Online Shop Analysis

Specifying The Question

To assist the sales team in identifying characteristics of consumer groups, do cluster analysis on customer behavior data obtained by Kira Plastinina, a Russian company.

Metrics of success

Distinction of customer groups and their differentiating characteristics.

Understanding the context

We will be using data collected from an E-Commerce site. E-commerce is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the internet.

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.

Recording the experimental design

- Loading the data
- Check the Data
- Perform Data Cleaning
- Perform Exploratory Data Analysis (Univariate, Bivariate & Multivariate)
- Implement the Solution
- Conclusion

Loading libraries

```
# Importing the necessary R libraries
library(tidyverse)
```

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

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

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

```
library(magrittr)
```

```
##
## Attaching package: 'magrittr'
```

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

```
## The following object is masked from 'package:tidyr':
##
##     extract
```

```
library(corrplot)
```

```
## corrplot 0.90 loaded
```

```
library(caret)
```

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

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

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

```
library(readr)
library(BBmisc)
```

```
##
## Attaching package: 'BBmisc'
```

```
## The following objects are masked from 'package:dplyr':
##
##     coalesce, collapse
```

```
## The following object is masked from 'package:base':
##
##     isFALSE
```

```
library(psych)
```

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

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

```
options(warn = -1)

library(grid)
```

```
##
## Attaching package: 'grid'

## The following object is masked from 'package:BBmisc':
##
##     explode
```

```
theme_set(theme_bw())
options(warn = -1)
```

```
library(ggplot2)
```

Loading data

```
shop = read.csv("http://bit.ly/EcommerceCustomersDataset")
```

Exploratory Analysis

Checking the data

```
# checking the head of our data
head(shop)
```

```
##   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 the tail of our data
tail(shop)
```

```
##       Administrative Administrative_Duration Informational
## 12325              0                      0             1
## 12326              3                    145             0
## 12327              0                      0             0
## 12328              0                      0             0
## 12329              4                     75             0
## 12330              0                      0             0
##       Informational_Duration ProductRelated ProductRelated_Duration BounceRates
## 12325                      0             16                503.000 0.000000000
## 12326                      0             53               1783.792 0.007142857
## 12327                      0              5                465.750 0.000000000
## 12328                      0              6                184.250 0.083333333
## 12329                      0             15                346.000 0.000000000
## 12330                      0              3                 21.250 0.000000000
##        ExitRates PageValues SpecialDay Month OperatingSystems Browser Region
## 12325 0.03764706    0.00000          0   Nov                2       2      1
## 12326 0.02903061   12.24172          0   Dec                4       6      1
## 12327 0.02133333    0.00000          0   Nov                3       2      1
## 12328 0.08666667    0.00000          0   Nov                3       2      1
## 12329 0.02105263    0.00000          0   Nov                2       2      3
## 12330 0.06666667    0.00000          0   Nov                3       2      1
##       TrafficType       VisitorType Weekend Revenue
## 12325           1 Returning_Visitor   FALSE   FALSE
## 12326           1 Returning_Visitor    TRUE   FALSE
## 12327           8 Returning_Visitor    TRUE   FALSE
## 12328          13 Returning_Visitor    TRUE   FALSE
## 12329          11 Returning_Visitor   FALSE   FALSE
## 12330           2       New_Visitor    TRUE   FALSE
```

```
# checking the structure of the data
str(shop)
```

```
## '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" "Returni
##  $ Weekend                : logi  FALSE FALSE FALSE FALSE TRUE FALSE ...
##  $ Revenue                : logi  FALSE FALSE FALSE FALSE FALSE FALSE ...
```

The dataset consists of 10 numerical and 8 categorical attributes

```
# checking the number of observations and features
dim(shop)
```

```
## [1] 12330    18
```

Our data set has 12330 observations and 18 variables.

Tidying the data

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

```
##          Administrative Administrative_Duration           Informational
##                      14                      14                      14
##  Informational_Duration          ProductRelated ProductRelated_Duration
##                      14                      14                      14
##             BounceRates              ExitRates             PageValues
##                      14                      14                       0
##              SpecialDay                   Month        OperatingSystems
##                       0                       0                       0
##                 Browser                  Region             TrafficType
##                       0                       0                       0
##             VisitorType                 Weekend                 Revenue
##                       0                       0                       0
```

There are missing values in the columns: Administrative, Administrative_Duration,Informationa,Informational_Duration,Pro

Let's check whether the features (columns) and samples (rows) have more than 5% of the data missing using a function.

```r
pMiss <- function(x){sum(is.na(x))/length(x)*100}
apply(shop,2,pMiss)
```

```
##          Administrative Administrative_Duration           Informational
##               0.1135442                0.1135442               0.1135442
##  Informational_Duration          ProductRelated ProductRelated_Duration
##               0.1135442                0.1135442               0.1135442
##             BounceRates              ExitRates              PageValues
##               0.1135442                0.1135442               0.0000000
##              SpecialDay                  Month        OperatingSystems
##               0.0000000                0.0000000               0.0000000
##                 Browser                 Region             TrafficType
##               0.0000000                0.0000000               0.0000000
##             VisitorType                Weekend                 Revenue
##               0.0000000                0.0000000               0.0000000
```

```r
apply(shop,1,pMiss)
```

```
##     [1]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##     [9]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [17]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [25]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [33]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [41]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [49]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [57]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [65]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [73]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [81]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [89]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##    [97]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [105]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [113]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [121]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [129]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [137]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [145]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [153]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [161]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [169]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [177]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [185]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [193]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [201]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [209]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [217]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [225]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [233]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [241]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [249]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [257]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [265]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
##   [273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##   [697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##   [705]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [713]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [721]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [729]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [737]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [745]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [753]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [761]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [769]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [777]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [785]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [793]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [801]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [809]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [817]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [825]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [833]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [841]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [849]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [857]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [865]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [873]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [881]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [889]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [897]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [905]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [913]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [921]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [929]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [937]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [945]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [953]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [961]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [969]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [977]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [985]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##   [993]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1001]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1009]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1017]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1025]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1033]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1041]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1049]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1057]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1065]  0.00000 44.44444  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1073]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1081]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1089]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1097]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1105]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1113]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1121]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1129]  0.00000  0.00000  0.00000  0.00000 44.44444 44.44444 44.44444 44.44444
```

```
##  [1137] 44.44444  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1145]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1153]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1161]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1169]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1177]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1185]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1193]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1201]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1209]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1217]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1225]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1233]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1241]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1249]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1257]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1265]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1273]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1281]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1289]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1297]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1305]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1313]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1321]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1329]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1337]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1345]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1353]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1361]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1369]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1377]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1385]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1393]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1401]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1409]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1417]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1425]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1433]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1441]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1449]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1457]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1465]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1473]  0.00000 44.44444 44.44444 44.44444 44.44444  0.00000  0.00000  0.00000
##  [1481]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1489]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1497]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1505]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1513]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1521]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1529]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1537]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1545]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1553]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [1561]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
##  [1569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1705] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1713] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1721] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1729] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1737] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1745] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1777] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1785] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1793] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1801] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1809] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1817] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1825] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1833] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1841] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1849] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1857] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [1993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [2001]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2009]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2017]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2025]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2033]  0.00000  0.00000  0.00000  0.00000  0.00000 44.44444 44.44444 44.44444
##  [2041]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2049]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2057]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2065]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2073]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2081]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2089]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2097]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2105]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2113]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2121]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2129]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2137]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2145]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2153]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2161]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2169]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2177]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2185]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2193]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2201]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2209]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2217]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2225]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2233]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2241]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2249]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2257]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2265]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2273]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2281]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2289]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2297]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2305]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2313]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2321]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2329]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2337]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2345]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2353]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2361]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2369]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2377]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2385]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2393]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2401]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2409]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2417]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2425]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
##  [2433]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2441]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2449]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2457]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2465]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2473]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2481]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2489]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2497]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2505]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2513]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2521]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2529]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2537]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2545]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2553]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2561]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2569]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2577]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2585]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2593]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2601]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2609]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2617]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2625]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2633]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2641]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2649]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2657]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2665]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2673]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2681]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2689]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2697]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2705]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2713]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2721]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2729]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2737]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2745]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2753]  0.00000 44.44444  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2761]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2769]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2777]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2785]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2793]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2801]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2809]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2817]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2825]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2833]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2841]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2849]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [2857]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
##  [2865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [2993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3001] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3009] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3017] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3025] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3033] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3041] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [3297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3705] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3713] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3721] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [3729] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3737] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3745] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3777] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3785] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3793] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3801] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3809] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3817] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3825] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3833] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3841] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3849] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3857] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [3993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4001] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4009] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4017] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4025] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4033] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4041] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [4161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [4593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4705] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4713] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4721] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4729] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4737] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4745] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4777] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4785] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4793] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4801] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4809] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4817] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4825] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4833] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4841] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4849] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4857] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [4993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5001] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5009] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5017] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [5025] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5033] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5041] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [5457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5705] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5713] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5721] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5729] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5737] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5745] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5777] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5785] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5793] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5801] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5809] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5817] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5825] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5833] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5841] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5849] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5857] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [5889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [5993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6001] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6009] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6017] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6025] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6033] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6041] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [6321]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6329]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6337]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6345]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6353]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6361]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6369]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6377]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6385]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6393]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6401]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6409]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6417]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6425]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6433]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6441]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6449]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6457]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6465]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6473]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6481]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6489]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6497]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6505]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6513]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6521]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6529]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6537]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6545]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6553]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6561]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6569]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6577]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6585]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6593]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6601]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6609]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6617]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6625]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6633]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6641]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6649]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6657]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6665]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6673]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6681]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6689]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6697]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6705]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6713]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6721]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6729]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6737]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [6745]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
##  [6753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6777] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6785] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6793] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6801] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6809] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6817] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6825] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6833] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6841] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6849] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6857] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [6993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7001] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7009] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7017] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7025] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7033] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7041] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [7185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [7609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [7617]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7625]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7633]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7641]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7649]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7657]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7665]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7673]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7681]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7689]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7697]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7705]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7713]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7721]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7729]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7737]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7745]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7753]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7761]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7769]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7777]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7785]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7793]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7801]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7809]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7817]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7825]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7833]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7841]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7849]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7857]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7865]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7873]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7881]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7889]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7897]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7905]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7913]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7921]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7929]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7937]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7945]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7953]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7961]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7969]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7977]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7985]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [7993]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [8001]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [8009]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [8017]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [8025]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [8033]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [8041]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
##  [8049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [8481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8705] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8713] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8721] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8729] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8737] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8745] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8777] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8785] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8793] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8801] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8809] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8817] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8825] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8833] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8841] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8849] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8857] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8865] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8873] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8881] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8889] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8897] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8905] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [8913] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8921] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8929] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8937] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8945] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8953] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8961] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8969] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8977] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8985] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [8993] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9001] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9009] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9017] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9025] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9033] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9041] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9049] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9057] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9065] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9073] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9081] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9089] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9097] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9105] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9113] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9121] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9129] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9137] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9145] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9153] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9161] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9169] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9177] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9185] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9193] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9201] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9209] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9217] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9225] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9233] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9241] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9249] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9257] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9265] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9273] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9281] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9289] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9297] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9305] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9313] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9321] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9329] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9337] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [9345] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9353] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9361] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9369] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9377] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9385] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9393] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9401] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9409] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9417] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9425] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9433] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9441] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9449] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9457] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9465] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9473] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9481] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9489] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9497] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9505] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9513] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9521] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9529] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9537] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9545] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9553] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9561] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9569] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9577] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9585] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9593] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9601] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9609] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9617] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9625] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9633] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9641] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9649] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9657] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9665] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9673] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9681] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9689] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9697] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9705] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9713] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9721] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9729] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9737] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9745] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9753] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9761] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
##  [9769] 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

```
##  [9777]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9785]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9793]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9801]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9809]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9817]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9825]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9833]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9841]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9849]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9857]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9865]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9873]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9881]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9889]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9897]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9905]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9913]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9921]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9929]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9937]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9945]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9953]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9961]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9969]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9977]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9985]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
##  [9993]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10001]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10009]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10017]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10025]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10033]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10041]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10049]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10057]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10065]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10073]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10081]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10089]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10097]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10105]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10113]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10121]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10129]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10137]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10145]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10153]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10161]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10169]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10177]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10185]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10193]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10201]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
## [10209]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10217]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10225]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10233]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10241]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10249]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10257]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10265]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10273]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10281]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10289]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10297]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10305]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10313]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10321]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10329]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10337]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10345]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10353]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10361]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10369]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10377]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10385]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10393]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10401]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10409]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10417]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10425]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10433]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10441]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10449]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10457]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10465]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10473]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10481]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10489]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10497]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10505]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10513]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10521]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10529]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10537]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10545]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10553]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10561]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10569]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10577]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10585]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10593]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10601]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10609]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10617]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10625]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10633]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
## [10641]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10649]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10657]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10665]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10673]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10681]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10689]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10697]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10705]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10713]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10721]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10729]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10737]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10745]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10753]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10761]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10769]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10777]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10785]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10793]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10801]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10809]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10817]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10825]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10833]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10841]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10849]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10857]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10865]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10873]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10881]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10889]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10897]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10905]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10913]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10921]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10929]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10937]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10945]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10953]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10961]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10969]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10977]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10985]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [10993]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11001]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11009]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11017]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11025]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11033]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11041]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11049]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11057]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11065]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
## [11073]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11081]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11089]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11097]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11105]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11113]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11121]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11129]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11137]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11145]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11153]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11161]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11169]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11177]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11185]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11193]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11201]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11209]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11217]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11225]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11233]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11241]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11249]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11257]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11265]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11273]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11281]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11289]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11297]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11305]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11313]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11321]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11329]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11337]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11345]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11353]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11361]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11369]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11377]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11385]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11393]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11401]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11409]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11417]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11425]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11433]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11441]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11449]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11457]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11465]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11473]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11481]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11489]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11497]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
## [11505]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11513]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11521]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11529]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11537]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11545]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11553]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11561]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11569]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11577]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11585]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11593]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11601]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11609]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11617]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11625]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11633]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11641]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11649]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11657]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11665]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11673]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11681]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11689]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11697]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11705]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11713]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11721]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11729]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11737]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11745]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11753]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11761]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11769]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11777]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11785]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11793]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11801]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11809]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11817]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11825]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11833]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11841]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11849]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11857]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11865]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11873]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11881]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11889]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11897]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11905]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11913]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11921]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11929]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
```

```
## [11937]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11945]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11953]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11961]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11969]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11977]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11985]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [11993]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12001]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12009]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12017]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12025]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12033]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12041]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12049]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12057]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12065]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12073]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12081]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12089]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12097]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12105]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12113]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12121]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12129]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12137]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12145]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12153]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12161]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12169]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12177]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12185]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12193]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12201]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12209]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12217]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12225]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12233]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12241]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12249]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12257]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12265]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12273]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12281]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12289]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12297]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12305]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12313]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12321]  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000  0.00000
## [12329]  0.00000  0.00000
```

The columns have more than 5% of missing data, we will still drop the rows as they are just 14 and our data has 12330 rows.

```r
# Omitting missing values
shop = na.omit(shop)

# Checking for missing values

colSums(is.na(shop))
```

```
##          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
```

```r
# Check for number of remaining columns
print("The number of rows is:",quote=FALSE)
```

```
## [1] The number of rows is:
```

```r
nrow(shop)
```

```
## [1] 12316
```

The missing values have been omitted and we now have 12316 observations which is enough for our analysis.

```r
# Checking for duplicates
duplicates <- shop[duplicated(shop),]
dim(duplicates)
```

```
## [1] 117  18
```

There are 117 duplicates rows. We will remove the duplicates so as to have reliable data.

```r
# removing duplicates
shop <- shop[!duplicated(shop),]
dim(shop)
```

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

We now have 12199 observations and 18 variables.Our data set seems to still be enough for the analysis.

```r
# Check for unique values in month and visitor type columns
unique(shop$Month);
```

```
##  [1] "Feb"  "Mar"  "May"  "Oct"  "June" "Jul"  "Aug"  "Nov"  "Sep"  "Dec"
```

```
unique(shop$VisitorType);
```

```
## [1] "Returning_Visitor" "New_Visitor"       "Other"
```

- The unique values seem okay.
- The visitor type has 3 unique values; Returning visitor, New visitor and other.
- The months;Jan and April have no record.

```
# Check the number of records with this anomaly

anomaly <- shop %>% select(c(Administrative_Duration, Administrative, Informational_Duration, Informati

anomaly
```

There appears to be anomalies in the ProductRelated_Duration, Administrative_Duration and Informational_Duration columns with some observations having a value of -1. Duration cannot be negative.

```
##    Administrative_Duration Administrative Informational_Duration Informational
## 1                       -1              0                      -1             0
## 2                       -1              0                      -1             0
## 3                       -1              1                      -1             0
## 4                       -1              0                      -1             0
## 5                       -1              0                      -1             0
## 6                       -1              0                      -1             0
## 7                       -1              0                      -1             0
## 8                       -1              0                      -1             0
## 9                       -1              0                      -1             0
## 10                      -1              0                      -1             0
## 11                      -1              0                      -1             0
## 12                      -1              0                      -1             0
## 13                      -1              0                      -1             0
## 14                      -1              0                      -1             0
## 15                      -1              0                      -1             0
## 16                      -1              0                      -1             0
## 17                      -1              0                      -1             0
## 18                      -1              0                      -1             0
## 19                      -1              0                      -1             0
## 20                      -1              0                      -1             0
## 21                      -1              0                      -1             0
## 22                      -1              0                      -1             0
## 23                      -1              0                      -1             0
## 24                      -1              0                      -1             0
## 25                      -1              0                      -1             0
## 26                      -1              0                      -1             0
## 27                      -1              0                      -1             0
## 28                      -1              0                      -1             0
## 29                      -1              1                      -1             0
```

```
## 30                        -1              0                        -1             0
## 31                        -1              0                        -1             0
## 32                        -1              0                        -1             0
## 33                        -1              0                        -1             0
##    ProductRelated_Duration ProductRelated
## 1                        -1              1
## 2                        -1              1
## 3                        -1              1
## 4                        -1              1
## 5                        -1              1
## 6                        -1              1
## 7                        -1              1
## 8                        -1              1
## 9                        -1              1
## 10                       -1              1
## 11                       -1              1
## 12                       -1              1
## 13                       -1              1
## 14                       -1              1
## 15                       -1              1
## 16                       -1              1
## 17                       -1              1
## 18                       -1              1
## 19                       -1              1
## 20                       -1              1
## 21                       -1              1
## 22                       -1              1
## 23                       -1              1
## 24                       -1              1
## 25                       -1              1
## 26                       -1              1
## 27                       -1              1
## 28                       -1              1
## 29                       -1              1
## 30                       -1              1
## 31                       -1              1
## 32                       -1              1
## 33                       -1              1
```

There are 33 records with this anomaly. We will drop this records.

```
# Dropping the 33 records
shop <- shop %>% filter(Administrative_Duration != -1, Informational_Duration != -1, ProductRelated_Dura
```

```
# checking the remaining observations in our data
dim(shop)
```

```
## [1] 12164    18
```

Our data has 12164 observations now. This is still good for our analysis.

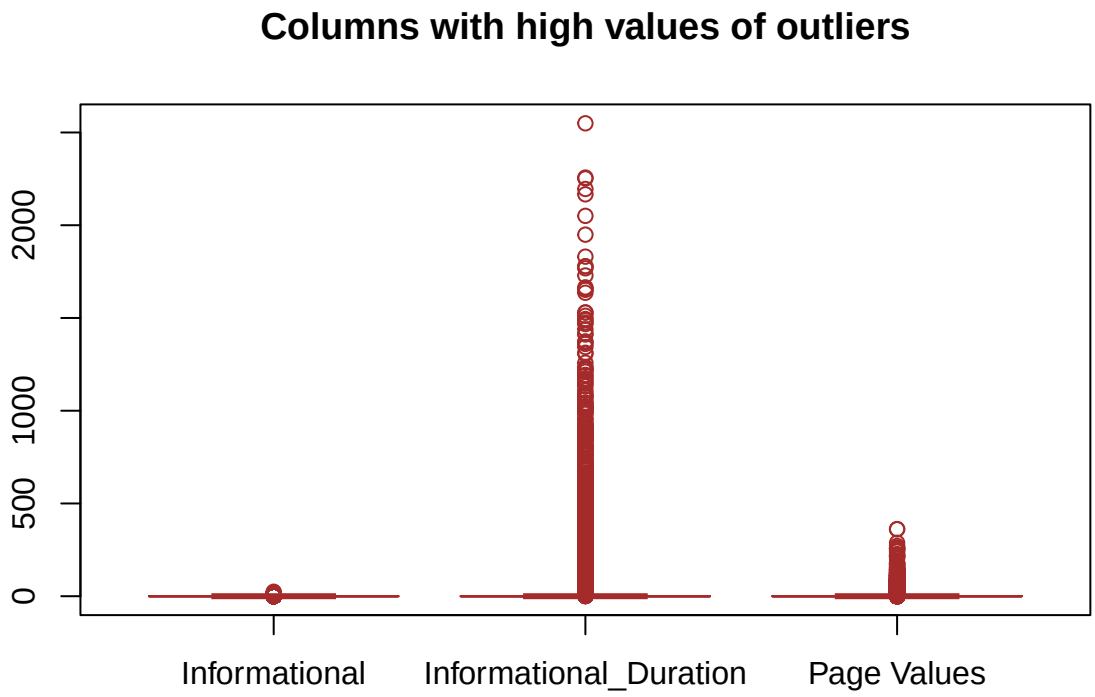
```r
# Creating a  function to check for the number of outliers in each column

outlier_detector <- function(x){
  out <- boxplot.stats(x)$out
  return((length(out)/  12164)*100)
}
```

```r
# Get outlier count per column
sapply(shop[,c(1:9)], outlier_detector)
```

```
##          Administrative Administrative_Duration           Informational
##                3.321276                9.363696               21.621177
##  Informational_Duration          ProductRelated ProductRelated_Duration
##               19.763236                8.278527                7.809931
##             BounceRates               ExitRates              PageValues
##               11.649129               10.637948               22.443275
```

```r
# Plot boxplots of columns with high % of outliers
boxplot(shop$Informational, shop$Informational_Duration, shop$PageValues,
main = "Columns with high values of outliers",
names = c("Informational", "Informational_Duration", "Page Values"),
col = c("orange","blue"),
border = "brown",
notch = TRUE)
```



- All outliers are found above the third quantile, implying that they are all found in the higher ranges of the above variables. Given the nature of the data, it's quite possible for customers to spend extended periods of time on informational pages or browsing pages containing high-value items. As a result, we will keep the outliers.
- The other outliers will not be removed because they may reveal information about certain special days or consumers.

Univariate Analysis

When using univariate approaches, you just look at one variable at a time.

The following are examples of univariate analysis:

- Mean, Median, and Mode are three measures of central tendancy.
- Dispersion measures include the minimum, maximum, range, quartiles, variance, and standard deviation.
- Other factors to consider are skewness and kurtosis.
- Histogram, Box plots, Bar plots, and Kernel density plots are examples of univariate graphs.

```
# checking the summary statistics of each column
summary(shop)
```

```
##  Administrative   Administrative_Duration Informational
##  Min.   : 0.000   Min.   :   0.00         Min.   : 0.0000
##  1st Qu.: 0.000   1st Qu.:   0.00         1st Qu.: 0.0000
##  Median : 1.000   Median :  10.00         Median : 0.0000
##  Mean   : 2.347   Mean   :  81.92         Mean   : 0.5103
##  3rd Qu.: 4.000   3rd Qu.:  95.00         3rd Qu.: 0.0000
##  Max.   :27.000   Max.   :3398.75         Max.   :24.0000
##  Informational_Duration ProductRelated   ProductRelated_Duration
##  Min.   :   0.00        Min.   :  0.00   Min.   :    0.0
##  1st Qu.:   0.00        1st Qu.:  8.00   1st Qu.:  196.5
##  Median :   0.00        Median : 18.00   Median :  613.2
##  Mean   :  34.94        Mean   : 32.15   Mean   : 1211.0
##  3rd Qu.:   0.00        3rd Qu.: 38.00   3rd Qu.: 1482.0
##  Max.   :2549.38        Max.   :705.00   Max.   :63973.5
##   BounceRates         ExitRates         PageValues       SpecialDay
##  Min.   :0.000000   Min.   :0.00000   Min.   :  0.00   Min.   :0.00000
##  1st Qu.:0.000000   1st Qu.:0.01417   1st Qu.:  0.00   1st Qu.:0.00000
##  Median :0.002865   Median :0.02500   Median :  0.00   Median :0.00000
##  Mean   :0.020001   Mean   :0.04108   Mean   :  5.97   Mean   :0.06202
##  3rd Qu.:0.016318   3rd Qu.:0.04804   3rd Qu.:  0.00   3rd Qu.:0.00000
##  Max.   :0.200000   Max.   :0.20000   Max.   :361.76   Max.   :1.00000
##     Month           OperatingSystems    Browser          Region
##  Length:12164       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   :2.125    Mean   : 2.358   Mean   :3.153
##                     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.   : 1.000   Length:12164       Mode :logical   Mode :logical
##  1st Qu.: 2.000   Class :character   FALSE:9311      FALSE:10256
##  Median : 2.000   Mode  :character   TRUE :2853      TRUE :1908
##  Mean   : 4.076
##  3rd Qu.: 4.000
##  Max.   :20.000
```

The method describe() gives more measures of dispersion compared to the summary()

The describe() function which is part of the Hmisc package displays the following additional statistics:

- Number of rows
- Standard deviation
- Trimmed mean
- Mean absolute deviation
- Skewness
- Kurtosis
- Standard error

```
# describing our columns
describe(shop)
```

```
##                          vars     n    mean      sd median trimmed    mad min
## Administrative              1 12164    2.35    3.33   1.00    1.66   1.48   0
## Administrative_Duration     2 12164   81.92  177.73  10.00   43.06  14.83   0
## Informational               3 12164    0.51    1.28   0.00    0.18   0.00   0
## Informational_Duration      4 12164   34.94  141.65   0.00    3.76   0.00   0
## ProductRelated              5 12164   32.15   44.63  18.00   23.14  19.27   0
## ProductRelated_Duration     6 12164 1210.99 1921.59 613.24  835.59 747.59   0
## BounceRates                 7 12164    0.02    0.04   0.00    0.01   0.00   0
## ExitRates                   8 12164    0.04    0.05   0.03    0.03   0.02   0
## PageValues                  9 12164    5.97   18.68   0.00    1.34   0.00   0
## SpecialDay                 10 12164    0.06    0.20   0.00    0.00   0.00   0
## Month*                     11 12164    6.17    2.38   7.00    6.36   1.48   1
## OperatingSystems           12 12164    2.12    0.91   2.00    2.06   0.00   1
## Browser                    13 12164    2.36    1.71   2.00    2.00   0.00   1
## Region                     14 12164    3.15    2.40   3.00    2.79   2.97   1
## TrafficType                15 12164    4.08    4.02   2.00    3.23   1.48   1
## VisitorType*               16 12164    2.71    0.69   3.00    2.89   0.00   1
## Weekend                    17 12164     NaN      NA     NA     NaN     NA Inf
## Revenue                    18 12164     NaN      NA     NA     NaN     NA Inf
##                             max    range  skew kurtosis    se
## Administrative            27.00    27.00  1.94     4.62  0.03
## Administrative_Duration 3398.75  3398.75  5.58    49.97  1.61
## Informational             24.00    24.00  4.01    26.56  0.01
## Informational_Duration  2549.38  2549.38  7.53    75.23  1.28
## ProductRelated           705.00   705.00  4.33    31.01  0.40
## ProductRelated_Duration 63973.52 63973.52  7.25   136.43 17.42
## BounceRates                0.20     0.20  3.21     9.71  0.00
## ExitRates                  0.20     0.20  2.26     4.79  0.00
## PageValues               361.76   361.76  6.34    64.75  0.17
## SpecialDay                 1.00     1.00  3.28     9.78  0.00
```

