

Project 4 - Group 6

Zeyu Gan, Virgile Mison, Galen Simmons, Siyuan Yao, Qingyuan Zhang

4/14/2017

Setup: assign Knitr root directory and load dependencies

We set the `knitr` root.dir to the project directory and load/install the necessary packages to run our `main.Rmd` script.

Section I: Paper 3

“Name Disambiguation in Author Citations using a K-way Spectral Clustering Method”

As discussed in Section 3.1, authors Han, Zha, and Giles use **three** citation attributes to design features for name disambiguation. Those attributes are:

- co-author names
- paper titles
- publication venue titles

Together these attributes are called a “citation vector.” For a dataset with m features, each citation is represented as an m -dimensional vector given by $M = (\alpha_1, \dots, \alpha_m)$, where α_i is the weight assigned to feature i . Two types of feature weights assignments are profiled: (i) TFIDF and (ii) normalized TF (“NTF”).

We demonstrate how we create the citation vector from our clean data sources in the `output` library in the chunks below: `### Step 1: Load text file`

```
source(file.path(projDir,"lib","feature_extraction.R"))
exFile <- file.path(projDir,"output","Agupta.csv")
exText <- readTextFile(exFile)
```

```
## Warning: Missing column names filled in: 'X1' [1]
```

```
## Parsed with column specification:
```

```
## cols(
##   X1 = col_integer(),
##   AuthorID = col_integer(),
##   PaperNO = col_integer(),
##   QuestAuthor = col_character(),
##   Coauthor = col_character(),
##   Paper = col_character(),
##   Journal = col_character()
## )
```

```
exText %>%
  tbl_df() %>%
  select(QuestAuthor, Coauthor, Paper, Journal) %>%
  head()
```

```
## # A tibble: 6 × 4
```

```
##   QuestAuthor
##   <chr>
```

```
Coauthor
<chr>
```

```
## 1      A Gupta                                     <NA>
## 2      A Gupta                                     A Acero; Y Rui
## 3      A Gupta                                     A Acharya; M Tambe
## 4      A Gupta                                     A Agarwal
## 5      A Gupta                                     A Agrawal; N Chaddha; T Meng
## 6      A Gupta A Balachandran; E Sanocki; G Jancke; J Grudin; J Cadiz
## # ... with 2 more variables: Paper <chr>, Journal <chr>
```

Step 2: Prep the co-author and journal terms to be included in the document term matrix

We want the individual co-author names and journal names to be considered as single “terms” in our corpus. Therefore, we collapse the spaces separating the unique letters in someone’s name, so that it appears to be a term. For example, “C L Zhang” would become “clzhang”. Likewise, with journal names, we combine them into a single string without spaces so that each journal is a unique term in our Document Term Matrix.

```
as_tibble(exText) %>%
  mutate(x = str_replace_all(Coauthor, " ", "")) %>%
  mutate(x = str_replace_all(x, ";", " ")) %>%
  mutate(y = str_replace_all(Journal, " ", "")) %>%
  mutate(term_col = tolower(paste(x, y, Paper))) %>%
  select(term_col) %>%
  head()

## # A tibble: 6 × 1
##                                     term_col
##                                     <chr>
## 1 na parleparallelarchitecturesandlanguageseurope stanford dash multiprocesso
## 2 aacero yrui acmmultimedia automatically extracting highlights for tv baseba
## 3 acharya mtambe ieeetransparallelistribsys implementation of production s
## 4 agarwal sigmetricsmeasurementandmodelingofcomputersystems memory-reference
## 5 agrawal nchaddha tmeng icmcsinternationalconferencemultimediacomputingands
## 6 abalachandran esanocki gjancke jgrudin jcadiz cscwconferencecomputersupport
```

Step 3: Run our spectral clustering method on the example dataset

We use the `tm` package to construct citation vectors in the manner described above. We then use the `matching_matrix` and `performance_statistics` functions in the `lib/evaluation_metrics.R` file to benchmark our results.

```
source(file.path(projDir,"lib","SpectralClustering.R"))
source(file.path(projDir,"lib","evaluation_measures.R"))

num_authors <- length(unique(exText$AuthorID))
author_id <- exText$AuthorID
exDTM <- createCitationMatrix(exText)

exTFIDF <- weightTfIdf(exDTM, normalize = FALSE)
exNTF <- weightTf(exDTM)

exResultsTFIDF <- runSpectralClusteringQR(exTFIDF, num_authors)
exResultsNTF <- runSpectralClusteringQR(exNTF, num_authors)

m0 <- matching_matrix(author_id,exResultsTFIDF)
m1 <- matching_matrix(author_id,exResultsNTF)
```

```
p0 <- performance_statistics(m0)
p1 <- performance_statistics(m1)
```

Step 4: View results

We examine some results from our sample methods to confirm our methodology

```
ex_df <- data.frame(
  study=rep("Agupta", 2),
  method=c("QR Spectral Clustering - TFIDF", "QR Spectral Clustering - NTF"),
  precision=c(p0$precision, p1$precision),
  recall=c(p0$recall, p1$recall),
  f1=c(p0$f1, p1$f1),
  accuracy=c(p0$accuracy, p1$accuracy),
  mcc=c(p0$mcc, p1$mcc)
)

kable(ex_df)
```

study	method	precision	recall	f1	accuracy	mcc
Agupta	QR Spectral Clustering - TFIDF	0.1267663	0.2457352	0.1672528	0.7591650	0.0462060
Agupta	QR Spectral Clustering - NTF	0.1078698	0.2760624	0.1551253	0.7040427	0.0184078

Term Frequency Reverse Document Frequency (TF-IDF) Why TF-IDF? Term frequency counts the number of times a word from a corpus appears in a particular document. Some words appear frequently in all documents (i.e. they are common locally). Other words appear rarely in the corpus (i.e. they are rare globally). Inverse document frequency weights words that appear rarely more heavily by applying the following transformation to the term frequency (tf) vector:

$$\log \cdot \frac{\#ofdocs}{1 + \#ofdocsusingword}$$

Distance metrics

Scaled Euclidean Distance:

$$d(x_i, x_q) = \sqrt{a_1(x_i[1] - x_q[1])^2 + \dots + a_d(x_i[d] - x_q[d])^2}$$

Cosine Similarity:

$$\frac{x_i^T x_q}{\|x_i\| \|x_q\|} = \cos(\theta)$$

Normalizing - normalizing can make dissimilar objects appear more similar. For example a short tweet might appear more similar to a long document.

Complexity of brute-force search

Given a query point, $O(N)$ distance computations per 1-NN query. By extension, $O(N \log k)$ distance computations per k -NN query.

K-means algorithm

1. Initialize cluster centers
2. Assign observations to closest cluster center
3. Revise cluster centers as mean of assigned observations
4. Repeat steps 1 & 2 until convergence

Failure modes of k-means

- disparate cluster sizes
- overlapping clusters
- different shaped / oriented clusters

BELOW IS OLD CODE FROM TEACHER

This file is currently a template for implementing one of the suggested papers, Han, Zha, & Giles (2005). Due to the nature of the method, we only implement the method on a subset of the data, “AKumar.txt”. In your project, you need to work on the whole dataset. You should follow the same structure as in this tutorial, but update it according to the papers you are assigned.

Step 0: Load the packages, specify directories

```
if (!require("pacman")) install.packages("pacman")

## Loading required package: pacman
pacman::p_load(text2vec, dplyr, qLcMatrix, kernlab, knitr)

#setwd("~/Dropbox/Project4_WhoIsWho/doc")
# here replace it with your own path or manually set it in RStudio
# to where this rmd file is located
```

Step 1: Load and process the data

For each record in the dataset, there are some information we want to extract and store them in a regular form: canonical author id, coauthors, paper title, publication venue title. You may need to find regular matched in the input string vectors by using regex in R. Here is a tutorial for regular expression in R, which might help you https://rstudio-pubs-static.s3.amazonaws.com/74603__76cd14d5983f47408fdf0b323550b846.html

```
AKumar <- data.frame(
  scan(
    file.path(projDir, "data", "nameset", "AKumar.txt", fsep = .Platform$file.sep),
    what = list(Coauthor = "", Paper = "", Journal = ""),
    sep=">",
    quiet=TRUE),
  stringsAsFactors=FALSE)
# This need to be modified for different name set
```

```

# extract canonical author id befor "_"
AKumar$AuthorID <- sub("_.*", "", AKumar$Coauthor)
# extract paper number under same author between "_" and first whitespace
AKumar$PaperNO <- sub(".*_(\\w*)\\s.*", "\\1", AKumar$Coauthor)
# delete "<" in AKumar$Coauthor, you may need to further process the coauthor
# term depending on the method you are using
AKumar$Coauthor <- gsub("<", "", sub("^.*?\\s", "", AKumar$Coauthor))
# delete "<" in AKumar$Paper
AKumar$Paper <- gsub("<", "", AKumar$Paper)
# add PaperID for furthur use, you may want to combine all the nameset files and
# then assign the unique ID for all the citations
AKumar$PaperID <- rownames(AKumar)

```

Step 2: Feature design

Following the section 3.1 in the paper, we want to use paper titles to design features for citations. As the notation used in the paper, we want to find a m -dimensional citation vector α_i for each citation i , $i = 1, \dots, n$. In this dataset, $n = 244$. We study “TF-IDF” (term frequency-inverse document frequency) as suggested in the paper.

