Importing data into R

Dhafer Malouche

http://dhafermalouche.net

Aim of this chapter

Show how can we import data into `R` from several sources:

- Local files (`Rdata`,`csv`, other Statistical Software)
- Web Scraping
- pdf documents
- Social Networks
  - *Twitter*
  - *Facebook*

Local files

R environement, .RData file

```
> load(file="dir_location\\savedfile") # Windows only
> load(file="dir_location/savedfile") # other OS
```

Reading text files

```
> # Windows only
> ds = read.table("dir_location\\file.txt", header=TRUE)
> # all OS (including Windows)
> ds = read.table("dir_location/file.txt", header=TRUE)
```

Example:

```
> file.exists("banques.txt")
```

```
## [1] TRUE
```

```
> d1 = read.table("banques.txt", header=TRUE)
```

Example:

```
> head(d1)
```

```
##   Classe_PV Age_PV Cadre Non_Cadre Diplome Age_Moy Anc_Moy Surface_
## 1         3     29    14        10      10   41,71    5,54    12,75
## 2         3     21     6        14       6    34,2     4,7     11,8
## 3         5     13     3         5       3   31,13    6,63    12,25
## 4         3     18     5         7       4   36,58    5,33    16,42
## 5         4     17     2         5       2   44,86    4,14    27,86
## 6         4     16     3         3       2   40,33       5       40
##   Type_concep Nbr_reclam Age_RPV Anc_RPV Anc_RPV_PV Qualt_client
## 1           A         16      38      21         20         0,37
## 2           A          7      41      28          9         0,53
## 3           A          7      46      66         24         0,49
## 4           A         12      38      28          9         0,69
## 5           A          2      47       7          7         0,44
## 6           A          8      37      66          7          0,4
```

Other ASCII files

```
> file.exists("banques.txt")
```

```
## [1] TRUE
```

```
> d1 = readLines("banques.txt")
> d1[1:3]
```

```
## [1] "Classe_PV\tAge_PV\tCadre\tNon_Cadre\tDiplome\tAge_Moy\tAnc_Moy\tSurface_\tType_concep\tNbr_reclam\tAge_RPV\tAnc_RPV\tAnc_RPV_I
## [2] "3\t29\t14\t10\t10\t41,71\t5,54\t12,75\tA\t16\t38\t21\t20\t0,37"
## [3] "3\t21\t6\t14\t6\t34,2\t4,7\t11,8\tA\t7\t41\t28\t9\t0,53"
```

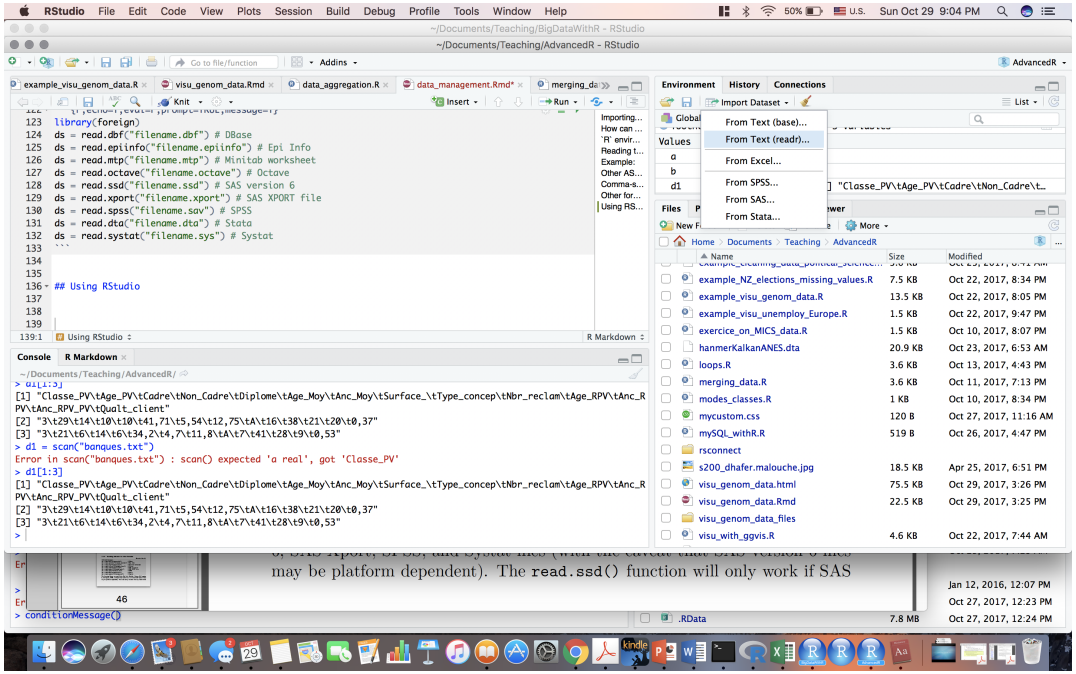
Comma-separated value (CSV)

```
> ds = read.csv("dir_location/file.csv")
```

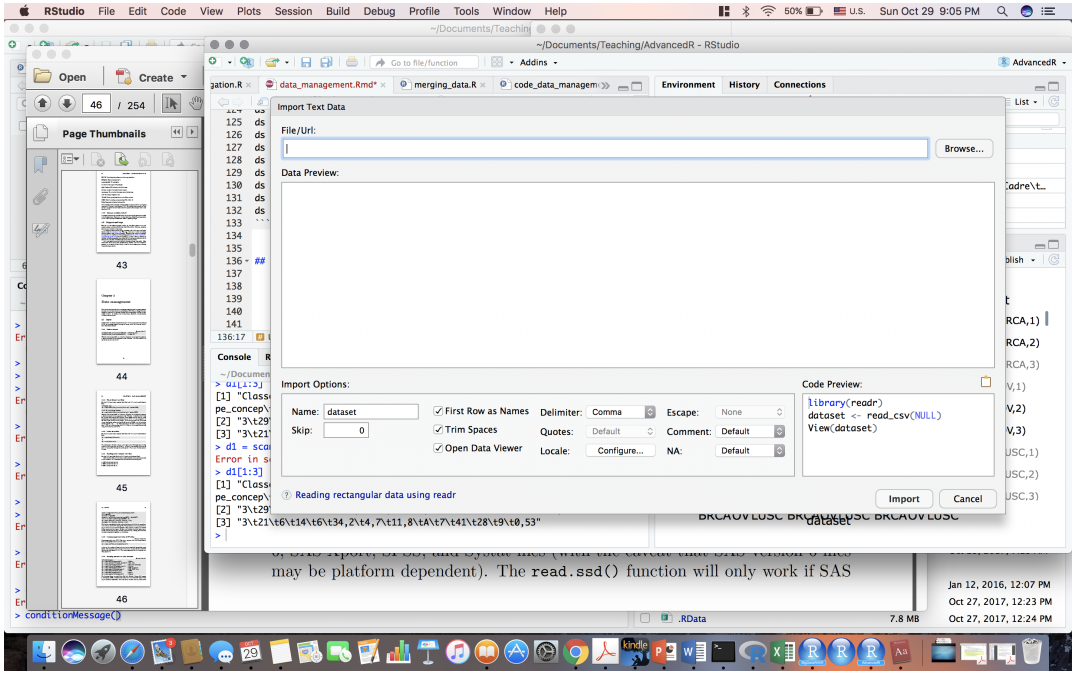
Other formats

```
> library(foreign)
> ds = read.dbf("filename.dbf") # DBase
> ds = read.epiinfo("filename.epiinfo") # Epi Info
> ds = read.mtp("filename.mtp") # Minitab worksheet
> ds = read.octave("filename.octave") # Octave
> ds = read.ssd("filename.ssd") # SAS version 6
> ds = read.xport("filename.xport") # SAS XPORT file
> ds = read.spss("filename.sav") # SPSS
> ds = read.dta("filename.dta") # Stata
> ds = read.systat("filename.sys") # Systat
```

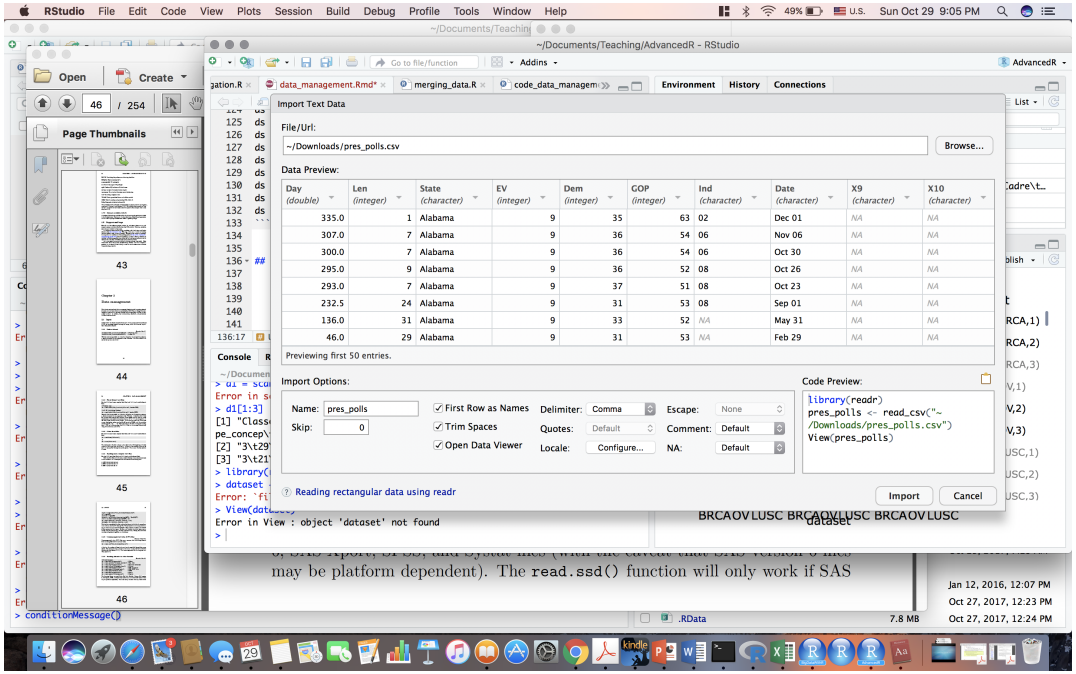
Using RStudio (1/3)



Using RStudio (2/3)



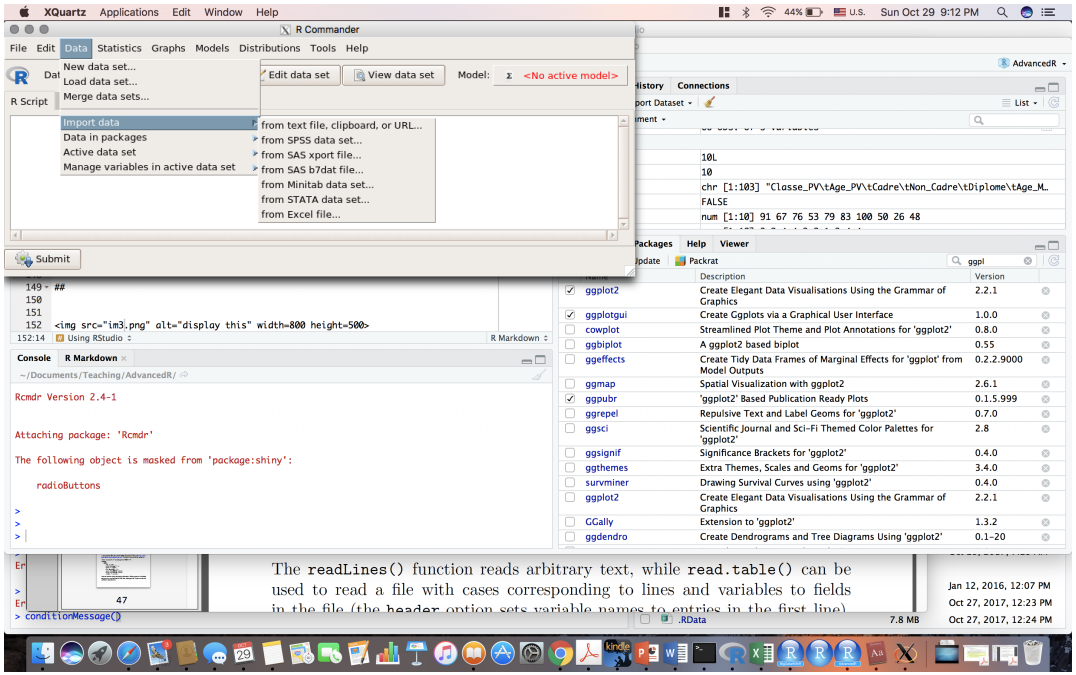
Using RStudio (3/3)



