875
## 289      2            2      1            3      48.51        7 16.9785
## 290      1            1      1            5      94.88        7 33.2080
## 291      2            1      2            1      40.30       10 20.1500
## 292      3            2      2            1      27.85        7  9.7475
## 293      1            1      1            1      62.48        1  3.1240
## 294      1            1      1            3      36.36        2  3.6360
## 295      2            2      2            4      18.11       10  9.0550
## 296      3            1      1            1      51.92        5 12.9800
## 297      3            2      2            1      28.84        4  5.7680
## 298      1            1      2            5      78.38        6 23.5140
## 299      1            1      2            5      60.01        4 12.0020
## 300      3            1      1            5      88.61        1  4.4305
## 301      3            2      2            2      99.82        2  9.9820
## 302      2            1      2            4      39.01        1  1.9505
## 303      3            2      2            3      48.61        1  2.4305
## 304      1            2      1            1      51.19        4 10.2380
## 305      2            2      1            1      14.96        8  5.9840
## 306      1            1      2            1      72.20        7 25.2700
## 307      1            2      1            6      40.23        7 14.0805
## 308      1            1      1            5      88.79        8 35.5160
## 309      1            1      1            1      26.48        3  3.9720
## 310      1            2      1            2      81.91        2  8.1910
## 311      2            1      2            6      79.93        6 23.9790
## 312      3            1      2            2      69.33        2  6.9330
## 313      1            1      1            3      14.23        5  3.5575
## 314      1            1      1            4      15.55        9  6.9975
## 315      3            1      1            1      78.13       10 39.0650
## 316      3            1      2            3      99.37        2  9.9370
## 317      3            1      1            3      21.08        3  3.1620
## 318      3            1      2            1      74.79        5 18.6975
## 319      3            1      1            4      29.67        7 10.3845
## 320      3            1      2            4      44.07        4  8.8140
## 321      3            2      1            3      22.93        9 10.3185
## 322      3            2      1            4      39.42        1  1.9710
## 323      1            2      2            4      15.26        6  4.5780
## 324      1            2      1            2      61.77        5 15.4425
## 325      1            2      2            5      21.52        6  6.4560
## 326      2            2      2            6      97.74        4 19.5480
## 327      1            1      2            3      99.78        5 24.9450
## 328      3            1      2            3      94.26        4 18.8520
## 329      2            1      2            4      51.13        4 10.2260
## 330      1            1      2            1      36.36        4  7.2720
## 331      2            2      2            5      22.02        9  9.9090
## 332      1            2      2            3      32.90        3  4.9350
```

```
## 333      1      2      2      2      77.02      5 19.2550
## 334      1      1      2      3      23.48      2  2.3480
## 335      3      1      2      6      14.70      5  3.6750
## 336      1      1      1      1      28.45      5  7.1125
## 337      1      2      2      2      76.40      9 34.3800
## 338      2      2      1      6      57.95      6 17.3850
## 339      3      2      1      1      47.65      3  7.1475
## 340      2      1      1      3      42.82      9 19.2690
## 341      2      1      2      1      48.09      3  7.2135
## 342      2      1      1      4      55.97      7 19.5895
## 343      2      1      1      4      76.90      7 26.9150
## 344      3      2      1      3      97.03      5 24.2575
## 345      1      2      2      6      44.65      3  6.6975
## 346      1      2      1      2      77.93      9 35.0685
## 347      1      1      2      1      71.95      1  3.5975
## 348      3      1      1      5      89.25      8 35.7000
## 349      1      2      2      1      26.02      7  9.1070
## 350      2      2      1      4      13.50     10  6.7500
## 351      3      1      1      2      99.30     10 49.6500
## 352      1      2      2      1      51.69      7 18.0915
## 353      2      1      1      2      54.73      7 19.1555
## 354      2      1      2      5      27.00      9 12.1500
## 355      3      2      1      1      30.24      1  1.5120
## 356      2      1      1      3      89.14      4 17.8280
## 357      3      2      1      2      37.55     10 18.7750
## 358      3      2      1      6      95.44     10 47.7200
## 359      2      2      2      1      27.50      3  4.1250
## 360      2      2      2      6      74.97      1  3.7485
## 361      1      1      2      3      80.96      8 32.3840
## 362      3      2      1      3      94.47      8 37.7880
## 363      3      2      2      3      99.79      2  9.9790
## 364      1      2      2      5      73.22      6 21.9660
## 365      3      2      1      3      41.24      4  8.2480
## 366      3      2      1      2      81.68      4 16.3360
## 367      3      2      1      1      51.32      9 23.0940
## 368      1      1      2      5      65.94      4 13.1880
## 369      3      2      1      6      14.36     10  7.1800
## 370      1      1      2      1      21.50      9  9.6750
## 371      2      1      1      1      26.26      7  9.1910
## 372      2      2      1      2      60.96      2  6.0960
## 373      3      2      1      5      70.11      6 21.0330
## 374      3      2      2      2      42.08      6 12.6240
## 375      1      2      1      5      67.09      5 16.7725
## 376      1      1      1      2      96.70      5 24.1750
## 377      2      1      1      5      35.38      9 15.9210
## 378      3      2      2      6      95.49      7 33.4215
## 379      3      1      2      2      96.98      4 19.3960
## 380      2      2      1      1      23.65      4  4.7300
## 381      1      1      2      6      82.33      4 16.4660
## 382      3      2      1      1      26.61      2  2.6610
## 383      2      2      1      3      99.69      5 24.9225
## 384      3      1      1      3      74.89      4 14.9780
## 385      1      2      1      3      40.94      5 10.2350
## 386      2      1      2      6      75.82      1  3.7910
```

```
## 387      3            2      2            3      46.77       6 14.0310
## 388      1            2      1            4      32.32      10 16.1600
## 389      3            1      1            2      54.07       9 24.3315
## 390      2            2      2            3      18.22       7  6.3770
## 391      3            1      1            2      80.48       3 12.0720
## 392      2            2      1            2      37.95      10 18.9750
## 393      1            1      2            1      76.82       1  3.8410
## 394      1            1      1            6      52.26      10 26.1300
## 395      1            2      1            4      79.74       1  3.9870
## 396      1            2      1            4      77.50       5 19.3750
## 397      1            2      1            3      54.27       5 13.5675
## 398      2            2      2            5      13.59       9  6.1155
## 399      2            1      1            4      41.06       6 12.3180
## 400      2            1      2            1      19.24       9  8.6580
## 401      3            2      1            3      39.43       6 11.8290
## 402      3            2      2            5      46.22       4  9.2440
## 403      3            1      2            5      13.98       1  0.6990
## 404      2            2      1            2      39.75       5  9.9375
## 405      3            1      1            2      97.79       7 34.2265
## 406      1            1      2            6      67.26       4 13.4520
## 407      1            2      2            3      13.79       5  3.4475
## 408      2            1      1            2      68.71       4 13.7420
## 409      1            2      1            5      56.53       4 11.3060
## 410      3            2      1            2      23.82       5  5.9550
## 411      2            2      1            4      34.21      10 17.1050
## 412      2            2      2            6      21.87       2  2.1870
## 413      1            1      2            4      20.97       5  5.2425
## 414      1            2      2            6      25.84       3  3.8760
## 415      1            2      2            5      50.93       8 20.3720
## 416      2            2      2            4      96.11       1  4.8055
## 417      3            2      1            5      45.38       4  9.0760
## 418      3            1      1            4      81.51       1  4.0755
## 419      2            2      1            4      57.22       2  5.7220
## 420      1            1      1            1      25.22       7  8.8270
## 421      3            1      1            3      38.60       3  5.7900
## 422      3            2      1            1      84.05       3 12.6075
## 423      3            1      1            2      97.21      10 48.6050
## 424      2            1      2            2      25.42       8 10.1680
## 425      3            2      2            2      16.28       1  0.8140
## 426      2            1      2            2      40.61       9 18.2745
## 427      1            1      2            4      53.17       7 18.6095
## 428      2            1      1            3      20.87       3  3.1305
## 429      2            2      2            6      67.27       5 16.8175
## 430      1            1      1            5      90.65      10 45.3250
## 431      2            2      2            2      69.08       2  6.9080
## 432      3            2      2            3      43.27       2  4.3270
## 433      1            2      1            1      23.46       6  7.0380
## 434      2            2      2            2      95.54       7 33.4390
## 435      2            2      1            2      47.44       1  2.3720
## 436      3            2      2            6      99.24       9 44.6580
## 437      3            1      2            6      82.93       4 16.5860
## 438      1            2      2            5      33.99       6 10.1970
## 439      3            1      2            3      17.04       4  3.4080
## 440      3            2      1            1      40.86       8 16.3440
```

```
## 441      3            1      2            3      17.44       5  4.3600
## 442      2            1      1            6      88.43       8 35.3720
## 443      1            1      1            5      89.21       9 40.1445
## 444      3            2      2            2      12.78       1  0.6390
## 445      1            2      1            6      19.10       7  6.6850
## 446      2            1      1            4      19.15       1  0.9575
## 447      3            1      2            3      27.66      10 13.8300
## 448      3            2      2            2      45.74       3  6.8610
## 449      2            1      1            4      27.07       1  1.3535
## 450      2            1      1            6      39.12       1  1.9560
## 451      2            2      1            1      74.71       6 22.4130
## 452      2            2      2            1      22.01       6  6.6030
## 453      1            2      1            3      63.61       5 15.9025
## 454      1            2      2            4      25.00       1  1.2500
## 455      1            1      2            1      20.77       4  4.1540
## 456      2            1      1            2      29.56       5  7.3900
## 457      2            1      1            3      77.40       9 34.8300
## 458      2            2      2            1      79.39      10 39.6950
## 459      3            1      1            1      46.57      10 23.2850
## 460      3            2      2            3      35.89       1  1.7945
## 461      3            2      2            3      40.52       5 10.1300
## 462      2            1      1            3      73.05      10 36.5250
## 463      3            2      1            6      73.95       4 14.7900
## 464      3            1      1            3      22.62       1  1.1310
## 465      1            1      2            3      51.34       5 12.8350
## 466      3            1      1            6      54.55      10 27.2750
## 467      3            1      1            4      37.15       7 13.0025
## 468      2            2      2            6      37.02       6 11.1060
## 469      3            2      2            3      21.58       1  1.0790
## 470      3            1      1            1      98.84       1  4.9420
## 471      3            1      1            5      83.77       6 25.1310
## 472      1            1      1            6      40.05       4  8.0100
## 473      1            1      2            2      43.13      10 21.5650
## 474      2            1      2            4      72.57       8 29.0280
## 475      1            1      1            1      64.44       5 16.1100
## 476      1            2      2            4      65.18       3  9.7770
## 477      1            2      1            6      33.26       5  8.3150
## 478      3            2      2            1      84.07       4 16.8140
## 479      2            2      2            6      34.37      10 17.1850
## 480      1            2      2            1      38.60       1  1.9300
## 481      3            2      2            3      65.97       8 26.3880
## 482      3            2      1            1      32.80      10 16.4000
## 483      1            2      2            6      37.14       5  9.2850
## 484      2            1      2            5      60.38      10 30.1900
## 485      3            1      1            6      36.98      10 18.4900
## 486      2            1      1            6      49.49       4  9.8980
## 487      2            2      1            2      41.09      10 20.5450
## 488      1            2      2            2      37.15       4  7.4300
## 489      3            2      2            5      22.96       1  1.1480
## 490      2            1      1            5      77.68       9 34.9560
## 491      2            2      1            2      34.70       2  3.4700
## 492      1            1      1            2      19.66      10  9.8300
## 493      2            1      1            4      25.32       8 10.1280
## 494      3            1      1            5      12.12      10  6.0600
```

```
## 495      2       2       2       2      99.89       2  9.9890
## 496      2       2       2       6      75.92       8 30.3680
## 497      3       2       1       1      63.22       2  6.3220
## 498      3       2       1       3      90.24       6 27.0720
## 499      2       1       1       6      98.13       1  4.9065
## 500      1       1       1       6      51.52       8 20.6080
## 501      2       1       2       6      73.97       1  3.6985
## 502      3       1       1       2      31.90       1  1.5950
## 503      3       2       2       5      69.40       2  6.9400
## 504      2       2       1       6      93.31       2  9.3310
## 505      2       2       2       6      88.45       1  4.4225
## 506      1       1       2       1      24.18       8  9.6720
## 507      2       1       1       6      48.50       3  7.2750
## 508      2       2       1       3      84.05       6 25.2150
## 509      2       1       2       4      61.29       5 15.3225
## 510      3       1       1       5      15.95       6  4.7850
## 511      2       1       1       6      90.74       7 31.7590
## 512      1       2       1       5      42.91       5 10.7275
## 513      1       2       1       2      54.28       7 18.9980
## 514      1       2       2       1      99.55       7 34.8425
## 515      3       1       2       6      58.39       7 20.4365
## 516      3       1       1       2      51.47       1  2.5735
## 517      2       1       2       4      54.86       5 13.7150
## 518      3       1       2       5      39.39       5  9.8475
## 519      1       2       2       5      34.73       2  3.4730
## 520      3       1       2       6      71.92       5 17.9800
## 521      2       2       1       1      45.71       3  6.8565
## 522      3       1       1       5      83.17       6 24.9510
## 523      1       1       1       5      37.44       6 11.2320
## 524      3       2       2       4      62.87       2  6.2870
## 525      1       2       2       3      81.71       6 24.5130
## 526      1       1       1       6      91.41       5 22.8525
## 527      2       2       2       2      39.21       4  7.8420
## 528      2       1       2       2      59.86       2  5.9860
## 529      2       1       1       3      54.36      10 27.1800
## 530      1       2       2       6      98.09       9 44.1405
## 531      1       2       2       4      25.43       6  7.6290
## 532      1       1       2       2      86.68       8 34.6720
## 533      2       2       2       1      22.95      10 11.4750
## 534      3       2       1       3      16.31       9  7.3395
## 535      1       2       1       5      28.32       5  7.0800
## 536      3       2       2       5      16.67       7  5.8345
## 537      2       1       1       2      73.96       1  3.6980
## 538      1       2       2       5      97.94       1  4.8970
## 539      1       2       1       2      73.05       4 14.6100
## 540      3       1       1       3      87.48       6 26.2440
## 541      1       2       2       5      30.68       3  4.6020
## 542      3       1       2       4      75.88       1  3.7940
## 543      2       1       1       6      20.18       4  4.0360
## 544      3       1       2       1      18.77       6  5.6310
## 545      2       2       1       3      71.20       1  3.5600
## 546      2       1       2       5      38.81       4  7.7620
## 547      1       2       1       2      29.42      10 14.7100
## 548      1       2       2       6      60.95       9 27.4275
```

