The inner_join verb

JOINING DATA WITH DPLYR

Chris Cardillo
Data Scientist

LEGO dataset

The sets table

```
sets
```

```
# A tibble: 4,977 x 4
   set_num   name                                                 year theme_id
   <chr>     <chr>                                               <dbl>    <dbl>
 1 700.3-1   Medium Gift Set (ABB)                                1949      365
 2 700.1.1-1 Single 2 x 4 Brick (ABB)                             1950      371
 3 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB)          1950      371
 4 700.1-2   Extra-Large Gift Set (Mursten)                       1953      366
 5 700.F-1   Automatic Binding Bricks - Small Brick Set (Lego Mursten) 1953  371
 6 700.24-1  Individual 2 x 12 Bricks                             1954      371
 7 700.C.1-1 Individual 1 x 6 x 4 Panorama Window (with glass)    1954      371
 8 700.C.4-1 Individual 1 x 4 x 3 Window (with glass)             1954      371
 9 700.H-1   Individual 4 x 4 Corner Bricks                       1954      371
10 1200-1    LEGO Town Plan Board, Large Plastic                  1955      372
# … with 4,967 more rows
```

Linking two tables

```
sets %>% head(3)
```

```
# A tibble: 4,977 x 4
   set_num   name                                           year theme_id
   <chr>     <chr>                                         <dbl>    <dbl>
 1 700.3-1   Medium Gift Set (ABB)                          1949      365
 2 700.1.1-1 Single 2 x 4 Brick (ABB)                       1950      371
 3 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB)    1950      371
```

```
themes %>% head(3)
```

```
# A tibble: 665 x 3
     id name           parent_id
  <dbl> <chr>              <dbl>
1     1 Technic               NA
2     2 Arctic Technic         1
3     3 Competition            1
```

Inner join

```
sets %>%
  inner_join(themes, by = c("theme_id" = "id"))
```

```
# A tibble: 4,977 x 6
   set_num    name.x                                            year theme_id name.y        parent_id
   <chr>      <chr>                                            <dbl>    <dbl> <chr>              <dbl>
 1 700.3-1    Medium Gift Set (ABB)                             1949      365 System                NA
 2 700.1.1-1  Single 2 x 4 Brick (ABB)                          1950      371 Supplemental         365
 3 700.B.2-1  Single 1 x 2 x 3 Window without Glass (ABB)       1950      371 Supplemental         365
 4 700.1-2    Extra-Large Gift Set (Mursten)                    1953      366 Basic Set            365
 5 700.F-1    Automatic Binding Bricks - Small Brick Set (Lego Mursten) 1953 371 Supplemental       365
 6 700.24-1   Individual 2 x 12 Bricks                          1954      371 Supplemental         365
 7 700.C.1-1  Individual 1 x 6 x 4 Panorama Window (with glass) 1954      371 Supplemental         365
 8 700.C.4-1  Individual 1 x 4 x 3 Window (with glass)          1954      371 Supplemental         365
 9 700.H-1    Individual 4 x 4 Corner Bricks                    1954      371 Supplemental         365
10 1200-1     LEGO Town Plan Board, Large Plastic               1955      372 Town Plan            365
# … with 4,967 more rows
```

Customizing your join

```
sets %>%
  inner_join(themes, by = c("theme_id" = "id"), suffix = c("_set", "_theme"))
```

```
# A tibble: 4,977 x 6
   set_num    name_set                                              year theme_id name_theme   parent_id
   <chr>      <chr>                                                <dbl>    <dbl> <chr>            <dbl>
 1 700.3-1    Medium Gift Set (ABB)                                 1949      365 System              NA
 2 700.1.1-1  Single 2 x 4 Brick (ABB)                              1950      371 Supplemental       365
 3 700.B.2-1  Single 1 x 2 x 3 Window without Glass (ABB)           1950      371 Supplemental       365
 4 700.1-2    Extra-Large Gift Set (Mursten)                        1953      366 Basic Set          365
 5 700.F-1    Automatic Binding Bricks - Small Brick Set (Lego Mursten) 1953  371 Supplemental       365
 6 700.24-1   Individual 2 x 12 Bricks                              1954      371 Supplemental       365
 7 700.C.1-1  Individual 1 x 6 x 4 Panorama Window (with glass)     1954      371 Supplemental       365
 8 700.C.4-1  Individual 1 x 4 x 3 Window (with glass)              1954      371 Supplemental       365
 9 700.H-1    Individual 4 x 4 Corner Bricks                        1954      371 Supplemental       365
10 1200-1     LEGO Town Plan Board, Large Plastic                   1955      372 Town Plan          365
# … with 4,967 more rows
```

