

# Working with tidy data in R: dplyr

Fundamental actions on data tables:

- choose rows — `filter()`
- choose columns — `select()`
- make new columns — `mutate()`
- arrange rows — `arrange()`
- calculate summary statistics — `summarize()`
- work on groups of data — `group_by()`

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- work on groups of data — `group_by()`
- combine tables — `left_join(), ...`

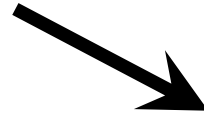
# left\_join(): combine two tables

Light Pink	Light Olive	Dark Olive
Dark Red	Light Olive	Dark Olive
Dark Maroon	Light Olive	Dark Olive

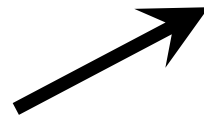
Light Pink	Light Blue	Dark Blue
Dark Red	Light Blue	Dark Blue
Dark Maroon	Light Blue	Dark Blue

# left\_join(): combine two tables

Light Red	Light Green	Dark Green
Red	Light Green	Dark Green
Dark Red	Light Green	Dark Green



Light Red	Light Blue	Dark Blue
Red	Light Blue	Dark Blue
Dark Red	Light Blue	Dark Blue



Light Red	Light Green	Dark Green	Light Blue	Dark Blue
Red	Light Green	Dark Green	Light Blue	Dark Blue
Dark Red	Light Green	Dark Green	Light Blue	Dark Blue

# Example: Joining tables

Let's extract two tables from msleep:

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```
> order_table <- select(msleep, name, order)
> order_table
```

	name	order
1	Cheetah	Carnivora
2	Owl monkey	Primates
3	Mountain beaver	Rodentia
4	Greater short-tailed shrew	Soricomorpha
5	Cow	Artiodactyla
6	Three-toed sloth	Pilosa
7	Northern fur seal	Carnivora
8	Vesper mouse	Rodentia
9	Dog	Carnivora
10	Roe deer	Artiodactyla

# Example: Joining tables

Let's extract two tables from msleep:

```
> awake_table <- select(msleep, name, awake)
```

```
> awake_table
```

	name	awake
1	Cheetah	11.90
2	Owl monkey	7.00
3	Mountain beaver	9.60
4	Greater short-tailed shrew	9.10
5	Cow	20.00
6	Three-toed sloth	9.60
7	Northern fur seal	15.30
8	Vesper mouse	17.00
9	Dog	13.90
10	Roe deer	21.00

# Example: Joining tables

And put them back together:

```
> left_join(order_table, awake_table)
```



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And put them back together:

```
> left_join(order_table, awake_table)
```

```
Joining by: "name"
```

	name	order	awake
1	Cheetah	Carnivora	11.90
2	Owl monkey	Primates	7.00
3	Mountain beaver	Rodentia	9.60
4	Greater short-tailed shrew	Soricomorpha	9.10
5	Cow	Artiodactyla	20.00
6	Three-toed sloth	Pilosa	9.60
7	Northern fur seal	Carnivora	15.30
8	Vesper mouse	Rodentia	17.00
9	Dog	Carnivora	13.90
10	Roe deer	Artiodactyla	21.00

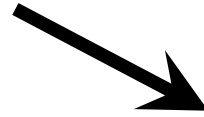
`left_join()`: missing values in 2<sup>nd</sup> table  
are set to NA

Light Pink	Light Olive	Dark Olive
Dark Red	Light Olive	Dark Olive
Dark Maroon	Light Olive	Dark Olive

Dark Red	Light Blue	Dark Blue
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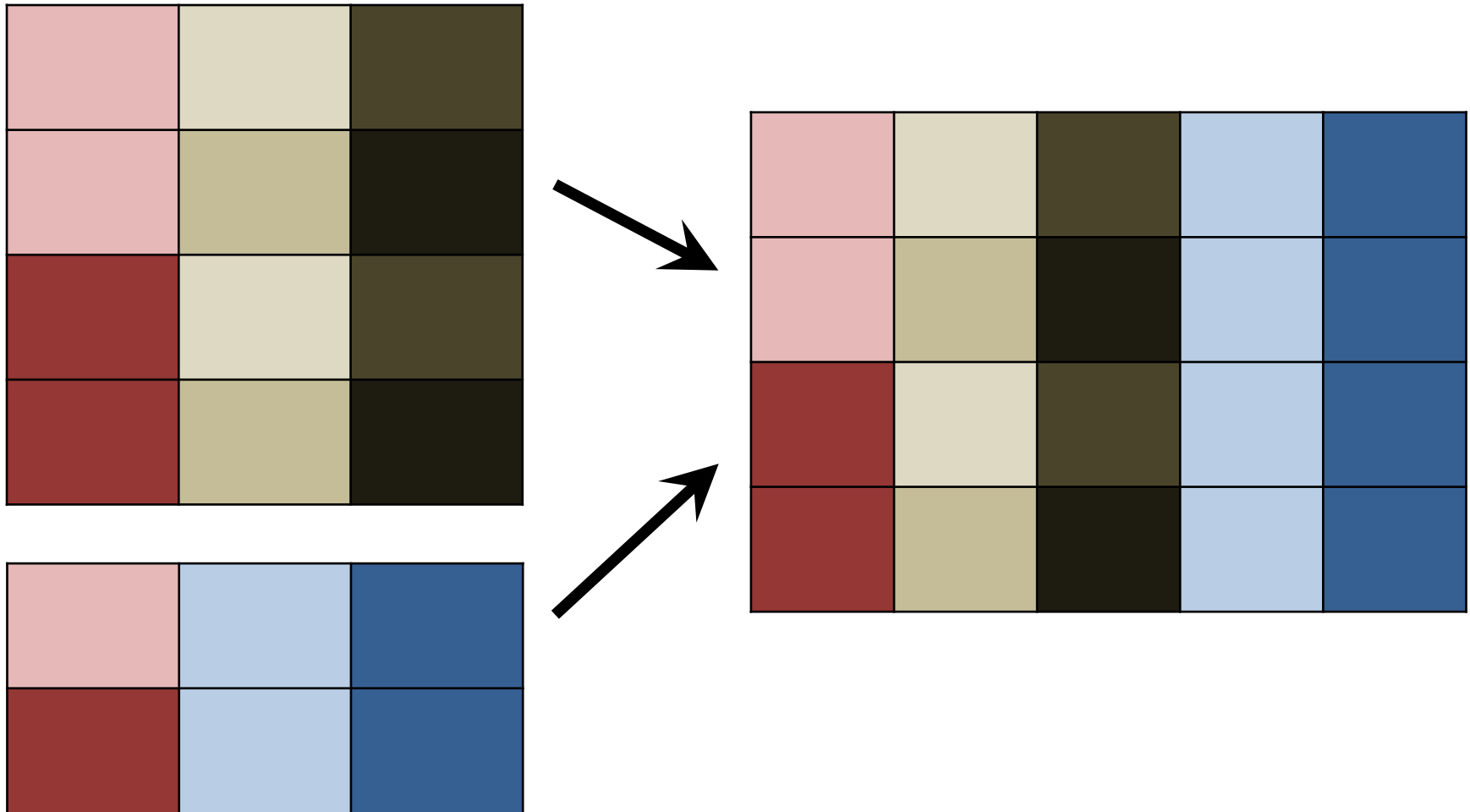
			NA	NA
			NA	NA

`left_join()`: values from 2<sup>nd</sup> table are duplicated where necessary

Light Red	Light Olive	Dark Olive
Light Red	Light Olive	Black
Dark Red	Light Olive	Dark Olive
Dark Red	Light Olive	Black

Light Red	Light Blue	Dark Blue
Dark Red	Light Blue	Dark Blue

`left_join()`: values from 2<sup>nd</sup> table are duplicated where necessary



# Several different join functions are available

- `left_join()`
- `right_join()`
- `inner_join()`
- `semi_join()`
- `full_join()`
- `anti_join()`