Customer Segmentation

Problem Definition

Kira Plastinina is a Russian brand that is sold through a defunct chain of retail stores in Russia, Ukraine, Kazakhstan, Belarus, China, Philippines, and Armenia. The brand's Sales and Marketing team would like to understand their customer's behavior from data that they have collected over the past year. More specifically, they would like to learn the characteristics of customer groups.

Data Sourcing

Data being used in this study was provided by Moringa School

Data Description

- The dataset consists of 10 numerical and 8 categorical attributes.
- The **Revenue** attribute can be used as the **class label**.
- "Administrative", "Administrative Duration", "Informational", "Informational Duration", "Product Related" and "Product Related Duration" represents the number of different types of pages visited by the visitor in that session and total time spent in each of these page categories. The values of these features are derived from the URL information of the pages visited by the user and updated in real-time when a user takes an action, e.g. moving from one page to another.

Metrics Measured by Google Analytics

1. The value of the **Bounce Rate** feature for a web page refers to the percentage of visitors who enter the site from that page and then leave ("bounce") without triggering any other requests to the analytics server during that session.
2. The value of the **Exit Rate** feature for a specific web page is calculated as for all pageviews to the page, the percentage that was the last in the session.
3. The **Page Value** feature represents the average value for a web page that a user visited before completing an e-commerce transaction.

- The **Special Day** feature indicates the closeness of the site visiting time to a specific special day (e.g. Mother's Day, Valentine's Day) in which the sessions are more likely to be finalized with the transaction. The value of this attribute is determined by considering the dynamics of e-commerce such as the duration between the order date and delivery date. For example, for Valentina's day, this value takes a nonzero value between February 2 and February 12, zero before and after this date unless it is close to another special day, and its maximum value of 1 on February 8.
- The dataset also includes the operating system, browser, region, traffic type, visitor type as returning or new visitor, a Boolean value indicating whether the date of the visit is weekend, and month of the year.

Reading/Checking data

```
#Loading the data
df <-read.csv("http://bit.ly/EcommerceCustomersDataset", header = TRUE)
#Showing head of data
head(df)
```

```
##   Administrative Administrative_Duration Informational Informational_Duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                      -1             0                     -1
## 4              0                       0             0                      0
## 5              0                       0             0                      0
## 6              0                       0             0                      0
##   ProductRelated ProductRelated_Duration BounceRates ExitRates PageValues
## 1              1                0.000000  0.20000000 0.2000000          0
## 2              2               64.000000  0.00000000 0.1000000          0
## 3              1               -1.000000  0.20000000 0.2000000          0
## 4              2                2.666667  0.05000000 0.1400000          0
## 5             10              627.500000  0.02000000 0.0500000          0
## 6             19              154.216667  0.01578947 0.0245614          0
##   SpecialDay Month OperatingSystems Browser Region TrafficType
## 1          0   Feb                1       1      1           1
## 2          0   Feb                2       2      1           2
## 3          0   Feb                4       1      9           3
## 4          0   Feb                3       2      2           4
## 5          0   Feb                3       3      1           4
## 6          0   Feb                2       2      1           3
##         VisitorType Weekend Revenue
## 1 Returning_Visitor   FALSE   FALSE
## 2 Returning_Visitor   FALSE   FALSE
## 3 Returning_Visitor   FALSE   FALSE
## 4 Returning_Visitor   FALSE   FALSE
## 5 Returning_Visitor    TRUE   FALSE
## 6 Returning_Visitor   FALSE   FALSE
```

```
#Checking for dimensions and class types
str(df)
```

```
## 'data.frame':    12330 obs. of  18 variables:
##  $ Administrative         : int  0 0 0 0 0 0 0 1 0 0 ...
##  $ Administrative_Duration: num  0 0 -1 0 0 0 -1 -1 0 0 ...
##  $ Informational          : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ Informational_Duration : num  0 0 -1 0 0 0 -1 -1 0 0 ...
##  $ ProductRelated         : int  1 2 1 2 10 19 1 1 2 3 ...
##  $ ProductRelated_Duration: num  0 64 -1 2.67 627.5 ...
##  $ BounceRates            : num  0.2 0 0.2 0.05 0.02 ...
##  $ ExitRates              : num  0.2 0.1 0.2 0.14 0.05 ...
##  $ PageValues             : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ SpecialDay             : num  0 0 0 0 0 0 0.4 0 0.8 0.4 ...
##  $ Month                  : chr  "Feb" "Feb" "Feb" "Feb" ...
##  $ OperatingSystems       : int  1 2 4 3 3 2 2 1 2 2 ...
##  $ Browser                : int  1 2 1 2 3 2 4 2 2 4 ...
##  $ Region                 : int  1 1 9 2 1 1 3 1 2 1 ...
##  $ TrafficType            : int  1 2 3 4 4 3 3 5 3 2 ...
##  $ VisitorType            : chr  "Returning_Visitor" "Returning_Visitor" "Returning_Visitor
##  $ Weekend                : logi  FALSE FALSE FALSE FALSE TRUE FALSE ...
##  $ Revenue                : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
```

Data has 12330 observations(rows) and 18 variables(columns) We have integers, numerics , character and logical features in our dataset.

```
summary((df))
```

```
##  Administrative   Administrative_Duration Informational
##  Min.   : 0.000   Min.   :  -1.00         Min.   : 0.000
##  1st Qu.: 0.000   1st Qu.:   0.00         1st Qu.: 0.000
##  Median : 1.000   Median :   8.00         Median : 0.000
##  Mean   : 2.318   Mean   :  80.91         Mean   : 0.504
##  3rd Qu.: 4.000   3rd Qu.:  93.50         3rd Qu.: 0.000
##  Max.   :27.000   Max.   :3398.75         Max.   :24.000
##  NA's   :14       NA's   :14              NA's   :14
##  Informational_Duration ProductRelated   ProductRelated_Duration
##  Min.   :  -1.00        Min.   :  0.00   Min.   :   -1.0
##  1st Qu.:   0.00        1st Qu.:  7.00   1st Qu.:  185.0
##  Median :   0.00        Median : 18.00   Median :  599.8
##  Mean   :  34.51        Mean   : 31.76   Mean   : 1196.0
##  3rd Qu.:   0.00        3rd Qu.: 38.00   3rd Qu.: 1466.5
##  Max.   :2549.38        Max.   :705.00   Max.   :63973.5
##  NA's   :14             NA's   :14       NA's   :14
##   BounceRates         ExitRates         PageValues        SpecialDay
##  Min.   :0.000000   Min.   :0.00000   Min.   :  0.000   Min.   :0.00000
##  1st Qu.:0.000000   1st Qu.:0.01429   1st Qu.:  0.000   1st Qu.:0.00000
##  Median :0.003119   Median :0.02512   Median :  0.000   Median :0.00000
##  Mean   :0.022152   Mean   :0.04300   Mean   :  5.889   Mean   :0.06143
##  3rd Qu.:0.016684   3rd Qu.:0.05000   3rd Qu.:  0.000   3rd Qu.:0.00000
##  Max.   :0.200000   Max.   :0.20000   Max.   :361.764   Max.   :1.00000
##  NA's   :14         NA's   :14
##     Month           OperatingSystems    Browser           Region
##  Length:12330       Min.   :1.000    Min.   : 1.000   Min.   :1.000
##  Class :character   1st Qu.:2.000    1st Qu.: 2.000   1st Qu.:1.000
##  Mode  :character   Median :2.000    Median : 2.000   Median :3.000
##                     Mean   :2.124    Mean   : 2.357   Mean   :3.147
##                     3rd Qu.:3.000    3rd Qu.: 2.000   3rd Qu.:4.000
##                     Max.   :8.000    Max.   :13.000   Max.   :9.000
##
##   TrafficType    VisitorType         Weekend         Revenue
##  Min.   : 1.00   Length:12330       Mode :logical   Mode :logical
##  1st Qu.: 2.00   Class :character   FALSE:9462      FALSE:10422
##  Median : 2.00   Mode  :character   TRUE :2868      TRUE :1908
##  Mean   : 4.07
##  3rd Qu.: 4.00
##  Max.   :20.00
##
```

Data Cleaning

```
# Changing the type of the loaded dataset to a dataframe
df = as.data.frame(df)

# Cleaning column names, by making them uniform
colnames(df) = tolower(colnames(df))
```

```
#Checking for duplicated rows
duplicated_rows <- df[duplicated(df),]
dim(duplicated_rows)
```

```
## [1] 119  18
```

```
#Dropping duplicated rows
df <- df[!duplicated(df), ]
dim(df)
```

```
## [1] 12211    18
```

```
#Checking for missing values
colSums(is.na(df))
```

```
##          administrative administrative_duration           informational
##                      12                      12                      12
##  informational_duration          productrelated productrelated_duration
##                      12                      12                      12
##             bouncerates               exitrates              pagevalues
##                      12                      12                       0
##              specialday                   month        operatingsystems
##                       0                       0                       0
##                 browser                  region             traffictype
##                       0                       0                       0
##             visitortype                 weekend                 revenue
##                       0                       0                       0
```

Since this data is generated from a website, it doesn't make sense that we have missing values. We will therefore drop this values.

```
#Dropping  missing values
df = na.omit(df)
colSums(is.na(df))
```

```
##          administrative administrative_duration           informational
##                       0                       0                       0
##  informational_duration          productrelated productrelated_duration
##                       0                       0                       0
##             bouncerates               exitrates              pagevalues
##                       0                       0                       0
##              specialday                   month        operatingsystems
##                       0                       0                       0
##                 browser                  region             traffictype
##                       0                       0                       0
##             visitortype                 weekend                 revenue
##                       0                       0                       0
```

```
dim(df)
```

```
## [1] 12199    18
```

```
library(magrittr)
library(tidyverse)
```

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

## v ggplot2 3.3.2     v purrr   0.3.4
## v tibble  3.0.2     v dplyr   1.0.0
## v tidyr   1.1.0     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0

## -- Conflicts ------------------------------------------------------------ tidyverse_confl
## x tidyr::extract()   masks magrittr::extract()
## x dplyr::filter()    masks stats::filter()
## x dplyr::lag()       masks stats::lag()
## x purrr::set_names() masks magrittr::set_names()
```

```
cat_cols = c('month', 'operatingsystems',   'browser',  'region',   'traffictype', 'visitortyp

# Changing columns to factors
df[,cat_cols] %<>% lapply(function(x) as.factor(as.character(x)))
str(df)
```

```
## 'data.frame':    12199 obs. of  18 variables:
##  $ administrative         : int  0 0 0 0 0 0 0 1 0 0 ...
##  $ administrative_duration: num  0 0 -1 0 0 0 -1 -1 0 0 ...
##  $ informational          : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ informational_duration : num  0 0 -1 0 0 0 -1 -1 0 0 ...
##  $ productrelated         : int  1 2 1 2 10 19 1 1 2 3 ...
##  $ productrelated_duration: num  0 64 -1 2.67 627.5 ...
##  $ bouncerates            : num  0.2 0 0.2 0.05 0.02 ...
##  $ exitrates              : num  0.2 0.1 0.2 0.14 0.05 ...
##  $ pagevalues             : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ specialday             : num  0 0 0 0 0 0 0.4 0 0.8 0.4 ...
##  $ month                  : Factor w/ 10 levels "Aug","Dec","Feb",..: 3 3 3 3 3 3 3 3 3 3 .
##  $ operatingsystems       : Factor w/ 8 levels "1","2","3","4",..: 1 2 4 3 3 2 2 1 2 2 ...
##  $ browser                : Factor w/ 13 levels "1","10","11",..: 1 6 1 6 7 6 8 6 6 8 ...
##  $ region                 : Factor w/ 9 levels "1","2","3","4",..: 1 1 9 2 1 1 3 1 2 1 ...
##  $ traffictype            : Factor w/ 20 levels "1","10","11",..: 1 12 14 15 15 14 14 16 14
##  $ visitortype            : Factor w/ 3 levels "New_Visitor",..: 3 3 3 3 3 3 3 3 3 3 ...
##  $ weekend                : logi  FALSE FALSE FALSE FALSE TRUE FALSE ...
##  $ revenue                : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
##  - attr(*, "na.action")= 'omit' Named int [1:12] 1050 1116 1117 1118 1119 1443 1444 1445 14
##   ..- attr(*, "names")= chr [1:12] "1066" "1133" "1134" "1135" ...
```

```
head(df)
```

```
##   administrative administrative_duration informational informational_duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                      -1             0                     -1
## 4              0                       0             0                      0
## 5              0                       0             0                      0
## 6              0                       0             0                      0
##   productrelated productrelated_duration bouncerates exitrates pagevalues
## 1              1                0.000000  0.20000000 0.2000000          0
## 2              2               64.000000  0.00000000 0.1000000          0
## 3              1               -1.000000  0.20000000 0.2000000          0
## 4              2                2.666667  0.05000000 0.1400000          0
## 5             10              627.500000  0.02000000 0.0500000          0
## 6             19              154.216667  0.01578947 0.0245614          0
##   specialday month operatingsystems browser region traffictype
## 1          0   Feb                1       1      1           1
## 2          0   Feb                2       2      1           2
## 3          0   Feb                4       1      9           3
## 4          0   Feb                3       2      2           4
## 5          0   Feb                3       3      1           4
## 6          0   Feb                2       2      1           3
##         visitortype weekend revenue
## 1 Returning_Visitor   FALSE   FALSE
## 2 Returning_Visitor   FALSE   FALSE
## 3 Returning_Visitor   FALSE   FALSE
## 4 Returning_Visitor   FALSE   FALSE
## 5 Returning_Visitor    TRUE   FALSE
## 6 Returning_Visitor   FALSE   FALSE
```

```
#Checking for unique values to see whether we have any abnormal values
#uniq <- df %<>% lapply(function(x)unique(x)))
#uniq
```

There are no abnormal values. Next we check for outliers

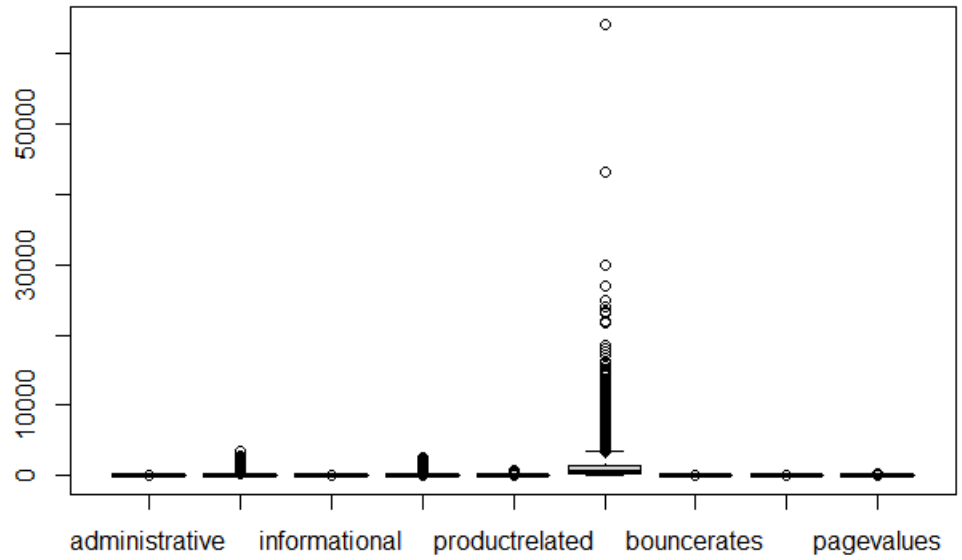
```
colnames(df)
```

```
##  [1] "administrative"          "administrative_duration"
##  [3] "informational"           "informational_duration"
##  [5] "productrelated"          "productrelated_duration"
##  [7] "bouncerates"             "exitrates"
##  [9] "pagevalues"              "specialday"
## [11] "month"                   "operatingsystems"
## [13] "browser"                 "region"
## [15] "traffictype"             "visitortype"
## [17] "weekend"                 "revenue"
```

```
#Checking for outliers
#First we select numeric columns
nums <- subset(df, select = -c(specialday, month, operatingsystems,browser, region, traffictype
head(nums)
```

```
##   administrative administrative_duration informational informational_duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                      -1             0                     -1
## 4              0                       0             0                      0
## 5              0                       0             0                      0
## 6              0                       0             0                      0
##   productrelated productrelated_duration bouncerates exitrates pagevalues
## 1              1                0.000000  0.20000000 0.2000000          0
## 2              2               64.000000  0.00000000 0.1000000          0
## 3              1               -1.000000  0.20000000 0.2000000          0
## 4              2                2.666667  0.05000000 0.1400000          0
## 5             10              627.500000  0.02000000 0.0500000          0
## 6             19              154.216667  0.01578947 0.0245614          0
```

```
boxplot(nums)
```



All of the numerical columns have outliers. It is also important to note that a few of this have negative values. But since we are dealing with customers and reatails have all sort of customers who have different values and capabilities we will leave these outliers as they are. This way we will be able to capture this groups when grouping the customers.

Data Exploration

1. Distributions of numerical values

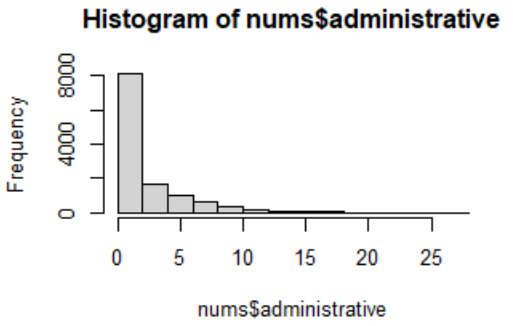
```
library(ggplot2)
library(psych)
```

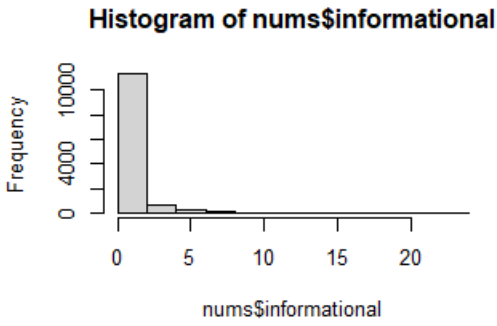
```
##
## Attaching package: 'psych'

## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha
```

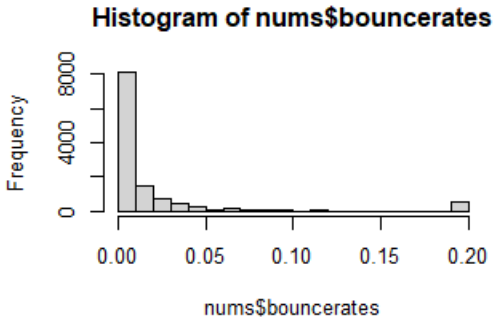
```
#Central tendency
describe(nums)
```

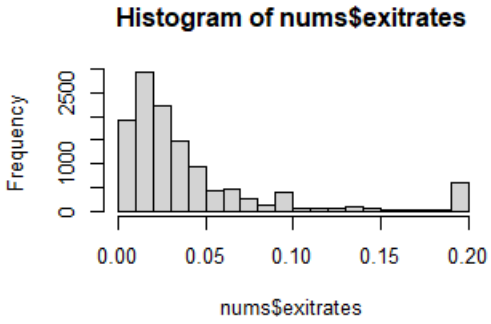
```
##                          vars     n    mean      sd median trimmed    mad min
## administrative              1 12199    2.34    3.33   1.00    1.66   1.48   0
## administrative_duration     2 12199   81.68  177.53   9.00   42.87  13.34  -1
## informational               3 12199    0.51    1.28   0.00    0.18   0.00   0
## informational_duration      4 12199   34.84  141.46   0.00    3.73   0.00  -1
## productrelated              5 12199   32.06   44.60  18.00   23.06  19.27   0
## productrelated_duration     6 12199 1207.51 1919.93 609.54  832.36 745.12  -1
## bouncerates                 7 12199    0.02    0.05   0.00    0.01   0.00   0
## exitrates                   8 12199    0.04    0.05   0.03    0.03   0.02   0
## pagevalues                  9 12199    5.95   18.66   0.00    1.33   0.00   0
##                             max    range skew kurtosis    se
## administrative            27.00    27.00 1.95     4.63  0.03
## administrative_duration 3398.75  3399.75 5.59    50.09  1.61
## informational             24.00    24.00 4.01    26.64  0.01
## informational_duration  2549.38  2550.38 7.54    75.45  1.28
## productrelated           705.00   705.00 4.33    31.04  0.40
## productrelated_duration 63973.52 63974.52 7.25   136.57 17.38
## bouncerates                0.20     0.20 3.15     9.25  0.00
## exitrates                  0.20     0.20 2.23     4.62  0.00
## pagevalues               361.76   361.76 6.35    64.93  0.17
```

```
#Plotting histograms to show distribution of variables
par(mfrow = c(2, 2))
hist(nums$administrative)
hist(nums$informational)
hist(nums$bouncerates)
hist(nums$exitrates)
```

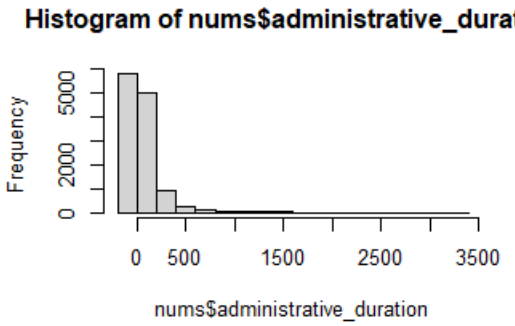


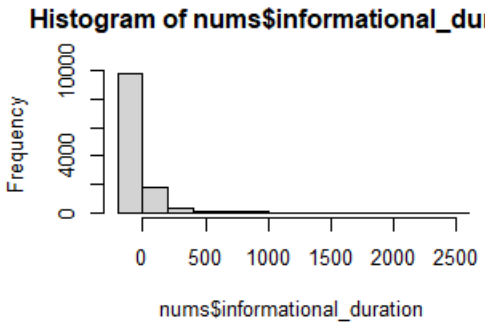


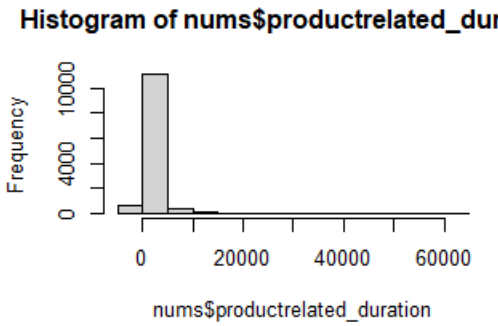


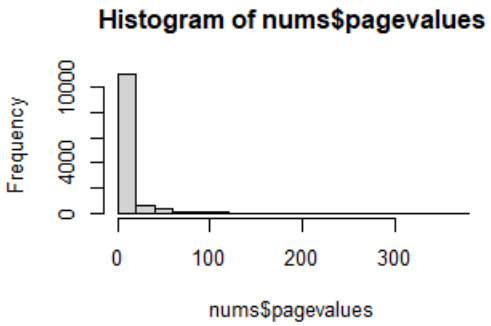