```
## 549      2          2      1          6      51.54       5 12.8850
## 550      1          2      1          1      66.06       6 19.8180
## 551      2          2      2          2      57.27       3  8.5905
## 552      2          2      1          2      54.31       9 24.4395
## 553      2          2      1          4      58.24       9 26.2080
## 554      3          2      2          1      22.21       6  6.6630
## 555      1          1      2          1      19.32       7  6.7620
## 556      2          2      2          5      37.48       3  5.6220
## 557      2          1      1          2      72.04       2  7.2040
## 558      3          1      1          3      98.52      10 49.2600
## 559      1          1      2          3      41.66       6 12.4980
## 560      1          1      1          5      72.42       3 10.8630
## 561      2          2      2          1      21.58       9  9.7110
## 562      3          2      2          3      89.20      10 44.6000
## 563      2          2      1          1      42.42       8 16.9680
## 564      1          1      2          1      74.51       6 22.3530
## 565      2          2      2          2      99.25       2  9.9250
## 566      1          2      1          3      81.21      10 40.6050
## 567      3          2      1          6      49.33      10 24.6650
## 568      1          2      1          2      65.74       9 29.5830
## 569      2          2      1          2      79.86       7 27.9510
## 570      3          2      1          6      73.98       7 25.8930
## 571      2          1      1          5      82.04       5 20.5100
## 572      2          1      2          6      26.67      10 13.3350
## 573      1          1      2          3      10.13       7  3.5455
## 574      2          2      2          3      72.39       2  7.2390
## 575      1          2      2          6      85.91       5 21.4775
## 576      2          1      2          2      81.31       7 28.4585
## 577      2          2      2          3      60.30       4 12.0600
## 578      3          2      2          3      31.77       4  6.3540
## 579      1          2      1          4      64.27       4 12.8540
## 580      2          2      2          4      69.51       2  6.9510
## 581      3          2      2          3      27.22       3  4.0830
## 582      1          1      1          4      77.68       4 15.5360
## 583      3          1      1          2      92.98       2  9.2980
## 584      2          1      1          2      18.08       4  3.6160
## 585      2          2      2          6      63.06       3  9.4590
## 586      1          2      2          4      51.71       4 10.3420
## 587      1          2      1          3      52.34       3  7.8510
## 588      1          2      1          6      43.06       5 10.7650
## 589      3          2      2          2      59.61      10 29.8050
## 590      1          2      2          4      14.62       5  3.6550
## 591      3          1      2          4      46.53       6 13.9590
## 592      3          1      1          5      24.24       7  8.4840
## 593      1          1      1          6      45.58       1  2.2790
## 594      1          1      1          6      75.20       3 11.2800
## 595      2          1      2          6      96.80       3 14.5200
## 596      2          2      2          4      14.82       3  2.2230
## 597      1          2      2          3      52.20       3  7.8300
## 598      3          2      1          6      46.66       9 20.9970
## 599      3          2      1          2      36.85       5  9.2125
## 600      1          1      1          5      70.32       2  7.0320
## 601      3          2      2          1      83.08       1  4.1540
## 602      3          2      1          2      64.99       1  3.2495
```

```
## 603      3          2      2          3      77.56      10 38.7800
## 604      2          2      1          6      54.51       6 16.3530
## 605      3          1      1          2      51.89       7 18.1615
## 606      2          2      2          5      31.75       4  6.3500
## 607      1          1      1          2      53.65       7 18.7775
## 608      3          1      1          3      49.79       4  9.9580
## 609      1          2      2          2      30.61       1  1.5305
## 610      2          1      2          3      57.89       2  5.7890
## 611      1          2      1          1      28.96       1  1.4480
## 612      3          1      1          3      98.97       9 44.5365
## 613      2          1      2          2      93.22       3 13.9830
## 614      3          1      2          6      80.93       1  4.0465
## 615      1          1      2          3      67.45      10 33.7250
## 616      1          1      1          6      38.72       9 17.4240
## 617      2          1      2          6      72.60       6 21.7800
## 618      3          1      2          1      87.91       5 21.9775
## 619      1          1      2          3      98.53       6 29.5590
## 620      3          1      1          2      43.46       6 13.0380
## 621      1          2      1          3      71.68       3 10.7520
## 622      1          1      1          3      91.61       1  4.5805
## 623      2          1      1          5      94.59       7 33.1065
## 624      2          2      1          2      83.25      10 41.6250
## 625      2          1      2          2      91.35       1  4.5675
## 626      2          1      1          3      78.88       2  7.8880
## 627      1          2      2          6      60.87       2  6.0870
## 628      2          1      2          4      82.58      10 41.2900
## 629      1          1      2          5      53.30       3  7.9950
## 630      1          2      1          2      12.09       1  0.6045
## 631      1          2      2          6      64.19      10 32.0950
## 632      1          2      2          1      78.31       3 11.7465
## 633      1          1      2          3      83.77       2  8.3770
## 634      2          2      2          5      99.70       3 14.9550
## 635      2          1      2          3      79.91       3 11.9865
## 636      2          1      2          4      66.47      10 33.2350
## 637      1          2      2          4      28.95       7 10.1325
## 638      3          2      1          1      46.20       1  2.3100
## 639      2          1      1          3      17.63       5  4.4075
## 640      2          2      2          2      52.42       3  7.8630
## 641      2          1      1          3      98.79       3 14.8185
## 642      3          1      1          1      88.55       8 35.4200
## 643      2          1      2          1      55.67       2  5.5670
## 644      3          1      1          3      72.52       8 29.0080
## 645      3          1      2          1      12.05       5  3.0125
## 646      1          1      2          5      19.36       9  8.7120
## 647      3          2      2          4      70.21       6 21.0630
## 648      2          1      2          2      33.63       1  1.6815
## 649      3          1      1          6      15.49       2  1.5490
## 650      3          2      2          1      24.74      10 12.3700
## 651      2          2      2          1      75.66       5 18.9150
## 652      2          2      1          4      55.81       6 16.7430
## 653      1          1      2          5      72.78      10 36.3900
## 654      2          1      2          6      37.32       9 16.7940
## 655      2          1      2          2      60.18       4 12.0360
## 656      1          2      1          1      15.69       3  2.3535
```

```
## 657      3            2      1            1      99.69       1  4.9845
## 658      1            1      1            2      88.15       3 13.2225
## 659      1            1      1            6      27.93       5  6.9825
## 660      1            1      2            2      55.45       1  2.7725
## 661      2            2      1            6      42.97       3  6.4455
## 662      3            1      2            6      17.14       7  5.9990
## 663      2            1      1            2      58.75       6 17.6250
## 664      3            1      1            3      87.10      10 43.5500
## 665      3            2      1            6      98.80       2  9.8800
## 666      1            2      1            2      48.63       4  9.7260
## 667      2            1      2            3      57.74       3  8.6610
## 668      2            2      1            4      17.97       4  3.5940
## 669      3            1      1            4      47.71       6 14.3130
## 670      2            2      1            6      40.62       2  4.0620
## 671      1            1      2            2      56.04      10 28.0200
## 672      2            1      2            3      93.40       2  9.3400
## 673      2            2      1            4      73.41       3 11.0115
## 674      3            2      2            4      33.64       8 13.4560
## 675      1            2      1            1      45.48      10 22.7400
## 676      2            1      2            2      83.77       2  8.3770
## 677      2            1      1            6      64.08       7 22.4280
## 678      1            1      1            3      73.47       4 14.6940
## 679      3            2      2            4      58.95      10 29.4750
## 680      1            1      2            3      48.50       6 14.5500
## 681      2            1      1            1      39.48       1  1.9740
## 682      2            2      1            6      34.81       1  1.7405
## 683      3            2      1            2      49.32       6 14.7960
## 684      1            1      2            2      21.48       2  2.1480
## 685      2            1      1            6      23.08       6  6.9240
## 686      2            1      1            5      49.10       2  4.9100
## 687      2            1      1            6      64.83       2  6.4830
## 688      1            1      2            5      63.56      10 31.7800
## 689      3            1      2            6      72.88       2  7.2880
## 690      1            2      1            3      67.10       3 10.0650
## 691      3            1      1            6      70.19       9 31.5855
## 692      3            1      2            3      55.04       7 19.2640
## 693      1            1      2            4      48.63      10 24.3150
## 694      3            1      1            2      73.38       7 25.6830
## 695      3            2      1            3      52.60       9 23.6700
## 696      1            1      1            5      87.37       5 21.8425
## 697      1            1      1            6      27.04       4  5.4080
## 698      2            2      2            5      62.19       4 12.4380
## 699      1            1      2            1      69.58       9 31.3110
## 700      3            2      2            5      97.50      10 48.7500
## 701      3            2      1            2      60.41       8 24.1640
## 702      2            2      2            3      32.32       3  4.8480
## 703      2            1      1            2      19.77      10  9.8850
## 704      2            1      2            4      80.47       9 36.2115
## 705      2            1      1            5      88.39       9 39.7755
## 706      2            2      2            4      71.77       7 25.1195
## 707      2            2      1            1      43.00       4  8.6000
## 708      3            1      2            3      68.98       1  3.4490
## 709      3            2      2            2      15.62       8  6.2480
## 710      1            2      2            6      25.70       3  3.8550
```

```
## 711     1     1     2     3     80.62     6 24.1860
## 712     3     1     1     5     75.53     4 15.1060
## 713     3     2     1     1     77.63     9 34.9335
## 714     3     2     1     4     13.85     9  6.2325
## 715     3     1     2     2     98.70     8 39.4800
## 716     1     2     1     4     35.68     5  8.9200
## 717     1     1     1     2     71.46     7 25.0110
## 718     1     1     2     1     11.94     3  1.7910
## 719     1     2     2     2     45.38     3  6.8070
## 720     2     1     1     2     17.48     6  5.2440
## 721     2     2     1     2     25.56     7  8.9460
## 722     3     1     1     6     90.63     9 40.7835
## 723     2     2     2     5     44.12     3  6.6180
## 724     3     1     1     3     36.77     7 12.8695
## 725     2     1     2     3     23.34     4  4.6680
## 726     3     1     1     4     28.50     8 11.4000
## 727     3     1     2     5     55.57     3  8.3355
## 728     2     2     2     6     69.74    10 34.8700
## 729     3     2     2     2     97.26     4 19.4520
## 730     2     1     1     5     52.18     7 18.2630
## 731     1     1     1     2     22.32     4  4.4640
## 732     1     2     2     4     56.00     3  8.4000
## 733     1     1     2     2     19.70     1  0.9850
## 734     2     2     2     1     75.88     7 26.5580
## 735     2     1     2     3     53.72     1  2.6860
## 736     3     1     2     4     81.95    10 40.9750
## 737     3     1     1     5     81.20     7 28.4200
## 738     3     2     2     1     58.76    10 29.3800
## 739     2     1     2     1     91.56     8 36.6240
## 740     1     2     2     5     93.96     9 42.2820
## 741     3     2     2     5     55.61     7 19.4635
## 742     3     2     2     3     84.83     1  4.2415
## 743     1     1     1     6     71.63     2  7.1630
## 744     1     1     2     5     37.69     2  3.7690
## 745     3     1     1     6     31.67     8 12.6680
## 746     3     1     1     3     38.42     1  1.9210
## 747     2     1     2     2     65.23    10 32.6150
## 748     3     1     1     5     10.53     5  2.6325
## 749     2     1     1     5     12.29     9  5.5305
## 750     3     1     2     4     81.23     7 28.4305
## 751     2     1     1     2     22.32     4  4.4640
## 752     1     2     1     3     27.28     5  6.8200
## 753     1     1     1     1     17.42    10  8.7100
## 754     2     2     2     5     73.28     5 18.3200
## 755     3     1     1     2     84.87     3 12.7305
## 756     1     2     1     2     97.29     8 38.9160
## 757     2     1     1     1     35.74     8 14.2960
## 758     1     2     1     5     96.52     6 28.9560
## 759     1     1     2     3     18.85    10  9.4250
## 760     1     2     1     3     55.39     4 11.0780
## 761     2     1     1     3     77.20    10 38.6000
## 762     2     2     2     1     72.13    10 36.0650
## 763     1     1     1     2     63.88     8 25.5520
## 764     1     1     1     4     10.69     5  2.6725
```

```
## 765      1      1      2      4      55.50      4 11.1000
## 766      2      2      1      5      95.46      8 38.1840
## 767      3      2      1      2      76.06      3 11.4090
## 768      2      2      2      6      13.69      6  4.1070
## 769      2      2      1      1      95.64      4 19.1280
## 770      1      2      1      5      11.43      6  3.4290
## 771      2      1      1      6      95.54      4 19.1080
## 772      3      1      1      4      85.87      7 30.0545
## 773      3      1      1      6      67.99      7 23.7965
## 774      3      2      1      3      52.42      1  2.6210
## 775      3      1      2      3      65.65      2  6.5650
## 776      2      2      1      3      28.86      5  7.2150
## 777      3      1      2      4      65.31      7 22.8585
## 778      2      2      2      6      93.38      1  4.6690
## 779      3      1      2      6      25.25      5  6.3125
## 780      2      1      2      1      87.87      9 39.5415
## 781      3      2      2      4      21.80      8  8.7200
## 782      1      2      1      6      94.76      4 18.9520
## 783      1      1      1      2      30.62      1  1.5310
## 784      3      2      1      5      44.01      8 17.6040
## 785      3      1      1      4      10.16      5  2.5400
## 786      1      2      2      1      74.58      7 26.1030
## 787      3      2      2      1      71.89      8 28.7560
## 788      3      2      1      4      10.99      5  2.7475
## 789      3      1      2      4      60.47      3  9.0705
## 790      1      2      2      6      58.91      7 20.6185
## 791      1      2      2      2      46.41      1  2.3205
## 792      3      1      2      4      68.55      4 13.7100
## 793      2      2      1      5      97.37     10 48.6850
## 794      1      1      2      1      92.60      7 32.4100
## 795      1      2      1      1      46.61      2  4.6610
## 796      2      2      2      2      27.18      2  2.7180
## 797      3      1      1      5      60.87      1  3.0435
## 798      1      1      1      6      24.49     10 12.2450
## 799      2      2      2      4      92.78      1  4.6390
## 800      3      1      2      5      86.69      5 21.6725
## 801      2      2      2      6      23.01      6  6.9030
## 802      3      1      1      1      30.20      8 12.0800
## 803      3      1      2      2      67.39      7 23.5865
## 804      1      1      1      2      48.96      9 22.0320
## 805      2      1      1      1      75.59      9 34.0155
## 806      1      2      1      5      77.47      4 15.4940
## 807      1      2      1      6      93.18      2  9.3180
## 808      1      2      1      1      50.23      4 10.0460
## 809      2      2      1      4      17.75      1  0.8875
## 810      3      2      1      2      62.18     10 31.0900
## 811      2      2      2      4      10.75      8  4.3000
## 812      1      2      1      1      40.26     10 20.1300
## 813      3      1      1      6      64.97      5 16.2425
## 814      1      2      2      1      95.15      1  4.7575
## 815      1      1      1      1      48.62      8 19.4480
## 816      2      2      1      3      53.21      8 21.2840
## 817      3      2      1      2      45.44      7 15.9040
## 818      1      2      2      3      33.88      8 13.5520
```