Using `Rcmdr` package (1/2)

```
> install.packages("Rcmdr")
> library(RCmdr)
```

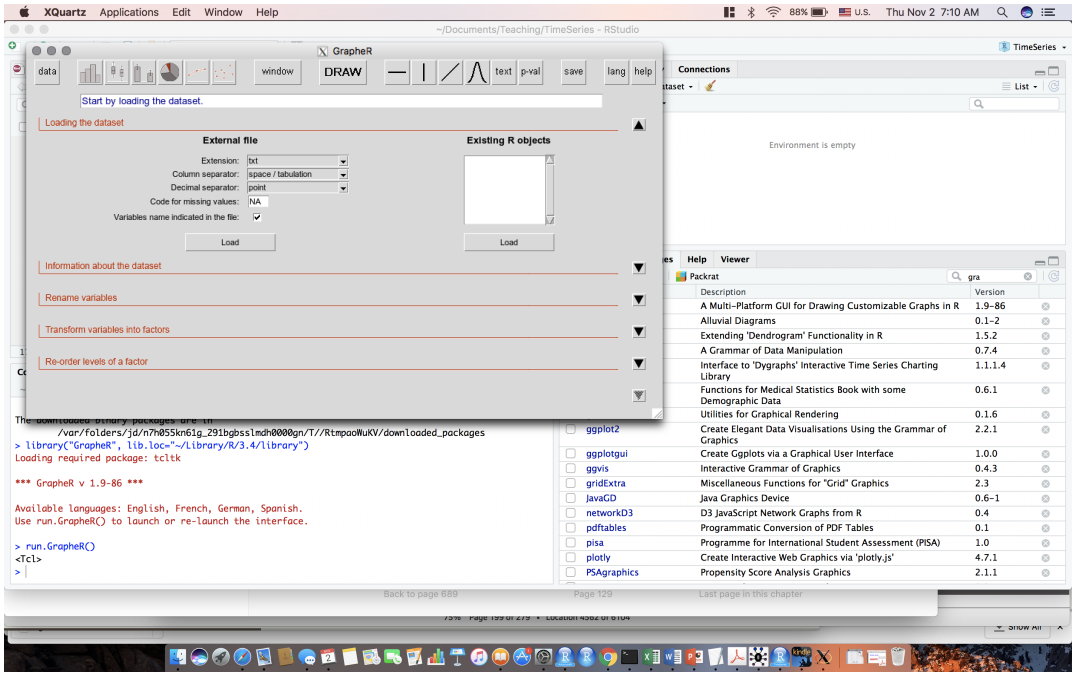
Using `Rcmdr` package (2/2)



Using GrapheR (1/2)

```
> library(GrapheR)
> run.GrapheR()
```

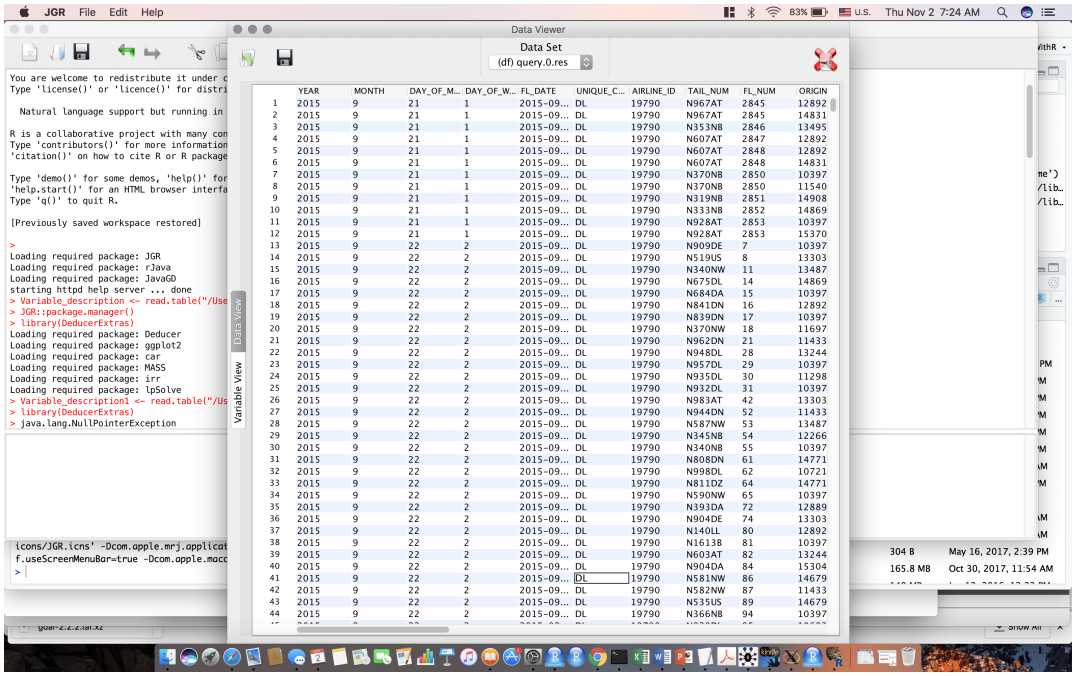
Using GrapheR (2/2)



Using JGR and deducer (1/2)

```
> Sys.setenv(JAVA_HOME = 'JAVA_HOME=/Library/Java/JavaVirtualMachines/1.6.0.jdk/Contents/Home')
> dyn.load("/Library/Java/JavaVirtualMachines/jdk1.8.0_121.jdk/Contents/Home/jre/lib/server/libjvm.dylib")
> library(rJava)
> library(JGR)
> library(Deducer)
> JGR()
```

Using JGR and deducer (2/2)



Web Scraping

From Wikipedia pages (1/2)

https://en.wikipedia.org/wiki/Upper_Peninsula_of_Michigan

WIKIPEDIA

Coordinates: 46°14′00″N 86°21′00″W

Upper Peninsula of Michigan

The **Upper Peninsula** (**the UP**), also known as **Upper Michigan**, is the northern of the two major peninsulas that make up the U.S. state of Michigan. The peninsula is bounded on the north by Lake Superior, on the east by the St. Marys River, on the southeast by Lake Michigan and Lake Huron, and on the southwest by Wisconsin.

The Upper Peninsula contains 29% of the land area of Michigan but just 3% of its total population. Residents are frequently called Yoopers (derived from "U.P.-ers") and have a strong regional identity. Large numbers of French Canadian, Finnish, Swedish, Cornish, and Italian immigrants came to the Upper Peninsula, especially the Keweenaw Peninsula, to work in the area's mines and lumber industry. The peninsula includes the only counties in the United States where a plurality of residents claim Finnish ancestry.[1]

Ordered by size, the peninsula's largest cities are Marquette, Sault Ste. Marie, Escanaba, Menominee, Houghton, and Iron Mountain. The land and climate are not very suitable for agriculture because of the long harsh winters. The economy has been based on logging, mining, and tourism. Most mines have closed since the "golden age" from 1890 to 1920. The land is heavily forested and logging remains a major industry.

Upper Peninsula
Michigan

The Lake of the Clouds in the Porcupine Mountains of the Upper Peninsula of Michigan

Nickname: *The UP, The 906*

Country	United States
State	Michigan
Highest point	
- location	Mount Arvon
- elevation	1,979 ft (603 m)
Area	16,377 sq mi (42,416 km^2)
Population	311,361 (*2010*)
Density	19/sq mi (7/km^2)
Area code	906

Contents

From Wikipedia pages (2/2)

```
> install.packages("htmltab")
```

```
> library(htmltab)
> htmltab("http://en.wikipedia.org/wiki/Upper_Peninsula_of_Michigan",3)
```

```
## Warning in strptime(x, fmt, tz = "GMT"): unknown timezone 'zone/tz/2017c.
## 1.0/zoneinfo/Africa/Tunis'
```

```
##   Year           REP           DEM      Others
## 2 2016  56.40%82,018 37.77% 54,923 5.83% 8,476
## 3 2012  50.80%73,529 47.49% 68,747 1.71% 2,477
## 4 2008 46.12% 69,647  51.82%78,257 2.06% 3,108
## 5 2004  51.52%78,276 47.31% 71,888 1.17% 1,781
## 6 2000  50.61%70,256 45.95% 63,791 3.43% 4,768
```

Using `XML` and `httr` package (1/2)

```
> library(httr)
> library(XML)
> url <- "https://en.wikipedia.org/wiki/Upper_Peninsula_of_Michigan"
> r <- GET(url)
> r
```

```
## Response [https://en.wikipedia.org/wiki/Upper_Peninsula_of_Michigan]
##   Date: 2017-11-15 21:11
##   Status: 200
##   Content-Type: text/html; charset=UTF-8
##   Size: 416 kB
## <!DOCTYPE html>
## <html class="client-nojs" lang="en" dir="ltr">
## <head>
## <meta charset="UTF-8"/>
## <title>Upper Peninsula of Michigan - Wikipedia</title>
## <script>document.documentElement.className = document.documentElement.cl...
## <script>(window.RLQ=window.RLQ||[]).push(function(){mw.config.set({"wgCa...
## mw.user.tokens.set({"editToken":"+\\","patrolToken":"+\\","watchToken":"...
##
## });mw.loader.load(["ext.cite.a11y","site","mediawiki.page.startup","medi...
## ...
```

Using `XML` and `httr` package (2/2)

```
> doc <- readHTMLTable(
+   doc=content(r, "text"))
> doc[6]
```

```
## $`Upper Peninsula land area and population density by county[6]`
##         County Population Land area (sq mi) Land area (km²)
## 1        Alger      9,601               915           2,370
## 2       Baraga      8,860               898           2,330
## 3     Chippewa     38,520             1,558           4,040
## 4        Delta     37,069             1,171           3,030
## 5    Dickinson     26,168               761           1,970
## 6      Gogebic     16,427             1,101           2,850
## 7     Houghton     36,628             1,009           2,610
## 8         Iron     11,817             1,166           3,020
## 9     Keweenaw      2,156               540           1,400
## 10       Luce      6,631               899           2,330
## 11    Mackinac     11,113             1,021           2,640
## 12   Marquette     67,077             1,808           4,680
## 13   Menominee     24,029             1,044           2,700
## 14   Ontonagon      6,780             1,311           3,400
## 15 Schoolcraft      8,485             1,171           3,030
## 16       Total    311,361            16,377          42,420
##    Population density\n(per sq mi) Population density\n(per km²)
## 1                              10.5                            4.1
## 2                               9.8                            3.8
## 3                              24.7                            9.5
## 4                              31.6                           12.2
## 5                              34.4                           13.3
## 6                              14.9                            5.8
## 7                              36.3                           14.0
## 8                              10.1                            3.9
## 9                               4.0                            1.5
## 10                              7.3                            2.8
## 11                             10.8                            4.2
## 12                             37.1                           14.3
## 13                             23.0                            8.9
## 14                              5.1                            2.0
## 15                              7.2                            2.8
## 16                             19.0                            7.3
```

Data available in the web?