```
par(mfrow = c(2, 2))
hist(nums$administrative_duration)
hist(nums$informational_duration)
hist(nums$productrelated_duration)
hist(nums$pagevalues)
```









Conclusions

From the central tendency we see that: 1. All variables have a sample size of 12199 2. Product related duration have the largest figures and range, meaning peole visiting the website spend alot of time in the product related page 3. People also spend a considerable amount of time checking on the administration 4. People spend the least of time checking out the information related page

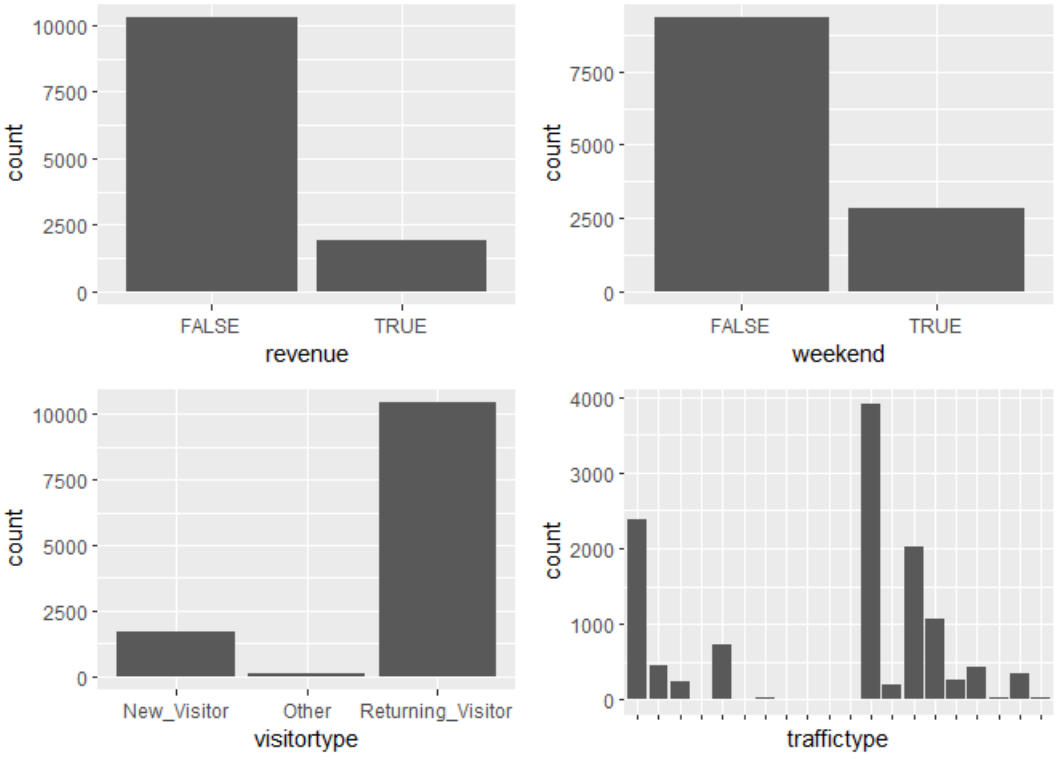
From the above distributions we can conclude that 1. Our numerical values are skewed to the left 2. They don't follow a normal distribution 3. Variables dealing with duration have larger values because they represent duration

of user on page 4. Exit rates vary alot

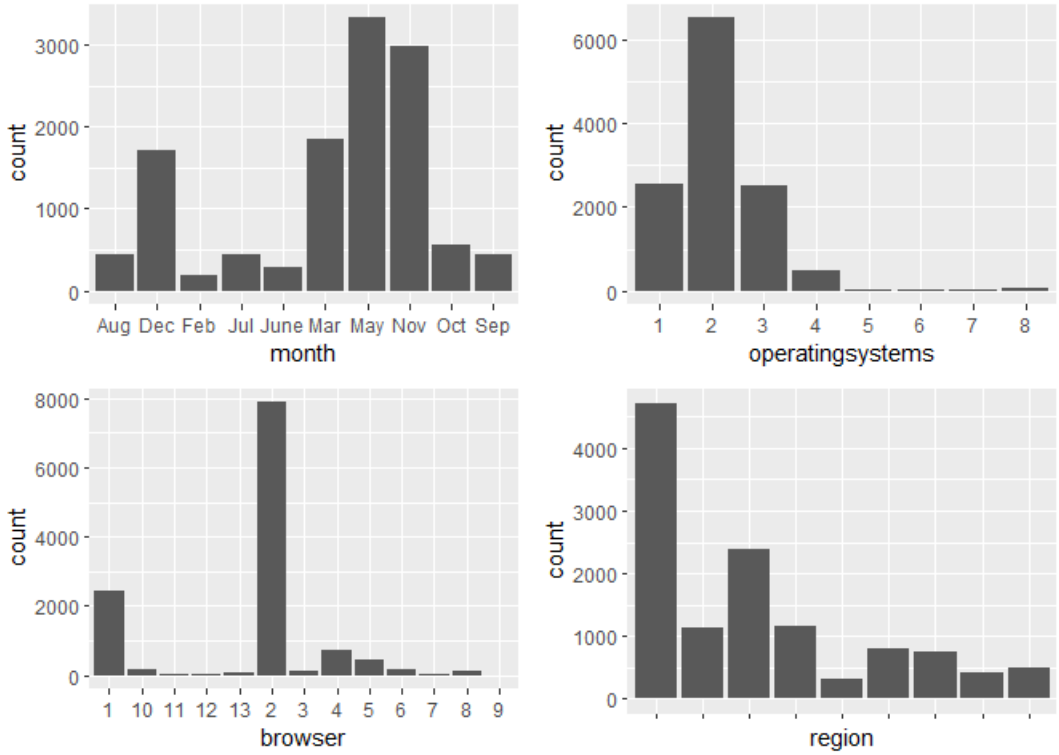
2. Categorical data Analysis

```
#install.packages("ggpubr")
library(ggpubr)
```

```
#Did most traffic generate any revenue?
r <- ggplot(data = df) +
  geom_bar(mapping = aes(x = revenue))
#Was traffic high on weekends or not?
w <- ggplot(data = df) +
  geom_bar(mapping = aes(x = weekend))
#What group of visitors frequented the website?
v <-ggplot(data = df) +
  geom_bar(mapping = aes(x = visitortype))
#What traffic type was mostly used?
t <- ggplot(data = df) +
  geom_bar(mapping = aes(x = traffictype))
ggarrange(r, w, v, t + rremove("x.text"),
          ncol = 2, nrow = 2)
```



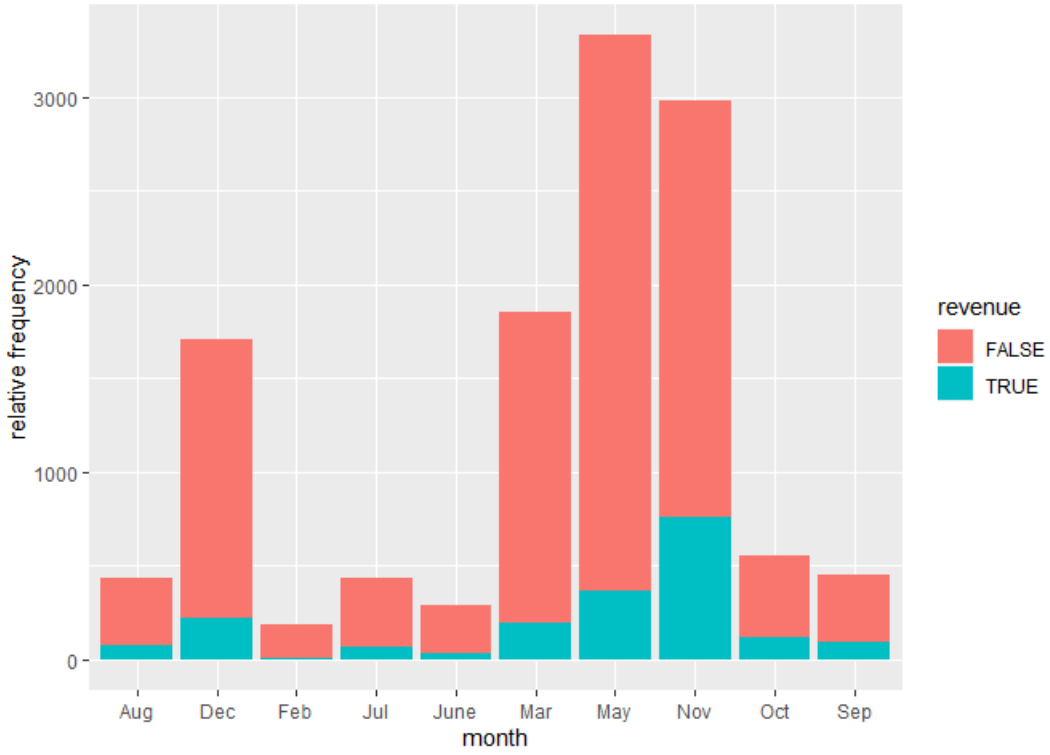
```
#Which months had the highest traffic
m <- ggplot(data = df) +
  geom_bar(mapping = aes(x = month))
#Distribution of operating systems on traffic
o <- ggplot(data = df) +
  geom_bar(mapping = aes(x = operatingsystems))
#Browser distribution
b <-ggplot(data = df) +
  geom_bar(mapping = aes(x = browser))
#Which regions trafficked the website the most?
r <- ggplot(data = df) +
  geom_bar(mapping = aes(x = region))
ggarrange(m, o, b, r + rremove("x.text"),
          ncol = 2, nrow = 2)
```



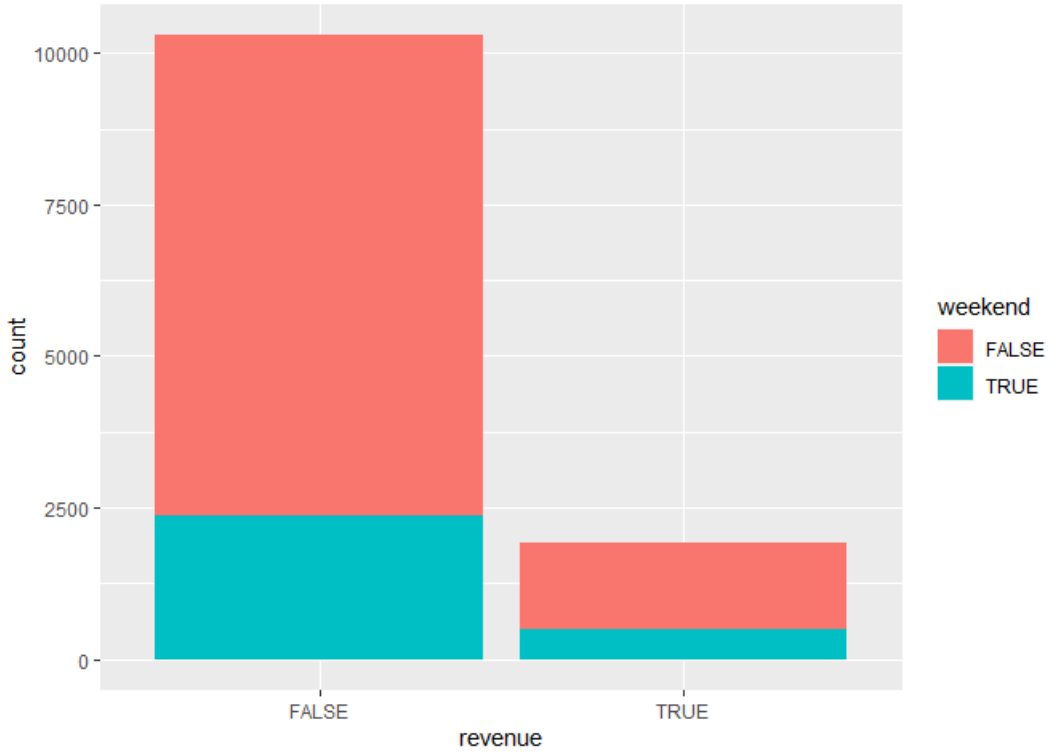
Conclusions 1. Most of the traffic in the website doesn't generate any revenue 2. There is more traffic on weekdays than weekends, but the traffic on weekends is relatively high considering that weekends consist of only 2 days per week. 3. Most of the people visiting the website are returning visitors, only a small percentage are new 4. There is alot of traffic in the website in May, November, March and Dec 5. Almost 5000 of the traffic in the website for the year was from region 1, around 2,300 from region 3 and the other regions ranging from 1000 to 300 individuals.

3. Bivariate Analysis

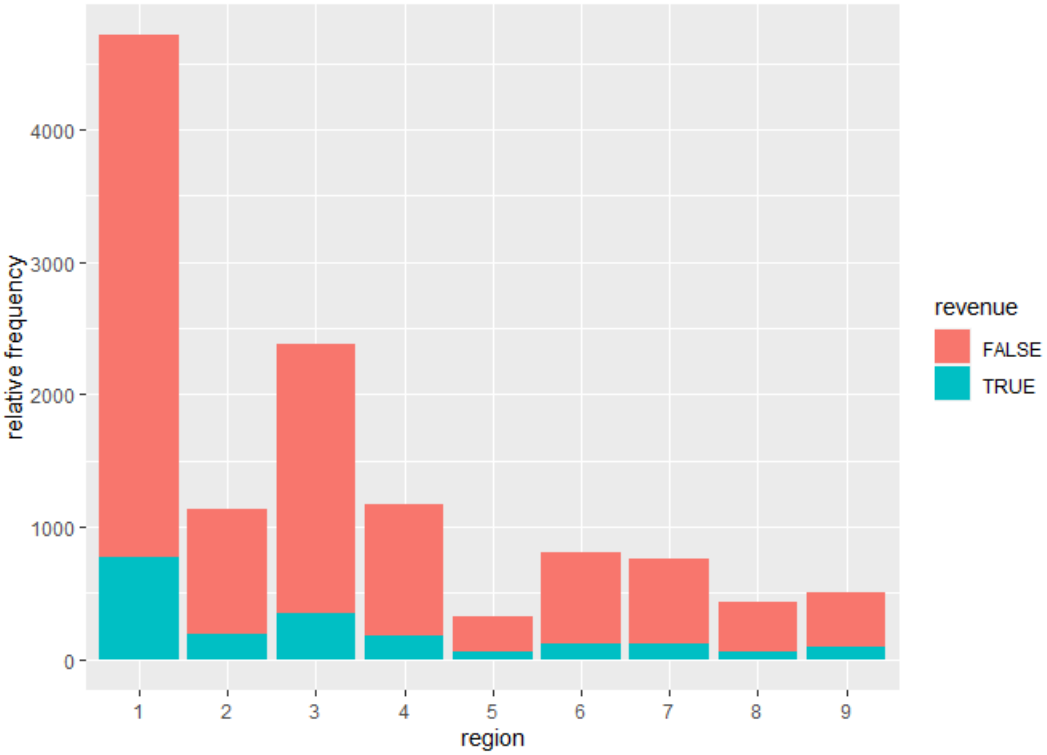
```
#Revenue generation per month
df %>%
  ggplot() +
  aes(x = month, revenue = ..count../nrow(df), fill = revenue) +
  geom_bar() +
  ylab("relative frequency")
```



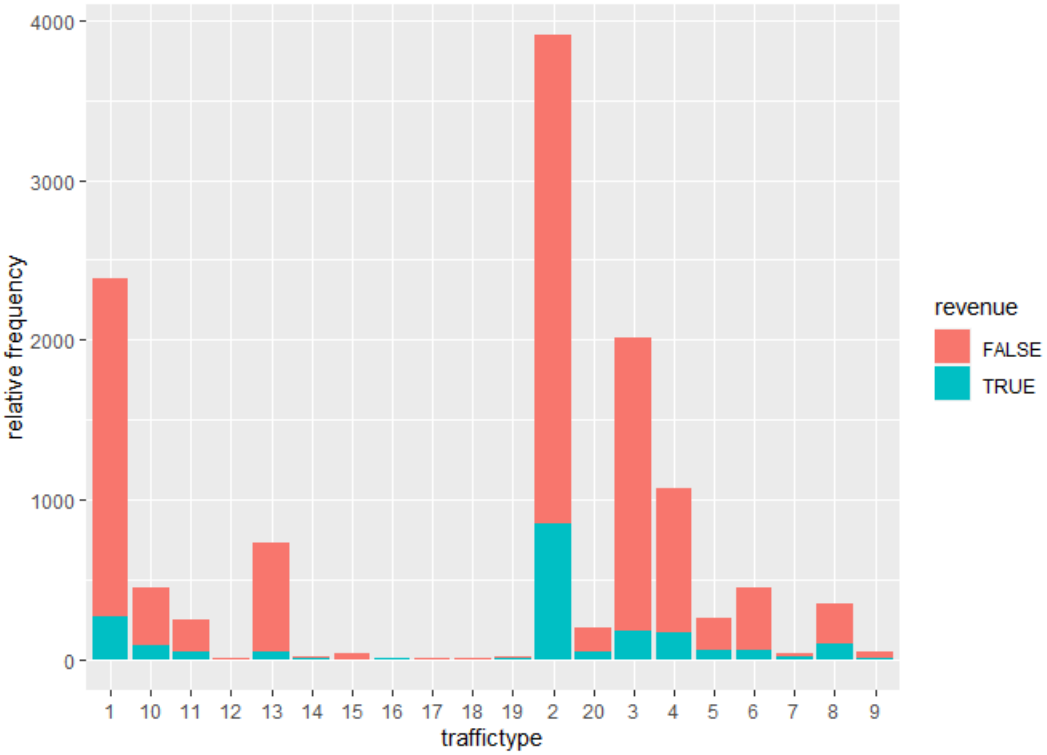

```
#Checking how weekends generated revenue as compared to weekdays
ggplot(df,
       aes(x = revenue,
           fill = weekend)) +
  geom_bar(position = "stack")
```




```
df %>%
  ggplot() +
  aes(x = region, revenue = ..count../nrow(df), fill = revenue) +
  geom_bar() +
  ylab("relative frequency")
```

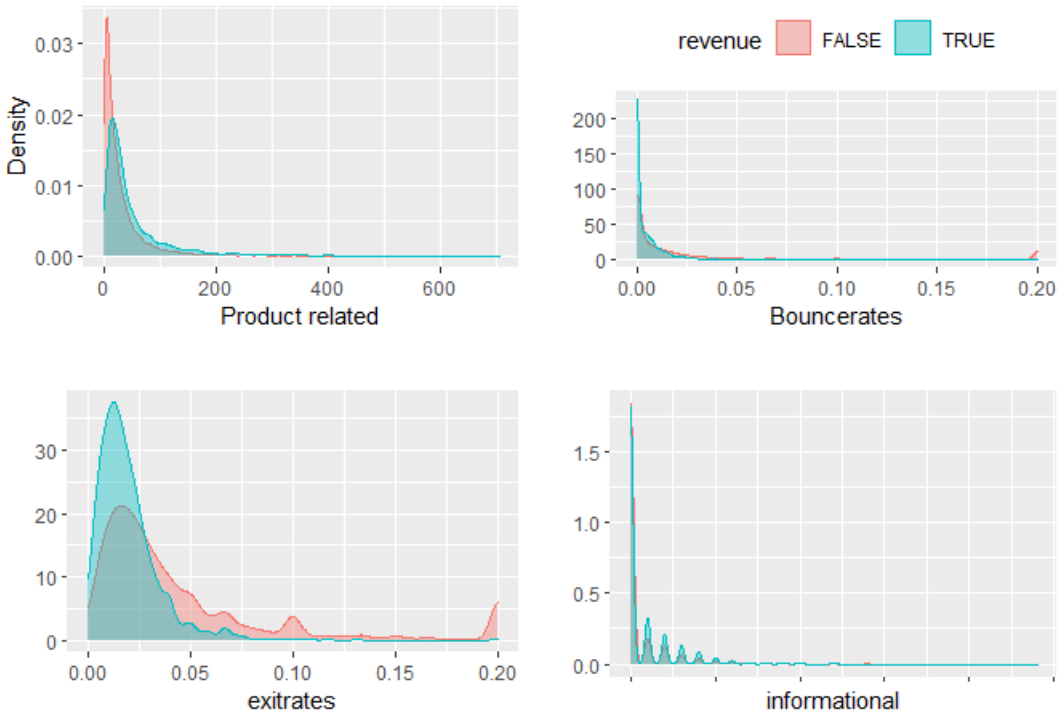



```
df %>%
  ggplot() +
  aes(x = traffictype, revenue = ..count../nrow(df), fill = revenue) +
  geom_bar() +
  ylab("relative frequency")
```



Conclusions 1. Most of the revenue is generated during weekdays, but a relative amount is generated on weekends 2. The month of November had most revenue, i.e most people who visit the site actually purchased 3. Traffic from region 1 seem to purchase from the website but also they are the most frequent 4. Traffic type 2 has the highest revenue count