```
## 819      2       1       2       4      96.16       4 19.2320
## 820      2       1       2       3      47.16       5 11.7900
## 821      2       2       2       1      52.89       4 10.5780
## 822      1       1       1       5      47.68       2  4.7680
## 823      3       1       2       6      10.17       1  0.5085
## 824      1       2       1       4      68.71       3 10.3065
## 825      2       1       1       6      60.08       7 21.0280
## 826      1       1       1       6      22.01       4  4.4020
## 827      2       1       1       4      72.11       9 32.4495
## 828      1       1       2       2      41.28       3  6.1920
## 829      3       2       2       1      64.95      10 32.4750
## 830      1       1       1       1      74.22      10 37.1100
## 831      1       2       2       1      10.56       8  4.2240
## 832      2       2       2       4      62.57       4 12.5140
## 833      2       1       1       6      11.85       8  4.7400
## 834      1       1       2       4      91.30       1  4.5650
## 835      2       1       1       5      40.73       7 14.2555
## 836      1       2       2       2      52.38       1  2.6190
## 837      1       1       2       2      38.54       5  9.6350
## 838      2       2       2       6      44.63       6 13.3890
## 839      3       2       2       1      55.87      10 27.9350
## 840      3       1       1       6      29.22       6  8.7660
## 841      1       2       2       2      51.94       3  7.7910
## 842      2       2       2       1      60.30       1  3.0150
## 843      1       1       1       6      39.47       2  3.9470
## 844      3       1       1       3      14.87       2  1.4870
## 845      1       2       2       2      21.32       1  1.0660
## 846      1       1       2       1      93.78       3 14.0670
## 847      1       1       2       1      73.26       1  3.6630
## 848      3       2       1       6      22.38       1  1.1190
## 849      3       1       1       3      72.88       9 32.7960
## 850      1       2       1       2      99.10       6 29.7300
## 851      1       2       2       2      74.10       1  3.7050
## 852      1       2       1       2      98.48       2  9.8480
## 853      3       2       2       4      53.19       7 18.6165
## 854      2       2       1       1      52.79      10 26.3950
## 855      1       1       1       4      95.95       5 23.9875
## 856      2       2       1       2      36.51       9 16.4295
## 857      2       2       2       3      21.12       8  8.4480
## 858      1       1       1       5      28.31       4  5.6620
## 859      2       2       2       4      57.59       6 17.2770
## 860      1       1       1       3      47.63       9 21.4335
## 861      3       1       1       5      86.27       1  4.3135
## 862      1       1       2       6      12.76       2  1.2760
## 863      2       2       1       5      11.28       9  5.0760
## 864      2       2       1       5      51.07       7 17.8745
## 865      1       1       1       1      79.59       3 11.9385
## 866      3       1       2       4      33.81       3  5.0715
## 867      2       1       2       6      90.53       8 36.2120
## 868      3       1       1       4      62.82       2  6.2820
## 869      3       1       2       3      24.31       3  3.6465
## 870      1       2       2       6      64.59       4 12.9180
## 871      1       1       2       3      24.82       7  8.6870
## 872      3       2       2       2      56.50       1  2.8250
```

```
## 873      2          1      1          1      21.43      10 10.7150
## 874      1          1      2          6      89.06       6 26.7180
## 875      1          1      2          5      23.29       4  4.6580
## 876      3          2      2          5      65.26       8 26.1040
## 877      3          1      2          2      52.35       1  2.6175
## 878      2          1      2          1      39.75       1  1.9875
## 879      1          2      1          1      90.02       8 36.0080
## 880      2          1      1          1      12.10       8  4.8400
## 881      2          1      1          3      33.21      10 16.6050
## 882      3          1      1          2      10.18       8  4.0720
## 883      2          1      2          6      31.99      10 15.9950
## 884      1          1      1          5      34.42       6 10.3260
## 885      1          1      1          3      83.34       2  8.3340
## 886      1          2      2          6      45.58       7 15.9530
## 887      1          1      2          3      87.90       1  4.3950
## 888      1          1      1          1      73.47      10 36.7350
## 889      3          2      1          2      12.19       8  4.8760
## 890      1          1      2          6      76.92      10 38.4600
## 891      3          2      1          4      83.66       5 20.9150
## 892      2          2      1          1      57.91       8 23.1640
## 893      3          1      1          2      92.49       5 23.1225
## 894      2          2      2          1      28.38       5  7.0950
## 895      2          1      2          1      50.45       6 15.1350
## 896      2          2      2          4      99.16       8 39.6640
## 897      3          2      2          2      60.74       7 21.2590
## 898      3          1      1          3      47.27       6 14.1810
## 899      3          1      2          4      85.60       7 29.9600
## 900      1          1      2          3      35.04       9 15.7680
## 901      3          1      1          1      44.84       9 20.1780
## 902      2          2      2          5      45.97       4  9.1940
## 903      1          1      1          4      27.73       5  6.9325
## 904      1          2      2          3      11.53       7  4.0355
## 905      3          2      1          4      58.32       2  5.8320
## 906      3          1      1          5      78.38       4 15.6760
## 907      3          2      2          4      84.61      10 42.3050
## 908      2          2      1          4      82.88       5 20.7200
## 909      1          1      1          3      79.54       2  7.9540
## 910      2          2      1          5      49.01      10 24.5050
## 911      2          1      1          3      29.15       3  4.3725
## 912      3          2      1          1      56.13       4 11.2260
## 913      1          2      1          5      93.12       8 37.2480
## 914      1          1      2          2      51.34       8 20.5360
## 915      1          1      1          3      99.60       3 14.9400
## 916      3          2      1          1      35.49       6 10.6470
## 917      3          1      2          6      42.85       1  2.1425
## 918      1          2      1          2      94.67       4 18.9340
## 919      2          2      2          5      68.97       3 10.3455
## 920      2          1      1          1      26.26       3  3.9390
## 921      3          1      1          5      35.79       9 16.1055
## 922      2          2      1          5      16.37       6  4.9110
## 923      3          1      1          5      12.73       2  1.2730
## 924      3          2      1          6      83.14       7 29.0990
## 925      3          1      1          6      35.22       6 10.5660
## 926      2          2      1          1      13.78       4  2.7560
```

```
## 927      2          1      2          6      88.31       1  4.4155
## 928      1          1      1          4      39.62       9 17.8290
## 929      2          2      1          1      88.25       9 39.7125
## 930      2          2      2          6      25.31       2  2.5310
## 931      2          2      2          5      99.92       6 29.9760
## 932      3          1      1          2      83.35       2  8.3350
## 933      1          2      1          3      74.44      10 37.2200
## 934      3          2      2          4      64.08       7 22.4280
## 935      2          2      1          5      63.15       6 18.9450
## 936      3          1      2          5      85.72       3 12.8580
## 937      3          2      1          4      78.89       7 27.6115
## 938      1          2      1          6      89.48       5 22.3700
## 939      1          1      1          4      92.09       3 13.8135
## 940      3          2      1          3      57.29       6 17.1870
## 941      1          2      2          3      66.52       4 13.3040
## 942      3          1      2          2      99.82       9 44.9190
## 943      1          2      1          5      45.68      10 22.8400
## 944      1          2      2          4      50.79       5 12.6975
## 945      1          1      2          4      10.08       7  3.5280
## 946      1          2      1          1      93.88       7 32.8580
## 947      3          1      2          1      84.25       2  8.4250
## 948      2          1      2          2      53.78       1  2.6890
## 949      3          1      2          5      35.81       5  8.9525
## 950      2          2      1          3      26.43       8 10.5720
## 951      2          1      2          4      39.91       3  5.9865
## 952      2          1      1          5      21.90       3  3.2850
## 953      2          1      1          3      62.85       4 12.5700
## 954      3          1      1          3      21.04       4  4.2080
## 955      2          1      2          5      65.91       6 19.7730
## 956      1          2      1          2      42.57       7 14.8995
## 957      3          1      2          3      50.49       9 22.7205
## 958      2          2      2          1      46.02       6 13.8060
## 959      3          2      1          5      15.80      10  7.9000
## 960      1          1      1          3      98.66       9 44.3970
## 961      3          1      2          2      91.98       1  4.5990
## 962      1          1      2          1      20.89       2  2.0890
## 963      1          2      1          2      15.50       1  0.7750
## 964      3          1      2          1      96.82       3 14.5230
## 965      2          2      2          3      33.33       2  3.3330
## 966      2          2      1          1      38.27       2  3.8270
## 967      1          2      1          5      33.30       9 14.9850
## 968      1          1      2          5      81.01       3 12.1515
## 969      1          2      1          4      15.80       3  2.3700
## 970      2          1      1          1      34.49       5  8.6225
## 971      2          1      1          3      84.63      10 42.3150
## 972      2          1      2          5      36.91       7 12.9185
## 973      2          2      2          1      87.08       7 30.4780
## 974      1          2      2          5      80.08       3 12.0120
## 975      3          2      2          2      86.13       2  8.6130
## 976      2          1      2          2      49.92       2  4.9920
## 977      1          2      1          3      74.66       4 14.9320
## 978      2          1      2          3      26.60       6  7.9800
## 979      2          2      1          1      25.45       1  1.2725
## 980      2          2      1          3      67.77       1  3.3885
```

```
## 981       3             1      2             3      59.59        4 11.9180
## 982       1             2      2             4      58.15        4 11.6300
## 983       1             1      1             6      97.48        9 43.8660
## 984       3             2      2             4      99.96        7 34.9860
## 985       3             2      2             1      96.37        7 33.7295
## 986       2             2      1             2      63.71        5 15.9275
## 987       2             2      1             4      14.76        2  1.4760
## 988       2             1      2             4      62.00        8 24.8000
## 989       3             1      2             1      82.34       10 41.1700
## 990       2             1      2             4      75.37        8 30.1480
## 991       1             2      1             3      56.56        5 14.1400
## 992       2             2      1             6      76.60       10 38.3000
## 993       1             2      2             1      58.03        2  5.8030
## 994       2             2      2             2      17.49       10  8.7450
## 995       3             1      1             1      60.95        1  3.0475
## 996       3             2      2             4      40.35        1  2.0175
## 997       2             2      1             5      97.38       10 48.6900
## 998       1             1      2             3      31.84        1  1.5920
## 999       1             2      2             5      65.82        1  3.2910
## 1000      1             1      1             2      88.34        7 30.9190
##      payment   cogs gross.margin.percentage rating     total
## 1          3 522.83                4.761905    9.1  548.9715
## 2          1  76.40                4.761905    9.6   80.2200
## 3          2 324.31                4.761905    7.4  340.5255
## 4          3 465.76                4.761905    8.4  489.0480
## 5          3 604.17                4.761905    5.3  634.3785
## 6          3 597.73                4.761905    4.1  627.6165
## 7          3 413.04                4.761905    5.8  433.6920
## 8          3 735.60                4.761905    8.0  772.3800
## 9          2  72.52                4.761905    7.2   76.1460
## 10         2 164.52                4.761905    5.9  172.7460
## 11         3  57.92                4.761905    4.5   60.8160
## 12         1 102.04                4.761905    6.8  107.1420
## 13         3 234.75                4.761905    7.1  246.4875
## 14         3 431.90                4.761905    8.2  453.4950
## 15         1 713.80                4.761905    5.7  749.4900
## 16         1 562.32                4.761905    4.5  590.4360
## 17         2 482.51                4.761905    4.6  506.6355
## 18         2 435.66                4.761905    6.9  457.4430
## 19         2 164.01                4.761905    8.6  172.2105
## 20         3  80.60                4.761905    4.4   84.6300
## 21         3 430.20                4.761905    4.8  451.7100
## 22         3 263.94                4.761905    5.1  277.1370
## 23         2  66.40                4.761905    4.4   69.7200
## 24         3 172.80                4.761905    9.9  181.4400
## 25         3 265.89                4.761905    6.0  279.1845
## 26         2 420.72                4.761905    8.5  441.7560
## 27         1  33.52                4.761905    6.7   35.1960
## 28         2 175.34                4.761905    7.7  184.1070
## 29         1 441.80                4.761905    9.6  463.8900
## 30         1 224.01                4.761905    7.4  235.2105
## 31         2 470.65                4.761905    4.8  494.1825
## 32         1 702.63                4.761905    4.5  737.7615
## 33         1 670.24                4.761905    5.1  703.7520
```

```
## 34         2 193.16              4.761905    5.1  202.8180
## 35         3 397.68              4.761905    7.5  417.5640
## 36         3  68.12              4.761905    6.8   71.5260
## 37         3 313.10              4.761905    7.0  328.7550
## 38         3 547.92              4.761905    4.7  575.3160
## 39         3 439.36              4.761905    7.6  461.3280
## 40         1 240.96              4.761905    7.7  253.0080
## 41         3  86.72              4.761905    7.9   91.0560
## 42         1 112.22              4.761905    6.3  117.8310
## 43         1 414.72              4.761905    5.6  435.4560
## 44         1 789.60              4.761905    7.6  829.0800
## 45         1  30.74              4.761905    7.2   32.2770
## 46         1 375.84              4.761905    9.5  394.6320
## 47         2 510.21              4.761905    8.4  535.7205
## 48         3 180.09              4.761905    4.1  189.0945
## 49         2 113.58              4.761905    8.1  119.2590
## 50         3 826.30              4.761905    7.9  867.6150
## 51         1 639.80              4.761905    9.5  671.7900
## 52         1 222.95              4.761905    8.5  234.0975
## 53         3  71.48              4.761905    6.5   75.0540
## 54         2  15.43              4.761905    6.1   16.2015
## 55         3  32.32              4.761905    6.5   33.9360
## 56         1 687.84              4.761905    8.2  722.2320
## 57         1  88.68              4.761905    5.8   93.1140
## 58         3 716.80              4.761905    6.6  752.6400
## 59         1 723.50              4.761905    5.4  759.6750
## 60         1 183.66              4.761905    9.3  192.8430
## 61         2  74.22              4.761905   10.0   77.9310
## 62         3 334.38              4.761905    7.0  351.0990
## 63         3 495.63              4.761905   10.0  520.4115
## 64         2 158.10              4.761905    8.6  166.0050
## 65         1 302.96              4.761905    7.6  318.1080
## 66         1 158.70              4.761905    5.8  166.6350
## 67         3  66.94              4.761905    6.7   70.2870
## 68         3 585.66              4.761905    9.9  614.9430
## 69         1 787.70              4.761905    6.4  827.0850
## 70         1  18.33              4.761905    4.3   19.2465
## 71         2 894.80              4.761905    9.6  939.5400
## 72         1 621.20              4.761905    5.9  652.2600
## 73         3 145.56              4.761905    4.0  152.8380
## 74         1 455.46              4.761905    8.7  478.2330
## 75         3 672.03              4.761905    9.4  705.6315
## 76         2 416.50              4.761905    5.4  437.3250
## 77         2 441.36              4.761905    8.6  463.4280
## 78         2 180.09              4.761905    5.7  189.0945
## 79         3 783.10              4.761905    6.6  822.2550
## 80         1 101.90              4.761905    6.0  106.9950
## 81         2 595.14              4.761905    5.5  624.8970
## 82         3 290.04              4.761905    6.4  304.5420
## 83         3 154.00              4.761905    6.6  161.7000
## 84         2 321.44              4.761905    8.3  337.5120
## 85         1 244.55              4.761905    6.6  256.7775
## 86         3 581.42              4.761905    4.0  610.4910
## 87         1 382.60              4.761905    9.9  401.7300
```