Most common themes

```
sets %>%
  inner_join(themes, by = c("theme_id" = "id"), suffix = c("_set", "_theme")) %>%
  count(name_theme, sort = TRUE)
```

```
# A tibble: 419 x 2
   name_theme         n
   <chr>          <int>
 1 Supplemental     180
 2 Basic Set        171
 3 Technic          144
 4 Friends          133
 5 Gear             122
 6 City             120
 7 Town             117
 8 Ninjago           95
 9 Service Packs     94
10 Star Wars         94
# … with 409 more rows
```

Other LEGO tables

```
parts %>% head(3)
```
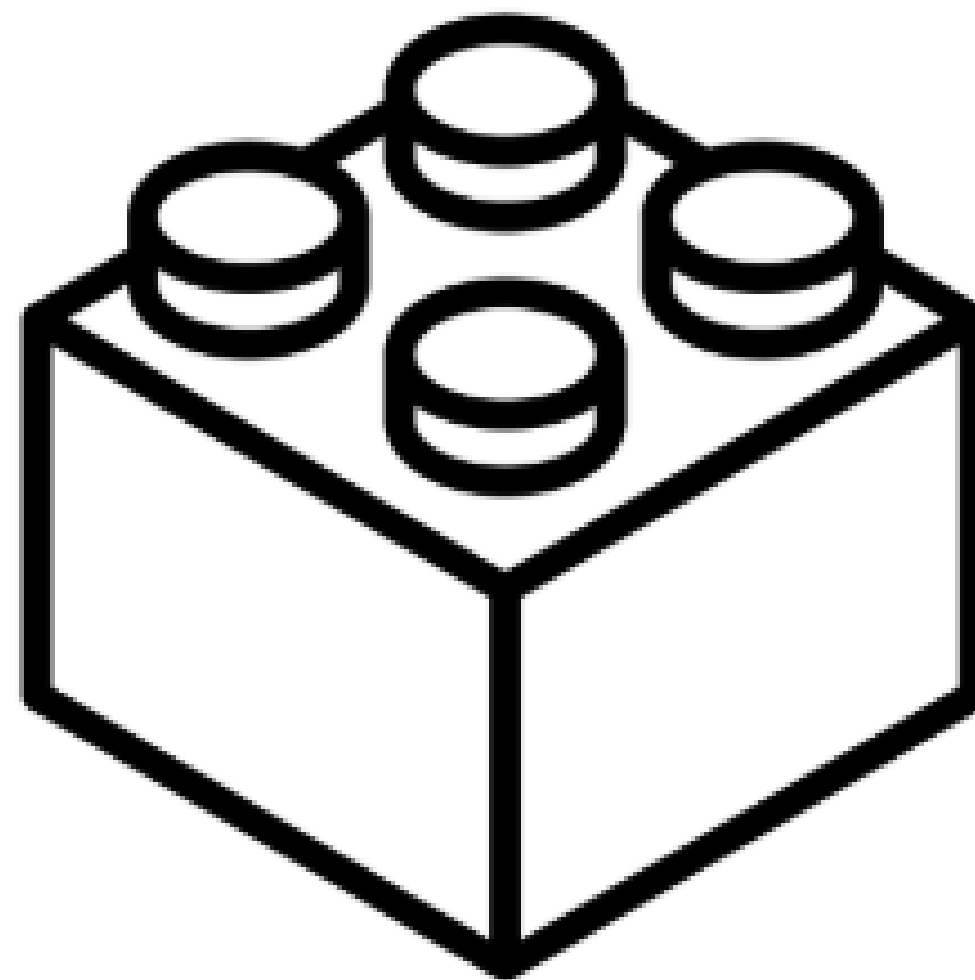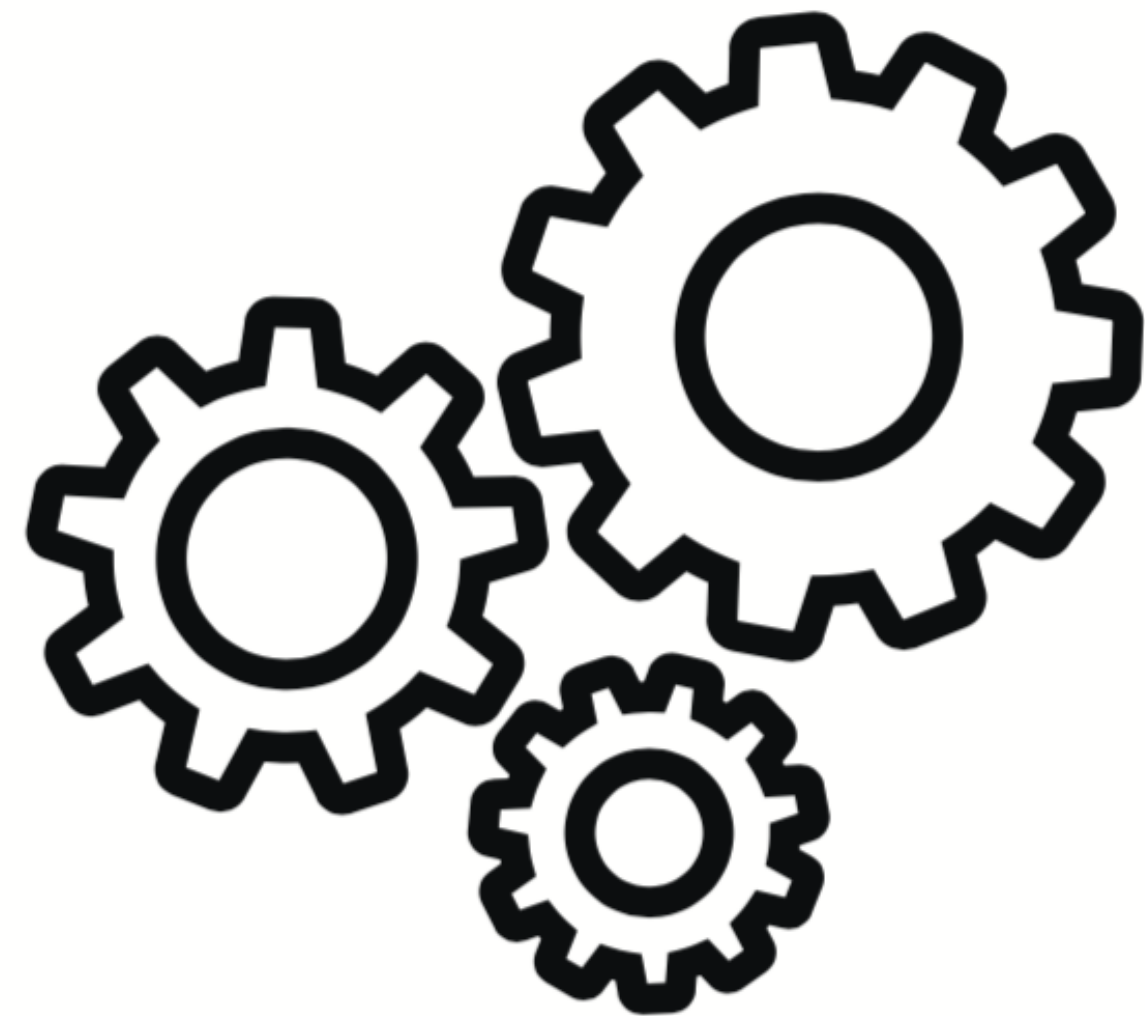
```
# A tibble: 17,501 x 3
   part_num   name                                              part_cat_id
   <chr>      <chr>                                                   <dbl>
 1 0901       Baseplate 16 x 30 with Set 080 Yellow House Print           1
 2 0902       Baseplate 16 x 24 with Set 080 Small White House Print      1
 3 0903       Baseplate 16 x 24 with Set 080 Red House Print             1
```

```
part_categories %>% head(3)
```

```
# A tibble: 64 x 2
      id name
   <dbl> <chr>
 1     1 Baseplates
 2     3 Bricks Sloped
 3     4 Duplo, Quatro and Primo
```

Part

Let's practice!

