QTM 151

Week 6 – dplyr (join datasets)

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Recap

We learned:

- `qplot`: quick way to make ggplot graphs.
- `ggplotly`: transform ggplot objects into nice plotly viz.
- `plot_ly`: create nice plotly graphs.
- `dplyr` methods: data wrangling

Do you have any questions about any of these contents?

The quiz is online!

Our GitHub page is: https://github.com/umbertomig/qtm151

dplyr Recap and Today's Agenda

`dplyr` is great for the following data manipulation:

- filter
- arrange
- select
- rename
- mutate
- summarise and group_by

- **dplyr is also great to merge datasets together**

Getting Started

Getting Started: loading packages

```
# Loading tidyverse
library(tidyverse)
```

```
## ── Attaching packages ─────────────────────────────────────── tidyv

## ✓ ggplot2 3.3.5     ✓ purrr   0.3.4
## ✓ tibble  3.1.4     ✓ dplyr   1.0.7
## ✓ tidyr   1.1.3     ✓ stringr 1.4.0
## ✓ readr   2.0.0     ✓ forcats 0.5.1

## ── Conflicts ────────────────────────────────────────── tidyverse_c
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

Loading data

```
band ← tribble(
   ~name,     ~band,
  "Mick",  "Stones",
  "John", "Beatles",
  "Paul", "Beatles")

instrument ← tribble(
    ~name,   ~plays,
   "John", "guitar",
   "Paul",   "bass",
  "Keith", "guitar")

instrument2 ← tribble(
    ~artist,   ~plays,
   "John", "guitar",
   "Paul",   "bass",
  "Keith", "guitar")
```

Loading data

```
# Loading PErisk dataset
PErisk ← read.csv('https://raw.githubusercontent.com/umbertomig/c
head(PErisk, 2)
```

```
##     country courts      barb2 prsexp2 prscorr2    gdpw2
## 1 Argentina      0 -0.7207754       1         3  9.69017
## 2 Australia      1 -6.9077550       5         4 10.30484
```

```
# First dataset
dat1 ← PErisk %>%
  filter(country %in% PErisk$country[1:5]) %>%
  select(country, courts:prsexp2)
dat1
```

```
##      country courts      barb2 prsexp2
## 1  Argentina      0 -0.7207754       1
## 2  Australia      1 -6.9077550       5
```

Join Datasets

Join Datasets

Join two or more datasets together is a common problem in data wrangling.

Lucky us, `dplyr` makes the job easy. Here are the functions we can use:

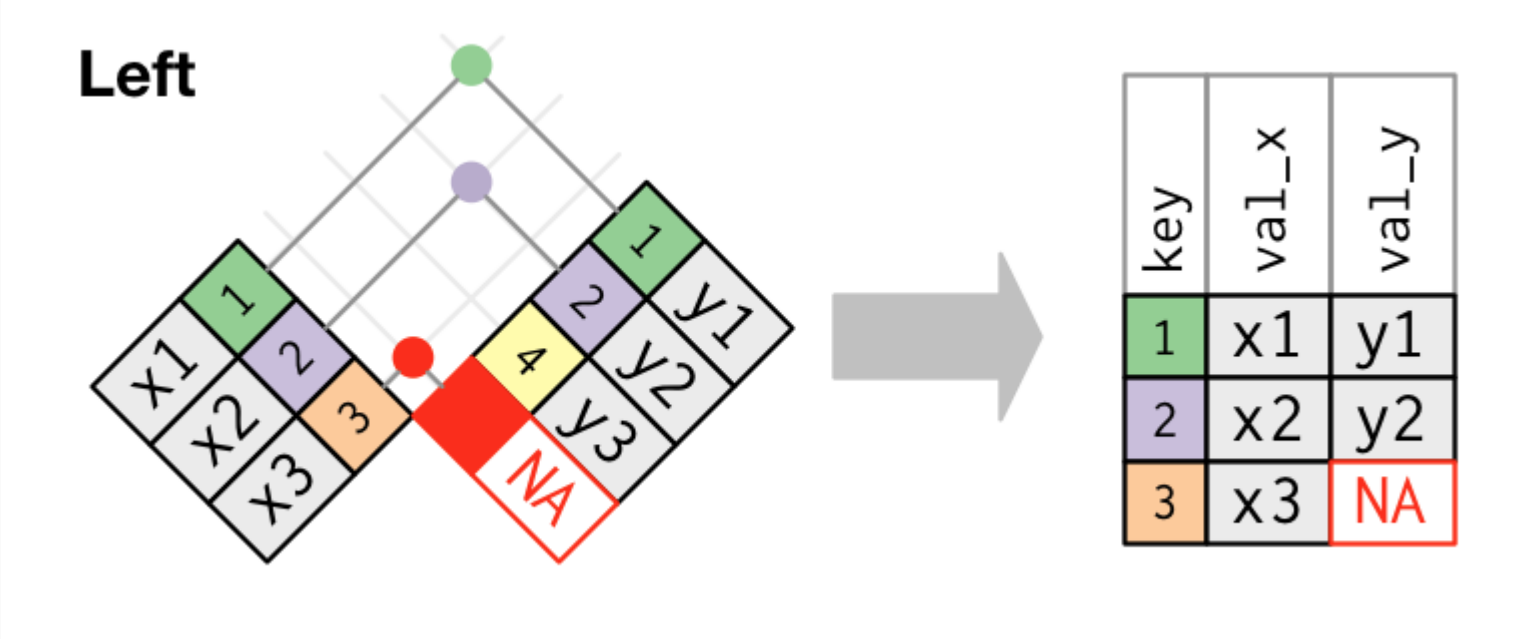
Function	Description
inner_join	Keep data in both datasets
left_join	Keep all data in the left dataset
right_join	Keep all data in the right dataset
full_join	Keep all data in both datasets
semi_join	Keep cases in the first that are also in the second
anti_join	Keep cases in the first that are NOT in the second

left_join

left_join

left_join(x, y, by="key variable"): join the datasets, keeping all the observations (rows) in x

- A key is a variable that uniquely identifies an observation, otherwise, we need multiple variables to identify an observation.



left_join

Example:

