Data manipulation with dplyr

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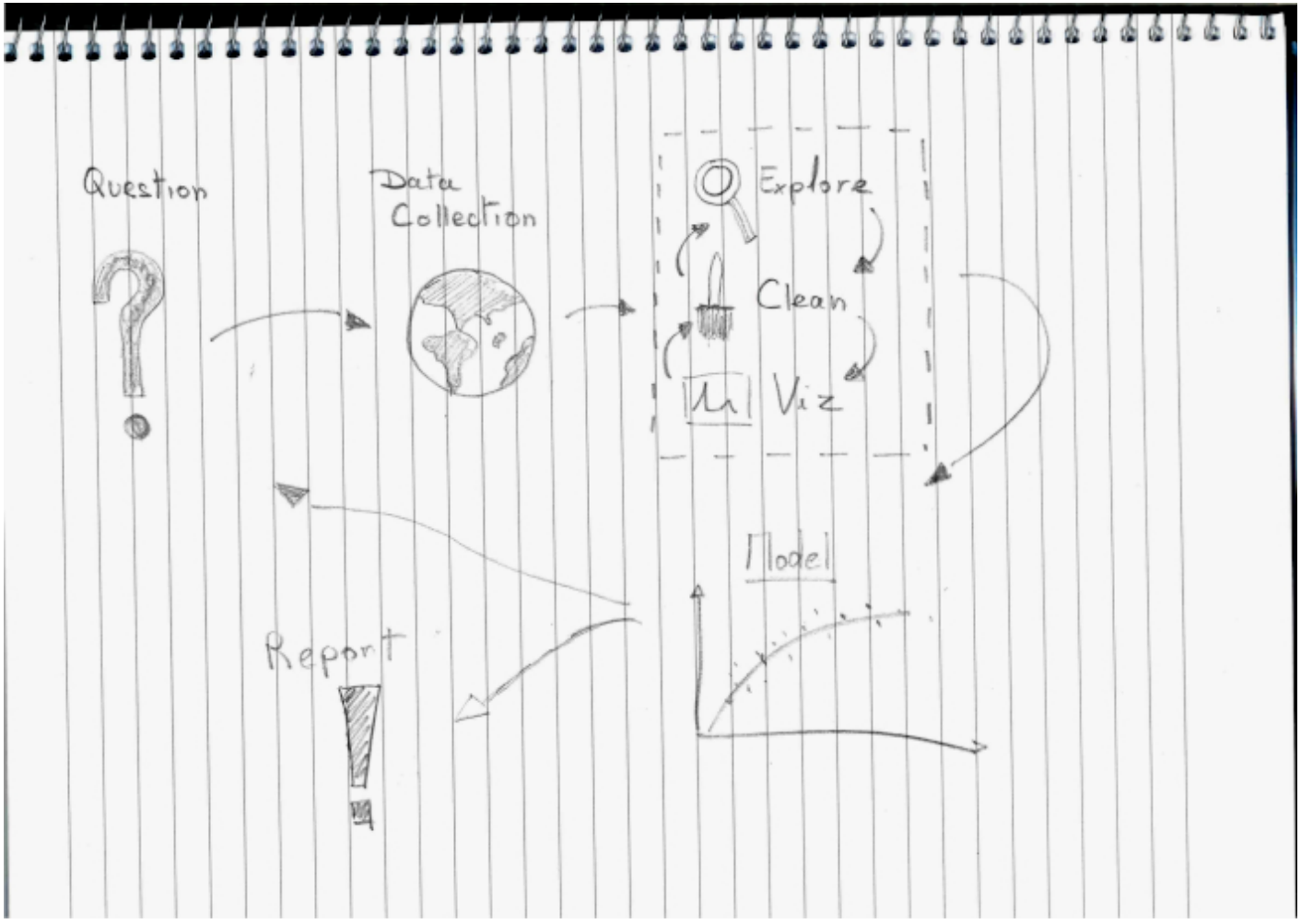
Epidemiological study workflow



Data manipulation tools

- `R` core function
- `dplyr`
- `data.table`
- `...`

Tidyverse (from www.tidyverse.org)

R packages for data science

The tidyverse is an opinionated collection of R packages designed for data science. All packages share an underlying design philosophy, grammar, and data structures.