datacamp

Joining sets and themes

```r
sets %>%
  inner_join(themes, by = c("theme_id" = "id"), suffix = c("_set", "_theme"))
```

```
# A tibble: 4,977 x 6
   set_num    name_set                                            year theme_id name_theme    parent_id
   <chr>      <chr>                                              <dbl>    <dbl> <chr>             <dbl>
 1 700.3-1    Medium Gift Set (ABB)                               1949      365 System               NA
 2 700.1.1-1  Single 2 x 4 Brick (ABB)                            1950      371 Supplemental        365
 3 700.B.2-1  Single 1 x 2 x 3 Window without Glass (ABB)         1950      371 Supplemental        365
 4 700.1-2    Extra-Large Gift Set (Mursten)                      1953      366 Basic Set           365
 5 700.F-1    Automatic Binding Bricks - Small Brick Set (Lego Mursten) 1953 371 Supplemental        365
 6 700.24-1   Individual 2 x 12 Bricks                            1954      371 Supplemental        365
 7 700.C.1-1  Individual 1 x 6 x 4 Panorama Window (with glass)   1954      371 Supplemental        365
 8 700.C.4-1  Individual 1 x 4 x 3 Window (with glass)            1954      371 Supplemental        365
 9 700.H-1    Individual 4 x 4 Corner Bricks                      1954      371 Supplemental        365
10 1200-1     LEGO Town Plan Board, Large Plastic                 1955      372 Town Plan           365
# … with 4,967 more rows
```

The inventories table

```
# A tibble: 15,174 x 3
      id version set_num
   <dbl>  <dbl> <chr>
 1     1      1 7922-1
 2     3      1 3931-1
 3     4      1 6942-1
 4    15      1 5158-1
 5    16      1 903-1
 6    17      1 850950-1
 7    19      1 4444-1
 8    21      1 3474-1
 9    22      1 30277-1
10    25      1 71012-11
# … with 15,164 more rows
```

Joining sets and inventories

```
sets %>%
  inner_join(inventories, by = "set_num")
```

```
# A tibble: 5,056 x 6
   set_num   name                                     year theme_id    id version
   <chr>     <chr>                                   <dbl>    <dbl> <dbl>   <dbl>
 1 700.3-1   Medium Gift Set (ABB)                    1949      365 24197       1
 2 700.3-1   Medium Gift Set (ABB)                    1949      365 24214       2
 3 700.3-1   Medium Gift Set (ABB)                    1949      365 24215       3
 4 700.1.1-1 Single 2 x 4 Brick (ABB)                 1950      371 11831       1
 5 700.1.1-1 Single 2 x 4 Brick (ABB)                 1950      371 24230       2
 6 700.1.1-1 Single 2 x 4 Brick (ABB)                 1950      371 24231       3
 7 700.1.1-1 Single 2 x 4 Brick (ABB)                 1950      371 24232       4
 8 700.1.1-1 Single 2 x 4 Brick (ABB)                 1950      371 24233       5
 9 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB) 1950  371   537       1
10 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB) 1950  371 24240       2
# … with 5,046 more rows
```