```
## Month*                    10.00     9.00 -0.83    -0.37  0.02
## OperatingSystems           8.00     7.00  2.03    10.29  0.01
## Browser                   13.00    12.00  3.22    12.56  0.02
## Region                     9.00     8.00  0.98    -0.16  0.02
## TrafficType               20.00    19.00  1.96     3.45  0.04
## VisitorType*               3.00     2.00 -2.04     2.21  0.01
## Weekend                    -Inf     -Inf    NA       NA    NA
## Revenue                    -Inf     -Inf    NA       NA    NA
```

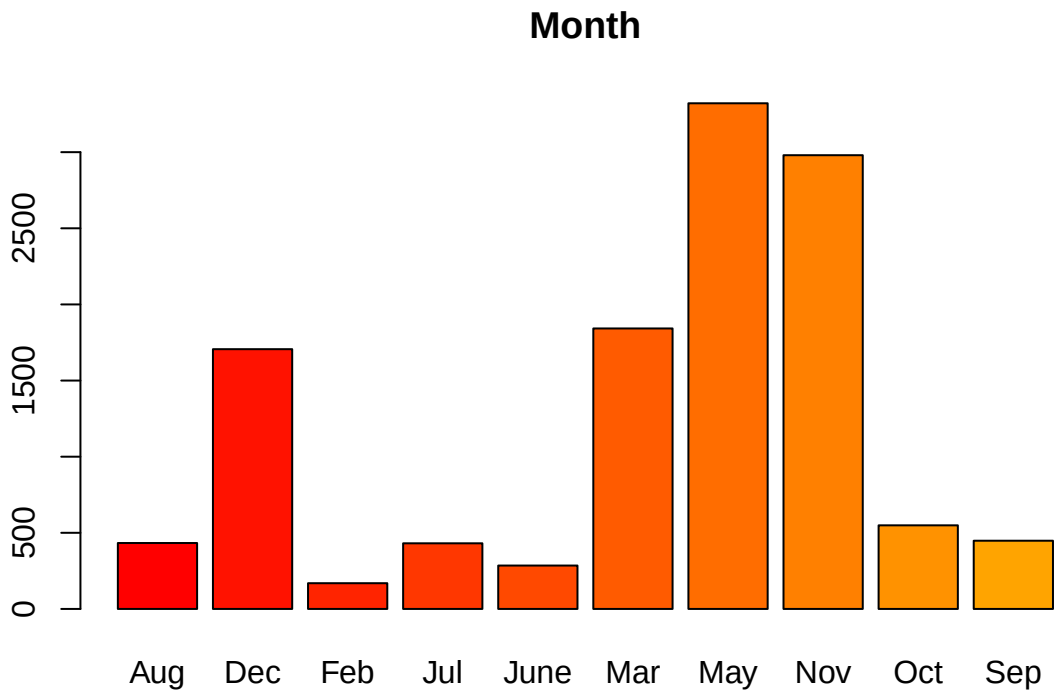
Informational Duration, ProductRelated Duration, and PageValues are the most positively skewed variables, having high kurtosis values.

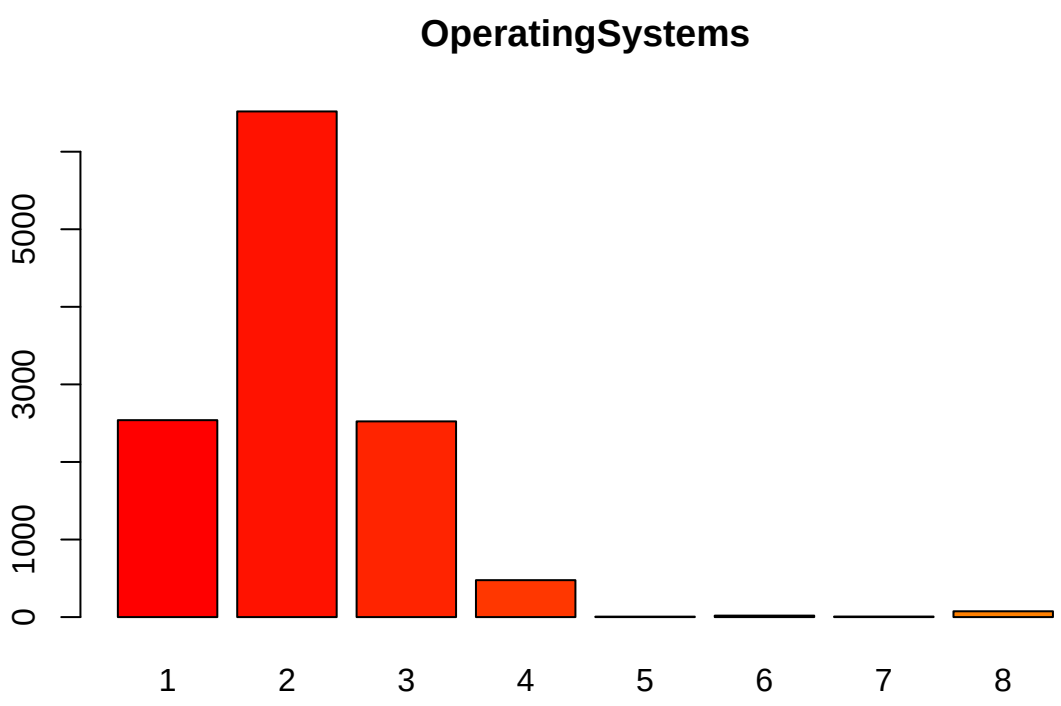
```
# Frequency distribution of the categorical variables
sapply(shop[, c(11:18)], table)
```

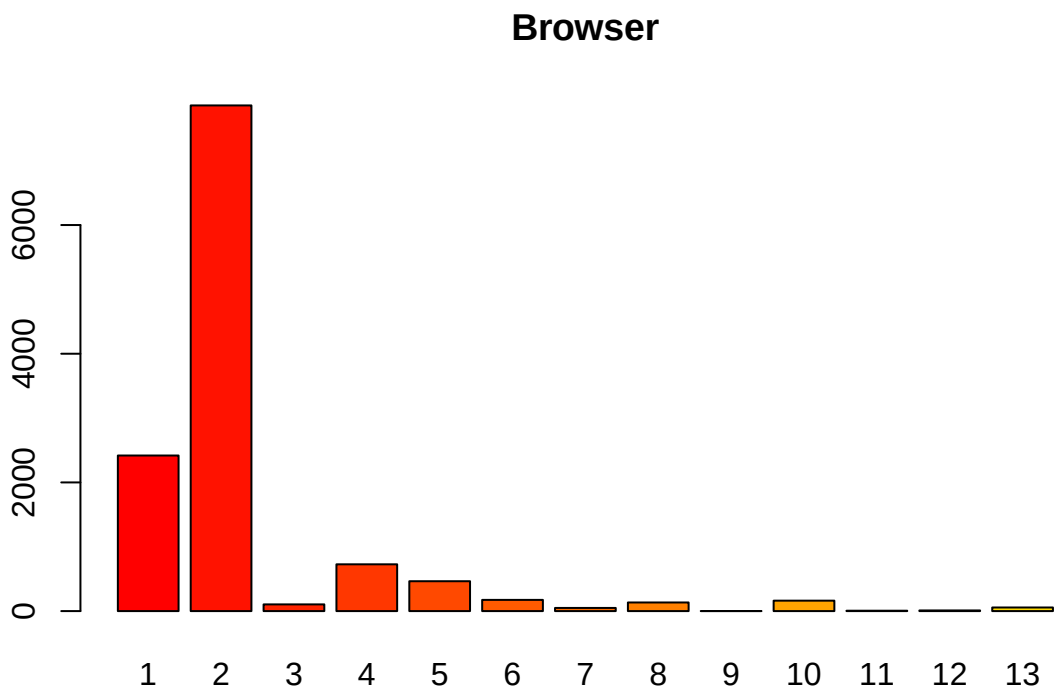
```
## $Month
##
##  Aug  Dec  Feb  Jul June  Mar  May  Nov  Oct  Sep
##  433 1706  169  431  285 1842 3321 2980  549  448
##
## $OperatingSystems
##
##    1    2    3    4    5    6    7    8
## 2539 6519 2523  476    6   19    7   75
##
## $Browser
##
##    1    2    3    4    5    6    7    8    9   10   11   12   13
## 2418 7859  104  727  464  174   49  134    1  162    6   10   56
##
## $Region
##
##    1    2    3    4    5    6    7    8    9
## 4701 1122 2374 1164  315  800  755  431  502
##
## $TrafficType
##
##    1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16
## 2373 3905 2002 1064  259  440   40  343   41  450  247    1  727   13   36    3
##   17   18   19   20
##    1   10   17  192
##
## $VisitorType
##
##       New_Visitor             Other Returning_Visitor
##              1693                81             10390
##
## $Weekend
##
## FALSE  TRUE
##  9311  2853
##
## $Revenue
```

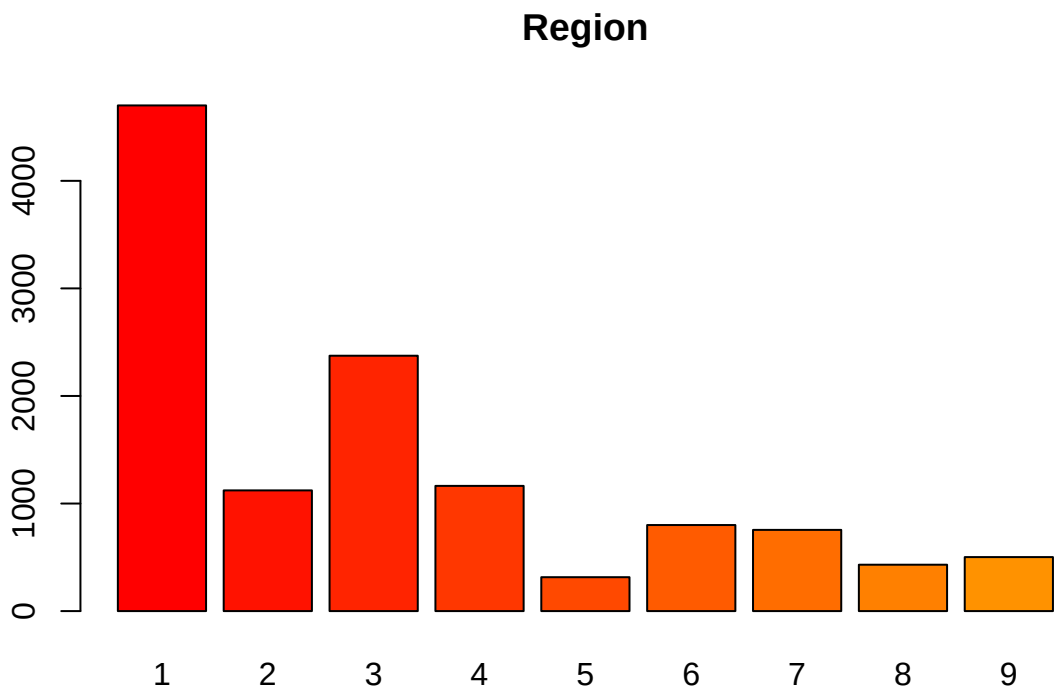
```
##
## FALSE  TRUE
## 10256  1908
```

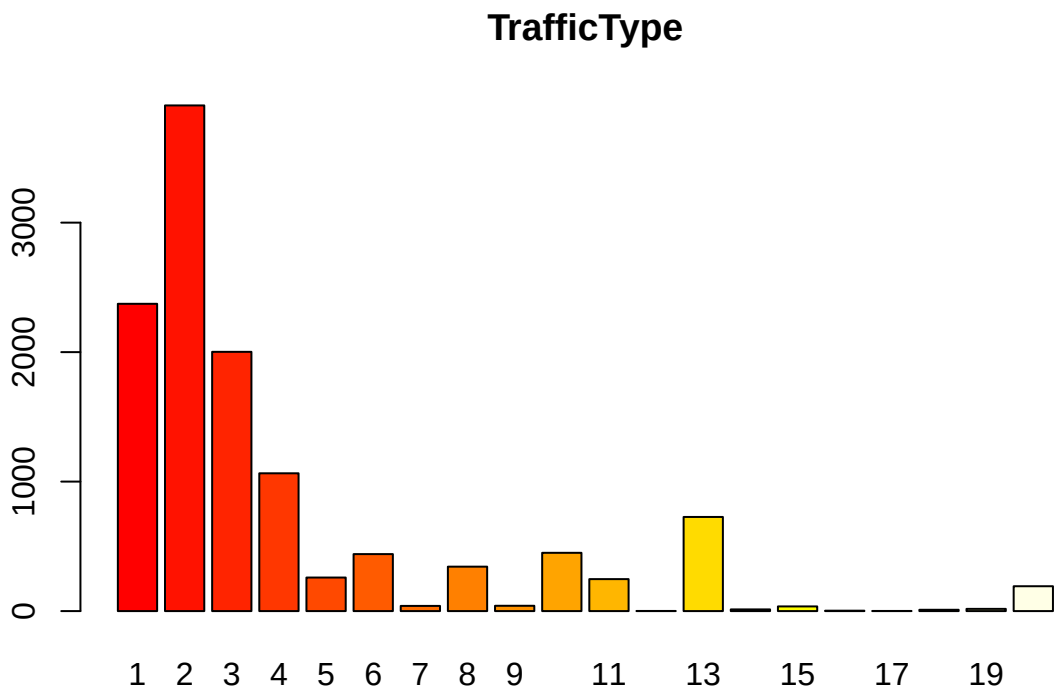
```r
# Creating histogram plots to visually view the categorical variables
#par(mfrow=c(4,1))
for(i in 11:18) {
    counts <- table(shop[,i])
    name <- names(shop)[i]
    barplot(counts, main=name, col = heat.colors(20))}
```

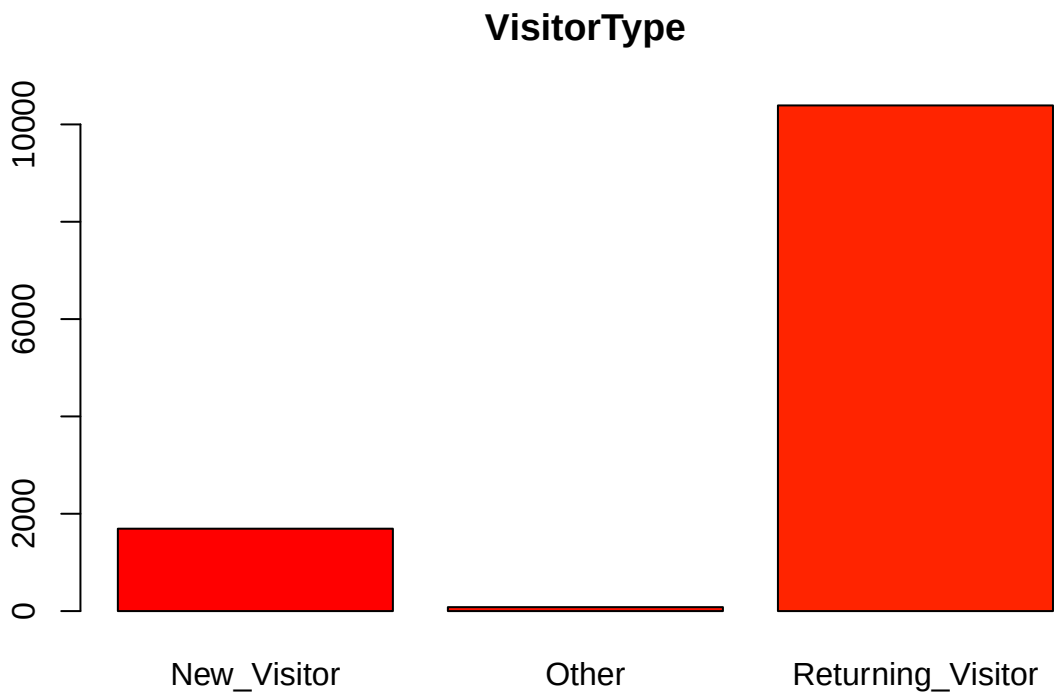


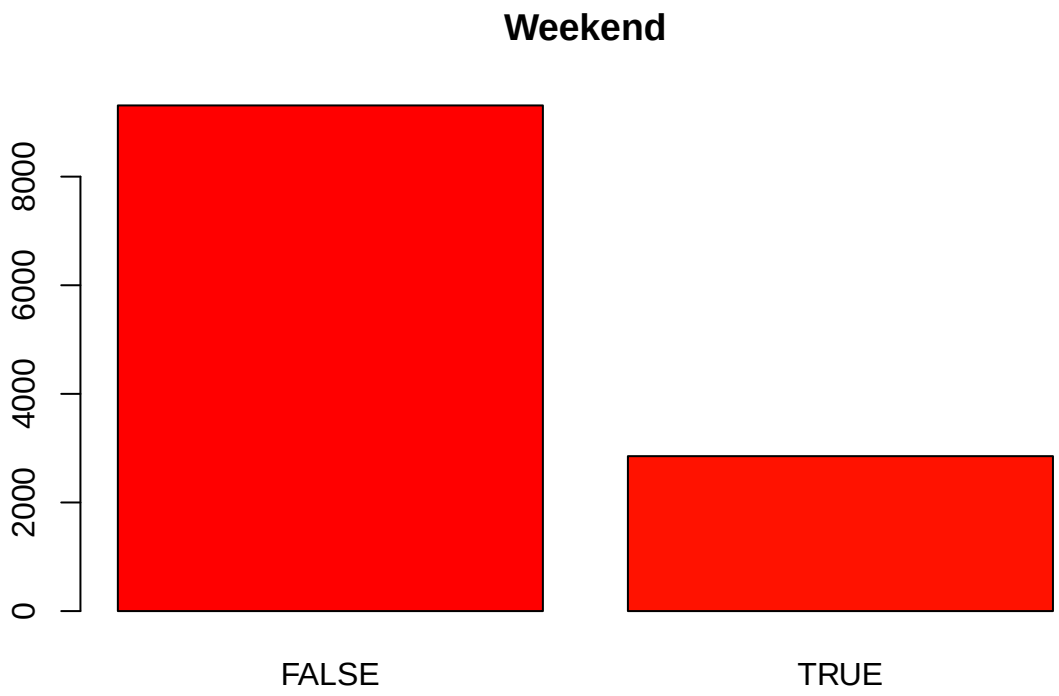

OperatingSystems
0
1000
3000
5000
1
2
3
4
5
6
7
8

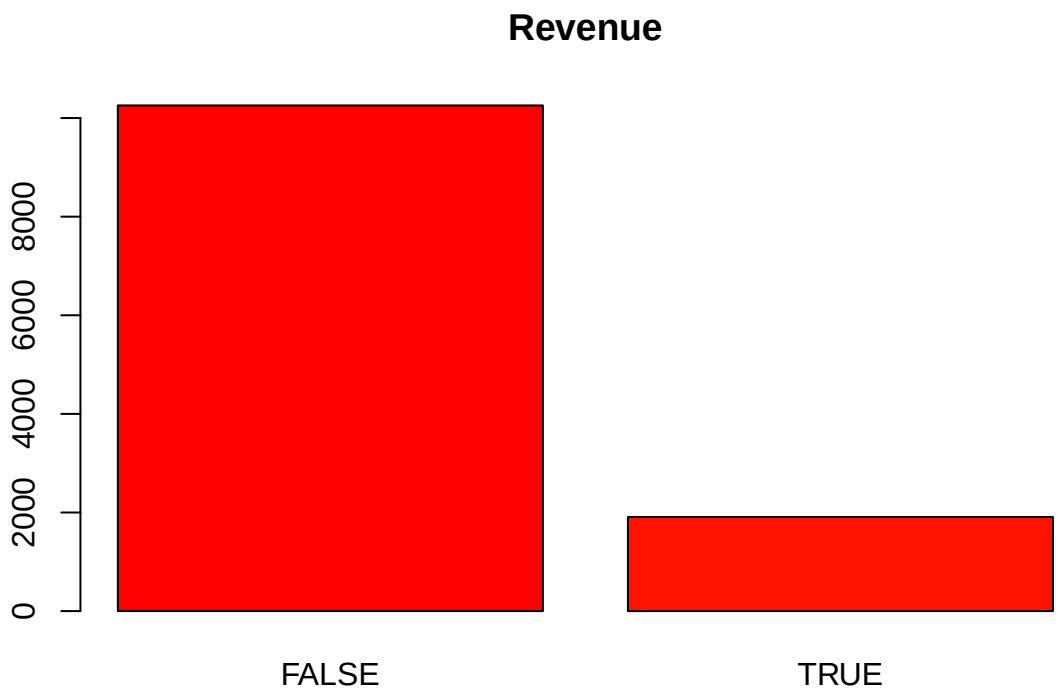

Browser
0
2000
4000
6000
1
2
3
4
5
6
7
8
9
10
11
12
13


Region
0
1000
2000
3000
4000
1
2
3
4
5
6
7
8
9


TrafficType
0
1000
2000
3000
1
2
3
4
5
6
7
8
9
11
13
15
17
19


VisitorType
0
2000
6000
10000
New_Visitor
Other
Returning_Visitor


Weekend
0
2000
4000
6000
8000
FALSE
TRUE

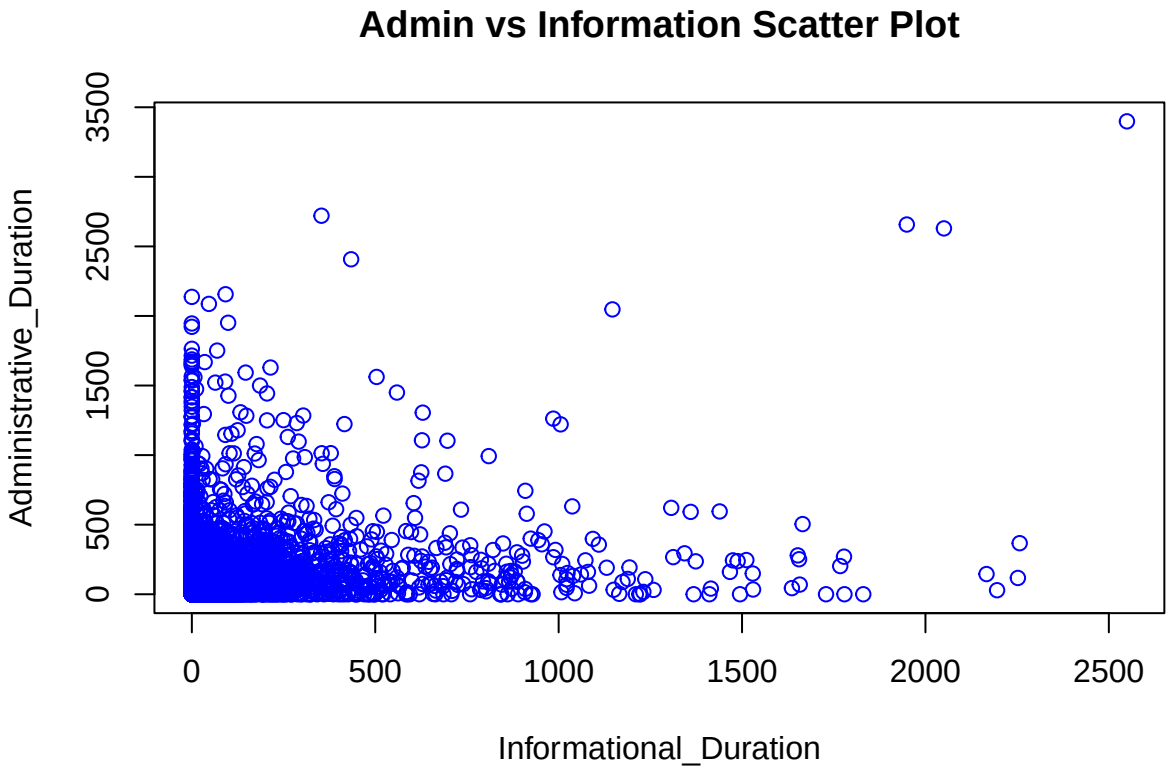


- Months with the highest activity are May, November, March and December.
- Most visitors have a type 2 operating system followed by type 3 and 1.
- Most visitors have a type 2 browser.
- Most visitors to the site are located in region 1 and 3.
- Most of the traffic to the website is of type 2 and 1
- Visitors to the site are mostly returning visitors.
- Most of the traffic happens on weekdays rather than on weekends.
- Most visits to the site do not earn revenue.

Bivariate Analysis

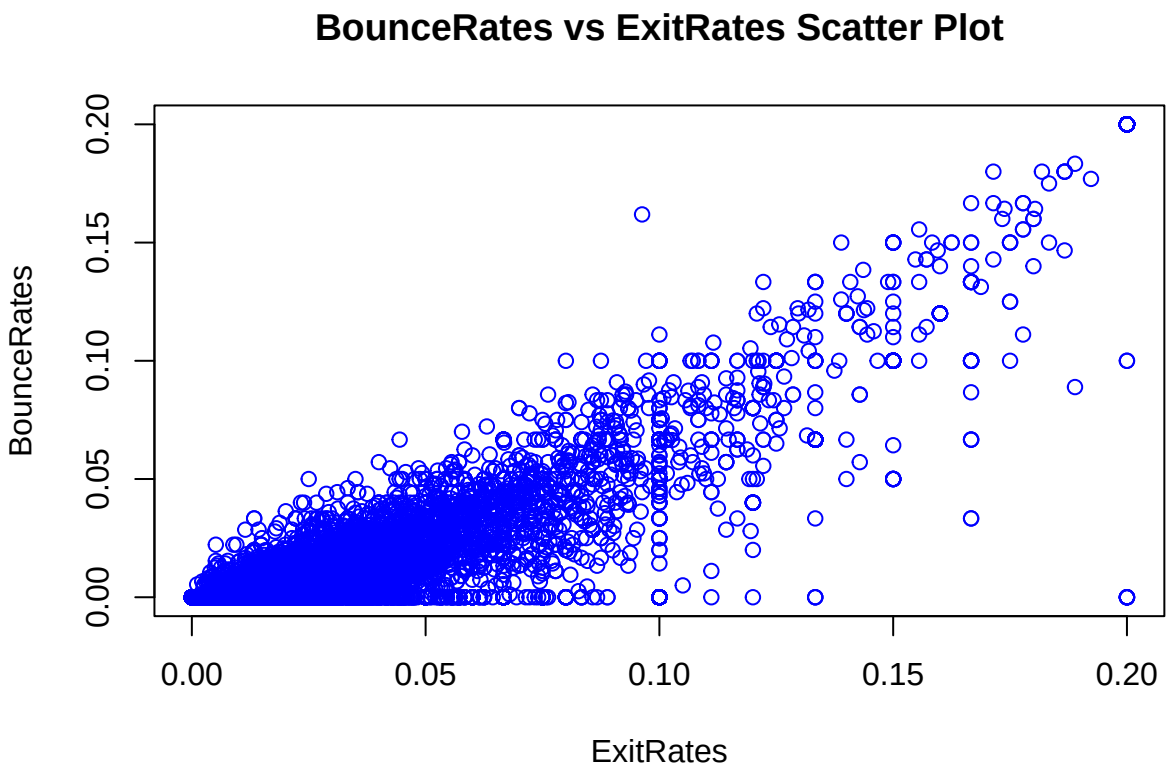
Two variables are analyzed to see if there is a relationship between them.

```
# Let's plot scatter plots
plot(Administrative_Duration ~ Informational_Duration, dat = shop,
      col = "blue",
      main = "Admin vs Information Scatter Plot")
```



The Administration duration and Information duration seem to have a weak relationship.

```
# Let's plot scatter plots
plot(BounceRates ~ ExitRates, dat = shop,
      col = "blue",
      main = "BounceRates vs ExitRates Scatter Plot")
```



There is a high positive correlation between Bounce and exit rates. This shows that users who bounce from one page to another are most likely to exit the site quicker.

```
# Number of visits to product related pages per month
product_stats <- shop %>% select(ProductRelated, ProductRelated_Duration, Month)%>%group_by(Month)%>% su
product_stats[order(product_stats$ProductRelated, decreasing = TRUE),]
```

```
## # A tibble: 10 x 3
##    Month ProductRelated ProductRelated_Duration
##    <chr>          <dbl>                  <dbl>
##  1 Nov             46.3                  1769.
##  2 Aug             38.3                  1273.
##  3 Jul             36.5                  1220.
##  4 June            36.4                  1226.
##  5 Oct             33.6                  1117.
##  6 Sep             33.1                  1253.
##  7 Dec             28.3                  1125.
##  8 May             26.8                   995.
##  9 Mar             20.5                   841.
## 10 Feb             12.1                   513.
```

It seems that there is more activity in November as it has the highest product related visits and the product related duration is high as well.

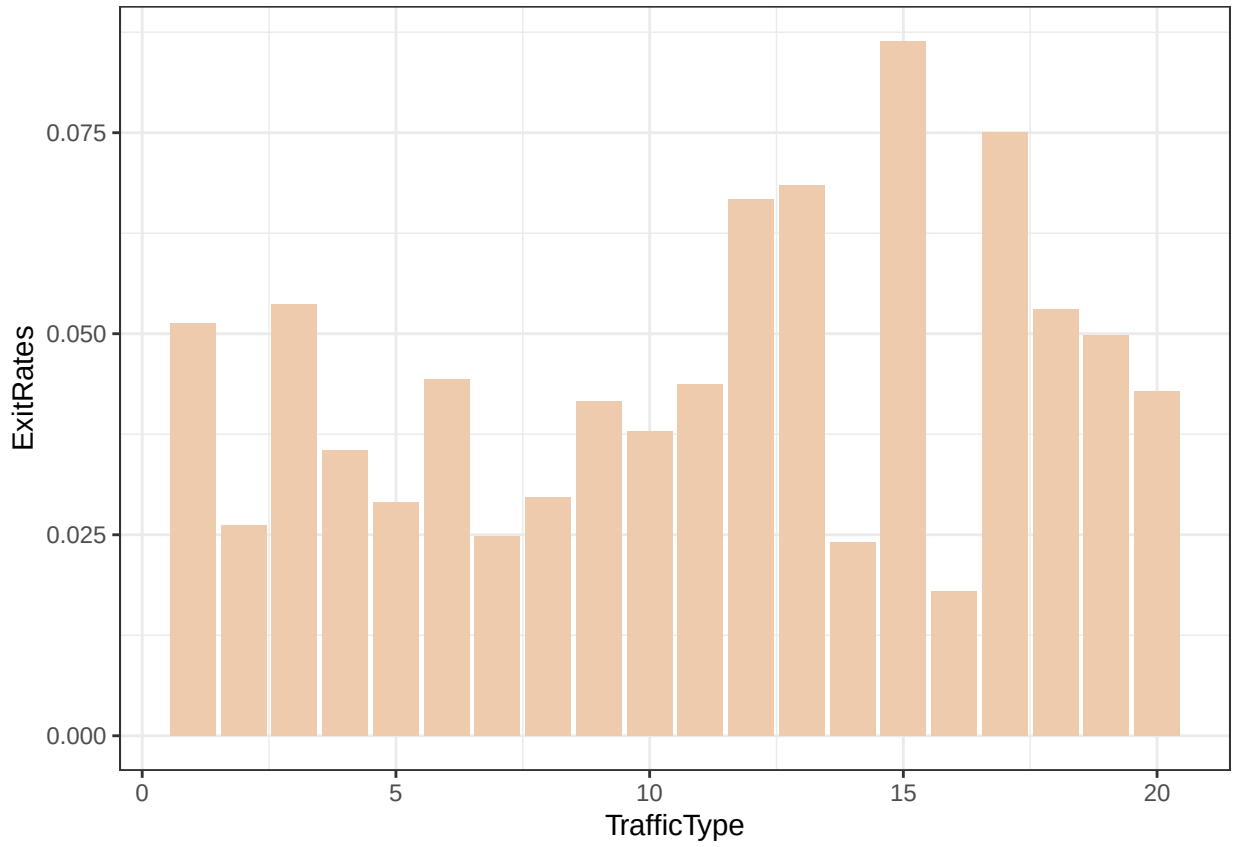
```
# Getting the  bounce rates and exit rates among visitor groups
visitor <- shop %>% select(VisitorType, ExitRates, BounceRates)%>% group_by(VisitorType)%>%summarise_al

visitor
```

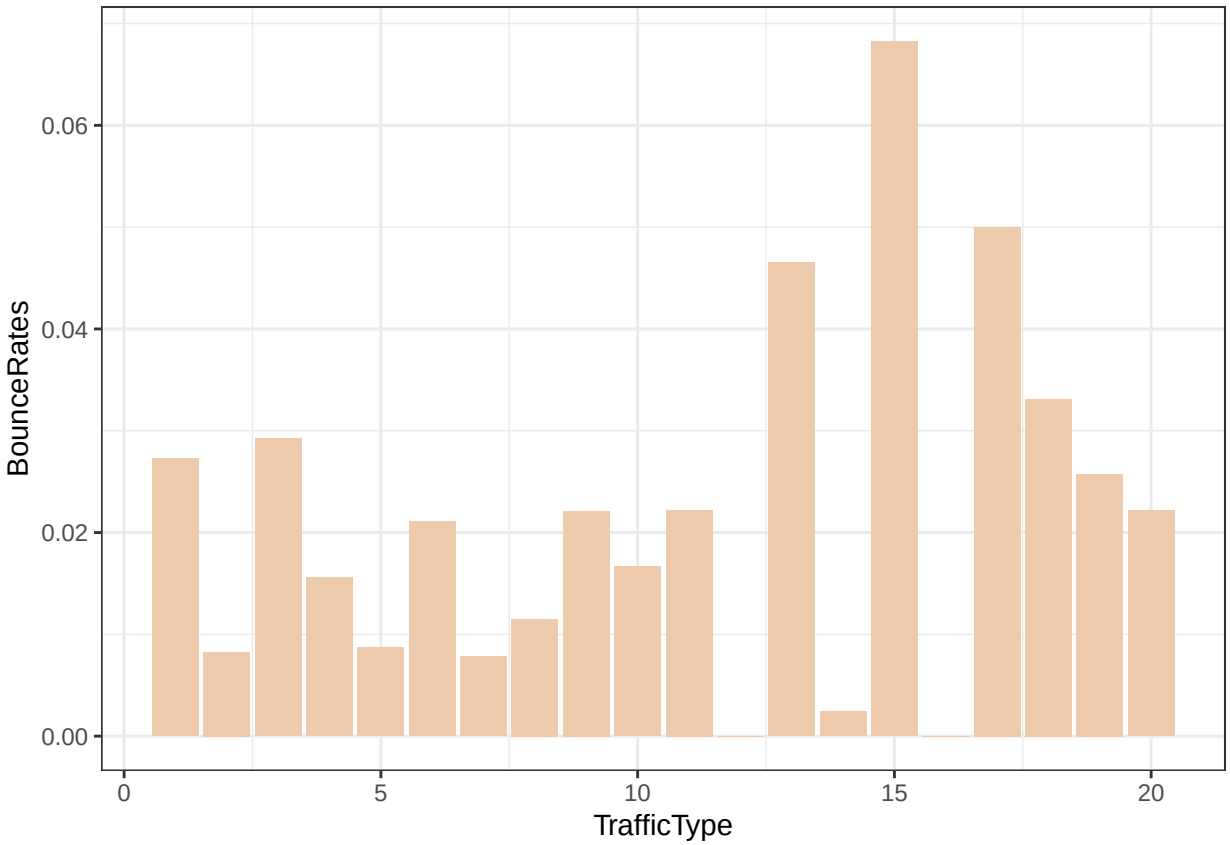
```
## # A tibble: 3 x 3
##   VisitorType       ExitRates BounceRates
##   <chr>                 <dbl>       <dbl>
## 1 New_Visitor          0.0206     0.00515
## 2 Other                0.0566     0.0306
## 3 Returning_Visitor    0.0443     0.0223
```

Visitors of type other have a higher ExitRate and BounceRates followed by ReturningVisitors.

