Scoped verbs: A subtitle

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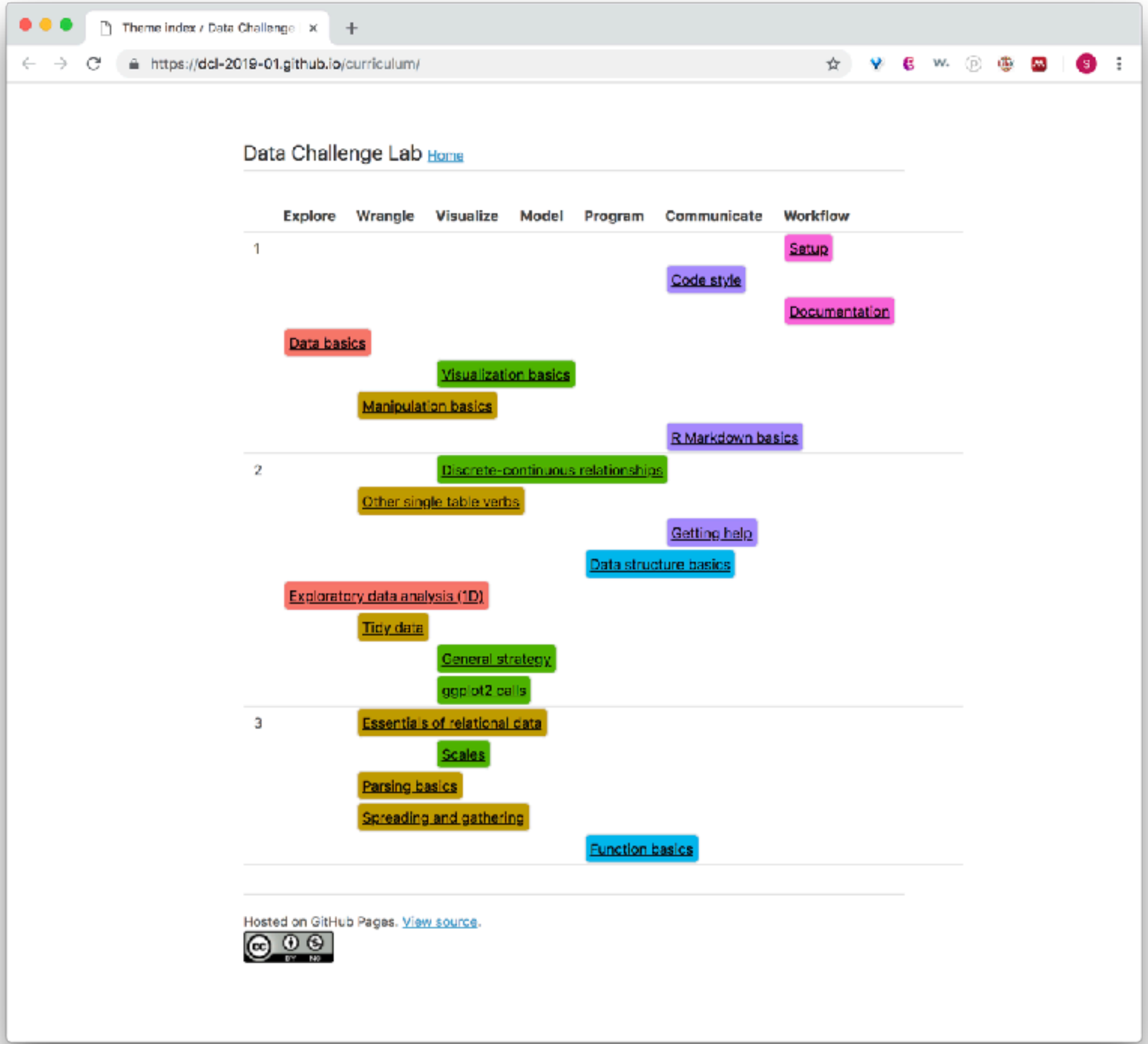
Data Challenge Lab



Theme index / Data Challenge

https://dcl-2019-01.github.io/curriculum/

Data Challenge Lab Home

	Explore	Wrangle	Visualize	Model	Program	Communicate	Workflow
1							Setup
						Code style	
							Documentation
	Data basics						
			Visualization basics				
		Manipulation basics					
						R Markdown basics	
2			Discrete-continuous relationships				
		Other single table verbs					
						Getting help	
					Data structure basics		
	Exploratory data analysis (1D)						
		Tidy data					
			General strategy				
			ggplot2 calls				
3		Essentials of relational data					
			Scales				
		Parsing basics					
		Spreading and gathering					
					Function basics		