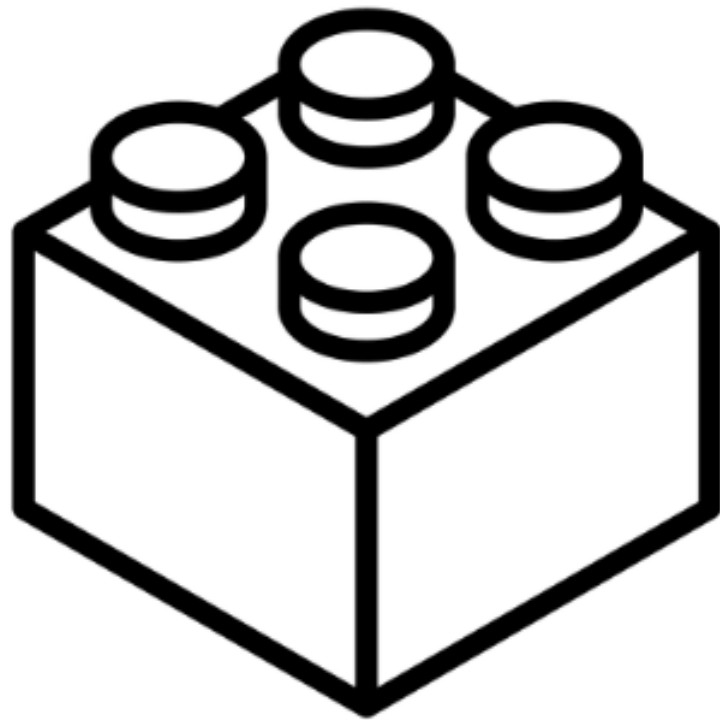# Filtering the joined table

```
sets %>%
  inner_join(inventories, by = "set_num") %>%
  filter(version == 1)
```

```
# A tibble: 4,976 x 6
   set_num   name                                                  year theme_id     id version
   <chr>     <chr>                                                <dbl>    <dbl>  <dbl>   <dbl>
 1 700.3-1   Medium Gift Set (ABB)                                 1949      365  24197       1
 2 700.1.1-1 Single 2 x 4 Brick (ABB)                              1950      371  11831       1
 3 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB)           1950      371    537       1
 4 700.1-2   Extra-Large Gift Set (Mursten)                        1953      366  12985       1
 5 700.F-1   Automatic Binding Bricks - Small Brick Set (Lego Mursten)  1953  371  11265     1
 6 700.24-1  Individual 2 x 12 Bricks                              1954      371   7645       1
 7 700.C.1-1 Individual 1 x 6 x 4 Panorama Window (with glass)     1954      371   3896       1
 8 700.C.4-1 Individual 1 x 4 x 3 Window (with glass)              1954      371   3663       1
 9 700.H-1   Individual 4 x 4 Corner Bricks                        1954      371  15503       1
10 1200-1    LEGO Town Plan Board, Large Plastic                   1955      372  10761       1
# … with 4,966 more rows
```

Parts and pieces

part + color = piece

The inventory parts
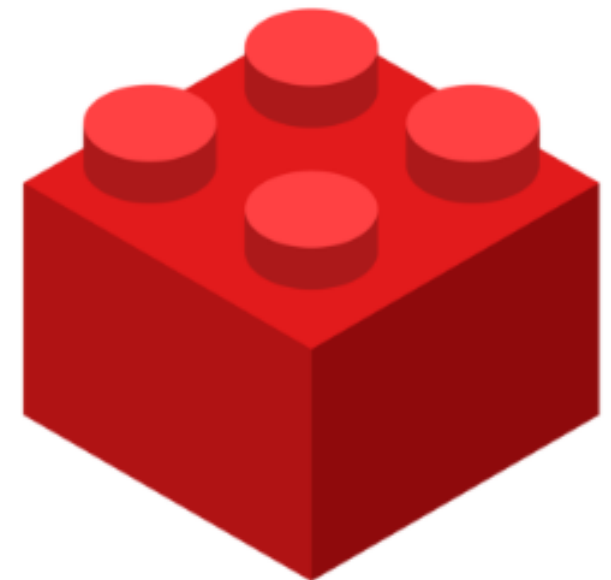
inventory_parts

```
# A tibble: 258,958 x 4
   inventory_id part_num              color_id quantity
          <dbl> <chr>                    <dbl>    <dbl>
 1           21 3009                         7       50
 2           25 21019c00pat004pr1033        15        1
 3           25 24629pr0002                 78        1
 4           25 24634pr0001                  5        1
 5           25 24782pr0001                  5        1
 6           25 88646                        0        1
 7           25 973pr3314c01                 5        1
 8           26 14226c11                     0        3
 9           26 2340px2                     15        1
10           26 2340px3                     15        1
# … with 258,948 more rows
```

Let's practice!