TF-IDF is a numerical statistics that is intended to reflect how important a word is to a document in a collection or corpus. It is often used as a weighting factor in information retrieval, text mining, and user modeling. The TF-IDF value increases proportionally to the number of times a word appears in the document, but is offset by the frequency of the word in the corpus, which helps to adjust for the fact that some words appear more frequently in general.

$$\begin{aligned}
 \text{TF}(t) &= \frac{\text{Number of times term } t \text{ appears in a document}}{\text{Total number of terms in the document}} \\
 \text{IDF}(t) &= \log \frac{\text{Total number of documents}}{\text{Number of documents with term } t \text{ in it}} \\
 \text{TF-IDF}(t) &= \text{TF}(t) \times \text{IDF}(t)
 \end{aligned}$$

To compute TF-IDF, we first need to construct a document-term matrix (DTM). In other words, the first step is to vectorize text by creating a map from words to a vector space. There are some good packages you could use for text mining (probably you have tried during first project, you don’t need to follow my code if you are familiar with other package), e.g. *text2vec*, *tm*, *tidytext*. Here, we are going to use *text2vec* package. A good tutorial can be found here, <https://cran.r-project.org/web/packages/text2vec/vignettes/text-vectorization.html>.

Let’s first create a vocabulary-based DTM. Here we collect unique terms from all documents and mark each of them with a unique ID using the `create_vocabulary()` function. We use an iterator to create the vocabulary.

```

it_train <- itoken(AKumar$Paper,
  preprocessor = tolower,
  tokenizer = word_tokenizer,
  ids = AKumar$PaperID,
  # turn off progressbar because it won't look nice in rmd
  progressbar = FALSE)
vocab <- create_vocabulary(it_train, stopwords = c("a", "an", "the", "in", "on",
  "at", "of", "above", "under"))

vocab

```

```
## Number of docs: 244
```

```
## 9 stopwords: a, an, the, in, on, at ...
## ngram_min = 1; ngram_max = 1
## Vocabulary:
##      terms terms_counts doc_counts
## 1:      modular          1          1
## 2: interference          1          1
## 3:      assembly          1          1
## 4:      tolerance          1          1
## 5:          form          1          1
## ---
## 662:      based         40         38
## 663:      yeast          1          1
## 664:      elastic          2          2
## 665:      schemes          1          1
## 666: information          3          3
```

Here, we remove pre-defined stopwords, the words like `???a???`, `???the???`, `???in???`, `???I???`, `???you???`, `???on???`, etc, which do not provide much useful information.

Now that we have a vocabulary list, we can construct a document-term matrix.

```
vectorizer <- vocab_vectorizer(vocab)
dtm_train <- create_dtm(it_train, vectorizer)
```

Now we have DTM and can check its dimensions.

```
dim(dtm_train)
```

```
## [1] 244 666
```

As you can see, the DTM has 244 rows, equal to the number of citations, and 666, equal to the number of unique terms excluding stopwords.

Then, we want to use DTM to compute TF-IDF transformation on DTM.

```
tfidf <- TfIdf$new()
dtm_train_tfidf <- fit_transform(dtm_train, tfidf)
```

Step 3: Clustering

Following suggestion in the paper, we carry out spectral clustering on the Gram matrix of the citation vectors by using R function `specc()` in *kernelab*. The number of clusters is assumed known as stated in the paper.

```
start.time <- Sys.time()
result_sclust <- specc(as.matrix(dtm_train_tfidf),
                      centers=length(unique(AKumar$AuthorID)))
end.time <- Sys.time()
time_sclust <- end.time - start.time
result_sclust
```

```
## Spectral Clustering object of class "specc"
```

```
##
```

```
## Cluster memberships:
```

```
##
```

```
## 8 8 8 2 5 11 2 2 2 12 2 11 4 2 1 12 2 14 6 12 14 3 3 7 12 6 2 3 12 12 6 12 1 7 11 11 12 11 12 12 7 1
```

```
##
```

```
## Gaussian Radial Basis kernel function.
```

```
## Hyperparameter : sigma = 0.0474582700433533
```

##	Centers:					
##	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]
##	[1,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[2,]	0.01112042	0.01112042	0.01112042	0.01429768	0.01429768
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]
##	[1,]	0.00000000	0.00000000	0.02053	0.02053	0.00000000
##	[2,]	0.02502094	0.01668063	0.000000	0.000000	0.01668063
##	[3,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.000000	0.000000	0.00000000
##	[14,]	0.00000000	0.00000000	0.000000	0.000000	0.03336126
##	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
##	[1,]	0.00000000	0.00000000	0.02416789	0.00000000	0.00000000
##	[2,]	0.00000000	0.00000000	0.00000000	0.00000000	0.01112042
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.02729557	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.02729557	0.02499180	0.03336126	0.00000000
##	[,19]	[,20]	[,21]	[,22]	[,23]	[,24]
##	[1,]	0.00000000				

##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.03753141	0.03211620	0.03436372	0.00000000	0.00000000	0.00000000
##		[,25]	[,26]	[,27]	[,28]	[,29]	[,30]
##	[1,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[2,]	0.01429768	0.01429768	0.01429768	0.01429768	0.0283637	0.00000000
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.1172948
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##		[,31]	[,32]	[,33]	[,34]	[,35]	[,36]
##	[1,]	0.00000000	0.03695401	0.03695401	0.03417681	0.02053	0.03417681
##	[2,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[13,]	0.08006702	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.000000	0.00000000
##		[,37]	[,38]	[,39]	[,40]	[,41]	[,42]
##	[1,]	0.00000000	0.03417681	0.00000000	0.00000000		

##	[1,]	0.00000000	0.00000000	0.06159001	0.06159001	0.00000000	0.1159477
##	[2,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.09608042	0.09608042	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.1512731	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##		[,49]	[,50]	[,51]	[,52]	[,53]	[,54]
##	[1,]	0.00000000	0.03383505	0.00000000	0.00000000	0.00000000	0.00000000
##	[2,]	0.02001675	0.01309094	0.00000000	0.00000000	0.00000000	0.00000000
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.04488322	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.0593089	0.0593089	0.10860632	0.08896335
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##		[,55]	[,56]	[,57]	[,58]	[,59]	[,60]
##	[1,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[2,]	0.01527276	0.00000000	0.00000000	0.00000000	0.00000000	0.01668063
##	[3,]	0.00000000	0.06862887	0.06862887	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##							

```

## [10,] 0.06672251 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.02965445 0.02965445 0.02965445 0.02715158 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.04887284 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.03436372
##      [,67]      [,68]      [,69]      [,70]      [,71]      [,72]
## [1,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [2,] 0.01668063 0.01668063 0.000000 0.0000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.288608 0.1482164 0.02668901 0.02668901
## [14,] 0.00000000 0.00000000 0.000000 0.0000000 0.00000000 0.00000000
##      [,73]      [,74]      [,75]      [,76]      [,77]      [,78]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.009515912 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.078651923 0.04488322 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.08006702 0.18218260 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0762543 0.0762543
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.02287289 0.00000000 0.00000000
## [13,] 0.00000000 0.09774569 0.00000000 0.03087841 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,79]      [,80]      [,81]      [,82]      [,83]      [,84]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.02528432 0.02315029 0.02528432 0.02528432 0.1612804 0.02528432
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.06109105 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,85]      [,86]      [,87]      [,88]      [,89]      [,90]
## [1,] 0.01537957 0.01421308 0.01421308 0.01421308 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.00000000 0.01112042 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000

```

[illegible]