```
#Checking the distribution of different variables in relation to revenue
options(repr.plot.width = 11, repr.plot.height = 5)
p1 = ggplot(df, aes(productrelated, col = revenue)) +
  geom_density(aes(fill = revenue), alpha = 0.4) +
  labs(x = 'Product related', y = 'Density', title = '') +
  theme(legend.position = 'none',
        plot.title = element_text(size = 12))

p2 = ggplot(df, aes(bouncerates, col = revenue)) +
  geom_density(aes(fill = revenue), alpha = 0.4) +
  labs(x = 'Bouncerates', y = '', title = '') +
  theme(legend.position = 'top')

p3 = ggplot(df, aes(exitrates, col = revenue)) +
  geom_density(aes(fill = revenue), alpha = 0.4) +
  labs(x = 'exitrates', y = '', title = '') +
  theme(legend.position = 'none',
        plot.title = element_text(size = 12))


p4 = ggplot(df, aes(informational, col = revenue)) +
  geom_density(aes(fill = revenue), alpha = 0.4) +
  labs(x = 'informational', y = '', title = '') +
  theme(legend.position = 'none',
        plot.title = element_text(size = 12))


ggarrange(p1, p2, p3, p4 + rremove("x.text"),
          ncol = 2, nrow = 2)
```



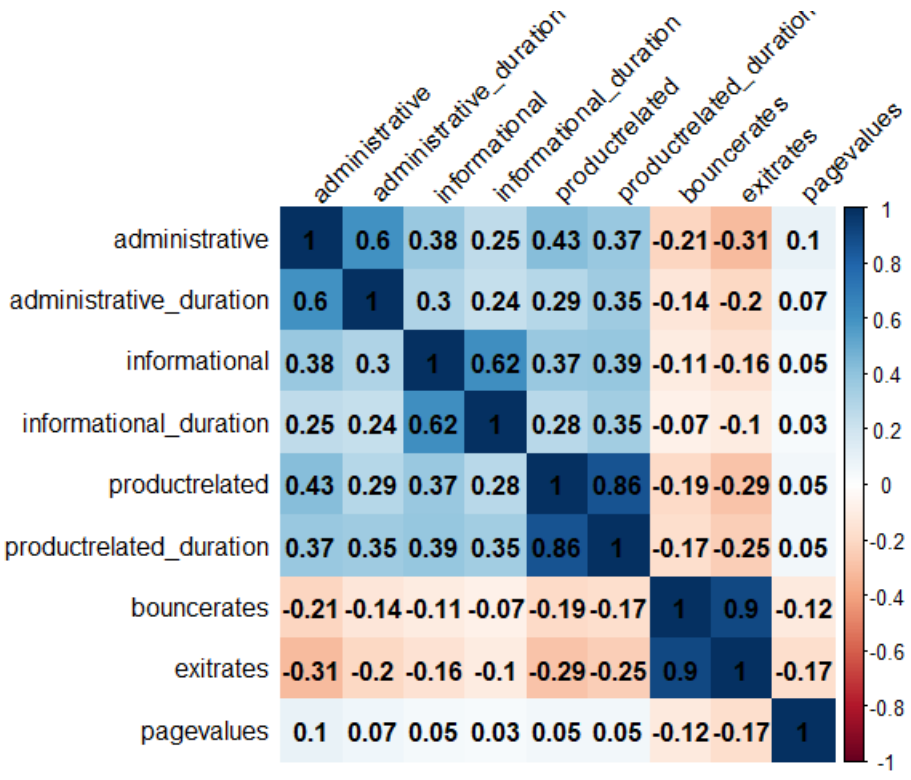

```
install.packages("corrplot")
```

```
## Installing package into 'C:/Users/Karimi/Documents/R/win-library/4.0'
## (as 'lib' is unspecified)

## Warning: unable to access index for repository https://mran.microsoft.com/snapshot/2020-07-
##   cannot open URL 'https://mran.microsoft.com/snapshot/2020-07-16/src/contrib/PACKAGES'

## Warning: package 'corrplot' is not available (for R version 4.0.2)

## Warning: unable to access index for repository https://mran.microsoft.com/snapshot/2020-07-
##   cannot open URL 'https://mran.microsoft.com/snapshot/2020-07-16/bin/windows/contrib/4.0/P
```

```
library(corrplot)
```

```
## corrplot 0.84 loaded
```

```
#Get the correlation matrix
res = cor(nums)
#Plotting a correlation plot

corrplot(res, method="color",addCoef.col = "black",
         tl.col="black", tl.srt=45)
```



Conclusions *

There is a strong positive correlation between a page and the duration taken by visitors on that page, for example product related and product related duration * There is also a strong correlation between exitrates and bounce rates

Implement the Solution

Feature Engineering

```r
#converting the variable weekend to a dummy
#with weekend being a '1' and a weekday being a '0'
mod.data <- df %>%
  mutate(Weekend_binary = ifelse(weekend == "FALSE",0,1))
head(mod.data)
```

```
##   administrative administrative_duration informational informational_duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                      -1             0                     -1
## 4              0                       0             0                      0
## 5              0                       0             0                      0
## 6              0                       0             0                      0
##   productrelated productrelated_duration bouncerates exitrates pagevalues
## 1              1                0.000000  0.20000000 0.2000000          0
## 2              2               64.000000  0.00000000 0.1000000          0
## 3              1               -1.000000  0.20000000 0.2000000          0
## 4              2                2.666667  0.05000000 0.1400000          0
## 5             10              627.500000  0.02000000 0.0500000          0
## 6             19              154.216667  0.01578947 0.0245614          0
##   specialday month operatingsystems browser region traffictype
## 1          0   Feb                1       1      1           1
## 2          0   Feb                2       2      1           2
## 3          0   Feb                4       1      9           3
## 4          0   Feb                3       2      2           4
## 5          0   Feb                3       3      1           4
## 6          0   Feb                2       2      1           3
##         visitortype weekend revenue Weekend_binary
## 1 Returning_Visitor   FALSE   FALSE              0
## 2 Returning_Visitor   FALSE   FALSE              0
## 3 Returning_Visitor   FALSE   FALSE              0
## 4 Returning_Visitor   FALSE   FALSE              0
## 5 Returning_Visitor    TRUE   FALSE              1
## 6 Returning_Visitor   FALSE   FALSE              0
```

```r
#Removing the target column and weekday column
mod <- subset(mod.data, select = -c(weekend))
#Separating features from target
mod.new <- mod[, c(1,2,3,4,5,6,7,8,9,10)]
mod.class <- mod[, "revenue"]
head(mod.new)
```

```
##   administrative administrative_duration informational informational_duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                      -1             0                     -1
## 4              0                       0             0                      0
## 5              0                       0             0                      0
## 6              0                       0             0                      0
##   productrelated productrelated_duration bouncerates exitrates pagevalues
## 1              1                0.000000  0.20000000 0.2000000          0
## 2              2               64.000000  0.00000000 0.1000000          0
## 3              1               -1.000000  0.20000000 0.2000000          0
## 4              2                2.666667  0.05000000 0.1400000          0
## 5             10              627.500000  0.02000000 0.0500000          0
## 6             19              154.216667  0.01578947 0.0245614          0
##   specialday
## 1          0
## 2          0
## 3          0
## 4          0
## 5          0
## 6          0
```

```
#Normalizing data

normalize <- function(x) {
  return ((x - min(x)) / (max(x) - min(x)))
}
## Creating a copy of the original data.
data.mod <- mod.new

## Normalizing our 10 variables.
data.mod$administrative <- normalize(data.mod$administrative)
data.mod$administrative_duration <- normalize(data.mod$administrative_duration)
data.mod$informational <- normalize(data.mod$informational)
data.mod$informational_duration <- normalize(data.mod$informational_duration)
data.mod$productrelated <- normalize(data.mod$productrelated)
data.mod$productrelated_duration <- normalize(data.mod$productrelated_duration)
data.mod$bouncerates <- normalize(data.mod$bouncerates)
data.mod$exitrates <- normalize(data.mod$exitrates)
data.mod$pagevalues <- normalize(data.mod$pagevalues)
data.mod$specialday <- normalize(data.mod$specialday)
head(data.mod)
```

```
##   administrative administrative_duration informational informational_duration
## 1              0            0.0002941393             0           0.0003920992
## 2              0            0.0002941393             0           0.0003920992
## 3              0            0.0000000000             0           0.0000000000
## 4              0            0.0002941393             0           0.0003920992
## 5              0            0.0002941393             0           0.0003920992
## 6              0            0.0002941393             0           0.0003920992
##   productrelated productrelated_duration bouncerates exitrates pagevalues
## 1    0.001418440            1.563122e-05  1.00000000  1.000000          0
## 2    0.002836879            1.016029e-03  0.00000000  0.500000          0
## 3    0.001418440            0.000000e+00  1.00000000  1.000000          0
## 4    0.002836879            5.731448e-05  0.25000000  0.700000          0
## 5    0.014184397            9.824223e-03  0.10000000  0.250000          0
## 6    0.026950355            2.426226e-03  0.07894737  0.122807          0
##   specialday
## 1          0
## 2          0
## 3          0
## 4          0
## 5          0
## 6          0
```

Modelling

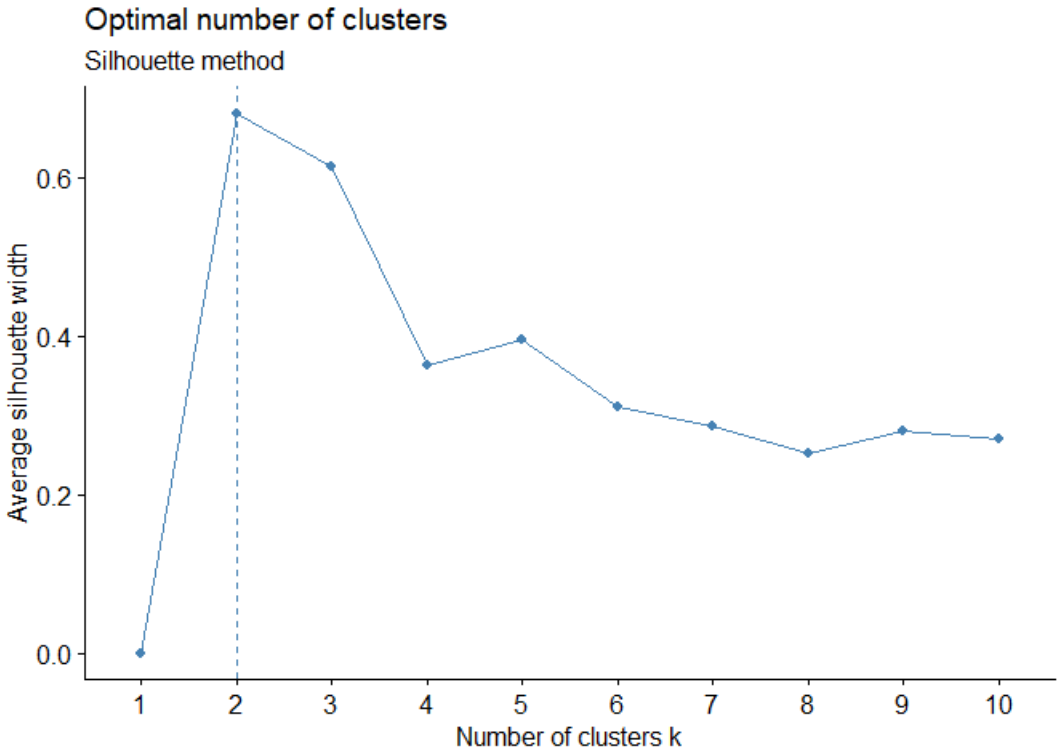
1. K-Means Clustering

```
#Load the packages as follow:


library(factoextra)
```

```
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
```

```
library(NbClust)
```

```
#Getting the optimal number of clusters
# Silhouette method
fviz_nbclust(data.mod, kmeans, method = "silhouette")+
  labs(subtitle = "Silhouette method")
```




```
#Modelling using centroid = 2
set.seed(5)
model_k <- kmeans(data.mod,2, iter.max = 100)
#Viewing centers of the clusters
model_k$centers
```

```
##   administrative administrative_duration informational informational_duration
## 1    0.093656006            0.0262669218  0.0228950327           0.0151795833
## 2    0.002185662            0.0007844135  0.0007153076           0.0004178465
##   productrelated productrelated_duration bouncerates exitrates pagevalues
## 1    0.048844961             0.020367634  0.04366175 0.1511488 0.01781518
## 2    0.004708855             0.001032834  0.81031289 0.8885226 0.00000000
##   specialday
## 1 0.05710482
## 2 0.12081545
```

```
model_k$cluster
```

```
##     1     2     3     4     5     6     7     8     9    10    11    12    13
##     2     1     2     1     1     1     2     2     1     1     1     1     1
##    14    15    16    17    18    19    20    21    22    23    24    25    26
##     1     1     1     2     1     1     1     1     2     1     1     2     1
##    27    28    29    30    31    32    33    34    35    36    37    38    39
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##    40    41    42    43    44    45    46    47    48    49    50    51    52
##     1     1     1     1     1     1     1     1     2     1     2     2     1
##    53    54    55    56    57    58    59    60    61    62    63    64    65
##     1     1     1     2     2     1     1     1     1     1     1     1     2
##    66    67    68    69    70    71    72    73    74    75    76    77    78
##     1     1     2     1     2     2     1     1     1     1     1     1     1
##    79    80    81    82    83    84    85    86    87    88    89    90    91
##     2     2     1     1     1     1     2     2     1     1     1     1     1
##    92    93    94    95    96    97    98    99   100   101   102   103   104
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##   105   106   107   108   109   110   111   112   113   114   115   116   117
```

```
##     1     2     1     1     1     1     1     2     2     1     1     1     1
##   118   119   120   121   122   123   124   125   126   127   128   129   130
##     1     1     1     1     1     1     1     1     2     1     1     1     2
##   131   132   133   134   135   136   137   138   139   140   141   142   143
##     1     1     2     1     1     1     1     1     2     1     2     1     1
##   144   145   146   147   148   149   150   151   152   153   154   155   156
##     2     1     1     1     1     1     1     1     2     2     1     1     1
##   157   158   159   160   161   162   163   164   165   166   167   168   169
##     2     1     2     1     1     1     1     1     1     1     2     1     1
##   170   171   172   173   174   175   176   177   178   179   180   181   182
##     1     1     1     2     1     1     1     1     1     1     2     2     1
##   183   184   185   186   187   188   189   190   191   192   193   194   195
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##   196   197   198   199   200   201   202   203   204   205   206   207   208
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   209   210   211   212   213   214   215   216   217   218   219   220   221
##     1     1     1     1     1     1     1     1     1     1     1     2     2
##   222   223   224   225   226   227   228   229   230   231   232   233   234
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   235   236   237   238   239   240   241   242   243   244   245   246   247
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   248   249   250   251   252   253   254   255   256   257   258   259   260
##     1     1     1     2     2     1     1     1     1     1     1     1     2
##   261   262   263   264   265   266   267   268   269   270   271   272   273
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##   274   275   276   277   278   279   280   281   282   283   284   285   286
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##   287   288   289   290   291   292   293   294   295   296   297   298   299
##     1     1     1     1     1     2     1     1     1     1     2     1     1
##   300   301   302   303   304   305   306   307   308   309   310   311   312
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##   313   314   315   316   317   318   319   320   321   322   323   324   325
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   326   327   328   329   330   331   332   333   334   335   336   337   338
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##   339   340   341   342   343   344   345   346   347   348   349   350   351
##     1     2     2     1     2     1     1     1     1     1     1     1     1
##   352   353   354   355   356   357   358   359   360   361   362   363   364
##     1     1     1     2     1     1     2     1     1     1     1     1     1
##   365   366   367   368   369   370   371   372   373   374   375   376   377
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   378   379   380   381   382   383   384   385   386   387   388   389   390
##     1     1     2     1     2     1     1     1     1     1     1     1     1
##   391   392   393   394   395   396   397   398   399   400   401   402   403
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##   404   405   406   407   408   409   410   411   412   413   414   415   416
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   417   418   419   420   421   422   423   424   425   426   427   428   429
##     1     1     2     1     1     1     1     2     1     1     2     1     1
##   430   431   432   433   434   435   436   437   438   439   440   441   442
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   443   444   445   446   447   448   449   450   451   452   453   454   455
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##   456   457   458   459   460   461   462   463   464   465   466   467   468
##     1     1     1     1     1     1     1     1     1     2     1     1     2
##   469   470   471   472   473   474   475   476   477   478   479   480   481
##     2     1     1     1     1     1     1     2     1     1     1     1     1
##   482   483   484   485   486   487   488   489   490   491   492   493   494
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   495   496   497   498   499   500   501   502   503   504   505   506   507
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   508   509   510   511   512   513   514   515   516   517   518   519   520
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##   521   522   523   524   525   526   527   528   529   530   531   532   533
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##   534   535   536   537   538   539   540   541   542   543   544   545   546
```

```
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  547  548  549  550  551  552  553  554  555  556  557  558  559
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  560  561  562  563  564  565  566  567  568  569  570  571  572
##    1    1    2    1    1    1    1    1    1    1    1    2    1
##  573  574  575  576  577  578  579  580  581  582  583  584  585
##    1    1    1    1    1    1    2    1    1    1    1    2    1
##  586  587  588  589  590  591  592  593  594  595  596  597  598
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  599  600  601  602  603  604  605  606  607  608  609  610  611
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  612  613  614  615  616  617  618  619  620  621  622  623  624
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  625  626  627  628  629  630  631  632  633  634  635  636  637
##    1    1    1    1    2    1    2    1    1    1    1    1    1
##  638  639  640  641  642  643  644  645  646  647  648  649  650
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  651  652  653  654  655  656  657  658  659  660  661  662  663
##    2    1    1    1    1    1    1    1    1    1    1    2    1
##  664  665  666  667  668  669  670  671  672  673  674  675  676
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  677  678  679  680  681  682  683  684  685  686  687  688  689
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  690  691  692  693  694  695  696  697  698  699  700  701  702
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  703  704  705  706  707  708  709  710  711  712  713  714  715
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  716  717  718  719  720  721  722  723  724  725  726  727  728
##    2    1    1    2    1    1    1    1    1    1    1    1    1
##  729  730  731  732  733  734  735  736  737  738  739  740  741
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  742  743  744  745  746  747  748  749  750  751  752  753  754
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  755  756  757  758  759  760  761  762  763  764  765  766  767
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  768  769  770  771  772  773  774  775  776  777  778  779  780
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  781  782  783  784  785  786  787  788  789  790  791  792  793
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  794  795  796  797  798  799  800  801  802  803  804  805  806
##    1    2    2    1    1    1    1    1    1    1    1    1    1
##  807  808  809  810  811  812  813  814  815  816  817  818  819
##    1    1    1    1    1    1    2    2    1    1    1    1    1
##  820  821  822  823  824  825  826  827  828  829  830  831  832
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  833  834  835  836  837  838  839  840  841  842  843  844  845
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  846  847  848  849  850  851  852  853  854  855  856  857  858
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  859  860  861  862  863  864  865  866  867  868  869  870  871
##    1    1    2    1    1    1    2    1    1    1    1    1    1
##  872  873  874  875  876  877  878  879  880  881  882  883  884
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  885  886  887  888  889  890  891  892  893  894  895  896  897
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  898  899  900  901  902  903  904  905  906  907  908  909  910
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  911  912  913  914  915  916  917  918  919  920  921  922  923
##    1    1    1    1    1    1    2    1    1    1    2    1    1
##  924  925  926  927  928  929  930  931  932  933  934  935  936
##    1    1    1    1    1    1    2    1    1    2    1    1    1
##  937  938  939  940  941  942  943  944  945  946  947  948  949
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  950  951  952  953  954  955  956  957  958  959  960  961  962
##    1    1    1    1    1    1    1    1    1    1    1    1    1
```

```
##   963   964   965   966   967   968   969   970   971   972   973   974   975
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##   976   977   978   979   980   981   982   983   984   985   986   987   988
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##   989   990   991   992   993   994   995   996   997   998   999  1000  1001
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  1002  1003  1004  1005  1006  1007  1008  1009  1010  1011  1012  1013  1014
##     1     1     1     1     1     1     2     2     1     1     1     1     1
##  1015  1016  1017  1018  1019  1020  1021  1022  1023  1024  1025  1026  1027
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  1028  1029  1030  1031  1032  1033  1034  1035  1036  1037  1038  1039  1040
##     1     1     1     1     2     1     1     1     1     1     1     1     2
##  1041  1042  1043  1044  1045  1046  1047  1048  1049  1050  1051  1052  1053
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  1054  1055  1056  1057  1058  1059  1060  1061  1062  1063  1064  1065  1066
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1067  1068  1069  1070  1071  1072  1073  1074  1075  1076  1077  1078  1079
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1080  1081  1082  1083  1084  1085  1086  1087  1088  1089  1090  1091  1092
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  1093  1094  1095  1096  1097  1098  1099  1100  1101  1102  1103  1104  1105
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  1106  1107  1108  1109  1110  1111  1112  1113  1114  1115  1116  1117  1118
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  1119  1120  1121  1122  1123  1124  1125  1126  1127  1128  1129  1130  1131
##     1     2     2     1     1     1     1     1     1     1     1     1     1
##  1132  1133  1134  1135  1136  1137  1138  1139  1140  1141  1142  1143  1144
##     2     2     1     1     1     1     1     1     2     1     1     1     1
##  1145  1146  1147  1148  1149  1150  1151  1152  1153  1154  1155  1156  1157
##     1     1     2     1     2     1     1     1     1     1     1     2     1
##  1158  1159  1160  1161  1162  1163  1164  1165  1166  1167  1168  1169  1170
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1171  1172  1173  1174  1175  1176  1177  1178  1179  1180  1181  1182  1183
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1184  1185  1186  1187  1188  1189  1190  1191  1192  1193  1194  1195  1196
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1197  1198  1199  1200  1201  1202  1203  1204  1205  1206  1207  1208  1209
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1210  1211  1212  1213  1214  1215  1216  1217  1218  1219  1220  1221  1222
##     2     1     1     2     1     1     1     1     1     1     1     1     1
##  1223  1224  1225  1226  1227  1228  1229  1230  1231  1232  1233  1234  1235
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1236  1237  1238  1239  1240  1241  1242  1243  1244  1245  1246  1247  1248
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  1249  1250  1251  1252  1253  1254  1255  1256  1257  1258  1259  1260  1261
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  1262  1263  1264  1265  1266  1267  1268  1269  1270  1271  1272  1273  1274
##     1     2     1     1     1     1     2     1     1     1     1     1     1
##  1275  1276  1277  1278  1279  1280  1281  1282  1283  1284  1285  1286  1287
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  1288  1289  1290  1291  1292  1293  1294  1295  1296  1297  1298  1299  1300
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  1301  1302  1303  1304  1305  1306  1307  1308  1309  1310  1311  1312  1313
##     1     1     1     2     1     1     1     2     1     1     1     1     1
##  1314  1315  1316  1317  1318  1319  1320  1321  1322  1323  1324  1325  1326
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1327  1328  1329  1330  1331  1332  1333  1334  1335  1336  1337  1338  1339
##     1     1     1     1     1     1     1     2     2     1     1     1     1
##  1340  1341  1342  1343  1344  1345  1346  1347  1348  1349  1350  1351  1352
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  1353  1354  1355  1356  1357  1358  1359  1360  1361  1362  1363  1364  1365
##     1     1     1     1     1     2     1     1     1     1     2     1     1
##  1366  1367  1368  1369  1370  1371  1372  1373  1374  1375  1376  1377  1378
##     1     2     1     1     1     1     1     1     1     2     2     1     1
##  1379  1380  1381  1382  1383  1384  1385  1386  1387  1388  1389  1390  1391
##     2     1     1     1     1     1     1     1     1     1     1     1     1
```