```
dat←left_join(band, instrument, by="name")
dat
```

```
## # A tibble: 3 × 3
##   name  band    plays
##   <chr> <chr>   <chr>
## 1 Mick  Stones  <NA>
## 2 John  Beatles guitar
## 3 Paul  Beatles bass
```

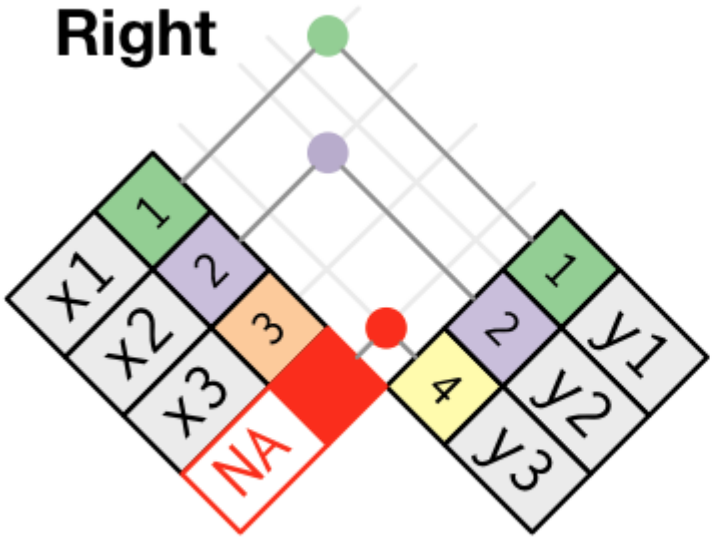
Your turn: Join the datasets `dat1` and `dat2` using left_join. Describe what happened.

right_join

right_join

right_join(x, y, by=""): keep all the observations (rows) in y

- The opposite way of *left_join()*



key	val_x	val_y
1	x1	y1
2	x2	y2
4	NA	y3

right_join

Example:

```
dat←right_join(band,instrument, by="name")
dat
```

```
## # A tibble: 3 × 3
##   name  band    plays
##   <chr> <chr>   <chr>
## 1 John  Beatles guitar
## 2 Paul  Beatles bass
## 3 Keith <NA>    guitar
```

Your turn: Join the datasets `dat1` and `dat2` using right_join. Describe what happened.

inner_join

inner_join

inner_join() keeps all the observations in **both** x and y

An inner join keeps observations that appear in both tables. But unmatched rows are not included in the result, it is easy to lose observations.

inner_join

Example:

```
inner_join(band, instrument, by="name")
```

```
## # A tibble: 2 × 3
##   name  band    plays
##   <chr> <chr>   <chr>
## 1 John  Beatles guitar
## 2 Paul  Beatles bass
```

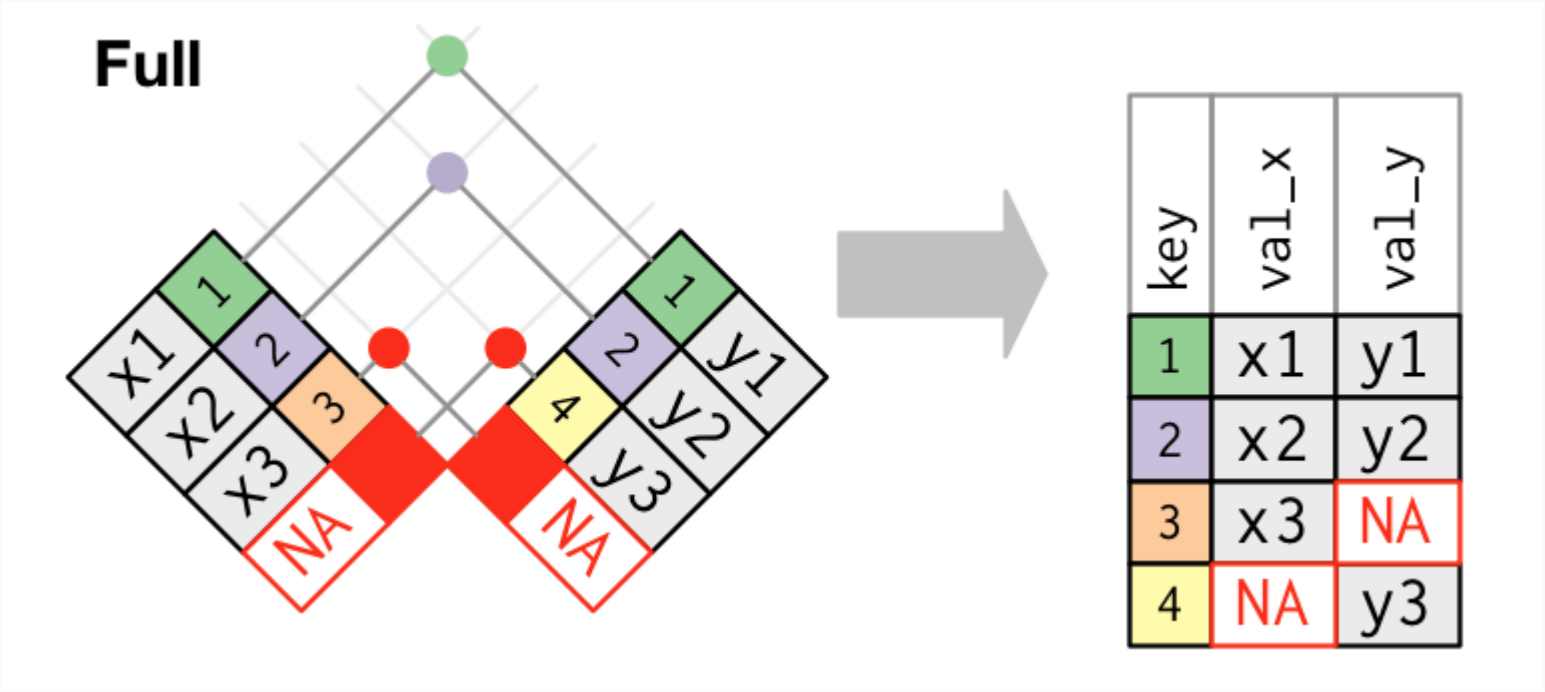
Your turn: Join the datasets `dat1` and `dat2` using inner_join. Describe what happened.

full_join

full_join

full_join keeps all observations in x and y

An full_join keeps observations that appear in either x or y.



full_join

Example:

```
full_join(band, instrument, by="name")
```

```
## # A tibble: 4 × 3
##   name  band    plays
##   <chr> <chr>   <chr>
## 1 Mick  Stones  <NA>
## 2 John  Beatles guitar
## 3 Paul  Beatles bass
## 4 Keith <NA>    guitar
```

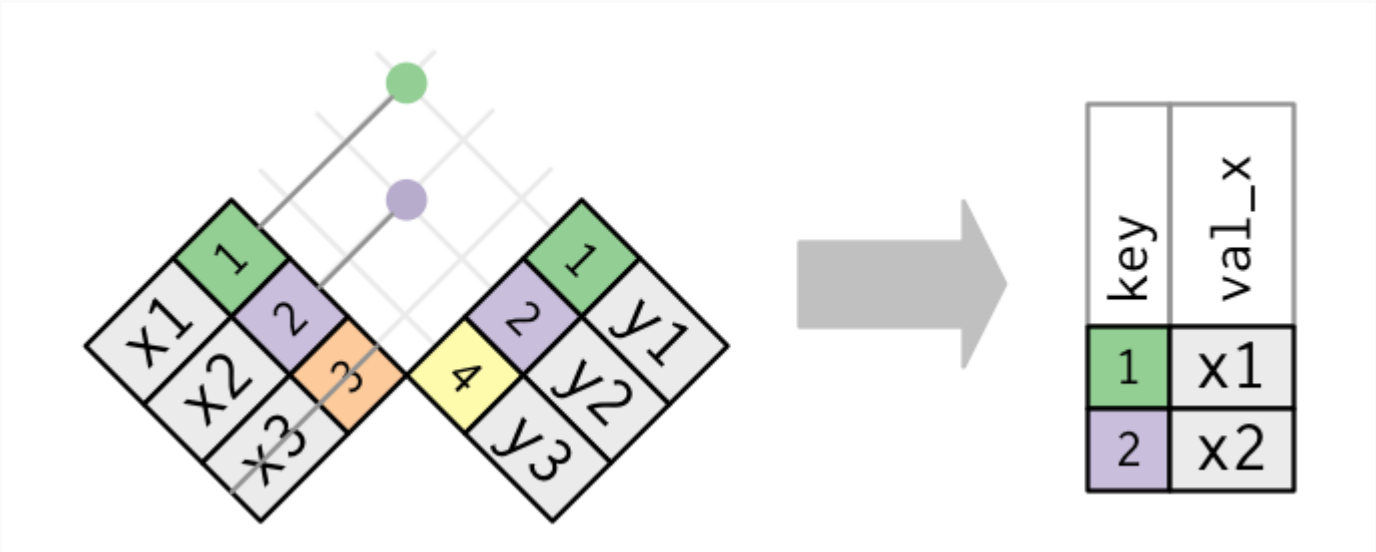
Your turn: Join the datasets `dat1` and `dat2` using full_join Describe what happened.

semi_join

semi_join

semi_join(x,y, by="") keeps all the observations of x that have a match in y

Use semi_join() to collect the artists in *band* that have instrument info in *instrument*.



semi_join

Example:

```
semi_join(band, instrument, by="name")
```

```
## # A tibble: 2 × 2
##   name  band
##   <chr> <chr>
## 1 John  Beatles
## 2 Paul  Beatles
```

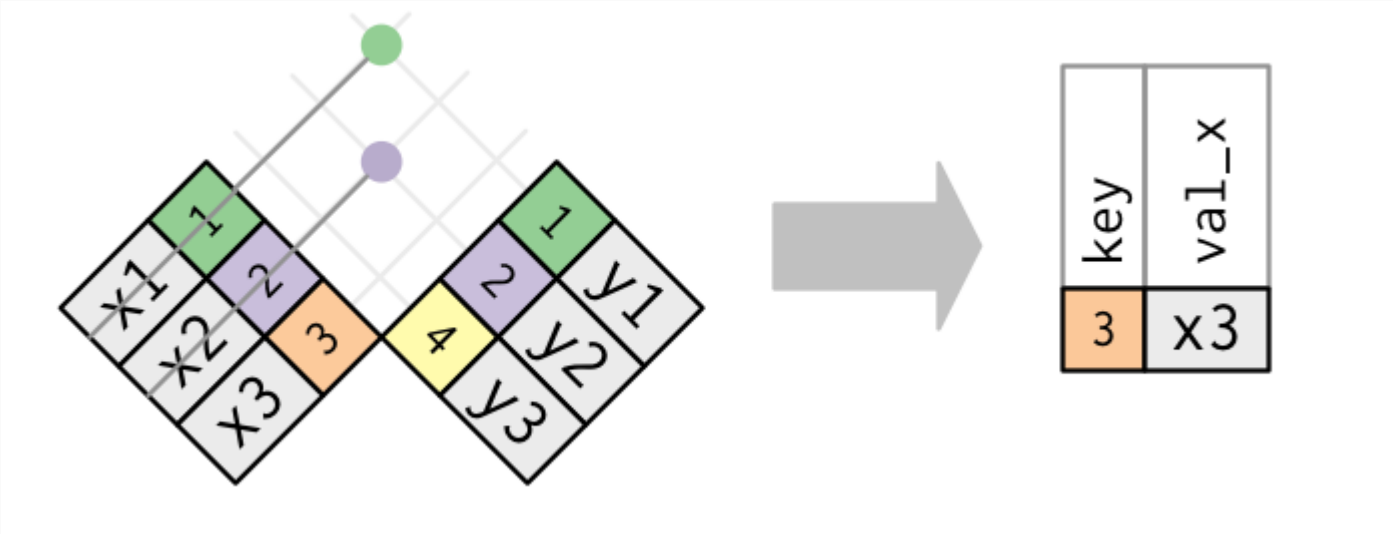
Your turn: Join the datasets `dat1` and `dat2` using semi_join. Describe what happened.

anti_join

anti_join

anti_join(x,y, by="") drops all the observations of x that have a match in y.

anti_join() also provide a great way to diagnose joins that go wrong.



anti_join

Example:

```
anti_join(band, instrument, by="name")
```

```
## # A tibble: 1 × 2
##   name  band
##   <chr> <chr>
## 1 Mick  Stones
```

Your turn: Join the datasets `dat1` and `dat2` using anti_join. Describe what happened.

Questions?

Have a great weekend!