```
## 88        2 345.66              4.761905    7.3  362.9430
## 89        1  42.47              4.761905    5.7   44.5935
## 90        1 461.94              4.761905    6.1  485.0370
## 91        1 189.52              4.761905    7.1  198.9960
## 92        3 448.60              4.761905    8.2  471.0300
## 93        3 153.86              4.761905    5.1  161.5530
## 94        2 579.24              4.761905    8.6  608.2020
## 95        2  89.75              4.761905    6.6   94.2375
## 96        3  97.16              4.761905    7.2  102.0180
## 97        3 878.70              4.761905    5.1  922.6350
## 98        1  74.70              4.761905    4.1   78.4350
## 99        3 158.25              4.761905    9.3  166.1625
## 100       1 496.20              4.761905    7.4  521.0100
## 101       1  48.71              4.761905    4.1   51.1455
## 102       1 706.95              4.761905    7.2  742.2975
## 103       1 207.63              4.761905    4.9  218.0115
## 104       1 349.56              4.761905    9.9  367.0380
## 105       1 212.45              4.761905    8.0  223.0725
## 106       3 886.70              4.761905    7.3  931.0350
## 107       2 164.28              4.761905    7.9  172.4940
## 108       1 372.78              4.761905    7.4  391.4190
## 109       1 305.82              4.761905    4.2  321.1110
## 110       1 819.70              4.761905    9.2  860.6850
## 111       3  32.98              4.761905    4.6   34.6290
## 112       2 294.63              4.761905    7.8  309.3615
## 113       1 509.88              4.761905    8.4  535.3740
## 114       3 522.63              4.761905    4.3  548.7615
## 115       2 727.11              4.761905    9.5  763.4655
## 116       2  81.06              4.761905    7.1   85.1130
## 117       3 109.70              4.761905    5.3  115.1850
## 118       3  51.36              4.761905    5.2   53.9280
## 119       3 109.60              4.761905    6.0  115.0800
## 120       3 106.88              4.761905    4.1  112.2240
## 121       2 796.48              4.761905    5.2  836.3040
## 122       2 399.84              4.761905    6.5  419.8320
## 123       2 899.64              4.761905    4.2  944.6220
## 124       2 511.28              4.761905    4.6  536.8440
## 125       3 451.76              4.761905    7.3  474.3480
## 126       2 655.83              4.761905    4.5  688.6215
## 127       1 161.25              4.761905    9.0  169.3125
## 128       2 285.57              4.761905    5.9  299.8485
## 129       3 548.32              4.761905    8.5  575.7360
## 130       3 812.52              4.761905    7.2  853.1460
## 131       1 277.34              4.761905    7.5  291.2070
## 132       1 552.78              4.761905    8.3  580.4190
## 133       1 139.36              4.761905    7.4  146.3280
## 134       2 524.70              4.761905    8.8  550.9350
## 135       3 487.80              4.761905    5.3  512.1900
## 136       1 270.66              4.761905    6.2  284.1930
## 137       2 131.55              4.761905    8.8  138.1275
## 138       1 206.52              4.761905    9.8  216.8460
## 139       1 519.10              4.761905    8.2  545.0550
## 140       3 580.00              4.761905    9.2  609.0000
## 141       2 898.00              4.761905    5.4  942.9000
```

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## 142        1 905.00              4.761905    8.1  950.2500
## 143        1 686.00              4.761905    9.1  720.3000
## 144        2  30.41              4.761905    8.4   31.9305
## 145        3 467.70              4.761905    8.0  491.0850
## 146        2 277.56              4.761905    9.5  291.4380
## 147        3 301.40              4.761905    9.2  316.4700
## 148        2 264.56              4.761905    5.6  277.7880
## 149        2 574.88              4.761905    6.2  603.6240
## 150        2 259.68              4.761905    4.9  272.6640
## 151        2 366.16              4.761905    4.8  384.4680
## 152        2 241.92              4.761905    7.3  254.0160
## 153        2 749.16              4.761905    7.4  786.6180
## 154        3  98.88              4.761905    9.9  103.8240
## 155        1 647.76              4.761905    9.3  680.1480
## 156        2 461.45              4.761905    9.0  484.5225
## 157        1  72.17              4.761905    6.1   75.7785
## 158        3 251.40              4.761905    9.7  263.9700
## 159        3 874.98              4.761905    6.0  918.7290
## 160        3 560.34              4.761905   10.0  588.3570
## 161        2 345.44              4.761905    8.3  362.7120
## 162        1  63.69              4.761905    6.0   66.8745
## 163        2 320.53              4.761905    7.0  336.5565
## 164        3 152.80              4.761905    6.5  160.4400
## 165        2 399.00              4.761905    5.9  418.9500
## 166        3 340.56              4.761905    5.6  357.5880
## 167        1 955.80              4.761905    4.8 1003.5900
## 168        2 989.80              4.761905    8.7 1039.2900
## 169        1 307.68              4.761905    6.5  323.0640
## 170        2 486.64              4.761905    8.5  510.9720
## 171        3 350.05              4.761905    5.5  367.5525
## 172        2 400.25              4.761905    9.4  420.2625
## 173        1 166.80              4.761905    6.3  175.1400
## 174        2 317.34              4.761905    9.8  333.2070
## 175        3 158.32              4.761905    8.7  166.2360
## 176        3 304.56              4.761905    8.8  319.7880
## 177        2 177.36              4.761905    9.6  186.2280
## 178        2 157.57              4.761905    4.8  165.4485
## 179        3 443.28              4.761905    4.4  465.4440
## 180        3 260.40              4.761905    9.9  273.4200
## 181        1 449.82              4.761905    5.7  472.3110
## 182        1 307.76              4.761905    7.7  323.1480
## 183        3 155.00              4.761905    8.0  162.7500
## 184        3 274.48              4.761905    5.7  288.2040
## 185        2  86.38              4.761905    6.7   90.6990
## 186        3  54.24              4.761905    8.0   56.9520
## 187        3 755.92              4.761905    7.5  793.7160
## 188        1 185.88              4.761905    7.0  195.1740
## 189        3  74.07              4.761905    9.9   77.7735
## 190        2 279.24              4.761905    5.9  293.2020
## 191        2 231.12              4.761905    7.2  242.6760
## 192        3 147.04              4.761905    4.6  154.3920
## 193        1 790.20              4.761905    9.2  829.7100
## 194        3 102.20              4.761905    5.7  107.3100
## 195        2 163.55              4.761905    9.9  171.7275
```

```
## 196       1  74.29              4.761905    5.0   78.0045
## 197       1  87.40              4.761905    4.9   91.7700
## 198       3  25.29              4.761905    6.1   26.5545
## 199       2 166.00              4.761905    8.2  174.3000
## 200       2 356.95              4.761905    5.5  374.7975
## 201       2 114.90              4.761905    6.8  120.6450
## 202       1 229.96              4.761905    6.6  241.4580
## 203       1 429.87              4.761905    9.8  451.3635
## 204       3 259.00              4.761905    8.7  271.9500
## 205       2  88.85              4.761905    5.4   93.2925
## 206       3 207.27              4.761905    7.9  217.6335
## 207       2 599.85              4.761905    9.7  629.8425
## 208       3 285.30              4.761905    7.8  299.5650
## 209       3  91.11              4.761905    5.1   95.6655
## 210       2 897.57              4.761905    6.5  942.4485
## 211       3 236.07              4.761905    5.9  247.8735
## 212       1 839.34              4.761905    8.8  881.3070
## 213       3 461.80              4.761905    4.9  484.8900
## 214       2 139.26              4.761905    4.4  146.2230
## 215       1 207.27              4.761905    6.5  217.6335
## 216       2  18.28              4.761905    8.3   19.1940
## 217       1 123.85              4.761905    8.5  130.0425
## 218       1 283.92              4.761905    5.5  298.1160
## 219       3 758.96              4.761905    8.7  796.9080
## 220       2 172.02              4.761905    7.9  180.6210
## 221       3 272.10              4.761905    6.1  285.7050
## 222       3 434.56              4.761905    5.4  456.2880
## 223       1  59.05              4.761905    9.4   62.0025
## 224       1  12.54              4.761905    8.2   13.1670
## 225       1  86.50              4.761905    6.2   90.8250
## 226       2 174.32              4.761905    9.7  183.0360
## 227       3 624.33              4.761905    4.0  655.5465
## 228       3 148.24              4.761905    9.7  155.6520
## 229       1 544.20              4.761905    5.3  571.4100
## 230       3 507.36              4.761905    7.4  532.7280
## 231       1 162.74              4.761905    6.5  170.8770
## 232       2  31.77              4.761905    8.7   33.3585
## 233       1 756.81              4.761905    8.0  794.6505
## 234       1 295.28              4.761905    6.7  310.0440
## 235       3 519.40              4.761905    6.5  545.3700
## 236       3 186.28              4.761905    4.1  195.5940
## 237       2  87.05              4.761905    4.9   91.4025
## 238       2 221.10              4.761905    8.6  232.1550
## 239       1  66.10              4.761905    4.3   69.4050
## 240       3  89.69              4.761905    4.9   94.1745
## 241       2 224.46              4.761905    5.6  235.6830
## 242       2 119.54              4.761905    5.8  125.5170
## 243       2 186.40              4.761905    6.0  195.7200
## 244       1 250.60              4.761905    4.2  263.1300
## 245       2 750.96              4.761905    8.3  788.5080
## 246       1 380.72              4.761905    5.7  399.7560
## 247       1 244.20              4.761905    4.8  256.4100
## 248       3  89.70              4.761905    6.8   94.1850
## 249       2 310.88              4.761905    8.8  326.4240
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## 250       2 511.42             4.761905    4.2  536.9910
## 251       3 418.95             4.761905    6.4  439.8975
## 252       2 351.90             4.761905    8.4  369.4950
## 253       2  28.78             4.761905    7.2   30.2190
## 254       1  95.00             4.761905    5.2   99.7500
## 255       1 471.20             4.761905    8.9  494.7600
## 256       1 130.48             4.761905    9.0  137.0040
## 257       2  66.35             4.761905    9.7   69.6675
## 258       3 155.46             4.761905    8.7  163.2330
## 259       3 129.00             4.761905    6.5  135.4500
## 260       2 263.76             4.761905    6.9  276.9480
## 261       3 675.54             4.761905    6.2  709.3170
## 262       3  65.80             4.761905    5.6   69.0900
## 263       1 153.20             4.761905    5.7  160.8600
## 264       1 222.40             4.761905    4.2  233.5200
## 265       3  54.45             4.761905    7.9   57.1725
## 266       2 688.80             4.761905    8.7  723.2400
## 267       2 141.88             4.761905    6.9  148.9740
## 268       1 746.00             4.761905    9.5  783.3000
## 269       2 282.96             4.761905    4.4  297.1080
## 270       3 355.40             4.761905    7.0  373.1700
## 271       3 337.15             4.761905    6.3  354.0075
## 272       1  42.24             4.761905    9.7   44.3520
## 273       2 193.86             4.761905    8.8  203.5530
## 274       1  24.06             4.761905    5.1   25.2630
## 275       3 598.26             4.761905    7.9  628.1730
## 276       1 335.79             4.761905    6.2  352.5795
## 277       1 218.20             4.761905    7.1  229.1100
## 278       3 381.68             4.761905    6.4  400.7640
## 279       1 709.90             4.761905    5.7  745.3950
## 280       2 440.20             4.761905    9.6  462.2100
## 281       2 559.68             4.761905    6.4  587.6640
## 282       2  37.00             4.761905    7.9   38.8500
## 283       1  15.34             4.761905    6.5   16.1070
## 284       3 598.98             4.761905    8.5  628.9290
## 285       1 190.68             4.761905    9.1  200.2140
## 286       1 333.40             4.761905    7.6  350.0700
## 287       1  74.86             4.761905    6.9   78.6030
## 288       1 213.75             4.761905    9.5  224.4375
## 289       2 339.57             4.761905    5.2  356.5485
## 290       1 664.16             4.761905    4.2  697.3680
## 291       2 403.00             4.761905    7.0  423.1500
## 292       3 194.95             4.761905    6.0  204.6975
## 293       1  62.48             4.761905    4.7   65.6040
## 294       1  72.72             4.761905    7.1   76.3560
## 295       3 181.10             4.761905    5.9  190.1550
## 296       1 259.60             4.761905    7.5  272.5800
## 297       1 115.36             4.761905    6.4  121.1280
## 298       3 470.28             4.761905    5.8  493.7940
## 299       1 240.04             4.761905    4.5  252.0420
## 300       1  88.61             4.761905    7.7   93.0405
## 301       2 199.64             4.761905    6.7  209.6220
## 302       2  39.01             4.761905    4.7   40.9605
## 303       1  48.61             4.761905    4.4   51.0405
```