##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.02854774
##		[,109]	[,110]	[,111]	[,112]	[,113]	[,114]
##	[1,]	0.00000000	0.00000000	0.00000000	0.00000000	0.02309626	0.00000000
##	[2,]	0.00000000	0.00000000	0.01429768	0.01429768	0.00000000	0.00000000
##	[3,]	0.03431444	0.07630148	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.02715158
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.03665463
##	[14,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##		[,115]	[,116]	[,117]	[,118]	[,119]	[,120]
##	[1,]	0.02309626	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[2,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.03753141	0.06872744	0.06872744	0.06872744	0.107054
##		[,121]	[,122]	[,123]	[,124]	[,125]	[,126]
##	[1,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[2,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[3,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.00000000	0.1374549	0.00000000	0.1374549	0.00000000	0.1099639
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000					

```

## [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [9,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [10,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [11,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.03336126 0.00000000
##      [,133]      [,134]      [,135]      [,136]      [,137]      [,138]
## [1,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.05491067
## [2,] 0.0000000 0.0000000 0.0000000 0.02502094 0.02502094 0.00000000
## [3,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [4,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.06341532
## [5,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [6,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [7,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [8,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [9,] 0.2802869 0.2802869 0.2802869 0.0000000 0.0000000 0.00000000
## [10,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [11,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [12,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [13,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.00000000
## [14,] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.02774420
##      [,139]      [,140]      [,141]      [,142]      [,143]      [,144]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.02061823 0.00000000 0.02061823
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.07854564 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.06672251 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.02965445 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.03753141 0.00000000 0.00000000 0.00000000
##      [,145]      [,146]      [,147]      [,148]      [,149]      [,150]
## [1,] 0.02819587 0.02896405 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.04582144 0.02502094 0.00000000 0.00000000 0.01429768
## [3,] 0.00000000 0.05763256 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.04564033 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.02749097 0.04235993 0.00000000 0.1120422 0.03753141 0.00000000
##      [,151]      [,152]      [,153]      [,154]      [,155]      [,156]

```

```

## [1,] 0.0000000 0.01421308 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.0000000 0.00000000 0.02558686 0.009098525 0.009098525 0.009098525
## [3,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.0000000 0.00000000 0.08099438 0.00000000 0.00000000 0.00000000
## [12,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.1255413 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,157]      [,158]      [,159]      [,160]      [,161]      [,162]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.02645497
## [2,] 0.00000000 0.009098525 0.00000000 0.009098525 0.02360336 0.01822374
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.02528432 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.0762543 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,163]      [,164]      [,165]      [,166]      [,167]
## [1,] 0.05137632 0.04511339 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.007148841 0.007148841 0.009098525
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.02429831 0.00000000 0.00000000 0.00000000 0.00000000
##      [,168]      [,169]      [,170]      [,171]      [,172]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.007148841 0.007148841 0.007148841 0.008340314 0.01000838
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000

```

```

## [10,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
## [11,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
## [12,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
## [13,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
## [14,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000
##      [,173]      [,174]      [,175]      [,176]      [,177]      [,178]
## [1,] 0.00000000 0.000000000 0.000000000 0.01879725 0.00000000 0.00000000
## [2,] 0.01680004 0.008340314 0.01000838 0.01527276 0.00000000 0.00000000
## [3,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.000000000 0.000000000 0.00000000 0.04893897 0.00000000
## [9,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.000000000 0.000000000 0.00000000 0.02635176 0.00000000
## [12,] 0.00000000 0.000000000 0.000000000 0.00000000 0.02175066 0.01617516
## [13,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
##      [,179]      [,180]      [,181]      [,182]      [,183]      [,184]
## [1,] 0.000000000 0.00000000 0.000000000 0.000000000 0.08722472 0.000000000
## [2,] 0.007698752 0.00000000 0.000000000 0.007698752 0.00000000 0.007698752
## [3,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [4,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [5,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [6,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [7,] 0.000000000 0.00000000 0.000000000 0.000000000 0.08544462 0.000000000
## [8,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [9,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [10,] 0.000000000 0.4415585 0.000000000 0.000000000 0.00000000 0.000000000
## [11,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [12,] 0.000000000 0.00000000 0.09359351 0.000000000 0.00000000 0.000000000
## [13,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
## [14,] 0.000000000 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000
##      [,185]      [,186]      [,187]      [,188]      [,189]      [,190]
## [1,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [2,] 0.01309094 0.005887281 0.000000000 0.01000838 0.00000000 0.01000838
## [3,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [4,] 0.02290915 0.000000000 0.02502094 0.000000000 0.00000000 0.000000000
## [5,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [6,] 0.000000000 0.000000000 0.000000000 0.000000000 0.06405361 0.000000000
## [7,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [8,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [9,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [10,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [11,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [12,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [13,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
## [14,] 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.000000000
##      [,191]      [,192]      [,193]      [,194]      [,195]      [,196]
## [1,] 0.000000000 0.000000000 0.01216235 0.000000000 0.000000000 0.000000000
## [2,] 0.000000000 0.000000000 0.01712864 0.03665463 0.008340314 0.000000000
## [3,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000

```

##	[4,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[9,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.06672251	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.01482723
##	[13,]	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.00000000	0.03753141	0.00000000	0.00000000	0.00000000	0.00000000
##		[,197]	[,198]	[,199]	[,200]	[,201]	[,202]
##	[1,]	0.000000000	0.00000000	0.000000000	0.01661423	0.00000000	0.00000000
##	[2,]	0.008340314	0.01832732	0.008340314	0.00000000	0.01000838	0.01309094
##	[3,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[4,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[5,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[6,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[7,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[8,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.06109105
##	[9,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[10,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[11,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[12,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[13,]	0.000000000	0.00000000	0.000000000	0.00000000	0.00000000	0.00000000
##	[14,]	0.000000000	0.00000000	0.000000000	0.07608563	0.00000000	0.00000000
##		[,203]	[,204]	[,205]	[,206]	[,207]	[,208]
##	[1,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[2,]	0.01000838	0.007148841	0.02001675	0.00000000	0.008340314	0.007148841
##	[3,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[4,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[5,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[6,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[7,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[8,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[9,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[10,]	0.00000000	0.000000000	0.00000000	0.00000000	0.000000000	0.000000000
##	[11,]	0.00000000	0.000000000	0.00000000	0.04448168	0.000000000	0.000000000
##	[12,]	0.00000000					


```

## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,215]      [,216]      [,217]      [,218]      [,219]      [,220]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.007148841 0.00000000 0.00000000 0.00000000 0.01309094 0.00000000
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.000000000 0.00000000 0.00000000 0.04367292 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.02819587 0.00000000
## [12,] 0.000000000 0.01617516 0.008896335 0.00000000 0.00000000 0.08145474
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,221]      [,222]      [,223]      [,224]      [,225]      [,226]
## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.009163658 0.00000000 0.01668063 0.00000000 0.00000000 0.02867281
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.000000000 0.00000000 0.00000000 0.02729557 0.00000000 0.02105346
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.040727370 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.000000000 0.08734584 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.2066312 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,227]      [,228]      [,229]      [,230]      [,231]      [,232]
## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.008330598 0.01251047 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.03431444
## [4,] 0.000000000 0.00000000 0.03336126 0.00000000 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.057124103 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.00000000 0.00000000 0.00000000 0.01186178 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.03753141 0.00000000 0.00000000
##      [,233]      [,234]      [,235]      [,236]      [,237]      [,238]
## [1,] 0.0153975 0.00000000 0.00000000 0.0153975 0.00000000 0.01421308
## [2,] 0.00000000 0.00000000 0.007148841 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.02729557 0.00000000 0.00000000 0.02729557 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000

```

```

## [7,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [8,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [9,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [10,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [11,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [12,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [13,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
## [14,] 0.0000000 0.00000000 0.000000000 0.0000000 0.00000000 0.00000000
##      [,239]      [,240]      [,241]      [,242]      [,243]      [,244]
## [1,] 0.00000000 0.000000000 0.00000000 0.01421308 0.04357544 0.00000000
## [2,] 0.01429768 0.009163658 0.00000000 0.00000000 0.00000000 0.01668063
## [3,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.024991795 0.03336126 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,245]      [,246]      [,247]      [,248]      [,249]      [,250]
## [1,] 0.00000000 0.018797248 0.00000000 0.00000000 0.02053 0.00000000
## [2,] 0.00000000 0.009163658 0.00000000 0.00000000 0.00000 0.00000000
## [3,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [4,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [7,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [8,] 0.00000000 0.000000000 0.04448168 0.00000000 0.00000 0.00000000
## [9,] 0.04367292 0.000000000 0.00000000 0.03970265 0.00000 0.00000000
## [10,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [11,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [12,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.02224084
## [13,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
## [14,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000 0.00000000
##      [,251]      [,252]      [,253]      [,254]      [,255]      [,256]
## [1,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.02001675 0.01668063 0.00000000 0.01619888 0.00000000
## [3,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.0727034 0.000000000 0.00000000 0.03970265 0.06426001 0.00000000
## [10,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.01976963
## [13,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,257]      [,258]      [,259]      [,260]      [,261]      [,262]