```
# Creating a plot to show the ExitRate and BounceRatesin relation to the traffic type.
traffic <- shop %>% select(TrafficType, ExitRates, BounceRates)%>% group_by(TrafficType)%>% summarise_a
par(mfrow = c(1,2))
ggplot(traffic, aes(x=TrafficType, y = ExitRates))+
  geom_bar(stat = "identity", fill="peachpuff2")
```

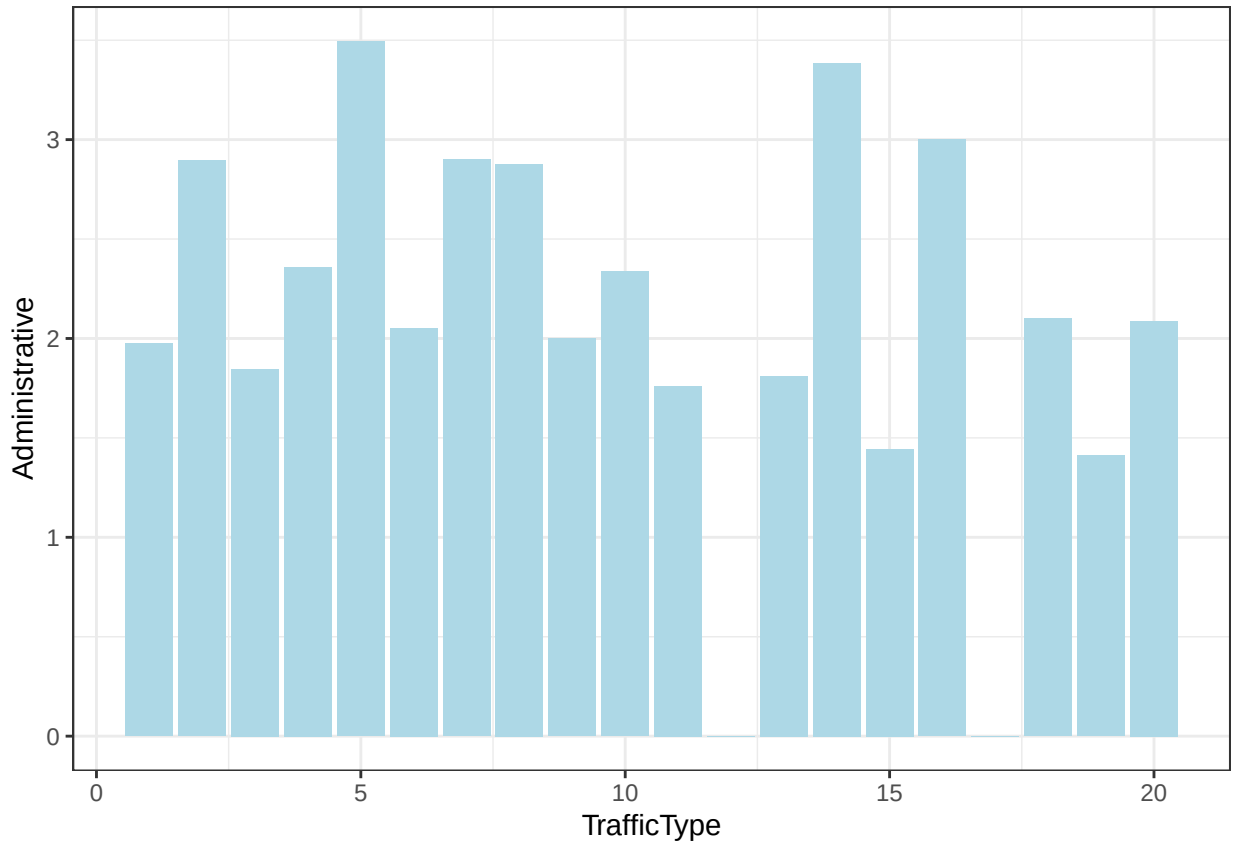



```
ggplot(traffic, aes(x=TrafficType, y = BounceRates))+
  geom_bar(stat = "identity", fill="peachpuff2")
```

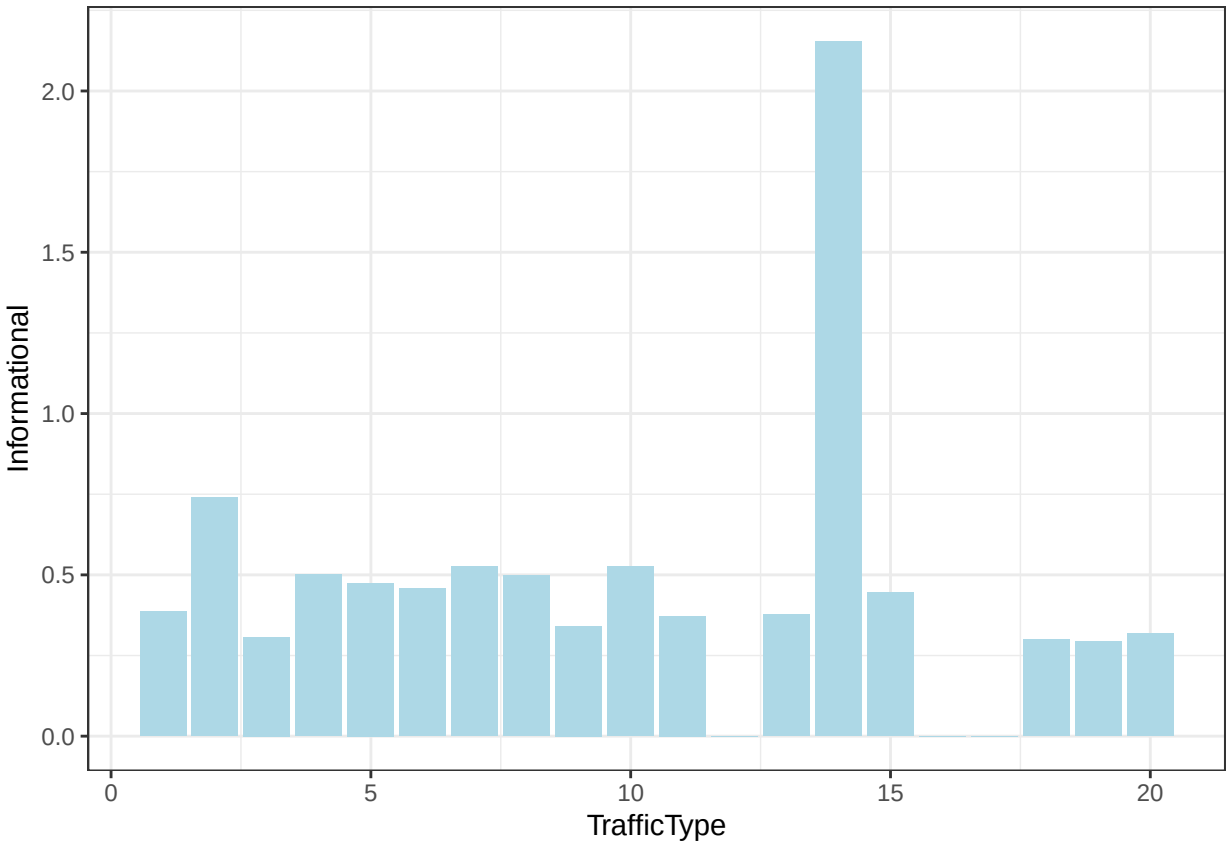


The traffic types 15 and 17 have the highest Exit and Bounce Rates.

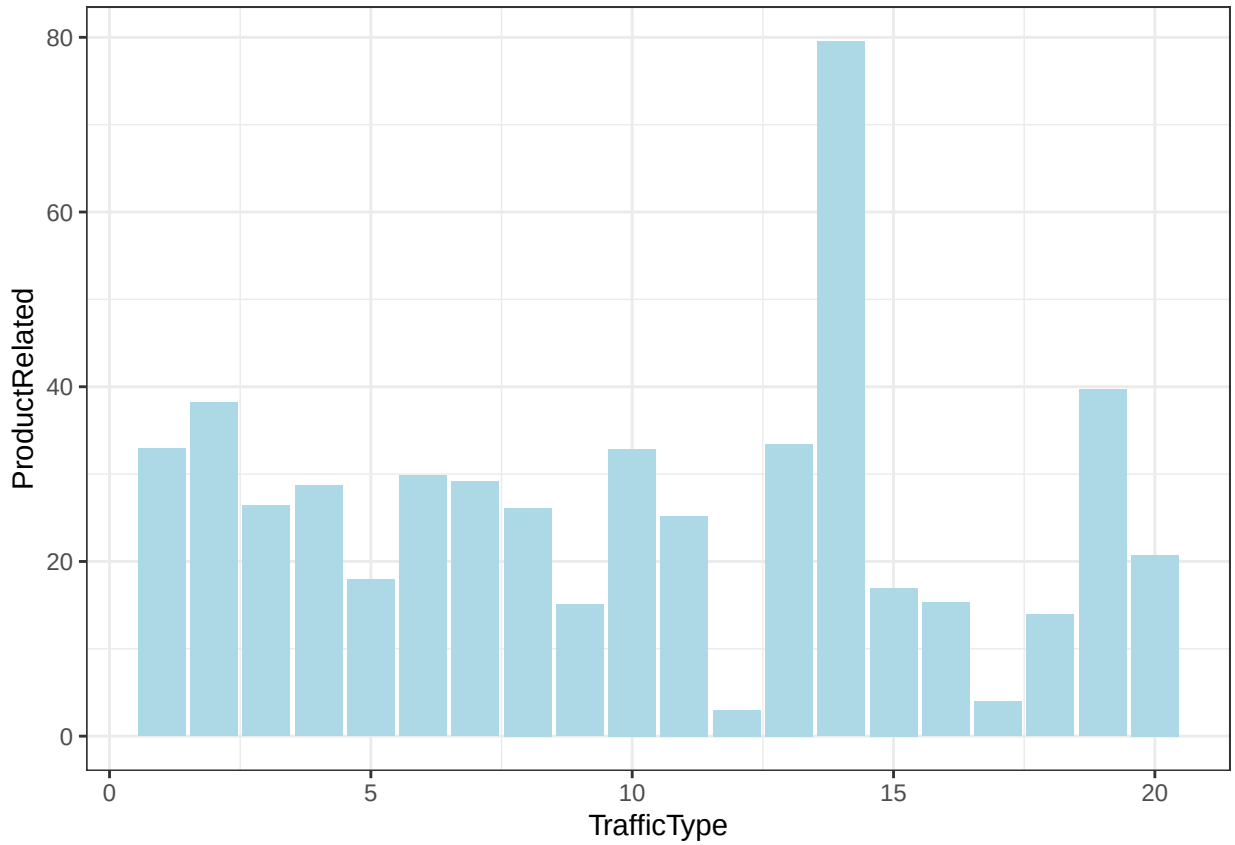
```
# Creating a plot to show the Administrative, ProductRelated and Informational relation to the traffic
traffic_page<- shop %>% select(TrafficType, Administrative,Informational,ProductRelated)%>% group_by(Tra
par(mfrow = c(1,3))
ggplot(traffic_page, aes(x=TrafficType, y = Administrative))+
  geom_bar(stat = "identity", fill="lightblue")
```



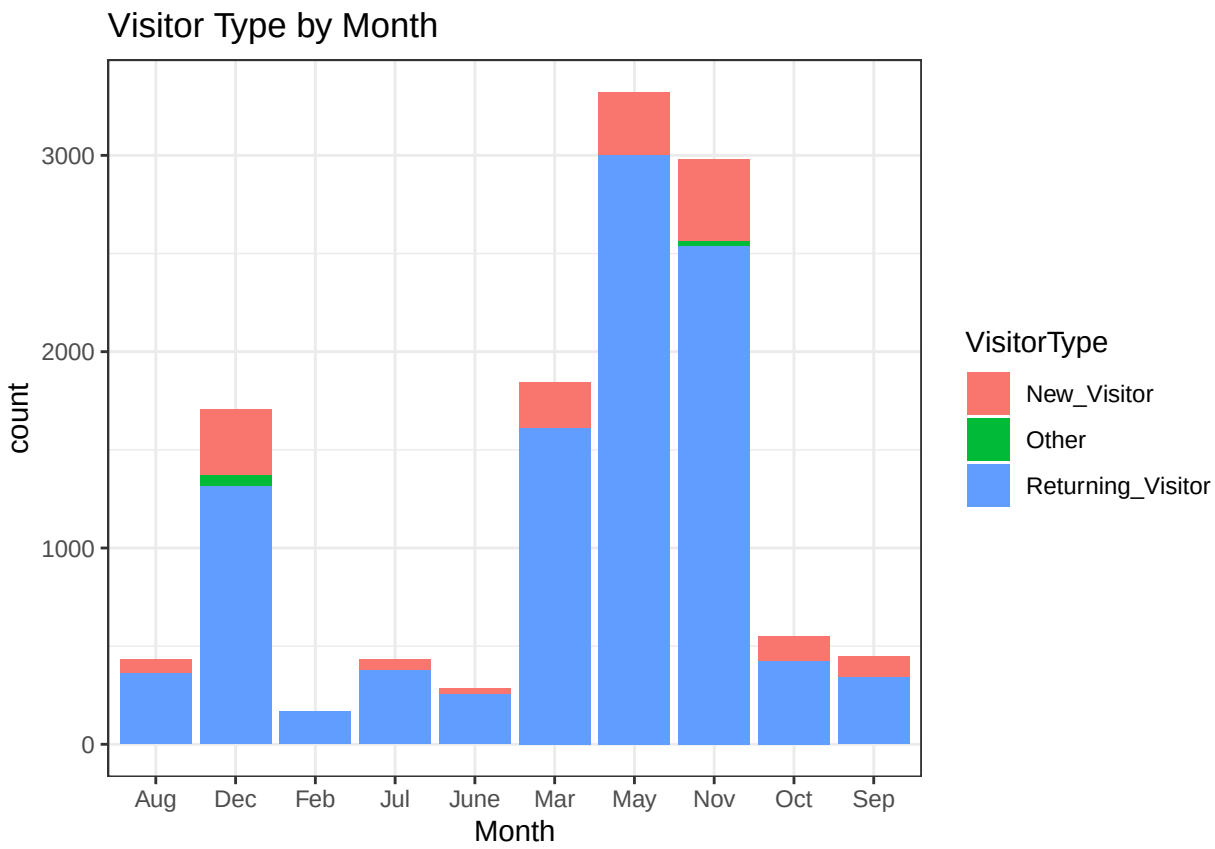

```
ggplot(traffic_page, aes(x=TrafficType, y = Informational))+
  geom_bar(stat = "identity", fill="lightblue")
```




```
ggplot(traffic_page, aes(x=TrafficType, y = ProductRelated))+
  geom_bar(stat = "identity", fill="lightblue")
```

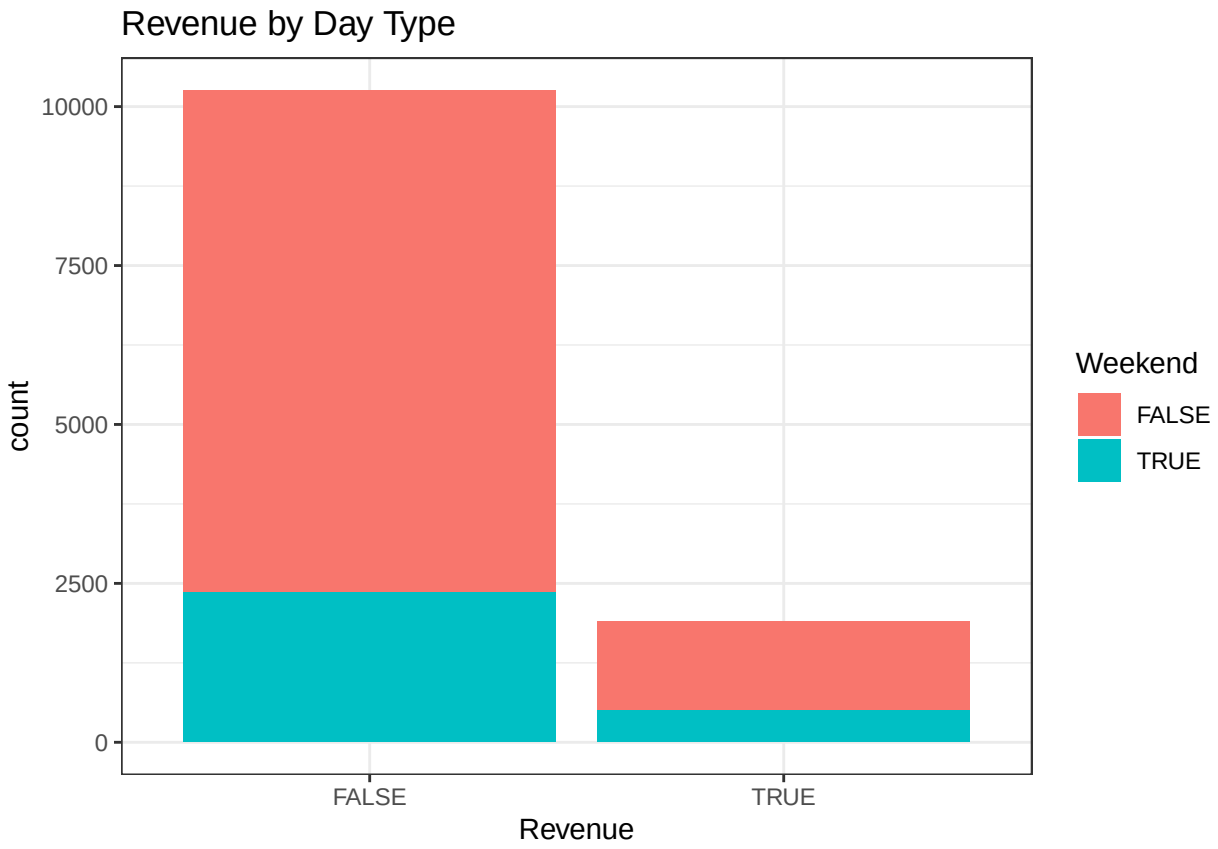



```
# Stacked bar chart: Visitor Type vs Month
shop %>%
    ggplot(aes(Month)) +
    geom_bar(aes(fill = VisitorType))+
    labs(title = "Visitor Type by Month")
```



- Feb and June are the least busy months.
- May, Nov, March, and December are the busy months.
- During these months there is a higher number of new visitors. This can be leveraged by the company to create advertisements that will attract the new users to register to the site.
- **Other** customer shops in November and December.

```
# Stacked bar chart: Revenue vs Day Type
shop %>%
    ggplot(aes(Revenue)) +
    geom_bar(aes(fill = Weekend))+
    labs(title = "Revenue by Day Type")
```

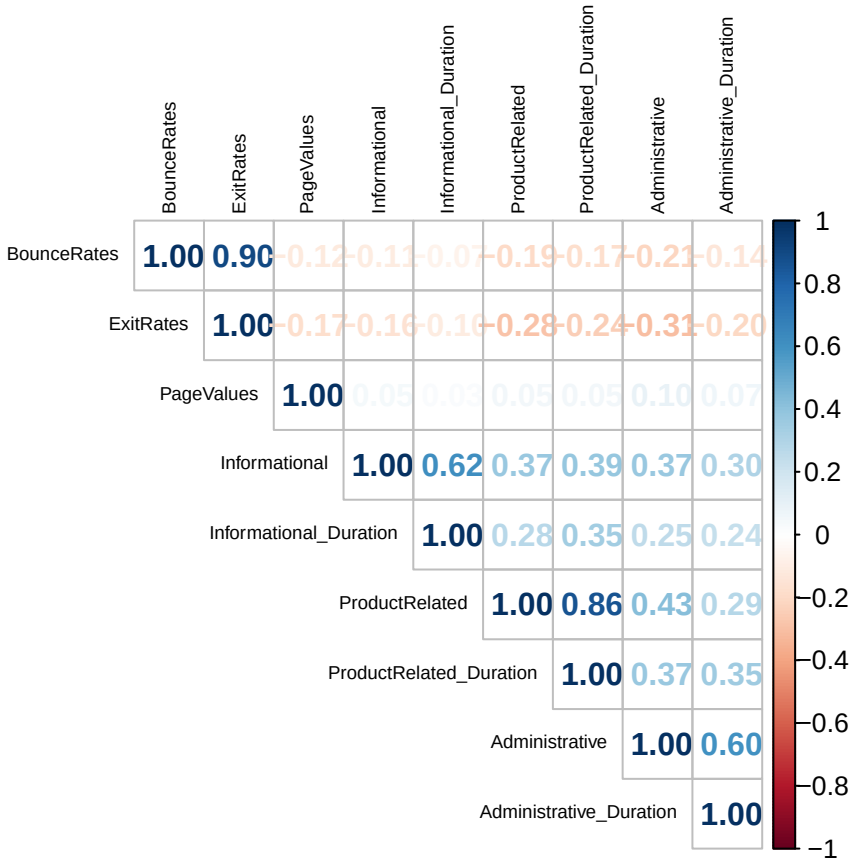


- Our data is imbalanced.
- Most of the data indicates that a client's visit to the page did not result in income for the company, i.e. the customer did not make a purchase.
- Of the remaining data, the company made revenue mostly during the weekdays.

Multivariate Analysis

Three or more variables are analyzed to derive conclusions and find relationships between them.

```
# calculating correlations and plotting a correlation plot
corrplot(corr = cor(shop[, c(1:9)]), method = "number", type = "upper", order = "hclust", tl.col = "bla
```



There is a high correlation between bounce rates and exit rates.

Implementing the solution

Encoding our categorical variables

```
# One hot encoding of the factor/categorical variables.

dummy_shop = dummyVars(" ~ .", data = shop)

df = data.frame(predict(dummy_shop, newdata = shop))
```

```
# checking the data types
sapply(df, class)
```

```
##              Administrative      Administrative_Duration
##                   "numeric"                   "numeric"
##               Informational       Informational_Duration
##                   "numeric"                   "numeric"
##             ProductRelated      ProductRelated_Duration
##                   "numeric"                   "numeric"
##                BounceRates                   ExitRates
##                   "numeric"                   "numeric"
##                 PageValues                  SpecialDay
```

```
##                     "numeric"                     "numeric"
##                      MonthAug                      MonthDec
##                     "numeric"                     "numeric"
##                      MonthFeb                      MonthJul
##                     "numeric"                     "numeric"
##                     MonthJune                      MonthMar
##                     "numeric"                     "numeric"
##                      MonthMay                      MonthNov
##                     "numeric"                     "numeric"
##                      MonthOct                      MonthSep
##                     "numeric"                     "numeric"
##             OperatingSystems                       Browser
##                     "numeric"                     "numeric"
##                        Region                   TrafficType
##                     "numeric"                     "numeric"
##       VisitorTypeNew_Visitor             VisitorTypeOther
##                     "numeric"                     "numeric"
## VisitorTypeReturning_Visitor                 WeekendFALSE
##                     "numeric"                     "numeric"
##                   WeekendTRUE                 RevenueFALSE
##                     "numeric"                     "numeric"
##                   RevenueTRUE
##                     "numeric"
```

```
glimpse(df)
```

```
## Rows: 12,164
## Columns: 31
## $ Administrative              <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2, 0,~
## $ Administrative_Duration     <dbl> 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0~
## $ Informational               <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ Informational_Duration      <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ ProductRelated              <dbl> 1, 2, 2, 10, 19, 2, 3, 3, 16, 7, 6, 2, 23~
## $ ProductRelated_Duration     <dbl> 0.000000, 64.000000, 2.666667, 627.500000~
## $ BounceRates                 <dbl> 0.200000000, 0.000000000, 0.050000000, 0.~
## $ ExitRates                   <dbl> 0.200000000, 0.100000000, 0.140000000, 0.~
## $ PageValues                  <dbl> 0.00000, 0.00000, 0.00000, 0.00000, 0.000~
## $ SpecialDay                  <dbl> 0.0, 0.0, 0.0, 0.0, 0.0, 0.8, 0.4, 0.0, 0~
## $ MonthAug                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthDec                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthFeb                    <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,~
## $ MonthJul                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthJune                   <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthMar                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthMay                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthNov                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthOct                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ MonthSep                    <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ OperatingSystems            <dbl> 1, 2, 3, 3, 2, 2, 2, 1, 1, 1, 2, 3, 1, 1,~
## $ Browser                     <dbl> 1, 2, 2, 3, 2, 2, 4, 1, 1, 1, 5, 2, 1, 1,~
## $ Region                      <dbl> 1, 1, 2, 1, 1, 2, 1, 3, 4, 1, 1, 3, 9, 1,~
## $ TrafficType                 <dbl> 1, 2, 4, 4, 3, 3, 2, 3, 3, 3, 3, 3, 3, 4,~
## $ VisitorTypeNew_Visitor      <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
## $ VisitorTypeOther            <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
```

```
## $ VisitorTypeReturning_Visitor <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,~
## $ WeekendFALSE                 <dbl> 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0,~
## $ WeekendTRUE                  <dbl> 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1,~
## $ RevenueFALSE                 <dbl> 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,~
## $ RevenueTRUE                  <dbl> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,~
```

```
# We will remove the Revenue column it is the class label, we will store it in another variable
df_copy <- df[, -c(30:31)]
df.class<- shop[, "Revenue"]

df_copy_copy <- df[, -c(30,31)]
```

```
# Previewing the dataset with dummies
head(df_copy)
```

```
##   Administrative Administrative_Duration Informational Informational_Duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                       0             0                      0
## 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              2                2.666667  0.05000000 0.1400000          0
## 4             10              627.500000  0.02000000 0.0500000          0
## 5             19              154.216667  0.01578947 0.0245614          0
## 6              2               37.000000  0.00000000 0.1000000          0
##   SpecialDay MonthAug MonthDec MonthFeb MonthJul MonthJune MonthMar MonthMay
## 1        0.0        0        0        1        0         0        0        0
## 2        0.0        0        0        1        0         0        0        0
## 3        0.0        0        0        1        0         0        0        0
## 4        0.0        0        0        1        0         0        0        0
## 5        0.0        0        0        1        0         0        0        0
## 6        0.8        0        0        1        0         0        0        0
##   MonthNov MonthOct MonthSep OperatingSystems Browser Region TrafficType
## 1        0        0        0                1       1      1           1
## 2        0        0        0                2       2      1           2
## 3        0        0        0                3       2      2           4
## 4        0        0        0                3       3      1           4
## 5        0        0        0                2       2      1           3
## 6        0        0        0                2       2      2           3
##   VisitorTypeNew_Visitor VisitorTypeOther VisitorTypeReturning_Visitor
## 1                      0                0                           1
## 2                      0                0                           1
## 3                      0                0                           1
## 4                      0                0                           1
## 5                      0                0                           1
## 6                      0                0                           1
##   WeekendFALSE WeekendTRUE
## 1            1           0
## 2            1           0
```

```
## 3            1           0
## 4            0           1
## 5            1           0
## 6            1           0
```

Normalizing or Scaling the data. Lets see which gives the best: This is important to ensure that no particular attribute has more impact on clustering algorithm than others.

```
# scaling
df_scaled <- scale(df_copy)
# check the output
summary(df_scaled)
```

```
##  Administrative   Administrative_Duration Informational
##  Min.   :-0.704   Min.   :-0.4609         Min.   :-0.3995
##  1st Qu.:-0.704   1st Qu.:-0.4609         1st Qu.:-0.3995
##  Median :-0.404   Median :-0.4047         Median :-0.3995
##  Mean   : 0.000   Mean   : 0.0000         Mean   : 0.0000
##  3rd Qu.: 0.496   3rd Qu.: 0.0736         3rd Qu.:-0.3995
##  Max.   : 7.396   Max.   :18.6624         Max.   :18.3893
##  Informational_Duration ProductRelated    ProductRelated_Duration
##  Min.   :-0.2467        Min.   :-0.7203   Min.   :-0.6302
##  1st Qu.:-0.2467        1st Qu.:-0.5410   1st Qu.:-0.5279
##  Median :-0.2467        Median :-0.3170   Median :-0.3111
##  Mean   : 0.0000        Mean   : 0.0000   Mean   : 0.0000
##  3rd Qu.:-0.2467        3rd Qu.: 0.1311   3rd Qu.: 0.1410
##  Max.   :17.7512        Max.   :15.0749   Max.   :32.6617
##   BounceRates         ExitRates         PageValues        SpecialDay
##  Min.   :-0.44877   Min.   :-0.9005   Min.   :-0.3195   Min.   :-0.3104
##  1st Qu.:-0.44877   1st Qu.:-0.5899   1st Qu.:-0.3195   1st Qu.:-0.3104
##  Median :-0.38448   Median :-0.3526   Median :-0.3195   Median :-0.3104
##  Mean   : 0.00000   Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000
##  3rd Qu.:-0.08264   3rd Qu.: 0.1524   3rd Qu.:-0.3195   3rd Qu.:-0.3104
##  Max.   : 4.03863   Max.   : 3.4832   Max.   :19.0449   Max.   : 4.6939
##     MonthAug          MonthDec          MonthFeb          MonthJul
##  Min.   :-0.1921   Min.   :-0.4039   Min.   :-0.1187   Min.   :-0.1917
##  1st Qu.:-0.1921   1st Qu.:-0.4039   1st Qu.:-0.1187   1st Qu.:-0.1917
##  Median :-0.1921   Median :-0.4039   Median :-0.1187   Median :-0.1917
##  Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000
##  3rd Qu.:-0.1921   3rd Qu.:-0.4039   3rd Qu.:-0.1187   3rd Qu.:-0.1917
##  Max.   : 5.2048   Max.   : 2.4758   Max.   : 8.4244   Max.   : 5.2173
##    MonthJune          MonthMar          MonthMay          MonthNov
##  Min.   :-0.1549   Min.   :-0.4224   Min.   :-0.6128   Min.   :-0.5696
##  1st Qu.:-0.1549   1st Qu.:-0.4224   1st Qu.:-0.6128   1st Qu.:-0.5696
##  Median :-0.1549   Median :-0.4224   Median :-0.6128   Median :-0.5696
##  Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000
##  3rd Qu.:-0.1549   3rd Qu.:-0.4224   3rd Qu.: 1.6317   3rd Qu.:-0.5696
##  Max.   : 6.4558   Max.   : 2.3671   Max.   : 1.6317   Max.   : 1.7555
##     MonthOct          MonthSep       OperatingSystems     Browser
##  Min.   :-0.2174   Min.   :-0.1955   Min.   :-1.2396   Min.   :-0.7940
##  1st Qu.:-0.2174   1st Qu.:-0.1955   1st Qu.:-0.1373   1st Qu.:-0.2091
##  Median :-0.2174   Median :-0.1955   Median :-0.1373   Median :-0.2091
##  Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000   Mean   : 0.0000
```

```
##  3rd Qu.:-0.2174   3rd Qu.:-0.1955   3rd Qu.: 0.9650   3rd Qu.:-0.2091
##  Max.   : 4.5994   Max.   : 5.1137   Max.   : 6.4765   Max.   : 6.2239
##      Region          TrafficType       VisitorTypeNew_Visitor
##  Min.   :-0.89608   Min.   :-0.76583   Min.   :-0.4021
##  1st Qu.:-0.89608   1st Qu.:-0.51688   1st Qu.:-0.4021
##  Median :-0.06355   Median :-0.51688   Median :-0.4021
##  Mean   : 0.00000   Mean   : 0.00000   Mean   : 0.0000
##  3rd Qu.: 0.35272   3rd Qu.:-0.01897   3rd Qu.:-0.4021
##  Max.   : 2.43405   Max.   : 3.96428   Max.   : 2.4868
##  VisitorTypeOther   VisitorTypeReturning_Visitor  WeekendFALSE
##  Min.   :-0.08187   Min.   :-2.4200              Min.   :-1.8065
##  1st Qu.:-0.08187   1st Qu.: 0.4132              1st Qu.: 0.5535
##  Median :-0.08187   Median : 0.4132              Median : 0.5535
##  Mean   : 0.00000   Mean   : 0.0000              Mean   : 0.0000
##  3rd Qu.:-0.08187   3rd Qu.: 0.4132              3rd Qu.: 0.5535
##  Max.   :12.21313   Max.   : 0.4132              Max.   : 0.5535
##   WeekendTRUE
##  Min.   :-0.5535
##  1st Qu.:-0.5535
##  Median :-0.5535
##  Mean   : 0.0000
##  3rd Qu.:-0.5535
##  Max.   : 1.8065
```

Some attributes continue to have high values when compared to others. The data is scaled to have a mean of 0 as a result of the scaling.