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## 304        2 204.76              4.761905    4.7  214.9980
## 305        1 119.68              4.761905    8.6  125.6640
## 306        3 505.40              4.761905    4.3  530.6700
## 307        1 281.61              4.761905    9.6  295.6905
## 308        1 710.32              4.761905    4.1  745.8360
## 309        3  79.44              4.761905    4.7   83.4120
## 310        1 163.82              4.761905    7.8  172.0110
## 311        1 479.58              4.761905    5.5  503.5590
## 312        3 138.66              4.761905    9.7  145.5930
## 313        2  71.15              4.761905    4.4   74.7075
## 314        1 139.95              4.761905    5.0  146.9475
## 315        1 781.30              4.761905    4.4  820.3650
## 316        1 198.74              4.761905    5.2  208.6770
## 317        1  63.24              4.761905    7.3   66.4020
## 318        1 373.95              4.761905    4.9  392.6475
## 319        2 207.69              4.761905    8.1  218.0745
## 320        3 176.28              4.761905    8.4  185.0940
## 321        1 206.37              4.761905    5.5  216.6885
## 322        1  39.42              4.761905    8.4   41.3910
## 323        3  91.56              4.761905    9.8   96.1380
## 324        1 308.85              4.761905    6.7  324.2925
## 325        2 129.12              4.761905    9.4  135.5760
## 326        3 390.96              4.761905    6.4  410.5080
## 327        1 498.90              4.761905    5.4  523.8450
## 328        1 377.04              4.761905    8.6  395.8920
## 329        2 204.52              4.761905    4.0  214.7460
## 330        1 145.44              4.761905    7.6  152.7120
## 331        1 198.18              4.761905    6.8  208.0890
## 332        2  98.70              4.761905    9.1  103.6350
## 333        1 385.10              4.761905    5.5  404.3550
## 334        2  46.96              4.761905    7.9   49.3080
## 335        3  73.50              4.761905    8.5   77.1750
## 336        2 142.25              4.761905    9.1  149.3625
## 337        3 687.60              4.761905    7.5  721.9800
## 338        1 347.70              4.761905    5.2  365.0850
## 339        2 142.95              4.761905    9.5  150.0975
## 340        2 385.38              4.761905    8.9  404.6490
## 341        2 144.27              4.761905    7.8  151.4835
## 342        3 391.79              4.761905    8.9  411.3795
## 343        1 538.30              4.761905    7.7  565.2150
## 344        3 485.15              4.761905    9.3  509.4075
## 345        1 133.95              4.761905    6.2  140.6475
## 346        3 701.37              4.761905    7.6  736.4385
## 347        1  71.95              4.761905    7.3   75.5475
## 348        1 714.00              4.761905    4.7  749.7000
## 349        1 182.14              4.761905    5.1  191.2470
## 350        2 135.00              4.761905    4.8  141.7500
## 351        2 993.00              4.761905    6.6 1042.6500
## 352        1 361.83              4.761905    5.5  379.9215
## 353        2 383.11              4.761905    8.5  402.2655
## 354        1 243.00              4.761905    4.8  255.1500
## 355        1  30.24              4.761905    8.4   31.7520
## 356        2 356.56              4.761905    7.8  374.3880
## 357        2 375.50              4.761905    9.3  394.2750
```

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## 358        1 954.40              4.761905    5.2 1002.1200
## 359        3  82.50              4.761905    6.5   86.6250
## 360        1  74.97              4.761905    5.6   78.7185
## 361        2 647.68              4.761905    7.4  680.0640
## 362        1 755.76              4.761905    9.1  793.5480
## 363        3 199.58              4.761905    8.0  209.5590
## 364        1 439.32              4.761905    7.2  461.2860
## 365        1 164.96              4.761905    7.1  173.2080
## 366        1 326.72              4.761905    9.1  343.0560
## 367        1 461.88              4.761905    5.6  484.9740
## 368        1 263.76              4.761905    6.0  276.9480
## 369        1 143.60              4.761905    5.4  150.7800
## 370        2 193.50              4.761905    7.8  203.1750
## 371        1 183.82              4.761905    9.9  193.0110
## 372        2 121.92              4.761905    4.9  128.0160
## 373        3 420.66              4.761905    5.2  441.6930
## 374        1 252.48              4.761905    8.9  265.1040
## 375        2 335.45              4.761905    9.1  352.2225
## 376        3 483.50              4.761905    7.0  507.6750
## 377        2 318.42              4.761905    9.6  334.3410
## 378        3 668.43              4.761905    8.7  701.8515
## 379        3 387.92              4.761905    9.4  407.3160
## 380        2  94.60              4.761905    4.0   99.3300
## 381        2 329.32              4.761905    7.5  345.7860
## 382        1  53.22              4.761905    4.2   55.8810
## 383        1 498.45              4.761905    9.9  523.3725
## 384        3 299.56              4.761905    4.2  314.5380
## 385        3 204.70              4.761905    9.9  214.9350
## 386        1  75.82              4.761905    5.8   79.6110
## 387        1 280.62              4.761905    6.0  294.6510
## 388        2 323.20              4.761905   10.0  339.3600
## 389        3 486.63              4.761905    9.5  510.9615
## 390        2 127.54              4.761905    6.6  133.9170
## 391        1 241.44              4.761905    8.1  253.5120
## 392        1 379.50              4.761905    9.7  398.4750
## 393        3  76.82              4.761905    7.2   80.6610
## 394        2 522.60              4.761905    6.2  548.7300
## 395        3  79.74              4.761905    7.3   83.7270
## 396        3 387.50              4.761905    4.3  406.8750
## 397        3 271.35              4.761905    4.6  284.9175
## 398        1 122.31              4.761905    5.8  128.4255
## 399        2 246.36              4.761905    8.3  258.6780
## 400        1 173.16              4.761905    8.0  181.8180
## 401        2 236.58              4.761905    9.4  248.4090
## 402        2 184.88              4.761905    6.2  194.1240
## 403        3  13.98              4.761905    9.8   14.6790
## 404        3 198.75              4.761905    9.6  208.6875
## 405        3 684.53              4.761905    4.9  718.7565
## 406        2 269.04              4.761905    8.0  282.4920
## 407        2  68.95              4.761905    7.8   72.3975
## 408        1 274.84              4.761905    4.1  288.5820
## 409        3 226.12              4.761905    5.5  237.4260
## 410        3 119.10              4.761905    5.4  125.0550
## 411        1 342.10              4.761905    5.1  359.2050
```

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## 412        3  43.74              4.761905    6.9   45.9270
## 413        1 104.85              4.761905    7.8  110.0925
## 414        3  77.52              4.761905    6.6   81.3960
## 415        3 407.44              4.761905    9.2  427.8120
## 416        3  96.11              4.761905    7.8  100.9155
## 417        2 181.52              4.761905    8.7  190.5960
## 418        3  81.51              4.761905    9.2   85.5855
## 419        3 114.44              4.761905    8.3  120.1620
## 420        1 176.54              4.761905    8.2  185.3670
## 421        3 115.80              4.761905    7.5  121.5900
## 422        1 252.15              4.761905    9.8  264.7575
## 423        2 972.10              4.761905    8.7 1020.7050
## 424        2 203.36              4.761905    6.7  213.5280
## 425        1  16.28              4.761905    5.0   17.0940
## 426        1 365.49              4.761905    7.0  383.7645
## 427        1 372.19              4.761905    8.9  390.7995
## 428        2  62.61              4.761905    8.0   65.7405
## 429        1 336.35              4.761905    6.9  353.1675
## 430        3 906.50              4.761905    7.3  951.8250
## 431        2 138.16              4.761905    6.9  145.0680
## 432        3  86.54              4.761905    5.7   90.8670
## 433        3 140.76              4.761905    6.4  147.7980
## 434        2 668.78              4.761905    9.6  702.2190
## 435        2  47.44              4.761905    6.8   49.8120
## 436        3 893.16              4.761905    9.0  937.8180
## 437        3 331.72              4.761905    9.6  348.3060
## 438        2 203.94              4.761905    7.7  214.1370
## 439        3  68.16              4.761905    7.0   71.5680
## 440        2 326.88              4.761905    6.5  343.2240
## 441        1  87.20              4.761905    8.1   91.5600
## 442        2 707.44              4.761905    4.3  742.8120
## 443        2 802.89              4.761905    6.5  843.0345
## 444        3  12.78              4.761905    9.5   13.4190
## 445        1 133.70              4.761905    9.7  140.3850
## 446        2  19.15              4.761905    9.5   20.1075
## 447        2 276.60              4.761905    8.9  290.4300
## 448        2 137.22              4.761905    6.5  144.0810
## 449        2  27.07              4.761905    5.3   28.4235
## 450        2  39.12              4.761905    9.6   41.0760
## 451        1 448.26              4.761905    6.7  470.6730
## 452        1 132.06              4.761905    7.6  138.6630
## 453        3 318.05              4.761905    4.8  333.9525
## 454        3  25.00              4.761905    5.5   26.2500
## 455        1  83.08              4.761905    4.7   87.2340
## 456        1 147.80              4.761905    6.9  155.1900
## 457        2 696.60              4.761905    4.5  731.4300
## 458        1 793.90              4.761905    6.2  833.5950
## 459        1 465.70              4.761905    7.6  488.9850
## 460        2  35.89              4.761905    7.9   37.6845
## 461        1 202.60              4.761905    4.5  212.7300
## 462        2 730.50              4.761905    8.7  767.0250
## 463        1 295.80              4.761905    6.1  310.5900
## 464        1  22.62              4.761905    6.4   23.7510
## 465        2 256.70              4.761905    9.1  269.5350
```

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## 466       2 545.50             4.761905    7.1  572.7750
## 467       2 260.05             4.761905    7.7  273.0525
## 468       1 222.12             4.761905    4.5  233.2260
## 469       3  21.58             4.761905    7.2   22.6590
## 470       1  98.84             4.761905    8.4  103.7820
## 471       3 502.62             4.761905    5.4  527.7510
## 472       1 160.20             4.761905    9.7  168.2100
## 473       2 431.30             4.761905    5.5  452.8650
## 474       1 580.56             4.761905    4.6  609.5880
## 475       1 322.20             4.761905    6.6  338.3100
## 476       2 195.54             4.761905    6.3  205.3170
## 477       2 166.30             4.761905    4.2  174.6150
## 478       3 336.28             4.761905    4.4  353.0940
## 479       3 343.70             4.761905    6.7  360.8850
## 480       3  38.60             4.761905    6.7   40.5300
## 481       1 527.76             4.761905    8.4  554.1480
## 482       1 328.00             4.761905    6.2  344.4000
## 483       3 185.70             4.761905    5.0  194.9850
## 484       1 603.80             4.761905    6.0  633.9900
## 485       2 369.80             4.761905    7.0  388.2900
## 486       3 197.96             4.761905    6.6  207.8580
## 487       1 410.90             4.761905    7.3  431.4450
## 488       3 148.60             4.761905    8.3  156.0300
## 489       1  22.96             4.761905    4.3   24.1080
## 490       3 699.12             4.761905    9.8  734.0760
## 491       3  69.40             4.761905    8.2   72.8700
## 492       2 196.60             4.761905    7.2  206.4300
## 493       3 202.56             4.761905    8.7  212.6880
## 494       2 121.20             4.761905    8.4  127.2600
## 495       3 199.78             4.761905    7.1  209.7690
## 496       1 607.36             4.761905    5.5  637.7280
## 497       1 126.44             4.761905    8.5  132.7620
## 498       1 541.44             4.761905    6.2  568.5120
## 499       1  98.13             4.761905    8.9  103.0365
## 500       1 412.16             4.761905    9.6  432.7680
## 501       2  73.97             4.761905    5.4   77.6685
## 502       3  31.90             4.761905    9.1   33.4950
## 503       3 138.80             4.761905    9.0  145.7400
## 504       1 186.62             4.761905    6.3  195.9510
## 505       2  88.45             4.761905    9.5   92.8725
## 506       3 193.44             4.761905    9.8  203.1120
## 507       1 145.50             4.761905    6.7  152.7750
## 508       2 504.30             4.761905    7.7  529.5150
## 509       1 306.45             4.761905    7.0  321.7725
## 510       2  95.70             4.761905    5.1  100.4850
## 511       2 635.18             4.761905    6.2  666.9390
## 512       3 214.55             4.761905    6.1  225.2775
## 513       3 379.96             4.761905    9.3  398.9580
## 514       1 696.85             4.761905    7.6  731.6925
## 515       2 408.73             4.761905    8.2  429.1665
## 516       3  51.47             4.761905    8.5   54.0435
## 517       3 274.30             4.761905    9.8  288.0150
## 518       2 196.95             4.761905    8.7  206.7975
## 519       3  69.46             4.761905    9.7   72.9330
```

