

Reading Dirty Data

Mark van der Loo and Edwin de Jonge

Statistics Netherlands Research & Development
@markvdloo @edwindjonge

useR!2019



Try the code together with your neighbour

```
01raw/json_to_raw.R
```



Reading Dirty Data

Reading raw data is about uniforming the technical layout of the data.

We saw the following issues in the example:

- Storage formats
- Data types
 - Locales. . .
 - Unit suffixes.
- Non-uniform formatting



Storage formats

Your raw data is often stored in external formats:

- A database (dump).
- Scraped data in html format.
- Data retrieved from an api (JSON/XML).
- csv / txt/ spss / stata / sas / etc.

Action:

Turn the data into a tabular format



Data types

Most important reading action is setting data types:

- numeric columns often contain units (“42%”, “42 \$”, “42 km”, etc.)
- numeric columns often contain locale dependent formatting: “4.2” vs “4,2” or “4.200,42” vs “4,200.42”
- date columns (not in example): “4/2/1942” vs “42/2/4” vs “1942-4-2” etc.
- encoding of strings (for non english): “forty two” vs “tweeënveertig”
- footnotes/annotations¹ in values may corrupt data type: 42^

Cleaning action

Fix the columns: remove non-relevant info and set data type



¹Footnotes can be essential to data interpretation, but disastrous for technical parsing.

Uniforming values

Some text variables are structured, but contain variations:

- phone numbers: “+311234567890” vs “0031-12-34567890” vs “012-34567890”
- soc. sec. numbers: “1234 5678” vs “123456789”
- bank account numbers, etc.
- zip codes: e.g Dutch zip codes: “1234AB” vs “1234 AB” vs “1234 ab”.

Cleaning action

Reformat values into standard format



String manipulations

Replace:

```
values <- c("3,4", "4,5")  
gsub(",", ".", values) # or use str_replace
```

```
toupper("small")
```



Encoding

```
bands <- c("Motörhead", "Iron Maiden")  
Encoding(bands)
```

```
## [1] "UTF-8"    "unknown"
```

```
Encoding(bands) <- "latin1"  
print(bands)
```

```
## [1] "MotÃ¶rhead" "Iron Maiden"
```

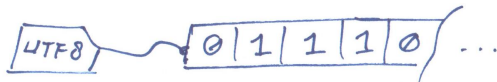
```
Encoding(bands) <- "UTF-8"  
print(bands)
```

```
## [1] "Motörhead"    "Iron Maiden"
```

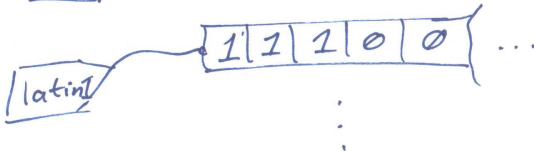
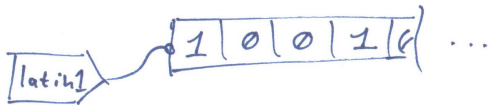


Character vector x

Encoding(\bar{X}) \leftarrow "UTF-8"



only changes
the labels,
not the data



Use iconv() to change the encoding.

Assignment

Read in the "01raw/backbone.xml" file and **reformat the zip code** into 4 digits, no space, two uppercase letters. "1234 ab" -> "1234AB"

```
library(XML)
backbone_xml <- XML::xmlParse("01raw/backbone.xml")
backbone <- xmlToDataFrame(backbone_xml)

# Fix zip code
...

# and save the result
write.csv( backbone, "01raw/my_backbone.csv"
          , row.names = FALSE, na="")
```