```
# Lets normalize the data and see if the results change.
# Normalize
df_norm <- as.data.frame(apply(df_copy, 2, function(x) (x - min(x))/(max(x)-min(x))))
# summary of normalized data
summary(df_norm)
```

```
##  Administrative    Administrative_Duration Informational
##  Min.   :0.00000   Min.   :0.000000        Min.   :0.00000
##  1st Qu.:0.00000   1st Qu.:0.000000        1st Qu.:0.00000
##  Median :0.03704   Median :0.002942        Median :0.00000
##  Mean   :0.08691   Mean   :0.024103        Mean   :0.02126
##  3rd Qu.:0.14815   3rd Qu.:0.027952        3rd Qu.:0.00000
##  Max.   :1.00000   Max.   :1.000000        Max.   :1.00000
##  Informational_Duration ProductRelated    ProductRelated_Duration
##  Min.   :0.00000        Min.   :0.00000   Min.   :0.000000
##  1st Qu.:0.00000        1st Qu.:0.01135   1st Qu.:0.003072
##  Median :0.00000        Median :0.02553   Median :0.009586
##  Mean   :0.01371        Mean   :0.04560   Mean   :0.018929
##  3rd Qu.:0.00000        3rd Qu.:0.05390   3rd Qu.:0.023165
##  Max.   :1.00000        Max.   :1.00000   Max.   :1.000000
##   BounceRates        ExitRates         PageValues       SpecialDay
##  Min.   :0.00000   Min.   :0.00000   Min.   :0.0000   Min.   :0.00000
##  1st Qu.:0.00000   1st Qu.:0.07087   1st Qu.:0.0000   1st Qu.:0.00000
##  Median :0.01433   Median :0.12500   Median :0.0000   Median :0.00000
##  Mean   :0.10001   Mean   :0.20542   Mean   :0.0165   Mean   :0.06202
##  3rd Qu.:0.08159   3rd Qu.:0.24020   3rd Qu.:0.0000   3rd Qu.:0.00000
```

```
##  Max.   :1.00000   Max.   :1.00000   Max.   :1.0000   Max.   :1.00000
##     MonthAug         MonthDec          MonthFeb          MonthJul
##  Min.   :0.0000   Min.   :0.0000   Min.   :0.00000   Min.   :0.00000
##  1st Qu.:0.0000   1st Qu.:0.0000   1st Qu.:0.00000   1st Qu.:0.00000
##  Median :0.0000   Median :0.0000   Median :0.00000   Median :0.00000
##  Mean   :0.0356   Mean   :0.1402   Mean   :0.01389   Mean   :0.03543
##  3rd Qu.:0.0000   3rd Qu.:0.0000   3rd Qu.:0.00000   3rd Qu.:0.00000
##  Max.   :1.0000   Max.   :1.0000   Max.   :1.00000   Max.   :1.00000
##    MonthJune          MonthMar         MonthMay        MonthNov
##  Min.   :0.00000   Min.   :0.0000   Min.   :0.000   Min.   :0.000
##  1st Qu.:0.00000   1st Qu.:0.0000   1st Qu.:0.000   1st Qu.:0.000
##  Median :0.00000   Median :0.0000   Median :0.000   Median :0.000
##  Mean   :0.02343   Mean   :0.1514   Mean   :0.273   Mean   :0.245
##  3rd Qu.:0.00000   3rd Qu.:0.0000   3rd Qu.:1.000   3rd Qu.:0.000
##  Max.   :1.00000   Max.   :1.0000   Max.   :1.000   Max.   :1.000
##     MonthOct          MonthSep       OperatingSystems    Browser
##  Min.   :0.00000   Min.   :0.00000   Min.   :0.0000   Min.   :0.00000
##  1st Qu.:0.00000   1st Qu.:0.00000   1st Qu.:0.1429   1st Qu.:0.08333
##  Median :0.00000   Median :0.00000   Median :0.1429   Median :0.08333
##  Mean   :0.04513   Mean   :0.03683   Mean   :0.1606   Mean   :0.11313
##  3rd Qu.:0.00000   3rd Qu.:0.00000   3rd Qu.:0.2857   3rd Qu.:0.08333
##  Max.   :1.00000   Max.   :1.00000   Max.   :1.0000   Max.   :1.00000
##      Region        TrafficType      VisitorTypeNew_Visitor VisitorTypeOther
##  Min.   :0.0000   Min.   :0.00000   Min.   :0.0000         Min.   :0.000000
##  1st Qu.:0.0000   1st Qu.:0.05263   1st Qu.:0.0000         1st Qu.:0.000000
##  Median :0.2500   Median :0.05263   Median :0.0000         Median :0.000000
##  Mean   :0.2691   Mean   :0.16191   Mean   :0.1392         Mean   :0.006659
##  3rd Qu.:0.3750   3rd Qu.:0.15789   3rd Qu.:0.0000         3rd Qu.:0.000000
##  Max.   :1.0000   Max.   :1.00000   Max.   :1.0000         Max.   :1.000000
##  VisitorTypeReturning_Visitor  WeekendFALSE     WeekendTRUE
##  Min.   :0.0000               Min.   :0.0000   Min.   :0.0000
##  1st Qu.:1.0000               1st Qu.:1.0000   1st Qu.:0.0000
##  Median :1.0000               Median :1.0000   Median :0.0000
##  Mean   :0.8542               Mean   :0.7655   Mean   :0.2345
##  3rd Qu.:1.0000               3rd Qu.:1.0000   3rd Qu.:0.0000
##  Max.   :1.0000               Max.   :1.0000   Max.   :1.0000
```

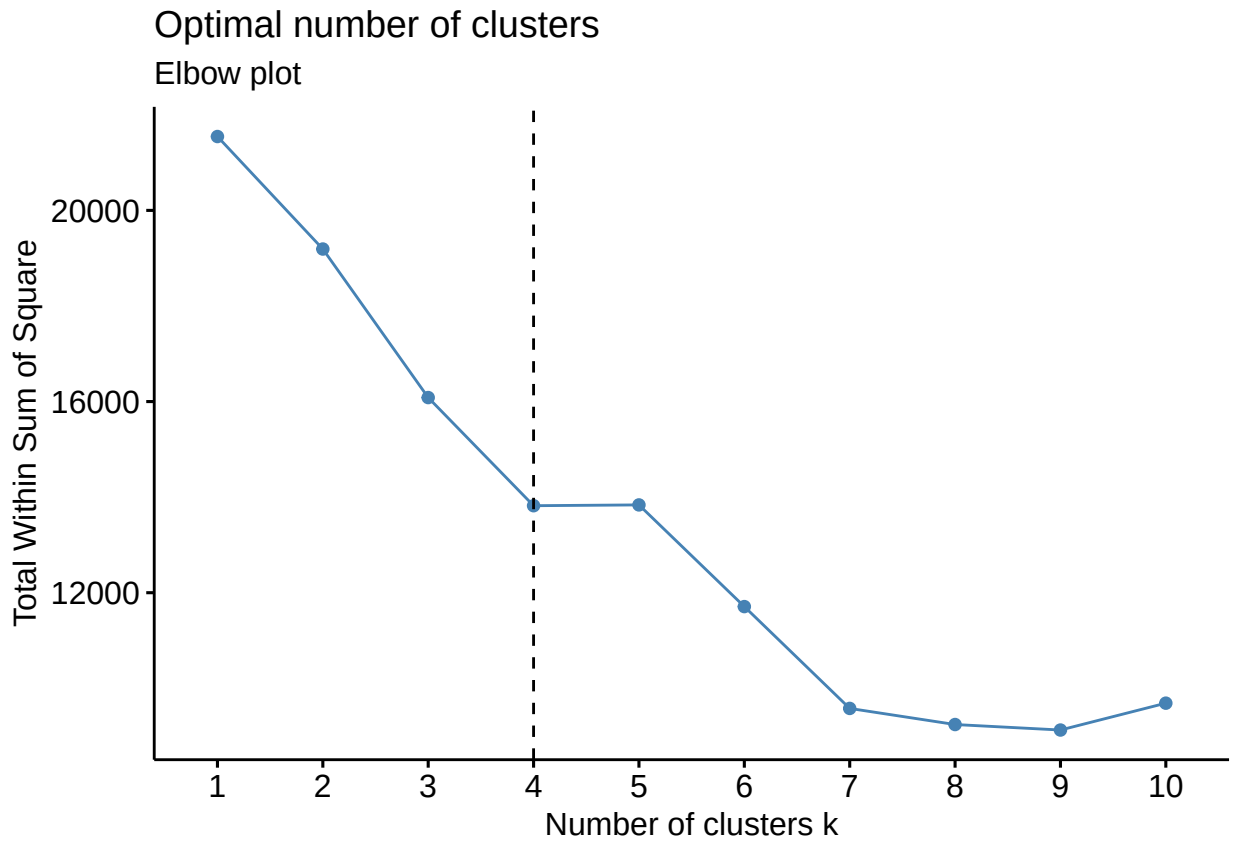
We have a maximum value of 1 and minimum value of 0s and mean of close to zero in all attributes. We will use the Normalized data set for clustering.

```
library(cluster)    # clustering algorithms
library(factoextra) # clustering algorithms & visualization
```

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

KMeans Clustering

```
# Using Elbow plot  method, Searching for the optimal number of clusters
fviz_nbclust(df_norm, kmeans, method = "wss") +
    geom_vline(xintercept = 4, linetype = 2)+
  labs(subtitle = "Elbow plot")
```




```
# Compute k-means clustering with k = 4
set.seed(123)
final <- kmeans(df_norm, 4, nstart = 25)
print(final)
```

```
## K-means clustering with 4 clusters of sizes 2607, 4515, 2189, 2853
##
## Cluster means:
##   Administrative Administrative_Duration Informational Informational_Duration
## 1     0.07038032              0.01988676    0.01681371             0.01004575
## 2     0.08817522              0.02443834    0.01989664             0.01355229
## 3     0.09720319              0.02683643    0.02512563             0.01536849
## 4     0.09211876              0.02532751    0.02452097             0.01601592
##   ProductRelated ProductRelated_Duration BounceRates ExitRates PageValues
## 1     0.03682230              0.01508009  0.13038712 0.2437403 0.01431690
## 2     0.04053282              0.01695680  0.09212228 0.2016800 0.01565459
## 3     0.06455877              0.02726596  0.09792094 0.1956149 0.01956196
## 4     0.04709140              0.01917252  0.08632375 0.1838577 0.01748962
##    SpecialDay   MonthAug  MonthDec    MonthFeb   MonthJul  MonthJune  MonthMar
## 1 0.216340621 0.00000000 0.0000000 0.000000000 0.00000000 0.00000000 0.0000000
## 2 0.006998893 0.07464009 0.2978959 0.031893688 0.07242525 0.05271318 0.3027685
## 3 0.000000000 0.00000000 0.0000000 0.000000000 0.00000000 0.00000000 0.0000000
## 4 0.055660708 0.03364879 0.1265335 0.008762706 0.03645286 0.01647389 0.1664914
##    MonthMay MonthNov   MonthOct   MonthSep OperatingSystems   Browser    Region
## 1 1.0000000 0.000000 0.00000000 0.00000000        0.1628582 0.1171525 0.2644323
## 2 0.0000000 0.000000 0.08970100 0.07796235        0.1602911 0.1214286 0.2801495
```

```
## 3 0.0000000 1.000000 0.00000000 0.00000000        0.1580630 0.1044236 0.2527981
## 4 0.2502629 0.277252 0.05047319 0.03364879        0.1611837 0.1030202 0.2683141
##   TrafficType VisitorTypeNew_Visitor VisitorTypeOther
## 1   0.1852099             0.08975834      0.000000000
## 2   0.1431486             0.15238095      0.011960133
## 3   0.1741242             0.13339424      0.009136592
## 4   0.1609202             0.16789345      0.002453558
##   VisitorTypeReturning_Visitor WeekendFALSE WeekendTRUE
## 1                    0.9102417            1           0
## 2                    0.8356589            1           0
## 3                    0.8574692            1           0
## 4                    0.8296530            0           1
##
## Clustering vector:
##     1     2     3     4     5     6     7     8     9    10    11    12    13
##     2     2     2     4     2     2     2     2     2     2     2     2     2
##    14    15    16    17    18    19    20    21    22    23    24    25    26
##     4     2     2     4     2     2     2     2     2     2     2     2     4
##    27    28    29    30    31    32    33    34    35    36    37    38    39
##     2     2     2     2     4     2     2     2     2     2     2     2     2
##    40    41    42    43    44    45    46    47    48    49    50    51    52
##     2     2     2     2     2     4     2     2     2     2     2     2     2
##    53    54    55    56    57    58    59    60    61    62    63    64    65
##     2     2     2     4     2     2     2     2     2     2     2     2     2
##    66    67    68    69    70    71    72    73    74    75    76    77    78
##     2     2     2     2     4     2     4     2     2     2     4     2     2
##    79    80    81    82    83    84    85    86    87    88    89    90    91
##     2     2     2     2     4     2     2     2     2     2     2     2     2
##    92    93    94    95    96    97    98    99   100   101   102   103   104
##     2     4     2     2     2     2     2     2     2     2     2     2     2
##   105   106   107   108   109   110   111   112   113   114   115   116   117
##     2     2     4     2     2     2     2     2     2     2     2     2     2
##   118   119   120   121   122   123   124   125   126   127   128   129   130
##     2     2     2     2     4     2     2     2     2     2     2     2     2
##   131   132   133   134   135   136   137   138   139   140   141   142   143
##     2     2     2     2     2     2     2     2     2     2     2     2     2
##   144   145   146   147   148   149   150   151   152   153   154   155   156
##     2     4     4     4     2     2     4     4     2     2     2     2     2
##   157   158   159   160   161   162   163   164   165   166   167   168   169
##     2     4     4     2     2     4     4     2     2     2     2     4     4
##   170   171   172   173   174   175   176   177   178   179   180   181   182
##     2     2     2     4     2     2     2     2     2     2     4     2     2
##   183   184   185   186   187   188   189   190   191   192   193   194   195
##     2     2     4     4     4     2     2     2     2     2     4     2     2
##   196   197   198   199   200   201   202   203   204   205   206   207   208
##     2     2     2     4     2     2     2     2     2     2     2     2     2
##   209   210   211   212   213   214   215   216   217   218   219   220   221
##     2     2     4     2     2     2     2     4     2     4     4     4     2
##   222   223   224   225   226   227   228   229   230   231   232   233   234
##     4     4     4     2     2     2     2     4     2     2     2     2     2
##   235   236   237   238   239   240   241   242   243   244   245   246   247
##     4     4     2     2     4     2     2     2     2     2     4     2     4
##   248   249   250   251   252   253   254   255   256   257   258   259   260
##     2     2     4     2     2     2     4     4     2     2     2     4     2
```

```
##   261   262   263   264   265   266   267   268   269   270   271   272   273
##     4     2     2     2     4     4     2     2     2     2     2     2     2
##   274   275   276   277   278   279   280   281   282   283   284   285   286
##     2     2     2     2     4     2     2     2     2     2     2     4     4
##   287   288   289   290   291   292   293   294   295   296   297   298   299
##     2     2     2     2     4     2     2     4     2     4     2     2     2
##   300   301   302   303   304   305   306   307   308   309   310   311   312
##     2     2     2     2     2     2     2     2     2     2     2     2     4
##   313   314   315   316   317   318   319   320   321   322   323   324   325
##     2     2     2     2     2     2     2     2     2     2     2     2     2
##   326   327   328   329   330   331   332   333   334   335   336   337   338
##     2     2     2     2     2     2     2     2     4     2     2     4     2
##   339   340   341   342   343   344   345   346   347   348   349   350   351
##     2     2     2     2     2     2     2     4     2     2     4     2     4
##   352   353   354   355   356   357   358   359   360   361   362   363   364
##     2     2     4     2     2     4     2     2     2     2     4     2     2
##   365   366   367   368   369   370   371   372   373   374   375   376   377
##     2     2     2     2     2     2     2     2     2     2     2     4     2
##   378   379   380   381   382   383   384   385   386   387   388   389   390
##     4     2     2     2     2     2     2     2     2     2     2     2     2
##   391   392   393   394   395   396   397   398   399   400   401   402   403
##     2     4     2     2     4     4     4     4     2     4     4     2     4
##   404   405   406   407   408   409   410   411   412   413   414   415   416
##     2     2     4     2     4     4     2     2     2     2     4     2     4
##   417   418   419   420   421   422   423   424   425   426   427   428   429
##     4     4     2     2     2     2     4     2     2     2     2     4     2
##   430   431   432   433   434   435   436   437   438   439   440   441   442
##     2     2     4     2     2     2     4     4     4     4     2     2     4
##   443   444   445   446   447   448   449   450   451   452   453   454   455
##     2     4     2     2     4     2     2     2     4     2     2     2     4
##   456   457   458   459   460   461   462   463   464   465   466   467   468
##     2     4     4     2     2     2     2     2     2     2     2     2     2
##   469   470   471   472   473   474   475   476   477   478   479   480   481
##     4     2     4     4     2     2     4     4     4     4     4     2     2
##   482   483   484   485   486   487   488   489   490   491   492   493   494
##     2     2     2     2     4     2     2     2     2     2     2     4     2
##   495   496   497   498   499   500   501   502   503   504   505   506   507
##     2     2     4     2     4     2     2     4     4     2     2     4     2
##   508   509   510   511   512   513   514   515   516   517   518   519   520
##     2     2     2     2     4     4     2     2     2     2     2     2     2
##   521   522   523   524   525   526   527   528   529   530   531   532   533
##     4     2     4     4     2     2     2     2     2     2     2     2     2
##   534   535   536   537   538   539   540   541   542   543   544   545   546
##     4     2     2     2     2     2     2     4     4     2     2     4     4
##   547   548   549   550   551   552   553   554   555   556   557   558   559
##     2     2     4     2     4     2     4     4     2     2     4     2     2
##   560   561   562   563   564   565   566   567   568   569   570   571   572
##     2     2     2     2     2     2     2     2     2     2     2     2     2
##   573   574   575   576   577   578   579   580   581   582   583   584   585
##     2     4     2     2     4     2     2     4     2     4     2     4     2
##   586   587   588   589   590   591   592   593   594   595   596   597   598
##     2     2     4     2     2     2     2     2     2     2     2     2     2
##   599   600   601   602   603   604   605   606   607   608   609   610   611
##     4     2     2     2     2     2     2     2     4     2     2     2     2
```

```
##   612   613   614   615   616   617   618   619   620   621   622   623   624
##     2     4     2     2     2     2     2     2     4     2     2     4     2
##   625   626   627   628   629   630   631   632   633   634   635   636   637
##     2     4     2     2     2     2     2     4     2     4     2     4     2
##   638   639   640   641   642   643   644   645   646   647   648   649   650
##     2     2     4     2     2     2     2     4     2     2     2     4     4
##   651   652   653   654   655   656   657   658   659   660   661   662   663
##     2     2     2     4     2     2     4     2     4     2     2     2     2
##   664   665   666   667   668   669   670   671   672   673   674   675   676
##     4     2     2     4     4     4     2     4     2     2     2     2     2
##   677   678   679   680   681   682   683   684   685   686   687   688   689
##     2     4     2     2     2     2     2     2     2     2     2     2     2
##   690   691   692   693   694   695   696   697   698   699   700   701   702
##     2     2     2     2     4     4     2     2     2     2     4     2     4
##   703   704   705   706   707   708   709   710   711   712   713   714   715
##     2     4     2     4     2     2     2     2     4     2     4     2     2
##   716   717   718   719   720   721   722   723   724   725   726   727   728
##     2     2     2     2     2     2     4     2     2     4     4     2     2
##   729   730   731   732   733   734   735   736   737   738   739   740   741
##     2     2     2     2     2     2     2     2     4     2     2     2     2
##   742   743   744   745   746   747   748   749   750   751   752   753   754
##     4     4     2     4     2     2     4     4     2     2     4     2     2
##   755   756   757   758   759   760   761   762   763   764   765   766   767
##     2     2     2     4     4     2     2     2     4     2     2     4     2
##   768   769   770   771   772   773   774   775   776   777   778   779   780
##     2     2     2     2     2     4     2     2     2     2     2     4     2
##   781   782   783   784   785   786   787   788   789   790   791   792   793
##     4     4     4     2     2     2     4     2     2     2     2     2     2
##   794   795   796   797   798   799   800   801   802   803   804   805   806
##     2     2     2     2     2     4     4     2     2     2     4     4     4
##   807   808   809   810   811   812   813   814   815   816   817   818   819
##     4     2     4     2     4     2     4     2     2     2     2     4     2
##   820   821   822   823   824   825   826   827   828   829   830   831   832
##     2     2     2     4     2     2     2     2     4     2     4     2     2
##   833   834   835   836   837   838   839   840   841   842   843   844   845
##     2     4     2     2     4     2     2     2     4     2     4     4     2
##   846   847   848   849   850   851   852   853   854   855   856   857   858
##     4     2     4     2     2     2     2     4     2     2     2     4     2
##   859   860   861   862   863   864   865   866   867   868   869   870   871
##     2     2     2     2     4     2     4     2     2     2     2     2     2
##   872   873   874   875   876   877   878   879   880   881   882   883   884
##     4     2     4     2     4     4     2     2     4     2     2     4     4
##   885   886   887   888   889   890   891   892   893   894   895   896   897
##     2     4     2     2     2     2     4     2     2     2     2     2     2
##   898   899   900   901   902   903   904   905   906   907   908   909   910
##     2     2     2     2     2     4     2     2     2     2     2     2     4
##   911   912   913   914   915   916   917   918   919   920   921   922   923
##     2     2     4     2     2     4     2     2     2     2     2     2     2
##   924   925   926   927   928   929   930   931   932   933   934   935   936
##     4     2     2     4     2     4     2     2     2     2     4     4     2
##   937   938   939   940   941   942   943   944   945   946   947   948   949
##     2     2     2     2     2     4     2     2     2     2     2     2     2
##   950   951   952   953   954   955   956   957   958   959   960   961   962
##     4     2     4     4     2     2     4     4     2     4     2     2     2
```

```
##  963  964  965  966  967  968  969  970  971  972  973  974  975
##    2    2    2    2    2    4    2    2    2    4    2    2    4
##  976  977  978  979  980  981  982  983  984  985  986  987  988
##    4    2    2    2    2    4    2    2    2    4    2    2    4
##  989  990  991  992  993  994  995  996  997  998  999 1000 1001
##    2    2    2    2    2    2    2    2    2    4    4    2    2
## 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014
##    4    2    2    4    4    4    2    2    2    2    2    2    4
## 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027
##    4    2    2    4    4    2    2    2    4    2    2    2    4
## 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040
##    4    2    2    2    2    2    2    2    4    2    2    2    4
## 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053
##    2    2    2    2    2    4    2    2    2    4    2    4    2
## 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066
##    2    2    2    2    2    2    4    2    2    2    4    2    4
## 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079
##    4    2    4    4    4    2    2    2    2    2    2    2    4
## 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092
##    2    2    2    2    4    2    2    2    2    2    2    2    2
## 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105
##    2    2    2    2    2    4    4    2    2    2    2    2    2
## 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118
##    2    2    4    2    4    4    4    2    2    2    4    2    4
## 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131
##    2    2    2    2    2    2    2    2    2    2    2    4    2
## 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144
##    2    2    2    2    2    2    2    4    4    2    4    2    2
## 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157
##    4    2    2    2    2    2    2    2    4    2    2    2    2
## 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170
##    4    2    2    2    2    2    2    2    4    2    2    2    2
## 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183
##    4    2    4    2    4    4    2    4    2    2    2    2    2
## 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196
##    2    2    4    4    4    4    2    2    4    2    2    2    2
## 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209
##    2    4    2    2    2    2    2    2    2    2    2    2    4
## 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222
##    2    2    2    2    2    2    2    2    2    2    2    2    4
## 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235
##    4    2    2    2    2    2    2    2    2    4    4    4    2
## 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248
##    2    4    2    2    2    4    2    2    2    2    2    4    2
## 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261
##    2    2    4    2    2    4    4    2    2    2    2    2    2
## 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274
##    2    4    2    4    2    2    2    2    2    2    4    2    4
## 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287
##    4    2    4    2    4    2    2    2    2    4    2    2    2
## 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300
##    2    2    4    4    4    2    2    4    4    4    2    2    2
## 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313
##    2    2    4    2    4    2    2    4    2    2    2    2    2
```

```
##  1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326
##     2    2    2    2    2    4    2    2    4    2    2    2    4
##  1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339
##     4    2    4    2    2    2    2    2    4    4    2    4    2
##  1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352
##     2    4    4    4    2    2    2    2    4    2    4    2    2
##  1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365
##     4    2    2    4    4    2    2    2    2    2    2    2    2
##  1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378
##     2    2    2    2    2    2    4    4    4    2    2    2    2
##  1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391
##     2    2    2    4    2    2    2    2    2    2    2    2    2
##  1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404
##     2    2    2    2    2    2    2    4    2    2    2    4    2
##  1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417
##     2    4    2    2    4    2    2    2    2    2    4    4    2
##  1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430
##     2    2    4    2    2    2    2    2    2    2    2    2    2
##  1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443
##     2    2    2    2    4    2    2    4    2    2    2    2    2
##  1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456
##     2    2    2    2    2    2    4    4    2    4    2    2    2
##  1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469
##     2    2    2    4    2    2    2    2    2    2    4    2    2
##  1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482
##     2    2    2    2    2    2    2    2    4    2    4    2    2
##  1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495
##     4    4    2    4    2    2    2    2    2    4    4    2    4
##  1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508
##     2    4    2    2    2    2    4    2    2    2    4    2    2
##  1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521
##     2    2    2    4    4    2    4    2    2    2    4    2    2
##  1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534
##     2    2    2    2    2    2    2    2    4    2    2    2    4
##  1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547
##     2    2    2    4    2    2    2    2    2    2    2    4    2
##  1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560
##     2    4    4    2    2    2    2    2    2    2    4    2    2
##  1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573
##     4    2    4    2    2    2    2    4    2    2    2    2    4
##  1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586
##     4    2    4    4    2    2    2    2    2    2    2    2    2
##  1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599
##     2    2    4    2    2    2    2    4    2    4    2    2    2
##  1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612
##     4    4    4    4    2    2    2    2    4    2    2    2    4
##  1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625
##     2    2    4    2    2    4    2    2    2    2    2    2    4
##  1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638
##     2    4    4    2    4    2    2    2    4    4    2    2    2
##  1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651
##     4    2    2    2    2    2    2    2    4    4    4    2    2
##  1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664
##     2    2    2    2    2    2    2    2    4    2    2    2    2
```

```
##  1665  1666  1667  1668  1669  1670  1671  1672  1673  1674  1675  1676  1677
##     2     2     4     2     2     2     2     4     4     2     2     2     2
##  1678  1679  1680  1681  1682  1683  1684  1685  1686  1687  1688  1689  1690
##     2     2     4     4     2     4     2     2     2     2     4     2     4
##  1691  1692  1693  1694  1695  1696  1697  1698  1699  1700  1701  1702  1703
##     2     2     4     2     4     2     2     2     2     2     4     4     2
##  1704  1705  1706  1707  1708  1709  1710  1711  1712  1713  1714  1715  1716
##     2     2     2     2     2     2     4     2     4     2     2     4     4
##  1717  1718  1719  1720  1721  1722  1723  1724  1725  1726  1727  1728  1729
##     4     4     2     2     4     2     2     4     2     4     2     2     2
##  1730  1731  1732  1733  1734  1735  1736  1737  1738  1739  1740  1741  1742
##     2     2     4     4     2     4     2     2     2     2     2     2     2
##  1743  1744  1745  1746  1747  1748  1749  1750  1751  1752  1753  1754  1755
##     4     2     2     2     4     4     2     2     4     2     2     2     2
##  1756  1757  1758  1759  1760  1761  1762  1763  1764  1765  1766  1767  1768
##     2     4     4     2     2     4     2     2     2     2     2     2     4
##  1769  1770  1771  1772  1773  1774  1775  1776  1777  1778  1779  1780  1781
##     2     4     2     2     2     2     2     2     2     4     2     2     2
##  1782  1783  1784  1785  1786  1787  1788  1789  1790  1791  1792  1793  1794
##     2     4     2     2     2     2     2     2     4     4     2     4     2
##  1795  1796  1797  1798  1799  1800  1801  1802  1803  1804  1805  1806  1807
##     2     4     2     2     2     2     2     4     2     2     2     2     2
##  1808  1809  1810  1811  1812  1813  1814  1815  1816  1817  1818  1819  1820
##     2     2     4     2     2     2     2     2     2     2     2     2     2
##  1821  1822  1823  1824  1825  1826  1827  1828  1829  1830  1831  1832  1833
##     4     2     4     4     2     2     2     2     2     2     4     2     4
##  1834  1835  1836  1837  1838  1839  1840  1841  1842  1843  1844  1845  1846
##     2     2     4     2     2     2     4     2     2     4     4     2     2
##  1847  1848  1849  1850  1851  1852  1853  1854  1855  1856  1857  1858  1859
##     2     4     2     4     2     2     2     2     2     2     2     2     4
##  1860  1861  1862  1863  1864  1865  1866  1867  1868  1869  1870  1871  1872
##     2     2     2     2     2     4     4     2     2     4     2     2     2
##  1873  1874  1875  1876  1877  1878  1879  1880  1881  1882  1883  1884  1885
##     2     4     2     2     2     2     2     2     2     2     4     2     4
##  1886  1887  1888  1889  1890  1891  1892  1893  1894  1895  1896  1897  1898
##     4     4     2     2     4     2     4     2     2     2     2     2     2
##  1899  1900  1901  1902  1903  1904  1905  1906  1907  1908  1909  1910  1911
##     4     2     4     4     2     2     2     4     2     2     2     4     2
##  1912  1913  1914  1915  1916  1917  1918  1919  1920  1921  1922  1923  1924
##     2     2     2     2     2     2     2     2     2     2     4     2     2
##  1925  1926  1927  1928  1929  1930  1931  1932  1933  1934  1935  1936  1937
##     2     4     2     2     4     4     4     2     2     2     2     2     2
##  1938  1939  1940  1941  1942  1943  1944  1945  1946  1947  1948  1949  1950
##     4     4     2     2     2     2     2     2     2     4     4     2     2
##  1951  1952  1953  1954  1955  1956  1957  1958  1959  1960  1961  1962  1963
##     4     4     2     2     4     2     2     2     2     2     2     2     2
##  1964  1965  1966  1967  1968  1969  1970  1971  1972  1973  1974  1975  1976
##     2     2     2     2     2     2     4     4     2     2     2     2     2
##  1977  1978  1979  1980  1981  1982  1983  1984  1985  1986  1987  1988  1989
##     2     2     2     2     2     2     4     2     2     4     2     2     2
##  1990  1991  1992  1993  1994  1995  1996  1997  1998  1999  2000  2001  2002
##     2     2     2     4     2     2     2     2     2     2     2     4     2
##  2003  2004  2005  2006  2007  2008  2009  2010  2011  2012  2013  2014  2015
##     2     2     4     4     2     4     2     4     4     1     1     1     1
```

```
##  2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028
##     1    1    1    1    1    1    1    4    1    1    1    1    1
##  2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041
##     1    1    1    1    4    1    1    1    1    1    1    4    1
##  2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054
##     1    1    4    1    1    4    1    1    1    1    4    4    4
##  2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067
##     1    1    1    1    1    1    4    1    4    1    1    1    4
##  2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080
##     1    1    1    1    1    4    1    1    1    1    4    1    1
##  2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093
##     1    1    4    1    1    4    1    4    4    4    1    1    1
##  2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106
##     1    4    1    1    1    1    1    1    1    1    1    1    4
##  2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119
##     1    4    1    4    1    1    1    1    1    1    1    1    1
##  2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132
##     4    1    1    1    1    4    1    1    1    1    4    1    1
##  2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145
##     4    4    1    4    4    1    1    1    1    4    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    1    1    1    1
##  2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171
##     1    4    1    1    4    1    4    4    4    4    1    1    1
##  2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184
##     1    1    1    4    1    4    1    4    1    1    4    1    4
##  2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197
##     1    1    4    1    4    1    1    1    4    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    1    4    1    1
##  2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223
##     1    1    1    1    1    1    1    1    1    1    1    1    1
##  2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236
##     1    4    1    4    1    1    1    1    4    4    1    4    4
##  2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249
##     1    1    1    4    1    4    1    1    1    1    1    1    4
##  2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262
##     1    1    1    4    1    1    1    1    4    1    1    1    1
##  2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275
##     1    4    4    1    1    1    1    1    1    1    1    1    1
##  2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288
##     1    1    4    1    1    1    1    1    1    1    1    4    1
##  2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301
##     1    1    1    4    4    1    1    1    1    1    1    4    1
##  2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314
##     1    1    1    1    1    1    1    1    1    1    1    1    1
##  2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327
##     4    1    1    4    4    1    1    1    1    1    4    4    4
##  2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340
##     1    1    1    1    4    1    1    4    4    1    1    4    4
##  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    1    1    1    1    1    1    1
```

```
##  2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379
##     4    1    4    1    1    1    4    1    4    1    1    1    4
##  2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392
##     1    4    1    1    4    1    1    1    1    1    1    1    1
##  2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405
##     4    1    1    1    1    1    1    4    1    1    4    4    4
##  2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418
##     4    1    4    1    1    1    1    1    1    1    1    4    1
##  2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431
##     1    4    4    4    1    1    1    1    1    1    1    1    1
##  2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444
##     1    1    1    4    1    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    4    1    4    1    1    1
##  2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470
##     1    1    1    1    1    4    1    1    4    1    1    1    1
##  2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483
##     4    1    1    1    4    1    1    1    1    1    1    1    1
##  2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496
##     1    1    1    1    4    1    4    1    4    4    1    1    1
##  2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509
##     1    1    1    1    1    1    1    1    1    4    1    1    1
##  2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522
##     1    1    1    1    1    1    1    1    4    4    1    1    4
##  2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535
##     4    4    1    1    1    1    4    4    1    4    1    1    1
##  2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548
##     4    4    1    1    1    1    1    1    1    1    1    1    4
##  2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561
##     4    1    1    1    1    1    4    1    1    4    4    1    1
##  2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574
##     1    4    1    1    1    1    1    1    1    1    4    1    1
##  2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587
##     1    4    1    1    4    1    1    1    1    1    4    1    1
##  2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600
##     4    4    1    1    1    4    1    1    1    4    1    1    1
##  2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613
##     1    4    1    1    1    1    4    4    1    1    1    4    1
##  2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626
##     1    1    1    1    1    1    1    1    1    1    1    4    1
##  2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639
##     1    1    1    1    1    1    1    1    1    1    1    1    1
##  2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652
##     4    1    1    1    1    4    1    1    1    1    4    1    1
##  2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665
##     1    1    1    1    1    4    1    1    4    1    4    1    1
##  2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678
##     4    1    1    1    1    1    4    1    1    1    1    1    1
##  2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691
##     1    4    1    1    4    4    4    1    4    4    1    4    1
##  2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704
##     1    1    1    1    4    1    1    4    4    1    1    1    1
##  2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717
##     1    1    1    1    1    1    1    1    1    1    1    1    1
```