pipe functions %>%

```
chill(fold(add(melt(add(chocolate, butter)),
               beat(add(eggs.white, cream)))))
```

pipe functions %>%

```
chill(fold(add(melt(add(chocolate, butter)),
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```

```
chocolate %>%
  add(butter) %>%
  melt() %>%
  add(
    eggs.white %>%
      add(cream) %>%
      beat()
  ) %>%
  fold() %>%
  chill()
```

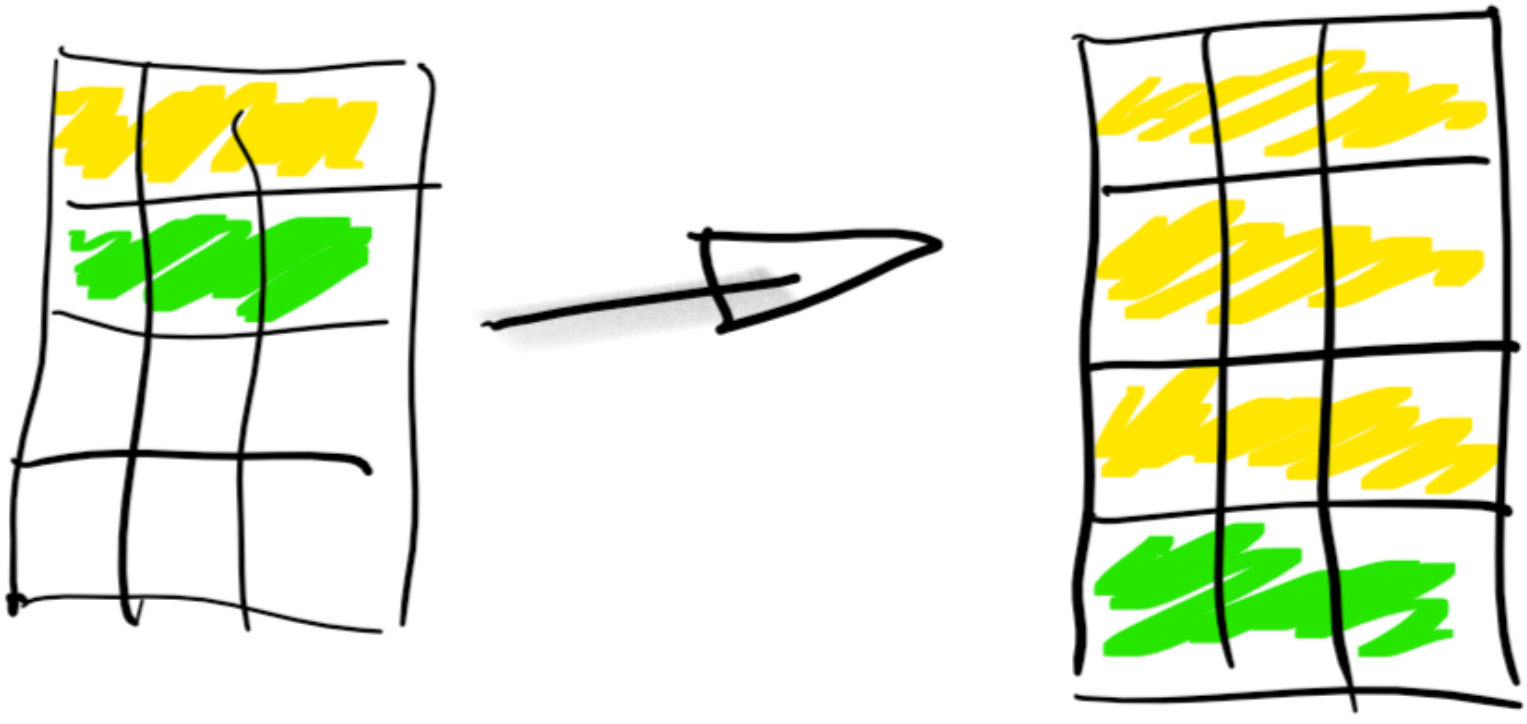
code as you speak

Data manipulation with `dplyr` is done using a limited number of **verbes** corresponding to an action to be applied to a table.

- `slice`
- `filter`
- `arrange`
- `select`
- `mutate`
- `group_by`
- `summarize`
- `join`
- `...`

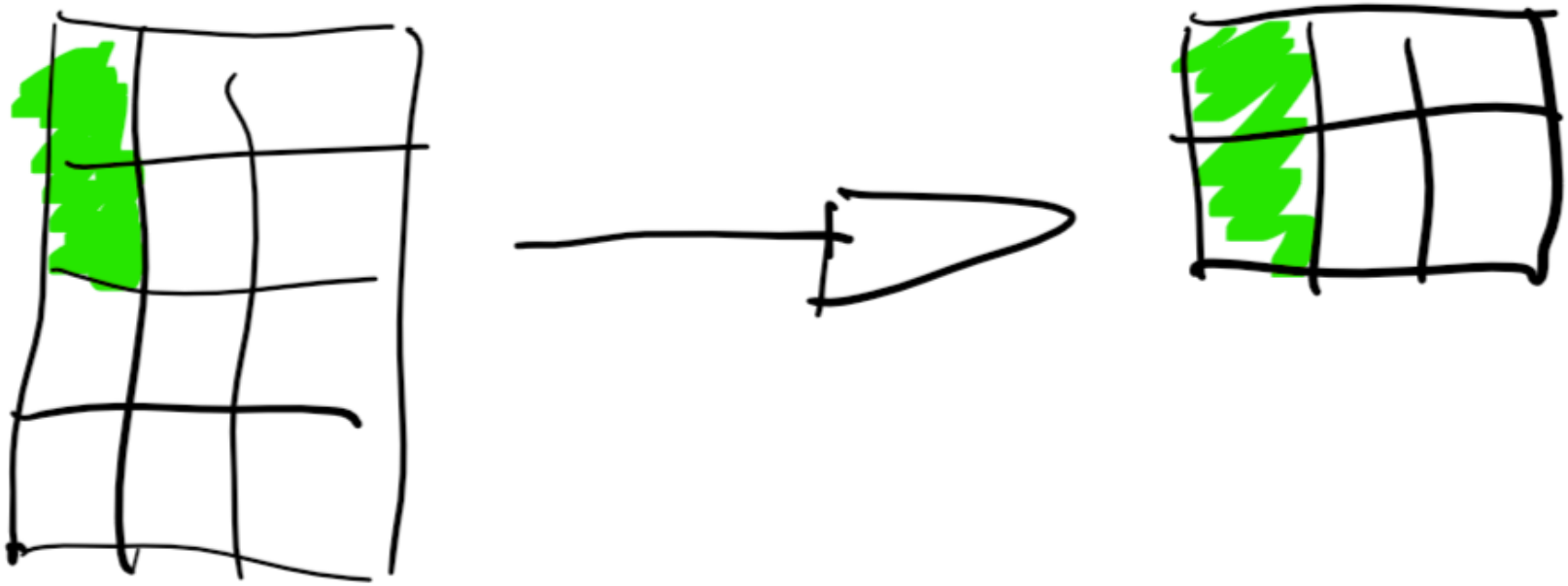
select rows