```

[illegible]

```

## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.04448168 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.02224084 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,281]      [,282]      [,283]      [,284]      [,285]      [,286]
## [1,] 0.02819587 0.00000000 0.02053 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.02197924 0.000000 0.00000000 0.01917176 0.00000000
## [3,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.000000 0.03753141 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.03534300 0.000000 0.00000000 0.00000000 0.00000000
## [10,] 0.08145474 0.00000000 0.000000 0.00000000 0.04574579 0.00000000
## [11,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.000000 0.00000000 0.01247612 0.01976963
## [13,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
##      [,287]      [,288]      [,289]      [,290]      [,291]      [,292]
## [1,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [4,] 0.03753141 0.00000000 0.000000 0.00000000 0.01815104 0.00000000
## [5,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.23068 0.00000000 0.25665882 0.00000000
## [8,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.0727882 0.000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.03079501
## [12,] 0.00000000 0.00000000 0.000000 0.008896335 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.00000000
##      [,293]      [,294]      [,295]      [,296]      [,297]      [,298]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.02443642 0.01325431 0.00654547
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.02141080 0.02499180
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.1446328 0.05004189 0.1243866 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,299]      [,300]      [,301]      [,302]      [,303]      [,304]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.04619251
## [2,] 0.00000000 0.00000000 0.00654547 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000

```

```

## [4,] 0.00000000 0.00000000 0.02499180 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.04575258 0.00000000 0.00000000 0.04575258 0.00000000 0.00000000
## [7,] 0.00000000 0.05258041 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.07120264 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.04003351 0.00000000
## [14,] 0.00000000 0.06688733 0.00000000 0.00000000 0.00000000 0.00000000
##      [,305]      [,306]      [,307]      [,308]      [,309]      [,310]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.01429768 0.00000000 0.00000000 0.00000000 0.00000000 0.02001675
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.03670423 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.02729557 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.1761803 0.06479551 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.05981124 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.07612729 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,311]      [,312]      [,313]      [,314]      [,315]      [,316]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.007148841 0.00000000 0.009098525 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.08145474 0.00000000 0.00000000 0.08145474 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.01617516
## [13,] 0.00000000 0.1663085 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,317]      [,318]      [,319]      [,320]      [,321]      [,322]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [2,] 0.00000000 0.006749532 0.00000000 0.01251047 0.000000 0.01251047
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [4,] 0.00000000 0.022089377 0.00000000 0.00000000 0.000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [8,] 0.00000000 0.071995006 0.00000000 0.00000000 0.000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [10,] 0.0593089 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000

```

```

## [13,] 0.0000000 0.000000000 0.00000000 0.00000000 0.160134 0.00000000
## [14,] 0.0000000 0.000000000 0.06109105 0.00000000 0.000000 0.00000000
##      [,323]  [,324]      [,325]      [,326]      [,327]      [,328]
## [1,] 0.00000000 0.029931 0.01216235 0.00000000 0.00000000 0.00000000
## [2,] 0.02502094 0.000000 0.01682277 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.000000 0.00000000 0.04902062 0.00000000 0.00000000
## [4,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.000000 0.00000000 0.00000000 0.1332896 0.1332896
## [10,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,329]      [,330]      [,331]      [,332]      [,333]      [,334]
## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [2,] 0.008577335 0.00654547 0.00000000 0.00000000 0.00000000 0.007136934
## [3,] 0.000000000 0.00000000 0.02936338 0.00000000 0.00000000 0.000000000
## [4,] 0.040352463 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [6,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [9,] 0.000000000 0.03998687 0.12457194 0.1332896 0.00000000 0.000000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.065251966
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.15561737 0.000000000
## [12,] 0.027447472 0.00000000 0.00000000 0.00000000 0.02646721 0.016917176
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
##      [,335]      [,336]      [,337]      [,338]      [,339]      [,340]
## [1,] 0.03417681 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [2,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.01000838
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.05864741 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.0593089 0.00000000 0.0762543 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.01186178 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,341]      [,342]      [,343]      [,344]      [,345]      [,346]
## [1,] 0.000000000 0.00000000 0.03492948 0.00000000 0.00000000 0.000000000
## [2,] 0.008564321 0.00000000 0.00000000 0.00000000 0.00000000 0.01429768
## [3,] 0.000000000 0.00000000 0.07339468 0.00000000 0.00000000 0.00000000
## [4,] 0.000000000 0.00000000 0.00000000 0.00000000 0.03336126 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.04891847 0.01614518 0.07099074 0.00000000 0.00000000

```

```

## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.034257282 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.04468515 0.01707663 0.04119998 0.00000000 0.00000000
## [12,] 0.000000000 0.22677148 0.10301095 0.06638948 0.00000000 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.032116202 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,347]      [,348]      [,349]      [,350]      [,351]      [,352]
## [1,] 0.09719326 0.00000000 0.02053 0.00000000 0.00000000 0.02416789
## [2,] 0.00000000 0.00000000 0.00000 0.01223474 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000 0.07232093 0.06839526 0.00000000
## [9,] 0.00000000 0.0727882 0.00000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000 0.00000000 0.08099438 0.00000000
## [12,] 0.00000000 0.00000000 0.00000 0.00000000 0.01599889 0.00000000
## [13,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000 0.00000000 0.00000000 0.02499180
##      [,353]      [,354]      [,355]      [,356]      [,357]      [,358]
## [1,] 0.00000000 0.00000000 0.00000000 0.000000 0.0153975 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.01429768
## [3,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [4,] 0.00000000 0.02729557 0.02729557 0.000000 0.00000000 0.00000000
## [5,] 0.01467957 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.077382 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [12,] 0.02439044 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [13,] 0.22467895 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
## [14,] 0.07263328 0.00000000 0.00000000 0.000000 0.00000000 0.00000000
##      [,359]      [,360]      [,361]      [,362]      [,363]      [,364]
## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.01246067
## [2,] 0.007698752 0.00000000 0.00000000 0.01429768 0.02063428 0.02198419
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.02776950 0.00000000
## [4,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.05864741 0.00000000 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.04799667
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.01976963 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,365]      [,366]      [,367]      [,368]      [,369]      [,370]

```

```

## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.005887281 0.00000000 0.00000000 0.01561896 0.00000000 0.00000000
## [3,] 0.000000000 0.00000000 0.08976645 0.00000000 0.00000000 0.00000000
## [4,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.01869083 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.09163658
## [9,] 0.000000000 0.00000000 0.00000000 0.04035521 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.01482723 0.00000000 0.03945842 0.01617516 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,371]      [,372]      [,373]      [,374]      [,375]      [,376]
## [1,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.02053
## [2,] 0.007698752 0.01668063 0.005887281 0.0000000 0.0000000 0.00000
## [3,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [4,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [5,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [6,] 0.000000000 0.00000000 0.000000000 0.0000000 0.1075203 0.00000
## [7,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [8,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [9,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [10,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [11,] 0.000000000 0.00000000 0.000000000 0.2104935 0.0000000 0.00000
## [12,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [13,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
## [14,] 0.000000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000
##      [,377]      [,378]      [,379]      [,380]      [,381]      [,382]
## [1,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [2,] 0.00000000 0.02854774 0.0000000 0.00000000 0.00000000 0.005887281
## [3,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [4,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [5,] 0.00000000 0.00000000 0.4601626 0.00000000 0.08006702 0.000000000
## [6,] 0.07330927 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [7,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [8,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [9,] 0.00000000 0.04671448 0.0000000 0.05459115 0.00000000 0.000000000
## [10,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [11,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [12,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
## [13,] 0.00000000 0.00000000 0.1054292 0.00000000 0.00000000 0.000000000
## [14,] 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000 0.000000000
##      [,383]      [,384]      [,385]      [,386]      [,387]      [,388]
## [1,] 0.02190850 0.00000000 0.00000000 0.01879725 0.00000000 0.00000000
## [2,] 0.02525998 0.00000000 0.00654547 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.02290915 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.04631761
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.04491405
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.05649135 0.05459115 0.00000000 0.00000000 0.00000000 0.00000000