- from `R` packages
- Available in web pages

From R packages

Example: `WDI` package

Search, extract and format data from the World Bank's World Development Indicators

https://data.worldbank.org/data-catalog/world-development-indicators

or

https://www.indexmundi.com/facts/indicators

Exemple: Create a data about R&D in the world (1/5)

```
> library(WDI)
> # Collecting the available indicators
> ind_data=rbind.data.frame(WDIsearch("research"),
+                           WDIsearch("technology"),
+                           WDIsearch("technical")
+                           ,WDIsearch("scientific"))
> # Collecting the data from 1960 to 2016.
> all_data=WDI(indicator = ind_data$indicator,start = 1960,end = 2016)
```

Exemple: Create a data about R&D in the world (2/5)

The indicator data

Show 5 entries Search:

indicator	name
GB.XPD.RSDV.GD.ZS	Research and development expenditure (% of GDP)
SP.POP.SCIE.RD.P6	Researchers in RD (per million people)
IC.FRM.TECH.ZS	Firms using technology licensed from foreign companies (% of firms)
IE.ICT.PCAP.CD	Information and communication technology expenditure per capita (current US$)
IE.ICT.TOTL.CD	Information and communication technology expenditure (current US$)

Showing 1 to 5 of 24 entries Previous 1 2 3 4 5 Next

Exemple: Create a data about R&D in the world (3/5)

The research data (after reshaping it and from 2010 to 2014)

```
> library(reshape)
> i=which(all_data$year>=2010 & all_data$year<=2014)
> x=melt(all_data[i,],id.vars = colnames(all_data)[1:3])
> colnames(x)[4]="indicator"
> datatable(x,options = list(pageLength = 5), rownames = FALSE)
```

Exemple: Create a data about R&D in the world (4/5)

Show 5 entries Search:

iso2c	country	year	indicator	value
AD	Andorra	2010	IP.JRN.ARTC.SC	1.2
AD	Andorra	2011	IP.JRN.ARTC.SC	1
AD	Andorra	2012	IP.JRN.ARTC.SC	3.9
AD	Andorra	2013	IP.JRN.ARTC.SC	5.9
AD	Andorra	2014	IP.JRN.ARTC.SC	

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Exemple: Create a data about R&D in the world (5/5)

I have also created a Shiny App to better explore this data

https://dhafer.shinyapps.io/Research_Indicators/

`pisa` package

Data from Programme of International Student Assessment (PISA).

Installation of `pisa` package

```
> require(devtools)
> install_github('pisa', 'jbryer',force=T)
```

Some available data (1/3)

School results from the 2009 Programme of International Student Assessment (PISA) as provided by the Organization for Economic Co-operation and Development (OECD).

See http://www.pisa.oecd.org/ for more information including the code book.