```
dat %>% slice(c(1, 1, 1, 2))
```



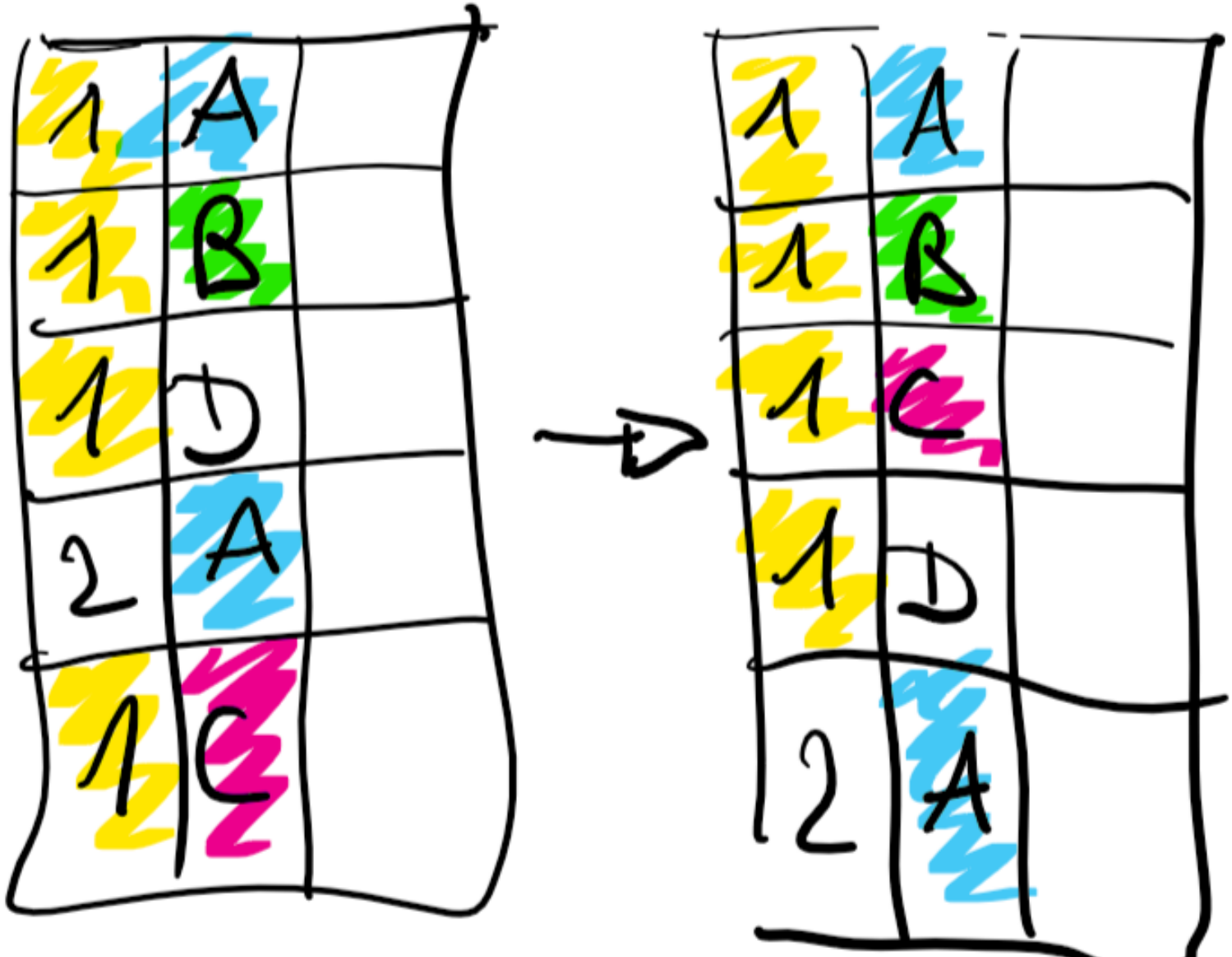
select columns