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## 520       2 359.60             4.761905    4.3  377.5800
## 521       2 137.13             4.761905    7.7  143.9865
## 522       1 499.02             4.761905    7.3  523.9710
## 523       2 224.64             4.761905    5.9  235.8720
## 524       1 125.74             4.761905    5.0  132.0270
## 525       2 490.26             4.761905    8.0  514.7730
## 526       3 457.05             4.761905    7.1  479.9025
## 527       2 156.84             4.761905    9.0  164.6820
## 528       3 119.72             4.761905    6.7  125.7060
## 529       2 543.60             4.761905    6.1  570.7800
## 530       1 882.81             4.761905    9.3  926.9505
## 531       3 152.58             4.761905    7.0  160.2090
## 532       2 693.44             4.761905    7.2  728.1120
## 533       3 229.50             4.761905    8.2  240.9750
## 534       3 146.79             4.761905    8.4  154.1295
## 535       3 141.60             4.761905    6.2  148.6800
## 536       3 116.69             4.761905    7.4  122.5245
## 537       2  73.96             4.761905    5.0   77.6580
## 538       3  97.94             4.761905    6.9  102.8370
## 539       2 292.20             4.761905    4.9  306.8100
## 540       3 524.88             4.761905    5.1  551.1240
## 541       3  92.04             4.761905    9.1   96.6420
## 542       2  75.88             4.761905    7.1   79.6740
## 543       2  80.72             4.761905    5.0   84.7560
## 544       2 112.62             4.761905    5.5  118.2510
## 545       2  71.20             4.761905    9.2   74.7600
## 546       3 155.24             4.761905    4.9  163.0020
## 547       3 294.20             4.761905    8.9  308.9100
## 548       2 548.55             4.761905    6.0  575.9775
## 549       1 257.70             4.761905    4.2  270.5850
## 550       1 396.36             4.761905    7.3  416.1780
## 551       3 171.81             4.761905    6.5  180.4005
## 552       1 488.79             4.761905    8.9  513.2295
## 553       1 524.16             4.761905    9.7  550.3680
## 554       2 133.26             4.761905    8.6  139.9230
## 555       1 135.24             4.761905    6.9  142.0020
## 556       2 112.44             4.761905    7.7  118.0620
## 557       1 144.08             4.761905    9.5  151.2840
## 558       3 985.20             4.761905    4.5 1034.4600
## 559       3 249.96             4.761905    5.6  262.4580
## 560       3 217.26             4.761905    8.2  228.1230
## 561       1 194.22             4.761905    7.3  203.9310
## 562       2 892.00             4.761905    4.4  936.6000
## 563       3 339.36             4.761905    5.7  356.3280
## 564       3 447.06             4.761905    5.0  469.4130
## 565       1 198.50             4.761905    9.0  208.4250
## 566       2 812.10             4.761905    6.3  852.7050
## 567       2 493.30             4.761905    9.4  517.9650
## 568       1 591.66             4.761905    7.7  621.2430
## 569       2 559.02             4.761905    5.5  586.9710
## 570       3 517.86             4.761905    4.1  543.7530
## 571       2 410.20             4.761905    7.6  430.7100
## 572       1 266.70             4.761905    8.6  280.0350
## 573       3  70.91             4.761905    8.3   74.4555
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## 574       2 144.78             4.761905    8.1  152.0190
## 575       2 429.55             4.761905    8.6  451.0275
## 576       3 569.17             4.761905    6.3  597.6285
## 577       1 241.20             4.761905    5.8  253.2600
## 578       3 127.08             4.761905    6.2  133.4340
## 579       1 257.08             4.761905    7.7  269.9340
## 580       3 139.02             4.761905    8.1  145.9710
## 581       1  81.66             4.761905    7.3   85.7430
## 582       1 310.72             4.761905    8.4  326.2560
## 583       2 185.96             4.761905    8.0  195.2580
## 584       2  72.32             4.761905    9.5   75.9360
## 585       3 189.18             4.761905    7.0  198.6390
## 586       2 206.84             4.761905    9.8  217.1820
## 587       1 157.02             4.761905    9.2  164.8710
## 588       3 215.30             4.761905    7.7  226.0650
## 589       1 596.10             4.761905    5.3  625.9050
## 590       1  73.10             4.761905    4.4   76.7550
## 591       2 279.18             4.761905    4.3  293.1390
## 592       3 169.68             4.761905    9.4  178.1640
## 593       1  45.58             4.761905    9.8   47.8590
## 594       3 225.60             4.761905    4.8  236.8800
## 595       1 290.40             4.761905    5.3  304.9200
## 596       2  44.46             4.761905    8.7   46.6830
## 597       2 156.60             4.761905    9.5  164.4300
## 598       3 419.94             4.761905    5.3  440.9370
## 599       1 184.25             4.761905    9.2  193.4625
## 600       3 140.64             4.761905    9.6  147.6720
## 601       3  83.08             4.761905    6.4   87.2340
## 602       2  64.99             4.761905    4.5   68.2395
## 603       3 775.60             4.761905    6.9  814.3800
## 604       3 327.06             4.761905    7.8  343.4130
## 605       1 363.23             4.761905    4.5  381.3915
## 606       1 127.00             4.761905    8.6  133.3500
## 607       3 375.55             4.761905    5.2  394.3275
## 608       2 199.16             4.761905    6.4  209.1180
## 609       3  30.61             4.761905    5.2   32.1405
## 610       3 115.78             4.761905    8.9  121.5690
## 611       2  28.96             4.761905    6.2   30.4080
## 612       1 890.73             4.761905    6.7  935.2665
## 613       1 279.66             4.761905    7.2  293.6430
## 614       2  80.93             4.761905    9.0   84.9765
## 615       3 674.50             4.761905    4.2  708.2250
## 616       3 348.48             4.761905    4.2  365.9040
## 617       1 435.60             4.761905    6.9  457.3800
## 618       3 439.55             4.761905    4.4  461.5275
## 619       2 591.18             4.761905    4.0  620.7390
## 620       3 260.76             4.761905    8.5  273.7980
## 621       2 215.04             4.761905    9.2  225.7920
## 622       1  91.61             4.761905    9.8   96.1905
## 623       2 662.13             4.761905    4.9  695.2365
## 624       2 832.50             4.761905    4.4  874.1250
## 625       1  91.35             4.761905    6.8   95.9175
## 626       1 157.76             4.761905    9.1  165.6480
## 627       3 121.74             4.761905    8.7  127.8270
```

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## 628       1 825.80             4.761905    5.0  867.0900
## 629       3 159.90             4.761905    7.5  167.8950
## 630       2  12.09             4.761905    8.2   12.6945
## 631       2 641.90             4.761905    6.7  673.9950
## 632       3 234.93             4.761905    5.4  246.6765
## 633       2 167.54             4.761905    7.0  175.9170
## 634       3 299.10             4.761905    4.7  314.0550
## 635       2 239.73             4.761905    5.0  251.7165
## 636       2 664.70             4.761905    5.0  697.9350
## 637       2 202.65             4.761905    6.0  212.7825
## 638       1  46.20             4.761905    6.3   48.5100
## 639       1  88.15             4.761905    8.5   92.5575
## 640       3 157.26             4.761905    7.5  165.1230
## 641       3 296.37             4.761905    6.4  311.1885
## 642       3 708.40             4.761905    4.7  743.8200
## 643       3 111.34             4.761905    6.0  116.9070
## 644       2 580.16             4.761905    4.0  609.1680
## 645       3  60.25             4.761905    5.5   63.2625
## 646       3 174.24             4.761905    8.7  182.9520
## 647       1 421.26             4.761905    7.4  442.3230
## 648       1  33.63             4.761905    5.6   35.3115
## 649       1  30.98             4.761905    6.3   32.5290
## 650       1 247.40             4.761905    7.1  259.7700
## 651       3 378.30             4.761905    7.8  397.2150
## 652       1 334.86             4.761905    9.9  351.6030
## 653       1 727.80             4.761905    7.3  764.1900
## 654       3 335.88             4.761905    5.1  352.6740
## 655       2 240.72             4.761905    9.4  252.7560
## 656       2  47.07             4.761905    5.8   49.4235
## 657       2  99.69             4.761905    8.0  104.6745
## 658       3 264.45             4.761905    7.9  277.6725
## 659       1 139.65             4.761905    5.9  146.6325
## 660       2  55.45             4.761905    4.9   58.2225
## 661       1 128.91             4.761905    9.3  135.3555
## 662       2 119.98             4.761905    7.9  125.9790
## 663       2 352.50             4.761905    5.9  370.1250
## 664       2 871.00             4.761905    9.9  914.5500
## 665       1 197.60             4.761905    7.7  207.4800
## 666       3 194.52             4.761905    7.6  204.2460
## 667       3 173.22             4.761905    7.7  181.8810
## 668       3  71.88             4.761905    6.4   75.4740
## 669       3 286.26             4.761905    4.4  300.5730
## 670       2  81.24             4.761905    4.1   85.3020
## 671       3 560.40             4.761905    4.4  588.4200
## 672       1 186.80             4.761905    5.5  196.1400
## 673       3 220.23             4.761905    4.0  231.2415
## 674       2 269.12             4.761905    9.3  282.5760
## 675       2 454.80             4.761905    4.8  477.5400
## 676       1 167.54             4.761905    4.6  175.9170
## 677       2 448.56             4.761905    7.3  470.9880
## 678       1 293.88             4.761905    6.0  308.5740
## 679       3 589.50             4.761905    8.1  618.9750
## 680       3 291.00             4.761905    9.4  305.5500
## 681       1  39.48             4.761905    6.5   41.4540
```

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## 682       2  34.81              4.761905    7.0   36.5505
## 683       3 295.92              4.761905    7.1  310.7160
## 684       3  42.96              4.761905    6.6   45.1080
## 685       3 138.48              4.761905    4.9  145.4040
## 686       2  98.20              4.761905    6.4  103.1100
## 687       2 129.66              4.761905    8.0  136.1430
## 688       1 635.60              4.761905    4.3  667.3800
## 689       1 145.76              4.761905    6.1  153.0480
## 690       1 201.30              4.761905    7.5  211.3650
## 691       1 631.71              4.761905    6.7  663.2955
## 692       3 385.28              4.761905    5.2  404.5440
## 693       1 486.30              4.761905    8.8  510.6150
## 694       1 513.66              4.761905    9.5  539.3430
## 695       1 473.40              4.761905    7.6  497.0700
## 696       1 436.85              4.761905    6.6  458.6925
## 697       3 108.16              4.761905    6.9  113.5680
## 698       3 248.76              4.761905    4.3  261.1980
## 699       2 626.22              4.761905    7.8  657.5310
## 700       3 975.00              4.761905    8.0 1023.7500
## 701       3 483.28              4.761905    9.6  507.4440
## 702       2  96.96              4.761905    4.3  101.8080
## 703       2 197.70              4.761905    5.0  207.5850
## 704       1 724.23              4.761905    9.2  760.4415
## 705       1 795.51              4.761905    6.3  835.2855
## 706       1 502.39              4.761905    8.9  527.5095
## 707       3 172.00              4.761905    7.6  180.6000
## 708       1  68.98              4.761905    4.8   72.4290
## 709       3 124.96              4.761905    9.1  131.2080
## 710       3  77.10              4.761905    6.1   80.9550
## 711       1 483.72              4.761905    9.1  507.9060
## 712       3 302.12              4.761905    8.3  317.2260
## 713       3 698.67              4.761905    7.2  733.6035
## 714       3 124.65              4.761905    6.0  130.8825
## 715       3 789.60              4.761905    8.5  829.0800
## 716       2 178.40              4.761905    6.6  187.3200
## 717       3 500.22              4.761905    4.5  525.2310
## 718       2  35.82              4.761905    8.1   37.6110
## 719       2 136.14              4.761905    7.2  142.9470
## 720       2 104.88              4.761905    6.1  110.1240
## 721       1 178.92              4.761905    7.1  187.8660
## 722       1 815.67              4.761905    5.1  856.4535
## 723       2 132.36              4.761905    7.9  138.9780
## 724       1 257.39              4.761905    7.4  270.2595
## 725       3  93.36              4.761905    7.4   98.0280
## 726       1 228.00              4.761905    6.6  239.4000
## 727       2 166.71              4.761905    5.9  175.0455
## 728       2 697.40              4.761905    8.9  732.2700
## 729       3 389.04              4.761905    6.8  408.4920
## 730       1 365.26              4.761905    9.3  383.5230
## 731       2  89.28              4.761905    4.4   93.7440
## 732       3 168.00              4.761905    4.8  176.4000
## 733       3  19.70              4.761905    9.5   20.6850
## 734       3 531.16              4.761905    8.9  557.7180
## 735       3  53.72              4.761905    6.4   56.4060
```

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## 736        2 819.50              4.761905    6.0  860.4750
## 737        2 568.40              4.761905    8.1  596.8200
## 738        3 587.60              4.761905    9.0  616.9800
## 739        3 732.48              4.761905    6.0  769.1040
## 740        1 845.64              4.761905    9.8  887.9220
## 741        1 389.27              4.761905    8.5  408.7335
## 742        3  84.83              4.761905    8.8   89.0715
## 743        3 143.26              4.761905    8.8  150.4230
## 744        3  75.38              4.761905    9.5   79.1490
## 745        2 253.36              4.761905    5.6  266.0280
## 746        1  38.42              4.761905    8.6   40.3410
## 747        2 652.30              4.761905    5.2  684.9150
## 748        2  52.65              4.761905    5.8   55.2825
## 749        2 110.61              4.761905    8.0  116.1405
## 750        1 568.61              4.761905    9.0  597.0405
## 751        3  89.28              4.761905    4.1   93.7440
## 752        2 136.40              4.761905    8.6  143.2200
## 753        3 174.20              4.761905    7.0  182.9100
## 754        3 366.40              4.761905    8.4  384.7200
## 755        3 254.61              4.761905    7.4  267.3405
## 756        2 778.32              4.761905    6.2  817.2360
## 757        3 285.92              4.761905    4.9  300.2160
## 758        1 579.12              4.761905    4.5  608.0760
## 759        3 188.50              4.761905    5.6  197.9250
## 760        3 221.56              4.761905    8.0  232.6380
## 761        2 772.00              4.761905    5.6  810.6000
## 762        2 721.30              4.761905    4.2  757.3650
## 763        3 511.04              4.761905    9.9  536.5920
## 764        3  53.45              4.761905    7.6   56.1225
## 765        2 222.00              4.761905    6.6  233.1000
## 766        3 763.68              4.761905    4.7  801.8640
## 767        2 228.18              4.761905    9.8  239.5890
## 768        1  82.14              4.761905    6.3   86.2470
## 769        1 382.56              4.761905    7.9  401.6880
## 770        1  68.58              4.761905    7.7   72.0090
## 771        3 382.16              4.761905    4.5  401.2680
## 772        2 601.09              4.761905    8.0  631.1445
## 773        3 475.93              4.761905    5.7  499.7265
## 774        2  52.42              4.761905    6.3   55.0410
## 775        1 131.30              4.761905    6.0  137.8650
## 776        2 144.30              4.761905    8.0  151.5150
## 777        2 457.17              4.761905    4.2  480.0285
## 778        1  93.38              4.761905    9.6   98.0490
## 779        1 126.25              4.761905    6.1  132.5625
## 780        3 790.83              4.761905    5.6  830.3715
## 781        1 174.40              4.761905    8.3  183.1200
## 782        3 379.04              4.761905    7.8  397.9920
## 783        2  30.62              4.761905    4.1   32.1510
## 784        1 352.08              4.761905    8.8  369.6840
## 785        3  50.80              4.761905    4.1   53.3400
## 786        2 522.06              4.761905    9.0  548.1630
## 787        3 575.12              4.761905    5.5  603.8760
## 788        2  54.95              4.761905    9.3   57.6975
## 789        2 181.41              4.761905    5.6  190.4805
```