Some available data (2/3)

```
> library(pisa)
> data(pisa.school)
> head(pisa.school)
```

```
##       CNT COUNTRY     OECD SUBNATIO SCHOOLID SC01Q01 SC01Q02 SC01Q03
## 1 Albania Albania Non-OECD  Albania    00001      No      No      No
## 2 Albania Albania Non-OECD  Albania    00002     Yes     Yes     Yes
## 3 Albania Albania Non-OECD  Albania    00003     Yes     Yes     Yes
## 4 Albania Albania Non-OECD  Albania    00004      No      No      No
## 5 Albania Albania Non-OECD  Albania    00005     Yes     Yes     Yes
## 6 Albania Albania Non-OECD  Albania    00006     Yes     Yes     Yes
##   SC01Q04 SC01Q05 SC01Q06 SC01Q07 SC01Q08 SC01Q09 SC01Q10 SC01Q11 SC01Q12
## 1      No      No      No      No      No      No     Yes     Yes     Yes
## 2     Yes     Yes     Yes     Yes     Yes     Yes      No      No      No
## 3     Yes     Yes     Yes     Yes     Yes     Yes     Yes     Yes     Yes
## 4      No      No      No      No      No      No     Yes     Yes     Yes
## 5     Yes     Yes     Yes     Yes     Yes     Yes      No      No      No
## 6     Yes     Yes     Yes     Yes     Yes     Yes      No      No      No
##   SC01Q13 SC01Q14 SC02Q01 SC03Q01 SC03Q02 SC03Q03 SC03Q04 SC04Q01
## 1    <NA>    <NA>  Public      60      40       0       0    Town
## 2    <NA>    <NA>  Public      90      10       0       0 Village
## 3    <NA>    <NA>  Public     100       0       0       0    Town
## 4    <NA>    <NA>  Public      90      10       0       0 Village
## 5    <NA>    <NA>  Public      95       5       0       0    Town
## 6    <NA>    <NA>  Public      99       0       0       1    City
##               SC05Q01 SC06Q01 SC06Q02 SC07Q01 SC07Q02 SC08Q01 SC09Q11
## 1 Two or More Schools     285     316    <NA>    <NA>    None      NA
## 2 Two or More Schools      93     118    <NA>    <NA>    None      10
## 3 Two or More Schools     475     581    <NA>    <NA>    None      47
## 4           One Other     121     163    <NA>    <NA>    None      22
## 5 Two or More Schools     219     187    <NA>    <NA>    None      26
## 6 Two or More Schools     530     472    <NA>    <NA>    None      44
##   SC09Q12 SC09Q21 SC09Q22 SC09Q31 SC09Q32 SC10Q01 SC10Q02 SC10Q03
## 1       2      NA       0      NA       0     212      30       0
## 2       0      10       0      10       0      25       0       0
## 3       2      47       2      41       2      79      15       1
## 4       0      22       0      22       0      87      15       1
## 5       0      26       0      21       0      56       8       1
## 6       5      44       5      36       5     123      18      18
##       SC11Q01     SC11Q02    SC11Q03     SC11Q04     SC11Q05
## 1  Not at all  Not at all Not at all Very little       A lot
## 2 Very little Very little Not at all Very little Very little
## 3  Not at all  Not at all Not at all  Not at all Very little
## 4  Not at all  Not at all Not at all Very little  Not at all
## 5  Not at all Very little Not at all  Not at all  Not at all
## 6  Not at all  Not at all Not at all Very little  Not at all
```

```
##          SC11Q06        SC11Q07     SC11Q08        SC11Q09     SC11Q10
## 1 To some extent To some extent Very little    Very little       A lot
## 2     Not at all          A lot Very little          A lot       A lot
## 3     Not at all    Very little  Not at all    Very little       A lot
## 4    Very little          A lot Very little To some extent Very little
## 5     Not at all To some extent Very little To some extent       A lot
## 6    Very little To some extent  Not at all To some extent  Not at all
##       SC11Q11        SC11Q12        SC11Q13             SC12Q01
## 1  Not at all          A lot     Not at all Not for any subject
## 2       A lot    Very little          A lot    For all subjects
## 3  Not at all    Very little To some extent Not for any subject
## 4 Very little To some extent    Very little   For some subjects
## 5       A lot          A lot          A lot   For some subjects
## 6 Very little To some extent To some extent Not for any subject
##              SC12Q02 SC13Q01 SC13Q02 SC13Q03 SC13Q04 SC13Q05 SC13Q06
## 1 Not for any subject     Yes     Yes      No     Yes      No      No
## 2    For all subjects      No      No      No      No      No      No
## 3   For some subjects      No     Yes      No     Yes     Yes     Yes
## 4 Not for any subject     Yes     Yes     Yes     Yes     Yes     Yes
## 5 Not for any subject     Yes      No     Yes      No     Yes      No
## 6   For some subjects     Yes      No      No     Yes      No      No
##   SC13Q07 SC13Q08 SC13Q09 SC13Q10 SC13Q11 SC13Q12 SC13Q13 SC13Q14 SC14Q01
## 1     Yes     Yes     Yes     Yes      No      No      No     Yes    <NA>
## 2     Yes      No      No     Yes      No      No      No     Yes    <NA>
## 3     Yes     Yes     Yes     Yes      No     Yes      No     Yes    <NA>
## 4     Yes     Yes     Yes     Yes     Yes      No      No     Yes    <NA>
## 5     Yes      No     Yes     Yes     Yes     Yes      No     Yes    <NA>
## 6     Yes      No      No     Yes     Yes     Yes      No     Yes    <NA>
##   SC14Q02 SC14Q03 SC14Q04 SC14Q05          SC15Q01               SC15Q02
## 1    <NA>    <NA>    <NA>    <NA> 1-2 times a year               Monthly
## 2    <NA>    <NA>    <NA>    <NA> 1-2 times a year       3-5 times a year
## 3    <NA>    <NA>    <NA>    <NA> 1-2 times a year More than once a month
## 4    <NA>    <NA>    <NA>    <NA> 1-2 times a year       3-5 times a year
## 5    <NA>    <NA>    <NA>    <NA> 3-5 times a year               Monthly
## 6    <NA>    <NA>    <NA>    <NA> 1-2 times a year More than once a month
##   SC15Q03                SC15Q04                SC15Q05 SC16Q01 SC16Q02
## 1   Never       1-2 times a year More than once a month     Yes     Yes
## 2   Never       1-2 times a year More than once a month     Yes     Yes
## 3   Never               Monthly More than once a month     Yes     Yes
## 4   Never               Monthly More than once a month     Yes      No
## 5   Never More than once a month More than once a month     Yes     Yes
## 6   Never                 Never       3-5 times a year     Yes     Yes
##   SC16Q03 SC16Q04 SC16Q05 SC16Q06 SC16Q07 SC16Q08        SC17Q01
## 1      No     Yes     Yes     Yes     Yes     Yes To some extent
## 2     Yes     Yes     Yes     Yes     Yes     Yes     Not at all
## 3     Yes      No     Yes      No     Yes      No     Not at all
## 4     Yes     Yes     Yes     Yes     Yes      No     Not at all
## 5     Yes     Yes     Yes      No     Yes     Yes    Very little
## 6     Yes      No     Yes     Yes     Yes      No    Very little
##          SC17Q02     SC17Q03     SC17Q04     SC17Q05     SC17Q06
## 1 To some extent Very little Very little  Not at all Very little
## 2    Very little  Not at all  Not at all  Not at all Very little
## 3     Not at all  Not at all  Not at all  Not at all  Not at all
```

```
## 4    Very little Very little Very little Very little  Not at all
## 5    Very little  Not at all Very little Very little Very little
## 6    Very little Very little Very little Very little Very little
##          SC17Q07     SC17Q08    SC17Q09    SC17Q10     SC17Q11     SC17Q12
## 1 To some extent  Not at all Not at all Not at all  Not at all  Not at all
## 2     Not at all  Not at all Not at all Not at all  Not at all  Not at all
## 3    Very little  Not at all Not at all Not at all  Not at all  Not at all
## 4     Not at all Very little Not at all Not at all Very little Very little
## 5    Very little Very little Not at all Not at all  Not at all Very little
## 6    Very little  Not at all Not at all Not at all  Not at all  Not at all
##          SC17Q13             SC18Q01   SC19Q01   SC19Q02   SC19Q03 SC19Q04
## 1    Very little Minority of Parents    Always Sometimes Sometimes   Never
## 2     Not at all Minority of Parents    Always    Always    Always   Never
## 3    Very little Minority of Parents Sometimes    Always    Always  Always
## 4    Very little Minority of Parents    Always    Always    Always   Never
## 5 To some extent Minority of Parents     Never     Never    Always  Always
## 6    Very little Minority of Parents Sometimes Sometimes Sometimes  Always
##     SC19Q05   SC19Q06   SC19Q07     SC20Q01     SC20Q02     SC20Q03
## 1     Never Sometimes Sometimes      Likely  Not likely      Likely
## 2     Never    Always    Always Very likely Very likely  Not likely
## 3 Sometimes Sometimes      <NA>      Likely  Not likely      Likely
## 4    Always Sometimes Sometimes  Not likely      Likely  Not likely
## 5 Sometimes    Always Sometimes Very likely  Not likely Very likely
## 6    Always Sometimes Sometimes  Not likely  Not likely      Likely
##       SC20Q04     SC20Q05     SC20Q06 SC21Q01 SC21Q02 SC21Q03 SC22Q01
## 1      Likely      Likely      Likely     Yes     Yes     Yes      No
## 2 Very likely Very likely Very likely     Yes     Yes     Yes      No
## 3      Likely      Likely        <NA>     Yes      No      No      No
## 4      Likely      Likely      Likely    <NA>    <NA>    <NA>     Yes
## 5 Very likely      Likely      Likely     Yes      No      No      No
## 6      Likely Very likely      Likely     Yes     Yes      No      No
##   SC22Q02 SC22Q03 SC22Q04 SC22Q05 SC23Q01 SC23Q02 SC23Q03 SC23Q04 SC24Qa1
## 1     Yes     Yes     Yes     Yes     Yes     Yes     Yes      No No Tick
## 2     Yes     Yes     Yes     Yes     Yes     Yes     Yes     Yes No Tick
## 3     Yes     Yes     Yes      No     Yes     Yes     Yes     Yes No Tick
## 4     Yes     Yes      No     Yes     Yes     Yes     Yes     Yes No Tick
## 5     Yes     Yes     Yes     Yes     Yes     Yes     Yes     Yes No Tick
## 6     Yes     Yes     Yes      No     Yes     Yes     Yes     Yes No Tick
##   SC24Qa2 SC24Qa3 SC24Qa4 SC24Qa5 SC24Qb1 SC24Qb2 SC24Qb3 SC24Qb4 SC24Qb5
## 1 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 2 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 3 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 4 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 5 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 6 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
##   SC24Qc1 SC24Qc2 SC24Qc3 SC24Qc4 SC24Qc5 SC24Qd1 SC24Qd2 SC24Qd3 SC24Qd4
## 1 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 2 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 3 No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick
## 4 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 5 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 6 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
##   SC24Qd5 SC24Qe1 SC24Qe2 SC24Qe3 SC24Qe4 SC24Qe5 SC24Qf1 SC24Qf2 SC24Qf3
```

```
## 1    Tick No Tick No Tick No Tick No Tick    Tick No Tick No Tick    Tick
## 2    Tick No Tick No Tick No Tick No Tick    Tick No Tick No Tick    Tick
## 3 No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick
## 4    Tick    Tick No Tick    Tick    Tick No Tick    Tick    Tick    Tick
## 5    Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick
## 6    Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick
##   SC24Qf4 SC24Qf5 SC24Qg1 SC24Qg2 SC24Qg3 SC24Qg4 SC24Qg5 SC24Qh1 SC24Qh2
## 1 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick    Tick
## 2 No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 3 No Tick No Tick    Tick No Tick No Tick No Tick No Tick No Tick    Tick
## 4 No Tick No Tick    Tick    Tick    Tick    Tick    Tick No Tick    Tick
## 5 No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 6 No Tick No Tick No Tick No Tick No Tick No Tick    Tick No Tick No Tick
##   SC24Qh3 SC24Qh4 SC24Qh5 SC24Qi1 SC24Qi2 SC24Qi3 SC24Qi4 SC24Qi5 SC24Qj1
## 1 No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick No Tick
## 2 No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick No Tick
## 3 No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick No Tick
## 4 No Tick No Tick    Tick    Tick No Tick No Tick    Tick No Tick No Tick
## 5 No Tick No Tick    Tick    Tick No Tick No Tick No Tick No Tick No Tick
## 6 No Tick No Tick    Tick    Tick No Tick No Tick No Tick No Tick No Tick
##   SC24Qj2 SC24Qj3 SC24Qj4 SC24Qj5 SC24Qk1 SC24Qk2 SC24Qk3 SC24Qk4 SC24Qk5
## 1 No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick    Tick
## 2    Tick No Tick No Tick No Tick No Tick No Tick No Tick    Tick No Tick
## 3    Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 4    Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick    Tick
## 5    Tick No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick
## 6    Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick    Tick
##   SC24Ql1 SC24Ql2 SC24Ql3 SC24Ql4 SC24Ql5 SC25Qa1 SC25Qa2 SC25Qa3 SC25Qa4
## 1 No Tick No Tick No Tick No Tick    Tick    Tick    Tick No Tick No Tick
## 2 No Tick No Tick No Tick    Tick No Tick No Tick No Tick    Tick No Tick
## 3    Tick No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick
## 4 No Tick No Tick No Tick No Tick    Tick    Tick No Tick No Tick    Tick
## 5    Tick No Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick
## 6 No Tick No Tick No Tick No Tick    Tick    Tick No Tick    Tick    Tick
##   SC25Qb1 SC25Qb2 SC25Qb3 SC25Qb4 SC25Qc1 SC25Qc2 SC25Qc3 SC25Qc4 SC25Qd1
## 1 No Tick    Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick
## 2 No Tick    Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick
## 3 No Tick    Tick No Tick No Tick No Tick    Tick No Tick No Tick No Tick
## 4    Tick    Tick No Tick No Tick No Tick    Tick No Tick No Tick    Tick
## 5 No Tick    Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick
## 6 No Tick    Tick No Tick No Tick No Tick No Tick No Tick    Tick No Tick
##   SC25Qd2 SC25Qd3 SC25Qd4 SC25Qe1 SC25Qe2 SC25Qe3 SC25Qe4 SC25Qf1 SC25Qf2
## 1 No Tick No Tick    Tick No Tick No Tick No Tick No Tick No Tick No Tick
## 2 No Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick
## 3 No Tick    Tick No Tick No Tick    Tick No Tick No Tick No Tick No Tick
## 4 No Tick No Tick No Tick    Tick    Tick No Tick No Tick No Tick No Tick
## 5 No Tick    Tick No Tick No Tick No Tick No Tick No Tick No Tick No Tick
## 6 No Tick    Tick    Tick No Tick No Tick No Tick    Tick No Tick No Tick
##   SC25Qf3 SC25Qf4     SC26Q01     SC26Q02     SC26Q03     SC26Q04
## 1 No Tick    Tick  Very often  Very often Quite often  Very often
## 2 No Tick No Tick  Very often  Very often Quite often  Very often
## 3 No Tick    Tick  Very often  Very often  Very often  Very often
## 4    Tick    Tick Quite often  Very often  Very often  Very often
```

```
## 5 No Tick No Tick Quite often Quite often Quite often  Very often
## 6 No Tick    Tick  Very often Quite often Quite often Quite often
##       SC26Q05     SC26Q06     SC26Q07     SC26Q08     SC26Q09     SC26Q10
## 1  Very often  Very often  Very often  Very often Quite often  Very often
## 2  Very often  Very often Quite often Quite often  Very often  Very often
## 3 Quite often  Very often      Seldom Quite often  Very often Quite often
## 4 Quite often Quite often  Very often Quite often  Very often Quite often
## 5 Quite often  Very often Quite often      Seldom Quite often  Very often
## 6  Very often Quite often  Very often  Very often  Very often      Seldom
##       SC26Q11     SC26Q12     SC26Q13     SC26Q14 SC27Q01
## 1  Very often  Very often  Very often      Seldom    Male
## 2  Very often  Very often  Very often  Very often    Male
## 3  Very often  Very often Quite often      Seldom  Female
## 4 Quite often  Very often  Very often Quite often  Female
## 5  Very often Quite often  Very often      Seldom    Male
## 6  Very often  Very often Quite often Quite often    Male
##               ABGROUP COMPWEB IRATCOMP PCGIRLS PROPCERT PROPQUAL SCHSIZE
## 1 Not for any subjects   0.000    0.142 52.5790       NA       NA     601
## 2     For all subjects      NA    0.000 55.9242        1    1.000     211
## 3    For some subjects   0.067    0.190 55.0189        1    0.875    1056
## 4    For some subjects   0.067    0.172 57.3944        1    1.000     284
## 5    For some subjects   0.125    0.143 46.0591        1    0.808     406
## 6    For some subjects   1.000    0.146 47.1058        1    0.828    1002
##   SCHTYPE                                                SELSCH STRATIO
## 1  Public At least one sometimes but neither always considered      NA
## 2  Public                      At least one always considered  21.100
## 3  Public                      At least one always considered  22.000
## 4  Public                      At least one always considered  12.909
## 5  Public                      At least one always considered  15.615
## 6  Public At least one sometimes but neither always considered  21.548
##   EXCURACT LDRSHP RESPCURR RESPRES SCMATEDU STUDBEHA TCHPARTI TCSHORT
## 1   0.1527 1.6750  -1.1970 -0.8256  -0.5602   0.3454  -1.2768 -0.2606
## 2  -1.2758 1.9462  -0.9125 -0.8256  -1.7503   1.6729  -1.2768  0.4283
## 3   0.7130 0.8741   1.3635 -0.8096  -0.2728   1.6729  -0.7877 -1.0222
## 4   1.4227 1.0501  -1.0548 -0.6658  -0.7064   0.6491   0.0910 -0.2606
## 5   0.4233 0.3866  -0.3435 -0.8096  -1.7503   0.3454  -0.7877 -0.2606
## 6  -0.1104 0.8741  -1.1970 -0.8096  -0.4165   0.9549  -1.2768 -0.2606
##   TEACBEHA W_FSCHWT                    STRATUM       VER_SCH
## 1   0.2091   1.3226  ALB: North/Urban/General P2009_07DEC10
## 2   1.4029  25.9638  ALB: South/Rural/General P2009_07DEC10
## 3   1.4029   4.1397  ALB: South/Urban/General P2009_07DEC10
## 4   0.4524   3.2925  ALB: South/Rural/General P2009_07DEC10
## 5   0.2091   7.5364 ALB: Center/Urban/General P2009_07DEC10
## 6   0.2091   1.7948  ALB: South/Urban/General P2009_07DEC10
```

Some available data (3/3)

Parent survey results from the 2009 Programme of International Student Assessment (PISA)

```
> data(pisa.parent)
> head(pisa.parent)
```

```
##   CNT COUNTRY OECD SUBNATIO SCHOOLID STIDSTD PA01Q01 PA01Q02 PA01Q03
## 1 CHL     152    1    15200    00001   00001       2       2       2
## 2 CHL     152    1    15200    00001   00002       2       2       1
## 3 CHL     152    1    15200    00001   00003       1       2       2
## 4 CHL     152    1    15200    00001   00004       2       2       1
## 5 CHL     152    1    15200    00001   00005       1       1       2
## 6 CHL     152    1    15200    00002   00006       1       2       2
##   PA02Q01 PA03Q01 PA03Q02 PA03Q03 PA03Q04 PA03Q05 PA03Q06 PA03Q07 PA03Q08
## 1       2       3       2       3       4       4       2       4       4
## 2       2       4       3       4       4       3       4       4       4
## 3       2       4       2       1       2       1       1       1       1
## 4       2       2       1       3       3       4       4       3       2
## 5       2       4       2       4       1       4       4       1       3
## 6       2       1       1       1       1       4       1       1       3
##   PA03Q09 PA04Q01 PA05Q01 PA06Q01 PA06Q02 PA06Q03 PA06Q04 PA07Q01 PA07Q02
## 1       4       1       4       2       2       4       2       2       2
## 2       4       1       4       2       2       4       2       2       2
## 3      NA       1       4       2       2       3       4       2       2
## 4       2       1       4       2       2       4       1       2       2
## 5       4       1       3       2       2       4       2       2       2
## 6       4       1       3       2       1       4       2       2       2
##   PA07Q03 PA07Q04 PA07Q05 PA07Q06 PA08Q01 PA08Q02 PA08Q03 PA08Q04 PA08Q05
## 1       2       2       2       1       1       2       3       4       3
## 2       2       2       2       1       1       3       3       4       4
## 3       2       2       2       1       3       1       3       4       4
## 4       2       2       1       1       4       4       4       4       2
## 5       2       2       2       1       1       2       1       2       3
## 6       2       2       2       1       1       2       3       3       4
##   PA08Q06 PA08Q07 PA08Q08 PA09Q01 PA09Q02 PA09Q03 PA09Q04 PA10Q01 PA10Q02
## 1       2       4       2       2       2       2       2       2       2
## 2       2       2       4       2       2       2       2       2       2
## 3       1       2       1       2       2       2       1       2       2
## 4       1       3       4       2       2       2       2       2       2
## 5       1       2       1       2       2       2       2       2       2
## 6       1       3       1       2       2       2       1       2       2
##   PA10Q03 PA10Q04 PA11Q01 PA12Q01 PA13Q01 PA14Q01 PA14Q02 PA14Q03 PA14Q04
## 1       2       2       1       3       2       1       1       2       2
## 2       2       1       1       2       3       1       1       1       1
## 3       2       1       3       2       3       1       1       1       1
## 4       1       1       1       2       4       2       2       1       1
```