```
dat %>% filter(C1 == 'green')
```



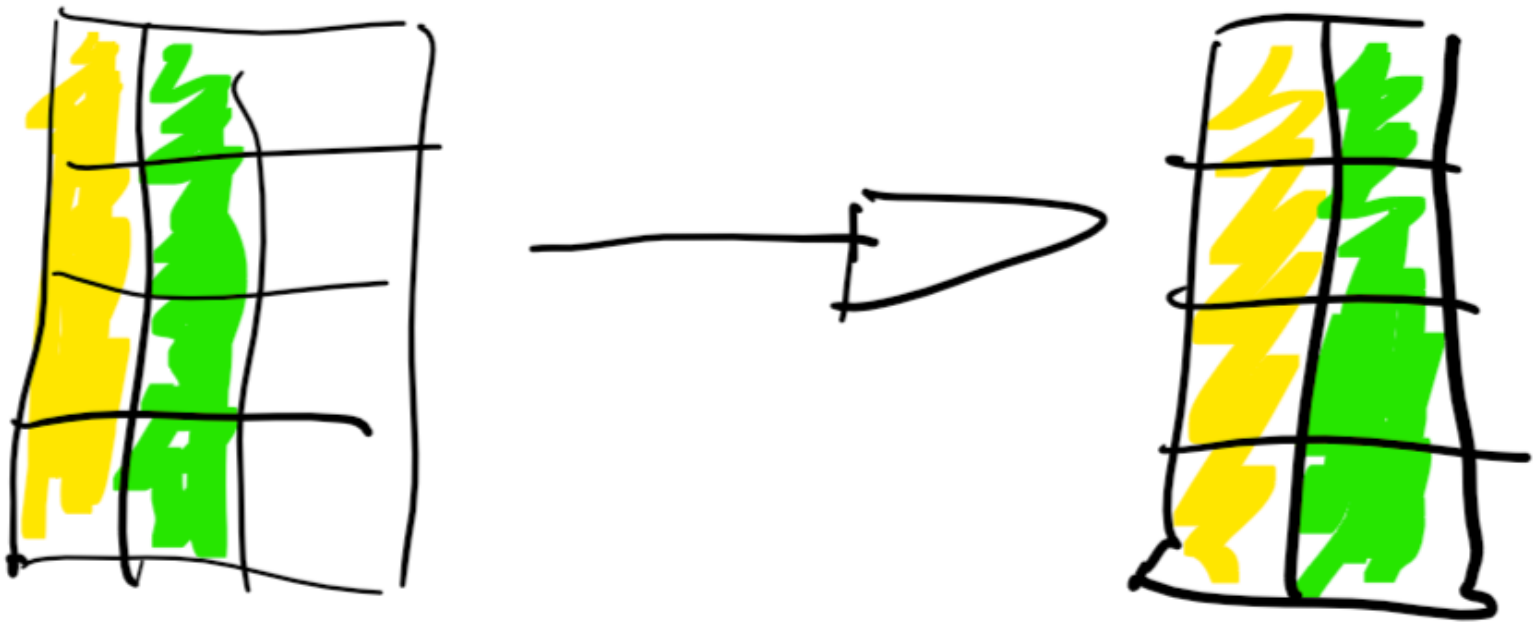
arrange rows