```
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469
##    1    1    2    1    1    2    2    1    1    1    1    1    1
##  1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573
##    1    1    1    1    1    1    1    2    1    1    2    1    1
##  1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586
##    1    1    1    1    1    2    1    1    1    1    1    2    1
##  1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690
##    1    1    1    1    2    1    1    1    2    1    1    1    1
##  1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820
```

```
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846
##    1    1    1    1    1    2    1    1    2    1    1    1    1
##  1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872
##    1    1    1    2    1    1    1    1    2    1    1    1    1
##  1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
##    1    1    1    2    1    1    1    1    1    1    2    1    1
##  2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054
##    2    1    1    1    1    2    1    2    1    2    1    1    1
##  2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093
##    1    1    1    1    1    1    2    1    1    1    1    1    2
##  2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106
##    1    1    2    1    1    1    2    1    1    1    1    1    1
##  2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119
##    1    2    1    1    2    1    1    1    1    1    2    1    1
##  2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132
##    2    2    2    1    1    1    1    2    1    1    1    1    1
##  2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184
##    1    1    2    1    1    1    1    1    2    2    1    1    2
##  2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223
##    1    2    1    1    1    2    1    1    1    2    1    1    1
##  2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236
##    1    1    2    2    1    2    1    1    1    1    1    1    1
```

```
##  2237  2238  2239  2240  2241  2242  2243  2244  2245  2246  2247  2248  2249
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  2250  2251  2252  2253  2254  2255  2256  2257  2258  2259  2260  2261  2262
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2263  2264  2265  2266  2267  2268  2269  2270  2271  2272  2273  2274  2275
##     1     1     2     1     2     2     2     1     1     1     1     1     2
##  2276  2277  2278  2279  2280  2281  2282  2283  2284  2285  2286  2287  2288
##     2     2     1     1     1     1     1     2     1     1     1     2     1
##  2289  2290  2291  2292  2293  2294  2295  2296  2297  2298  2299  2300  2301
##     1     1     1     1     1     1     2     2     1     1     1     2     1
##  2302  2303  2304  2305  2306  2307  2308  2309  2310  2311  2312  2313  2314
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  2315  2316  2317  2318  2319  2320  2321  2322  2323  2324  2325  2326  2327
##     1     1     1     1     1     1     2     1     1     2     1     1     1
##  2328  2329  2330  2331  2332  2333  2334  2335  2336  2337  2338  2339  2340
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  2341  2342  2343  2344  2345  2346  2347  2348  2349  2350  2351  2352  2353
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2354  2355  2356  2357  2358  2359  2360  2361  2362  2363  2364  2365  2366
##     1     1     1     1     1     1     2     1     2     1     2     1     1
##  2367  2368  2369  2370  2371  2372  2373  2374  2375  2376  2377  2378  2379
##     2     1     1     1     1     1     1     2     1     1     2     1     2
##  2380  2381  2382  2383  2384  2385  2386  2387  2388  2389  2390  2391  2392
##     1     1     2     1     1     1     1     1     1     1     1     2     1
##  2393  2394  2395  2396  2397  2398  2399  2400  2401  2402  2403  2404  2405
##     1     2     1     1     1     1     1     2     1     1     1     1     1
##  2406  2407  2408  2409  2410  2411  2412  2413  2414  2415  2416  2417  2418
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2419  2420  2421  2422  2423  2424  2425  2426  2427  2428  2429  2430  2431
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  2432  2433  2434  2435  2436  2437  2438  2439  2440  2441  2442  2443  2444
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  2445  2446  2447  2448  2449  2450  2451  2452  2453  2454  2455  2456  2457
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  2458  2459  2460  2461  2462  2463  2464  2465  2466  2467  2468  2469  2470
##     1     1     1     1     2     1     2     2     1     1     1     1     1
##  2471  2472  2473  2474  2475  2476  2477  2478  2479  2480  2481  2482  2483
##     1     2     1     1     1     1     2     1     1     2     1     1     1
##  2484  2485  2486  2487  2488  2489  2490  2491  2492  2493  2494  2495  2496
##     2     1     1     1     2     1     1     1     1     2     1     1     1
##  2497  2498  2499  2500  2501  2502  2503  2504  2505  2506  2507  2508  2509
##     1     2     1     1     1     1     1     1     1     2     1     1     1
##  2510  2511  2512  2513  2514  2515  2516  2517  2518  2519  2520  2521  2522
##     1     1     1     2     1     1     1     1     1     1     2     1     1
##  2523  2524  2525  2526  2527  2528  2529  2530  2531  2532  2533  2534  2535
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2536  2537  2538  2539  2540  2541  2542  2543  2544  2545  2546  2547  2548
##     1     2     1     1     2     1     1     1     1     1     1     1     1
##  2549  2550  2551  2552  2553  2554  2555  2556  2557  2558  2559  2560  2561
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  2562  2563  2564  2565  2566  2567  2568  2569  2570  2571  2572  2573  2574
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  2575  2576  2577  2578  2579  2580  2581  2582  2583  2584  2585  2586  2587
##     1     1     1     1     1     1     2     1     1     2     1     1     1
##  2588  2589  2590  2591  2592  2593  2594  2595  2596  2597  2598  2599  2600
##     1     1     1     1     1     1     1     1     1     2     1     1     2
##  2601  2602  2603  2604  2605  2606  2607  2608  2609  2610  2611  2612  2613
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2614  2615  2616  2617  2618  2619  2620  2621  2622  2623  2624  2625  2626
##     1     1     1     1     1     2     1     1     2     2     2     1     2
##  2627  2628  2629  2630  2631  2632  2633  2634  2635  2636  2637  2638  2639
##     1     2     2     1     2     1     1     1     1     1     1     1     1
##  2640  2641  2642  2643  2644  2645  2646  2647  2648  2649  2650  2651  2652
##     1     1     1     1     1     2     1     2     1     1     2     1     1
##  2653  2654  2655  2656  2657  2658  2659  2660  2661  2662  2663  2664  2665
##     1     1     2     1     1     1     1     1     1     1     1     1     1
```

```
##  2666  2667  2668  2669  2670  2671  2672  2673  2674  2675  2676  2677  2678
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  2679  2680  2681  2682  2683  2684  2685  2686  2687  2688  2689  2690  2691
##     1     1     1     1     1     1     2     1     1     1     1     2     1
##  2692  2693  2694  2695  2696  2697  2698  2699  2700  2701  2702  2703  2704
##     1     2     1     1     1     2     1     1     1     1     2     1     1
##  2705  2706  2707  2708  2709  2710  2711  2712  2713  2714  2715  2716  2717
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  2718  2719  2720  2721  2722  2723  2724  2725  2726  2727  2728  2729  2730
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  2731  2732  2733  2734  2735  2736  2737  2738  2739  2740  2741  2742  2743
##     1     1     1     2     1     1     2     2     2     1     2     1     1
##  2744  2745  2746  2747  2748  2749  2750  2751  2752  2753  2754  2755  2756
##     1     1     1     1     1     1     1     1     1     2     1     2     2
##  2757  2758  2759  2760  2761  2762  2763  2764  2765  2766  2767  2768  2769
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  2770  2771  2772  2773  2774  2775  2776  2777  2778  2779  2780  2781  2782
##     1     2     1     2     1     1     1     1     1     1     1     1     1
##  2783  2784  2785  2786  2787  2788  2789  2790  2791  2792  2793  2794  2795
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  2796  2797  2798  2799  2800  2801  2802  2803  2804  2805  2806  2807  2808
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  2809  2810  2811  2812  2813  2814  2815  2816  2817  2818  2819  2820  2821
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  2822  2823  2824  2825  2826  2827  2828  2829  2830  2831  2832  2833  2834
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2835  2836  2837  2838  2839  2840  2841  2842  2843  2844  2845  2846  2847
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  2848  2849  2850  2851  2852  2853  2854  2855  2856  2857  2858  2859  2860
##     1     1     1     1     1     1     1     1     1     2     2     2     1
##  2861  2862  2863  2864  2865  2866  2867  2868  2869  2870  2871  2872  2873
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  2874  2875  2876  2877  2878  2879  2880  2881  2882  2883  2884  2885  2886
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2887  2888  2889  2890  2891  2892  2893  2894  2895  2896  2897  2898  2899
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  2900  2901  2902  2903  2904  2905  2906  2907  2908  2909  2910  2911  2912
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2913  2914  2915  2916  2917  2918  2919  2920  2921  2922  2923  2924  2925
##     1     1     1     1     2     1     1     2     1     2     1     1     1
##  2926  2927  2928  2929  2930  2931  2932  2933  2934  2935  2936  2937  2938
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  2939  2940  2941  2942  2943  2944  2945  2946  2947  2948  2949  2950  2951
##     1     1     1     1     1     1     2     1     1     2     1     1     1
##  2952  2953  2954  2955  2956  2957  2958  2959  2960  2961  2962  2963  2964
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2965  2966  2967  2968  2969  2970  2971  2972  2973  2974  2975  2976  2977
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2978  2979  2980  2981  2982  2983  2984  2985  2986  2987  2988  2989  2990
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  2991  2992  2993  2994  2995  2996  2997  2998  2999  3000  3001  3002  3003
##     2     1     1     1     1     1     1     1     1     1     1     2     1
##  3004  3005  3006  3007  3008  3009  3010  3011  3012  3013  3014  3015  3016
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  3017  3018  3019  3020  3021  3022  3023  3024  3025  3026  3027  3028  3029
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3030  3031  3032  3033  3034  3035  3036  3037  3038  3039  3040  3041  3042
##     1     2     1     1     1     1     1     1     1     1     1     2     2
##  3043  3044  3045  3046  3047  3048  3049  3050  3051  3052  3053  3054  3055
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3056  3057  3058  3059  3060  3061  3062  3063  3064  3065  3066  3067  3068
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3069  3070  3071  3072  3073  3074  3075  3076  3077  3078  3079  3080  3081
##     1     1     1     1     1     1     1     1     1     2     2     1     1
##  3082  3083  3084  3085  3086  3087  3088  3089  3090  3091  3092  3093  3094
```

```
##    2    2    1    1    1    1    1    1    1    1    1    1    1
##  3095 3096 3097 3098 3099 3100 3101 3102 3103 3104 3105 3106 3107
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  3108 3109 3110 3111 3112 3113 3114 3115 3116 3117 3118 3119 3120
##    2    1    1    2    1    1    2    1    1    1    1    1    1
##  3121 3122 3123 3124 3125 3126 3127 3128 3129 3130 3131 3132 3133
##    1    2    2    1    1    1    1    2    1    1    1    1    1
##  3134 3135 3136 3137 3138 3139 3140 3141 3142 3143 3144 3145 3146
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3147 3148 3149 3150 3151 3152 3153 3154 3155 3156 3157 3158 3159
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  3160 3161 3162 3163 3164 3165 3166 3167 3168 3169 3170 3171 3172
##    1    1    1    1    2    1    2    1    1    1    1    1    1
##  3173 3174 3175 3176 3177 3178 3179 3180 3181 3182 3183 3184 3185
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3186 3187 3188 3189 3190 3191 3192 3193 3194 3195 3196 3197 3198
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3199 3200 3201 3202 3203 3204 3205 3206 3207 3208 3209 3210 3211
##    1    1    1    1    1    1    2    1    1    1    2    1    1
##  3212 3213 3214 3215 3216 3217 3218 3219 3220 3221 3222 3223 3224
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  3225 3226 3227 3228 3229 3230 3231 3232 3233 3234 3235 3236 3237
##    1    2    1    1    1    1    1    1    2    1    1    1    1
##  3238 3239 3240 3241 3242 3243 3244 3245 3246 3247 3248 3249 3250
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3251 3252 3253 3254 3255 3256 3257 3258 3259 3260 3261 3262 3263
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  3264 3265 3266 3267 3268 3269 3270 3271 3272 3273 3274 3275 3276
##    1    1    1    1    2    2    1    1    1    1    1    1    1
##  3277 3278 3279 3280 3281 3282 3283 3284 3285 3286 3287 3288 3289
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  3290 3291 3292 3293 3294 3295 3296 3297 3298 3299 3300 3301 3302
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  3303 3304 3305 3306 3307 3308 3309 3310 3311 3312 3313 3314 3315
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  3316 3317 3318 3319 3320 3321 3322 3323 3324 3325 3326 3327 3328
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3329 3330 3331 3332 3333 3334 3335 3336 3337 3338 3339 3340 3341
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3342 3343 3344 3345 3346 3347 3348 3349 3350 3351 3352 3353 3354
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  3355 3356 3357 3358 3359 3360 3361 3362 3363 3364 3365 3366 3367
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3368 3369 3370 3371 3372 3373 3374 3375 3376 3377 3378 3379 3380
##    1    2    1    1    1    1    1    1    2    1    1    1    1
##  3381 3382 3383 3384 3385 3386 3387 3388 3389 3390 3391 3392 3393
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3394 3395 3396 3397 3398 3399 3400 3401 3402 3403 3404 3405 3406
##    1    1    1    1    1    1    2    1    1    2    1    1    1
##  3407 3408 3409 3410 3411 3412 3413 3414 3415 3416 3417 3418 3419
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  3420 3421 3422 3423 3424 3425 3426 3427 3428 3429 3430 3431 3432
##    1    1    1    2    1    1    1    1    2    1    1    1    1
##  3433 3434 3435 3436 3437 3438 3439 3440 3441 3442 3443 3444 3445
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3446 3447 3448 3449 3450 3451 3452 3453 3454 3455 3456 3457 3458
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3459 3460 3461 3462 3463 3464 3465 3466 3467 3468 3469 3470 3471
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  3472 3473 3474 3475 3476 3477 3478 3479 3480 3481 3482 3483 3484
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  3485 3486 3487 3488 3489 3490 3491 3492 3493 3494 3495 3496 3497
##    1    1    2    1    1    1    1    1    1    1    1    2    1
##  3498 3499 3500 3501 3502 3503 3504 3505 3506 3507 3508 3509 3510
##    1    1    1    1    1    1    2    1    1    2    1    1    1
##  3511 3512 3513 3514 3515 3516 3517 3518 3519 3520 3521 3522 3523
```

```
##  3511  3512  3513  3514  3515  3516  3517  3518  3519  3520  3521  3522  3523
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3524  3525  3526  3527  3528  3529  3530  3531  3532  3533  3534  3535  3536
##     1     1     1     1     1     1     1     1     2     1     2     1     1
##  3537  3538  3539  3540  3541  3542  3543  3544  3545  3546  3547  3548  3549
##     1     1     1     1     1     2     2     1     2     1     1     1     1
##  3550  3551  3552  3553  3554  3555  3556  3557  3558  3559  3560  3561  3562
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3563  3564  3565  3566  3567  3568  3569  3570  3571  3572  3573  3574  3575
##     1     1     1     1     1     2     1     1     1     1     1     2     1
##  3576  3577  3578  3579  3580  3581  3582  3583  3584  3585  3586  3587  3588
##     1     1     1     1     1     1     2     1     1     1     2     1     1
##  3589  3590  3591  3592  3593  3594  3595  3596  3597  3598  3599  3600  3601
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3602  3603  3604  3605  3606  3607  3608  3609  3610  3611  3612  3613  3614
##     1     1     1     2     2     2     1     1     1     1     2     1     1
##  3615  3616  3617  3618  3619  3620  3621  3622  3623  3624  3625  3626  3627
##     1     1     1     2     1     1     1     2     1     1     1     1     2
##  3628  3629  3630  3631  3632  3633  3634  3635  3636  3637  3638  3639  3640
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  3641  3642  3643  3644  3645  3646  3647  3648  3649  3650  3651  3652  3653
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3654  3655  3656  3657  3658  3659  3660  3661  3662  3663  3664  3665  3666
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3667  3668  3669  3670  3671  3672  3673  3674  3675  3676  3677  3678  3679
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  3680  3681  3682  3683  3684  3685  3686  3687  3688  3689  3690  3691  3692
##     2     1     1     1     1     1     1     1     1     2     1     1     1
##  3693  3694  3695  3696  3697  3698  3699  3700  3701  3702  3703  3704  3705
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3706  3707  3708  3709  3710  3711  3712  3713  3714  3715  3716  3717  3718
##     1     1     1     2     1     1     1     1     1     1     1     2     1
##  3719  3720  3721  3722  3723  3724  3725  3726  3727  3728  3729  3730  3731
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  3732  3733  3734  3735  3736  3737  3738  3739  3740  3741  3742  3743  3744
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3745  3746  3747  3748  3749  3750  3751  3752  3753  3754  3755  3756  3757
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  3758  3759  3760  3761  3762  3763  3764  3765  3766  3767  3768  3769  3770
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3771  3772  3773  3774  3775  3776  3777  3778  3779  3780  3781  3782  3783
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3784  3785  3786  3787  3788  3789  3790  3791  3792  3793  3794  3795  3796
##     1     2     1     1     2     1     1     1     1     1     1     1     1
##  3797  3798  3799  3800  3801  3802  3803  3804  3805  3806  3807  3808  3809
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  3810  3811  3812  3813  3814  3815  3816  3817  3818  3819  3820  3821  3822
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3823  3824  3825  3826  3827  3828  3829  3830  3831  3832  3833  3834  3835
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  3836  3837  3838  3839  3840  3841  3842  3843  3844  3845  3846  3847  3848
##     1     1     1     1     1     1     2     1     1     1     2     1     1
##  3849  3850  3851  3852  3853  3854  3855  3856  3857  3858  3859  3860  3861
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  3862  3863  3864  3865  3866  3867  3868  3869  3870  3871  3872  3873  3874
##     1     1     1     2     1     1     1     1     1     1     1     2     1
##  3875  3876  3877  3878  3879  3880  3881  3882  3883  3884  3885  3886  3887
##     1     1     1     1     1     1     2     1     1     1     1     1     2
##  3888  3889  3890  3891  3892  3893  3894  3895  3896  3897  3898  3899  3900
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  3901  3902  3903  3904  3905  3906  3907  3908  3909  3910  3911  3912  3913
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  3914  3915  3916  3917  3918  3919  3920  3921  3922  3923  3924  3925  3926
##     1     1     1     2     2     1     1     1     1     1     1     2     1
##  3927  3928  3929  3930  3931  3932  3933  3934  3935  3936  3937  3938  3939
##     1     1     1     1     1     1     1     1     1     1     1     1     1
```

```
##  3940  3941  3942  3943  3944  3945  3946  3947  3948  3949  3950  3951  3952
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3953  3954  3955  3956  3957  3958  3959  3960  3961  3962  3963  3964  3965
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  3966  3967  3968  3969  3970  3971  3972  3973  3974  3975  3976  3977  3978
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  3979  3980  3981  3982  3983  3984  3985  3986  3987  3988  3989  3990  3991
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  3992  3993  3994  3995  3996  3997  3998  3999  4000  4001  4002  4003  4004
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4005  4006  4007  4008  4009  4010  4011  4012  4013  4014  4015  4016  4017
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  4018  4019  4020  4021  4022  4023  4024  4025  4026  4027  4028  4029  4030
##     1     1     1     2     1     1     1     1     1     2     1     1     1
##  4031  4032  4033  4034  4035  4036  4037  4038  4039  4040  4041  4042  4043
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4044  4045  4046  4047  4048  4049  4050  4051  4052  4053  4054  4055  4056
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4057  4058  4059  4060  4061  4062  4063  4064  4065  4066  4067  4068  4069
##     1     1     1     1     2     1     1     1     1     1     1     1     2
##  4070  4071  4072  4073  4074  4075  4076  4077  4078  4079  4080  4081  4082
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  4083  4084  4085  4086  4087  4088  4089  4090  4091  4092  4093  4094  4095
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  4096  4097  4098  4099  4100  4101  4102  4103  4104  4105  4106  4107  4108
##     1     1     1     2     1     1     2     1     1     1     1     1     2
##  4109  4110  4111  4112  4113  4114  4115  4116  4117  4118  4119  4120  4121
##     1     2     1     1     1     1     1     1     2     1     2     1     1
##  4122  4123  4124  4125  4126  4127  4128  4129  4130  4131  4132  4133  4134
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4135  4136  4137  4138  4139  4140  4141  4142  4143  4144  4145  4146  4147
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4148  4149  4150  4151  4152  4153  4154  4155  4156  4157  4158  4159  4160
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  4161  4162  4163  4164  4165  4166  4167  4168  4169  4170  4171  4172  4173
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  4174  4175  4176  4177  4178  4179  4180  4181  4182  4183  4184  4185  4186
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  4187  4188  4189  4190  4191  4192  4193  4194  4195  4196  4197  4198  4199
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4200  4201  4202  4203  4204  4205  4206  4207  4208  4209  4210  4211  4212
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  4213  4214  4215  4216  4217  4218  4219  4220  4221  4222  4223  4224  4225
##     1     1     1     1     1     1     1     1     2     1     1     2     1
##  4226  4227  4228  4229  4230  4231  4232  4233  4234  4235  4236  4237  4238
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  4239  4240  4241  4242  4243  4244  4245  4246  4247  4248  4249  4250  4251
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4252  4253  4254  4255  4256  4257  4258  4259  4260  4261  4262  4263  4264
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  4265  4266  4267  4268  4269  4270  4271  4272  4273  4274  4275  4276  4277
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4278  4279  4280  4281  4282  4283  4284  4285  4286  4287  4288  4289  4290
##     2     1     1     1     1     1     1     2     1     1     1     1     1
##  4291  4292  4293  4294  4295  4296  4297  4298  4299  4300  4301  4302  4303
##     1     1     2     2     1     1     1     2     1     1     1     1     1
##  4304  4305  4306  4307  4308  4309  4310  4311  4312  4313  4314  4315  4316
##     2     2     1     1     1     1     1     1     1     1     1     1     1
##  4317  4318  4319  4320  4321  4322  4323  4324  4325  4326  4327  4328  4329
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  4330  4331  4332  4333  4334  4335  4336  4337  4338  4339  4340  4341  4342
##     1     1     2     1     1     1     2     1     1     1     1     1     1
##  4343  4344  4345  4346  4347  4348  4349  4350  4351  4352  4353  4354  4355
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4356  4357  4358  4359  4360  4361  4362  4363  4364  4365  4366  4367  4368
```