```



```

## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.03079501 0.03859801
## [12,] 0.00000000 0.00000000 0.00000000 0.01629095 0.00000000 0.02287289
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,389]      [,390]      [,391]      [,392]      [,393]      [,394]
## [1,] 0.00000000 0.00000000 0.02053 0.000000000 0.00000000 0.00000000
## [2,] 0.02001675 0.01000838 0.000000 0.009098525 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.1529894
## [9,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.000000 0.000000000 0.1101127 0.00000000
## [12,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.000000 0.000000000 0.00000000 0.00000000
##      [,395]      [,396]      [,397]      [,398]      [,399]      [,400]
## [1,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [2,] 0.000000000 0.009098525 0.00000000 0.01112042 0.005887281 0.000000000
## [3,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [4,] 0.000000000 0.000000000 0.1374549 0.000000000 0.000000000 0.000000000
## [5,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [6,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [7,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [8,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [9,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [10,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [11,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [12,] 0.008896335 0.000000000 0.00000000 0.000000000 0.000000000 0.008896335
## [13,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
## [14,] 0.000000000 0.000000000 0.00000000 0.000000000 0.000000000 0.000000000
##      [,401]      [,402]      [,403]      [,404]      [,405]      [,406]
## [1,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [2,] 0.01070540 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [3,] 0.000000000 0.000000000 0.000000000 0.04488322 0.000000000 0.00000000
## [4,] 0.000000000 0.000000000 0.000000000 0.03436372 0.000000000 0.00000000
## [5,] 0.000000000 0.000000000 0.08221748 0.000000000 0.000000000 0.00000000
## [6,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [7,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [8,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [9,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [10,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.0762543
## [11,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
## [12,] 0.02283819 0.000000000 0.03806365 0.000000000 0.01482723 0.00000000
## [13,] 0.000000000 0.04003351 0.000000000 0.000000000 0.000000000 0.00000000
## [14,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000
##      [,407]      [,408]      [,409]      [,410]      [,411]      [,412]
## [1,] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.018778718
## [2,] 0.004631159 0.000000000 0.01018184 0.000000000 0.000000000 0.007911404
## [3,] 0.047634778 0.000000000 0.000000000 0.000000000 0.04488322 0.000000000

```

```

## [4,] 0.011367390 0.00000000 0.02290915 0.00000000 0.00000000 0.037219561
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [6,] 0.090939121 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [7,] 0.108949286 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [8,] 0.228514614 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.044386061
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [11,] 0.027786954 0.00000000 0.00000000 0.1649458 0.00000000 0.000000000
## [12,] 0.031697710 0.02961991 0.00000000 0.00000000 0.02036368 0.000000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.047468426
##      [,413]      [,414]      [,415]      [,416]      [,417]      [,418]
## [1,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [2,] 0.00000000 0.01309094 0.000000 0.00000000 0.00000000 0.000000000
## [3,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [4,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [5,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [6,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [7,] 0.00000000 0.00000000 0.000000 0.12648843 0.06767009 0.000000000
## [8,] 0.00000000 0.00000000 0.000000 0.05709547 0.00000000 0.07612729
## [9,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [10,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [11,] 0.00000000 0.00000000 0.132364 0.00000000 0.00000000 0.000000000
## [12,] 0.01976963 0.02715158 0.000000 0.00000000 0.00000000 0.000000000
## [13,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.000000000
## [14,] 0.00000000 0.00000000 0.000000 0.00000000 0.00000000 0.02854774
##      [,419]      [,420]      [,421]      [,422]      [,423]      [,424]
## [1,] 0.03079501 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.008340314 0.009098525 0.01429768 0.01112042 0.00000000
## [3,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.0325819
## [13,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000
##      [,425]      [,426]      [,427]      [,428]      [,429]      [,430]
## [1,] 0.00000000 0.000000000 0.00000000 0.01756784 0.000000000 0.00000000
## [2,] 0.00000000 0.000000000 0.01602059 0.00000000 0.008340314 0.00000000
## [3,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [4,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [7,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [8,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [9,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [10,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [11,] 0.00000000 0.000000000 0.02190850 0.00000000 0.000000000 0.00000000
## [12,] 0.0325819 0.04671448 0.04109820 0.00000000 0.000000000 0.0254181

```

```

## [13,] 0.0000000 0.00000000 0.04556969 0.00000000 0.000000000 0.00000000
## [14,] 0.0000000 0.00000000 0.00000000 0.06423240 0.000000000 0.00000000
##      [,431]      [,432]      [,433]      [,434]      [,435]      [,436]
## [1,] 0.029841752 0.00000000 0.00000000 0.05270351 0.000000000 0.00000000
## [2,] 0.008174029 0.02175066 0.02850916 0.00000000 0.005887281 0.00000000
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.04902062
## [4,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [6,] 0.251021798 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.12648843 0.000000000 0.00000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [12,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [14,] 0.000000000 0.03211620 0.00000000 0.00000000 0.000000000 0.00000000
##      [,437]      [,438]      [,439]      [,440]      [,441]      [,442]
## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.007698752 0.00000000 0.00000000 0.02670099 0.00000000 0.008564321
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.000000000 0.00000000 0.05553732 0.00000000 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.05696211 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.00000000 0.08699668 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.000000000 0.07232093 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.000000000 0.04671448 0.00000000 0.00000000 0.00000000 0.067948328
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.00000000 0.00000000 0.00000000 0.01976963 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,443]      [,444]      [,445]      [,446]      [,447]      [,448]
## [1,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [2,] 0.01751458 0.008340314 0.007148841 0.00000000 0.008099438 0.00000000
## [3,] 0.00000000 0.000000000 0.000000000 0.00000000 0.039670717 0.00000000
## [4,] 0.01718721 0.000000000 0.000000000 0.00000000 0.000000000 0.3002513
## [5,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [6,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [7,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [8,] 0.12985889 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [9,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [10,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [11,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [12,] 0.00000000 0.000000000 0.000000000 0.01976963 0.028798002 0.00000000
## [13,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
## [14,] 0.00000000 0.000000000 0.000000000 0.00000000 0.000000000 0.00000000
##      [,449]      [,450]      [,451]      [,452]      [,453]      [,454]
## [1,] 0.00000000 0.00000000 0.00000000 0.000000000 0.01216235 0.00000000
## [2,] 0.01822374 0.00000000 0.00000000 0.007363126 0.00000000 0.00000000
## [3,] 0.00000000 0.08976645 0.00000000 0.000000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000

```

```

## [7,] 0.00000000 0.00000000 0.06767009 0.00000000 0.07027135 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.128562510 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.06171000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.03079501
## [12,] 0.01439900 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,455]      [,456]      [,457]      [,458]      [,459]      [,460]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.005887281 0.01112042 0.00000000 0.005887281 0.02001675 0.04057981
## [3,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.02094442
## [4,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.08509097 0.00000000 0.00000000 0.02792589
## [7,] 0.000000000 0.00000000 0.18264949 0.00000000 0.00000000 0.05012340
## [8,] 0.000000000 0.00000000 0.14772739 0.00000000 0.00000000 0.05430035
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,461]      [,462]      [,463]      [,464]      [,465]      [,466]
## [1,] 0.00000000 0.00000000 0.031926165 0.00000000 0.00000000 0.000000000
## [2,] 0.00000000 0.00000000 0.008564321 0.00000000 0.00000000 0.026652103
## [3,] 0.00000000 0.1719064 0.000000000 0.00000000 0.03431444 0.148132233
## [4,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.044051545
## [5,] 0.08006702 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
## [6,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.063017580
## [7,] 0.00000000 0.00000000 0.000000000 0.3549537 0.00000000 0.041130355
## [8,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
## [9,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
## [10,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
## [11,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
## [12,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.007426314
## [13,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
## [14,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000
##      [,467]      [,468]      [,469]      [,470]      [,471]      [,472]
## [1,] 0.00000000 0.021908504 0.00000000 0.00000000 0.02819587 0.00000000
## [2,] 0.01570913 0.007120264 0.00000000 0.00000000 0.00000000 0.01834007
## [3,] 0.00000000 0.000000000 0.00000000 0.2673732 0.00000000 0.00000000
## [4,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.05258041
## [8,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.056491350 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.000000000 0.02224084 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.066887328 0.00000000 0.00000000 0.06872744 0.06688733
##      [,473]      [,474]      [,475]      [,476]      [,477]      [,478]