```
dat %>% arrange(C1, C2)
```



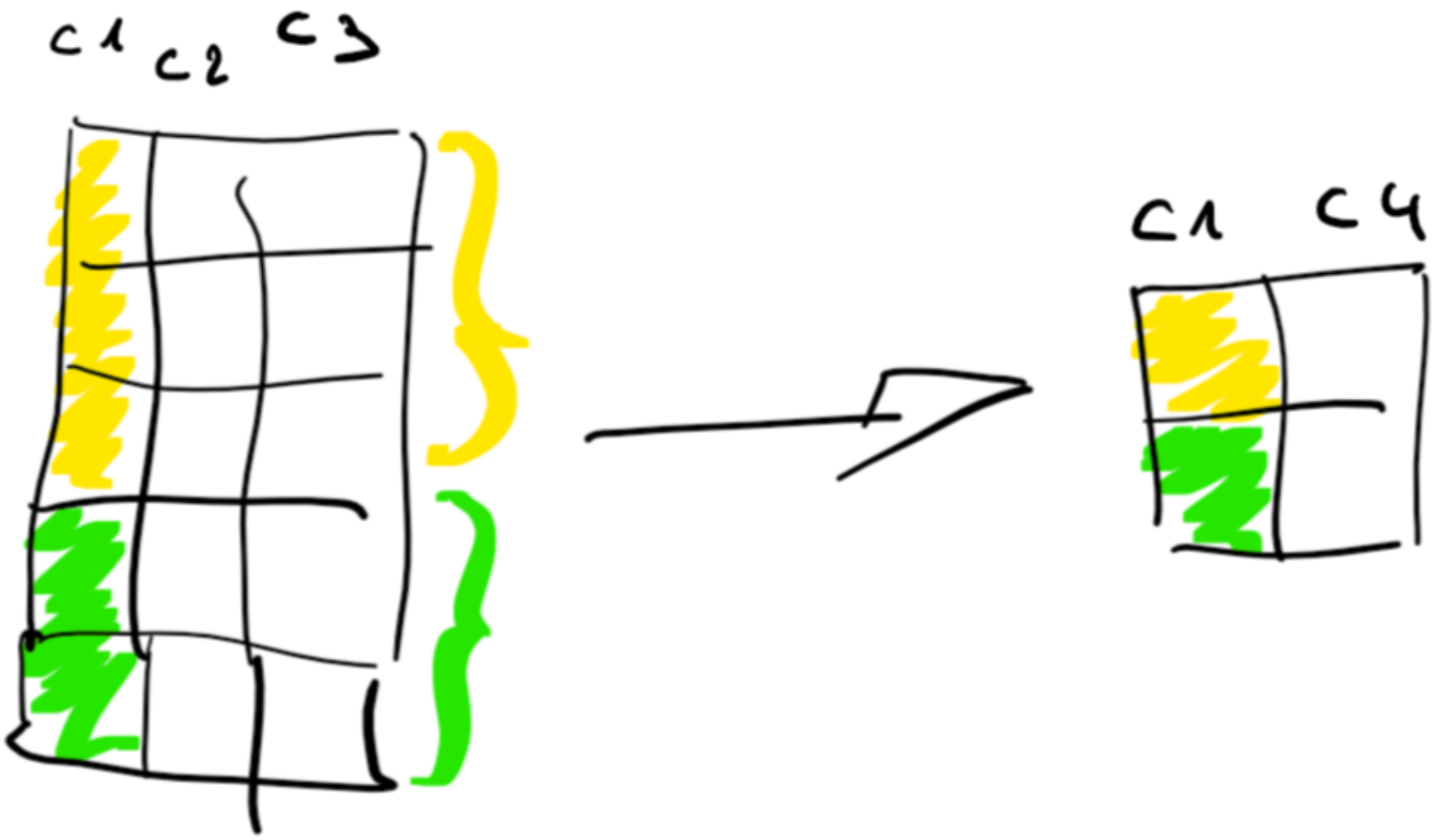
columns selection

