

# Manipulating Data in R

John Muschelli

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## Overview

In this module, we will show you how to:

1. Reshaping data from long (tall) to wide (fat)
2. Reshaping data from wide (fat) to long (tall)
3. Merging Data
4. Perform operations by a grouping variable

## Setup

We will show you how to do each operation in base R then show you how to use the `dplyr` or `tidyr` package to do the same operation (if applicable).

See the “Data Wrangling Cheat Sheet using `dplyr` and `tidyr`”:

- ▶ <https://www.rstudio.com/wp-content/uploads/2015/02/data-wrangling-cheatsheet.pdf>

## Load the packages/libraries

# Reshaping data from wide (fat) to long (tall)

## Resources

See [http://www.cookbook-r.com/Manipulating\\_data/Converting\\_data\\_between\\_wide\\_and\\_long\\_format/](http://www.cookbook-r.com/Manipulating_data/Converting_data_between_wide_and_long_format/)

### Reshaping data from wide (fat) to long (tall): base R

The reshape command exists. It is a **confusing** function. Don't use it.

### Reshaping data from wide (fat) to long (tall): tidyr

In tidyr, the gather function gathers columns into rows.

We want the column names into "var" variable in the output dataset and the value in "number" variable. We then describe which columns we want to "gather:"

```
long = gather(ex_data, "var", "number",  
              starts_with("orange"),  
              starts_with("purple"), starts_with("green"),  
              starts_with("banner"))
```

# Reshaping data from long (tall) to wide (fat)

## Reshaping data from long (tall) to wide (fat): tidyr

In `tidyr`, the `spread` function spreads rows into columns. Now we have a long data set, but we want to separate the Average, Alightings and Boardings into different columns:

```
# have to remove missing days  
wide = filter(long, !is.na(date))  
wide = spread(wide, type, number)  
head(wide)
```

	day	date	line	Alightings	Average	Boardings
1	Friday	2010-01-15	banner	NA	NA	NA
2	Friday	2010-01-15	green	NA	NA	NA
3	Friday	2010-01-15	orange	1643	1644	1645
4	Friday	2010-01-15	purple	NA	NA	NA
5	Friday	2010-01-22	banner	NA	NA	NA
6	Friday	2010-01-22	green	NA	NA	NA

# Merging Data

## Data Merging/Append in Base R

- ▶ Merging - joining data sets together - usually on key variables, usually “id”
- ▶ `merge()` is the most common way to do this with data sets
- ▶ `rbind/cbind` - row/column bind, respectively
  - ▶ `rbind` is the equivalent of “appending” in Stata or “setting” in SAS
  - ▶ `cbind` allows you to add columns in addition to the previous ways
- ▶ `t()` is a function that will transpose the data

## Merging

```
base <- data.frame(id = 1:10, Age= seq(55,60, length=10))  
base[1:2,]
```

# Perform Operations By Groups of Variables

## Perform Operations By Groups: base R

The `tapply` command will take in a vector (`X`), perform a function (`FUN`) over an index (`INDEX`):

```
args(tapply)
```

```
function (X, INDEX, FUN = NULL, ..., simplify = TRUE)
NULL
```

## Perform Operations By Groups: base R

Let's get the mean Average ridership by line:

```
tapply(wide$Average, wide$line, mean, na.rm = TRUE)
```