```

```

## [1,] 0.01879725 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.02001675 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.1421574 0.00000000 0.05331583 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.02965445 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.02499180 0.00000000 0.00000000 0.00000000 0.00000000 0.02729557
##      [,479]      [,480]      [,481]      [,482]      [,483]      [,484]
## [1,] 0.01986713 0.009933567 0.00000000 0.000000000 0.01517632 0.00000000
## [2,] 0.00000000 0.020397677 0.01956434 0.007148841 0.01268306 0.00000000
## [3,] 0.00000000 0.000000000 0.27264552 0.000000000 0.00000000 0.00000000
## [4,] 0.00000000 0.000000000 0.00000000 0.000000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.01139455 0.000000000 0.00000000 0.00000000
## [6,] 0.23385423 0.000000000 0.04198718 0.000000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.00000000 0.000000000 0.00000000 0.00000000
## [8,] 0.00000000 0.000000000 0.00000000 0.000000000 0.00000000 0.00000000
## [9,] 0.00000000 0.000000000 0.03578452 0.000000000 0.00000000 0.00000000
## [10,] 0.00000000 0.000000000 0.04009192 0.000000000 0.04384269 0.00000000
## [11,] 0.00000000 0.096852280 0.00000000 0.000000000 0.00000000 0.05672741
## [12,] 0.01147879 0.035219011 0.03462484 0.000000000 0.00000000 0.00000000
## [13,] 0.00000000 0.000000000 0.00000000 0.000000000 0.00000000 0.00000000
## [14,] 0.00000000 0.048426140 0.00000000 0.000000000 0.07213493 0.00000000
##      [,485]      [,486]      [,487]      [,488]      [,489]      [,490]
## [1,] 0.13433239 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.01018184 0.01388865 0.009098525 0.009098525
## [3,] 0.03162523 0.00000000 0.03927282 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.15073204 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.19399669 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.01522546 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.01937046 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,491]      [,492]      [,493]      [,494]      [,495]      [,496]
## [1,] 0.02053 0.03525581 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000 0.01116052 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.00000 0.00000000 0.06077927 0.00000000 0.00000000 0.00000000
## [4,] 0.00000 0.01718721 0.01450414 0.00000000 0.00000000 0.00000000
## [5,] 0.00000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000 0.00000000 0.04254549 0.00000000 0.00000000 0.00000000
## [7,] 0.00000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000 0.00000000 0.00000000 0.08700262 0.00000000 0.00000000
## [9,] 0.00000 0.00000000 0.00000000 0.05338797 0.00000000 0.04367292

```

```

## [10,] 0.00000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [11,] 0.00000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [12,] 0.00000 0.02444403 0.13394973 0.00000000 0.0254181 0.00000000
## [13,] 0.00000 0.02749953 0.00000000 0.00000000 0.0000000 0.00000000
## [14,] 0.00000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
##      [,497]      [,498]      [,499]      [,500]      [,501]      [,502]
## [1,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.009515912 0.00000000 0.00000000 0.01018184
## [3,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.044768039 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.05498195
## [6,] 0.00000000 0.09135275 0.000000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [11,] 0.05672741 0.00000000 0.000000000 0.1649458 0.0000000 0.00000000
## [12,] 0.00000000 0.02537576 0.000000000 0.00000000 0.0254181 0.00000000
## [13,] 0.00000000 0.00000000 0.000000000 0.00000000 0.0000000 0.00000000
## [14,] 0.00000000 0.00000000 0.000000000 0.0000000 0.0000000 0.00000000
##      [,503]      [,504]      [,505]      [,506]      [,507]      [,508]
## [1,] 0.000000000 0.00000000 0.01476527 0.00000000 0.01879725 0.00000000
## [2,] 0.005887281 0.01112042 0.05620066 0.01018184 0.00000000 0.00000000
## [3,] 0.000000000 0.00000000 0.01980421 0.00000000 0.03141826 0.09256501
## [4,] 0.000000000 0.00000000 0.05308940 0.02290915 0.00000000 0.00000000
## [5,] 0.000000000 0.00000000 0.07278045 0.00000000 0.00000000 0.00000000
## [6,] 0.000000000 0.00000000 0.01848392 0.00000000 0.00000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.000000000 0.00000000 0.07380734 0.00000000 0.00000000 0.00000000
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.000000000 0.00000000 0.01925409 0.00000000 0.00000000 0.00000000
## [11,] 0.000000000 0.00000000 0.10414134 0.00000000 0.00000000 0.00000000
## [12,] 0.000000000 0.00000000 0.05678984 0.00000000 0.00000000 0.03999723
## [13,] 0.000000000 0.00000000 0.01540327 0.00000000 0.00000000 0.00000000
## [14,] 0.000000000 0.00000000 0.04583786 0.00000000 0.00000000 0.00000000
##      [,509]      [,510]      [,511]      [,512]      [,513]      [,514]
## [1,] 0.00000000 0.04229381 0.01253085 0.00000000 0.0000000 0.00000000
## [2,] 0.00000000 0.00000000 0.02332447 0.00000000 0.0000000 0.01251047
## [3,] 0.04902062 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [4,] 0.00000000 0.00000000 0.01527197 0.04790094 0.3002513 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [6,] 0.00000000 0.00000000 0.03554205 0.00000000 0.0000000 0.00000000
## [7,] 0.00000000 0.00000000 0.09523446 0.00000000 0.0000000 0.00000000
## [8,] 0.00000000 0.00000000 0.05158533 0.00000000 0.0000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000
##      [,515]      [,516]      [,517]      [,518]      [,519]      [,520]
## [1,] 0.04229381 0.01879725 0.02190850 0.00000000 0.0000000 0.00000000
## [2,] 0.00000000 0.00000000 0.01649658 0.00000000 0.0000000 0.00000000
## [3,] 0.00000000 0.00000000 0.02441233 0.00000000 0.0000000 0.00000000

```

```

## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.02208938
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [8,] 0.00000000 0.06109105 0.03164562 0.08145474 0.000000 0.00000000
## [9,] 0.00000000 0.00000000 0.04438606 0.00000000 0.000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.132364 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000 0.07608563
##      [,521]      [,522]      [,523]      [,524]      [,525]      [,526]
## [1,] 0.00000000 0.077185346 0.00000000 0.00000000 0.0153975 0.00000000
## [2,] 0.008577335 0.005085903 0.02181823 0.00000000 0.0000000 0.00000000
## [3,] 0.000000000 0.000000000 0.00000000 0.15702842 0.0000000 0.00000000
## [4,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [5,] 0.000000000 0.068354534 0.00000000 0.00000000 0.0000000 0.00000000
## [6,] 0.000000000 0.000000000 0.00000000 0.05918763 0.0000000 0.08639401
## [7,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [8,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [9,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [10,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [11,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [12,] 0.053543364 0.000000000 0.00000000 0.00000000 0.0000000 0.03599750
## [13,] 0.000000000 0.000000000 0.00000000 0.00000000 0.0000000 0.00000000
## [14,] 0.000000000 0.026700990 0.00000000 0.00000000 0.0000000 0.00000000
##      [,527]      [,528]      [,529]      [,530]      [,531]      [,532]
## [1,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [2,] 0.005887281 0.01527752 0.00000000 0.02699813 0.008220505 0.01429768
## [3,] 0.000000000 0.00000000 0.06862887 0.00000000 0.000000000 0.00000000
## [4,] 0.000000000 0.03593689 0.00000000 0.03037289 0.000000000 0.00000000
## [5,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [6,] 0.000000000 0.04399925 0.00000000 0.03702600 0.000000000 0.00000000
## [7,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [8,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [9,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [10,] 0.000000000 0.00000000 0.00000000 0.00000000 0.043842692 0.00000000
## [11,] 0.000000000 0.00000000 0.00000000 0.00000000 0.182025464 0.00000000
## [12,] 0.000000000 0.02444403 0.00000000 0.00000000 0.006576404 0.00000000
## [13,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
## [14,] 0.000000000 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000
##      [,533]      [,534]      [,535]      [,536]      [,537]      [,538]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.008181825 0.000000000
## [2,] 0.0222546 0.00000000 0.01251047 0.00000000 0.000000000 0.008564321
## [3,] 0.00000000 0.04289305 0.00000000 0.00000000 0.000000000 0.000000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.311453458 0.000000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.067948328
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.008595048 0.000000000