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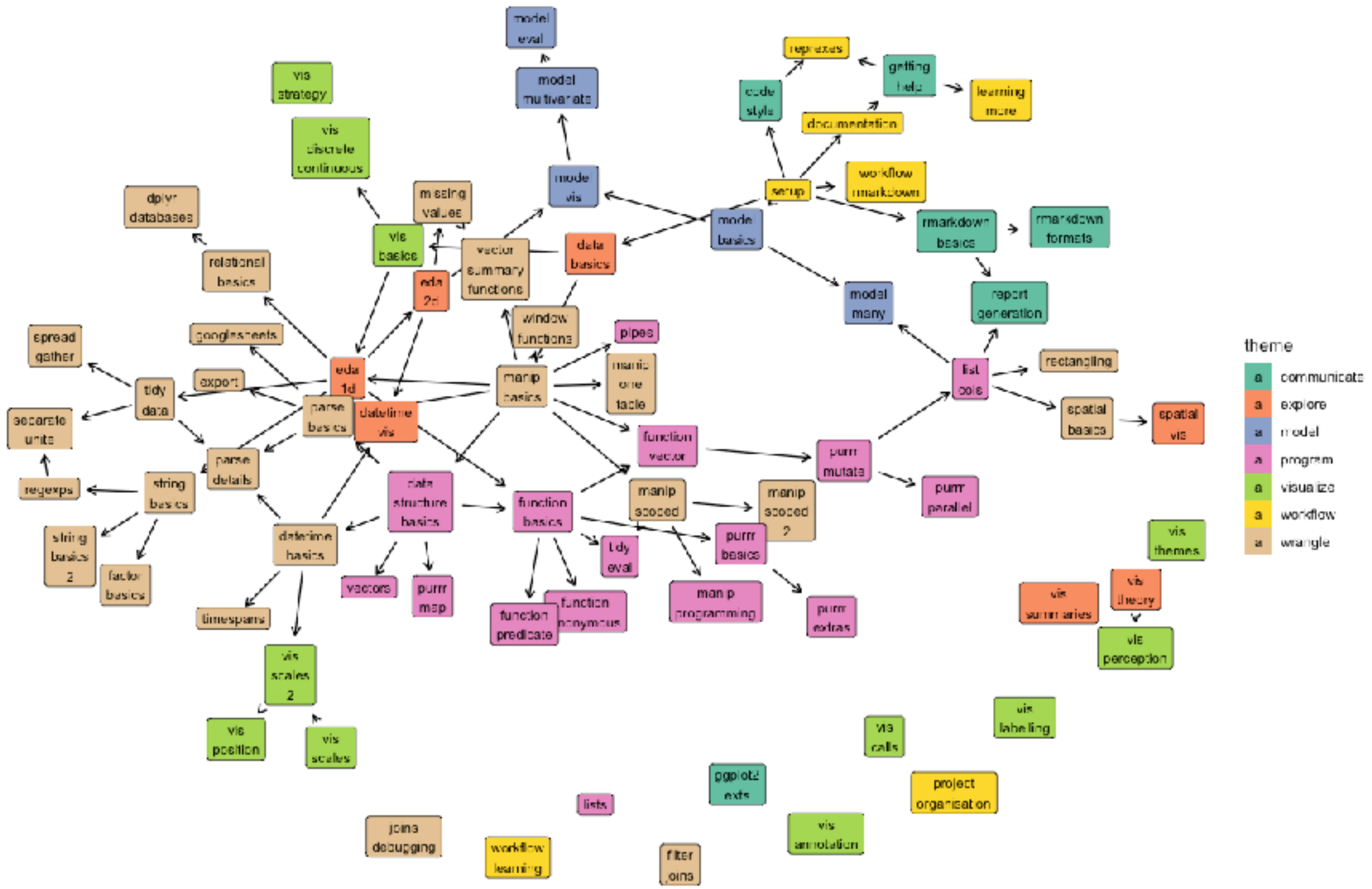
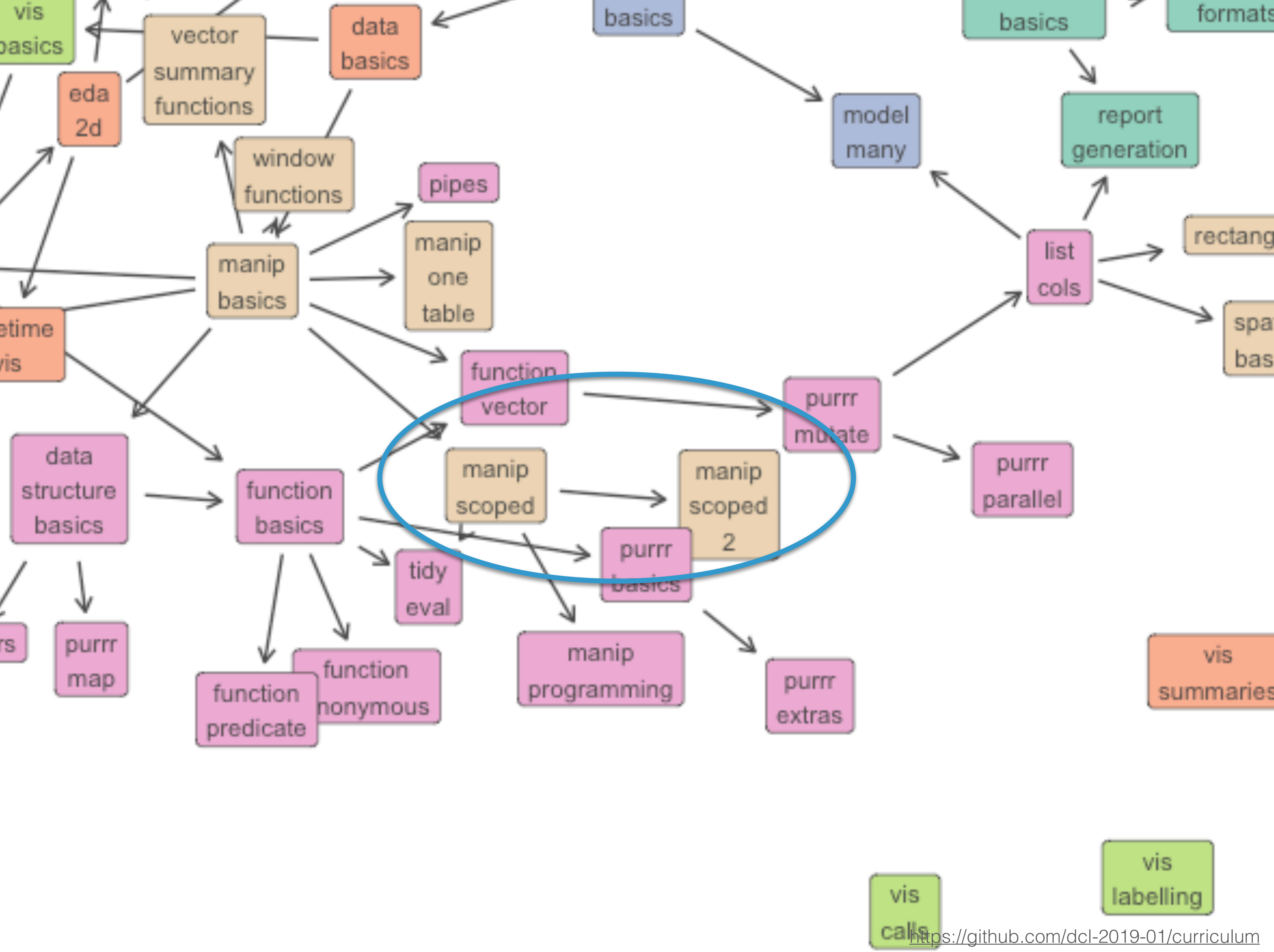