```
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4369 4370 4371 4372 4373 4374 4375 4376 4377 4378 4379 4380 4381
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4382 4383 4384 4385 4386 4387 4388 4389 4390 4391 4392 4393 4394
##    1    2    1    1    1    2    1    1    1    1    1    2    1
##  4395 4396 4397 4398 4399 4400 4401 4402 4403 4404 4405 4406 4407
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  4408 4409 4410 4411 4412 4413 4414 4415 4416 4417 4418 4419 4420
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4421 4422 4423 4424 4425 4426 4427 4428 4429 4430 4431 4432 4433
##    2    1    1    1    1    1    1    1    1    1    2    1    1
##  4434 4435 4436 4437 4438 4439 4440 4441 4442 4443 4444 4445 4446
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  4447 4448 4449 4450 4451 4452 4453 4454 4455 4456 4457 4458 4459
##    1    2    2    1    1    1    1    1    1    1    1    1    1
##  4460 4461 4462 4463 4464 4465 4466 4467 4468 4469 4470 4471 4472
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  4473 4474 4475 4476 4477 4478 4479 4480 4481 4482 4483 4484 4485
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4486 4487 4488 4489 4490 4491 4492 4493 4494 4495 4496 4497 4498
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  4499 4500 4501 4502 4503 4504 4505 4506 4507 4508 4509 4510 4511
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4512 4513 4514 4515 4516 4517 4518 4519 4520 4521 4522 4523 4524
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4525 4526 4527 4528 4529 4530 4531 4532 4533 4534 4535 4536 4537
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  4538 4539 4540 4541 4542 4543 4544 4545 4546 4547 4548 4549 4550
##    1    1    1    1    2    1    1    1    1    1    2    1    1
##  4551 4552 4553 4554 4555 4556 4557 4558 4559 4560 4561 4562 4563
##    1    1    1    1    1    1    1    1    2    1    2    1    2
##  4564 4565 4566 4567 4568 4569 4570 4571 4572 4573 4574 4575 4576
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4577 4578 4579 4580 4581 4582 4583 4584 4585 4586 4587 4588 4589
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  4590 4591 4592 4593 4594 4595 4596 4597 4598 4599 4600 4601 4602
##    1    1    1    1    1    2    2    1    1    1    1    1    1
##  4603 4604 4605 4606 4607 4608 4609 4610 4611 4612 4613 4614 4615
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  4616 4617 4618 4619 4620 4621 4622 4623 4624 4625 4626 4627 4628
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4629 4630 4631 4632 4633 4634 4635 4636 4637 4638 4639 4640 4641
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4642 4643 4644 4645 4646 4647 4648 4649 4650 4651 4652 4653 4654
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4655 4656 4657 4658 4659 4660 4661 4662 4663 4664 4665 4666 4667
##    1    1    1    2    1    2    1    1    1    1    1    2    1
##  4668 4669 4670 4671 4672 4673 4674 4675 4676 4677 4678 4679 4680
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  4681 4682 4683 4684 4685 4686 4687 4688 4689 4690 4691 4692 4693
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4694 4695 4696 4697 4698 4699 4700 4701 4702 4703 4704 4705 4706
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4707 4708 4709 4710 4711 4712 4713 4714 4715 4716 4717 4718 4719
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  4720 4721 4722 4723 4724 4725 4726 4727 4728 4729 4730 4731 4732
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  4733 4734 4735 4736 4737 4738 4739 4740 4741 4742 4743 4744 4745
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  4746 4747 4748 4749 4750 4751 4752 4753 4754 4755 4756 4757 4758
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4759 4760 4761 4762 4763 4764 4765 4766 4767 4768 4769 4770 4771
##    1    2    1    1    1    1    1    1    1    1    2    1    1
##  4772 4773 4774 4775 4776 4777 4778 4779 4780 4781 4782 4783 4784
##    1    1    1    1    1    1    1    1    1    1    1    2    2
##  4785 4786 4787 4788 4789 4790 4791 4792 4793 4794 4795 4796 4797
```

```
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  4798 4799 4800 4801 4802 4803 4804 4805 4806 4807 4808 4809 4810
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  4811 4812 4813 4814 4815 4816 4817 4818 4819 4820 4821 4822 4823
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  4824 4825 4826 4827 4828 4829 4830 4831 4832 4833 4834 4835 4836
##    1    1    1    1    1    1    2    1    1    1    1    2    1
##  4837 4838 4839 4840 4841 4842 4843 4844 4845 4846 4847 4848 4849
##    1    1    2    1    1    1    1    2    1    2    1    1    2
##  4850 4851 4852 4853 4854 4855 4856 4857 4858 4859 4860 4861 4862
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  4863 4864 4865 4866 4867 4868 4869 4870 4871 4872 4873 4874 4875
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  4876 4877 4878 4879 4880 4881 4882 4883 4884 4885 4886 4887 4888
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4889 4890 4891 4892 4893 4894 4895 4896 4897 4898 4899 4900 4901
##    1    1    1    2    1    1    1    1    1    2    1    1    1
##  4902 4903 4904 4905 4906 4907 4908 4909 4910 4911 4912 4913 4914
##    1    1    1    1    1    1    1    2    1    2    1    1    1
##  4915 4916 4917 4918 4919 4920 4921 4922 4923 4924 4925 4926 4927
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  4928 4929 4930 4931 4932 4933 4934 4935 4936 4937 4938 4939 4940
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  4941 4942 4943 4944 4945 4946 4947 4948 4949 4950 4951 4952 4953
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  4954 4955 4956 4957 4958 4959 4960 4961 4962 4963 4964 4965 4966
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4967 4968 4969 4970 4971 4972 4973 4974 4975 4976 4977 4978 4979
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4980 4981 4982 4983 4984 4985 4986 4987 4988 4989 4990 4991 4992
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  4993 4994 4995 4996 4997 4998 4999 5000 5001 5002 5003 5004 5005
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5006 5007 5008 5009 5010 5011 5012 5013 5014 5015 5016 5017 5018
##    1    1    1    1    1    1    2    2    1    1    1    1    1
##  5019 5020 5021 5022 5023 5024 5025 5026 5027 5028 5029 5030 5031
##    1    1    1    1    1    2    1    2    1    1    1    1    1
##  5032 5033 5034 5035 5036 5037 5038 5039 5040 5041 5042 5043 5044
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5045 5046 5047 5048 5049 5050 5051 5052 5053 5054 5055 5056 5057
##    1    1    1    1    2    2    1    1    2    2    1    1    1
##  5058 5059 5060 5061 5062 5063 5064 5065 5066 5067 5068 5069 5070
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  5071 5072 5073 5074 5075 5076 5077 5078 5079 5080 5081 5082 5083
##    2    2    1    1    1    1    1    1    2    1    1    1    1
##  5084 5085 5086 5087 5088 5089 5090 5091 5092 5093 5094 5095 5096
##    1    1    2    1    1    1    1    2    1    2    1    1    1
##  5097 5098 5099 5100 5101 5102 5103 5104 5105 5106 5107 5108 5109
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5110 5111 5112 5113 5114 5115 5116 5117 5118 5119 5120 5121 5122
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5123 5124 5125 5126 5127 5128 5129 5130 5131 5132 5133 5134 5135
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  5136 5137 5138 5139 5140 5141 5142 5143 5144 5145 5146 5147 5148
##    1    1    1    1    1    1    1    2    1    1    1    1    2
##  5149 5150 5151 5152 5153 5154 5155 5156 5157 5158 5159 5160 5161
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5162 5163 5164 5165 5166 5167 5168 5169 5170 5171 5172 5173 5174
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  5175 5176 5177 5178 5179 5180 5181 5182 5183 5184 5185 5186 5187
##    1    1    2    1    1    1    1    1    2    2    1    1    1
##  5188 5189 5190 5191 5192 5193 5194 5195 5196 5197 5198 5199 5200
##    1    1    1    2    1    1    2    1    1    1    1    1    1
##  5201 5202 5203 5204 5205 5206 5207 5208 5209 5210 5211 5212 5213
##    2    2    2    1    1    1    1    1    1    1    1    1    1
```

```
##  5214  5215  5216  5217  5218  5219  5220  5221  5222  5223  5224  5225  5226
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  5227  5228  5229  5230  5231  5232  5233  5234  5235  5236  5237  5238  5239
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  5240  5241  5242  5243  5244  5245  5246  5247  5248  5249  5250  5251  5252
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  5253  5254  5255  5256  5257  5258  5259  5260  5261  5262  5263  5264  5265
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5266  5267  5268  5269  5270  5271  5272  5273  5274  5275  5276  5277  5278
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  5279  5280  5281  5282  5283  5284  5285  5286  5287  5288  5289  5290  5291
##     1     1     1     2     1     1     1     1     2     2     2     1     1
##  5292  5293  5294  5295  5296  5297  5298  5299  5300  5301  5302  5303  5304
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  5305  5306  5307  5308  5309  5310  5311  5312  5313  5314  5315  5316  5317
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  5318  5319  5320  5321  5322  5323  5324  5325  5326  5327  5328  5329  5330
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  5331  5332  5333  5334  5335  5336  5337  5338  5339  5340  5341  5342  5343
##     1     1     1     1     1     1     1     2     2     1     2     1     1
##  5344  5345  5346  5347  5348  5349  5350  5351  5352  5353  5354  5355  5356
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5357  5358  5359  5360  5361  5362  5363  5364  5365  5366  5367  5368  5369
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  5370  5371  5372  5373  5374  5375  5376  5377  5378  5379  5380  5381  5382
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  5383  5384  5385  5386  5387  5388  5389  5390  5391  5392  5393  5394  5395
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5396  5397  5398  5399  5400  5401  5402  5403  5404  5405  5406  5407  5408
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  5409  5410  5411  5412  5413  5414  5415  5416  5417  5418  5419  5420  5421
##     1     2     1     1     2     1     1     1     1     1     1     1     1
##  5422  5423  5424  5425  5426  5427  5428  5429  5430  5431  5432  5433  5434
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5435  5436  5437  5438  5439  5440  5441  5442  5443  5444  5445  5446  5447
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5448  5449  5450  5451  5452  5453  5454  5455  5456  5457  5458  5459  5460
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5461  5462  5463  5464  5465  5466  5467  5468  5469  5470  5471  5472  5473
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  5474  5475  5476  5477  5478  5479  5480  5481  5482  5483  5484  5485  5486
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  5487  5488  5489  5490  5491  5492  5493  5494  5495  5496  5497  5498  5499
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5500  5501  5502  5503  5504  5505  5506  5507  5508  5509  5510  5511  5512
##     1     1     1     2     1     1     1     1     1     1     2     1     1
##  5513  5514  5515  5516  5517  5518  5519  5520  5521  5522  5523  5524  5525
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5526  5527  5528  5529  5530  5531  5532  5533  5534  5535  5536  5537  5538
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5539  5540  5541  5542  5543  5544  5545  5546  5547  5548  5549  5550  5551
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5552  5553  5554  5555  5556  5557  5558  5559  5560  5561  5562  5563  5564
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5565  5566  5567  5568  5569  5570  5571  5572  5573  5574  5575  5576  5577
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  5578  5579  5580  5581  5582  5583  5584  5585  5586  5587  5588  5589  5590
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  5591  5592  5593  5594  5595  5596  5597  5598  5599  5600  5601  5602  5603
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  5604  5605  5606  5607  5608  5609  5610  5611  5612  5613  5614  5615  5616
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5617  5618  5619  5620  5621  5622  5623  5624  5625  5626  5627  5628  5629
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5630  5631  5632  5633  5634  5635  5636  5637  5638  5639  5640  5641  5642
##     1     1     1     1     2     1     1     1     1     1     1     1     1
```

```
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  5643  5644  5645  5646  5647  5648  5649  5650  5651  5652  5653  5654  5655
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5656  5657  5658  5659  5660  5661  5662  5663  5664  5665  5666  5667  5668
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5669  5670  5671  5672  5673  5674  5675  5676  5677  5678  5679  5680  5681
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5682  5683  5684  5685  5686  5687  5688  5689  5690  5691  5692  5693  5694
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5695  5696  5697  5698  5699  5700  5701  5702  5703  5704  5705  5706  5707
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5708  5709  5710  5711  5712  5713  5714  5715  5716  5717  5718  5719  5720
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  5721  5722  5723  5724  5725  5726  5727  5728  5729  5730  5731  5732  5733
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5734  5735  5736  5737  5738  5739  5740  5741  5742  5743  5744  5745  5746
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  5747  5748  5749  5750  5751  5752  5753  5754  5755  5756  5757  5758  5759
##    1    1    1    1    1    1    1    1    2    1    1    2    1
##  5760  5761  5762  5763  5764  5765  5766  5767  5768  5769  5770  5771  5772
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  5773  5774  5775  5776  5777  5778  5779  5780  5781  5782  5783  5784  5785
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5786  5787  5788  5789  5790  5791  5792  5793  5794  5795  5796  5797  5798
##    1    1    1    1    1    1    1    2    1    2    1    1    1
##  5799  5800  5801  5802  5803  5804  5805  5806  5807  5808  5809  5810  5811
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  5812  5813  5814  5815  5816  5817  5818  5819  5820  5821  5822  5823  5824
##    1    2    1    1    2    1    1    1    1    1    1    1    1
##  5825  5826  5827  5828  5829  5830  5831  5832  5833  5834  5835  5836  5837
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  5838  5839  5840  5841  5842  5843  5844  5845  5846  5847  5848  5849  5850
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  5851  5852  5853  5854  5855  5856  5857  5858  5859  5860  5861  5862  5863
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  5864  5865  5866  5867  5868  5869  5870  5871  5872  5873  5874  5875  5876
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  5877  5878  5879  5880  5881  5882  5883  5884  5885  5886  5887  5888  5889
##    1    1    1    1    1    1    1    1    1    2    1    2    1
##  5890  5891  5892  5893  5894  5895  5896  5897  5898  5899  5900  5901  5902
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5903  5904  5905  5906  5907  5908  5909  5910  5911  5912  5913  5914  5915
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  5916  5917  5918  5919  5920  5921  5922  5923  5924  5925  5926  5927  5928
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5929  5930  5931  5932  5933  5934  5935  5936  5937  5938  5939  5940  5941
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5942  5943  5944  5945  5946  5947  5948  5949  5950  5951  5952  5953  5954
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  5955  5956  5957  5958  5959  5960  5961  5962  5963  5964  5965  5966  5967
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  5968  5969  5970  5971  5972  5973  5974  5975  5976  5977  5978  5979  5980
##    1    1    1    1    1    2    1    1    1    1    1    2    1
##  5981  5982  5983  5984  5985  5986  5987  5988  5989  5990  5991  5992  5993
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  5994  5995  5996  5997  5998  5999  6000  6001  6002  6003  6004  6005  6006
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  6007  6008  6009  6010  6011  6012  6013  6014  6015  6016  6017  6018  6019
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6020  6021  6022  6023  6024  6025  6026  6027  6028  6029  6030  6031  6032
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6033  6034  6035  6036  6037  6038  6039  6040  6041  6042  6043  6044  6045
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  6046  6047  6048  6049  6050  6051  6052  6053  6054  6055  6056  6057  6058
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  6059  6060  6061  6062  6063  6064  6065  6066  6067  6068  6069  6070  6071
```

```
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  6072 6073 6074 6075 6076 6077 6078 6079 6080 6081 6082 6083 6084
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  6085 6086 6087 6088 6089 6090 6091 6092 6093 6094 6095 6096 6097
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6098 6099 6100 6101 6102 6103 6104 6105 6106 6107 6108 6109 6110
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  6111 6112 6113 6114 6115 6116 6117 6118 6119 6120 6121 6122 6123
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6124 6125 6126 6127 6128 6129 6130 6131 6132 6133 6134 6135 6136
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6137 6138 6139 6140 6141 6142 6143 6144 6145 6146 6147 6148 6149
##    1    1    1    1    2    2    1    1    1    1    1    1    1
##  6150 6151 6152 6153 6154 6155 6156 6157 6158 6159 6160 6161 6162
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6163 6164 6165 6166 6167 6168 6169 6170 6171 6172 6173 6174 6175
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  6176 6177 6178 6179 6180 6181 6182 6183 6184 6185 6186 6187 6188
##    1    2    1    1    1    1    1    1    1    1    1    1    1
##  6189 6190 6191 6192 6193 6194 6195 6196 6197 6198 6199 6200 6201
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  6202 6203 6204 6205 6206 6207 6208 6209 6210 6211 6212 6213 6214
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6215 6216 6217 6218 6219 6220 6221 6222 6223 6224 6225 6226 6227
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  6228 6229 6230 6231 6232 6233 6234 6235 6236 6237 6238 6239 6240
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  6241 6242 6243 6244 6245 6246 6247 6248 6249 6250 6251 6252 6253
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  6254 6255 6256 6257 6258 6259 6260 6261 6262 6263 6264 6265 6266
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6267 6268 6269 6270 6271 6272 6273 6274 6275 6276 6277 6278 6279
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  6280 6281 6282 6283 6284 6285 6286 6287 6288 6289 6290 6291 6292
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  6293 6294 6295 6296 6297 6298 6299 6300 6301 6302 6303 6304 6305
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6306 6307 6308 6309 6310 6311 6312 6313 6314 6315 6316 6317 6318
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6319 6320 6321 6322 6323 6324 6325 6326 6327 6328 6329 6330 6331
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  6332 6333 6334 6335 6336 6337 6338 6339 6340 6341 6342 6343 6344
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  6345 6346 6347 6348 6349 6350 6351 6352 6353 6354 6355 6356 6357
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6358 6359 6360 6361 6362 6363 6364 6365 6366 6367 6368 6369 6370
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  6371 6372 6373 6374 6375 6376 6377 6378 6379 6380 6381 6382 6383
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  6384 6385 6386 6387 6388 6389 6390 6391 6392 6393 6394 6395 6396
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  6397 6398 6399 6400 6401 6402 6403 6404 6405 6406 6407 6408 6409
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6410 6411 6412 6413 6414 6415 6416 6417 6418 6419 6420 6421 6422
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  6423 6424 6425 6426 6427 6428 6429 6430 6431 6432 6433 6434 6435
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  6436 6437 6438 6439 6440 6441 6442 6443 6444 6445 6446 6447 6448
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  6449 6450 6451 6452 6453 6454 6455 6456 6457 6458 6459 6460 6461
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6462 6463 6464 6465 6466 6467 6468 6469 6470 6471 6472 6473 6474
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  6475 6476 6477 6478 6479 6480 6481 6482 6483 6484 6485 6486 6487
##    1    1    1    1    1    1    1    1    1    1    1    2    1
```