```
##  2718  2719  2720  2721  2722  2723  2724  2725  2726  2727  2728  2729  2730
##     1     1     1     1     4     1     1     1     1     1     1     1     1
##  2731  2732  2733  2734  2735  2736  2737  2738  2739  2740  2741  2742  2743
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  2744  2745  2746  2747  2748  2749  2750  2751  2752  2753  2754  2755  2756
##     1     1     4     1     1     1     1     1     1     4     1     4     1
##  2757  2758  2759  2760  2761  2762  2763  2764  2765  2766  2767  2768  2769
##     1     1     1     1     1     4     1     1     1     1     4     1     4
##  2770  2771  2772  2773  2774  2775  2776  2777  2778  2779  2780  2781  2782
##     1     1     1     4     1     1     1     1     1     4     1     1     1
##  2783  2784  2785  2786  2787  2788  2789  2790  2791  2792  2793  2794  2795
##     4     1     1     1     1     4     1     4     1     4     4     4     1
##  2796  2797  2798  2799  2800  2801  2802  2803  2804  2805  2806  2807  2808
##     4     1     1     1     1     1     1     1     4     1     1     1     1
##  2809  2810  2811  2812  2813  2814  2815  2816  2817  2818  2819  2820  2821
##     4     1     4     1     1     1     1     1     1     1     4     1     1
##  2822  2823  2824  2825  2826  2827  2828  2829  2830  2831  2832  2833  2834
##     4     1     4     1     4     4     1     4     1     1     1     1     1
##  2835  2836  2837  2838  2839  2840  2841  2842  2843  2844  2845  2846  2847
##     1     1     1     1     1     1     4     4     1     1     1     4     1
##  2848  2849  2850  2851  2852  2853  2854  2855  2856  2857  2858  2859  2860
##     4     1     1     4     1     1     1     4     1     1     4     4     1
##  2861  2862  2863  2864  2865  2866  2867  2868  2869  2870  2871  2872  2873
##     1     4     1     1     1     1     1     1     1     1     1     1     1
##  2874  2875  2876  2877  2878  2879  2880  2881  2882  2883  2884  2885  2886
##     1     4     1     1     1     4     1     4     4     4     4     1     4
##  2887  2888  2889  2890  2891  2892  2893  2894  2895  2896  2897  2898  2899
##     4     1     1     4     1     1     4     1     1     4     1     1     4
##  2900  2901  2902  2903  2904  2905  2906  2907  2908  2909  2910  2911  2912
##     4     4     4     1     1     1     1     1     1     1     4     4     1
##  2913  2914  2915  2916  2917  2918  2919  2920  2921  2922  2923  2924  2925
##     1     1     1     4     1     1     4     1     1     1     1     1     1
##  2926  2927  2928  2929  2930  2931  2932  2933  2934  2935  2936  2937  2938
##     1     1     4     1     1     1     1     4     1     4     1     1     4
##  2939  2940  2941  2942  2943  2944  2945  2946  2947  2948  2949  2950  2951
##     1     1     1     1     1     1     4     1     1     1     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     4     1     1     1
##  2965  2966  2967  2968  2969  2970  2971  2972  2973  2974  2975  2976  2977
##     4     4     1     1     4     1     1     1     1     1     1     1     1
##  2978  2979  2980  2981  2982  2983  2984  2985  2986  2987  2988  2989  2990
##     1     1     4     1     1     4     4     1     1     1     1     1     1
##  2991  2992  2993  2994  2995  2996  2997  2998  2999  3000  3001  3002  3003
##     1     1     1     1     1     1     1     1     1     1     1     4     1
##  3004  3005  3006  3007  3008  3009  3010  3011  3012  3013  3014  3015  3016
##     1     4     4     1     4     1     1     1     1     1     1     1     1
##  3017  3018  3019  3020  3021  3022  3023  3024  3025  3026  3027  3028  3029
##     1     4     1     1     1     1     4     1     1     1     1     4     1
##  3030  3031  3032  3033  3034  3035  3036  3037  3038  3039  3040  3041  3042
##     4     4     1     1     4     1     1     1     1     1     4     1     1
##  3043  3044  3045  3046  3047  3048  3049  3050  3051  3052  3053  3054  3055
##     1     4     1     4     4     4     1     1     1     1     1     1     4
##  3056  3057  3058  3059  3060  3061  3062  3063  3064  3065  3066  3067  3068
##     4     4     1     1     1     1     1     1     1     1     4     4     1
```

```
##  3069  3070  3071  3072  3073  3074  3075  3076  3077  3078  3079  3080  3081
##     1     1     4     1     1     4     1     4     4     1     1     4     1
##  3082  3083  3084  3085  3086  3087  3088  3089  3090  3091  3092  3093  3094
##     1     4     1     4     1     1     1     4     1     1     1     1     1
##  3095  3096  3097  3098  3099  3100  3101  3102  3103  3104  3105  3106  3107
##     1     1     1     1     1     1     1     1     1     1     1     4     1
##  3108  3109  3110  3111  3112  3113  3114  3115  3116  3117  3118  3119  3120
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3121  3122  3123  3124  3125  3126  3127  3128  3129  3130  3131  3132  3133
##     1     1     4     1     1     1     1     4     1     1     1     1     1
##  3134  3135  3136  3137  3138  3139  3140  3141  3142  3143  3144  3145  3146
##     1     1     4     1     4     1     1     1     1     1     1     1     1
##  3147  3148  3149  3150  3151  3152  3153  3154  3155  3156  3157  3158  3159
##     1     4     1     1     4     1     1     4     1     1     1     1     4
##  3160  3161  3162  3163  3164  3165  3166  3167  3168  3169  3170  3171  3172
##     1     1     1     1     1     4     4     1     4     4     1     1     1
##  3173  3174  3175  3176  3177  3178  3179  3180  3181  3182  3183  3184  3185
##     1     1     1     4     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     4     1     1     1     1     1     1     1
##  3199  3200  3201  3202  3203  3204  3205  3206  3207  3208  3209  3210  3211
##     1     1     1     1     4     1     1     1     1     1     1     1     1
##  3212  3213  3214  3215  3216  3217  3218  3219  3220  3221  3222  3223  3224
##     4     4     1     1     1     4     4     1     1     4     4     1     1
##  3225  3226  3227  3228  3229  3230  3231  3232  3233  3234  3235  3236  3237
##     1     1     1     4     4     1     1     1     1     4     4     4     1
##  3238  3239  3240  3241  3242  3243  3244  3245  3246  3247  3248  3249  3250
##     4     1     1     1     4     1     1     1     1     1     1     1     1
##  3251  3252  3253  3254  3255  3256  3257  3258  3259  3260  3261  3262  3263
##     4     1     1     4     1     4     1     1     4     1     1     1     1
##  3264  3265  3266  3267  3268  3269  3270  3271  3272  3273  3274  3275  3276
##     1     1     1     1     4     1     1     1     4     4     1     1     1
##  3277  3278  3279  3280  3281  3282  3283  3284  3285  3286  3287  3288  3289
##     4     1     1     1     1     1     1     4     4     4     4     1     4
##  3290  3291  3292  3293  3294  3295  3296  3297  3298  3299  3300  3301  3302
##     1     1     1     1     1     1     1     1     1     1     1     4     1
##  3303  3304  3305  3306  3307  3308  3309  3310  3311  3312  3313  3314  3315
##     1     1     1     1     1     1     1     1     1     4     4     1     1
##  3316  3317  3318  3319  3320  3321  3322  3323  3324  3325  3326  3327  3328
##     1     1     1     1     1     4     4     1     1     1     4     1     1
##  3329  3330  3331  3332  3333  3334  3335  3336  3337  3338  3339  3340  3341
##     1     1     1     1     1     4     1     1     1     1     1     1     4
##  3342  3343  3344  3345  3346  3347  3348  3349  3350  3351  3352  3353  3354
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  3355  3356  3357  3358  3359  3360  3361  3362  3363  3364  3365  3366  3367
##     4     1     1     1     1     1     1     1     4     1     1     1     1
##  3368  3369  3370  3371  3372  3373  3374  3375  3376  3377  3378  3379  3380
##     4     4     1     1     1     4     1     1     1     1     1     1     1
##  3381  3382  3383  3384  3385  3386  3387  3388  3389  3390  3391  3392  3393
##     1     1     4     1     4     1     1     1     1     1     1     1     1
##  3394  3395  3396  3397  3398  3399  3400  3401  3402  3403  3404  3405  3406
##     1     1     4     4     1     1     4     1     1     1     1     1     4
##  3407  3408  3409  3410  3411  3412  3413  3414  3415  3416  3417  3418  3419
##     1     1     1     1     1     1     4     4     1     1     4     4     1
```

```
##  3420  3421  3422  3423  3424  3425  3426  3427  3428  3429  3430  3431  3432
##     4     4     1     1     4     1     1     1     1     1     4     1     4
##  3433  3434  3435  3436  3437  3438  3439  3440  3441  3442  3443  3444  3445
##     1     1     1     1     1     4     1     1     1     1     1     4     4
##  3446  3447  3448  3449  3450  3451  3452  3453  3454  3455  3456  3457  3458
##     1     1     1     1     4     1     4     1     1     4     1     1     1
##  3459  3460  3461  3462  3463  3464  3465  3466  3467  3468  3469  3470  3471
##     1     1     1     4     1     1     1     1     4     1     4     1     1
##  3472  3473  3474  3475  3476  3477  3478  3479  3480  3481  3482  3483  3484
##     1     1     1     1     1     1     1     4     4     1     1     1     1
##  3485  3486  3487  3488  3489  3490  3491  3492  3493  3494  3495  3496  3497
##     1     1     1     1     1     4     1     1     1     4     1     1     1
##  3498  3499  3500  3501  3502  3503  3504  3505  3506  3507  3508  3509  3510
##     4     1     1     1     1     1     1     1     1     1     1     4     4
##  3511  3512  3513  3514  3515  3516  3517  3518  3519  3520  3521  3522  3523
##     4     1     1     1     4     4     4     1     1     1     4     1     1
##  3524  3525  3526  3527  3528  3529  3530  3531  3532  3533  3534  3535  3536
##     1     1     1     1     1     1     1     4     1     1     1     4     4
##  3537  3538  3539  3540  3541  3542  3543  3544  3545  3546  3547  3548  3549
##     1     4     1     4     1     4     1     4     1     1     1     1     4
##  3550  3551  3552  3553  3554  3555  3556  3557  3558  3559  3560  3561  3562
##     1     1     1     1     1     4     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     1     1     4     1     1     1     1     1
##  3576  3577  3578  3579  3580  3581  3582  3583  3584  3585  3586  3587  3588
##     4     1     4     1     4     1     1     4     1     1     1     4     1
##  3589  3590  3591  3592  3593  3594  3595  3596  3597  3598  3599  3600  3601
##     1     1     1     1     4     1     1     1     1     1     1     1     1
##  3602  3603  3604  3605  3606  3607  3608  3609  3610  3611  3612  3613  3614
##     1     1     1     4     1     1     1     1     1     1     1     1     4
##  3615  3616  3617  3618  3619  3620  3621  3622  3623  3624  3625  3626  3627
##     1     1     1     1     1     1     4     1     1     1     1     1     1
##  3628  3629  3630  3631  3632  3633  3634  3635  3636  3637  3638  3639  3640
##     1     1     4     1     1     4     1     1     1     4     1     1     1
##  3641  3642  3643  3644  3645  3646  3647  3648  3649  3650  3651  3652  3653
##     1     1     1     1     1     1     1     4     1     1     4     1     1
##  3654  3655  3656  3657  3658  3659  3660  3661  3662  3663  3664  3665  3666
##     4     1     1     1     1     1     1     1     1     4     1     1     1
##  3667  3668  3669  3670  3671  3672  3673  3674  3675  3676  3677  3678  3679
##     4     4     4     1     1     1     1     4     1     1     1     4     1
##  3680  3681  3682  3683  3684  3685  3686  3687  3688  3689  3690  3691  3692
##     4     1     1     1     1     1     1     1     1     4     1     4     4
##  3693  3694  3695  3696  3697  3698  3699  3700  3701  3702  3703  3704  3705
##     1     4     1     4     1     1     1     1     4     1     4     1     1
##  3706  3707  3708  3709  3710  3711  3712  3713  3714  3715  3716  3717  3718
##     4     1     1     1     1     1     1     1     1     1     1     1     1
##  3719  3720  3721  3722  3723  3724  3725  3726  3727  3728  3729  3730  3731
##     1     4     4     1     1     1     1     1     4     4     1     4     4
##  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     1     4     4     1     1     1     1     4
##  3758  3759  3760  3761  3762  3763  3764  3765  3766  3767  3768  3769  3770
##     1     1     4     1     1     4     1     1     1     1     1     1     1
```

```
##  3771  3772  3773  3774  3775  3776  3777  3778  3779  3780  3781  3782  3783
##     1     1     1     1     4     1     4     1     4     1     1     1     1
##  3784  3785  3786  3787  3788  3789  3790  3791  3792  3793  3794  3795  3796
##     4     1     1     1     1     1     4     1     1     4     4     1     1
##  3797  3798  3799  3800  3801  3802  3803  3804  3805  3806  3807  3808  3809
##     4     1     1     1     1     4     1     1     4     1     1     4     4
##  3810  3811  3812  3813  3814  3815  3816  3817  3818  3819  3820  3821  3822
##     1     1     1     1     4     1     1     1     4     1     1     4     4
##  3823  3824  3825  3826  3827  3828  3829  3830  3831  3832  3833  3834  3835
##     1     1     4     1     4     4     1     1     1     4     1     4     4
##  3836  3837  3838  3839  3840  3841  3842  3843  3844  3845  3846  3847  3848
##     1     4     4     1     1     4     4     1     1     1     1     1     1
##  3849  3850  3851  3852  3853  3854  3855  3856  3857  3858  3859  3860  3861
##     4     1     1     1     1     1     1     1     1     1     4     1     1
##  3862  3863  3864  3865  3866  3867  3868  3869  3870  3871  3872  3873  3874
##     4     1     1     1     4     1     1     1     4     1     1     1     4
##  3875  3876  3877  3878  3879  3880  3881  3882  3883  3884  3885  3886  3887
##     1     1     1     4     1     1     1     1     1     1     1     1     1
##  3888  3889  3890  3891  3892  3893  3894  3895  3896  3897  3898  3899  3900
##     1     1     1     1     1     1     4     1     1     1     1     1     1
##  3901  3902  3903  3904  3905  3906  3907  3908  3909  3910  3911  3912  3913
##     1     1     1     4     4     1     1     1     1     1     1     1     4
##  3914  3915  3916  3917  3918  3919  3920  3921  3922  3923  3924  3925  3926
##     4     4     1     1     1     1     1     1     1     4     1     1     1
##  3927  3928  3929  3930  3931  3932  3933  3934  3935  3936  3937  3938  3939
##     1     1     1     1     1     4     1     1     4     1     1     1     1
##  3940  3941  3942  3943  3944  3945  3946  3947  3948  3949  3950  3951  3952
##     4     4     4     4     1     1     4     4     1     1     1     1     1
##  3953  3954  3955  3956  3957  3958  3959  3960  3961  3962  3963  3964  3965
##     4     1     4     1     4     1     4     1     1     4     4     1     1
##  3966  3967  3968  3969  3970  3971  3972  3973  3974  3975  3976  3977  3978
##     1     1     1     1     1     4     1     4     1     1     1     1     1
##  3979  3980  3981  3982  3983  3984  3985  3986  3987  3988  3989  3990  3991
##     4     1     1     1     1     1     1     1     4     4     1     1     1
##  3992  3993  3994  3995  3996  3997  3998  3999  4000  4001  4002  4003  4004
##     1     1     1     1     1     1     4     1     1     1     4     1     1
##  4005  4006  4007  4008  4009  4010  4011  4012  4013  4014  4015  4016  4017
##     1     4     1     4     1     1     1     1     1     1     1     1     1
##  4018  4019  4020  4021  4022  4023  4024  4025  4026  4027  4028  4029  4030
##     1     1     1     1     1     1     1     4     1     1     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     4     1
##  4044  4045  4046  4047  4048  4049  4050  4051  4052  4053  4054  4055  4056
##     1     1     1     1     1     1     4     1     1     1     1     4     1
##  4057  4058  4059  4060  4061  4062  4063  4064  4065  4066  4067  4068  4069
##     4     4     1     1     1     1     1     1     4     1     1     1     4
##  4070  4071  4072  4073  4074  4075  4076  4077  4078  4079  4080  4081  4082
##     1     4     1     1     1     1     1     4     1     1     1     1     1
##  4083  4084  4085  4086  4087  4088  4089  4090  4091  4092  4093  4094  4095
##     4     1     1     4     1     4     1     4     4     4     4     1     1
##  4096  4097  4098  4099  4100  4101  4102  4103  4104  4105  4106  4107  4108
##     1     1     4     1     1     1     1     1     1     1     1     1     1
##  4109  4110  4111  4112  4113  4114  4115  4116  4117  4118  4119  4120  4121
##     1     1     4     1     4     1     1     1     1     1     1     1     1
```

```
##  4122  4123  4124  4125  4126  4127  4128  4129  4130  4131  4132  4133  4134
##     1     1     1     1     4     1     1     4     1     1     4     1     1
##  4135  4136  4137  4138  4139  4140  4141  4142  4143  4144  4145  4146  4147
##     4     1     1     1     1     1     1     1     4     1     1     1     1
##  4148  4149  4150  4151  4152  4153  4154  4155  4156  4157  4158  4159  4160
##     1     1     1     4     1     1     1     1     1     1     1     4     1
##  4161  4162  4163  4164  4165  4166  4167  4168  4169  4170  4171  4172  4173
##     1     1     1     4     1     1     4     1     1     1     1     4     4
##  4174  4175  4176  4177  4178  4179  4180  4181  4182  4183  4184  4185  4186
##     1     1     1     1     4     1     1     1     1     4     1     1     4
##  4187  4188  4189  4190  4191  4192  4193  4194  4195  4196  4197  4198  4199
##     1     4     1     1     1     4     1     4     4     1     1     4     1
##  4200  4201  4202  4203  4204  4205  4206  4207  4208  4209  4210  4211  4212
##     1     1     1     1     1     1     1     1     1     4     4     1     4
##  4213  4214  4215  4216  4217  4218  4219  4220  4221  4222  4223  4224  4225
##     1     1     4     4     1     1     1     1     4     1     1     1     1
##  4226  4227  4228  4229  4230  4231  4232  4233  4234  4235  4236  4237  4238
##     1     1     4     1     1     4     1     1     4     1     1     1     4
##  4239  4240  4241  4242  4243  4244  4245  4246  4247  4248  4249  4250  4251
##     1     1     1     1     1     1     1     1     1     1     4     1     1
##  4252  4253  4254  4255  4256  4257  4258  4259  4260  4261  4262  4263  4264
##     1     1     1     4     4     4     1     1     1     1     4     1     1
##  4265  4266  4267  4268  4269  4270  4271  4272  4273  4274  4275  4276  4277
##     1     1     1     1     1     1     4     1     1     1     1     1     1
##  4278  4279  4280  4281  4282  4283  4284  4285  4286  4287  4288  4289  4290
##     1     1     1     1     1     1     4     1     4     1     1     1     1
##  4291  4292  4293  4294  4295  4296  4297  4298  4299  4300  4301  4302  4303
##     1     1     1     1     1     1     1     1     1     1     4     1     1
##  4304  4305  4306  4307  4308  4309  4310  4311  4312  4313  4314  4315  4316
##     1     1     1     4     4     1     1     1     1     4     1     1     1
##  4317  4318  4319  4320  4321  4322  4323  4324  4325  4326  4327  4328  4329
##     1     1     4     1     1     1     1     1     1     1     1     4     1
##  4330  4331  4332  4333  4334  4335  4336  4337  4338  4339  4340  4341  4342
##     1     1     1     1     1     1     1     1     1     1     1     1     4
##  4343  4344  4345  4346  4347  4348  4349  4350  4351  4352  4353  4354  4355
##     1     4     1     1     1     4     1     1     1     4     1     1     1
##  4356  4357  4358  4359  4360  4361  4362  4363  4364  4365  4366  4367  4368
##     1     4     4     1     1     1     1     4     1     1     4     1     4
##  4369  4370  4371  4372  4373  4374  4375  4376  4377  4378  4379  4380  4381
##     4     1     4     1     4     4     1     1     1     1     4     1     1
##  4382  4383  4384  4385  4386  4387  4388  4389  4390  4391  4392  4393  4394
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4395  4396  4397  4398  4399  4400  4401  4402  4403  4404  4405  4406  4407
##     4     1     1     1     1     4     4     4     1     1     1     1     1
##  4408  4409  4410  4411  4412  4413  4414  4415  4416  4417  4418  4419  4420
##     4     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
##     1     1     1     1     1     1     4     1     1     1     4     1     1
##  4434  4435  4436  4437  4438  4439  4440  4441  4442  4443  4444  4445  4446
##     1     1     1     1     1     1     4     1     4     1     1     1     1
##  4447  4448  4449  4450  4451  4452  4453  4454  4455  4456  4457  4458  4459
##     1     1     1     1     1     1     1     1     4     4     1     1     4
##  4460  4461  4462  4463  4464  4465  4466  4467  4468  4469  4470  4471  4472
##     1     1     4     4     4     1     1     4     1     4     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     4     1     1     1     1     1     4     1     1     1     1     1
##  4499  4500  4501  4502  4503  4504  4505  4506  4507  4508  4509  4510  4511
##     1     4     1     4     1     1     1     1     1     1     1     4     1
##  4512  4513  4514  4515  4516  4517  4518  4519  4520  4521  4522  4523  4524
##     1     1     4     1     1     1     1     1     1     4     4     1     1
##  4525  4526  4527  4528  4529  4530  4531  4532  4533  4534  4535  4536  4537
##     1     1     1     4     1     1     1     4     1     4     1     1     1
##  4538  4539  4540  4541  4542  4543  4544  4545  4546  4547  4548  4549  4550
##     4     4     1     1     4     1     1     4     4     1     1     4     1
##  4551  4552  4553  4554  4555  4556  4557  4558  4559  4560  4561  4562  4563
##     4     1     1     1     4     4     1     4     1     1     1     4     1
##  4564  4565  4566  4567  4568  4569  4570  4571  4572  4573  4574  4575  4576
##     1     4     1     1     1     4     1     1     1     4     1     1     1
##  4577  4578  4579  4580  4581  4582  4583  4584  4585  4586  4587  4588  4589
##     4     1     1     1     1     4     1     1     1     1     1     1     1
##  4590  4591  4592  4593  4594  4595  4596  4597  4598  4599  4600  4601  4602
##     1     1     1     4     1     1     1     1     1     4     1     1     1
##  4603  4604  4605  4606  4607  4608  4609  4610  4611  4612  4613  4614  4615
##     1     1     4     1     4     1     4     1     4     1     1     1     4
##  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     4     1     1     1     4
##  4642  4643  4644  4645  4646  4647  4648  4649  4650  4651  4652  4653  4654
##     1     1     1     1     1     1     1     4     1     1     1     4     1
##  4655  4656  4657  4658  4659  4660  4661  4662  4663  4664  4665  4666  4667
##     1     1     1     1     4     1     1     4     1     1     1     4     1
##  4668  4669  4670  4671  4672  4673  4674  4675  4676  4677  4678  4679  4680
##     4     1     4     1     4     1     1     1     1     1     1     1     1
##  4681  4682  4683  4684  4685  4686  4687  4688  4689  4690  4691  4692  4693
##     1     1     1     1     1     1     4     1     1     4     1     4     1
##  4694  4695  4696  4697  4698  4699  4700  4701  4702  4703  4704  4705  4706
##     4     1     1     1     1     4     1     1     1     4     1     4     4
##  4707  4708  4709  4710  4711  4712  4713  4714  4715  4716  4717  4718  4719
##     1     1     1     4     4     4     1     1     1     1     1     1     4
##  4720  4721  4722  4723  4724  4725  4726  4727  4728  4729  4730  4731  4732
##     1     4     1     1     1     1     1     1     1     1     1     1     1
##  4733  4734  4735  4736  4737  4738  4739  4740  4741  4742  4743  4744  4745
##     4     1     1     1     1     1     1     4     4     1     4     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     1     1     1     4     4     1     1     1     4     1     1     4
##  4772  4773  4774  4775  4776  4777  4778  4779  4780  4781  4782  4783  4784
##     4     1     1     1     1     1     1     1     4     1     4     1     1
##  4785  4786  4787  4788  4789  4790  4791  4792  4793  4794  4795  4796  4797
##     1     1     4     4     1     1     1     1     1     4     4     1     4
##  4798  4799  4800  4801  4802  4803  4804  4805  4806  4807  4808  4809  4810
##     1     1     4     1     1     1     1     1     1     1     1     4     1
##  4811  4812  4813  4814  4815  4816  4817  4818  4819  4820  4821  4822  4823
##     1     1     1     1     1     4     1     1     1     4     1     1     1
```

```
##  4824  4825  4826  4827  4828  4829  4830  4831  4832  4833  4834  4835  4836
##     1     1     1     1     1     1     1     1     1     4     1     1     1
##  4837  4838  4839  4840  4841  4842  4843  4844  4845  4846  4847  4848  4849
##     1     4     1     4     1     1     1     1     1     1     4     1     1
##  4850  4851  4852  4853  4854  4855  4856  4857  4858  4859  4860  4861  4862
##     1     1     1     1     1     1     1     1     1     1     1     4     1
##  4863  4864  4865  4866  4867  4868  4869  4870  4871  4872  4873  4874  4875
##     4     1     1     1     1     1     1     1     4     1     1     1     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     1     1     1     1     1     4     1     1     4     4
##  4902  4903  4904  4905  4906  4907  4908  4909  4910  4911  4912  4913  4914
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  4915  4916  4917  4918  4919  4920  4921  4922  4923  4924  4925  4926  4927
##     4     1     1     4     1     1     4     1     1     1     4     1     1
##  4928  4929  4930  4931  4932  4933  4934  4935  4936  4937  4938  4939  4940
##     1     1     1     1     4     1     1     1     1     1     1     1     1
##  4941  4942  4943  4944  4945  4946  4947  4948  4949  4950  4951  4952  4953
##     1     1     1     4     4     1     4     1     1     1     1     1     1
##  4954  4955  4956  4957  4958  4959  4960  4961  4962  4963  4964  4965  4966
##     1     1     1     1     1     4     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     4     1     1     1     1     1     4
##  4980  4981  4982  4983  4984  4985  4986  4987  4988  4989  4990  4991  4992
##     1     4     1     1     1     4     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     4     1     1     1     1
##  5006  5007  5008  5009  5010  5011  5012  5013  5014  5015  5016  5017  5018
##     1     1     4     1     1     1     1     1     4     1     1     4     1
##  5019  5020  5021  5022  5023  5024  5025  5026  5027  5028  5029  5030  5031
##     1     1     1     1     1     1     1     4     1     1     1     1     1
##  5032  5033  5034  5035  5036  5037  5038  5039  5040  5041  5042  5043  5044
##     1     4     4     4     1     1     4     1     1     4     1     1     1
##  5045  5046  5047  5048  5049  5050  5051  5052  5053  5054  5055  5056  5057
##     1     1     1     1     1     1     1     1     1     1     1     1     4
##  5058  5059  5060  5061  5062  5063  5064  5065  5066  5067  5068  5069  5070
##     1     4     1     1     1     1     1     4     4     4     1     4     4
##  5071  5072  5073  5074  5075  5076  5077  5078  5079  5080  5081  5082  5083
##     1     1     1     1     1     4     4     1     4     1     4     1     1
##  5084  5085  5086  5087  5088  5089  5090  5091  5092  5093  5094  5095  5096
##     1     1     4     1     4     1     1     1     4     1     1     1     1
##  5097  5098  5099  5100  5101  5102  5103  5104  5105  5106  5107  5108  5109
##     1     1     1     1     1     1     1     4     1     4     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     4     1     4
##  5123  5124  5125  5126  5127  5128  5129  5130  5131  5132  5133  5134  5135
##     1     1     1     1     4     1     4     4     1     1     1     1     1
##  5136  5137  5138  5139  5140  5141  5142  5143  5144  5145  5146  5147  5148
##     1     1     1     4     1     1     1     4     4     4     1     4     1
##  5149  5150  5151  5152  5153  5154  5155  5156  5157  5158  5159  5160  5161
##     1     1     1     1     4     4     1     1     1     4     1     1     4
##  5162  5163  5164  5165  5166  5167  5168  5169  5170  5171  5172  5173  5174
##     4     1     1     1     4     1     1     4     1     1     1     4     1
```

```
##  5175  5176  5177  5178  5179  5180  5181  5182  5183  5184  5185  5186  5187
##     1     4     1     1     4     1     4     1     1     1     4     1     1
##  5188  5189  5190  5191  5192  5193  5194  5195  5196  5197  5198  5199  5200
##     1     4     1     1     1     1     1     1     1     1     1     1     1
##  5201  5202  5203  5204  5205  5206  5207  5208  5209  5210  5211  5212  5213
##     4     1     1     1     1     1     1     4     1     4     1     1     1
##  5214  5215  5216  5217  5218  5219  5220  5221  5222  5223  5224  5225  5226
##     1     1     1     4     4     1     1     1     4     4     1     1     1
##  5227  5228  5229  5230  5231  5232  5233  5234  5235  5236  5237  5238  5239
##     1     4     1     1     4     1     4     1     1     1     1     1     4
##  5240  5241  5242  5243  5244  5245  5246  5247  5248  5249  5250  5251  5252
##     1     1     1     1     1     1     1     1     1     1     4     1     4
##  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     1     1     1     1     1     1     4     1     1     1     1     1
##  5279  5280  5281  5282  5283  5284  5285  5286  5287  5288  5289  5290  5291
##     1     1     1     4     1     1     4     1     1     1     4     1     1
##  5292  5293  5294  5295  5296  5297  5298  5299  5300  5301  5302  5303  5304
##     1     1     1     1     1     1     1     1     1     1     1     1     1
##  5305  5306  5307  5308  5309  5310  5311  5312  5313  5314  5315  5316  5317
##     1     1     4     1     4     1     1     1     1     1     1     4     1
##  5318  5319  5320  5321  5322  5323  5324  5325  5326  5327  5328  5329  5330
##     1     4     1     1     1     1     4     1     1     1     1     1     1
##  5331  5332  5333  5334  5335  5336  5337  5338  5339  5340  5341  5342  5343
##     1     1     2     2     2     2     2     2     2     4     4     4     4
##  5344  5345  5346  5347  5348  5349  5350  5351  5352  5353  5354  5355  5356
##     2     3     2     2     2     2     2     2     2     2     4     2     4
##  5357  5358  5359  5360  5361  5362  5363  5364  5365  5366  5367  5368  5369
##     3     2     2     4     2     4     2     2     4     2     2     2     2
##  5370  5371  5372  5373  5374  5375  5376  5377  5378  5379  5380  5381  5382
##     2     2     3     2     2     3     4     2     2     2     2     2     4
##  5383  5384  5385  5386  5387  5388  5389  5390  5391  5392  5393  5394  5395
##     2     4     3     2     4     4     4     2     2     2     3     2     4
##  5396  5397  5398  5399  5400  5401  5402  5403  5404  5405  5406  5407  5408
##     4     2     2     2     4     2     2     2     2     4     2     2     2
##  5409  5410  5411  5412  5413  5414  5415  5416  5417  5418  5419  5420  5421
##     2     4     3     2     2     4     4     2     4     2     2     3     4
##  5422  5423  5424  5425  5426  5427  5428  5429  5430  5431  5432  5433  5434
##     2     4     2     2     4     2     2     4     2     2     3     2     3
##  5435  5436  5437  5438  5439  5440  5441  5442  5443  5444  5445  5446  5447
##     3     2     2     2     4     2     4     2     2     2     4     4     2
##  5448  5449  5450  5451  5452  5453  5454  5455  5456  5457  5458  5459  5460
##     2     2     4     2     2     2     4     2     2     3     2     2     2
##  5461  5462  5463  5464  5465  5466  5467  5468  5469  5470  5471  5472  5473
##     2     2     2     2     2     2     2     4     2     4     2     2     2
##  5474  5475  5476  5477  5478  5479  5480  5481  5482  5483  5484  5485  5486
##     2     2     4     2     2     2     4     2     4     4     2     2     3
##  5487  5488  5489  5490  5491  5492  5493  5494  5495  5496  5497  5498  5499
##     2     2     2     2     2     4     2     3     2     2     4     2     2
##  5500  5501  5502  5503  5504  5505  5506  5507  5508  5509  5510  5511  5512
##     4     2     2     4     2     2     2     4     4     4     2     2     4
##  5513  5514  5515  5516  5517  5518  5519  5520  5521  5522  5523  5524  5525
##     4     2     2     4     2     4     2     2     4     3     4     2     2
```