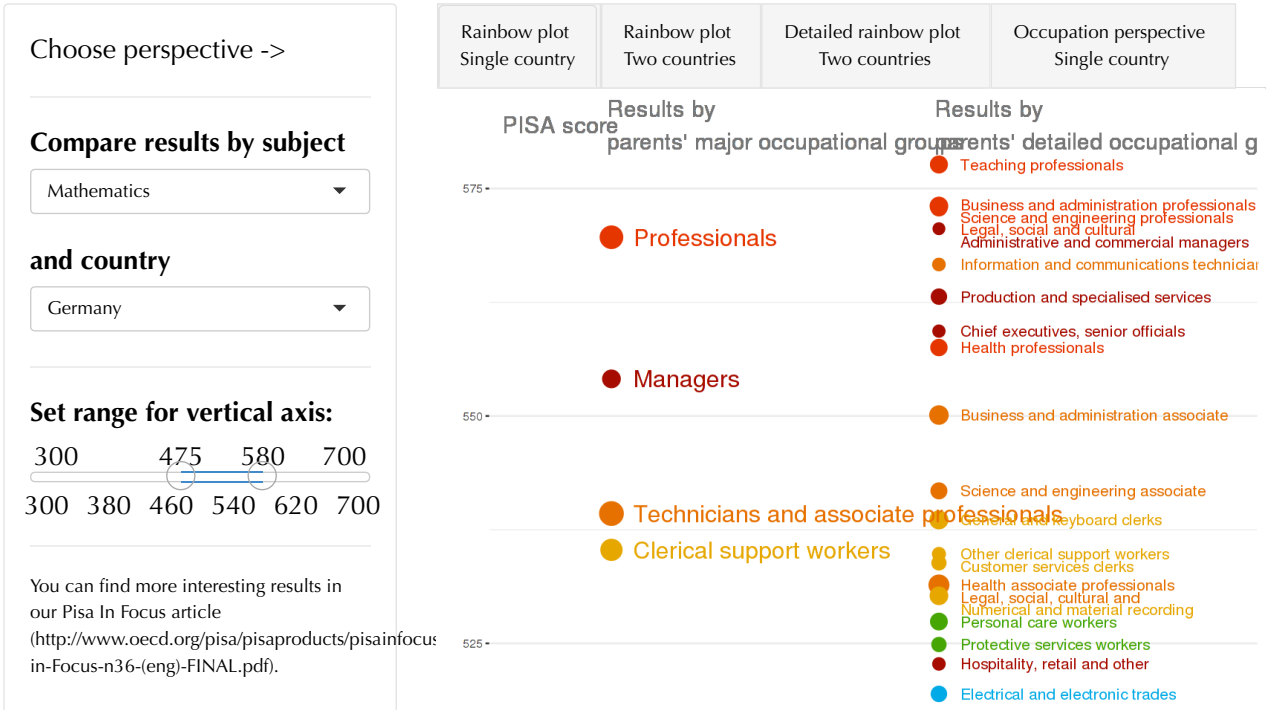
```
## 5       2       2       1       3       2       2       2       2       2
## 6       2       1       2       2       2       2       2       2       2
##   PA14Q05 PA14Q06 PA14Q07 PA15Q01 PA15Q02 PA15Q03 PA15Q04 PA15Q05 PA15Q06
## 1       2       2       2       1       1       1       1       1       1
## 2       1       1       1       1       1       2       2       2       2
## 3       1       1       1       1       1       1       1       2       2
## 4       1       2       1       2       2       2       2       2       2
## 5       2       2       2       2       2       2       2       2       2
## 6       1       2       2       2       2       2       2       2       2
##   PA15Q07 PA15Q08 PA16Q01 PA17Q01 PA17Q02 PA17Q03 PA17Q04 PA17Q05 PA17Q06
## 1       1       1       3       3       4       2       2       2       2
## 2       2       2       3       1       4       4       4       1       1
## 3       1       2       3       3       3       3       3      NA       2
## 4       2       2       3       1       3       3       4       1       3
## 5       2       2       3       3       3       3       3       1       1
## 6       2       2       3       4       4       2       3       3       1
##   PA17Q07 PA17Q08 PA17Q09 PA17Q10 PA17Q11 PQMISCED PQFISCED PQHISCED
## 1       4       3       3       3       4        0        0        0
## 2       2       3       4       4       4        1        0        1
## 3       3       4       4       4       4        1        1        1
## 4       3       3       3       2       4        2        0        2
## 5       3       3       3       3       3        0        0        0
## 6       3       1       4       3       4        1        1        1
##   CURSUPP MOTREAD PARINVOL PQSCHOOL PRESUPP READRES STRATUM       VER_PAR
## 1      NA      NA       NA       NA      NA      NA   15297 P2009_07DEC10
## 2      NA      NA       NA       NA      NA      NA   15297 P2009_07DEC10
## 3      NA      NA       NA       NA      NA      NA   15297 P2009_07DEC10
## 4      NA      NA       NA       NA      NA      NA   15297 P2009_07DEC10
## 5      NA      NA       NA       NA      NA      NA   15297 P2009_07DEC10
## 6      NA      NA       NA       NA      NA      NA   15297 P2009_07DEC10
```

Shiny App tp Explore PISA data

http://mi2.mini.pw.edu.pl:8080/SmarterPoland/PISAoccupations2012/

Occupations@PISA2012

How much can we infer about a student's performance in school by looking at what his or her parents do for a living? To find out, PISA 2012 asked participating students about their parents' occupations. **Occupations@PISA2012** is a web-based application that allows you to explore the relationship between parents' occupations and their children's performance in mathematics, reading and science - in your own country and in other countries.



From `pdf` documents

`tabulizer` package (I)

Installation of the package

```
> library("ghit")
> ghit::install_github(c("ropensci/tabulizerjars","ropensci/tabulizer"))
```

Case study: Size of the population and the Schools in Tunis (2013 to 2015)

Our aim is

- to obtain a data on the delegations of Tunis about the population, schools and the numbers de classrooms
- to display an interactive graph

Source of the data

- We download a pdf document in the General Comission of the Regional Developpement.
- We are interested in Tunis report that can be downloaded from the following link

http://www.cgdr.nat.tn/upload/files/gouvchiffres/gech2015/Tunis.pdf

- Put the file "Tunis.pdf" in your working directory.

Extracting the data on population from the pdf reports.

- We extract the table of the page 8.

```
> library(tabulizer)
> tab1 <- extract_tables("Tunis.pdf",pages = 8)
> tab1
```

```
## [[1]]
##       [,1]               [,2]          [,3]      [,4]      [,5]
##  [1,] ""                 "DELEGATION"  "2015"    "2014"    "2013"
##  [2,] "Carthage"         ""            "24906"   "24216"   "24100"
##  [3,] "Tunis Medina"     ""            "22009"   "21400"   "21298"
##  [4,] "Bab Bhar"         ""            "37241"   "36210"   "36037"
##  [5,] "Bab Souika"       ""            "30016"   "29185"   "29046"
##  [6,] "El Omran"         ""            "43410"   "42208"   "42006"
##  [7,] "Omrane Superieur" ""            "57094"   "55513"   "55248"
##  [8,] "Tahrir"           ""            "22327"   "21709"   "21605"
##  [9,] "Menzah"           ""            "43021"   "41830"   "41630"
## [10,] "Cité Khadra"      ""            "36175"   "35173"   "35005"
## [11,] "Le Bardo"         ""            "74010"   "71961"   "71617"
## [12,] "Sejoumi"          ""            "34835"   "33870"   "33708"
## [13,] "Ezzouhour"        ""            "41888"   "40728"   "40534"
## [14,] "El Hrairia"       ""            "113322"  "110184"  "109658"
## [15,] "Sidi Hessine"     ""            "112795"  "109672"  "109148"
## [16,] "El Ouardia"       ""            "33063"   "32147"   "31993"
## [17,] "El Kabaria"       ""            "88474"   "86024"   "85613"
## [18,] "Sidi El Bechir"   ""            "28539"   "27749"   "27616"
## [19,] "Jebel Jelloud"    ""            "24311"   "23638"   "23525"
## [20,] "La Goulette"      ""            "47013"   "45711"   "45493"
## [21,] "El Kram"          ""            "76243"   "74132"   "73778"
## [22,] "La Marsa"         ""            "95635"   "92987"   "92543"
## [23,] ""                 "Total"       "1086327" "1056247" "1051203"
##       [,6]          [,7]
##  [1,] "المعتمدية"   ""
##  [2,] ""           "قرطاج"
##  [3,] ""           "المدينة"
##  [4,] ""           "باب بحر"
##  [5,] ""           "باب سويقة"
##  [6,] ""           "العمران"
##  [7,] ""           "العمران الأعلى"
##  [8,] ""           "التحرير"
##  [9,] ""           "المنزه"
## [10,] ""           "حي الخضراء"
## [11,] ""           "باردو"
## [12,] ""           "السيجومي"
## [13,] ""           "الزهور"
```

```
## [14,] ""          "الحرائرية"
## [15,] ""          "سيدي حسين"
## [16,] ""          "الوردية"
## [17,] ""          "الكبارية"
## [18,] ""          "سيدي البشير"
## [19,] ""          "جبل الجلود"
## [20,] ""          "حلق الوادي"
## [21,] ""          "الكرم"
## [22,] ""          "المرسى"
## [23,] "الولاية"   ""
```

Cleaning the data into R

- We transform `tab1` to a `data.frame` object

```
> dt=tab1[[1]]
> colnames(dt)[c(1,3,4,5,7)]=tab1[[1]][1,2:6]
> dt=dt[1:22,c(1,3,4,5,7)]
> dt=dt[-1,]
> dt[,2]=as.numeric(as.character(dt[,2]))
> dt[,3]=as.numeric(as.character(dt[,3]))
> dt[,4]=as.numeric(as.character(dt[,4]))
> dt=as.data.frame(dt)
```

Reshaping the data

```
> library(reshape2)
```

```
##
## Attaching package: 'reshape2'
```

```
## The following objects are masked from 'package:reshape':
##
##     colsplit, melt, recast
```

```
> dtA=melt(dt,id.vars = colnames(dt)[c(1,5)])
> colnames(dtA)[3:4]=c("Year","Population")
```

Displaying the data on population sizes in each delegation

```
> DT::datatable(dtA)
```

Show 10 entries Search:

	DELEGATION	المعتمدية	Year	Population
1	Carthage	قرطاج	2015	24906
2	Tunis Medina	المدينة	2015	22009
3	Bab Bhar	باب بحر	2015	37241
4	Bab Souika	باب سويقة	2015	30016
5	El Omran	العمران	2015	43410
6	Omrane Superieur	العمران الأعلى	2015	57094
7	Tahrir	التحرير	2015	22327
8	Menzah	المنزه	2015	43021
9	Cité Khadra	حي الخضراء	2015	36175
10	Le Bardo	باردو	2015	74010