```
##  6488  6489  6490  6491  6492  6493  6494  6495  6496  6497  6498  6499  6500
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6501  6502  6503  6504  6505  6506  6507  6508  6509  6510  6511  6512  6513
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6514  6515  6516  6517  6518  6519  6520  6521  6522  6523  6524  6525  6526
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  6527  6528  6529  6530  6531  6532  6533  6534  6535  6536  6537  6538  6539
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  6540  6541  6542  6543  6544  6545  6546  6547  6548  6549  6550  6551  6552
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  6553  6554  6555  6556  6557  6558  6559  6560  6561  6562  6563  6564  6565
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  6566  6567  6568  6569  6570  6571  6572  6573  6574  6575  6576  6577  6578
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  6579  6580  6581  6582  6583  6584  6585  6586  6587  6588  6589  6590  6591
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6592  6593  6594  6595  6596  6597  6598  6599  6600  6601  6602  6603  6604
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  6605  6606  6607  6608  6609  6610  6611  6612  6613  6614  6615  6616  6617
##     1     1     1     1     2     1     2     1     1     1     1     1     1
##  6618  6619  6620  6621  6622  6623  6624  6625  6626  6627  6628  6629  6630
##     1     1     1     1     1     1     1     2     1     2     1     1     1
##  6631  6632  6633  6634  6635  6636  6637  6638  6639  6640  6641  6642  6643
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6644  6645  6646  6647  6648  6649  6650  6651  6652  6653  6654  6655  6656
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  6657  6658  6659  6660  6661  6662  6663  6664  6665  6666  6667  6668  6669
##     1     1     1     1     1     1     1     2     1     1     2     1     1
##  6670  6671  6672  6673  6674  6675  6676  6677  6678  6679  6680  6681  6682
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6683  6684  6685  6686  6687  6688  6689  6690  6691  6692  6693  6694  6695
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  6696  6697  6698  6699  6700  6701  6702  6703  6704  6705  6706  6707  6708
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  6709  6710  6711  6712  6713  6714  6715  6716  6717  6718  6719  6720  6721
##     1     2     1     1     1     1     1     1     1     1     2     1     1
##  6722  6723  6724  6725  6726  6727  6728  6729  6730  6731  6732  6733  6734
##     2     1     1     1     1     1     1     1     1     1     1     1     1
##  6735  6736  6737  6738  6739  6740  6741  6742  6743  6744  6745  6746  6747
##     1     2     1     1     2     1     1     1     1     1     1     1     1
##  6748  6749  6750  6751  6752  6753  6754  6755  6756  6757  6758  6759  6760
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6761  6762  6763  6764  6765  6766  6767  6768  6769  6770  6771  6772  6773
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  6774  6775  6776  6777  6778  6779  6780  6781  6782  6783  6784  6785  6786
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6787  6788  6789  6790  6791  6792  6793  6794  6795  6796  6797  6798  6799
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6800  6801  6802  6803  6804  6805  6806  6807  6808  6809  6810  6811  6812
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6813  6814  6815  6816  6817  6818  6819  6820  6821  6822  6823  6824  6825
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6826  6827  6828  6829  6830  6831  6832  6833  6834  6835  6836  6837  6838
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  6839  6840  6841  6842  6843  6844  6845  6846  6847  6848  6849  6850  6851
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6852  6853  6854  6855  6856  6857  6858  6859  6860  6861  6862  6863  6864
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6865  6866  6867  6868  6869  6870  6871  6872  6873  6874  6875  6876  6877
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6878  6879  6880  6881  6882  6883  6884  6885  6886  6887  6888  6889  6890
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6891  6892  6893  6894  6895  6896  6897  6898  6899  6900  6901  6902  6903
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  6904  6905  6906  6907  6908  6909  6910  6911  6912  6913  6914  6915  6916
##     1     1     1     1     1     1     1     1     1     2     1     1     1
```

```
##  6917  6918  6919  6920  6921  6922  6923  6924  6925  6926  6927  6928  6929
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6930  6931  6932  6933  6934  6935  6936  6937  6938  6939  6940  6941  6942
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6943  6944  6945  6946  6947  6948  6949  6950  6951  6952  6953  6954  6955
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  6956  6957  6958  6959  6960  6961  6962  6963  6964  6965  6966  6967  6968
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6969  6970  6971  6972  6973  6974  6975  6976  6977  6978  6979  6980  6981
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  6982  6983  6984  6985  6986  6987  6988  6989  6990  6991  6992  6993  6994
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  6995  6996  6997  6998  6999  7000  7001  7002  7003  7004  7005  7006  7007
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7008  7009  7010  7011  7012  7013  7014  7015  7016  7017  7018  7019  7020
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  7021  7022  7023  7024  7025  7026  7027  7028  7029  7030  7031  7032  7033
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7034  7035  7036  7037  7038  7039  7040  7041  7042  7043  7044  7045  7046
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7047  7048  7049  7050  7051  7052  7053  7054  7055  7056  7057  7058  7059
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  7060  7061  7062  7063  7064  7065  7066  7067  7068  7069  7070  7071  7072
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  7073  7074  7075  7076  7077  7078  7079  7080  7081  7082  7083  7084  7085
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7086  7087  7088  7089  7090  7091  7092  7093  7094  7095  7096  7097  7098
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  7099  7100  7101  7102  7103  7104  7105  7106  7107  7108  7109  7110  7111
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7112  7113  7114  7115  7116  7117  7118  7119  7120  7121  7122  7123  7124
##     1     1     1     1     1     2     1     2     1     1     1     1     1
##  7125  7126  7127  7128  7129  7130  7131  7132  7133  7134  7135  7136  7137
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7138  7139  7140  7141  7142  7143  7144  7145  7146  7147  7148  7149  7150
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7151  7152  7153  7154  7155  7156  7157  7158  7159  7160  7161  7162  7163
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7164  7165  7166  7167  7168  7169  7170  7171  7172  7173  7174  7175  7176
##     1     1     1     1     1     1     1     1     2     2     1     1     1
##  7177  7178  7179  7180  7181  7182  7183  7184  7185  7186  7187  7188  7189
##     1     1     1     1     1     2     2     1     1     1     1     1     1
##  7190  7191  7192  7193  7194  7195  7196  7197  7198  7199  7200  7201  7202
##     1     1     2     1     1     2     1     1     1     1     1     1     1
##  7203  7204  7205  7206  7207  7208  7209  7210  7211  7212  7213  7214  7215
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7216  7217  7218  7219  7220  7221  7222  7223  7224  7225  7226  7227  7228
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  7229  7230  7231  7232  7233  7234  7235  7236  7237  7238  7239  7240  7241
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7242  7243  7244  7245  7246  7247  7248  7249  7250  7251  7252  7253  7254
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  7255  7256  7257  7258  7259  7260  7261  7262  7263  7264  7265  7266  7267
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  7268  7269  7270  7271  7272  7273  7274  7275  7276  7277  7278  7279  7280
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7281  7282  7283  7284  7285  7286  7287  7288  7289  7290  7291  7292  7293
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  7294  7295  7296  7297  7298  7299  7300  7301  7302  7303  7304  7305  7306
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7307  7308  7309  7310  7311  7312  7313  7314  7315  7316  7317  7318  7319
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  7320  7321  7322  7323  7324  7325  7326  7327  7328  7329  7330  7331  7332
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7333  7334  7335  7336  7337  7338  7339  7340  7341  7342  7343  7344  7345
```

```
##    1    1    1    2    1    1    1    1    1    2    1    1    1
##  7346 7347 7348 7349 7350 7351 7352 7353 7354 7355 7356 7357 7358
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  7359 7360 7361 7362 7363 7364 7365 7366 7367 7368 7369 7370 7371
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  7372 7373 7374 7375 7376 7377 7378 7379 7380 7381 7382 7383 7384
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  7385 7386 7387 7388 7389 7390 7391 7392 7393 7394 7395 7396 7397
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  7398 7399 7400 7401 7402 7403 7404 7405 7406 7407 7408 7409 7410
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7411 7412 7413 7414 7415 7416 7417 7418 7419 7420 7421 7422 7423
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7424 7425 7426 7427 7428 7429 7430 7431 7432 7433 7434 7435 7436
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7437 7438 7439 7440 7441 7442 7443 7444 7445 7446 7447 7448 7449
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7450 7451 7452 7453 7454 7455 7456 7457 7458 7459 7460 7461 7462
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  7463 7464 7465 7466 7467 7468 7469 7470 7471 7472 7473 7474 7475
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  7476 7477 7478 7479 7480 7481 7482 7483 7484 7485 7486 7487 7488
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7489 7490 7491 7492 7493 7494 7495 7496 7497 7498 7499 7500 7501
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7502 7503 7504 7505 7506 7507 7508 7509 7510 7511 7512 7513 7514
##    1    1    1    1    1    2    2    2    1    1    1    1    1
##  7515 7516 7517 7518 7519 7520 7521 7522 7523 7524 7525 7526 7527
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7528 7529 7530 7531 7532 7533 7534 7535 7536 7537 7538 7539 7540
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7541 7542 7543 7544 7545 7546 7547 7548 7549 7550 7551 7552 7553
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  7554 7555 7556 7557 7558 7559 7560 7561 7562 7563 7564 7565 7566
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7567 7568 7569 7570 7571 7572 7573 7574 7575 7576 7577 7578 7579
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  7580 7581 7582 7583 7584 7585 7586 7587 7588 7589 7590 7591 7592
##    1    1    1    1    1    1    1    1    1    1    1    2    1
##  7593 7594 7595 7596 7597 7598 7599 7600 7601 7602 7603 7604 7605
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7606 7607 7608 7609 7610 7611 7612 7613 7614 7615 7616 7617 7618
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  7619 7620 7621 7622 7623 7624 7625 7626 7627 7628 7629 7630 7631
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  7632 7633 7634 7635 7636 7637 7638 7639 7640 7641 7642 7643 7644
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  7645 7646 7647 7648 7649 7650 7651 7652 7653 7654 7655 7656 7657
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  7658 7659 7660 7661 7662 7663 7664 7665 7666 7667 7668 7669 7670
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  7671 7672 7673 7674 7675 7676 7677 7678 7679 7680 7681 7682 7683
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  7684 7685 7686 7687 7688 7689 7690 7691 7692 7693 7694 7695 7696
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7697 7698 7699 7700 7701 7702 7703 7704 7705 7706 7707 7708 7709
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  7710 7711 7712 7713 7714 7715 7716 7717 7718 7719 7720 7721 7722
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  7723 7724 7725 7726 7727 7728 7729 7730 7731 7732 7733 7734 7735
##    1    1    1    1    1    1    2    1    1    2    2    1    1
##  7736 7737 7738 7739 7740 7741 7742 7743 7744 7745 7746 7747 7748
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  7749 7750 7751 7752 7753 7754 7755 7756 7757 7758 7759 7760 7761
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  7762 7763 7764 7765 7766 7767 7768 7769 7770 7771 7772 7773 7774
```

```
##  7762  7763  7764  7765  7766  7767  7768  7769  7770  7771  7772  7773  7774
##     1     1     1     1     1     1     1     2     1     2     1     1     1
##  7775  7776  7777  7778  7779  7780  7781  7782  7783  7784  7785  7786  7787
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  7788  7789  7790  7791  7792  7793  7794  7795  7796  7797  7798  7799  7800
##     1     1     1     2     2     1     1     2     1     1     1     1     1
##  7801  7802  7803  7804  7805  7806  7807  7808  7809  7810  7811  7812  7813
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7814  7815  7816  7817  7818  7819  7820  7821  7822  7823  7824  7825  7826
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7827  7828  7829  7830  7831  7832  7833  7834  7835  7836  7837  7838  7839
##     2     1     1     1     1     1     1     2     1     1     1     1     1
##  7840  7841  7842  7843  7844  7845  7846  7847  7848  7849  7850  7851  7852
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  7853  7854  7855  7856  7857  7858  7859  7860  7861  7862  7863  7864  7865
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  7866  7867  7868  7869  7870  7871  7872  7873  7874  7875  7876  7877  7878
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7879  7880  7881  7882  7883  7884  7885  7886  7887  7888  7889  7890  7891
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  7892  7893  7894  7895  7896  7897  7898  7899  7900  7901  7902  7903  7904
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  7905  7906  7907  7908  7909  7910  7911  7912  7913  7914  7915  7916  7917
##     1     1     2     1     1     1     1     1     1     1     1     1     2
##  7918  7919  7920  7921  7922  7923  7924  7925  7926  7927  7928  7929  7930
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  7931  7932  7933  7934  7935  7936  7937  7938  7939  7940  7941  7942  7943
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  7944  7945  7946  7947  7948  7949  7950  7951  7952  7953  7954  7955  7956
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  7957  7958  7959  7960  7961  7962  7963  7964  7965  7966  7967  7968  7969
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  7970  7971  7972  7973  7974  7975  7976  7977  7978  7979  7980  7981  7982
##     2     1     1     2     1     2     1     1     1     1     2     1     1
##  7983  7984  7985  7986  7987  7988  7989  7990  7991  7992  7993  7994  7995
##     1     1     2     1     1     1     1     1     1     1     1     1     1
##  7996  7997  7998  7999  8000  8001  8002  8003  8004  8005  8006  8007  8008
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8009  8010  8011  8012  8013  8014  8015  8016  8017  8018  8019  8020  8021
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  8022  8023  8024  8025  8026  8027  8028  8029  8030  8031  8032  8033  8034
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8035  8036  8037  8038  8039  8040  8041  8042  8043  8044  8045  8046  8047
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  8048  8049  8050  8051  8052  8053  8054  8055  8056  8057  8058  8059  8060
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  8061  8062  8063  8064  8065  8066  8067  8068  8069  8070  8071  8072  8073
##     1     1     1     1     1     1     1     2     1     1     1     2     1
##  8074  8075  8076  8077  8078  8079  8080  8081  8082  8083  8084  8085  8086
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8087  8088  8089  8090  8091  8092  8093  8094  8095  8096  8097  8098  8099
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  8100  8101  8102  8103  8104  8105  8106  8107  8108  8109  8110  8111  8112
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  8113  8114  8115  8116  8117  8118  8119  8120  8121  8122  8123  8124  8125
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8126  8127  8128  8129  8130  8131  8132  8133  8134  8135  8136  8137  8138
##     1     2     1     1     2     1     1     2     1     1     1     1     1
##  8139  8140  8141  8142  8143  8144  8145  8146  8147  8148  8149  8150  8151
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  8152  8153  8154  8155  8156  8157  8158  8159  8160  8161  8162  8163  8164
##     1     2     1     2     1     1     1     1     1     1     1     1     1
##  8165  8166  8167  8168  8169  8170  8171  8172  8173  8174  8175  8176  8177
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8178  8179  8180  8181  8182  8183  8184  8185  8186  8187  8188  8189  8190
##     1     1     1     1     1     1     1     1     1     1     1     1     1
```

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##  8191  8192  8193  8194  8195  8196  8197  8198  8199  8200  8201  8202  8203
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8204  8205  8206  8207  8208  8209  8210  8211  8212  8213  8214  8215  8216
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  8217  8218  8219  8220  8221  8222  8223  8224  8225  8226  8227  8228  8229
##     1     1     1     1     2     2     1     2     1     1     1     1     1
##  8230  8231  8232  8233  8234  8235  8236  8237  8238  8239  8240  8241  8242
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8243  8244  8245  8246  8247  8248  8249  8250  8251  8252  8253  8254  8255
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8256  8257  8258  8259  8260  8261  8262  8263  8264  8265  8266  8267  8268
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8269  8270  8271  8272  8273  8274  8275  8276  8277  8278  8279  8280  8281
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  8282  8283  8284  8285  8286  8287  8288  8289  8290  8291  8292  8293  8294
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8295  8296  8297  8298  8299  8300  8301  8302  8303  8304  8305  8306  8307
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8308  8309  8310  8311  8312  8313  8314  8315  8316  8317  8318  8319  8320
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8321  8322  8323  8324  8325  8326  8327  8328  8329  8330  8331  8332  8333
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8334  8335  8336  8337  8338  8339  8340  8341  8342  8343  8344  8345  8346
##     1     1     2     1     1     1     2     1     1     1     1     1     1
##  8347  8348  8349  8350  8351  8352  8353  8354  8355  8356  8357  8358  8359
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8360  8361  8362  8363  8364  8365  8366  8367  8368  8369  8370  8371  8372
##     1     1     1     1     1     1     1     2     1     1     1     1     1
##  8373  8374  8375  8376  8377  8378  8379  8380  8381  8382  8383  8384  8385
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8386  8387  8388  8389  8390  8391  8392  8393  8394  8395  8396  8397  8398
##     1     1     1     1     2     1     1     1     1     1     1     2     1
##  8399  8400  8401  8402  8403  8404  8405  8406  8407  8408  8409  8410  8411
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8412  8413  8414  8415  8416  8417  8418  8419  8420  8421  8422  8423  8424
##     1     1     1     1     1     1     2     1     1     1     1     1     1
##  8425  8426  8427  8428  8429  8430  8431  8432  8433  8434  8435  8436  8437
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  8438  8439  8440  8441  8442  8443  8444  8445  8446  8447  8448  8449  8450
##     1     1     1     1     2     1     1     1     1     2     1     1     1
##  8451  8452  8453  8454  8455  8456  8457  8458  8459  8460  8461  8462  8463
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  8464  8465  8466  8467  8468  8469  8470  8471  8472  8473  8474  8475  8476
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8477  8478  8479  8480  8481  8482  8483  8484  8485  8486  8487  8488  8489
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8490  8491  8492  8493  8494  8495  8496  8497  8498  8499  8500  8501  8502
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8503  8504  8505  8506  8507  8508  8509  8510  8511  8512  8513  8514  8515
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8516  8517  8518  8519  8520  8521  8522  8523  8524  8525  8526  8527  8528
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  8529  8530  8531  8532  8533  8534  8535  8536  8537  8538  8539  8540  8541
##     1     1     1     1     1     1     1     1     1     1     1     1     2
##  8542  8543  8544  8545  8546  8547  8548  8549  8550  8551  8552  8553  8554
##     1     1     1     1     2     1     2     1     1     1     1     1     1
##  8555  8556  8557  8558  8559  8560  8561  8562  8563  8564  8565  8566  8567
##     2     2     1     1     2     1     2     1     1     1     1     2     1
##  8568  8569  8570  8571  8572  8573  8574  8575  8576  8577  8578  8579  8580
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  8581  8582  8583  8584  8585  8586  8587  8588  8589  8590  8591  8592  8593
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  8594  8595  8596  8597  8598  8599  8600  8601  8602  8603  8604  8605  8606
##     1     1     1     1     2     1     1     1     1     1     1     2     1
##  8607  8608  8609  8610  8611  8612  8613  8614  8615  8616  8617  8618  8619
```