```

```

## [13,] 0.0000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000
## [14,] 0.0000000 0.00000000 0.00000000 0.08992537 0.039886394 0.000000000
##      [,539]      [,540]      [,541]      [,542]      [,543]      [,544]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.02729557 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.08797112 0.00000000
## [6,] 0.00000000 0.04887284 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.05236376 0.00000000 0.06672251 0.05236376 0.05719073
## [12,] 0.00000000 0.00000000 0.02965445 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,545]      [,546]      [,547]      [,548]      [,549]      [,550]
## [1,] 0.0000000 0.000000000 0.00000000 0.00000000 0.008355117 0.00000000
## [2,] 0.0000000 0.009163658 0.01000838 0.00000000 0.060964171 0.00000000
## [3,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.03141826
## [4,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [5,] 0.0000000 0.000000000 0.00000000 0.00000000 0.052135929 0.00000000
## [6,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [7,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [8,] 0.1359416 0.000000000 0.00000000 0.00000000 0.036205506 0.00000000
## [9,] 0.0000000 0.000000000 0.00000000 0.00000000 0.066785695 0.06664479
## [10,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [11,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [12,] 0.0000000 0.013575790 0.00000000 0.00000000 0.000000000 0.00000000
## [13,] 0.0000000 0.000000000 0.00000000 0.00000000 0.000000000 0.00000000
## [14,] 0.0000000 0.000000000 0.00000000 0.06872744 0.000000000 0.00000000
##      [,551]      [,552]      [,553]      [,554]      [,555]      [,556]
## [1,] 0.00000000 0.000000000 0.00000000 0.01301348 0.00000000 0.01216235
## [2,] 0.00000000 0.005037836 0.00000000 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.03753141 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.000000000 0.09667156 0.00000000 0.19545013 0.00000000
## [8,] 0.00000000 0.000000000 0.00000000 0.03665463 0.03430934 0.08564321
## [9,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.042821603 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.025375765 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,557]      [,558]      [,559]      [,560]      [,561]      [,562]
## [1,] 0.00000000 0.00000000 0.00000000 0.1990569 0.00000000 0.00000000
## [2,] 0.00000000 0.01000838 0.01000838 0.0000000 0.03374766 0.008340314
## [3,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [4,] 0.07854564 0.00000000 0.00000000 0.0000000 0.06942376 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000

```



```

## [7,] 0.00000000 0.00000000 0.00000000 0.2107257 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.0000000 0.00000000 0.00000000
##      [,563]      [,564]      [,565]      [,566]      [,567]      [,568]
## [1,] 0.04229381 0.00000000 0.00000000 0.02053 0.00000000 0.00000000
## [2,] 0.00000000 0.01112042 0.02749097 0.00000 0.02001675 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.06672251
## [12,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
##      [,569]      [,570]      [,571]      [,572]      [,573]      [,574]
## [1,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.029931
## [2,] 0.00000000 0.01112042 0.00000000 0.009515912 0.00000000 0.000000
## [3,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [4,] 0.00000000 0.00000000 0.00000000 0.044768039 0.00000000 0.000000
## [5,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [6,] 0.00000000 0.00000000 0.00000000 0.000000000 0.05481165 0.000000
## [7,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [8,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [9,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [10,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [11,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [12,] 0.00000000 0.00000000 0.01186178 0.000000000 0.01691718 0.000000
## [13,] 0.04003351 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
## [14,] 0.00000000 0.00000000 0.00000000 0.000000000 0.00000000 0.000000
##      [,575]      [,576]      [,577]      [,578]      [,579]      [,580]
## [1,] 0.00000000 0.03994415 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.01000838 0.005887281 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.01186178 0.00000000 0.01186178 0.00000000 0.00000000 0.04671448
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,581]      [,582]      [,583]      [,584]      [,585]      [,586]

```

```

## [1,] 0.07698643 0.00000000 0.00000000 0.00000000 0.01421308 0.00000000
## [2,] 0.01146508 0.01429768 0.00000000 0.00000000 0.00000000 0.01112042
## [3,] 0.04521994 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.04649116 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.12031368 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.04448168 0.00000000 0.00000000 0.00000000
## [12,] 0.01930960 0.00000000 0.00000000 0.13468906 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.03666604 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,587]      [,588]      [,589]      [,590]      [,591]      [,592]
## [1,] 0.00000000 0.02896405 0.00000000 0.09211753 0.00000000 0.00000000
## [2,] 0.00000000 0.01934960 0.02327278 0.00000000 0.01251047 0.008564321
## [3,] 0.169486902 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.023357238
## [5,] 0.00000000 0.06936129 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.113490125 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.008148009 0.06879857 0.00000000 0.00000000 0.00000000 0.010150306
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,593]      [,594]      [,595]      [,596]      [,597]      [,598]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.01756784
## [2,] 0.01112042 0.01251047 0.005887281 0.00000000 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.02528432 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.07027135
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.02729557 0.00000000 0.00000000
##      [,599]      [,600]      [,601]      [,602]      [,603]      [,604]
## [1,] 0.00000000 0.00000000 0.013593463 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.01112042 0.008999376 0.008340314 0.00000000 0.01270531
## [3,] 0.1021093 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.02335724
## [5,] 0.00000000 0.00000000 0.020461738 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000

```

```

## [10,] 0.0000000 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000
## [11,] 0.0000000 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000
## [12,] 0.0000000 0.00000000 0.000000000 0.000000000 0.04363647 0.00000000
## [13,] 0.0000000 0.00000000 0.032397753 0.000000000 0.00000000 0.00000000
## [14,] 0.0000000 0.00000000 0.000000000 0.000000000 0.00000000 0.00000000
##      [,605]      [,606]      [,607]      [,608]      [,609]      [,610]
## [1,] 0.00000000 0.00000000 0.000000000 0.00000000 0.04511339 0.0000000
## [2,] 0.00000000 0.00000000 0.000000000 0.01527276 0.00000000 0.023562
## [3,] 0.04902062 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [4,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [5,] 0.00000000 0.4279491 0.000000000 0.00000000 0.00000000 0.0000000
## [6,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [7,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [8,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [9,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [10,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [11,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
## [12,] 0.00000000 0.00000000 0.008896335 0.01086063 0.00000000 0.028798
## [13,] 0.00000000 0.2331635 0.000000000 0.00000000 0.00000000 0.0000000
## [14,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.0000000
##      [,611]      [,612]      [,613]      [,614]      [,615]      [,616]
## [1,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [2,] 0.00000000 0.01018184 0.01668063 0.01018184 0.00000000 0.00000000
## [3,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.000000000 0.02290915 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.06238988
## [10,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [12,] 0.01186178 0.00000000 0.000000000 0.00000000 0.01617516 0.00000000
## [13,] 0.00000000 0.00000000 0.000000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.03436372 0.000000000 0.00000000 0.00000000 0.00000000
##      [,617]      [,618]      [,619]      [,620]      [,621]      [,622]
## [1,] 0.00000000 0.000000000 0.03738202 0.00000000 0.000000000 0.000000000
## [2,] 0.01527276 0.007636382 0.01822374 0.01429768 0.008999376 0.005090658
## [3,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [4,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [5,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [6,] 0.00000000 0.000000000 0.00000000 0.00000000 0.064795505 0.000000000
## [7,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [8,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [9,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.479731086
## [10,] 0.05430316 0.000000000 0.06171000 0.00000000 0.000000000 0.000000000
## [11,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [12,] 0.00000000 0.014809953 0.00000000 0.00000000 0.000000000 0.000000000
## [13,] 0.00000000 0.000000000 0.00000000 0.00000000 0.000000000 0.000000000
## [14,] 0.00000000 0.000000000 0.00000000 0.00000000 0.030372893 0.000000000
##      [,623]      [,624]      [,625]      [,626]      [,627]      [,628]
## [1,] 0.00000000 0.00000000 0.00000000 0.03413016 0.02136116 0.00000000
## [2,] 0.01112042 0.01000838 0.00000000 0.01331076 0.00000000 0.0238940
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000