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## 790       3 412.37             4.761905    9.7  432.9885
## 791       2  46.41             4.761905    4.0   48.7305
## 792       2 274.20             4.761905    9.2  287.9100
## 793       2 973.70             4.761905    4.9 1022.3850
## 794       2 648.20             4.761905    9.3  680.6100
## 795       2  93.22             4.761905    6.6   97.8810
## 796       3  54.36             4.761905    4.3   57.0780
## 797       1  60.87             4.761905    5.5   63.9135
## 798       1 244.90             4.761905    8.1  257.1450
## 799       2  92.78             4.761905    9.8   97.4190
## 800       3 433.45             4.761905    9.4  455.1225
## 801       3 138.06             4.761905    7.9  144.9630
## 802       3 241.60             4.761905    5.1  253.6800
## 803       3 471.73             4.761905    6.9  495.3165
## 804       1 440.64             4.761905    8.0  462.6720
## 805       1 680.31             4.761905    8.0  714.3255
## 806       1 309.88             4.761905    4.2  325.3740
## 807       2 186.36             4.761905    8.5  195.6780
## 808       1 200.92             4.761905    9.0  210.9660
## 809       1  17.75             4.761905    8.6   18.6375
## 810       3 621.80             4.761905    6.0  652.8900
## 811       3  86.00             4.761905    6.2   90.3000
## 812       2 402.60             4.761905    5.0  422.7300
## 813       2 324.85             4.761905    6.5  341.0925
## 814       1  95.15             4.761905    6.0   99.9075
## 815       1 388.96             4.761905    5.0  408.4080
## 816       3 425.68             4.761905    5.0  446.9640
## 817       1 318.08             4.761905    9.2  333.9840
## 818       3 271.04             4.761905    9.6  284.5920
## 819       2 384.64             4.761905    8.4  403.8720
## 820       2 235.80             4.761905    6.0  247.5900
## 821       3 211.56             4.761905    6.7  222.1380
## 822       2  95.36             4.761905    4.1  100.1280
## 823       1  10.17             4.761905    5.9   10.6785
## 824       1 206.13             4.761905    8.7  216.4365
## 825       2 420.56             4.761905    4.5  441.5880
## 826       2  88.04             4.761905    6.6   92.4420
## 827       2 648.99             4.761905    7.7  681.4395
## 828       2 123.84             4.761905    8.5  130.0320
## 829       1 649.50             4.761905    5.2  681.9750
## 830       2 742.20             4.761905    4.3  779.3100
## 831       1  84.48             4.761905    7.6   88.7040
## 832       1 250.28             4.761905    9.5  262.7940
## 833       1  94.80             4.761905    4.1   99.5400
## 834       3  91.30             4.761905    9.2   95.8650
## 835       3 285.11             4.761905    5.4  299.3655
## 836       1  52.38             4.761905    5.8   54.9990
## 837       3 192.70             4.761905    5.6  202.3350
## 838       2 267.78             4.761905    5.1  281.1690
## 839       1 558.70             4.761905    5.8  586.6350
## 840       3 175.32             4.761905    5.0  184.0860
## 841       1 155.82             4.761905    7.9  163.6110
## 842       1  60.30             4.761905    6.0   63.3150
## 843       2  78.94             4.761905    5.0   82.8870
```

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## 844       2  29.74              4.761905    8.9   31.2270
## 845       1  21.32              4.761905    5.9   22.3860
## 846       2 281.34              4.761905    5.9  295.4070
## 847       3  73.26              4.761905    9.7   76.9230
## 848       2  22.38              4.761905    8.6   23.4990
## 849       1 655.92              4.761905    4.0  688.7160
## 850       1 594.60              4.761905    4.2  624.3300
## 851       1  74.10              4.761905    9.2   77.8050
## 852       3 196.96              4.761905    9.2  206.8080
## 853       3 372.33              4.761905    5.0  390.9465
## 854       3 527.90              4.761905   10.0  554.2950
## 855       3 479.75              4.761905    8.8  503.7375
## 856       1 328.59              4.761905    4.2  345.0195
## 857       1 168.96              4.761905    6.3  177.4080
## 858       1 113.24              4.761905    8.2  118.9020
## 859       1 345.54              4.761905    5.1  362.8170
## 860       1 428.67              4.761905    5.0  450.1035
## 861       3  86.27              4.761905    7.0   90.5835
## 862       3  25.52              4.761905    7.8   26.7960
## 863       2 101.52              4.761905    4.3  106.5960
## 864       1 357.49              4.761905    7.0  375.3645
## 865       1 238.77              4.761905    6.6  250.7085
## 866       3 101.43              4.761905    7.3  106.5015
## 867       2 724.24              4.761905    6.5  760.4520
## 868       3 125.64              4.761905    4.9  131.9220
## 869       2  72.93              4.761905    4.3   76.5765
## 870       3 258.36              4.761905    9.3  271.2780
## 871       2 173.74              4.761905    7.1  182.4270
## 872       3  56.50              4.761905    9.6   59.3250
## 873       1 214.30              4.761905    6.2  225.0150
## 874       1 534.36              4.761905    9.9  561.0780
## 875       2  93.16              4.761905    5.9   97.8180
## 876       3 522.08              4.761905    6.3  548.1840
## 877       1  52.35              4.761905    4.0   54.9675
## 878       1  39.75              4.761905    6.1   41.7375
## 879       2 720.16              4.761905    4.5  756.1680
## 880       3  96.80              4.761905    8.6  101.6400
## 881       3 332.10              4.761905    6.0  348.7050
## 882       2  81.44              4.761905    9.5   85.5120
## 883       2 319.90              4.761905    9.9  335.8950
## 884       3 206.52              4.761905    7.5  216.8460
## 885       1 166.68              4.761905    7.6  175.0140
## 886       1 319.06              4.761905    5.0  335.0130
## 887       3  87.90              4.761905    6.7   92.2950
## 888       3 734.70              4.761905    9.5  771.4350
## 889       3  97.52              4.761905    6.8  102.3960
## 890       3 769.20              4.761905    5.6  807.6600
## 891       1 418.30              4.761905    7.2  439.2150
## 892       1 463.28              4.761905    8.1  486.4440
## 893       2 462.45              4.761905    8.6  485.5725
## 894       1 141.90              4.761905    9.4  148.9950
## 895       2 302.70              4.761905    8.9  317.8350
## 896       2 793.28              4.761905    4.2  832.9440
## 897       3 425.18              4.761905    5.0  446.4390
```

```
## 898        1 283.62              4.761905    8.8  297.8010
## 899        1 599.20              4.761905    5.3  629.1600
## 900        3 315.36              4.761905    4.6  331.1280
## 901        2 403.56              4.761905    7.5  423.7380
## 902        3 183.88              4.761905    5.1  193.0740
## 903        2 138.65              4.761905    4.2  145.5825
## 904        1  80.71              4.761905    8.1   84.7455
## 905        3 116.64              4.761905    6.0  122.4720
## 906        1 313.52              4.761905    7.9  329.1960
## 907        2 846.10              4.761905    8.8  888.4050
## 908        2 414.40              4.761905    6.6  435.1200
## 909        3 159.08              4.761905    6.2  167.0340
## 910        2 490.10              4.761905    4.2  514.6050
## 911        2  87.45              4.761905    7.3   91.8225
## 912        3 224.52              4.761905    8.6  235.7460
## 913        1 744.96              4.761905    6.8  782.2080
## 914        3 410.72              4.761905    7.6  431.2560
## 915        1 298.80              4.761905    5.8  313.7400
## 916        1 212.94              4.761905    4.1  223.5870
## 917        2  42.85              4.761905    9.3   44.9925
## 918        1 378.68              4.761905    6.8  397.6140
## 919        3 206.91              4.761905    8.7  217.2555
## 920        3  78.78              4.761905    6.3   82.7190
## 921        2 322.11              4.761905    5.1  338.2155
## 922        1  98.22              4.761905    7.0  103.1310
## 923        2  25.46              4.761905    5.2   26.7330
## 924        2 581.98              4.761905    6.6  611.0790
## 925        3 211.32              4.761905    6.5  221.8860
## 926        3  55.12              4.761905    9.0   57.8760
## 927        2  88.31              4.761905    5.2   92.7255
## 928        2 356.58              4.761905    6.8  374.4090
## 929        2 794.25              4.761905    7.6  833.9625
## 930        3  50.62              4.761905    7.2   53.1510
## 931        3 599.52              4.761905    7.1  629.4960
## 932        2 166.70              4.761905    9.5  175.0350
## 933        3 744.40              4.761905    5.1  781.6200
## 934        3 448.56              4.761905    7.6  470.9880
## 935        3 378.90              4.761905    9.8  397.8450
## 936        3 257.16              4.761905    5.1  270.0180
## 937        3 552.23              4.761905    7.5  579.8415
## 938        1 447.40              4.761905    7.4  469.7700
## 939        1 276.27              4.761905    4.2  290.0835
## 940        3 343.74              4.761905    5.9  360.9270
## 941        3 266.08              4.761905    6.9  279.3840
## 942        1 898.38              4.761905    6.6  943.2990
## 943        3 456.80              4.761905    5.7  479.6400
## 944        2 253.95              4.761905    5.3  266.6475
## 945        1  70.56              4.761905    4.2   74.0880
## 946        2 657.16              4.761905    7.3  690.0180
## 947        2 168.50              4.761905    5.3  176.9250
## 948        3  53.78              4.761905    4.7   56.4690
## 949        3 179.05              4.761905    7.9  188.0025
## 950        3 211.44              4.761905    8.9  222.0120
## 951        3 119.73              4.761905    9.3  125.7165
```

```
## 952       3  65.70              4.761905    4.7   68.9850
## 953       3 251.40              4.761905    8.7  263.9700
## 954       1  84.16              4.761905    7.6   88.3680
## 955       1 395.46              4.761905    5.7  415.2330
## 956       1 297.99              4.761905    6.8  312.8895
## 957       1 454.41              4.761905    5.4  477.1305
## 958       1 276.12              4.761905    7.1  289.9260
## 959       1 158.00              4.761905    7.8  165.9000
## 960       1 887.94              4.761905    8.4  932.3370
## 961       1  91.98              4.761905    9.8   96.5790
## 962       1  41.78              4.761905    9.8   43.8690
## 963       2  15.50              4.761905    7.4   16.2750
## 964       1 290.46              4.761905    6.7  304.9830
## 965       2  66.66              4.761905    6.4   69.9930
## 966       2  76.54              4.761905    5.8   80.3670
## 967       3 299.70              4.761905    7.2  314.6850
## 968       2 243.03              4.761905    9.3  255.1815
## 969       1  47.40              4.761905    9.5   49.7700
## 970       2 172.45              4.761905    9.0  181.0725
## 971       2 846.30              4.761905    9.0  888.6150
## 972       3 258.37              4.761905    6.7  271.2885
## 973       1 609.56              4.761905    5.5  640.0380
## 974       1 240.24              4.761905    5.4  252.2520
## 975       1 172.26              4.761905    8.2  180.8730
## 976       2  99.84              4.761905    7.0  104.8320
## 977       1 298.64              4.761905    8.5  313.5720
## 978       3 159.60              4.761905    4.9  167.5800
## 979       2  25.45              4.761905    5.1   26.7225
## 980       2  67.77              4.761905    6.5   71.1585
## 981       1 238.36              4.761905    9.8  250.2780
## 982       1 232.60              4.761905    8.4  244.2300
## 983       3 877.32              4.761905    7.4  921.1860
## 984       1 699.72              4.761905    6.1  734.7060
## 985       1 674.59              4.761905    6.0  708.3195
## 986       3 318.55              4.761905    8.5  334.4775
## 987       3  29.52              4.761905    4.3   30.9960
## 988       2 496.00              4.761905    6.2  520.8000
## 989       3 823.40              4.761905    4.3  864.5700
## 990       2 602.96              4.761905    8.4  633.1080
## 991       2 282.80              4.761905    4.5  296.9400
## 992       3 766.00              4.761905    6.0  804.3000
## 993       3 116.06              4.761905    8.8  121.8630
## 994       3 174.90              4.761905    6.6  183.6450
## 995       3  60.95              4.761905    5.9   63.9975
## 996       3  40.35              4.761905    6.2   42.3675
## 997       3 973.80              4.761905    4.4 1022.4900
## 998       1  31.84              4.761905    7.7   33.4320
## 999       1  65.82              4.761905    4.1   69.1110
## 1000      1 618.38              4.761905    6.6  649.2990
```

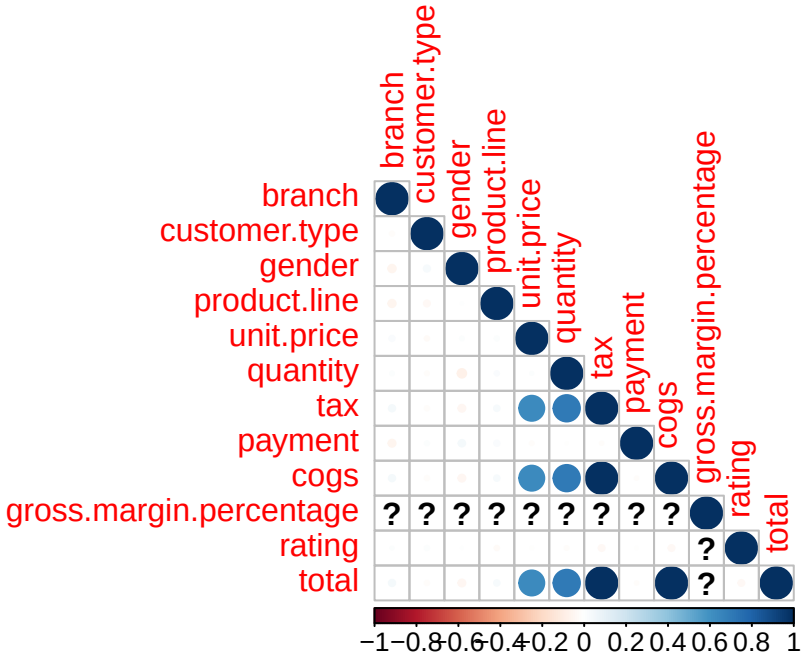
```
data.cor = cor(data.num)
```

```
## Warning in cor(data.num): the standard deviation is zero
```

```
library(corrplot)
```

```
## corrplot 0.90 loaded
```

```
corrplot(data.cor, type = 'lower')
```



PCA

Let's select numerical variables

```
head(supermarket)
```

```
##    invoice.id branch customer.type gender product.line unit.price quantity
## 1 750-67-8428      1             1      1            4      74.69        7
## 2 226-31-3081      3             2      1            1      15.28        5
## 3 631-41-3108      1             2      2            5      46.33        7
## 4 123-19-1176      1             1      2            4      58.22        8
## 5 373-73-7910      1             2      2            6      86.31        7
## 6 699-14-3026      3             2      2            1      85.39        7
##       tax      date  time payment   cogs gross.margin.percentage rating
## 1 26.1415  1/5/2019 13:08       3 522.83                4.761905    9.1
## 2  3.8200  3/8/2019 10:29       1  76.40                4.761905    9.6
## 3 16.2155  3/3/2019 13:23       2 324.31                4.761905    7.4
```

```
## 4 23.2880 1/27/2019 20:33       3 465.76                4.761905    8.4
## 5 30.2085  2/8/2019 10:37       3 604.17                4.761905    5.3
## 6 29.8865 3/25/2019 18:30       3 597.73                4.761905    4.1
##      total
## 1 548.9715
## 2  80.2200
## 3 340.5255
## 4 489.0480
## 5 634.3785
## 6 627.6165
```

```
# Importing the library dplyr
library(dplyr)
df <- select_if(supermarket, is.numeric)
```

```
head(df)
```

```
##   branch customer.type gender product.line unit.price quantity     tax payment
## 1      1             1      1            4      74.69        7 26.1415       3
## 2      3             2      1            1      15.28        5  3.8200       1
## 3      1             2      2            5      46.33        7 16.2155       2
## 4      1             1      2            4      58.22        8 23.2880       3
## 5      1             2      2            6      86.31        7 30.2085       3
## 6      3             2      2            1      85.39        7 29.8865       3
##     cogs gross.margin.percentage rating    total
## 1 522.83                4.761905    9.1 548.9715
## 2  76.40                4.761905    9.6  80.2200
## 3 324.31                4.761905    7.4 340.5255
## 4 465.76                4.761905    8.4 489.0480
## 5 604.17                4.761905    5.3 634.3785
## 6 597.73                4.761905    4.1 627.6165
```

```
df <- df[,c(-1,-2,-3,-4,-8,-10)]
head(df)
```

```
##   unit.price quantity     tax   cogs rating    total
## 1      74.69        7 26.1415 522.83    9.1 548.9715
## 2      15.28        5  3.8200  76.40    9.6  80.2200
## 3      46.33        7 16.2155 324.31    7.4 340.5255
## 4      58.22        8 23.2880 465.76    8.4 489.0480
## 5      86.31        7 30.2085 604.17    5.3 634.3785
## 6      85.39        7 29.8865 597.73    4.1 627.6165
```

We removed the categorical columns as well as the gross.margin.percentage column because it has a constant value throughout for all the rows.

```
# passing df to the prcomp()
# set two arguments, center and scale,to be TRUE then preview our object with summary

super.pca <- prcomp(df, center = TRUE, scale. = T)
summary(super.pca)
```

```
## Importance of components:
##                           PC1    PC2    PC3    PC4       PC5       PC6
## Standard deviation     1.9817 1.0002 0.9939 0.2909 2.886e-16 1.058e-16
## Proportion of Variance 0.6545 0.1667 0.1646 0.0141 0.000e+00 0.000e+00
## Cumulative Proportion  0.6545 0.8213 0.9859 1.0000 1.000e+00 1.000e+00
```

We have obtained 6 principal components.