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##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8620 8621 8622 8623 8624 8625 8626 8627 8628 8629 8630 8631 8632
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8633 8634 8635 8636 8637 8638 8639 8640 8641 8642 8643 8644 8645
##    1    1    1    1    2    1    1    1    1    1    1    1    1
## 8646 8647 8648 8649 8650 8651 8652 8653 8654 8655 8656 8657 8658
##    1    2    1    2    1    1    1    1    1    1    1    2    2
## 8659 8660 8661 8662 8663 8664 8665 8666 8667 8668 8669 8670 8671
##    1    1    1    1    1    2    1    1    1    1    1    1    2
## 8672 8673 8674 8675 8676 8677 8678 8679 8680 8681 8682 8683 8684
##    2    1    1    1    1    1    1    1    1    1    1    1    1
## 8685 8686 8687 8688 8689 8690 8691 8692 8693 8694 8695 8696 8697
##    1    1    1    1    1    1    1    1    1    1    2    1    1
## 8698 8699 8700 8701 8702 8703 8704 8705 8706 8707 8708 8709 8710
##    1    1    1    2    1    1    1    1    2    1    1    1    1
## 8711 8712 8713 8714 8715 8716 8717 8718 8719 8720 8721 8722 8723
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8724 8725 8726 8727 8728 8729 8730 8731 8732 8733 8734 8735 8736
##    1    1    1    1    1    1    1    1    1    2    1    1    1
## 8737 8738 8739 8740 8741 8742 8743 8744 8745 8746 8747 8748 8749
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8750 8751 8752 8753 8754 8755 8756 8757 8758 8759 8760 8761 8762
##    1    1    1    2    1    1    1    1    1    1    1    1    1
## 8763 8764 8765 8766 8767 8768 8769 8770 8771 8772 8773 8774 8775
##    1    1    1    1    1    1    1    2    1    1    2    1    1
## 8776 8777 8778 8779 8780 8781 8782 8783 8784 8785 8786 8787 8788
##    1    1    2    1    1    1    1    1    1    1    2    2    1
## 8789 8790 8791 8792 8793 8794 8795 8796 8797 8798 8799 8800 8801
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8802 8803 8804 8805 8806 8807 8808 8809 8810 8811 8812 8813 8814
##    1    1    1    1    1    1    2    1    1    1    1    1    1
## 8815 8816 8817 8818 8819 8820 8821 8822 8823 8824 8825 8826 8827
##    1    1    2    1    2    1    1    1    1    1    1    1    1
## 8828 8829 8830 8831 8832 8833 8834 8835 8836 8837 8838 8839 8840
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8841 8842 8843 8844 8845 8846 8847 8848 8849 8850 8851 8852 8853
##    1    1    2    1    1    1    1    2    1    1    1    1    1
## 8854 8855 8856 8857 8858 8859 8860 8861 8862 8863 8864 8865 8866
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8867 8868 8869 8870 8871 8872 8873 8874 8875 8876 8877 8878 8879
##    1    1    1    1    1    2    1    1    2    2    1    1    1
## 8880 8881 8882 8883 8884 8885 8886 8887 8888 8889 8890 8891 8892
##    1    1    1    2    2    1    1    1    1    1    1    1    1
## 8893 8894 8895 8896 8897 8898 8899 8900 8901 8902 8903 8904 8905
##    1    1    1    1    2    1    1    1    1    1    1    1    2
## 8906 8907 8908 8909 8910 8911 8912 8913 8914 8915 8916 8917 8918
##    1    2    1    1    1    1    2    1    1    1    1    1    1
## 8919 8920 8921 8922 8923 8924 8925 8926 8927 8928 8929 8930 8931
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8932 8933 8934 8935 8936 8937 8938 8939 8940 8941 8942 8943 8944
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8945 8946 8947 8948 8949 8950 8951 8952 8953 8954 8955 8956 8957
##    1    1    1    1    1    1    2    1    1    2    1    1    1
## 8958 8959 8960 8961 8962 8963 8964 8965 8966 8967 8968 8969 8970
##    1    1    2    1    1    1    1    2    1    1    1    1    1
## 8971 8972 8973 8974 8975 8976 8977 8978 8979 8980 8981 8982 8983
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8984 8985 8986 8987 8988 8989 8990 8991 8992 8993 8994 8995 8996
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 8997 8998 8999 9000 9001 9002 9003 9004 9005 9006 9007 9008 9009
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 9010 9011 9012 9013 9014 9015 9016 9017 9018 9019 9020 9021 9022
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 9023 9024 9025 9026 9027 9028 9029 9030 9031 9032 9033 9034 9035
##    1    1    1    1    1    1    1    1    1    1    1    2    1
## 9036 9037 9038 9039 9040 9041 9042 9043 9044 9045 9046 9047 9048
```

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##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9049 9050 9051 9052 9053 9054 9055 9056 9057 9058 9059 9060 9061
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9062 9063 9064 9065 9066 9067 9068 9069 9070 9071 9072 9073 9074
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  9075 9076 9077 9078 9079 9080 9081 9082 9083 9084 9085 9086 9087
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  9088 9089 9090 9091 9092 9093 9094 9095 9096 9097 9098 9099 9100
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  9101 9102 9103 9104 9105 9106 9107 9108 9109 9110 9111 9112 9113
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9114 9115 9116 9117 9118 9119 9120 9121 9122 9123 9124 9125 9126
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9127 9128 9129 9130 9131 9132 9133 9134 9135 9136 9137 9138 9139
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  9140 9141 9142 9143 9144 9145 9146 9147 9148 9149 9150 9151 9152
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  9153 9154 9155 9156 9157 9158 9159 9160 9161 9162 9163 9164 9165
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9166 9167 9168 9169 9170 9171 9172 9173 9174 9175 9176 9177 9178
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9179 9180 9181 9182 9183 9184 9185 9186 9187 9188 9189 9190 9191
##    1    1    2    1    1    1    1    1    1    1    1    1    1
##  9192 9193 9194 9195 9196 9197 9198 9199 9200 9201 9202 9203 9204
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  9205 9206 9207 9208 9209 9210 9211 9212 9213 9214 9215 9216 9217
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9218 9219 9220 9221 9222 9223 9224 9225 9226 9227 9228 9229 9230
##    1    1    1    1    1    1    2    1    1    1    1    1    1
##  9231 9232 9233 9234 9235 9236 9237 9238 9239 9240 9241 9242 9243
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9244 9245 9246 9247 9248 9249 9250 9251 9252 9253 9254 9255 9256
##    1    1    2    1    1    2    1    1    1    1    1    1    1
##  9257 9258 9259 9260 9261 9262 9263 9264 9265 9266 9267 9268 9269
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  9270 9271 9272 9273 9274 9275 9276 9277 9278 9279 9280 9281 9282
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9283 9284 9285 9286 9287 9288 9289 9290 9291 9292 9293 9294 9295
##    1    1    1    1    1    2    1    1    1    1    1    1    1
##  9296 9297 9298 9299 9300 9301 9302 9303 9304 9305 9306 9307 9308
##    1    1    1    1    1    1    1    1    1    1    1    1    2
##  9309 9310 9311 9312 9313 9314 9315 9316 9317 9318 9319 9320 9321
##    1    2    1    1    1    1    1    1    1    1    1    2    1
##  9322 9323 9324 9325 9326 9327 9328 9329 9330 9331 9332 9333 9334
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9335 9336 9337 9338 9339 9340 9341 9342 9343 9344 9345 9346 9347
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  9348 9349 9350 9351 9352 9353 9354 9355 9356 9357 9358 9359 9360
##    1    1    1    2    1    1    1    1    1    1    1    1    1
##  9361 9362 9363 9364 9365 9366 9367 9368 9369 9370 9371 9372 9373
##    1    1    2    1    1    1    1    2    1    1    1    1    1
##  9374 9375 9376 9377 9378 9379 9380 9381 9382 9383 9384 9385 9386
##    1    1    1    2    1    1    1    1    1    1    1    1    2
##  9387 9388 9389 9390 9391 9392 9393 9394 9395 9396 9397 9398 9399
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9400 9401 9402 9403 9404 9405 9406 9407 9408 9409 9410 9411 9412
##    1    1    1    1    1    1    1    2    1    1    1    1    1
##  9413 9414 9415 9416 9417 9418 9419 9420 9421 9422 9423 9424 9425
##    1    1    1    1    1    1    1    1    1    2    1    1    1
##  9426 9427 9428 9429 9430 9431 9432 9433 9434 9435 9436 9437 9438
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9439 9440 9441 9442 9443 9444 9445 9446 9447 9448 9449 9450 9451
##    1    1    1    1    1    1    1    1    1    1    2    2    1
##  9452 9453 9454 9455 9456 9457 9458 9459 9460 9461 9462 9463 9464
##    1    1    2    1    1    1    1    2    1    1    1    2    1
```

```
##  9465  9466  9467  9468  9469  9470  9471  9472  9473  9474  9475  9476  9477
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  9478  9479  9480  9481  9482  9483  9484  9485  9486  9487  9488  9489  9490
##     2     1     2     1     1     1     1     1     1     1     1     1     1
##  9491  9492  9493  9494  9495  9496  9497  9498  9499  9500  9501  9502  9503
##     1     1     1     1     1     1     1     1     1     2     1     1     1
##  9504  9505  9506  9507  9508  9509  9510  9511  9512  9513  9514  9515  9516
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9517  9518  9519  9520  9521  9522  9523  9524  9525  9526  9527  9528  9529
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9530  9531  9532  9533  9534  9535  9536  9537  9538  9539  9540  9541  9542
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  9543  9544  9545  9546  9547  9548  9549  9550  9551  9552  9553  9554  9555
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9556  9557  9558  9559  9560  9561  9562  9563  9564  9565  9566  9567  9568
##     1     1     1     1     1     1     1     1     1     1     2     1     1
##  9569  9570  9571  9572  9573  9574  9575  9576  9577  9578  9579  9580  9581
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  9582  9583  9584  9585  9586  9587  9588  9589  9590  9591  9592  9593  9594
##     1     1     1     1     1     2     1     1     1     1     1     1     2
##  9595  9596  9597  9598  9599  9600  9601  9602  9603  9604  9605  9606  9607
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9608  9609  9610  9611  9612  9613  9614  9615  9616  9617  9618  9619  9620
##     1     1     1     2     1     1     1     2     1     1     1     1     1
##  9621  9622  9623  9624  9625  9626  9627  9628  9629  9630  9631  9632  9633
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9634  9635  9636  9637  9638  9639  9640  9641  9642  9643  9644  9645  9646
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9647  9648  9649  9650  9651  9652  9653  9654  9655  9656  9657  9658  9659
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9660  9661  9662  9663  9664  9665  9666  9667  9668  9669  9670  9671  9672
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9673  9674  9675  9676  9677  9678  9679  9680  9681  9682  9683  9684  9685
##     1     2     1     1     1     1     2     1     1     1     1     1     1
##  9686  9687  9688  9689  9690  9691  9692  9693  9694  9695  9696  9697  9698
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9699  9700  9701  9702  9703  9704  9705  9706  9707  9708  9709  9710  9711
##     1     1     1     1     2     1     1     1     1     1     1     1     1
##  9712  9713  9714  9715  9716  9717  9718  9719  9720  9721  9722  9723  9724
##     1     1     1     1     1     2     1     1     1     1     1     1     1
##  9725  9726  9727  9728  9729  9730  9731  9732  9733  9734  9735  9736  9737
##     1     2     1     2     1     1     1     2     1     1     1     1     1
##  9738  9739  9740  9741  9742  9743  9744  9745  9746  9747  9748  9749  9750
##     1     2     1     1     1     1     1     1     1     1     1     1     1
##  9751  9752  9753  9754  9755  9756  9757  9758  9759  9760  9761  9762  9763
##     1     1     1     1     1     1     1     1     2     1     1     2     1
##  9764  9765  9766  9767  9768  9769  9770  9771  9772  9773  9774  9775  9776
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9777  9778  9779  9780  9781  9782  9783  9784  9785  9786  9787  9788  9789
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9790  9791  9792  9793  9794  9795  9796  9797  9798  9799  9800  9801  9802
##     1     1     1     2     1     1     1     1     1     1     1     1     1
##  9803  9804  9805  9806  9807  9808  9809  9810  9811  9812  9813  9814  9815
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  9816  9817  9818  9819  9820  9821  9822  9823  9824  9825  9826  9827  9828
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  9829  9830  9831  9832  9833  9834  9835  9836  9837  9838  9839  9840  9841
##     1     1     1     2     2     1     1     1     1     1     2     2     1
##  9842  9843  9844  9845  9846  9847  9848  9849  9850  9851  9852  9853  9854
##     1     1     2     2     1     1     1     1     1     1     1     1     1
##  9855  9856  9857  9858  9859  9860  9861  9862  9863  9864  9865  9866  9867
##     1     1     1     1     1     1     1     1     1     1     1     2     1
##  9868  9869  9870  9871  9872  9873  9874  9875  9876  9877  9878  9879  9880
##     1     1     1     1     1     1     1     1     2     1     1     1     1
##  9881  9882  9883  9884  9885  9886  9887  9888  9889  9890  9891  9892  9893
##     1     1     1     1     1     1     1     1     2     1     1     1     1
```

```
##    1    1    1    1    1    1    1    1    2    1    1    1    1
##  9894  9895  9896  9897  9898  9899  9900  9901  9902  9903  9904  9905  9906
##    1    1    1    1    1    1    1    1    2    1    1    2    1
##  9907  9908  9909  9910  9911  9912  9913  9914  9915  9916  9917  9918  9919
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9920  9921  9922  9923  9924  9925  9926  9927  9928  9929  9930  9931  9932
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9933  9934  9935  9936  9937  9938  9939  9940  9941  9942  9943  9944  9945
##    2    1    1    1    1    1    1    1    1    1    1    1    1
##  9946  9947  9948  9949  9950  9951  9952  9953  9954  9955  9956  9957  9958
##    1    1    1    1    1    1    1    1    1    1    2    2    1
##  9959  9960  9961  9962  9963  9964  9965  9966  9967  9968  9969  9970  9971
##    1    1    1    1    1    1    1    1    1    1    1    1    1
##  9972  9973  9974  9975  9976  9977  9978  9979  9980  9981  9982  9983  9984
##    1    1    1    1    1    1    1    1    1    1    2    1    1
##  9985  9986  9987  9988  9989  9990  9991  9992  9993  9994  9995  9996  9997
##    1    1    1    1    2    1    1    1    1    1    1    1    1
##  9998  9999 10000 10001 10002 10003 10004 10005 10006 10007 10008 10009 10010
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10011 10012 10013 10014 10015 10016 10017 10018 10019 10020 10021 10022 10023
##    2    1    1    1    1    1    1    1    1    1    1    1    1
## 10024 10025 10026 10027 10028 10029 10030 10031 10032 10033 10034 10035 10036
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10037 10038 10039 10040 10041 10042 10043 10044 10045 10046 10047 10048 10049
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10050 10051 10052 10053 10054 10055 10056 10057 10058 10059 10060 10061 10062
##    1    1    1    1    1    1    1    1    1    1    2    2    1
## 10063 10064 10065 10066 10067 10068 10069 10070 10071 10072 10073 10074 10075
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10076 10077 10078 10079 10080 10081 10082 10083 10084 10085 10086 10087 10088
##    1    1    1    1    1    1    1    1    1    1    1    2    1
## 10089 10090 10091 10092 10093 10094 10095 10096 10097 10098 10099 10100 10101
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10102 10103 10104 10105 10106 10107 10108 10109 10110 10111 10112 10113 10114
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10115 10116 10117 10118 10119 10120 10121 10122 10123 10124 10125 10126 10127
##    1    1    1    1    1    1    1    1    1    1    2    1    1
## 10128 10129 10130 10131 10132 10133 10134 10135 10136 10137 10138 10139 10140
##    1    1    1    1    1    2    1    1    1    1    1    1    1
## 10141 10142 10143 10144 10145 10146 10147 10148 10149 10150 10151 10152 10153
##    1    1    1    2    1    1    1    1    1    1    1    1    1
## 10154 10155 10156 10157 10158 10159 10160 10161 10162 10163 10164 10165 10166
##    1    2    1    1    1    1    1    1    1    1    1    1    1
## 10167 10168 10169 10170 10171 10172 10173 10174 10175 10176 10177 10178 10179
##    1    2    1    1    1    1    1    1    2    2    1    1    1
## 10180 10181 10182 10183 10184 10185 10186 10187 10188 10189 10190 10191 10192
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10193 10194 10195 10196 10197 10198 10199 10200 10201 10202 10203 10204 10205
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10206 10207 10208 10209 10210 10211 10212 10213 10214 10215 10216 10217 10218
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10219 10220 10221 10222 10223 10224 10225 10226 10227 10228 10229 10230 10231
##    1    1    1    1    1    1    1    1    1    1    1    2    1
## 10232 10233 10234 10235 10236 10237 10238 10239 10240 10241 10242 10243 10244
##    1    1    2    1    1    1    1    1    1    1    1    1    1
## 10245 10246 10247 10248 10249 10250 10251 10252 10253 10254 10255 10256 10257
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10258 10259 10260 10261 10262 10263 10264 10265 10266 10267 10268 10269 10270
##    1    1    1    1    1    1    1    1    1    1    2    1    1
## 10271 10272 10273 10274 10275 10276 10277 10278 10279 10280 10281 10282 10283
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10284 10285 10286 10287 10288 10289 10290 10291 10292 10293 10294 10295 10296
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10297 10298 10299 10300 10301 10302 10303 10304 10305 10306 10307 10308 10309
##    1    1    1    1    1    1    1    1    1    1    1    1    1
## 10310 10311 10312 10313 10314 10315 10316 10317 10318 10319 10320 10321 10322
```

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##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10323 10324 10325 10326 10327 10328 10329 10330 10331 10332 10333 10334 10335
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10336 10337 10338 10339 10340 10341 10342 10343 10344 10345 10346 10347 10348
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10349 10350 10351 10352 10353 10354 10355 10356 10357 10358 10359 10360 10361
##     1     1     1     1     1     1     1     1     1     1     1     2     1
## 10362 10363 10364 10365 10366 10367 10368 10369 10370 10371 10372 10373 10374
##     1     1     1     1     2     1     1     2     1     1     1     1     1
## 10375 10376 10377 10378 10379 10380 10381 10382 10383 10384 10385 10386 10387
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10388 10389 10390 10391 10392 10393 10394 10395 10396 10397 10398 10399 10400
##     1     1     1     1     1     1     2     1     1     1     1     2     1
## 10401 10402 10403 10404 10405 10406 10407 10408 10409 10410 10411 10412 10413
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 10414 10415 10416 10417 10418 10419 10420 10421 10422 10423 10424 10425 10426
##     1     1     1     1     1     1     1     1     1     1     2     1     1
## 10427 10428 10429 10430 10431 10432 10433 10434 10435 10436 10437 10438 10439
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 10440 10441 10442 10443 10444 10445 10446 10447 10448 10449 10450 10451 10452
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10453 10454 10455 10456 10457 10458 10459 10460 10461 10462 10463 10464 10465
##     1     1     1     1     1     1     1     1     1     2     1     1     1
## 10466 10467 10468 10469 10470 10471 10472 10473 10474 10475 10476 10477 10478
##     1     1     1     2     1     1     2     1     1     1     1     1     1
## 10479 10480 10481 10482 10483 10484 10485 10486 10487 10488 10489 10490 10491
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10492 10493 10494 10495 10496 10497 10498 10499 10500 10501 10502 10503 10504
##     1     1     1     1     1     2     1     1     1     1     1     1     1
## 10505 10506 10507 10508 10509 10510 10511 10512 10513 10514 10515 10516 10517
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10518 10519 10520 10521 10522 10523 10524 10525 10526 10527 10528 10529 10530
##     1     1     1     1     1     1     2     1     1     1     1     1     1
## 10531 10532 10533 10534 10535 10536 10537 10538 10539 10540 10541 10542 10543
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10544 10545 10546 10547 10548 10549 10550 10551 10552 10553 10554 10555 10556
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 10557 10558 10559 10560 10561 10562 10563 10564 10565 10566 10567 10568 10569
##     1     1     1     1     1     1     1     1     1     2     1     1     1
## 10570 10571 10572 10573 10574 10575 10576 10577 10578 10579 10580 10581 10582
##     1     1     2     1     1     1     1     1     1     1     1     1     2
## 10583 10584 10585 10586 10587 10588 10589 10590 10591 10592 10593 10594 10595
##     1     2     1     2     1     1     1     1     1     1     1     1     1
## 10596 10597 10598 10599 10600 10601 10602 10603 10604 10605 10606 10607 10608
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10609 10610 10611 10612 10613 10614 10615 10616 10617 10618 10619 10620 10621
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10622 10623 10624 10625 10626 10627 10628 10629 10630 10631 10632 10633 10634
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10635 10636 10637 10638 10639 10640 10641 10642 10643 10644 10645 10646 10647
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10648 10649 10650 10651 10652 10653 10654 10655 10656 10657 10658 10659 10660
##     1     1     1     1     1     2     1     1     1     1     1     1     1
## 10661 10662 10663 10664 10665 10666 10667 10668 10669 10670 10671 10672 10673
##     1     1     1     1     1     1     1     1     1     1     2     1     2
## 10674 10675 10676 10677 10678 10679 10680 10681 10682 10683 10684 10685 10686
##     1     2     1     1     1     2     1     1     2     1     2     1     1
## 10687 10688 10689 10690 10691 10692 10693 10694 10695 10696 10697 10698 10699
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10700 10701 10702 10703 10704 10705 10706 10707 10708 10709 10710 10711 10712
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10713 10714 10715 10716 10717 10718 10719 10720 10721 10722 10723 10724 10725
##     1     1     1     1     1     1     1     2     1     1     1     1     1
## 10726 10727 10728 10729 10730 10731 10732 10733 10734 10735 10736 10737 10738
##     1     1     1     1     2     1     1     1     1     1     1     1     1
```

```
## 10739 10740 10741 10742 10743 10744 10745 10746 10747 10748 10749 10750 10751
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10752 10753 10754 10755 10756 10757 10758 10759 10760 10761 10762 10763 10764
##     1     1     1     1     2     1     1     1     1     1     1     1     1
## 10765 10766 10767 10768 10769 10770 10771 10772 10773 10774 10775 10776 10777
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10778 10779 10780 10781 10782 10783 10784 10785 10786 10787 10788 10789 10790
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10791 10792 10793 10794 10795 10796 10797 10798 10799 10800 10801 10802 10803
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 10804 10805 10806 10807 10808 10809 10810 10811 10812 10813 10814 10815 10816
##     1     2     1     1     1     1     1     2     1     1     1     1     1
## 10817 10818 10819 10820 10821 10822 10823 10824 10825 10826 10827 10828 10829
##     1     1     1     1     1     1     1     1     1     1     1     2     1
## 10830 10831 10832 10833 10834 10835 10836 10837 10838 10839 10840 10841 10842
##     1     1     1     1     1     1     1     1     1     2     1     2     1
## 10843 10844 10845 10846 10847 10848 10849 10850 10851 10852 10853 10854 10855
##     1     1     1     1     2     1     1     1     2     1     1     1     1
## 10856 10857 10858 10859 10860 10861 10862 10863 10864 10865 10866 10867 10868
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10869 10870 10871 10872 10873 10874 10875 10876 10877 10878 10879 10880 10881
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 10882 10883 10884 10885 10886 10887 10888 10889 10890 10891 10892 10893 10894
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10895 10896 10897 10898 10899 10900 10901 10902 10903 10904 10905 10906 10907
##     1     1     1     1     1     1     1     1     1     1     1     1     2
## 10908 10909 10910 10911 10912 10913 10914 10915 10916 10917 10918 10919 10920
##     1     2     1     1     1     1     1     1     1     1     1     1     1
## 10921 10922 10923 10924 10925 10926 10927 10928 10929 10930 10931 10932 10933
##     1     1     1     1     1     2     1     1     1     1     1     1     2
## 10934 10935 10936 10937 10938 10939 10940 10941 10942 10943 10944 10945 10946
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10947 10948 10949 10950 10951 10952 10953 10954 10955 10956 10957 10958 10959
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 10960 10961 10962 10963 10964 10965 10966 10967 10968 10969 10970 10971 10972
##     1     1     1     1     1     2     2     1     2     1     1     1     1
## 10973 10974 10975 10976 10977 10978 10979 10980 10981 10982 10983 10984 10985
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 10986 10987 10988 10989 10990 10991 10992 10993 10994 10995 10996 10997 10998
##     1     1     1     1     1     1     1     1     1     1     2     1     1
## 10999 11000 11001 11002 11003 11004 11005 11006 11007 11008 11009 11010 11011
##     1     1     1     1     1     1     1     1     2     1     1     1     1
## 11012 11013 11014 11015 11016 11017 11018 11019 11020 11021 11022 11023 11024
##     1     1     1     1     1     1     1     1     1     1     2     1     1
## 11025 11026 11027 11028 11029 11030 11031 11032 11033 11034 11035 11036 11037
##     2     2     1     2     1     1     1     1     2     1     1     1     1
## 11038 11039 11040 11041 11042 11043 11044 11045 11046 11047 11048 11049 11050
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 11051 11052 11053 11054 11055 11056 11057 11058 11059 11060 11061 11062 11063
##     1     2     2     1     1     1     1     1     1     1     1     1     1
## 11064 11065 11066 11067 11068 11069 11070 11071 11072 11073 11074 11075 11076
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11077 11078 11079 11080 11081 11082 11083 11084 11085 11086 11087 11088 11089
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11090 11091 11092 11093 11094 11095 11096 11097 11098 11099 11100 11101 11102
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11103 11104 11105 11106 11107 11108 11109 11110 11111 11112 11113 11114 11115
##     1     1     1     1     2     1     1     1     1     1     1     1     2
## 11116 11117 11118 11119 11120 11121 11122 11123 11124 11125 11126 11127 11128
##     1     1     1     1     1     1     1     1     1     2     1     1     1
## 11129 11130 11131 11132 11133 11134 11135 11136 11137 11138 11139 11140 11141
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11142 11143 11144 11145 11146 11147 11148 11149 11150 11151 11152 11153 11154
##     1     1     1     1     1     1     1     1     2     1     1     1     1
## 11155 11156 11157 11158 11159 11160 11161 11162 11163 11164 11165 11166 11167
##     1     1     1     1     1     1     1     1     1     1     1     1     1
```