```

```

## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.05864741 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.1225334
## [9,] 0.00000000 0.00000000 0.00000000 0.05280303 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.06252025 0.07608563 0.00000000
##      [,629]      [,630]      [,631]      [,632]      [,633]      [,634]
## [1,] 0.00000000 0.00000000 0.00000000 0.02375262 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.00000000 0.02502094 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.02105346 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.05236376 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.0593089 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.02819587 0.00000000 0.05146401 0.00000000 0.18318145
## [12,] 0.00000000 0.00000000 0.00000000 0.02058560 0.00000000 0.05587234
## [13,] 0.00000000 0.00000000 0.3748592 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,635]      [,636]      [,637]      [,638]      [,639]      [,640]
## [1,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.01112042 0.01668063 0.00000000 0.00000000 0.01309094 0.01112042
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.03141826 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.04790094 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.04448168 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
##      [,641]      [,642]      [,643]      [,644]      [,645]      [,646]
## [1,] 0.00000000 0.00000000 0.00000000 0.05119524 0.05558105 0.00000000
## [2,] 0.00000000 0.00000000 0.00000000 0.00000000 0.03421091 0.01145457
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.05406208 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.02913330 0.00000000
## [5,] 0.00000000 0.08006702 0.00000000 0.00000000 0.01856828 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.07008430 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.08651215 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000000 0.04015247 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000000 0.04715241 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.04080497 0.00000000
## [12,] 0.01186178 0.00000000 0.01186178 0.00000000 0.02842304 0.01086063

```

```

## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.03919970 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.16235097 0.07547148 0.00000000
##      [,647]      [,648]      [,649]      [,650]      [,651]      [,652]
## [1,] 0.00000000 0.00000000 0.00000000 0.02053 0.00000000 0.01246067
## [2,] 0.00000000 0.00000000 0.03639836 0.00000 0.01145457 0.00000000
## [3,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [4,] 0.00000000 0.04476804 0.00000000 0.00000 0.00000000 0.09326626
## [5,] 0.05498195 0.00000000 0.00000000 0.00000 0.07330927 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [9,] 0.00000000 0.06228597 0.00000000 0.00000 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [13,] 0.03665463 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.00000 0.00000000 0.00000000
##      [,653]      [,654]      [,655]      [,656]      [,657]      [,658]
## [1,] 0.00000000 0.04253514 0.00000000 0.00000000 0.00000000 0.00000000
## [2,] 0.01427387 0.00000000 0.005887281 0.00000000 0.02001675 0.00000000
## [3,] 0.00000000 0.02659996 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.09821634
## [6,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [7,] 0.00000000 0.05729223 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.00000000 0.04827401 0.00000000 0.00000000 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [10,] 0.05075153 0.00000000 0.00000000 0.06981835 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.01810105 0.00000000 0.03599750
## [13,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [14,] 0.00000000 0.20262741 0.00000000 0.00000000 0.00000000 0.00000000
##      [,659]      [,660]      [,661]      [,662]      [,663]      [,664]
## [1,] 0.00000000 0.00000000 0.00000000 0.01567185 0.00000000 0.00000000
## [2,] 0.00000000 0.00000000 0.01251047 0.01426579 0.01251047 0.009163658
## [3,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.022909146
## [5,] 0.00000000 0.00000000 0.00000000 0.12626151 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000 0.00000000 0.03056011 0.00000000 0.00000000
## [7,] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000
## [8,] 0.09309113 0.05719073 0.00000000 0.06063514 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000 0.00000000 0.03750559 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000 0.00000000 0.03395568 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000 0.00000000 0.08731460 0.00000000 0.00000000
## [12,] 0.00000000 0.00000000 0.00000000 0.03131468 0.00000000 0.00000000
## [13,] 0.00000000 0.00000000 0.00000000 0.21799545 0.00000000 0.00000000
## [14,] 0.00000000 0.00000000 0.00000000 0.02315160 0.00000000 0.00000000
##      [,665]      [,666]
## [1,] 0.00000000 0.01756784
## [2,] 0.00000000 0.01070540
## [3,] 0.00000000 0.00000000
## [4,] 0.00000000 0.00000000
## [5,] 0.00000000 0.00000000
## [6,] 0.00000000 0.00000000

```

```
## [7,] 0.00000000 0.00000000
## [8,] 0.00000000 0.00000000
## [9,] 0.00000000 0.00000000
## [10,] 0.00000000 0.00000000
## [11,] 0.00000000 0.00000000
## [12,] 0.00000000 0.02537576
## [13,] 0.00000000 0.00000000
## [14,] 0.02729557 0.00000000
##
## Cluster size:
## [1] 26 48 14 16 10 15 13 12 11 9 12 27 15 16
##
## Within-cluster sum of squares:
## [1] 59.63401 105.32237 28.99900 82.42294 28.31112 30.86420 24.20945
## [8] 21.79380 34.80995 28.80422 29.61511 47.63987 44.32458 29.51425
table(result_sclust)

## result_sclust
## 1 2 3 4 5 6 7 8 9 10 11 12 13 14
## 26 48 14 16 10 15 13 12 11 9 12 27 15 16
```

Our K-way clustering with QR decomposition

```
source("lib/SpectralClustering.R")
## compute cosine similarities matrix
docsdissim <- cosSparse(t(dtm_train_tfidf))
## apply K-WAY SPECTRAL CLUSTERING
k <- length(unique(AKumar$AuthorID))
result_sQRclust <- specClusteringQR(as.matrix(docsdissim), k)
```

We can also using hierarchical clustering method under the cosine distance. The intention of using a different clustering method is just to let you know how to compare performance between various methods.

```
start.time <- Sys.time()
docsdissim <- cosSparse(t(dtm_train_tfidf))
rownames(docsdissim) <- c(1:nrow(dtm_train_tfidf))
colnames(docsdissim) <- c(1:nrow(dtm_train_tfidf))
#compute pairwise cosine similarities using cosSparse function in package qlcMatrix
h <- hclust(as.dist(docsdissim), method = "ward.D")
result_hclust <- cutree(h,length(unique(AKumar$AuthorID)))
end.time <- Sys.time()
time_hclust <- end.time - start.time
table(result_hclust)

## result_hclust
## 1 2 3 4 5 6 7 8 9 10 11 12 13 14
## 44 29 39 22 18 16 16 12 13 7 6 8 5 9
```

Step 4: Evaluation

To evaluate the performance of the method, it is required to calculate the degree of agreement between a set of system-output partitions and a set of true partitions. In general, the agreement between two partitions is measured for a pair of entities within partitions. The basic unit for which pair-wise agreement is assessed is a

pair of entities (authors in our case) which belongs to one of the four cells in the following table (Kang et al.(2009)):

Matching matrix for the agreement between two sets of clusters

		Gold standard clusters (G)	
		Match	Mismatch
Machine-generated clusters (M)	Match	a	b
	Mismatch	c	d

Let M be the set of machine-generated clusters, and G the set of gold standard clusters. Then, in the table, for example, a is the number of pairs of entities that are assigned to the same cluster in each of M and G . Hence, a and d are interpreted as agreements, and b and c disagreements. When the table is considered as a confusion matrix for a two-class prediction problem, the standard “Precision”, “Recall”, “F1”, and “Accuracy” are defined as follows.

$$\begin{aligned}\text{Precision} &= \frac{a}{a+b} \\ \text{Recall} &= \frac{a}{a+c} \\ \text{F1} &= \frac{2 \times \text{Precision} \times \text{Recall}}{\text{Precision} + \text{Recall}} \\ \text{Accuracy} &= \frac{a+d}{a+b+c+d}\end{aligned}$$

```
source('lib/evaluation_measures.R')
matching_matrix_hclust <- matching_matrix(AKumar$AuthorID,result_hclust)
performance_hclust <- performance_statistics(matching_matrix_hclust)
matching_matrix_sclust <- matching_matrix(AKumar$AuthorID,result_sclust)
performance_sclust <- performance_statistics(matching_matrix_sclust)
# our result (awful for now -> accuracy of 38%)
matching_matrix_sQRclust <- matching_matrix(AKumar$AuthorID,result_sQRclust)
performance_sQRclust <- performance_statistics(matching_matrix_sQRclust)
performance_sQRclust

## $precision
## [1] 0.2258346
##
## $recall
## [1] 0.7765689
##
## $f1
## [1] 0.3499112
##
## $mcc
## [1] 0.04844667
##
## $accuracy
## [1] 0.382716

compare_df <- data.frame(method=c("sClust","hClust"),
                          precision=c(performance_sclust$precision, performance_hclust$precision),
                          recall=c(performance_sclust$recall, performance_hclust$recall),
                          f1=c(performance_sclust$f1, performance_hclust$f1),
                          accuracy=c(performance_sclust$accuracy, performance_hclust$accuracy),
```

```

time=c(time_sclust,time_hclust))
kable(compare_df,caption="Comparision of performance for two clustering methods",digits = 2)

```

Table 2: Comparision of performance for two clustering methods

method	precision	recall	f1	accuracy	time
sClust	0.34	0.14	0.20	0.76	0.73319197 secs
hClust	0.20	0.09	0.12	0.73	0.01806307 secs