Monitoring data cleaning processes

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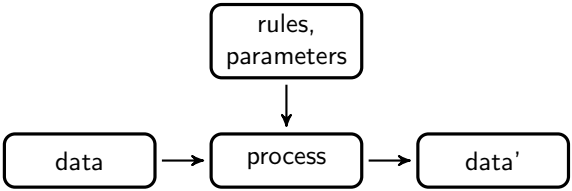
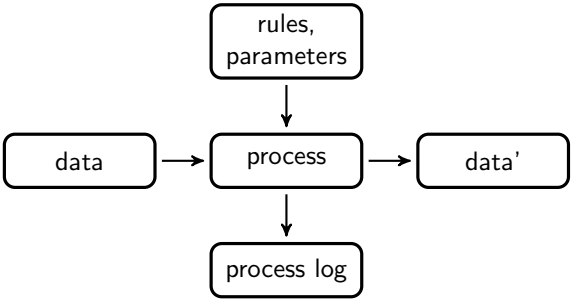
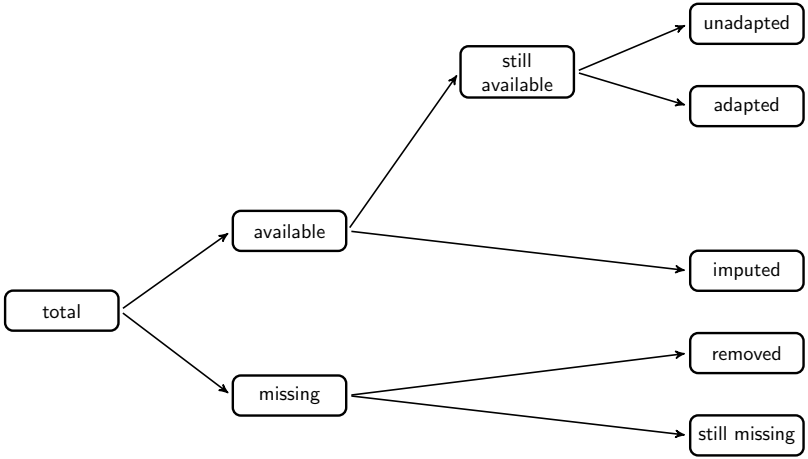
Process overview



Process overview

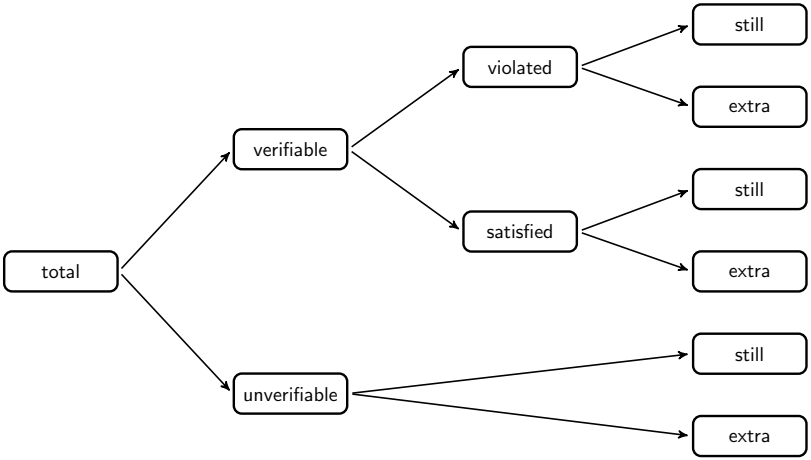


How to measure changes? 1. Track cells




```
validate::cells()
```

How to measure changes? 2. Track validations




```
validate::compare()
```

How to measure changes between `data` and `data'`?

Many ways

- List every change (record, variable, old, new) ('diff')
- Count differences in cells, or validation
- ⋮
- Note if something has changed (`TRUE`/`FALSE`)

Needs

Logging framework

- Supporting any type of comparison of `data` and `data'`
- Supporting any kind of transformation between `data` and `data'`
- Without demanding changes in the transforming functions
- That does not get in the way of the user

Logging framework

Idea

- A data cleaning procedure is implemented as a sequence of expressions (a script).
- These expressions are *composed* into a programe when you run the script (`source()`)
- To obtain a logging framework that is not intrusive for the user, we can *change the way expressions are composed*.

The `lumberjack` package: preparation

```
dat <- read.csv("SBS2000.csv", stringsAsFactors = FALSE)
head(dat,3)
```

```
##      id size incl.prob staff turnover other.rev total.rev staff.costs
## 1 RET01  sc0      0.02    75       NA        NA      1130          NA
## 2 RET02  sc3      0.14     9     1607        NA      1607         131
## 3 RET03  sc3      0.14    NA     6886       -33      6919         324
##   total.costs profit vat
## 1       18915  20045  NA
## 2        1544     63  NA
## 3        6493    426  NA
```

```
library(validate)
rules <- validator(.file="ruleset.R")

library(lumberjack)
logger <- cellwise$new(key="id")
```

The lumberjack package: clean up

```
dat %L>%
  lumberjack::start_log(logger) %L>%
  errorlocate::replace_errors(rules) %L>%
  rspa::tag_missing() %L>%
  simputation::impute_rhd(. ~ 1, backend="VIM") %L>%
  rspa::match_restrictions(rules) %L>%
  lumberjack::dump_log() -> dat_out
```

```
## Dumped a log at cellwise.csv
```

Read the log:

```
read.csv("cellwise.csv") %L>% head(3)
```

```
##   step                    time                          expression   key
## 1    1 2019-05-23 09:36:15 CEST errorlocate::replace_errors(rules) RET01
## 2    1 2019-05-23 09:36:15 CEST errorlocate::replace_errors(rules) RET03
## 3    1 2019-05-23 09:36:15 CEST errorlocate::replace_errors(rules) RET03
##    variable   old new
## 1    profit 20045  NA
## 2 other.rev   -33  NA
## 3  turnover  6886  NA
```

Background

The pipe is a sort of *function composition* operator.

```
# Pseudocode:
`%>%` <- function(x, fun){
  return( fun(x) )
}
```

The `lumberjack` does some extra things:

```
# Pseudocode
%L>% <- function(x, fun){
  y <- fun(x)
  if ( logger_attached_to(x) ){
    logger <- get_logger(x)
    logger$add_difference(x,y)
  }
  return(y)
}
```