```
dat %>% select(C1, C2)
```



group and summarize data

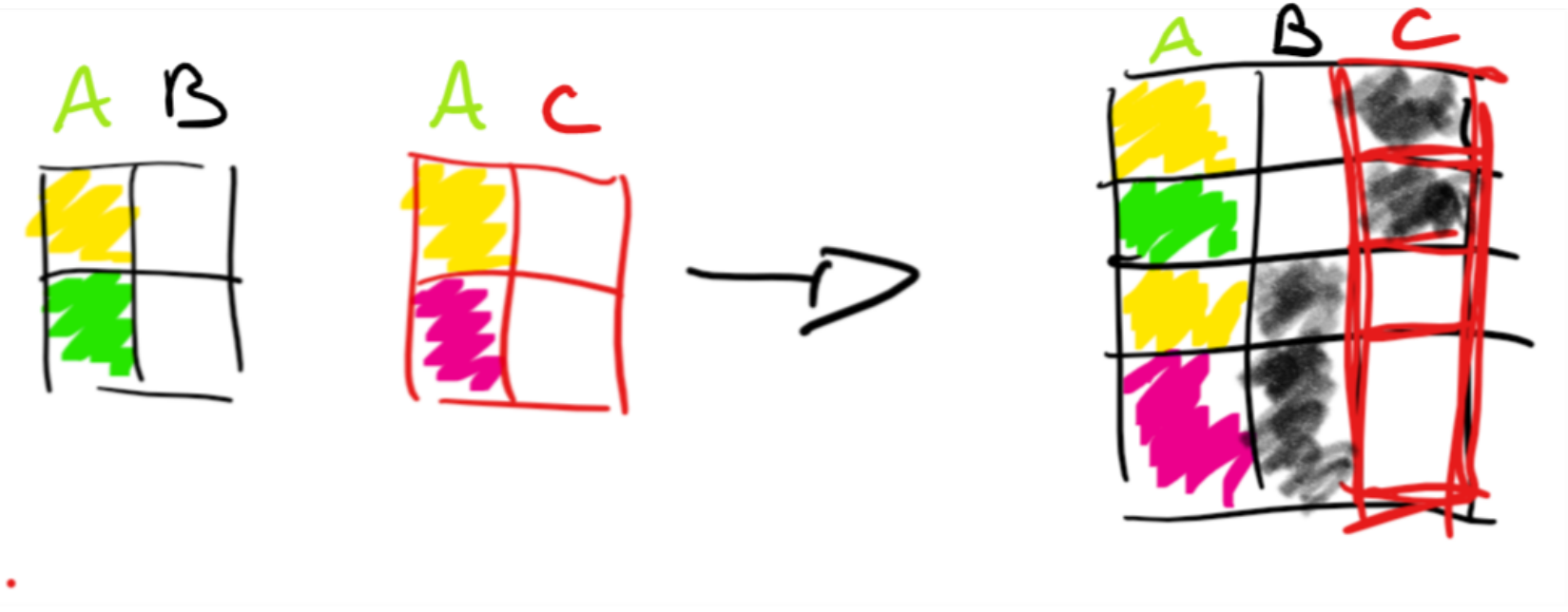
```
dat %>% group_by(C1) %>% summarize(C4 = mean(C2 + C3))
```



note: `summarise()` is an alias for `summarize()`

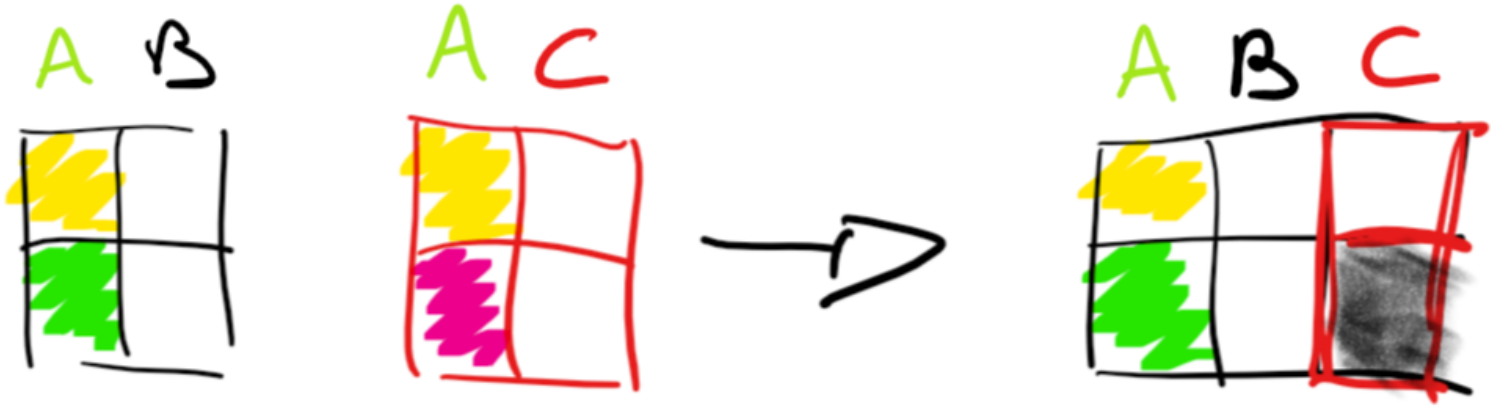
bind and merge tables