```
## 11168 11169 11170 11171 11172 11173 11174 11175 11176 11177 11178 11179 11180
##     1     1     1     2     1     1     1     1     1     1     1     1     1
## 11181 11182 11183 11184 11185 11186 11187 11188 11189 11190 11191 11192 11193
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 11194 11195 11196 11197 11198 11199 11200 11201 11202 11203 11204 11205 11206
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11207 11208 11209 11210 11211 11212 11213 11214 11215 11216 11217 11218 11219
##     1     1     1     1     1     1     1     2     1     1     1     1     1
## 11220 11221 11222 11223 11224 11225 11226 11227 11228 11229 11230 11231 11232
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11233 11234 11235 11236 11237 11238 11239 11240 11241 11242 11243 11244 11245
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11246 11247 11248 11249 11250 11251 11252 11253 11254 11255 11256 11257 11258
##     1     2     1     1     1     1     1     1     1     1     1     1     1
## 11259 11260 11261 11262 11263 11264 11265 11266 11267 11268 11269 11270 11271
##     1     1     1     1     2     1     1     1     1     1     1     1     1
## 11272 11273 11274 11275 11276 11277 11278 11279 11280 11281 11282 11283 11284
##     1     1     1     1     1     1     1     1     1     2     1     1     1
## 11285 11286 11287 11288 11289 11290 11291 11292 11293 11294 11295 11296 11297
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 11298 11299 11300 11301 11302 11303 11304 11305 11306 11307 11308 11309 11310
##     1     1     1     1     1     2     1     1     1     1     1     1     1
## 11311 11312 11313 11314 11315 11316 11317 11318 11319 11320 11321 11322 11323
##     1     1     1     1     1     1     1     1     1     1     1     2     1
## 11324 11325 11326 11327 11328 11329 11330 11331 11332 11333 11334 11335 11336
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11337 11338 11339 11340 11341 11342 11343 11344 11345 11346 11347 11348 11349
##     1     1     1     1     1     1     1     1     1     1     1     2     1
## 11350 11351 11352 11353 11354 11355 11356 11357 11358 11359 11360 11361 11362
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11363 11364 11365 11366 11367 11368 11369 11370 11371 11372 11373 11374 11375
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11376 11377 11378 11379 11380 11381 11382 11383 11384 11385 11386 11387 11388
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11389 11390 11391 11392 11393 11394 11395 11396 11397 11398 11399 11400 11401
##     1     2     1     1     1     2     1     1     1     1     1     1     1
## 11402 11403 11404 11405 11406 11407 11408 11409 11410 11411 11412 11413 11414
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11415 11416 11417 11418 11419 11420 11421 11422 11423 11424 11425 11426 11427
##     1     1     1     1     1     1     1     1     2     1     1     1     1
## 11428 11429 11430 11431 11432 11433 11434 11435 11436 11437 11438 11439 11440
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11441 11442 11443 11444 11445 11446 11447 11448 11449 11450 11451 11452 11453
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11454 11455 11456 11457 11458 11459 11460 11461 11462 11463 11464 11465 11466
##     1     1     1     1     1     1     1     2     1     2     1     1     1
## 11467 11468 11469 11470 11471 11472 11473 11474 11475 11476 11477 11478 11479
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11480 11481 11482 11483 11484 11485 11486 11487 11488 11489 11490 11491 11492
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11493 11494 11495 11496 11497 11498 11499 11500 11501 11502 11503 11504 11505
##     1     1     1     1     1     1     2     1     1     1     2     1     1
## 11506 11507 11508 11509 11510 11511 11512 11513 11514 11515 11516 11517 11518
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11519 11520 11521 11522 11523 11524 11525 11526 11527 11528 11529 11530 11531
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11532 11533 11534 11535 11536 11537 11538 11539 11540 11541 11542 11543 11544
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11545 11546 11547 11548 11549 11550 11551 11552 11553 11554 11555 11556 11557
##     1     1     1     1     1     1     1     2     1     1     1     1     1
## 11558 11559 11560 11561 11562 11563 11564 11565 11566 11567 11568 11569 11570
##     1     1     1     2     1     1     1     1     1     1     1     1     1
## 11571 11572 11573 11574 11575 11576 11577 11578 11579 11580 11581 11582 11583
##     1     1     1     1     1     1     2     2     1     1     1     1     1
## 11584 11585 11586 11587 11588 11589 11590 11591 11592 11593 11594 11595 11596
```

```
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 11597 11598 11599 11600 11601 11602 11603 11604 11605 11606 11607 11608 11609
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11610 11611 11612 11613 11614 11615 11616 11617 11618 11619 11620 11621 11622
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11623 11624 11625 11626 11627 11628 11629 11630 11631 11632 11633 11634 11635
##     1     1     1     1     2     1     1     1     1     1     1     1     1
## 11636 11637 11638 11639 11640 11641 11642 11643 11644 11645 11646 11647 11648
##     1     1     1     1     1     2     1     1     1     1     1     1     1
## 11649 11650 11651 11652 11653 11654 11655 11656 11657 11658 11659 11660 11661
##     1     1     1     1     2     1     1     1     1     1     1     1     1
## 11662 11663 11664 11665 11666 11667 11668 11669 11670 11671 11672 11673 11674
##     1     1     1     1     1     1     2     1     1     1     1     1     1
## 11675 11676 11677 11678 11679 11680 11681 11682 11683 11684 11685 11686 11687
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11688 11689 11690 11691 11692 11693 11694 11695 11696 11697 11698 11699 11700
##     1     1     1     1     1     1     1     1     1     2     1     1     1
## 11701 11702 11703 11704 11705 11706 11707 11708 11709 11710 11711 11712 11713
##     1     1     1     1     1     1     1     1     1     1     2     1     1
## 11714 11715 11716 11717 11718 11719 11720 11721 11722 11723 11724 11725 11726
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11727 11728 11729 11730 11731 11732 11733 11734 11735 11736 11737 11738 11739
##     1     1     1     1     1     1     1     1     1     1     1     1     2
## 11740 11741 11742 11743 11744 11745 11746 11747 11748 11749 11750 11751 11752
##     2     1     1     1     1     1     1     1     1     1     1     1     1
## 11753 11754 11755 11756 11757 11758 11759 11760 11761 11762 11763 11764 11765
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11766 11767 11768 11769 11770 11771 11772 11773 11774 11775 11776 11777 11778
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11779 11780 11781 11782 11783 11784 11785 11786 11787 11788 11789 11790 11791
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11792 11793 11794 11795 11796 11797 11798 11799 11800 11801 11802 11803 11804
##     1     2     1     1     1     1     1     1     1     1     1     1     1
## 11805 11806 11807 11808 11809 11810 11811 11812 11813 11814 11815 11816 11817
##     1     1     1     1     1     1     1     2     1     1     1     1     1
## 11818 11819 11820 11821 11822 11823 11824 11825 11826 11827 11828 11829 11830
##     1     1     1     1     1     2     1     1     1     1     1     1     1
## 11831 11832 11833 11834 11835 11836 11837 11838 11839 11840 11841 11842 11843
##     1     1     1     1     1     2     1     1     1     1     1     2     1
## 11844 11845 11846 11847 11848 11849 11850 11851 11852 11853 11854 11855 11856
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11857 11858 11859 11860 11861 11862 11863 11864 11865 11866 11867 11868 11869
##     1     1     1     1     1     2     1     1     1     2     1     1     1
## 11870 11871 11872 11873 11874 11875 11876 11877 11878 11879 11880 11881 11882
##     1     2     1     1     1     1     1     1     1     1     1     1     1
## 11883 11884 11885 11886 11887 11888 11889 11890 11891 11892 11893 11894 11895
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 11896 11897 11898 11899 11900 11901 11902 11903 11904 11905 11906 11907 11908
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11909 11910 11911 11912 11913 11914 11915 11916 11917 11918 11919 11920 11921
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11922 11923 11924 11925 11926 11927 11928 11929 11930 11931 11932 11933 11934
##     1     1     1     1     1     1     1     2     1     1     1     1     2
## 11935 11936 11937 11938 11939 11940 11941 11942 11943 11944 11945 11946 11947
##     1     2     1     1     1     1     1     1     1     1     1     1     1
## 11948 11949 11950 11951 11952 11953 11954 11955 11956 11957 11958 11959 11960
##     1     2     1     1     1     1     2     1     1     1     1     1     1
## 11961 11962 11963 11964 11965 11966 11967 11968 11969 11970 11971 11972 11973
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 11974 11975 11976 11977 11978 11979 11980 11981 11982 11983 11984 11985 11986
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 11987 11988 11989 11990 11991 11992 11993 11994 11995 11996 11997 11998 11999
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 12000 12001 12002 12003 12004 12005 12006 12007 12008 12009 12010 12011 12012
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12013 12014 12015 12016 12017 12018 12019 12020 12021 12022 12023 12024 12025
```

```
## 12013 12014 12015 12016 12017 12018 12019 12020 12021 12022 12023 12024 12025
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12026 12027 12028 12029 12030 12031 12032 12033 12034 12035 12036 12037 12038
##     1     1     1     1     1     1     1     1     2     1     1     1     1
## 12039 12040 12041 12042 12043 12044 12045 12046 12047 12048 12049 12050 12051
##     1     1     1     1     1     1     1     2     2     1     1     1     1
## 12052 12053 12054 12055 12056 12057 12058 12059 12060 12061 12062 12063 12064
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12065 12066 12067 12068 12069 12070 12071 12072 12073 12074 12075 12076 12077
##     1     1     2     1     1     2     1     1     1     1     1     1     1
## 12078 12079 12080 12081 12082 12083 12084 12085 12086 12087 12088 12089 12090
##     1     1     1     1     1     1     1     1     1     1     1     1     2
## 12091 12092 12093 12094 12095 12096 12097 12098 12099 12100 12101 12102 12103
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12104 12105 12106 12107 12108 12109 12110 12111 12112 12113 12114 12115 12116
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12117 12118 12119 12120 12121 12122 12123 12124 12125 12126 12127 12128 12129
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12130 12131 12132 12133 12134 12135 12136 12137 12138 12139 12140 12141 12142
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12143 12144 12145 12146 12147 12148 12149 12150 12151 12152 12153 12154 12155
##     1     1     1     1     1     1     1     1     1     1     1     1     1
## 12156 12157 12158 12159 12160 12161 12162 12163 12164 12165 12166 12167 12168
##     1     1     1     1     2     1     1     1     1     1     1     1     1
## 12169 12170 12171 12172 12173 12174 12175 12176 12177 12178 12179 12180 12181
##     1     1     2     1     1     1     1     1     1     1     1     1     1
## 12182 12183 12184 12185 12186 12187 12188 12189 12190 12191 12192 12193 12194
##     1     1     1     1     1     1     1     1     1     2     1     1     1
## 12195 12196 12197 12198 12199
##     1     1     1     1     1
```

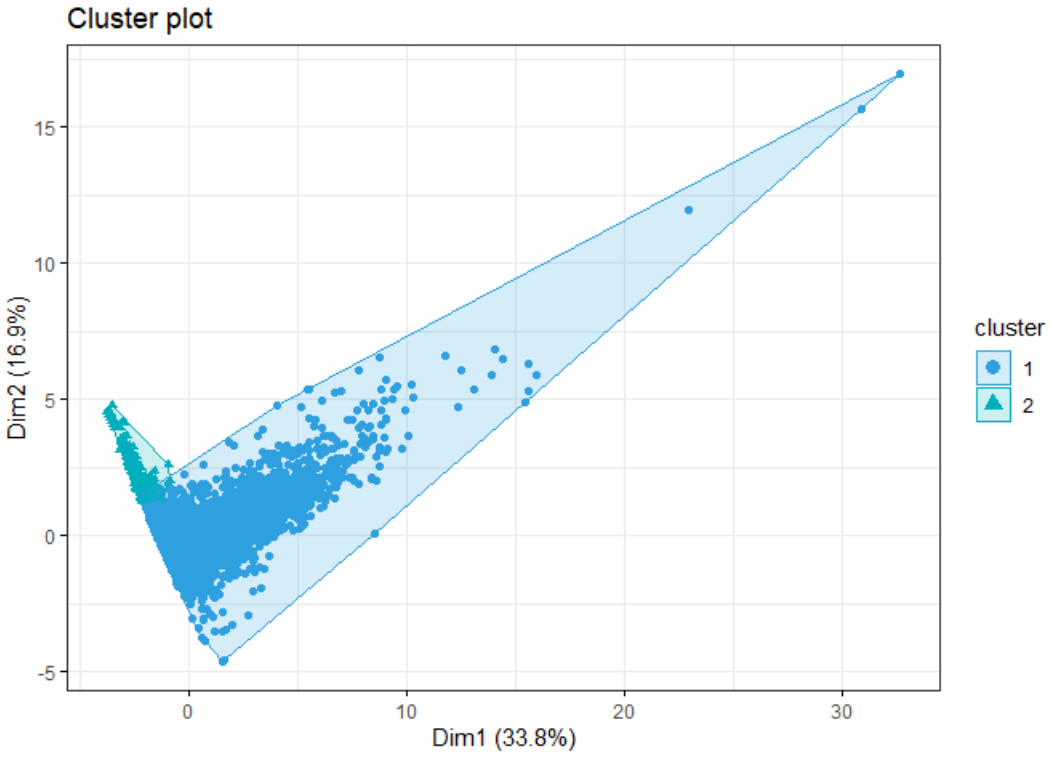
```
# Previewing the no. of records in each cluster
#
model_k$size
```

```
## [1] 11267   932
```

```
t1 <- table(model_k$cluster, mod.class)
t1
```

```
##    mod.class
##     FALSE TRUE
##   1  9365 1902
##   2   926    6
```

```
fviz_cluster(model_k, data = data.mod,
             palette = c("#2E9FDF", "#00AFBB", "#E7B800"),
             geom = "point",
             ellipse.type = "convex",
             ggtheme = theme_bw()
             )
```



Conclusion From the K Means Clustering, using two centroids and a 100 iterations, we can see that the algorithm did a good job by classifying most True's in the revenue column as true but did not cluster the false group well. It clusters well to around 50% on both

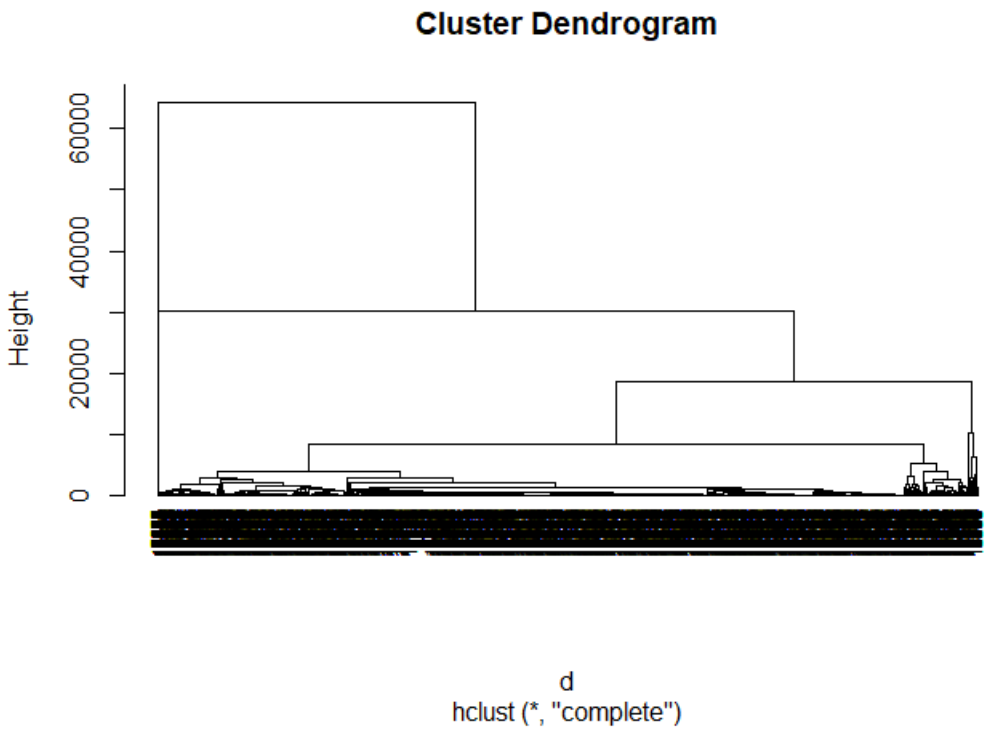
Hierarchical Clustering

```
library(cluster)
library(dendextend)
```

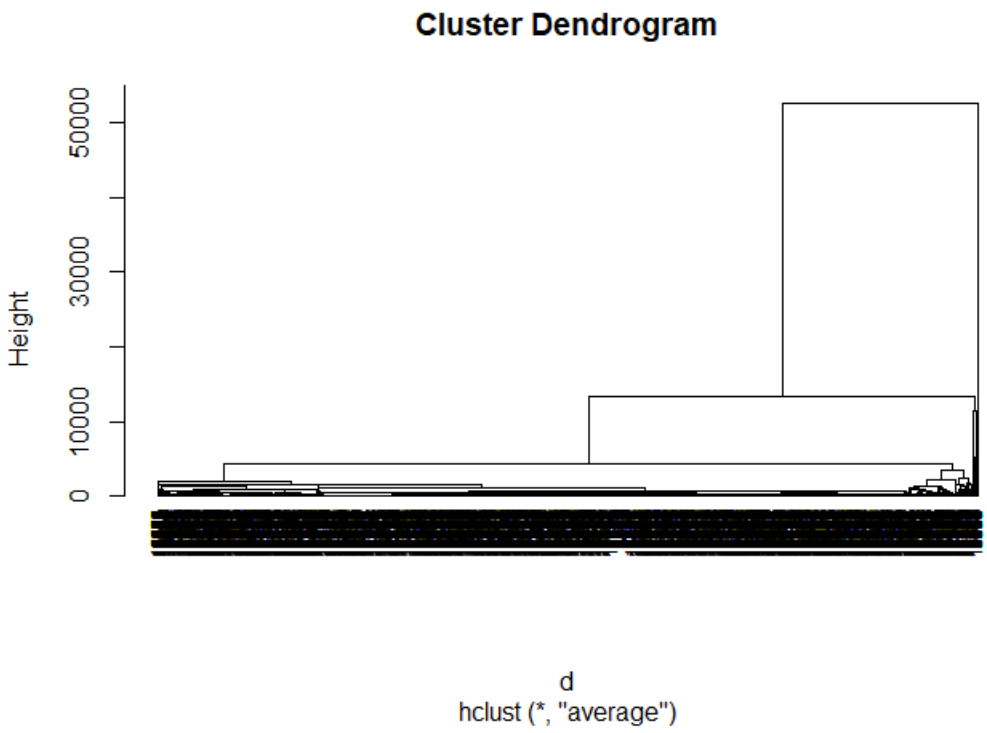
```
##
## ---------------------
## Welcome to dendextend version 1.13.4
## Type citation('dendextend') for how to cite the package.
##
## Type browseVignettes(package = 'dendextend') for the package vignette.
## The github page is: https://github.com/talgalili/dendextend/
##
## Suggestions and bug-reports can be submitted at: https://github.com/talgalili/dendextend/is
## Or contact: <tal.galili@gmail.com>
##
##  To suppress this message use:  suppressPackageStartupMessages(library(dendextend))
## ---------------------

##
## Attaching package: 'dendextend'

## The following object is masked from 'package:ggpubr':
##
##     rotate

## The following object is masked from 'package:stats':
##
##     cutree
```

```
library(purrr)
```

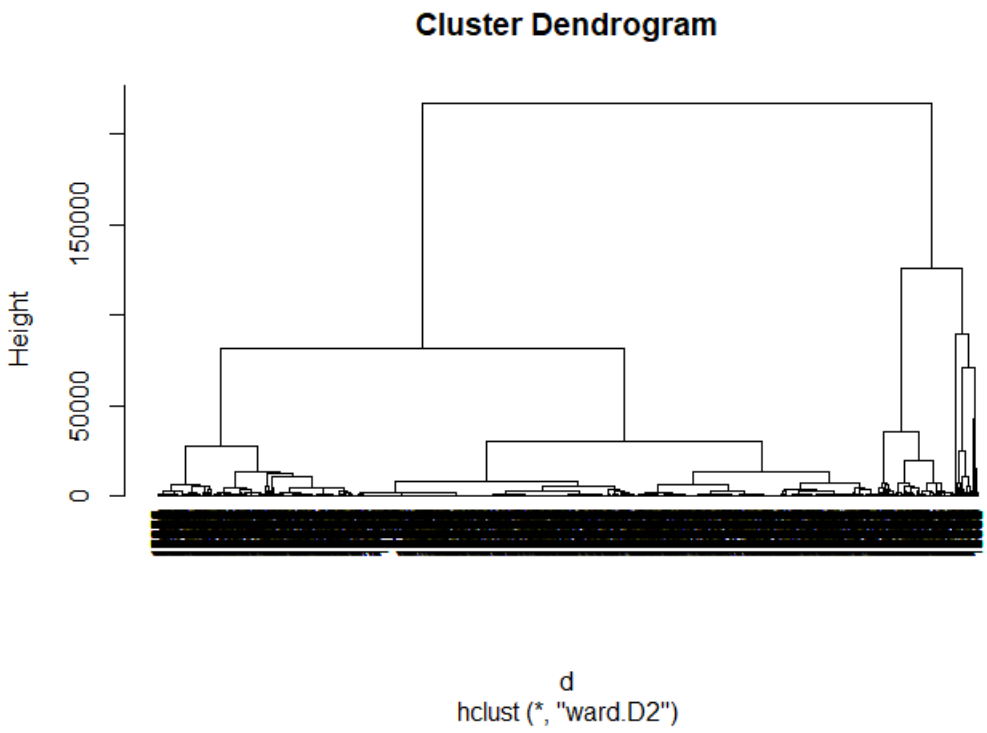
```
# Dissimilarity matrix

d <- dist(mod.new, method = "euclidean")

# Hierarchical clustering using Complete Linkage
hc1 <- hclust(d, method = "complete" )

# Plot the obtained dendrogram
plot(hc1, cex = 0.6, hang = -1)
```




```
# Hierarchical clustering using Average Linkage
hc2 <- hclust(d, method = "average" )

# Plot the obtained dendrogram
plot(hc2, cex = 0.6, hang = -1)
```




```
# Hierarchical clustering using Average Linkage
hc3 <- hclust(d, method = "ward.D2" )

# Plot the obtained dendrogram
plot(hc3, cex = 0.6, hang = -1)
```



Conclusion

It would be advised that the Kira Plastinina marketers should use the K Means clustering for Customer Segmentation since the clusters are clearer. * But, it would also be great to use DBSCAN for this study to be able to classify potential customers and also the outliers.