```
##  5526  5527  5528  5529  5530  5531  5532  5533  5534  5535  5536  5537  5538
##     4     2     4     2     2     4     2     2     3     4     2     2     2
##  5539  5540  5541  5542  5543  5544  5545  5546  5547  5548  5549  5550  5551
##     2     2     3     2     2     2     2     3     2     2     2     2     4
##  5552  5553  5554  5555  5556  5557  5558  5559  5560  5561  5562  5563  5564
##     4     2     2     4     2     2     4     2     2     4     4     2     2
##  5565  5566  5567  5568  5569  5570  5571  5572  5573  5574  5575  5576  5577
##     2     2     2     2     2     2     4     4     2     2     3     4     2
##  5578  5579  5580  5581  5582  5583  5584  5585  5586  5587  5588  5589  5590
##     4     2     2     2     4     2     4     3     4     2     2     4     2
##  5591  5592  5593  5594  5595  5596  5597  5598  5599  5600  5601  5602  5603
##     2     4     2     3     2     2     4     2     4     2     2     3     2
##  5604  5605  5606  5607  5608  5609  5610  5611  5612  5613  5614  5615  5616
##     2     3     2     2     4     2     2     2     4     2     2     4     2
##  5617  5618  5619  5620  5621  5622  5623  5624  5625  5626  5627  5628  5629
##     3     2     2     3     2     2     4     3     4     2     2     2     2
##  5630  5631  5632  5633  5634  5635  5636  5637  5638  5639  5640  5641  5642
##     2     2     4     3     2     2     4     2     2     2     2     2     4
##  5643  5644  5645  5646  5647  5648  5649  5650  5651  5652  5653  5654  5655
##     4     2     2     3     2     2     2     4     2     2     4     2     2
##  5656  5657  5658  5659  5660  5661  5662  5663  5664  5665  5666  5667  5668
##     3     2     2     2     4     2     2     2     3     2     2     2     3
##  5669  5670  5671  5672  5673  5674  5675  5676  5677  5678  5679  5680  5681
##     2     2     2     4     2     2     4     2     2     2     2     2     2
##  5682  5683  5684  5685  5686  5687  5688  5689  5690  5691  5692  5693  5694
##     2     4     4     2     4     4     2     2     3     2     4     2     2
##  5695  5696  5697  5698  5699  5700  5701  5702  5703  5704  5705  5706  5707
##     2     2     4     4     2     2     3     2     4     2     3     2     3
##  5708  5709  5710  5711  5712  5713  5714  5715  5716  5717  5718  5719  5720
##     2     3     2     2     2     2     2     4     4     4     2     2     3
##  5721  5722  5723  5724  5725  5726  5727  5728  5729  5730  5731  5732  5733
##     2     2     2     2     2     2     2     2     4     2     4     2     2
##  5734  5735  5736  5737  5738  5739  5740  5741  5742  5743  5744  5745  5746
##     2     4     2     3     2     2     3     2     2     4     2     2     2
##  5747  5748  5749  5750  5751  5752  5753  5754  5755  5756  5757  5758  5759
##     2     2     2     2     2     2     3     2     4     2     2     4     2
##  5760  5761  5762  5763  5764  5765  5766  5767  5768  5769  5770  5771  5772
##     3     4     2     2     2     3     2     4     2     2     4     2     2
##  5773  5774  5775  5776  5777  5778  5779  5780  5781  5782  5783  5784  5785
##     3     2     3     2     2     2     4     4     3     2     4     4     2
##  5786  5787  5788  5789  5790  5791  5792  5793  5794  5795  5796  5797  5798
##     4     2     2     2     2     2     2     2     2     2     4     2     4     2
##  5799  5800  5801  5802  5803  5804  5805  5806  5807  5808  5809  5810  5811
##     3     2     2     2     2     2     2     2     2     2     2     2     4
##  5812  5813  5814  5815  5816  5817  5818  5819  5820  5821  5822  5823  5824
##     2     4     4     4     4     3     4     3     2     2     2     2     2
##  5825  5826  5827  5828  5829  5830  5831  5832  5833  5834  5835  5836  5837
##     2     2     3     4     4     2     2     2     2     3     4     2     2
##  5838  5839  5840  5841  5842  5843  5844  5845  5846  5847  5848  5849  5850
##     2     2     2     4     2     2     2     2     4     2     2     4     4
##  5851  5852  5853  5854  5855  5856  5857  5858  5859  5860  5861  5862  5863
##     2     4     3     2     2     3     4     3     2     2     4     4     2
##  5864  5865  5866  5867  5868  5869  5870  5871  5872  5873  5874  5875  5876
##     2     2     2     4     2     4     2     3     2     4     2     2     2
```

```
##  5877  5878  5879  5880  5881  5882  5883  5884  5885  5886  5887  5888  5889
##     4     2     4     2     3     3     4     2     2     2     4     3     3
##  5890  5891  5892  5893  5894  5895  5896  5897  5898  5899  5900  5901  5902
##     4     2     2     2     2     2     2     4     4     4     2     2     2
##  5903  5904  5905  5906  5907  5908  5909  5910  5911  5912  5913  5914  5915
##     2     2     2     2     2     4     2     2     2     2     2     2     2
##  5916  5917  5918  5919  5920  5921  5922  5923  5924  5925  5926  5927  5928
##     3     2     2     2     3     2     2     2     2     3     2     4     4
##  5929  5930  5931  5932  5933  5934  5935  5936  5937  5938  5939  5940  5941
##     2     2     4     4     2     2     2     4     3     4     2     2     2
##  5942  5943  5944  5945  5946  5947  5948  5949  5950  5951  5952  5953  5954
##     2     3     2     3     4     2     4     2     4     2     4     2     3
##  5955  5956  5957  5958  5959  5960  5961  5962  5963  5964  5965  5966  5967
##     2     2     4     2     2     2     2     2     2     2     2     4     2
##  5968  5969  5970  5971  5972  5973  5974  5975  5976  5977  5978  5979  5980
##     2     4     2     2     2     2     2     2     2     4     3     2     2
##  5981  5982  5983  5984  5985  5986  5987  5988  5989  5990  5991  5992  5993
##     4     2     3     2     2     2     2     2     3     2     2     2     2
##  5994  5995  5996  5997  5998  5999  6000  6001  6002  6003  6004  6005  6006
##     4     4     2     4     2     4     3     4     3     4     2     2     2
##  6007  6008  6009  6010  6011  6012  6013  6014  6015  6016  6017  6018  6019
##     3     2     2     2     2     4     2     2     4     4     2     4     2
##  6020  6021  6022  6023  6024  6025  6026  6027  6028  6029  6030  6031  6032
##     4     2     4     2     3     3     4     3     3     4     2     4     4
##  6033  6034  6035  6036  6037  6038  6039  6040  6041  6042  6043  6044  6045
##     2     4     2     4     2     4     2     3     4     2     2     2     4
##  6046  6047  6048  6049  6050  6051  6052  6053  6054  6055  6056  6057  6058
##     2     2     4     2     2     2     2     2     2     2     4     4     4
##  6059  6060  6061  6062  6063  6064  6065  6066  6067  6068  6069  6070  6071
##     4     4     2     2     2     2     2     2     3     4     2     2     2
##  6072  6073  6074  6075  6076  6077  6078  6079  6080  6081  6082  6083  6084
##     2     2     3     2     4     2     2     3     2     4     2     2     2
##  6085  6086  6087  6088  6089  6090  6091  6092  6093  6094  6095  6096  6097
##     2     2     4     2     2     2     2     2     4     2     2     3     2
##  6098  6099  6100  6101  6102  6103  6104  6105  6106  6107  6108  6109  6110
##     2     2     4     4     4     2     2     2     4     2     3     2     2
##  6111  6112  6113  6114  6115  6116  6117  6118  6119  6120  6121  6122  6123
##     2     2     2     2     2     2     4     2     2     4     3     2     4
##  6124  6125  6126  6127  6128  6129  6130  6131  6132  6133  6134  6135  6136
##     2     4     2     2     4     4     2     4     2     2     2     2     2
##  6137  6138  6139  6140  6141  6142  6143  6144  6145  6146  6147  6148  6149
##     2     2     2     2     4     2     2     2     4     3     3     2     4
##  6150  6151  6152  6153  6154  6155  6156  6157  6158  6159  6160  6161  6162
##     4     3     2     4     4     2     3     2     2     2     3     2     3
##  6163  6164  6165  6166  6167  6168  6169  6170  6171  6172  6173  6174  6175
##     2     2     2     3     4     2     2     4     4     2     3     2     3
##  6176  6177  6178  6179  6180  6181  6182  6183  6184  6185  6186  6187  6188
##     2     4     2     2     2     2     3     2     4     4     2     2     3
##  6189  6190  6191  6192  6193  6194  6195  6196  6197  6198  6199  6200  6201
##     2     2     2     2     2     2     2     3     2     2     4     4     2
##  6202  6203  6204  6205  6206  6207  6208  6209  6210  6211  6212  6213  6214
##     2     2     3     4     2     4     2     3     2     2     2     2     4
##  6215  6216  6217  6218  6219  6220  6221  6222  6223  6224  6225  6226  6227
##     2     4     2     4     4     2     2     2     2     2     3     2     2
```

```
##  6228  6229  6230  6231  6232  6233  6234  6235  6236  6237  6238  6239  6240
##     2     2     2     2     2     3     4     2     4     2     2     3     2
##  6241  6242  6243  6244  6245  6246  6247  6248  6249  6250  6251  6252  6253
##     4     2     4     2     2     2     3     2     2     2     4     2     4
##  6254  6255  6256  6257  6258  6259  6260  6261  6262  6263  6264  6265  6266
##     2     2     4     4     4     4     2     2     2     2     3     3     2
##  6267  6268  6269  6270  6271  6272  6273  6274  6275  6276  6277  6278  6279
##     2     4     2     2     4     2     2     2     2     3     2     2     2
##  6280  6281  6282  6283  6284  6285  6286  6287  6288  6289  6290  6291  6292
##     2     2     2     4     2     4     2     2     2     2     4     2     4
##  6293  6294  6295  6296  6297  6298  6299  6300  6301  6302  6303  6304  6305
##     2     4     2     4     2     2     4     4     3     2     2     4     2
##  6306  6307  6308  6309  6310  6311  6312  6313  6314  6315  6316  6317  6318
##     4     4     4     2     3     3     2     4     2     2     2     4     3
##  6319  6320  6321  6322  6323  6324  6325  6326  6327  6328  6329  6330  6331
##     2     4     2     2     4     2     2     2     4     2     2     2     2
##  6332  6333  6334  6335  6336  6337  6338  6339  6340  6341  6342  6343  6344
##     2     2     2     2     2     4     2     2     2     2     4     2     2
##  6345  6346  6347  6348  6349  6350  6351  6352  6353  6354  6355  6356  6357
##     2     4     2     2     2     2     2     2     2     2     2     3     4
##  6358  6359  6360  6361  6362  6363  6364  6365  6366  6367  6368  6369  6370
##     2     3     2     4     2     4     2     2     2     2     2     2     4
##  6371  6372  6373  6374  6375  6376  6377  6378  6379  6380  6381  6382  6383
##     2     2     2     2     2     2     2     3     2     2     3     2     3
##  6384  6385  6386  6387  6388  6389  6390  6391  6392  6393  6394  6395  6396
##     2     3     2     2     4     2     3     4     2     2     4     2     2
##  6397  6398  6399  6400  6401  6402  6403  6404  6405  6406  6407  6408  6409
##     2     2     4     2     2     2     4     2     4     2     4     2     4
##  6410  6411  6412  6413  6414  6415  6416  6417  6418  6419  6420  6421  6422
##     2     2     2     4     2     2     2     2     4     2     2     2     4
##  6423  6424  6425  6426  6427  6428  6429  6430  6431  6432  6433  6434  6435
##     2     2     4     2     2     2     2     2     2     3     2     2     2
##  6436  6437  6438  6439  6440  6441  6442  6443  6444  6445  6446  6447  6448
##     2     2     4     2     3     4     2     2     3     4     2     2     2
##  6449  6450  6451  6452  6453  6454  6455  6456  6457  6458  6459  6460  6461
##     2     4     2     2     2     4     2     2     4     2     2     3     2
##  6462  6463  6464  6465  6466  6467  6468  6469  6470  6471  6472  6473  6474
##     4     2     2     2     2     2     2     2     2     2     2     2     2
##  6475  6476  6477  6478  6479  6480  6481  6482  6483  6484  6485  6486  6487
##     2     3     2     4     2     2     2     2     3     2     4     2     2
##  6488  6489  6490  6491  6492  6493  6494  6495  6496  6497  6498  6499  6500
##     2     4     3     2     2     2     2     2     4     2     4     2     2
##  6501  6502  6503  6504  6505  6506  6507  6508  6509  6510  6511  6512  6513
##     3     2     2     3     2     2     4     2     2     2     4     2     2
##  6514  6515  6516  6517  6518  6519  6520  6521  6522  6523  6524  6525  6526
##     2     2     4     2     3     4     4     2     2     4     4     3     4
##  6527  6528  6529  6530  6531  6532  6533  6534  6535  6536  6537  6538  6539
##     2     3     2     2     4     2     2     2     2     4     2     3     4
##  6540  6541  6542  6543  6544  6545  6546  6547  6548  6549  6550  6551  6552
##     2     3     2     2     2     2     4     2     4     2     3     2     3
##  6553  6554  6555  6556  6557  6558  6559  6560  6561  6562  6563  6564  6565
##     4     2     3     4     2     2     4     2     2     2     4     3     2
##  6566  6567  6568  6569  6570  6571  6572  6573  6574  6575  6576  6577  6578
##     2     2     3     2     2     2     2     2     2     3     2     2     2
```

```
##  6579  6580  6581  6582  6583  6584  6585  6586  6587  6588  6589  6590  6591
##     2     2     4     2     2     2     2     2     2     2     2     2     2
##  6592  6593  6594  6595  6596  6597  6598  6599  6600  6601  6602  6603  6604
##     2     4     3     2     3     2     4     3     3     4     2     2     2
##  6605  6606  6607  6608  6609  6610  6611  6612  6613  6614  6615  6616  6617
##     2     2     3     2     3     2     3     2     3     3     2     2     4
##  6618  6619  6620  6621  6622  6623  6624  6625  6626  6627  6628  6629  6630
##     2     3     2     2     2     2     2     2     2     2     3     2     3
##  6631  6632  6633  6634  6635  6636  6637  6638  6639  6640  6641  6642  6643
##     2     2     4     4     2     4     2     2     2     4     2     2     2
##  6644  6645  6646  6647  6648  6649  6650  6651  6652  6653  6654  6655  6656
##     2     2     2     3     2     2     4     2     2     4     2     3     2
##  6657  6658  6659  6660  6661  6662  6663  6664  6665  6666  6667  6668  6669
##     2     2     3     2     2     3     2     2     2     2     2     2     3
##  6670  6671  6672  6673  6674  6675  6676  6677  6678  6679  6680  6681  6682
##     4     2     4     4     3     2     2     2     2     2     2     2     4
##  6683  6684  6685  6686  6687  6688  6689  6690  6691  6692  6693  6694  6695
##     2     2     2     4     4     4     3     2     2     3     4     4     2
##  6696  6697  6698  6699  6700  6701  6702  6703  6704  6705  6706  6707  6708
##     2     2     2     3     2     2     2     2     2     2     4     2     2
##  6709  6710  6711  6712  6713  6714  6715  6716  6717  6718  6719  6720  6721
##     2     2     2     2     2     2     2     2     2     3     3     2     4
##  6722  6723  6724  6725  6726  6727  6728  6729  6730  6731  6732  6733  6734
##     2     4     2     2     2     2     2     2     2     3     2     2     2
##  6735  6736  6737  6738  6739  6740  6741  6742  6743  6744  6745  6746  6747
##     2     2     2     4     2     2     4     4     3     2     3     2     2
##  6748  6749  6750  6751  6752  6753  6754  6755  6756  6757  6758  6759  6760
##     2     2     2     4     4     2     3     4     4     2     3     2     4
##  6761  6762  6763  6764  6765  6766  6767  6768  6769  6770  6771  6772  6773
##     4     2     2     4     2     2     2     2     2     2     3     2     4
##  6774  6775  6776  6777  6778  6779  6780  6781  6782  6783  6784  6785  6786
##     2     2     3     2     2     2     4     2     2     2     2     2     4
##  6787  6788  6789  6790  6791  6792  6793  6794  6795  6796  6797  6798  6799
##     2     3     2     2     4     4     2     2     2     3     2     2     3
##  6800  6801  6802  6803  6804  6805  6806  6807  6808  6809  6810  6811  6812
##     2     4     2     2     4     2     2     2     2     3     2     2     2
##  6813  6814  6815  6816  6817  6818  6819  6820  6821  6822  6823  6824  6825
##     4     2     2     2     2     4     2     2     2     2     4     3     3
##  6826  6827  6828  6829  6830  6831  6832  6833  6834  6835  6836  6837  6838
##     2     2     2     2     3     4     2     2     4     4     2     2     4
##  6839  6840  6841  6842  6843  6844  6845  6846  6847  6848  6849  6850  6851
##     2     2     4     2     3     2     2     4     2     2     4     4     2
##  6852  6853  6854  6855  6856  6857  6858  6859  6860  6861  6862  6863  6864
##     2     2     2     2     2     3     2     2     2     4     2     4     2
##  6865  6866  6867  6868  6869  6870  6871  6872  6873  6874  6875  6876  6877
##     2     4     2     2     4     2     2     2     2     2     2     3     2
##  6878  6879  6880  6881  6882  6883  6884  6885  6886  6887  6888  6889  6890
##     2     4     2     2     2     2     2     2     2     2     2     2     2
##  6891  6892  6893  6894  6895  6896  6897  6898  6899  6900  6901  6902  6903
##     2     4     2     4     2     2     3     4     2     4     4     4     4
##  6904  6905  6906  6907  6908  6909  6910  6911  6912  6913  6914  6915  6916
##     2     2     2     2     4     3     2     2     2     2     2     4     2
##  6917  6918  6919  6920  6921  6922  6923  6924  6925  6926  6927  6928  6929
##     3     2     4     2     2     4     4     2     4     4     2     4     4
```

```
##  6930  6931  6932  6933  6934  6935  6936  6937  6938  6939  6940  6941  6942
##     2     2     4     3     2     2     4     3     2     2     2     4     4
##  6943  6944  6945  6946  6947  6948  6949  6950  6951  6952  6953  6954  6955
##     4     2     3     4     2     2     2     4     2     2     2     2     2
##  6956  6957  6958  6959  6960  6961  6962  6963  6964  6965  6966  6967  6968
##     2     4     4     2     4     3     2     4     2     2     2     2     4
##  6969  6970  6971  6972  6973  6974  6975  6976  6977  6978  6979  6980  6981
##     2     2     2     4     2     2     2     2     3     2     3     4     3
##  6982  6983  6984  6985  6986  6987  6988  6989  6990  6991  6992  6993  6994
##     4     2     2     2     2     2     3     2     2     2     2     3     4
##  6995  6996  6997  6998  6999  7000  7001  7002  7003  7004  7005  7006  7007
##     2     2     2     2     2     2     2     2     2     2     3     2     2
##  7008  7009  7010  7011  7012  7013  7014  7015  7016  7017  7018  7019  7020
##     2     3     4     2     3     2     2     2     2     2     3     4     2
##  7021  7022  7023  7024  7025  7026  7027  7028  7029  7030  7031  7032  7033
##     2     2     2     2     3     2     3     2     2     2     2     4     3
##  7034  7035  7036  7037  7038  7039  7040  7041  7042  7043  7044  7045  7046
##     2     4     4     3     2     4     2     2     4     3     4     2     2
##  7047  7048  7049  7050  7051  7052  7053  7054  7055  7056  7057  7058  7059
##     2     2     4     4     2     2     2     3     2     3     2     2     2
##  7060  7061  7062  7063  7064  7065  7066  7067  7068  7069  7070  7071  7072
##     2     2     4     2     2     2     2     2     2     2     4     2     2
##  7073  7074  7075  7076  7077  7078  7079  7080  7081  7082  7083  7084  7085
##     2     2     4     2     2     2     4     4     2     3     3     2     2
##  7086  7087  7088  7089  7090  7091  7092  7093  7094  7095  7096  7097  7098
##     2     2     4     4     2     4     4     2     2     2     2     2     2
##  7099  7100  7101  7102  7103  7104  7105  7106  7107  7108  7109  7110  7111
##     3     2     4     2     2     2     2     2     4     2     2     2     3
##  7112  7113  7114  7115  7116  7117  7118  7119  7120  7121  7122  7123  7124
##     2     2     4     3     4     4     3     4     2     2     2     2     2
##  7125  7126  7127  7128  7129  7130  7131  7132  7133  7134  7135  7136  7137
##     4     2     2     4     2     2     2     2     4     4     2     2     3
##  7138  7139  7140  7141  7142  7143  7144  7145  7146  7147  7148  7149  7150
##     2     2     2     4     2     2     4     2     2     2     2     2     4
##  7151  7152  7153  7154  7155  7156  7157  7158  7159  7160  7161  7162  7163
##     2     4     2     2     2     2     2     2     2     4     2     2     3
##  7164  7165  7166  7167  7168  7169  7170  7171  7172  7173  7174  7175  7176
##     2     2     4     2     2     4     2     3     4     2     2     3     3
##  7177  7178  7179  7180  7181  7182  7183  7184  7185  7186  7187  7188  7189
##     3     4     2     2     2     3     3     2     2     4     4     3     2
##  7190  7191  7192  7193  7194  7195  7196  7197  7198  7199  7200  7201  7202
##     4     2     2     2     2     2     2     2     2     2     2     3     4
##  7203  7204  7205  7206  7207  7208  7209  7210  7211  7212  7213  7214  7215
##     2     2     2     4     2     2     2     4     2     2     4     4     2
##  7216  7217  7218  7219  7220  7221  7222  7223  7224  7225  7226  7227  7228
##     2     2     2     4     2     4     4     2     2     2     3     3     3
##  7229  7230  7231  7232  7233  7234  7235  7236  7237  7238  7239  7240  7241
##     2     4     4     2     2     2     4     2     4     2     2     3     3
##  7242  7243  7244  7245  7246  7247  7248  7249  7250  7251  7252  7253  7254
##     2     2     3     4     2     4     2     4     2     2     3     2     2
##  7255  7256  7257  7258  7259  7260  7261  7262  7263  7264  7265  7266  7267
##     2     2     2     2     2     2     2     4     4     2     2     4     4
##  7268  7269  7270  7271  7272  7273  7274  7275  7276  7277  7278  7279  7280
##     4     2     2     4     2     2     2     4     2     2     4     2     2
```

```
##  7281  7282  7283  7284  7285  7286  7287  7288  7289  7290  7291  7292  7293
##     2     4     2     3     4     2     3     2     3     2     2     4     4
##  7294  7295  7296  7297  7298  7299  7300  7301  7302  7303  7304  7305  7306
##     2     2     2     3     3     2     2     2     4     2     2     2     2
##  7307  7308  7309  7310  7311  7312  7313  7314  7315  7316  7317  7318  7319
##     2     4     2     2     2     2     4     2     4     3     3     2     2
##  7320  7321  7322  7323  7324  7325  7326  7327  7328  7329  7330  7331  7332
##     2     2     4     2     2     2     2     4     2     2     2     2     3
##  7333  7334  7335  7336  7337  7338  7339  7340  7341  7342  7343  7344  7345
##     2     2     3     2     4     2     2     2     2     2     3     3     2
##  7346  7347  7348  7349  7350  7351  7352  7353  7354  7355  7356  7357  7358
##     2     3     2     2     3     2     3     2     3     2     3     2     4
##  7359  7360  7361  7362  7363  7364  7365  7366  7367  7368  7369  7370  7371
##     2     2     2     2     2     2     2     2     2     3     2     4     2
##  7372  7373  7374  7375  7376  7377  7378  7379  7380  7381  7382  7383  7384
##     2     2     3     2     2     4     4     4     2     2     2     2     4
##  7385  7386  7387  7388  7389  7390  7391  7392  7393  7394  7395  7396  7397
##     2     2     2     4     2     3     4     2     2     2     2     2     2
##  7398  7399  7400  7401  7402  7403  7404  7405  7406  7407  7408  7409  7410
##     2     2     2     4     2     2     2     4     3     2     4     2     2
##  7411  7412  7413  7414  7415  7416  7417  7418  7419  7420  7421  7422  7423
##     2     3     3     4     2     2     4     4     2     2     3     2     4
##  7424  7425  7426  7427  7428  7429  7430  7431  7432  7433  7434  7435  7436
##     2     2     2     4     2     2     3     4     4     4     3     2     2
##  7437  7438  7439  7440  7441  7442  7443  7444  7445  7446  7447  7448  7449
##     2     2     2     2     2     2     2     3     2     2     2     2     2
##  7450  7451  7452  7453  7454  7455  7456  7457  7458  7459  7460  7461  7462
##     4     4     2     3     2     4     2     4     2     2     2     2     2
##  7463  7464  7465  7466  7467  7468  7469  7470  7471  7472  7473  7474  7475
##     4     4     2     3     2     4     2     4     2     4     2     3     4
##  7476  7477  7478  7479  7480  7481  7482  7483  7484  7485  7486  7487  7488
##     2     2     4     2     2     2     2     3     4     2     3     4     2
##  7489  7490  7491  7492  7493  7494  7495  7496  7497  7498  7499  7500  7501
##     2     4     2     2     2     4     2     2     2     2     3     2     2
##  7502  7503  7504  7505  7506  7507  7508  7509  7510  7511  7512  7513  7514
##     2     2     2     4     2     2     2     2     2     2     2     3     2
##  7515  7516  7517  7518  7519  7520  7521  7522  7523  7524  7525  7526  7527
##     2     2     2     4     2     3     4     4     2     2     4     3     2
##  7528  7529  7530  7531  7532  7533  7534  7535  7536  7537  7538  7539  7540
##     2     2     2     3     2     2     2     2     4     2     2     2     2
##  7541  7542  7543  7544  7545  7546  7547  7548  7549  7550  7551  7552  7553
##     2     2     2     2     2     2     2     2     4     2     2     2     4
##  7554  7555  7556  7557  7558  7559  7560  7561  7562  7563  7564  7565  7566
##     2     2     4     2     4     2     2     2     2     4     4     2     2
##  7567  7568  7569  7570  7571  7572  7573  7574  7575  7576  7577  7578  7579
##     2     2     2     2     3     2     2     2     2     4     2     3     2
##  7580  7581  7582  7583  7584  7585  7586  7587  7588  7589  7590  7591  7592
##     2     2     2     2     2     2     2     4     2     2     2     2     2
##  7593  7594  7595  7596  7597  7598  7599  7600  7601  7602  7603  7604  7605
##     3     2     2     4     4     2     2     3     3     4     2     2     4
##  7606  7607  7608  7609  7610  7611  7612  7613  7614  7615  7616  7617  7618
##     2     2     2     2     2     3     2     2     2     3     4     2     2
##  7619  7620  7621  7622  7623  7624  7625  7626  7627  7628  7629  7630  7631
##     3     4     4     2     2     4     4     3     2     2     3     2     2
```

```
##  7632  7633  7634  7635  7636  7637  7638  7639  7640  7641  7642  7643  7644
##     2     2     2     2     3     3     2     3     4     2     2     2     2
##  7645  7646  7647  7648  7649  7650  7651  7652  7653  7654  7655  7656  7657
##     2     2     2     3     2     2     2     2     2     2     2     4     4
##  7658  7659  7660  7661  7662  7663  7664  7665  7666  7667  7668  7669  7670
##     4     2     3     4     2     2     4     2     2     4     2     2     2
##  7671  7672  7673  7674  7675  7676  7677  7678  7679  7680  7681  7682  7683
##     2     2     2     3     3     2     2     2     4     2     4     2     2
##  7684  7685  7686  7687  7688  7689  7690  7691  7692  7693  7694  7695  7696
##     2     2     2     4     3     2     2     2     4     2     3     2     3
##  7697  7698  7699  7700  7701  7702  7703  7704  7705  7706  7707  7708  7709
##     2     2     4     2     4     2     3     2     2     2     3     2     2
##  7710  7711  7712  7713  7714  7715  7716  7717  7718  7719  7720  7721  7722
##     2     2     2     2     3     3     2     4     2     2     2     3     4
##  7723  7724  7725  7726  7727  7728  7729  7730  7731  7732  7733  7734  7735
##     2     2     2     4     2     2     2     2     4     2     4     2     2
##  7736  7737  7738  7739  7740  7741  7742  7743  7744  7745  7746  7747  7748
##     2     4     2     2     2     2     2     4     3     4     2     4     3
##  7749  7750  7751  7752  7753  7754  7755  7756  7757  7758  7759  7760  7761
##     4     2     2     2     3     4     4     4     2     2     2     4     3
##  7762  7763  7764  7765  7766  7767  7768  7769  7770  7771  7772  7773  7774
##     2     4     4     2     2     4     2     2     2     4     2     2     2
##  7775  7776  7777  7778  7779  7780  7781  7782  7783  7784  7785  7786  7787
##     2     2     2     4     4     2     2     2     3     2     2     2     2
##  7788  7789  7790  7791  7792  7793  7794  7795  7796  7797  7798  7799  7800
##     3     4     4     3     2     2     2     2     2     4     2     2     2
##  7801  7802  7803  7804  7805  7806  7807  7808  7809  7810  7811  7812  7813
##     4     4     2     2     2     2     2     4     4     2     2     4     2
##  7814  7815  7816  7817  7818  7819  7820  7821  7822  7823  7824  7825  7826
##     2     2     4     4     3     3     2     3     2     3     4     4     2
##  7827  7828  7829  7830  7831  7832  7833  7834  7835  7836  7837  7838  7839
##     4     2     2     2     3     2     2     2     2     2     2     4     4
##  7840  7841  7842  7843  7844  7845  7846  7847  7848  7849  7850  7851  7852
##     2     2     2     3     2     2     3     2     2     4     2     2     4
##  7853  7854  7855  7856  7857  7858  7859  7860  7861  7862  7863  7864  7865
##     2     2     2     2     2     2     3     3     3     2     3     4     2
##  7866  7867  7868  7869  7870  7871  7872  7873  7874  7875  7876  7877  7878
##     4     2     4     3     3     2     3     4     4     3     2     3     2
##  7879  7880  7881  7882  7883  7884  7885  7886  7887  7888  7889  7890  7891
##     2     4     3     3     3     4     4     2     3     4     4     2     4
##  7892  7893  7894  7895  7896  7897  7898  7899  7900  7901  7902  7903  7904
##     2     4     4     3     2     3     2     3     2     3     3     4     2
##  7905  7906  7907  7908  7909  7910  7911  7912  7913  7914  7915  7916  7917
##     4     2     3     3     2     3     3     3     2     2     2     3     3
##  7918  7919  7920  7921  7922  7923  7924  7925  7926  7927  7928  7929  7930
##     3     4     3     3     2     3     3     4     3     2     4     3     2
##  7931  7932  7933  7934  7935  7936  7937  7938  7939  7940  7941  7942  7943
##     2     3     3     2     3     2     2     3     3     3     2     3     2
##  7944  7945  7946  7947  7948  7949  7950  7951  7952  7953  7954  7955  7956
##     4     2     2     4     4     2     4     2     2     3     3     3     4
##  7957  7958  7959  7960  7961  7962  7963  7964  7965  7966  7967  7968  7969
##     2     2     3     3     3     2     3     3     3     3     4     3     2
##  7970  7971  7972  7973  7974  7975  7976  7977  7978  7979  7980  7981  7982
##     2     2     3     3     2     2     3     3     4     2     3     2     2
```