```
dat1 %>% bind_rows(dat2)
```



bind and merge tables

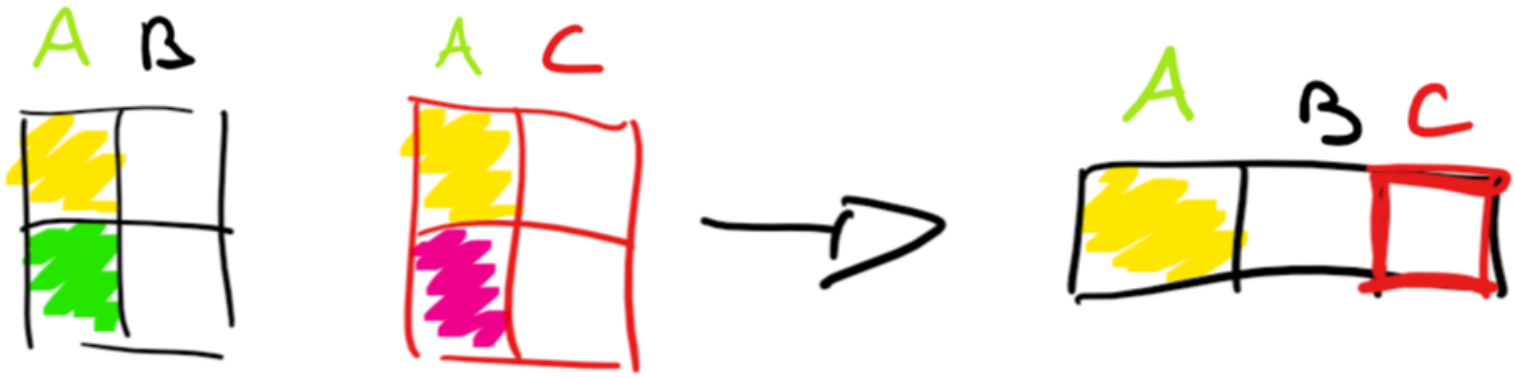
```
dat1 %>% left_join(dat2)
```



note: `right_join` will keep all rows of `dat2`

bind and merge tables

```
dat1 %>% inner_join(dat2)
```



bind and merge tables

```
dat1 %>% full_join(dat2)
```