9595N1: Network Analysis and Infographics

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# Lecture 3 - R code in handouts

This document reproduced the code included in the slides of the third lecture of Network Analysis and Infograohics.

## Preparing the global enviroment

We first clean our global enviroment, so to remove objects that may have been leaft from previous sessions in R.

rm(list=ls())

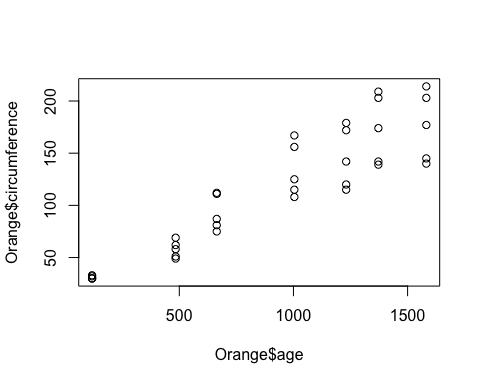
## Variable analysis data: An example

Executing the function data() we can explore the sample of datasets available in R. Orange is of these datasets and it includes information about growth of trees in terms of their circumference. We can recall this dataset and plot age and circumference variable, to seek for evidence of the relationship between these two varible. This would be a simple variable analysis.

data()  
Orange

## Tree age circumference  
## 1 1 118 30  
## 2 1 484 58  
## 3 1 664 87  
## 4 1 1004 115  
## 5 1 1231 120  
## 6 1 1372 142  
## 7 1 1582 145  
## 8 2 118 33  
## 9 2 484 69  
## 10 2 664 111  
## 11 2 1004 156  
## 12 2 1231 172  
## 13 2 1372 203  
## 14 2 1582 203  
## 15 3 118 30  
## 16 3 484 51  
## 17 3 664 75  
## 18 3 1004 108  
## 19 3 1231 115  
## 20 3 1372 139  
## 21 3 1582 140  
## 22 4 118 32  
## 23 4 484 62  
## 24 4 664 112  
## 25 4 1004 167  
## 26 4 1231 179  
## 27 4 1372 209  
## 28 4 1582 214  
## 29 5 118 30  
## 30 5 484 49  
## 31 5 664 81  
## 32 5 1004 125  
## 33 5 1231 142  
## 34 5 1372 174  
## 35 5 1582 177

plot(Orange$age, Orange$circumference)



## Network analysis data: An example

The package igraphdata provides a few examples network data. One of this is the UKfaculty data on personal friendship in a UK faculty. We can load these data as well as the package igraph.

library(igraphdata)  
library(igraph)

##   
## Attaching package: 'igraph'

## The following objects are masked from 'package:stats':  
##   
## decompose, spectrum

## The following object is masked from 'package:base':  
##   
## union

data(UKfaculty)  
UKfaculty

## IGRAPH 6f42903 D-W- 81 817 --   
## + attr: Type (g/c), Date (g/c), Citation (g/c), Author (g/c), Group  
## | (v/n), weight (e/n)  
## + edges from 6f42903:  
## [1] 57->52 76->42 12->69 43->34 28->47 58->51 7->29 40->71 5->37 48->55  
## [11] 6->58 21-> 8 28->69 43->21 67->58 65->42 5->67 52->75 37->64 4->36  
## [21] 12->49 19->46 37-> 9 74->36 62-> 1 15-> 2 72->49 46->62 2->29 40->12  
## [31] 22->29 71->69 4-> 3 37->69 5-> 6 77->13 23->49 52->35 20->14 62->70  
## [41] 34->35 76->72 7->42 37->42 51->80 38->45 62->64 36->53 62->77 17->61  
## [51] 7->68 46->29 44->53 18->58 12->16 72->42 52->32 58->21 38->17 15->51  
## [61] 22-> 7 22->69 5->13 29-> 2 77->12 37->35 18->46 10->71 22->47 20->19  
## + ... omitted several edges

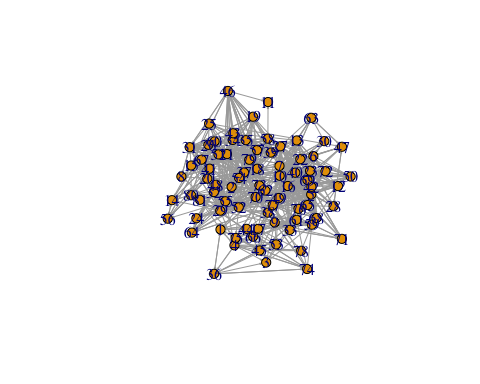
This will allow us to retrieve the adjacency matrix.

A <- get.adjacency(UKfaculty, sparse = F)  
A

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## [80,] 0 0 0 0 0 0 0 0  
## [81,] 1 1 0 0 0 0 0 0

With this comand we plot the network using the Kamada-Kaway layout

ll <- layout\_with\_kk(UKfaculty)  
plot(UKfaculty,  
 layout = ll,  
 vertex.size = 10,  
 edge.arrow.size = 0.1)



library(tidyverse)

## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.0 ──

## ✓ ggplot2 3.2.1 ✓ purrr 0.3.3  
## ✓ tibble 2.1.3 ✓ dplyr 0.8.4  
## ✓ tidyr 1.0.2 ✓ stringr 1.4.0  
## ✓ readr 1.3.1 ✓ forcats 0.4.0

## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## x dplyr::as\_data\_frame() masks tibble::as\_data\_frame(), igraph::as\_data\_frame()  
## x purrr::compose() masks igraph::compose()  
## x tidyr::crossing() masks igraph::crossing()  
## x dplyr::filter() masks stats::filter()  
## x dplyr::groups() masks igraph::groups()  
## x dplyr::lag() masks stats::lag()  
## x purrr::simplify() masks igraph::simplify()

library(readr)  
PR <- read\_csv("proj\_org.csv") %>%  
 separate\_rows(Partners,   
 sep = ";")

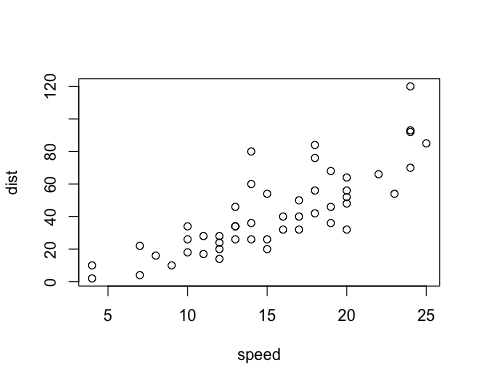
## Parsed with column specification:  
## cols(  
## Project = col\_character(),  
## Partners = col\_character()  
## )

PO <- table(PR$Project,   
 PR$Partners)  
OO <- t(PO)%\*%PO  
PP <- PO%\*%t(PO)

This is an [R Markdown](http://rmarkdown.rstudio.com) Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Cmd+Shift+Enter*.

plot(cars)



Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Cmd+Option+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Cmd+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.