PC1 explains 65% of the total variance and PC2 ~17% of the variance.

```
# let's have a look at the PCA object
str(super.pca)
```

```
## List of 5
##  $ sdev    : num [1:6] 1.98 1.00 9.94e-01 2.91e-01 2.89e-16 ...
##  $ rotation: num [1:6, 1:6] -0.3281 -0.3649 -0.5029 -0.5029 0.0217 ...
##   ..- attr(*, "dimnames")=List of 2
##   .. ..$ : chr [1:6] "unit.price" "quantity" "tax" "cogs" ...
##   .. ..$ : chr [1:6] "PC1" "PC2" "PC3" "PC4" ...
##  $ center  : Named num [1:6] 55.67 5.51 15.38 307.59 6.97 ...
##   ..- attr(*, "names")= chr [1:6] "unit.price" "quantity" "tax" "cogs" ...
##  $ scale   : Named num [1:6] 26.49 2.92 11.71 234.18 1.72 ...
##   ..- attr(*, "names")= chr [1:6] "unit.price" "quantity" "tax" "cogs" ...
##  $ x       : num [1:1000, 1:6] -1.781 2.087 -0.173 -1.343 -2.497 ...
##   ..- attr(*, "dimnames")=List of 2
##   .. ..$ : NULL
##   .. ..$ : chr [1:6] "PC1" "PC2" "PC3" "PC4" ...
##  - attr(*, "class")= chr "prcomp"
```

```
# Let's plot our pca
# Installing our ggbiplot visualisation package
#
library(devtools)
```

```
## Loading required package: usethis
```

```
install_github("vqv/ggbiplot")
```

```
## Skipping install of 'ggbiplot' from a github remote, the SHA1 (7325e880) has not changed since last i
##   Use 'force = TRUE' to force installation
```

```
# Then Loading our ggbiplot library
#
library(ggbiplot)
```

```
## Loading required package: plyr
```

```
## ------------------------------------------------------------------------------
```

```
## You have loaded plyr after dplyr - this is likely to cause problems.
## If you need functions from both plyr and dplyr, please load plyr first, then dplyr:
## library(plyr); library(dplyr)
```

```
## ------------------------------------------------------------------------------

##
## Attaching package: 'plyr'

## The following objects are masked from 'package:dplyr':
##
##     arrange, count, desc, failwith, id, mutate, rename, summarise,
##     summarize

## The following object is masked from 'package:purrr':
##
##     compact

## Loading required package: scales

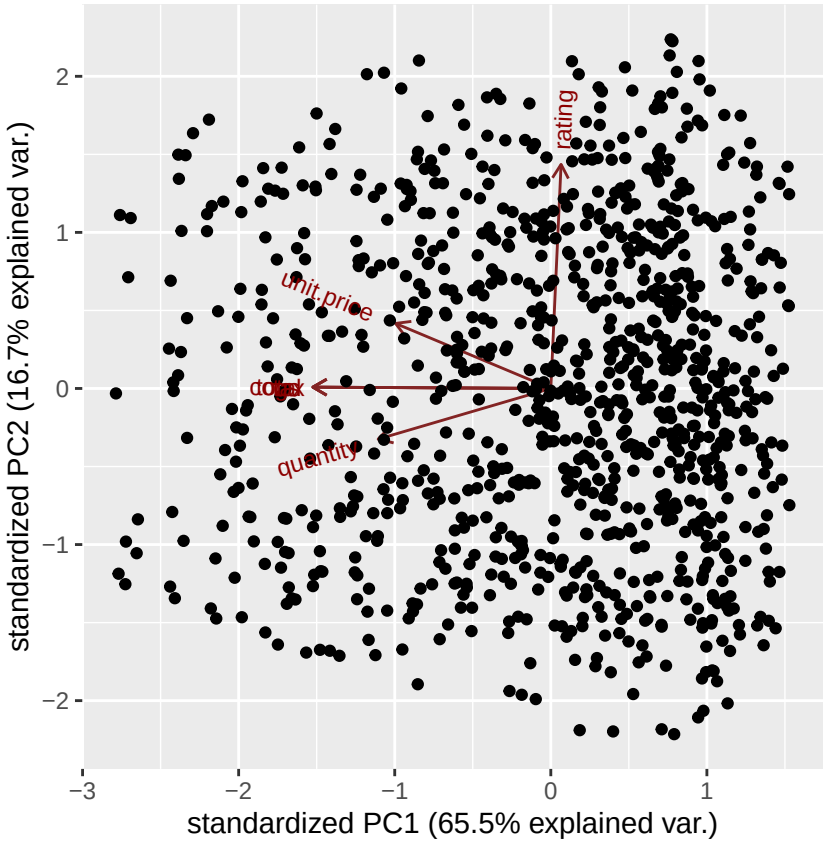
##
## Attaching package: 'scales'

## The following object is masked from 'package:purrr':
##
##     discard

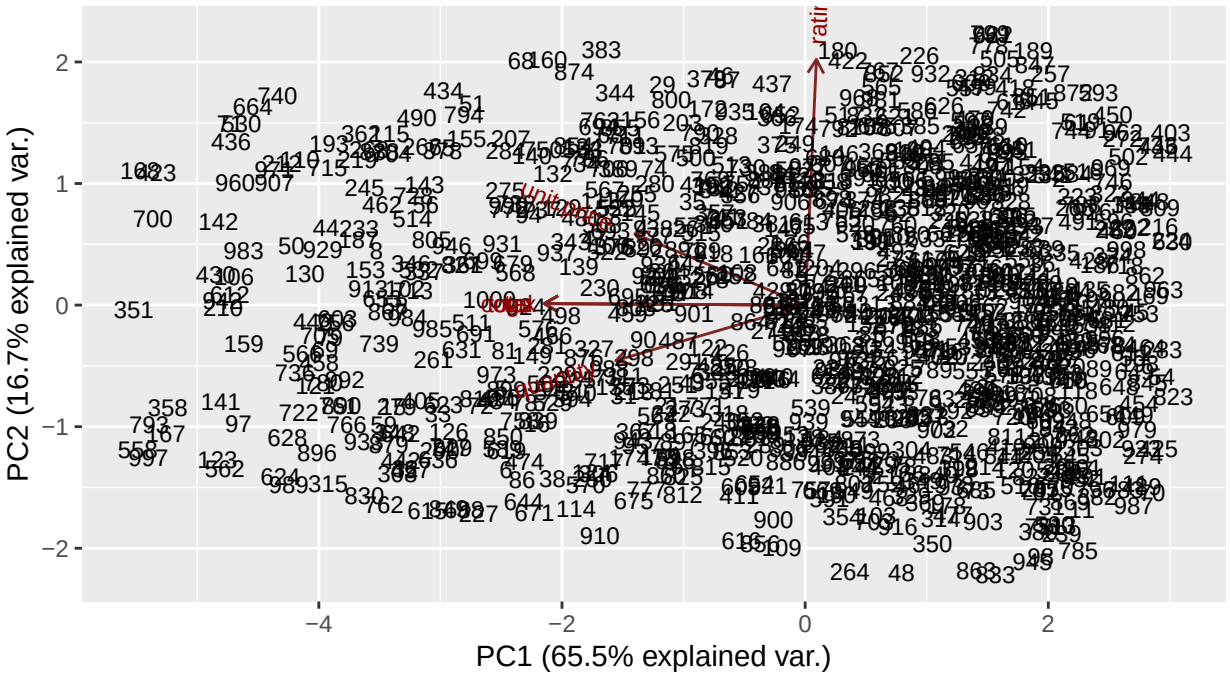
## The following object is masked from 'package:readr':
##
##     col_factor

## Loading required package: grid
```

```
ggbiplot(super.pca)
```




```
# Adding more detail to the plot, we provide arguments rownames as labels
#
ggbiplot(super.pca, labels=rownames(supermarket), obs.scale = 1, var.scale = 1)
```



This plot is not really visually explainable.

Having performed PCA using this dataset, if we were to build a classification model the rating,unit price,quantity and cogs would be significant variables as seen in our PCA analysis.

Feature Selection

```
# reload our dataset
super<- read.csv('http://bit.ly/CarreFourDataset')
head(super)
```

```
##    Invoice.ID Branch Customer.type Gender           Product.line Unit.price
## 1 750-67-8428      A        Member Female      Health and beauty      74.69
## 2 226-31-3081      C        Normal Female Electronic accessories      15.28
## 3 631-41-3108      A        Normal   Male     Home and lifestyle      46.33
## 4 123-19-1176      A        Member   Male      Health and beauty      58.22
## 5 373-73-7910      A        Normal   Male      Sports and travel      86.31
## 6 699-14-3026      C        Normal   Male Electronic accessories      85.39
##   Quantity     Tax      Date  Time     Payment   cogs gross.margin.percentage
## 1        7 26.1415  1/5/2019 13:08     Ewallet 522.83                4.761905
## 2        5  3.8200  3/8/2019 10:29        Cash  76.40                4.761905
## 3        7 16.2155  3/3/2019 13:23 Credit card 324.31                4.761905
## 4        8 23.2880 1/27/2019 20:33     Ewallet 465.76                4.761905
## 5        7 30.2085  2/8/2019 10:37     Ewallet 604.17                4.761905
```

```
## 6        7 29.8865 3/25/2019 18:30     Ewallet 597.73                4.761905
##   gross.income Rating    Total
## 1      26.1415    9.1 548.9715
## 2       3.8200    9.6  80.2200
## 3      16.2155    7.4 340.5255
## 4      23.2880    8.4 489.0480
## 5      30.2085    5.3 634.3785
## 6      29.8865    4.1 627.6165
```

```
# lower case of the column names
names(super) <- tolower(names(super))
names(super)
```

```
##  [1] "invoice.id"              "branch"
##  [3] "customer.type"           "gender"
##  [5] "product.line"            "unit.price"
##  [7] "quantity"                "tax"
##  [9] "date"                    "time"
## [11] "payment"                 "cogs"
## [13] "gross.margin.percentage" "gross.income"
## [15] "rating"                  "total"
```

```
# changing data types
super$branch <- as.integer(as.factor(super$branch))
super$customer.type <- as.integer(as.factor(super$customer.type))
super$gender <- as.integer(as.factor(super$gender))
super$product.line <-as.integer(as.factor(super$product.line))
super$payment <-as.integer(as.factor(super$payment))
```

```
# subsetting our data excluding some variables
super_f <- subset( super, select = -c(`invoice.id`  , date, time,`gross.margin.percentage`))
names(super_f)
```

```
##  [1] "branch"        "customer.type" "gender"        "product.line"
##  [5] "unit.price"    "quantity"      "tax"           "payment"
##  [9] "cogs"          "gross.income"  "rating"        "total"
```

```
# Loading our libraries
library(caret)
```

```
## Loading required package: lattice
```

```
##
## Attaching package: 'caret'
```

```
## The following object is masked from 'package:purrr':
##
##     lift
```

```
library(corrplot)
```

```
# Calculating the correlation matrix
correlationMatrix <- cor(super_f)
```

```
# Find attributes that are highly correlated
highlyCorrelated <- findCorrelation(correlationMatrix, cutoff=0.75)
```

```
# Highly correlated attributes
highlyCorrelated
```

```
## [1]  9 12  7
```

```
names(super_f[,highlyCorrelated])
```

```
## [1] "cogs"  "total" "tax"
```

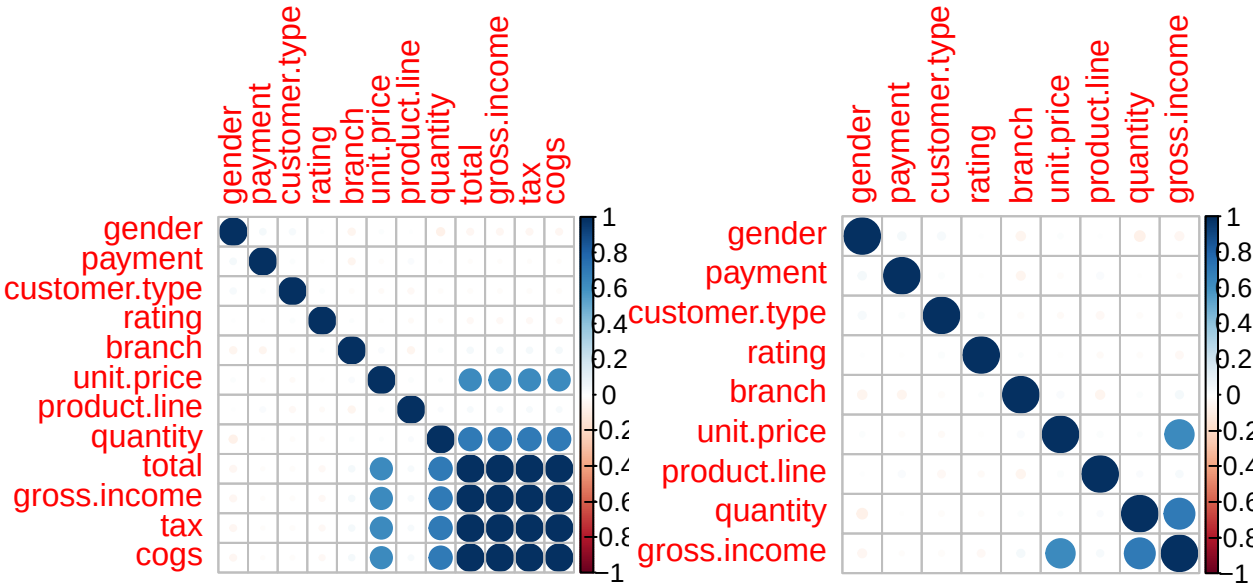
Cogs,total and tax have a high correlation to each other.

```
# removing the variables with a higher correlation
# and comparing the results graphically

# Removing Redundant Features

Dataset <-super_f[-highlyCorrelated]
```

```
# our graphical comparison
par(mfrow = c(1, 2))
corrplot(correlationMatrix, order = "hclust")
corrplot(cor(Dataset), order = "hclust")
```



We have removed irrelevant and unnecessary variables.