JOINING DATA WITH DPLYR

Joining three or more tables

JOINING DATA WITH DPLYR

Chris Cardillo
Data Scientist

Joining sets and inventories

```
sets %>%
  inner_join(inventories, by = "set_num")
```

```
# A tibble: 5,056 x 6
   set_num   name                                      year theme_id    id version
   <chr>     <chr>                                     <dbl>    <dbl> <dbl>   <dbl>
 1 700.3-1   Medium Gift Set (ABB)                      1949      365 24197       1
 2 700.3-1   Medium Gift Set (ABB)                      1949      365 24214       2
 3 700.3-1   Medium Gift Set (ABB)                      1949      365 24215       3
 4 700.1.1-1 Single 2 x 4 Brick (ABB)                   1950      371 11831       1
 5 700.1.1-1 Single 2 x 4 Brick (ABB)                   1950      371 24230       2
 6 700.1.1-1 Single 2 x 4 Brick (ABB)                   1950      371 24231       3
 7 700.1.1-1 Single 2 x 4 Brick (ABB)                   1950      371 24232       4
 8 700.1.1-1 Single 2 x 4 Brick (ABB)                   1950      371 24233       5
 9 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB) 1950      371   537       1
10 700.B.2-1 Single 1 x 2 x 3 Window without Glass (ABB) 1950      371 24240       2
# … with 5,046 more rows
```

The themes table

themes

```
# A tibble: 665 x 3
      id name           parent_id
   <dbl> <chr>              <dbl>
 1     1 Technic               NA
 2     2 Arctic Technic         1
 3     3 Competition            1
 4     4 Expert Builder         1
 5     5 Model                  1
 6     6 Airport                5
 7     7 Construction           5
 8     8 Farm                   5
 9     9 Fire                   5
10    10 Harbor                 5
# … with 655 more rows
```

Adding another join
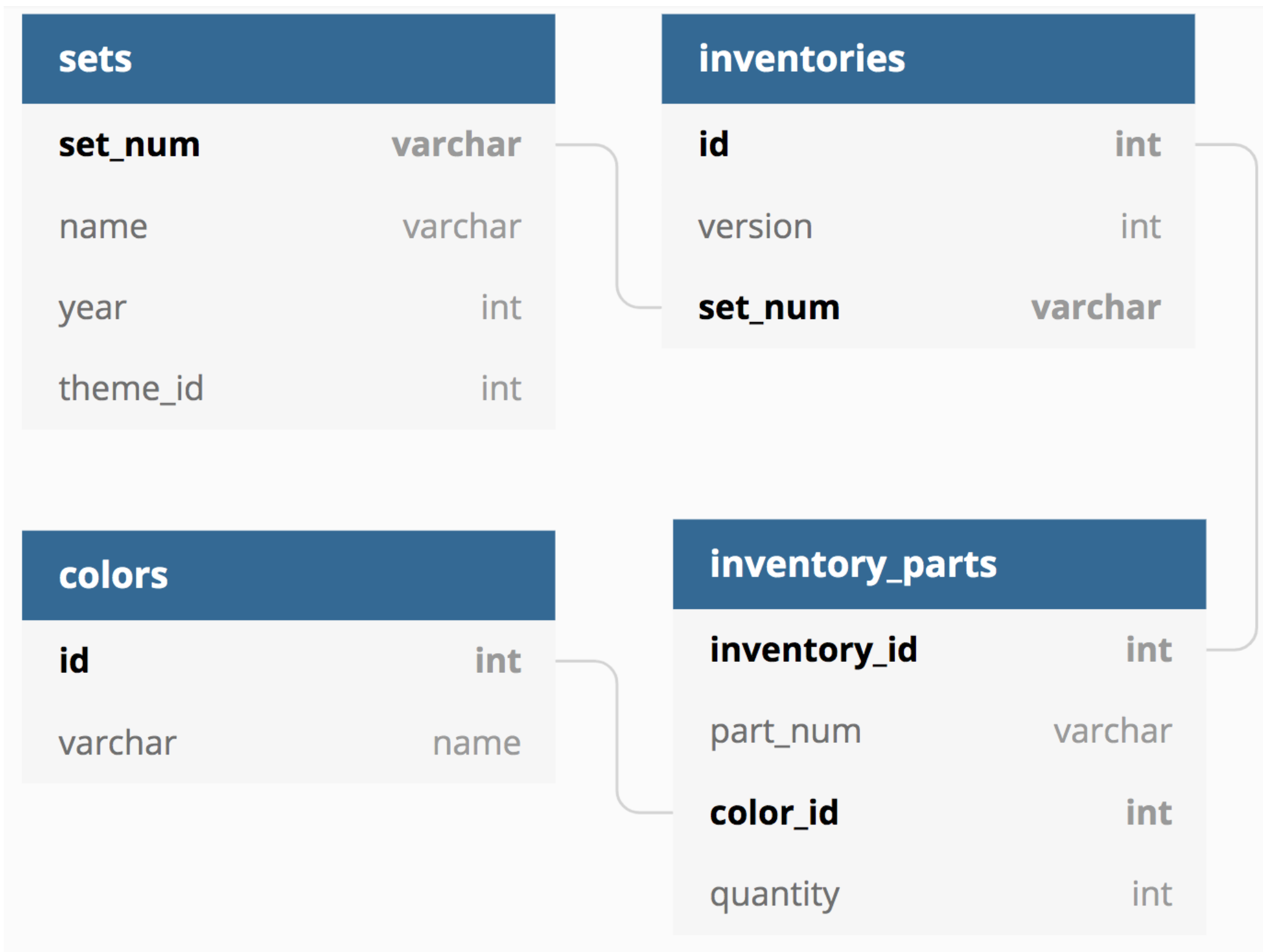
```
sets %>%
  inner_join(inventories, by = "set_num") %>%
  inner_join(themes, by = c("theme_id" = "id"))
```

```
# A tibble: 5,056 x 8
   set_num   name.x                        year theme_id    id version name.y      parent_id
   <chr>     <chr>                        <dbl>    <dbl> <dbl>   <dbl> <chr>           <dbl>
 1 700.3-1   Medium Gift Set (ABB)         1949      365 24197       1 System             NA
 2 700.3-1   Medium Gift Set (ABB)         1949      365 24214       2 System             NA
 3 700.3-1   Medium Gift Set (ABB)         1949      365 24215       3 System             NA
 4 700.1.1-1 Single 2 x 4 Brick (ABB)      1950      371 11831       1 Supplemen…        365
 5 700.1.1-1 Single 2 x 4 Brick (ABB)      1950      371 24230       2 Supplemen…        365
 6 700.1.1-1 Single 2 x 4 Brick (ABB)      1950      371 24231       3 Supplemen…        365
 7 700.1.1-1 Single 2 x 4 Brick (ABB)      1950      371 24232       4 Supplemen…        365
 8 700.1.1-1 Single 2 x 4 Brick (ABB)      1950      371 24233       5 Supplemen…        365
 9 700.B.2-1 Single 1 x 2 x 3 Window without … 1950  371   537       1 Supplemen…        365
10 700.B.2-1 Single 1 x 2 x 3 Window without … 1950  371 24240       2 Supplemen…        365
# … with 5,046 more rows
```