Showing 1 to 10 of 63 entries Previous 1 2 3 4 5 6 7 Next

Extracting now the data on Schools and classrooms

We can extract a second table: Number of schools and Classrooms (page 14)

```
> tab2 <- extract_tables("Tunis.pdf",pages = 14)
> tab2
```

```
## [[1]]
##       [,1]               [,2]              [,3]   [,4]    [,5]     [,6]
##  [1,] ""                 "salles d'études" ""     "قاعات" "écoles" ""
##  [2,] "DELEGATION"       ""                ""     ""      ""       ""
##  [3,] ""                 "2015"            "2014" "2013"  "2015"   "2014"
##  [4,] "CARTHAGE"         "76"              "73"   "59"    "8"      "8"
##  [5,] "TUNIS MEDINA"     "67"              "65"   "67"    "6"      "6"
##  [6,] "BAB BHAR"         "97"              "97"   "96"    "8"      "8"
##  [7,] "BAB SOUIKA"       "46"              "50"   "49"    "4"      "4"
##  [8,] "EL OMRAN"         "114"             "125"  "111"   "10"     "10"
##  [9,] "OMRANE SUPERIEUR" "108"             "109"  "109"   "9"      "9"
## [10,] "TAHRIR"           "45"              "45"   "46"    "4"      "4"
## [11,] "MENZAH"           "58"              "56"   "52"    "6"      "6"
## [12,] "CITE KHADRA"      "64"              "63"   "61"    "5"      "5"
## [13,] "LE BARDO"         "138"             "136"  "136"   "13"     "13"
## [14,] "SEJOUMI"          "34"              "34"   "37"    "3"      "3"
## [15,] "EZZOUHOUR"        "90"              "91"   "89"    "9"      "9"
## [16,] "EL HRAIRIA"       "204"             "200"  "211"   "19"     "19"
## [17,] "SIDI HESSINE"     "205"             "203"  "195"   "18"     "18"
## [18,] "EL OUARDIA"       "72"              "72"   "71"    "7"      "7"
## [19,] "EL KABARIA"       "164"             "154"  "163"   "18"     "18"
## [20,] "SIDI EL BECHIR"   "58"              "57"   "58"    "6"      "6"
## [21,] "JEBEL JELLOUD"    "50"              "50"   "49"    "6"      "6"
## [22,] "LA GOULETTE"      "62"              "61"   "60"    "6"      "6"
## [23,] "EL KRAM"          "72"              "73"   "71"    "8"      "8"
## [24,] "LA MARSA"         "131"             "128"  "123"   "12"     "12"
## [25,] "TOTAL"            "1955"            "1942" "1913"  "185"    "185"
##       [,7]    [,8]
##  [1,] "مدارس" ""
##  [2,] ""      "المعتمدية"
##  [3,] "2013"  ""
##  [4,] "7"     "قرطاج"
##  [5,] "6"     "تونس المدينة"
##  [6,] "8"     "باب بحر"
##  [7,] "4"     "باب سويقة"
##  [8,] "10"    "العمران"
##  [9,] "9"     "العمران الأعلى"
## [10,] "4"     "التحرير"
## [11,] "5"     "المنزه"
## [12,] "5"     "حي الحضراء"
```

```
## [13,] "13"    "باردو"
## [14,] "3"     "السيجومي"
## [15,] "9"     "الزهور"
## [16,] "19"    "الحرايرية"
## [17,] "18"    "سيدي حسين"
## [18,] "7"     "الوردية"
## [19,] "18"    "الكبارية"
## [20,] "6"     "سيدي البشير"
## [21,] "6"     "جبل الجلود"
## [22,] "6"     "حلق الوادي"
## [23,] "8"     "الكرم"
## [24,] "11"    "المرسى"
## [25,] "182"   "المجموع"
```

Cleaning the data (1)

```
> tab2[[1]][1,]
```

```
## [1] ""                "salles d'études" ""                "قاعات"
## [5] "écoles"          ""                "مدارس"          ""
```

```
> tab2[[1]][2,]
```

```
## [1] "DELEGATION" ""           ""           ""           ""
## [6] ""           ""           "المعتمدية"
```

```
> tab2[[1]][3,]
```

```
## [1] ""     "2015" "2014" "2013" "2015" "2014" "2013" ""
```

```
> ds1=tab2[[1]][,c(1,2,3,4,8)] # data classrooms
> ds2=tab2[[1]][,c(1,5,6,7,8)] # data school
> colnames(ds1)=colnames(ds2)=c(ds1[2,1],ds1[3,2:4],ds1[2,5])
> ds1=ds1[-c(1:3,25),]
> ds2=ds2[-c(1:3,25),]
```

Cleaning the data (2)

```
> ds1[,2]=as.numeric(as.character(ds1[,2]))
> ds1[,3]=as.numeric(as.character(ds1[,3]))
> ds1[,4]=as.numeric(as.character(ds1[,4]))
> ds1=as.data.frame(ds1)
```

and

```
> ds2[,2]=as.numeric(as.character(ds2[,2]))
> ds2[,3]=as.numeric(as.character(ds2[,3]))
> ds2[,4]=as.numeric(as.character(ds2[,4]))
> ds2=as.data.frame(ds2)
```

Cleaning the data (3)

```
> ds1A=melt(ds1,id.vars = colnames(ds1)[c(1,5)])
> colnames(ds1A)[3:4]=c("Year","Classrooms")
> ds2A=melt(ds2,id.vars = colnames(ds2)[c(1,5)])
> colnames(ds2A)[3:4]=c("Year","Schools")
```

One data for all variables

```
> data_all=cbind.data.frame(dtA,ds1A$Classrooms,ds2A$Schools)
> colnames(data_all)[c(5,6)]=c("Classrooms","Schools")
```

Displaying the whole data

```
> DT::datatable(data_all)
```

Show 10 entries Search:

	DELEGATION	المعتمدية	Year	Population	Classrooms	Schools
1	Carthage	قرطاج	2015	24906	76	8
2	Tunis Medina	المدينة	2015	22009	67	6
3	Bab Bhar	باب بحر	2015	37241	97	8
4	Bab Souika	باب سويقة	2015	30016	46	4
5	El Omran	العمران	2015	43410	114	10
6	Omrane Superieur	العمران الأعلى	2015	57094	108	9
7	Tahrir	التحرير	2015	22327	45	4
8	Menzah	المنزه	2015	43021	58	6
9	Cité Khadra	حي الخضراء	2015	36175	64	5
10	Le Bardo	باردو	2015	74010	138	13

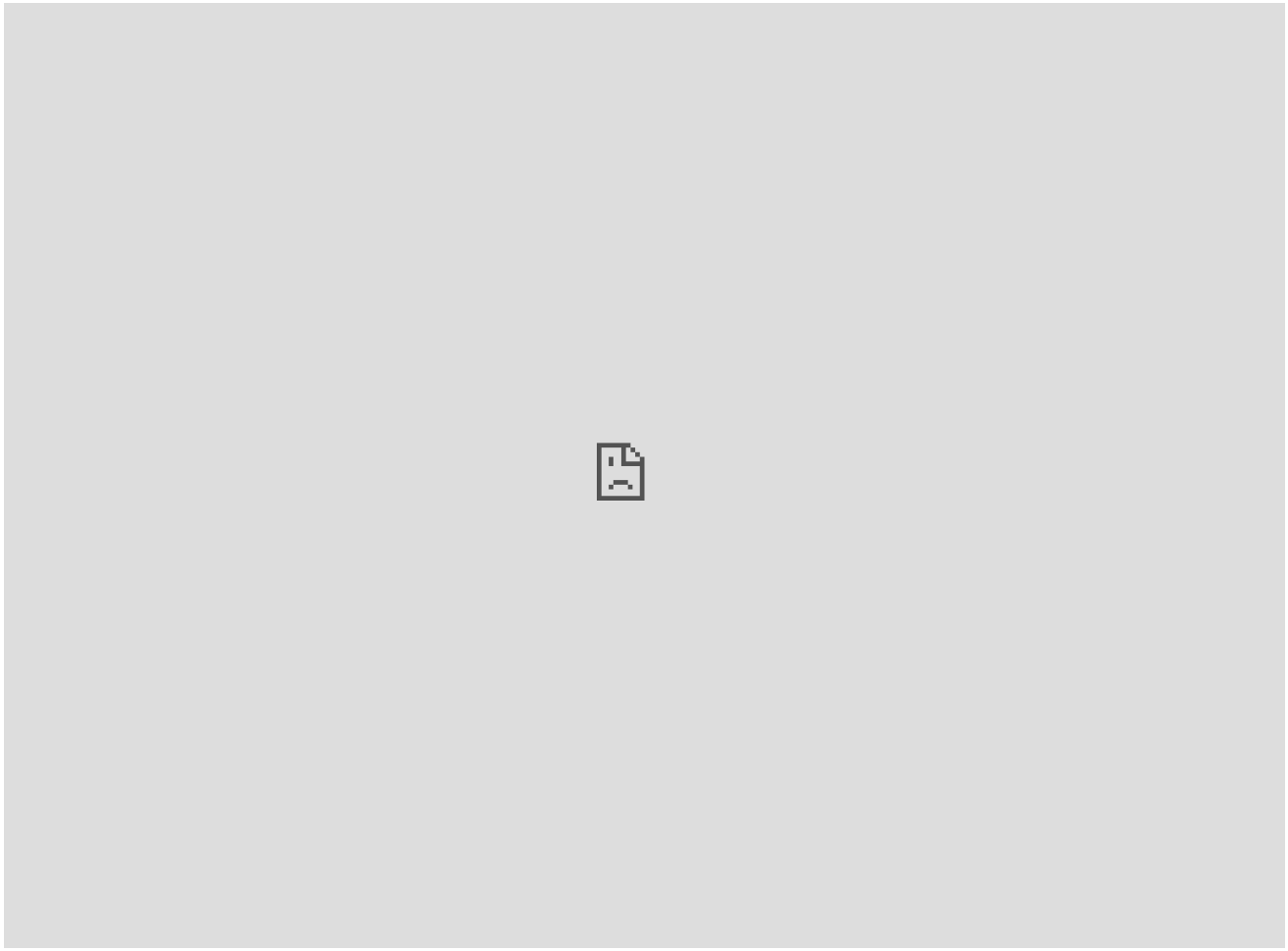
Showing 1 to 10 of 63 entries Previous 1 2 3 4 5 6 7 Next

Bubble chart with googleVis

```
> apply(data_all,2,class)
##  DELEGATION   المعتمدية        Year  Population  Classrooms     Schools
## "character" "character" "character" "character" "character" "character"
> data_all$Year=as.numeric(as.character(data_all$Year))
> data_all$Population=as.numeric(as.character(data_all$Population))
> data_all$Classrooms=as.numeric(as.character(data_all$Classrooms))
```

```
> data_all$Schools=as.numeric(as.character(data_all$Schools))
> op <- options(gvis.plot.tag="chart")
> Motion=gvisMotionChart(data_all[,-2],
+                        idvar="DELEGATION",
+                        timevar="Year")
> print(Motion, file="Motion.html")
> cat(Motion$html$chart, file = "Motion.html")
```