```
##  7983  7984  7985  7986  7987  7988  7989  7990  7991  7992  7993  7994  7995
##     3     2     3     3     2     4     3     3     3     3     4     2     3
##  7996  7997  7998  7999  8000  8001  8002  8003  8004  8005  8006  8007  8008
##     2     3     2     4     3     4     3     3     2     4     3     2     2
##  8009  8010  8011  8012  8013  8014  8015  8016  8017  8018  8019  8020  8021
##     4     3     4     4     3     2     3     3     3     2     3     2     3
##  8022  8023  8024  8025  8026  8027  8028  8029  8030  8031  8032  8033  8034
##     4     3     4     2     2     4     3     4     2     4     3     4     4
##  8035  8036  8037  8038  8039  8040  8041  8042  8043  8044  8045  8046  8047
##     4     3     2     3     3     2     2     2     2     3     3     2     3
##  8048  8049  8050  8051  8052  8053  8054  8055  8056  8057  8058  8059  8060
##     2     3     3     3     3     2     2     3     2     3     3     2     2
##  8061  8062  8063  8064  8065  8066  8067  8068  8069  8070  8071  8072  8073
##     3     3     2     4     3     2     2     4     3     3     3     3     3
##  8074  8075  8076  8077  8078  8079  8080  8081  8082  8083  8084  8085  8086
##     4     3     2     2     3     3     3     2     2     2     4     3     2
##  8087  8088  8089  8090  8091  8092  8093  8094  8095  8096  8097  8098  8099
##     2     2     2     2     3     3     3     2     2     3     2     3     3
##  8100  8101  8102  8103  8104  8105  8106  8107  8108  8109  8110  8111  8112
##     2     3     3     2     4     4     3     2     2     2     4     4     3
##  8113  8114  8115  8116  8117  8118  8119  8120  8121  8122  8123  8124  8125
##     2     3     3     3     4     4     4     3     3     3     2     3     4
##  8126  8127  8128  8129  8130  8131  8132  8133  8134  8135  8136  8137  8138
##     3     3     4     2     3     2     3     3     3     3     3     4     3
##  8139  8140  8141  8142  8143  8144  8145  8146  8147  8148  8149  8150  8151
##     2     3     3     3     4     3     2     3     3     3     3     3     3
##  8152  8153  8154  8155  8156  8157  8158  8159  8160  8161  8162  8163  8164
##     2     3     2     3     3     3     3     3     3     2     2     3     4
##  8165  8166  8167  8168  8169  8170  8171  8172  8173  8174  8175  8176  8177
##     4     2     3     3     4     2     2     2     4     2     4     2     2
##  8178  8179  8180  8181  8182  8183  8184  8185  8186  8187  8188  8189  8190
##     2     2     3     3     4     3     2     2     2     3     3     4     4
##  8191  8192  8193  8194  8195  8196  8197  8198  8199  8200  8201  8202  8203
##     2     3     3     3     3     3     3     3     4     4     2     4     3
##  8204  8205  8206  8207  8208  8209  8210  8211  8212  8213  8214  8215  8216
##     3     2     2     3     3     3     3     3     2     3     3     3     3
##  8217  8218  8219  8220  8221  8222  8223  8224  8225  8226  8227  8228  8229
##     2     3     4     4     3     2     3     3     3     2     3     3     4
##  8230  8231  8232  8233  8234  8235  8236  8237  8238  8239  8240  8241  8242
##     3     4     3     2     3     3     4     2     2     2     2     3     2
##  8243  8244  8245  8246  8247  8248  8249  8250  8251  8252  8253  8254  8255
##     2     3     2     2     3     3     3     4     2     3     3     2     3
##  8256  8257  8258  8259  8260  8261  8262  8263  8264  8265  8266  8267  8268
##     2     4     3     2     2     2     3     3     4     4     2     3     3
##  8269  8270  8271  8272  8273  8274  8275  8276  8277  8278  8279  8280  8281
##     2     4     3     3     2     4     4     4     3     2     4     2     2
##  8282  8283  8284  8285  8286  8287  8288  8289  8290  8291  8292  8293  8294
##     4     2     3     4     2     3     4     3     3     3     3     2     3
##  8295  8296  8297  8298  8299  8300  8301  8302  8303  8304  8305  8306  8307
##     3     3     3     3     3     4     4     3     3     4     3     4     2
##  8308  8309  8310  8311  8312  8313  8314  8315  8316  8317  8318  8319  8320
##     2     2     3     2     4     4     4     4     2     3     2     3     2
##  8321  8322  8323  8324  8325  8326  8327  8328  8329  8330  8331  8332  8333
##     4     2     3     3     2     3     3     3     3     3     4     4     3
```

```
##  8334  8335  8336  8337  8338  8339  8340  8341  8342  8343  8344  8345  8346
##     3     3     3     3     3     2     4     2     2     2     4     4     4
##  8347  8348  8349  8350  8351  8352  8353  8354  8355  8356  8357  8358  8359
##     2     4     4     2     3     4     3     4     2     2     3     3     3
##  8360  8361  8362  8363  8364  8365  8366  8367  8368  8369  8370  8371  8372
##     2     2     2     3     4     2     3     4     2     2     2     3     2
##  8373  8374  8375  8376  8377  8378  8379  8380  8381  8382  8383  8384  8385
##     3     4     4     3     2     2     3     4     3     3     4     4     2
##  8386  8387  8388  8389  8390  8391  8392  8393  8394  8395  8396  8397  8398
##     3     3     2     2     3     2     3     3     3     3     4     3     3
##  8399  8400  8401  8402  8403  8404  8405  8406  8407  8408  8409  8410  8411
##     3     3     3     3     2     3     2     2     3     3     4     3     3
##  8412  8413  8414  8415  8416  8417  8418  8419  8420  8421  8422  8423  8424
##     4     3     4     3     3     3     2     3     2     4     3     3     3
##  8425  8426  8427  8428  8429  8430  8431  8432  8433  8434  8435  8436  8437
##     2     3     4     3     3     2     4     2     4     4     4     3     3
##  8438  8439  8440  8441  8442  8443  8444  8445  8446  8447  8448  8449  8450
##     2     3     3     4     2     3     3     3     2     3     3     3     2
##  8451  8452  8453  8454  8455  8456  8457  8458  8459  8460  8461  8462  8463
##     2     2     4     4     2     4     3     4     3     2     2     3     3
##  8464  8465  8466  8467  8468  8469  8470  8471  8472  8473  8474  8475  8476
##     3     3     4     3     2     3     2     3     4     4     2     3     3
##  8477  8478  8479  8480  8481  8482  8483  8484  8485  8486  8487  8488  8489
##     2     2     3     3     2     4     3     2     2     2     2     2     3
##  8490  8491  8492  8493  8494  8495  8496  8497  8498  8499  8500  8501  8502
##     2     2     2     3     3     3     2     3     3     3     2     3     2
##  8503  8504  8505  8506  8507  8508  8509  8510  8511  8512  8513  8514  8515
##     3     2     4     2     3     2     2     2     2     2     3     2     3
##  8516  8517  8518  8519  8520  8521  8522  8523  8524  8525  8526  8527  8528
##     2     2     4     3     2     3     2     3     4     4     2     3     2
##  8529  8530  8531  8532  8533  8534  8535  8536  8537  8538  8539  8540  8541
##     3     3     2     2     3     3     2     2     2     3     2     3     3
##  8542  8543  8544  8545  8546  8547  8548  8549  8550  8551  8552  8553  8554
##     4     2     4     3     3     3     4     3     2     3     4     4     2
##  8555  8556  8557  8558  8559  8560  8561  8562  8563  8564  8565  8566  8567
##     2     4     3     3     4     4     3     3     3     3     4     2     4
##  8568  8569  8570  8571  8572  8573  8574  8575  8576  8577  8578  8579  8580
##     2     2     3     4     2     3     3     3     3     3     2     3     2
##  8581  8582  8583  8584  8585  8586  8587  8588  8589  8590  8591  8592  8593
##     3     4     2     3     3     3     2     3     3     4     2     2     4
##  8594  8595  8596  8597  8598  8599  8600  8601  8602  8603  8604  8605  8606
##     3     3     3     4     2     4     4     3     3     3     2     2     3
##  8607  8608  8609  8610  8611  8612  8613  8614  8615  8616  8617  8618  8619
##     2     3     2     4     2     3     4     3     4     2     2     3     2
##  8620  8621  8622  8623  8624  8625  8626  8627  8628  8629  8630  8631  8632
##     4     3     2     3     2     3     4     3     2     2     3     3     3
##  8633  8634  8635  8636  8637  8638  8639  8640  8641  8642  8643  8644  8645
##     4     4     2     3     3     3     4     3     3     3     3     3     4
##  8646  8647  8648  8649  8650  8651  8652  8653  8654  8655  8656  8657  8658
##     3     2     4     3     2     2     3     2     3     2     3     2     2
##  8659  8660  8661  8662  8663  8664  8665  8666  8667  8668  8669  8670  8671
##     2     3     4     4     3     3     4     2     2     4     4     2     2
##  8672  8673  8674  8675  8676  8677  8678  8679  8680  8681  8682  8683  8684
##     3     4     3     2     2     4     2     2     3     4     3     4     4
```

```
##  8685  8686  8687  8688  8689  8690  8691  8692  8693  8694  8695  8696  8697
##     2     3     3     4     4     2     3     2     3     2     3     4     2
##  8698  8699  8700  8701  8702  8703  8704  8705  8706  8707  8708  8709  8710
##     3     3     3     3     4     4     2     3     4     4     3     4     3
##  8711  8712  8713  8714  8715  8716  8717  8718  8719  8720  8721  8722  8723
##     4     2     2     4     4     4     3     3     3     2     2     3     4
##  8724  8725  8726  8727  8728  8729  8730  8731  8732  8733  8734  8735  8736
##     4     4     2     3     2     3     4     3     4     3     4     3     2
##  8737  8738  8739  8740  8741  8742  8743  8744  8745  8746  8747  8748  8749
##     3     4     4     4     2     4     3     3     3     2     4     4     4
##  8750  8751  8752  8753  8754  8755  8756  8757  8758  8759  8760  8761  8762
##     4     3     2     2     2     3     4     3     3     3     2     3     2
##  8763  8764  8765  8766  8767  8768  8769  8770  8771  8772  8773  8774  8775
##     2     4     3     2     4     2     4     3     4     4     4     4     2
##  8776  8777  8778  8779  8780  8781  8782  8783  8784  8785  8786  8787  8788
##     3     3     4     3     3     3     2     3     3     3     3     4     4
##  8789  8790  8791  8792  8793  8794  8795  8796  8797  8798  8799  8800  8801
##     2     2     2     3     2     4     4     3     3     2     3     3     3
##  8802  8803  8804  8805  8806  8807  8808  8809  8810  8811  8812  8813  8814
##     4     2     2     3     2     2     3     4     3     2     3     4     2
##  8815  8816  8817  8818  8819  8820  8821  8822  8823  8824  8825  8826  8827
##     3     3     3     3     2     2     2     3     3     3     3     2     2
##  8828  8829  8830  8831  8832  8833  8834  8835  8836  8837  8838  8839  8840
##     3     2     4     4     3     4     3     3     3     3     3     4     2
##  8841  8842  8843  8844  8845  8846  8847  8848  8849  8850  8851  8852  8853
##     4     3     3     4     3     4     2     3     3     3     2     3     3
##  8854  8855  8856  8857  8858  8859  8860  8861  8862  8863  8864  8865  8866
##     4     4     2     4     3     3     2     4     2     2     3     3     4
##  8867  8868  8869  8870  8871  8872  8873  8874  8875  8876  8877  8878  8879
##     3     2     4     3     4     4     4     3     3     2     3     2     4
##  8880  8881  8882  8883  8884  8885  8886  8887  8888  8889  8890  8891  8892
##     3     3     4     3     3     2     3     2     4     3     2     2     2
##  8893  8894  8895  8896  8897  8898  8899  8900  8901  8902  8903  8904  8905
##     3     3     4     3     4     3     2     2     4     3     2     3     3
##  8906  8907  8908  8909  8910  8911  8912  8913  8914  8915  8916  8917  8918
##     2     3     2     3     3     2     2     3     3     2     3     4     3
##  8919  8920  8921  8922  8923  8924  8925  8926  8927  8928  8929  8930  8931
##     3     3     3     3     2     2     3     2     3     3     3     2     2
##  8932  8933  8934  8935  8936  8937  8938  8939  8940  8941  8942  8943  8944
##     3     3     2     4     3     4     4     3     3     2     4     3     2
##  8945  8946  8947  8948  8949  8950  8951  8952  8953  8954  8955  8956  8957
##     2     3     3     4     2     3     4     2     4     3     4     4     3
##  8958  8959  8960  8961  8962  8963  8964  8965  8966  8967  8968  8969  8970
##     3     2     4     4     4     2     2     4     2     3     3     2     2
##  8971  8972  8973  8974  8975  8976  8977  8978  8979  8980  8981  8982  8983
##     2     3     3     3     4     4     2     3     3     2     2     3     4
##  8984  8985  8986  8987  8988  8989  8990  8991  8992  8993  8994  8995  8996
##     3     4     4     2     3     4     3     3     3     2     3     4     2
##  8997  8998  8999  9000  9001  9002  9003  9004  9005  9006  9007  9008  9009
##     2     4     2     3     3     3     3     3     2     3     2     3     4
##  9010  9011  9012  9013  9014  9015  9016  9017  9018  9019  9020  9021  9022
##     2     4     3     3     3     2     2     3     4     2     2     4     3
##  9023  9024  9025  9026  9027  9028  9029  9030  9031  9032  9033  9034  9035
##     3     4     2     2     3     2     4     3     4     2     4     3     4
```

```
##  9036  9037  9038  9039  9040  9041  9042  9043  9044  9045  9046  9047  9048
##     3     2     3     4     4     3     3     3     2     4     3     4     2
##  9049  9050  9051  9052  9053  9054  9055  9056  9057  9058  9059  9060  9061
##     4     3     3     3     3     2     2     4     4     3     3     4     4
##  9062  9063  9064  9065  9066  9067  9068  9069  9070  9071  9072  9073  9074
##     2     2     2     4     3     2     2     4     4     2     3     4     4
##  9075  9076  9077  9078  9079  9080  9081  9082  9083  9084  9085  9086  9087
##     3     4     2     4     2     2     3     4     3     3     3     2     2
##  9088  9089  9090  9091  9092  9093  9094  9095  9096  9097  9098  9099  9100
##     4     3     3     4     4     2     4     2     4     3     4     3     4
##  9101  9102  9103  9104  9105  9106  9107  9108  9109  9110  9111  9112  9113
##     3     4     2     2     4     3     4     2     3     4     4     3     2
##  9114  9115  9116  9117  9118  9119  9120  9121  9122  9123  9124  9125  9126
##     3     4     2     3     4     3     2     2     4     3     4     3     3
##  9127  9128  9129  9130  9131  9132  9133  9134  9135  9136  9137  9138  9139
##     4     4     3     3     2     2     4     2     2     3     2     3     4
##  9140  9141  9142  9143  9144  9145  9146  9147  9148  9149  9150  9151  9152
##     3     2     2     3     3     3     3     3     2     3     4     2     2
##  9153  9154  9155  9156  9157  9158  9159  9160  9161  9162  9163  9164  9165
##     2     3     2     3     3     2     3     2     3     2     3     3     4
##  9166  9167  9168  9169  9170  9171  9172  9173  9174  9175  9176  9177  9178
##     3     4     3     3     4     2     3     3     2     3     2     4     3
##  9179  9180  9181  9182  9183  9184  9185  9186  9187  9188  9189  9190  9191
##     3     2     3     3     2     4     3     3     3     4     3     4     2
##  9192  9193  9194  9195  9196  9197  9198  9199  9200  9201  9202  9203  9204
##     4     3     3     4     4     2     2     2     4     3     4     3     4
##  9205  9206  9207  9208  9209  9210  9211  9212  9213  9214  9215  9216  9217
##     3     2     3     4     4     3     4     3     4     3     3     3     4
##  9218  9219  9220  9221  9222  9223  9224  9225  9226  9227  9228  9229  9230
##     4     3     2     3     4     2     4     3     4     4     4     2     3
##  9231  9232  9233  9234  9235  9236  9237  9238  9239  9240  9241  9242  9243
##     4     2     3     2     4     2     3     2     3     3     3     4     4
##  9244  9245  9246  9247  9248  9249  9250  9251  9252  9253  9254  9255  9256
##     2     3     4     3     3     3     3     3     3     3     3     3     4
##  9257  9258  9259  9260  9261  9262  9263  9264  9265  9266  9267  9268  9269
##     3     4     3     3     3     2     3     3     2     3     3     2     4
##  9270  9271  9272  9273  9274  9275  9276  9277  9278  9279  9280  9281  9282
##     3     4     4     2     2     2     4     2     2     2     3     3     3
##  9283  9284  9285  9286  9287  9288  9289  9290  9291  9292  9293  9294  9295
##     2     4     2     2     2     2     3     4     3     3     3     4     3
##  9296  9297  9298  9299  9300  9301  9302  9303  9304  9305  9306  9307  9308
##     2     4     3     2     2     4     3     2     2     2     2     2     4
##  9309  9310  9311  9312  9313  9314  9315  9316  9317  9318  9319  9320  9321
##     2     4     3     3     4     4     3     4     3     2     4     3     2
##  9322  9323  9324  9325  9326  9327  9328  9329  9330  9331  9332  9333  9334
##     2     2     4     4     3     3     4     3     3     2     3     4     2
##  9335  9336  9337  9338  9339  9340  9341  9342  9343  9344  9345  9346  9347
##     3     2     3     3     3     4     3     4     2     4     2     4     4
##  9348  9349  9350  9351  9352  9353  9354  9355  9356  9357  9358  9359  9360
##     3     2     3     2     2     3     3     4     4     4     4     3     4
##  9361  9362  9363  9364  9365  9366  9367  9368  9369  9370  9371  9372  9373
##     2     3     2     3     2     4     3     3     2     2     4     4     2
##  9374  9375  9376  9377  9378  9379  9380  9381  9382  9383  9384  9385  9386
##     3     3     2     3     4     2     4     3     2     4     4     3     3
```

```
##  9387  9388  9389  9390  9391  9392  9393  9394  9395  9396  9397  9398  9399
##     2     3     4     4     3     2     2     3     3     4     3     3     4
##  9400  9401  9402  9403  9404  9405  9406  9407  9408  9409  9410  9411  9412
##     3     3     4     2     4     3     4     2     2     4     3     2     3
##  9413  9414  9415  9416  9417  9418  9419  9420  9421  9422  9423  9424  9425
##     3     3     3     4     4     3     2     2     2     2     3     3     4
##  9426  9427  9428  9429  9430  9431  9432  9433  9434  9435  9436  9437  9438
##     3     3     4     2     2     4     3     4     3     3     4     2     4
##  9439  9440  9441  9442  9443  9444  9445  9446  9447  9448  9449  9450  9451
##     3     2     4     3     2     2     4     3     3     2     4     2     2
##  9452  9453  9454  9455  9456  9457  9458  9459  9460  9461  9462  9463  9464
##     2     2     2     3     4     4     4     4     2     4     3     3     3
##  9465  9466  9467  9468  9469  9470  9471  9472  9473  9474  9475  9476  9477
##     2     2     3     3     4     3     3     4     4     2     3     4     4
##  9478  9479  9480  9481  9482  9483  9484  9485  9486  9487  9488  9489  9490
##     2     2     4     4     4     3     4     2     3     3     3     4     2
##  9491  9492  9493  9494  9495  9496  9497  9498  9499  9500  9501  9502  9503
##     2     3     3     3     4     3     3     2     2     3     3     2     4
##  9504  9505  9506  9507  9508  9509  9510  9511  9512  9513  9514  9515  9516
##     3     3     3     4     3     4     3     2     4     2     4     2     2
##  9517  9518  9519  9520  9521  9522  9523  9524  9525  9526  9527  9528  9529
##     2     4     3     2     3     4     4     4     2     4     4     3     3
##  9530  9531  9532  9533  9534  9535  9536  9537  9538  9539  9540  9541  9542
##     2     3     3     2     3     3     3     4     3     2     3     3     3
##  9543  9544  9545  9546  9547  9548  9549  9550  9551  9552  9553  9554  9555
##     4     2     2     4     4     3     4     4     3     2     4     4     2
##  9556  9557  9558  9559  9560  9561  9562  9563  9564  9565  9566  9567  9568
##     2     3     3     3     4     4     4     2     4     2     3     4     2
##  9569  9570  9571  9572  9573  9574  9575  9576  9577  9578  9579  9580  9581
##     2     3     2     4     4     3     4     2     2     3     3     3     2
##  9582  9583  9584  9585  9586  9587  9588  9589  9590  9591  9592  9593  9594
##     3     2     3     3     3     3     3     4     3     4     3     2     4
##  9595  9596  9597  9598  9599  9600  9601  9602  9603  9604  9605  9606  9607
##     4     2     4     4     3     3     3     2     2     4     2     3     3
##  9608  9609  9610  9611  9612  9613  9614  9615  9616  9617  9618  9619  9620
##     4     3     4     4     3     3     4     3     2     2     3     2     4
##  9621  9622  9623  9624  9625  9626  9627  9628  9629  9630  9631  9632  9633
##     3     3     3     3     3     2     3     3     3     3     3     2     3
##  9634  9635  9636  9637  9638  9639  9640  9641  9642  9643  9644  9645  9646
##     2     3     2     3     2     2     2     3     3     3     4     4     4
##  9647  9648  9649  9650  9651  9652  9653  9654  9655  9656  9657  9658  9659
##     4     4     3     3     3     3     2     2     3     4     3     2     2
##  9660  9661  9662  9663  9664  9665  9666  9667  9668  9669  9670  9671  9672
##     4     2     2     3     2     3     4     3     2     3     2     2     4
##  9673  9674  9675  9676  9677  9678  9679  9680  9681  9682  9683  9684  9685
##     3     3     2     2     2     3     4     2     2     4     3     3     4
##  9686  9687  9688  9689  9690  9691  9692  9693  9694  9695  9696  9697  9698
##     4     4     3     3     3     3     2     3     3     2     2     3     2
##  9699  9700  9701  9702  9703  9704  9705  9706  9707  9708  9709  9710  9711
##     3     3     2     4     2     2     2     4     4     4     4     3     2
##  9712  9713  9714  9715  9716  9717  9718  9719  9720  9721  9722  9723  9724
##     2     2     4     4     2     2     3     2     4     2     3     3     3
##  9725  9726  9727  9728  9729  9730  9731  9732  9733  9734  9735  9736  9737
##     3     2     4     2     3     3     2     3     2     2     4     4     4
```

```
##  9738  9739  9740  9741  9742  9743  9744  9745  9746  9747  9748  9749  9750
##     2     3     3     3     4     3     2     2     3     2     3     2     2
##  9751  9752  9753  9754  9755  9756  9757  9758  9759  9760  9761  9762  9763
##     2     2     2     2     3     2     4     3     3     4     4     2     4
##  9764  9765  9766  9767  9768  9769  9770  9771  9772  9773  9774  9775  9776
##     3     4     3     4     3     3     3     3     3     4     3     4     3
##  9777  9778  9779  9780  9781  9782  9783  9784  9785  9786  9787  9788  9789
##     4     3     4     3     2     2     4     3     3     4     3     3     4
##  9790  9791  9792  9793  9794  9795  9796  9797  9798  9799  9800  9801  9802
##     3     4     3     2     4     2     4     3     2     4     4     2     3
##  9803  9804  9805  9806  9807  9808  9809  9810  9811  9812  9813  9814  9815
##     2     3     3     4     3     4     3     3     3     2     4     4     3
##  9816  9817  9818  9819  9820  9821  9822  9823  9824  9825  9826  9827  9828
##     4     3     3     4     2     3     4     4     4     2     3     3     4
##  9829  9830  9831  9832  9833  9834  9835  9836  9837  9838  9839  9840  9841
##     3     3     3     3     3     4     2     4     4     2     2     3     4
##  9842  9843  9844  9845  9846  9847  9848  9849  9850  9851  9852  9853  9854
##     3     3     2     4     3     3     2     2     3     2     3     2     2
##  9855  9856  9857  9858  9859  9860  9861  9862  9863  9864  9865  9866  9867
##     3     4     3     3     4     3     4     2     4     2     2     2     3
##  9868  9869  9870  9871  9872  9873  9874  9875  9876  9877  9878  9879  9880
##     2     4     3     4     4     3     4     4     2     4     3     2     3
##  9881  9882  9883  9884  9885  9886  9887  9888  9889  9890  9891  9892  9893
##     3     3     2     3     2     3     4     2     4     3     3     3     2
##  9894  9895  9896  9897  9898  9899  9900  9901  9902  9903  9904  9905  9906
##     4     4     3     3     2     3     2     3     3     3     2     4     2
##  9907  9908  9909  9910  9911  9912  9913  9914  9915  9916  9917  9918  9919
##     3     2     2     3     3     2     3     4     3     2     2     3     3
##  9920  9921  9922  9923  9924  9925  9926  9927  9928  9929  9930  9931  9932
##     3     4     3     2     4     2     2     3     3     2     4     3     4
##  9933  9934  9935  9936  9937  9938  9939  9940  9941  9942  9943  9944  9945
##     3     4     2     3     3     2     4     2     2     3     4     4     2
##  9946  9947  9948  9949  9950  9951  9952  9953  9954  9955  9956  9957  9958
##     3     4     3     4     4     2     4     2     3     2     4     3     2
##  9959  9960  9961  9962  9963  9964  9965  9966  9967  9968  9969  9970  9971
##     2     2     2     3     4     3     3     2     3     4     4     2     4
##  9972  9973  9974  9975  9976  9977  9978  9979  9980  9981  9982  9983  9984
##     4     2     4     2     3     4     4     2     2     3     2     3     2
##  9985  9986  9987  9988  9989  9990  9991  9992  9993  9994  9995  9996  9997
##     3     2     2     2     2     2     2     3     4     3     4     3     3
##  9998  9999 10000 10001 10002 10003 10004 10005 10006 10007 10008 10009 10010
##     3     2     3     4     3     3     3     4     2     2     4     3     3
## 10011 10012 10013 10014 10015 10016 10017 10018 10019 10020 10021 10022 10023
##     2     2     3     3     4     2     4     2     3     4     4     2     3
## 10024 10025 10026 10027 10028 10029 10030 10031 10032 10033 10034 10035 10036
##     3     3     2     4     2     4     3     4     3     2     2     3     3
## 10037 10038 10039 10040 10041 10042 10043 10044 10045 10046 10047 10048 10049
##     3     3     4     2     3     4     4     3     4     3     4     4     2
## 10050 10051 10052 10053 10054 10055 10056 10057 10058 10059 10060 10061 10062
##     3     2     3     2     3     3     3     3     3     3     3     2     3
## 10063 10064 10065 10066 10067 10068 10069 10070 10071 10072 10073 10074 10075
##     2     3     3     2     4     4     3     3     3     2     4     3     2
## 10076 10077 10078 10079 10080 10081 10082 10083 10084 10085 10086 10087 10088
##     4     3     3     2     3     3     3     2     2     2     3     4     3
```

```
## 10089 10090 10091 10092 10093 10094 10095 10096 10097 10098 10099 10100 10101
##     3     3     4     2     3     3     3     3     4     3     3     4     3
## 10102 10103 10104 10105 10106 10107 10108 10109 10110 10111 10112 10113 10114
##     4     4     2     3     3     2     4     2     3     3     4     3     4
## 10115 10116 10117 10118 10119 10120 10121 10122 10123 10124 10125 10126 10127
##     3     2     4     3     2     3     3     3     3     3     3     2     2
## 10128 10129 10130 10131 10132 10133 10134 10135 10136 10137 10138 10139 10140
##     2     3     4     3     4     4     3     3     3     2     3     4     2
## 10141 10142 10143 10144 10145 10146 10147 10148 10149 10150 10151 10152 10153
##     2     3     2     2     3     3     2     2     2     3     2     3     3
## 10154 10155 10156 10157 10158 10159 10160 10161 10162 10163 10164 10165 10166
##     3     3     2     2     4     3     2     3     3     2     3     3     3
## 10167 10168 10169 10170 10171 10172 10173 10174 10175 10176 10177 10178 10179
##     4     3     4     2     3     3     4     3     4     4     2     4     3
## 10180 10181 10182 10183 10184 10185 10186 10187 10188 10189 10190 10191 10192
##     2     4     2     2     2     4     3     3     2     2     4     4     3
## 10193 10194 10195 10196 10197 10198 10199 10200 10201 10202 10203 10204 10205
##     2     3     3     3     3     3     4     4     4     3     3     4     4
## 10206 10207 10208 10209 10210 10211 10212 10213 10214 10215 10216 10217 10218
##     3     3     4     2     3     2     2     3     2     3     3     2     3
## 10219 10220 10221 10222 10223 10224 10225 10226 10227 10228 10229 10230 10231
##     4     3     2     3     2     2     3     2     4     2     3     3     3
## 10232 10233 10234 10235 10236 10237 10238 10239 10240 10241 10242 10243 10244
##     3     2     3     2     2     3     4     3     3     3     2     2     2
## 10245 10246 10247 10248 10249 10250 10251 10252 10253 10254 10255 10256 10257
##     3     2     3     2     3     4     4     4     4     2     3     3     3
## 10258 10259 10260 10261 10262 10263 10264 10265 10266 10267 10268 10269 10270
##     3     3     4     2     2     2     3     3     3     3     3     3     4
## 10271 10272 10273 10274 10275 10276 10277 10278 10279 10280 10281 10282 10283
##     2     4     3     3     2     3     4     3     4     2     3     3     2
## 10284 10285 10286 10287 10288 10289 10290 10291 10292 10293 10294 10295 10296
##     2     3     4     2     4     4     3     2     4     3     2     4     3
## 10297 10298 10299 10300 10301 10302 10303 10304 10305 10306 10307 10308 10309
##     2     3     3     3     2     2     2     3     3     2     3     2     3
## 10310 10311 10312 10313 10314 10315 10316 10317 10318 10319 10320 10321 10322
##     4     3     3     2     2     2     2     2     3     3     3     3     2
## 10323 10324 10325 10326 10327 10328 10329 10330 10331 10332 10333 10334 10335
##     2     4     2     2     2     4     2     3     3     4     3     3     3
## 10336 10337 10338 10339 10340 10341 10342 10343 10344 10345 10346 10347 10348
##     3     3     3     3     2     3     2     2     2     3     4     2     3
## 10349 10350 10351 10352 10353 10354 10355 10356 10357 10358 10359 10360 10361
##     3     2     3     2     4     3     2     3     3     3     4     4     3
## 10362 10363 10364 10365 10366 10367 10368 10369 10370 10371 10372 10373 10374
##     2     2     3     2     3     3     3     2     4     4     2     2     3
## 10375 10376 10377 10378 10379 10380 10381 10382 10383 10384 10385 10386 10387
##     4     2     2     3     2     3     3     4     3     2     2     3     3
## 10388 10389 10390 10391 10392 10393 10394 10395 10396 10397 10398 10399 10400
##     4     3     3     4     3     2     3     2     4     3     3     3     2
## 10401 10402 10403 10404 10405 10406 10407 10408 10409 10410 10411 10412 10413
##     4     3     2     3     3     2     2     3     2     3     2     3     4
## 10414 10415 10416 10417 10418 10419 10420 10421 10422 10423 10424 10425 10426
##     2     3     2     4     3     4     4     2     3     3     3     4     3
## 10427 10428 10429 10430 10431 10432 10433 10434 10435 10436 10437 10438 10439
##     2     2     2     4     2     2     3     3     4     3     3     2     2
```

```
## 10440 10441 10442 10443 10444 10445 10446 10447 10448 10449 10450 10451 10452
##     4     3     3     3     3     3     4     4     3     3     3     3     3
## 10453 10454 10455 10456 10457 10458 10459 10460 10461 10462 10463 10464 10465
##     3     4     3     3     3     2     4     3     2     3     3     3     3
## 10466 10467 10468 10469 10470 10471 10472 10473 10474 10475 10476 10477 10478
##     3     2     4     2     4     2     3     4     3     4     3     2     3
## 10479 10480 10481 10482 10483 10484 10485 10486 10487 10488 10489 10490 10491
##     4     3     3     3     4     3     2     3     4     2     3     3     3
## 10492 10493 10494 10495 10496 10497 10498 10499 10500 10501 10502 10503 10504
##     3     3     4     2     4     2     2     2     4     3     3     2     3
## 10505 10506 10507 10508 10509 10510 10511 10512 10513 10514 10515 10516 10517
##     2     2     2     3     4     3     4     2     2     2     3     2     3
## 10518 10519 10520 10521 10522 10523 10524 10525 10526 10527 10528 10529 10530
##     4     4     2     3     3     2     3     3     3     3     2     3     4
## 10531 10532 10533 10534 10535 10536 10537 10538 10539 10540 10541 10542 10543
##     3     3     2     2     4     4     2     4     3     3     2     2     2
## 10544 10545 10546 10547 10548 10549 10550 10551 10552 10553 10554 10555 10556
##     2     4     4     2     3     4     3     2     4     2     3     3     2
## 10557 10558 10559 10560 10561 10562 10563 10564 10565 10566 10567 10568 10569
##     2     2     3     2     2     2     2     2     3     4     2     3     2
## 10570 10571 10572 10573 10574 10575 10576 10577 10578 10579 10580 10581 10582
##     2     3     3     2     4     4     3     3     4     2     4     2     4
## 10583 10584 10585 10586 10587 10588 10589 10590 10591 10592 10593 10594 10595
##     2     2     2     4     2     3     2     3     2     2     2     3     4
## 10596 10597 10598 10599 10600 10601 10602 10603 10604 10605 10606 10607 10608
##     2     2     2     4     4     4     3     3     3     2     2     4     3
## 10609 10610 10611 10612 10613 10614 10615 10616 10617 10618 10619 10620 10621
##     4     3     4     4     3     2     3     3     3     4     2     4     4
## 10622 10623 10624 10625 10626 10627 10628 10629 10630 10631 10632 10633 10634
##     4     4     2     3     3     2     2     3     2     2     2     3     3
## 10635 10636 10637 10638 10639 10640 10641 10642 10643 10644 10645 10646 10647
##     3     4     4     2     2     3     2     3     2     3     3     3     3
## 10648 10649 10650 10651 10652 10653 10654 10655 10656 10657 10658 10659 10660
##     3     2     3     3     3     3     4     2     2     4     3     3     4
## 10661 10662 10663 10664 10665 10666 10667 10668 10669 10670 10671 10672 10673
##     2     3     4     3     3     2     4     3     3     3     3     4     2
## 10674 10675 10676 10677 10678 10679 10680 10681 10682 10683 10684 10685 10686
##     3     3     3     4     2     3     2     3     4     3     3     2     3
## 10687 10688 10689 10690 10691 10692 10693 10694 10695 10696 10697 10698 10699
##     3     3     3     4     2     3     2     3     3     3     4     3     4
## 10700 10701 10702 10703 10704 10705 10706 10707 10708 10709 10710 10711 10712
##     3     4     2     4     4     3     2     4     3     2     3     2     2
## 10713 10714 10715 10716 10717 10718 10719 10720 10721 10722 10723 10724 10725
##     2     3     2     4     4     4     2     3     2     3     2     3     2
## 10726 10727 10728 10729 10730 10731 10732 10733 10734 10735 10736 10737 10738
##     3     4     4     3     3     3     3     2     4     2     2     3     3
## 10739 10740 10741 10742 10743 10744 10745 10746 10747 10748 10749 10750 10751
##     3     3     4     3     2     3     3     4     4     3     3     3     4
## 10752 10753 10754 10755 10756 10757 10758 10759 10760 10761 10762 10763 10764
##     3     3     3     2     2     2     3     4     3     3     3     4     4
## 10765 10766 10767 10768 10769 10770 10771 10772 10773 10774 10775 10776 10777
##     3     2     2     4     3     3     3     3     3     3     2     2     3
## 10778 10779 10780 10781 10782 10783 10784 10785 10786 10787 10788 10789 10790
##     3     4     3     3     3     3     2     4     3     3     3     4     3
```

