

# Project

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## Image Processing, Wordclouds and Network Graphs

In this section, we show the R code and its corresponding output for image processing, word clouds, and network graphs.

### Image Processing

The following is the R code for image processing using the ‘magick’ library. It scales and annotates an image.

```
1 library(magick)
2 image <- image_read("C:/Users/user/Pictures/masoumeh.jpg")
3 print(image)
4 image_scale(image, "600")
5 image_scale(image, "x600")
6 image <- image_scale(image, "x600")
7 image <- image_modulate(image, brightness = 100, saturation = 90,
8   hue = 100)
9 image_annotate(image, "Masoumeh", size = 30, color = "brown",
10   boxcolor = "ivory", font = "Forte", strokecolor = "black",
11   degrees = 0, location = "+300+0")
```

Here is the output image after processing:



Figure 1: Processed Image: Masoumeh

## Wordcloud Examples

Below is the R code used to generate word clouds from text data.

```

1 library("tm")
2 library("SnowballC")
3 library("wordcloud")
4 library("RColorBrewer")
5 library("wordcloud2")
6
7 text <- readLines(file.choose())
8 docs <- Corpus(VectorSource(text))
9 docs <- tm_map(docs, content_transformer(tolower))
10 docs <- tm_map(docs, removePunctuation)
11 toSpace <- content_transformer(function(x, pattern) gsub(pattern, "
    ", x))
12 docs <- tm_map(docs, toSpace, "/" )
13 docs <- tm_map(docs, removeNumbers)
14 docs <- tm_map(docs, removeWords, c("and", "the", "these", "over",
    "have", "also", "one", "are", "for", "that", "can", "all", "
    with", "has", "froms", "from"))
15
16 dtm <- TermDocumentMatrix(docs)
17 m <- as.matrix(dtm)
18 v <- sort(rowSums(m), decreasing = TRUE)
19 d <- data.frame(word = names(v), freq = v)
20
21 set.seed(200)
22 wordcloud(words = d$word, freq = d$freq, min.freq = 1, max.words =
    150, random.order = FALSE, rot.per = 0.5, colors = brewer.pal
    (8, "Dark2"))
23 wordcloud2(data = d, size = 0.7, shape = "star", color = "white",

```



## Network Graph Examples

The following R code is used to create network graphs from the data:

```

1 library(igraph)
2 library("readxl")
3 data <- read_excel("C:/Users/user/Documents/data.xlsx")
4 x <- data.frame(data$Name, data$City)
5 net <- graph.data.frame(x, directed = TRUE)
6 V(net)
7 E(net)
8 V(net)$label <- V(net)$name
9 V(net)$degree <- degree(net)
10
11 hist(V(net)$degree, col = 'blue', main = 'Histogram of Node Degree',
12      , ylab = 'Frequency', xlab = 'Degree of Vertices')
13
14 set.seed(100)
15 plot(net, vertex.color = 'red', vertex.size = 2, edge.arrow.size =
16      0.5, vertex.label.cex = 0.8)
17 plot(net, vertex.color = rainbow(52), vertex.size = V(net)$degree *
18      3, edge.arrow.size = 1, layout = layout_fruchterman_reingold)

```

The following are the network graph outputs generated from the code above:

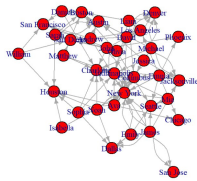


Figure 4: Network Graph Example  
1



Figure 5: Network Graph Example  
2