Bubble chart with googleVis

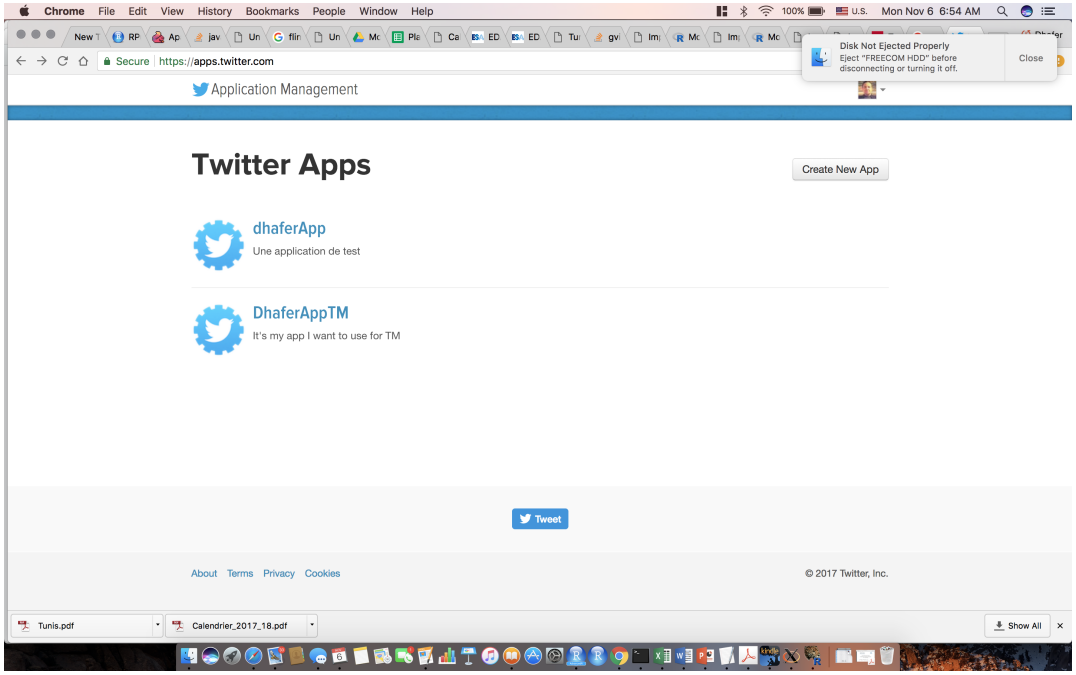


Social Network

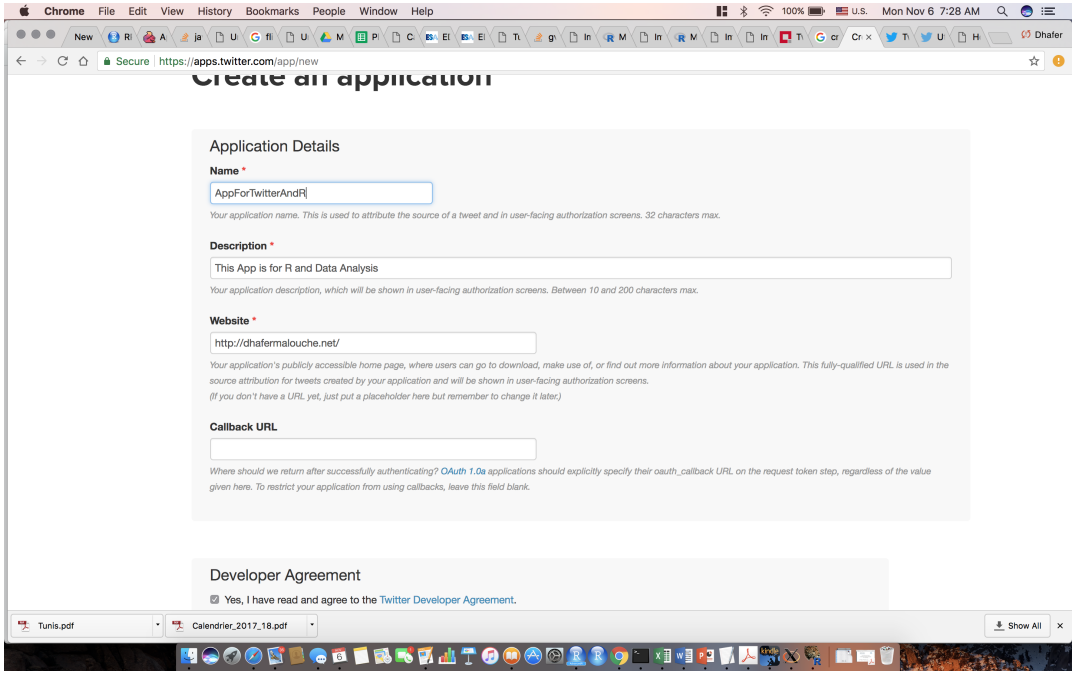
Data from `twitter`

An App on twitter

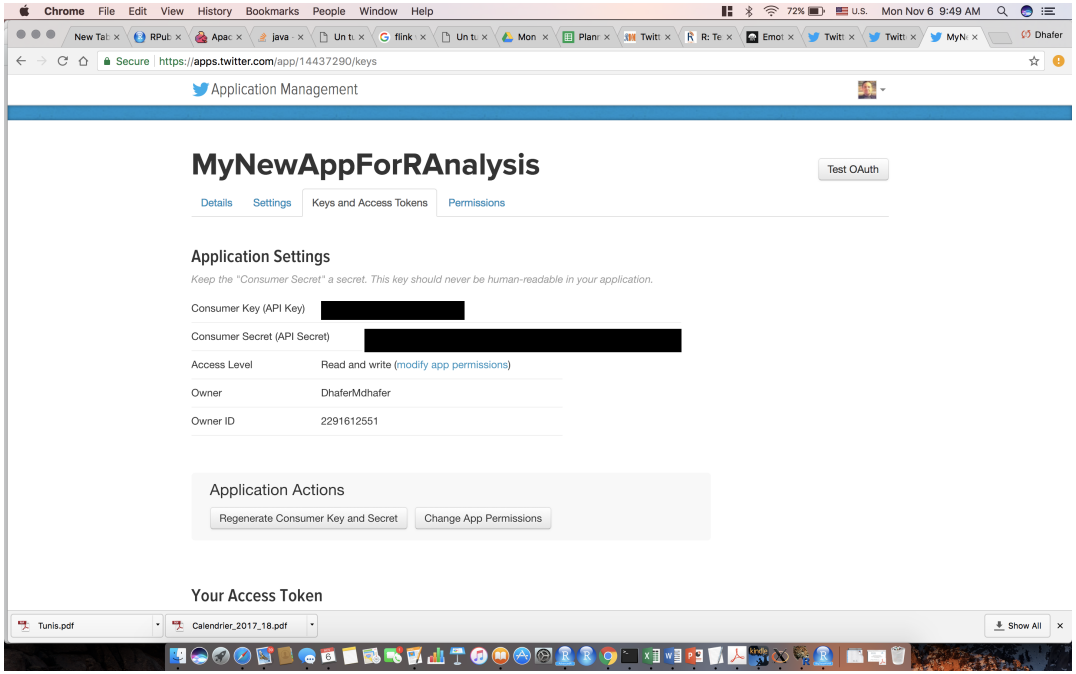
Step 1: create an app on your account twitter: goto https://apps.twitter.com/app/



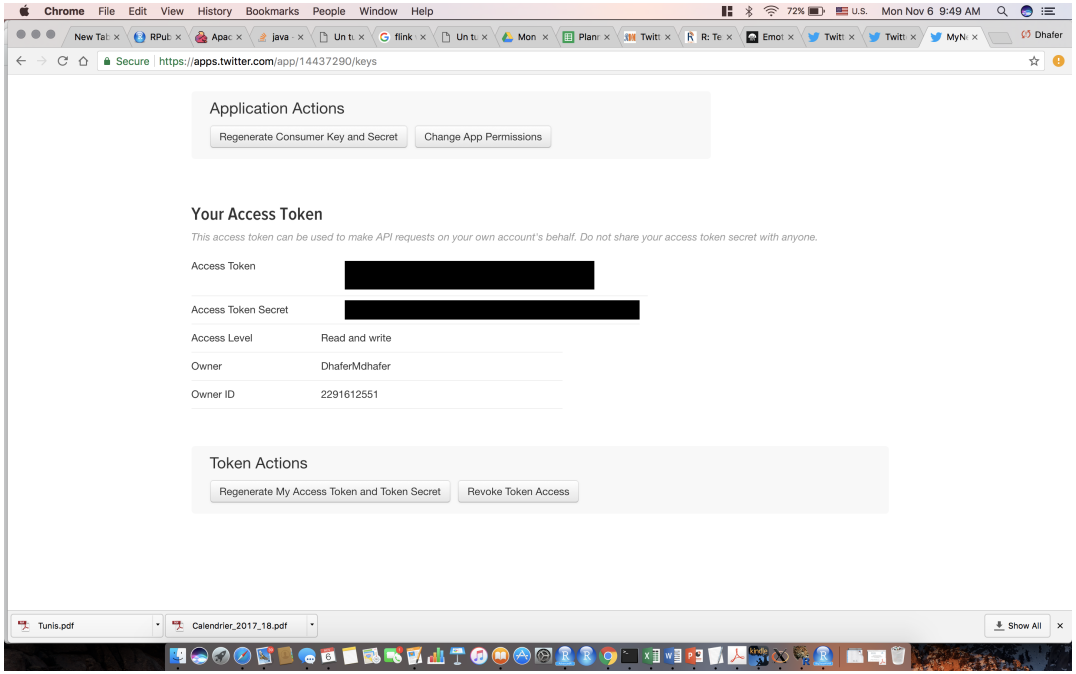
Setting up the App.



API key secret



Access token



Installing R packages

```
> devtools::install_github("jrowen/twitteR", ref = "oauth_httr_1_0",force=TRUE)
> install.packages('base64enc')
> install.packages('ROAuth')
> library(twitteR)
> library(ROAuth)
> library(base64enc)
```

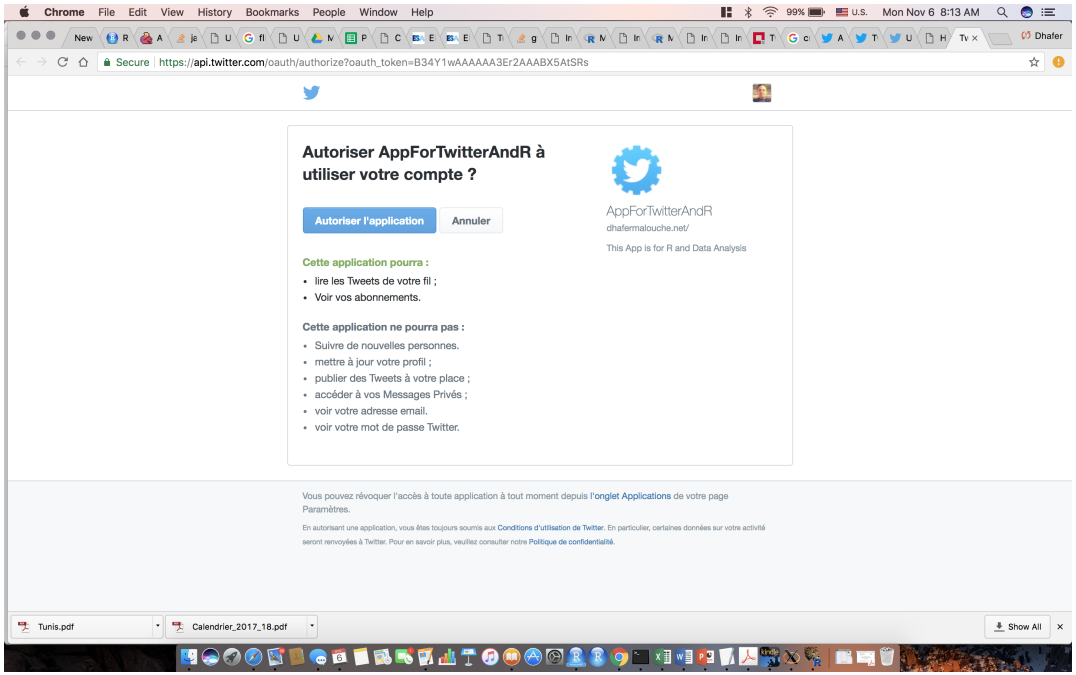
Importing twitter setting into R

```
> api_key = "XXXXXXX" # your api_key
> api_secret = "XXXXXXX" # your api_secret
> access_token = "XXXXX" # your access_token
> access_token_secret = "XXXXXX" # your access_token_sceret
> credential<-OAuthFactory$new(
+   consumerKey=api_key,
+   consumerSecret=api_secret,requestURL="https://api.twitter.com/oauth/request_token",accessURL="https://api.twitter.com/oauth/access_token",
+   authURL="https://api.twitter.com/oauth/authorize")
```