```
## 10791 10792 10793 10794 10795 10796 10797 10798 10799 10800 10801 10802 10803
##     2     4     4     3     2     3     4     3     2     2     3     4     3
## 10804 10805 10806 10807 10808 10809 10810 10811 10812 10813 10814 10815 10816
##     4     3     2     4     2     3     2     2     4     3     3     2     2
## 10817 10818 10819 10820 10821 10822 10823 10824 10825 10826 10827 10828 10829
##     4     4     2     4     3     3     3     2     3     3     2     4     4
## 10830 10831 10832 10833 10834 10835 10836 10837 10838 10839 10840 10841 10842
##     4     4     2     3     2     4     3     2     2     2     2     2     3
## 10843 10844 10845 10846 10847 10848 10849 10850 10851 10852 10853 10854 10855
##     2     3     4     4     3     3     3     3     3     2     4     3     4
## 10856 10857 10858 10859 10860 10861 10862 10863 10864 10865 10866 10867 10868
##     2     4     4     3     2     2     2     4     4     2     2     4     3
## 10869 10870 10871 10872 10873 10874 10875 10876 10877 10878 10879 10880 10881
##     2     3     3     4     4     2     3     4     4     2     4     2     3
## 10882 10883 10884 10885 10886 10887 10888 10889 10890 10891 10892 10893 10894
##     3     3     3     3     2     4     2     4     2     4     3     2     3
## 10895 10896 10897 10898 10899 10900 10901 10902 10903 10904 10905 10906 10907
##     4     4     3     3     2     3     2     3     4     3     3     2     3
## 10908 10909 10910 10911 10912 10913 10914 10915 10916 10917 10918 10919 10920
##     4     2     3     2     4     2     3     4     3     2     2     2     2
## 10921 10922 10923 10924 10925 10926 10927 10928 10929 10930 10931 10932 10933
##     3     3     3     3     3     4     2     3     4     3     3     3     3
## 10934 10935 10936 10937 10938 10939 10940 10941 10942 10943 10944 10945 10946
##     4     3     2     3     3     4     2     2     3     3     2     3     3
## 10947 10948 10949 10950 10951 10952 10953 10954 10955 10956 10957 10958 10959
##     4     2     3     3     4     4     2     2     3     3     4     3     2
## 10960 10961 10962 10963 10964 10965 10966 10967 10968 10969 10970 10971 10972
##     2     2     2     3     3     4     2     2     3     3     3     3     3
## 10973 10974 10975 10976 10977 10978 10979 10980 10981 10982 10983 10984 10985
##     2     4     3     4     2     3     4     3     3     2     3     3     2
## 10986 10987 10988 10989 10990 10991 10992 10993 10994 10995 10996 10997 10998
##     4     3     2     2     3     3     3     4     4     2     3     2     3
## 10999 11000 11001 11002 11003 11004 11005 11006 11007 11008 11009 11010 11011
##     2     4     2     3     3     4     3     2     4     3     3     3     2
## 11012 11013 11014 11015 11016 11017 11018 11019 11020 11021 11022 11023 11024
##     2     3     3     4     3     2     3     3     3     2     3     3     3
## 11025 11026 11027 11028 11029 11030 11031 11032 11033 11034 11035 11036 11037
##     3     4     3     3     2     3     3     3     3     4     4     4     3
## 11038 11039 11040 11041 11042 11043 11044 11045 11046 11047 11048 11049 11050
##     2     2     3     2     2     3     3     3     3     2     4     2     3
## 11051 11052 11053 11054 11055 11056 11057 11058 11059 11060 11061 11062 11063
##     3     4     3     3     2     3     3     4     2     2     4     2     2
## 11064 11065 11066 11067 11068 11069 11070 11071 11072 11073 11074 11075 11076
##     4     4     3     2     3     4     2     3     3     4     3     4     3
## 11077 11078 11079 11080 11081 11082 11083 11084 11085 11086 11087 11088 11089
##     3     3     4     4     2     3     4     2     3     2     2     4     4
## 11090 11091 11092 11093 11094 11095 11096 11097 11098 11099 11100 11101 11102
##     3     3     3     2     3     3     4     3     2     3     3     2     4
## 11103 11104 11105 11106 11107 11108 11109 11110 11111 11112 11113 11114 11115
##     2     2     4     2     3     4     3     4     2     3     2     2     3
## 11116 11117 11118 11119 11120 11121 11122 11123 11124 11125 11126 11127 11128
##     2     2     3     2     4     4     2     3     3     4     3     3     2
## 11129 11130 11131 11132 11133 11134 11135 11136 11137 11138 11139 11140 11141
##     4     4     3     4     4     4     2     2     3     3     3     2     4
```

```
## 11142 11143 11144 11145 11146 11147 11148 11149 11150 11151 11152 11153 11154
##     4     2     3     2     3     3     3     3     3     3     2     4     3
## 11155 11156 11157 11158 11159 11160 11161 11162 11163 11164 11165 11166 11167
##     4     2     2     3     2     4     3     4     3     2     2     2     3
## 11168 11169 11170 11171 11172 11173 11174 11175 11176 11177 11178 11179 11180
##     3     2     4     4     2     4     2     4     4     2     2     3     4
## 11181 11182 11183 11184 11185 11186 11187 11188 11189 11190 11191 11192 11193
##     4     3     2     3     4     2     3     3     4     3     4     3     3
## 11194 11195 11196 11197 11198 11199 11200 11201 11202 11203 11204 11205 11206
##     3     2     2     2     2     3     3     3     2     2     3     3     2
## 11207 11208 11209 11210 11211 11212 11213 11214 11215 11216 11217 11218 11219
##     4     4     4     4     3     3     2     2     4     3     2     4     2
## 11220 11221 11222 11223 11224 11225 11226 11227 11228 11229 11230 11231 11232
##     3     2     3     2     3     4     3     3     2     3     4     2     3
## 11233 11234 11235 11236 11237 11238 11239 11240 11241 11242 11243 11244 11245
##     3     2     2     4     3     2     4     2     2     3     4     3     3
## 11246 11247 11248 11249 11250 11251 11252 11253 11254 11255 11256 11257 11258
##     2     3     4     2     2     3     3     4     3     3     4     3     2
## 11259 11260 11261 11262 11263 11264 11265 11266 11267 11268 11269 11270 11271
##     2     2     4     2     4     3     3     2     2     2     3     2     2
## 11272 11273 11274 11275 11276 11277 11278 11279 11280 11281 11282 11283 11284
##     4     3     3     3     3     3     2     4     2     2     4     3     2
## 11285 11286 11287 11288 11289 11290 11291 11292 11293 11294 11295 11296 11297
##     3     4     3     4     3     3     2     3     2     3     4     3     4
## 11298 11299 11300 11301 11302 11303 11304 11305 11306 11307 11308 11309 11310
##     3     4     3     3     4     3     4     3     3     4     4     4     4
## 11311 11312 11313 11314 11315 11316 11317 11318 11319 11320 11321 11322 11323
##     2     4     3     4     2     3     2     4     2     2     4     4     3
## 11324 11325 11326 11327 11328 11329 11330 11331 11332 11333 11334 11335 11336
##     3     2     3     2     4     3     4     3     4     3     4     4     3
## 11337 11338 11339 11340 11341 11342 11343 11344 11345 11346 11347 11348 11349
##     3     4     3     3     3     3     2     3     2     2     4     3     2
## 11350 11351 11352 11353 11354 11355 11356 11357 11358 11359 11360 11361 11362
##     3     2     4     2     3     3     2     2     2     3     3     4     3
## 11363 11364 11365 11366 11367 11368 11369 11370 11371 11372 11373 11374 11375
##     4     4     4     3     3     2     4     3     3     2     3     3     2
## 11376 11377 11378 11379 11380 11381 11382 11383 11384 11385 11386 11387 11388
##     4     2     4     2     3     4     3     3     2     3     3     2     3
## 11389 11390 11391 11392 11393 11394 11395 11396 11397 11398 11399 11400 11401
##     2     4     2     4     4     3     2     4     3     4     3     4     4
## 11402 11403 11404 11405 11406 11407 11408 11409 11410 11411 11412 11413 11414
##     2     3     2     3     4     2     2     3     3     3     2     2     3
## 11415 11416 11417 11418 11419 11420 11421 11422 11423 11424 11425 11426 11427
##     2     4     3     3     3     3     3     3     4     2     4     3     3
## 11428 11429 11430 11431 11432 11433 11434 11435 11436 11437 11438 11439 11440
##     3     4     3     4     3     3     4     3     4     3     4     3     2
## 11441 11442 11443 11444 11445 11446 11447 11448 11449 11450 11451 11452 11453
##     3     4     4     3     4     3     3     3     3     2     2     3     3
## 11454 11455 11456 11457 11458 11459 11460 11461 11462 11463 11464 11465 11466
##     3     2     4     2     2     4     4     4     4     4     4     2     4
## 11467 11468 11469 11470 11471 11472 11473 11474 11475 11476 11477 11478 11479
##     3     3     2     4     2     2     3     4     4     2     4     3     2
## 11480 11481 11482 11483 11484 11485 11486 11487 11488 11489 11490 11491 11492
##     4     2     3     2     4     3     2     3     3     2     3     3     3
```

```
## 11493 11494 11495 11496 11497 11498 11499 11500 11501 11502 11503 11504 11505
##     3     4     2     4     4     4     4     4     2     3     2     4     4
## 11506 11507 11508 11509 11510 11511 11512 11513 11514 11515 11516 11517 11518
##     2     4     3     3     3     2     2     2     4     2     2     3     2
## 11519 11520 11521 11522 11523 11524 11525 11526 11527 11528 11529 11530 11531
##     2     3     3     3     3     2     4     3     2     2     3     4     4
## 11532 11533 11534 11535 11536 11537 11538 11539 11540 11541 11542 11543 11544
##     3     3     3     3     4     3     3     3     2     2     3     2     3
## 11545 11546 11547 11548 11549 11550 11551 11552 11553 11554 11555 11556 11557
##     3     2     3     3     3     2     2     2     2     4     3     4     3
## 11558 11559 11560 11561 11562 11563 11564 11565 11566 11567 11568 11569 11570
##     2     3     2     2     3     3     3     2     4     4     3     3     2
## 11571 11572 11573 11574 11575 11576 11577 11578 11579 11580 11581 11582 11583
##     3     3     3     2     2     2     2     3     3     3     2     3     2
## 11584 11585 11586 11587 11588 11589 11590 11591 11592 11593 11594 11595 11596
##     3     3     4     2     2     4     4     4     4     3     3     3     4
## 11597 11598 11599 11600 11601 11602 11603 11604 11605 11606 11607 11608 11609
##     3     2     3     3     2     2     3     3     3     3     3     4     2
## 11610 11611 11612 11613 11614 11615 11616 11617 11618 11619 11620 11621 11622
##     2     4     3     3     4     2     3     3     3     2     2     3     4
## 11623 11624 11625 11626 11627 11628 11629 11630 11631 11632 11633 11634 11635
##     3     3     2     4     3     3     4     3     4     3     3     3     3
## 11636 11637 11638 11639 11640 11641 11642 11643 11644 11645 11646 11647 11648
##     2     3     2     3     3     3     2     2     4     3     3     2     4
## 11649 11650 11651 11652 11653 11654 11655 11656 11657 11658 11659 11660 11661
##     3     3     2     4     3     2     3     4     3     2     4     3     4
## 11662 11663 11664 11665 11666 11667 11668 11669 11670 11671 11672 11673 11674
##     4     3     2     3     2     4     3     3     3     2     4     2     4
## 11675 11676 11677 11678 11679 11680 11681 11682 11683 11684 11685 11686 11687
##     3     3     3     4     3     2     3     3     4     4     4     2     2
## 11688 11689 11690 11691 11692 11693 11694 11695 11696 11697 11698 11699 11700
##     2     3     2     3     4     4     4     2     3     3     3     3     4
## 11701 11702 11703 11704 11705 11706 11707 11708 11709 11710 11711 11712 11713
##     3     2     3     4     3     3     3     2     4     4     2     2     2
## 11714 11715 11716 11717 11718 11719 11720 11721 11722 11723 11724 11725 11726
##     3     3     4     2     4     2     3     3     3     3     4     4     3
## 11727 11728 11729 11730 11731 11732 11733 11734 11735 11736 11737 11738 11739
##     2     3     3     3     4     2     3     4     3     3     2     4     2
## 11740 11741 11742 11743 11744 11745 11746 11747 11748 11749 11750 11751 11752
##     4     2     4     4     3     2     3     2     3     3     2     4     4
## 11753 11754 11755 11756 11757 11758 11759 11760 11761 11762 11763 11764 11765
##     3     2     2     3     4     3     4     2     3     3     2     2     2
## 11766 11767 11768 11769 11770 11771 11772 11773 11774 11775 11776 11777 11778
##     4     4     4     2     3     2     2     2     4     3     4     3     2
## 11779 11780 11781 11782 11783 11784 11785 11786 11787 11788 11789 11790 11791
##     2     3     2     4     3     4     4     3     2     4     3     3     3
## 11792 11793 11794 11795 11796 11797 11798 11799 11800 11801 11802 11803 11804
##     3     2     3     3     3     3     3     3     2     3     3     3     4
## 11805 11806 11807 11808 11809 11810 11811 11812 11813 11814 11815 11816 11817
##     3     3     3     3     2     2     2     4     3     3     3     2     4
## 11818 11819 11820 11821 11822 11823 11824 11825 11826 11827 11828 11829 11830
##     2     2     2     3     4     3     3     4     3     2     3     3     4
## 11831 11832 11833 11834 11835 11836 11837 11838 11839 11840 11841 11842 11843
##     2     4     3     2     2     3     4     3     3     4     3     3     2
```

```
## 11844 11845 11846 11847 11848 11849 11850 11851 11852 11853 11854 11855 11856
##     3     2     2     3     2     4     4     2     4     4     4     3     3
## 11857 11858 11859 11860 11861 11862 11863 11864 11865 11866 11867 11868 11869
##     4     3     3     4     4     3     4     4     3     3     2     3     3
## 11870 11871 11872 11873 11874 11875 11876 11877 11878 11879 11880 11881 11882
##     2     4     3     4     3     3     4     4     3     2     4     2     4
## 11883 11884 11885 11886 11887 11888 11889 11890 11891 11892 11893 11894 11895
##     2     2     3     4     3     4     3     3     2     2     3     3     2
## 11896 11897 11898 11899 11900 11901 11902 11903 11904 11905 11906 11907 11908
##     2     3     3     3     3     2     3     4     2     2     3     2     4
## 11909 11910 11911 11912 11913 11914 11915 11916 11917 11918 11919 11920 11921
##     3     3     2     2     2     3     2     2     2     3     3     3     2
## 11922 11923 11924 11925 11926 11927 11928 11929 11930 11931 11932 11933 11934
##     2     2     3     2     3     3     3     2     3     3     2     3     3
## 11935 11936 11937 11938 11939 11940 11941 11942 11943 11944 11945 11946 11947
##     3     2     4     3     2     4     3     3     3     2     3     2     2
## 11948 11949 11950 11951 11952 11953 11954 11955 11956 11957 11958 11959 11960
##     3     2     2     3     2     2     3     2     2     2     4     3     4
## 11961 11962 11963 11964 11965 11966 11967 11968 11969 11970 11971 11972 11973
##     4     2     2     2     3     3     2     4     4     4     3     4     3
## 11974 11975 11976 11977 11978 11979 11980 11981 11982 11983 11984 11985 11986
##     3     3     4     3     4     3     4     4     2     3     4     2     3
## 11987 11988 11989 11990 11991 11992 11993 11994 11995 11996 11997 11998 11999
##     2     3     4     3     2     2     2     2     2     2     3     3     2
## 12000 12001 12002 12003 12004 12005 12006 12007 12008 12009 12010 12011 12012
##     3     3     3     3     3     2     4     4     4     3     3     4     2
## 12013 12014 12015 12016 12017 12018 12019 12020 12021 12022 12023 12024 12025
##     4     4     3     3     2     2     4     3     4     2     3     4     3
## 12026 12027 12028 12029 12030 12031 12032 12033 12034 12035 12036 12037 12038
##     4     4     3     4     3     4     3     3     2     4     2     4     4
## 12039 12040 12041 12042 12043 12044 12045 12046 12047 12048 12049 12050 12051
##     2     3     2     3     3     2     2     4     2     4     3     2     4
## 12052 12053 12054 12055 12056 12057 12058 12059 12060 12061 12062 12063 12064
##     2     4     2     3     4     4     3     4     2     2     2     2     2
## 12065 12066 12067 12068 12069 12070 12071 12072 12073 12074 12075 12076 12077
##     3     4     2     3     3     2     4     3     3     3     3     3     2
## 12078 12079 12080 12081 12082 12083 12084 12085 12086 12087 12088 12089 12090
##     2     3     3     2     2     2     2     3     4     2     3     4     4
## 12091 12092 12093 12094 12095 12096 12097 12098 12099 12100 12101 12102 12103
##     3     4     3     2     3     4     3     2     2     4     3     3     2
## 12104 12105 12106 12107 12108 12109 12110 12111 12112 12113 12114 12115 12116
##     2     4     2     4     4     3     3     2     2     3     4     3     3
## 12117 12118 12119 12120 12121 12122 12123 12124 12125 12126 12127 12128 12129
##     3     2     4     3     3     2     3     4     4     3     2     2     3
## 12130 12131 12132 12133 12134 12135 12136 12137 12138 12139 12140 12141 12142
##     2     2     3     3     3     3     3     4     2     4     3     2     2
## 12143 12144 12145 12146 12147 12148 12149 12150 12151 12152 12153 12154 12155
##     4     2     3     3     4     2     4     4     2     2     4     2     3
## 12156 12157 12158 12159 12160 12161 12162 12163 12164
##     3     2     3     3     4     4     4     3     4
##
## Within cluster sum of squares by cluster:
## [1] 1441.297 6242.152 1251.533 4075.334
##  (between_SS / total_SS =  39.6 %)
```

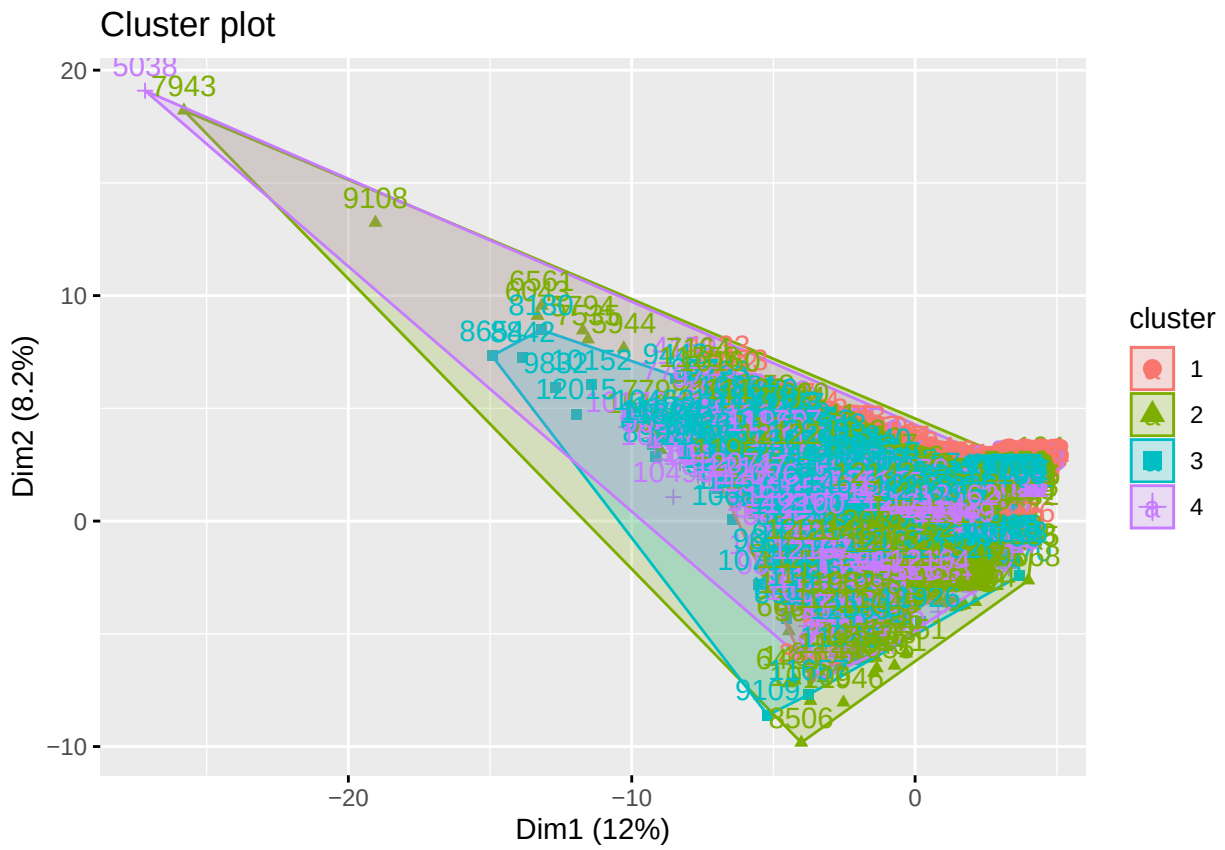
```
##
## Available components:
##
## [1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
## [6] "betweenss"    "size"         "iter"         "ifault"
```

```
# Previewing the number of records in each cluster

final$size
```

```
## [1] 2607 4515 2189 2853
```

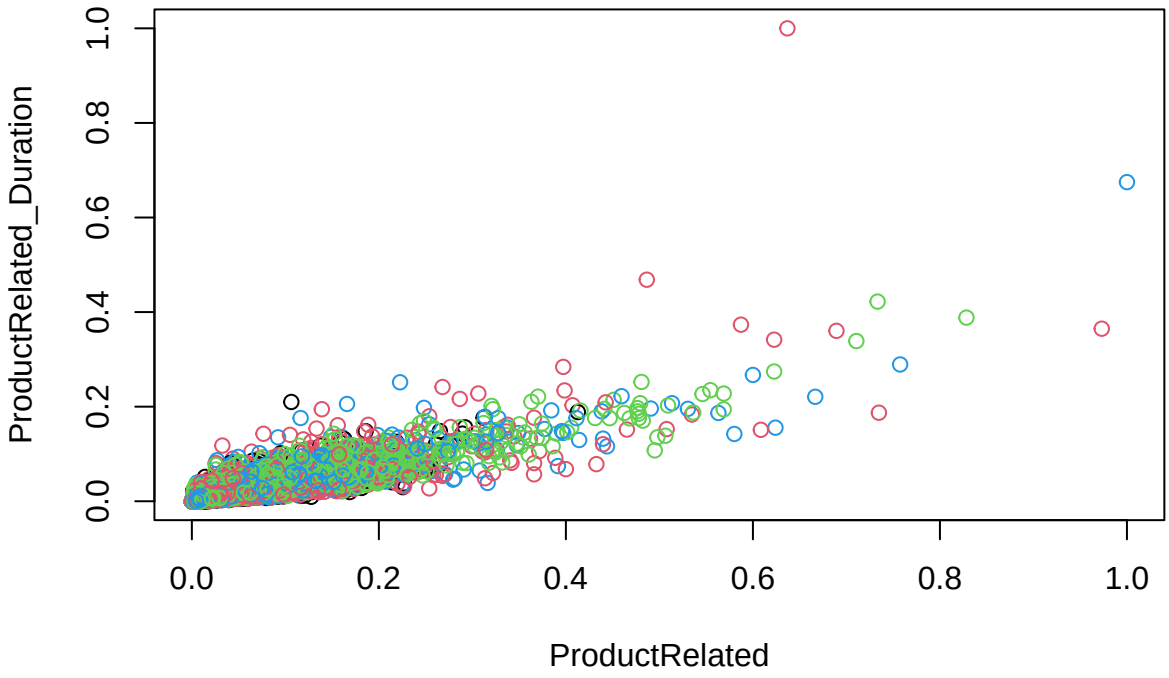
```
# visualize the results
fviz_cluster(final, data = df)
```



The visualization isn't really clear.

```
# Plotting two variables to see how their data points have been distributed in the cluster
# Product Related, vs Product Related Duration

plot(df_norm[, 5:6], col = final$cluster)
```



Extract the clusters and add to our initial data to do some descriptive statistics at the cluster level

```
shop %>%
  mutate(Cluster = final$cluster) %>%
  group_by(Cluster) %>%
  summarise_all("mean")
```

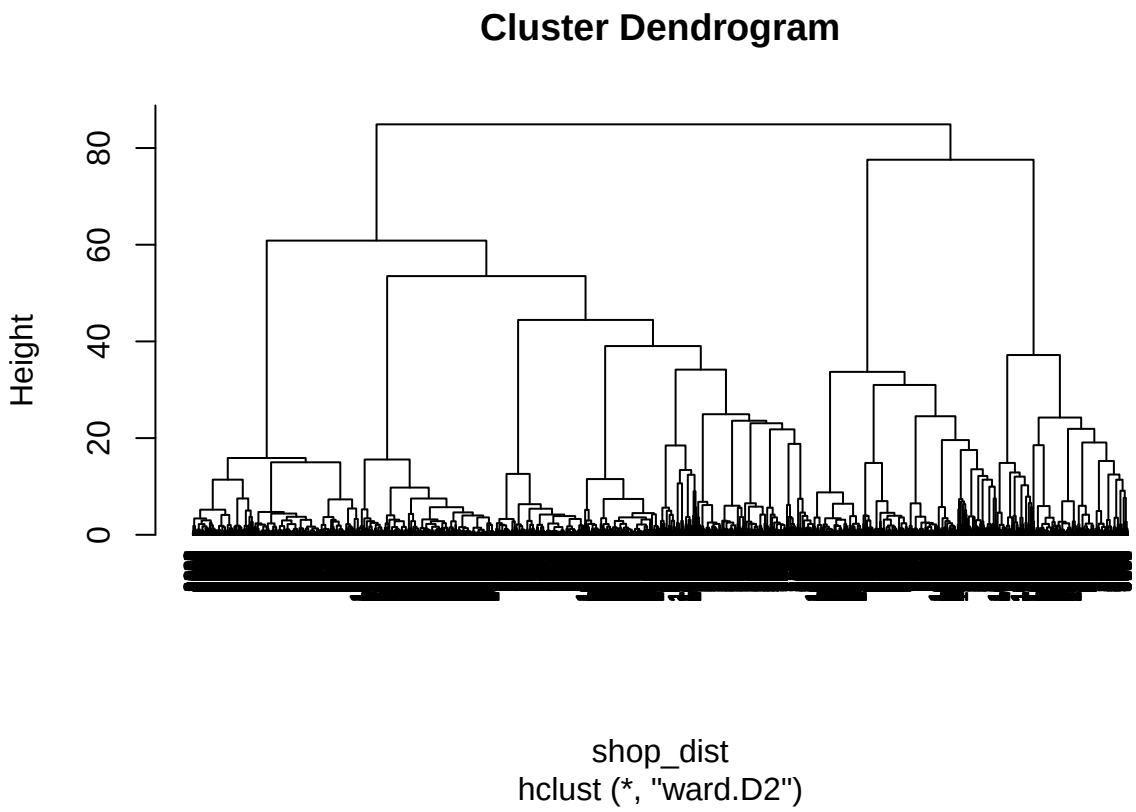
```
## # A tibble: 4 x 19
##   Cluster Administrative Administrative_Duration Informational Informational_Du~
##     <int>          <dbl>                   <dbl>         <dbl>             <dbl>
## 1       1           1.90                    67.6         0.404              25.6
## 2       2           2.38                    83.1         0.478              34.5
## 3       3           2.62                    91.2         0.603              39.2
## 4       4           2.49                    86.1         0.589              40.8
## # ... with 14 more variables: ProductRelated <dbl>,
## #   ProductRelated_Duration <dbl>, BounceRates <dbl>, ExitRates <dbl>,
## #   PageValues <dbl>, SpecialDay <dbl>, Month <dbl>, OperatingSystems <dbl>,
## #   Browser <dbl>, Region <dbl>, TrafficType <dbl>, VisitorType <dbl>,
## #   Weekend <dbl>, Revenue <dbl>
```

Hierachical Clustering

```
#First we use the dist() to compute the Euclidean distance btwn observation points
shop_dist = dist(df_norm, method = "euclidean")
```

```
#Set the hclust() dissimilairty matrix
#We then apply hierarchical clustering using the Ward's method
shop_hc = hclust(shop_dist, method = "ward.D2")

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




```
# cutting the clusters into 4 groups
group<-cutree(shop_hc,k=6)
# viewing the clustered groups
table(group)
```

```
## group
##    1    2    3    4    5    6
## 2979 2376 1709 1161 2159 1780
```

```
# creating a table
hclust<-dplyr::mutate(shop,clusters=group)
head(hclust)
```

```
##   Administrative Administrative_Duration Informational Informational_Duration
## 1              0                       0             0                      0
## 2              0                       0             0                      0
## 3              0                       0             0                      0
```

```
## 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              2                2.666667  0.05000000 0.1400000          0
## 4             10              627.500000  0.02000000 0.0500000          0
## 5             19              154.216667  0.01578947 0.0245614          0
## 6              2               37.000000  0.00000000 0.1000000          0
##   SpecialDay Month OperatingSystems Browser Region TrafficType
## 1        0.0   Feb                1       1      1           1
## 2        0.0   Feb                2       2      1           2
## 3        0.0   Feb                3       2      2           4
## 4        0.0   Feb                3       3      1           4
## 5        0.0   Feb                2       2      1           3
## 6        0.8   Feb                2       2      2           3
##         VisitorType Weekend Revenue clusters
## 1 Returning_Visitor   FALSE   FALSE        1
## 2 Returning_Visitor   FALSE   FALSE        1
## 3 Returning_Visitor   FALSE   FALSE        1
## 4 Returning_Visitor    TRUE   FALSE        2
## 5 Returning_Visitor   FALSE   FALSE        1
## 6 Returning_Visitor   FALSE   FALSE        1
```

Conclusion

- Informational Duration, ProductRelated Duration, and PageValues are the most positively skewed variables, having high kurtosis values.
- Months with the highest activity are May, November, March and December. The company should consider psudhing more adverts or offers to increase sales on these months.
- Most visitors have a type 2 operating system followed by type 3 and 1. It would be better if we would further explore what these os are.
- Most visitors have a type 2 browser.
- Most visitors to the site are located in region 1 and 3. The company should also focus more on these two regions in order to drive more sales and traffic to their site.
- Most of the traffic to the website is of type 2 and 1.
- Visitors to the site are mostly returning visitors.
- Most of the traffic happens on weekdays rather than on weekends. Most adverts should be running on weekdays as wel as offers.
- Most visits to the site do not earn revenue. We would further need to explore on this and get a reason as to why people do not purchase products.
- There is a high positive correlation between Bounce and exit rates. This shows that users who bounce from one page to another are most likely to exit the site quicker.
- It seems that there is more activity in November as it has the highest product related visits and the product related duration is high as well.

- Visitors of type other have a higher ExitRate and BounceRates followed by ReturningVisitors.

-The traffic types 15 and 17 have the highest Exit and Bounce Rates.

- During these months there is a higher number of new visitors. This can be leveraged by the company to create advertisements that will attract the new users to register to the site.
- **Other** customer shops in November and December.
- Most of the data indicates that a client's visit to the page did not result in income for the company, i.e. the customer did not make a purchase.