Recall: suffix

```
sets %>%
  inner_join(inventories, by = "set_num") %>%
  inner_join(themes, by = c("theme_id" = "id"), suffix = c("_set", "_theme"))
```

```
# A tibble: 5,056 x 8
   set_num   name_set                    year theme_id    id version name_theme   parent_id
   <chr>     <chr>                       <dbl>  <dbl> <dbl>   <dbl> <chr>            <dbl>
 1 700.3-1   Medium Gift Set (ABB)       1949    365 24197       1 System              NA
 2 700.3-1   Medium Gift Set (ABB)       1949    365 24214       2 System              NA
 3 700.3-1   Medium Gift Set (ABB)       1949    365 24215       3 System              NA
 4 700.1.1-1 Single 2 x 4 Brick (ABB)    1950    371 11831       1 Supplement…        365
 5 700.1.1-1 Single 2 x 4 Brick (ABB)    1950    371 24230       2 Supplement…        365
 6 700.1.1-1 Single 2 x 4 Brick (ABB)    1950    371 24231       3 Supplement…        365
 7 700.1.1-1 Single 2 x 4 Brick (ABB)    1950    371 24232       4 Supplement…        365
 8 700.1.1-1 Single 2 x 4 Brick (ABB)    1950    371 24233       5 Supplement…        365
 9 700.B.2-1 Single 1 x 2 x 3 Window without…  1950    371   537       1 Supplement…        365
10 700.B.2-1 Single 1 x 2 x 3 Window without…  1950    371 24240       2 Supplement…        365
# … with 5,046 more rows
```

sets

set_num	**varchar**
name	varchar
year	int
theme_id	int

inventories

id	**int**
version	int
set_num	**varchar**

colors

id	**int**
varchar	name

inventory_parts

inventory_id	**int**
part_num	varchar
color_id	**int**
quantity	int

Let's practice!

datacamp