Getting the authorization from R

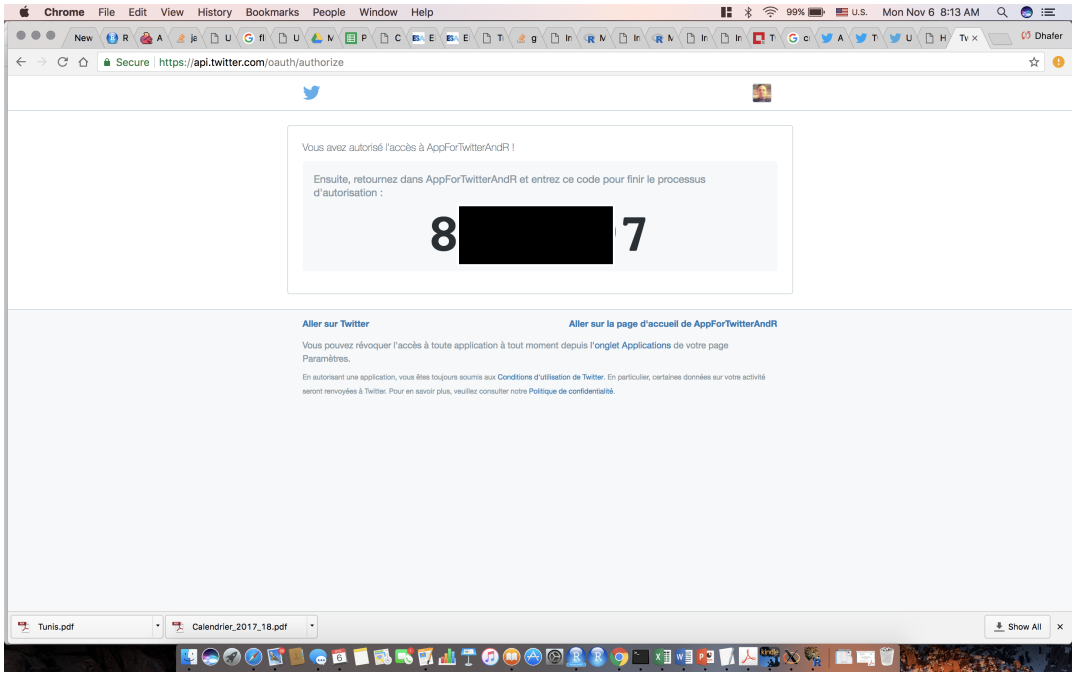
```
> credential$handshake()
To enable the connection, please direct your web browser to:
https://api.twitter.com/oauth/authorize?oauth_token=XXXXXXXXX
When complete, record the PIN given to you and provide it here:
```

Getting the authorization from R



Getting the authorization from R

Copy this pin number and paste it in R



Setting the authorization

```
> setup_twitter_oauth(consumer_key = api_key,consumer_secret = api_secret,
+                     access_token = access_token,access_secret = access_token_secret)
[1] "Using direct authentication"
```

Extracting data on tweets.

```
> metoo=searchTwitter("metoo", n=2000, lang="en",since='2017-10-01')
> df_metoo <- do.call("rbind", lapply(metoo, as.data.frame))
```

```
> colnames(df_metoo)
```

```
##  [1] "text"          "favorited"     "favoriteCount" "replyToSN"
##  [5] "created"       "truncated"     "replyToSID"    "id"
##  [9] "replyToUID"    "statusSource"  "screenName"    "retweetCount"
## [13] "isRetweet"     "retweeted"     "longitude"     "latitude"
```

Importing data from Facebook

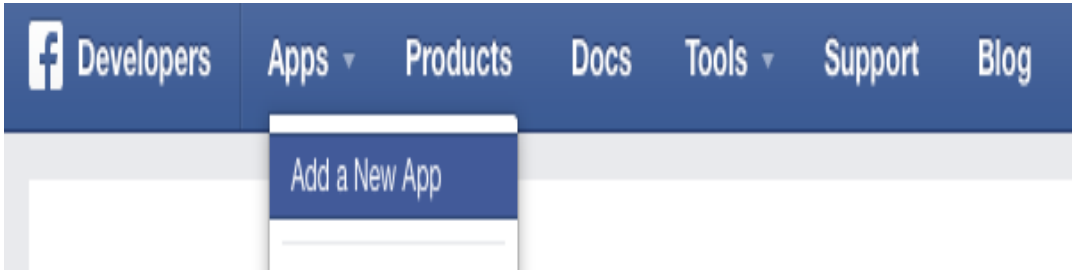
Installing R packages

Using `Rfacebook package

```
> install.packages("Rfacebook")
> install.packages("httpuv")
> library(Rfacebook)
> library(httpuv)
```

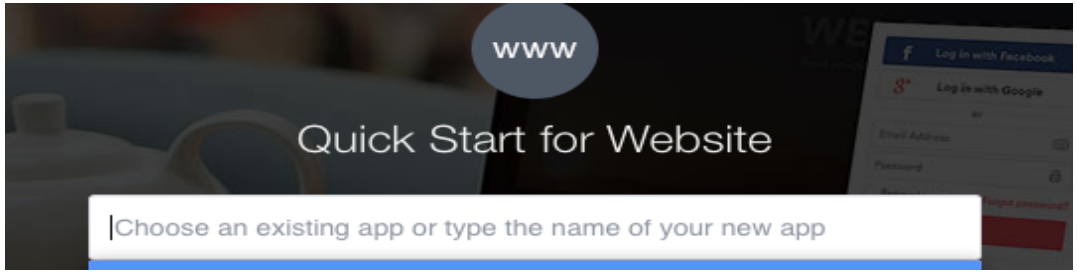
Creating the App on Facebook

Step1: Go to the link https://developers.facebook.com



Creating the App on Facebook

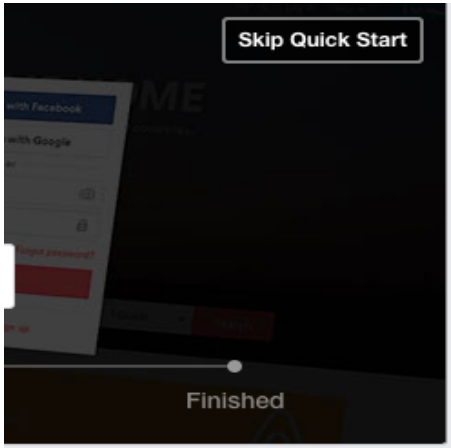
Step2: Give a name to your new App.



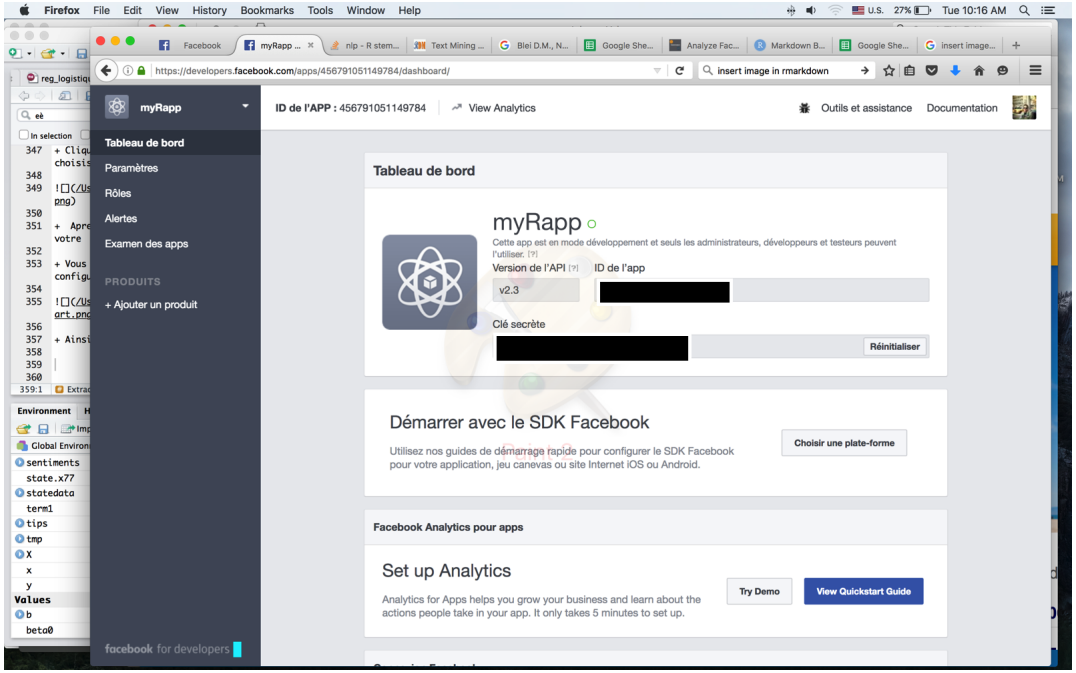
Click on “Create a New App ID” and choose a category for your app.

Creating the App on Facebook

Step3: Skip Quick Start and go to the setting of the app.



Setting up the App



Getting the authorization

```
> app_id="XXXX"
> app_secret="XXXX"
> fb_oauth=fbOAuth(app_id=app_id, app_secret=app_secret, extended_permissions = TRUE)
> save(fb_oauth, file="fb_oauth")
```

Getting data from Donal Trump official page

https://www.facebook.com/DonaldTrump/

```
> fb_page <- getPage(page="DonaldTrump",since='2017-11-01', token=fb_oauth)
```

```
> colnames(fb_page)
```

```
##  [1] "from_id"        "from_name"      "message"        "created_time"
##  [5] "type"           "link"           "id"             "story"
##  [9] "likes_count"    "comments_count" "shares_count"
```

Getting the data on the posts in DT's page

```
> post <- getPost(post=fb_page$id[1],  token=fb_oauth)
```

```
names(post)
```

```
## [1] "post"     "likes"    "comments"
```

Using `SocialMediaLab` package

```
> if (!"SocialMediaLab" %in%installed.packages()) {
+  devtools::install_github("voson-lab/SocialMediaLab/SocialMediaLab")}
> library(SocialMediaLab)
> require(magrittr)
```

Getting the data

```
> fb_page2<-Authenticate("Facebook",appID = app_id, appSecret = app_secret) %>%SaveCredential("FBCredential.RDS") %>%Collect(pageName="DonaldTrump", rangeFrom="2017-
+  rangeTo="2017-11-5", writeToFile=TRUE)
```

Getting the data

- The data is writting in a csv file

```
> file.exists("2017-11-4_to_2017-11-5_DonaldTrump_FacebookData.csv")
```

```
## [1] TRUE
```

- Importing it again into R

```
> dt<- read.csv("~/Documents/Teaching/AdvancedR/2017-11-4_to_2017-11-5_DonaldTrump_FacebookData.csv", comment.char="#")
> colnames(dt)
```

```
##  [1] "X"                "from_username"    "from"
##  [4] "to"               "edgeType"         "postType"
##  [7] "postLink"         "postTimestamp"    "commentText"
## [10] "commentTimestamp"
```