https://github.com/dcl-2019-01/curriculum



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dplyr verbs

mutate()

summarize()

filter()

rename()

select()

group_by()

dplyr

www.rstudio.com

dplyr

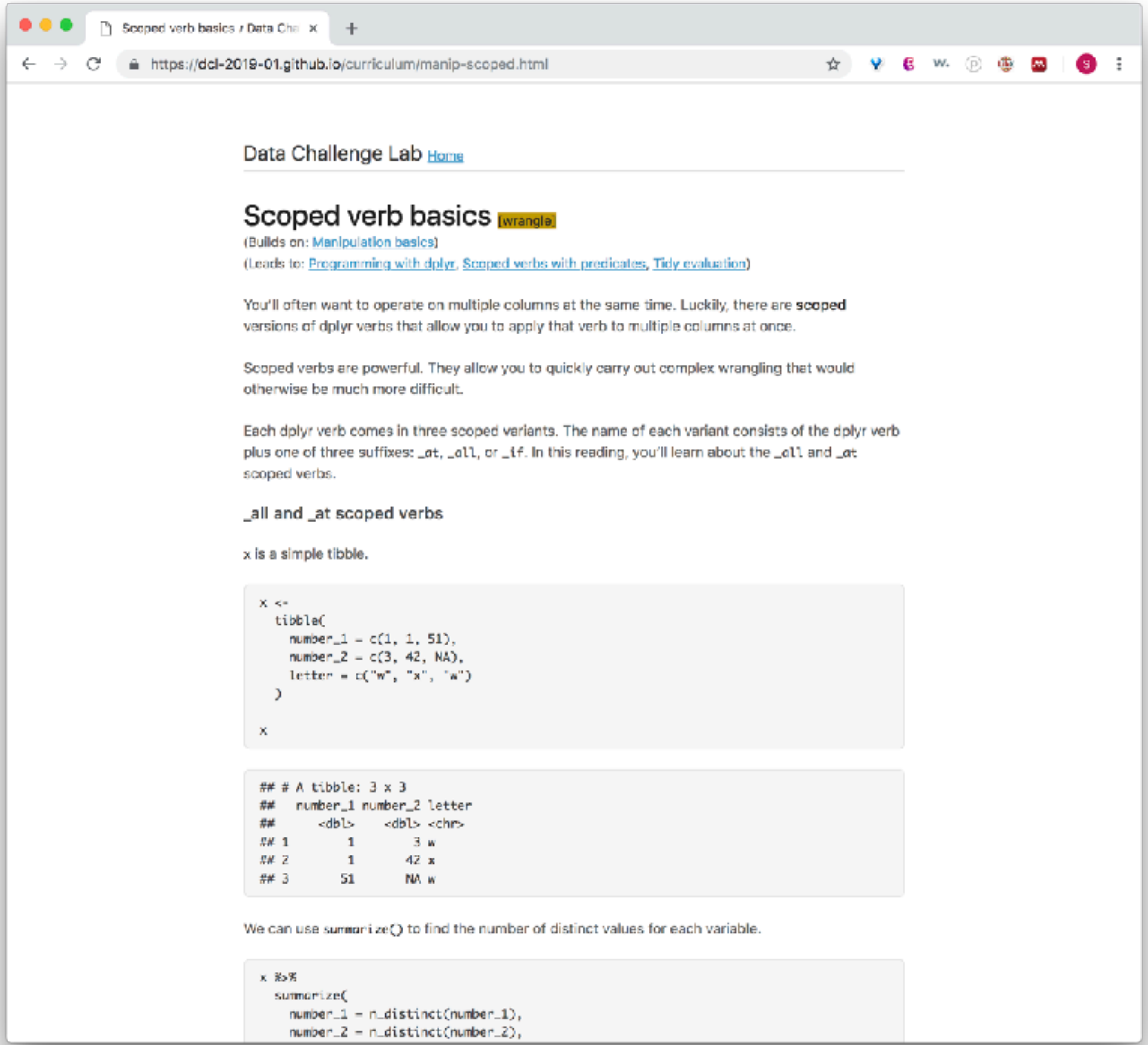
select helpers

predicate functions

anonymous functions

…

logic


Scoped verb basics / Data Cha
https://dcl-2019-01.github.io/curriculum/manip-scoped.html

Data Challenge Lab Home

Scoped verb basics [wrangle]

(Builds on: Manipulation basics)
(Leads to: Programming with dplyr, Scoped verbs with predicates, Tidy evaluation)

You'll often want to operate on multiple columns at the same time. Luckily, there are **scoped** versions of dplyr verbs that allow you to apply that verb to multiple columns at once.

Scoped verbs are powerful. They allow you to quickly carry out complex wrangling that would otherwise be much more difficult.

Each dplyr verb comes in three scoped variants. The name of each variant consists of the dplyr verb plus one of three suffixes: `_at`, `_all`, or `_if`. In this reading, you'll learn about the `_all` and `_at` scoped verbs.

_all and _at scoped verbs

x is a simple tibble.

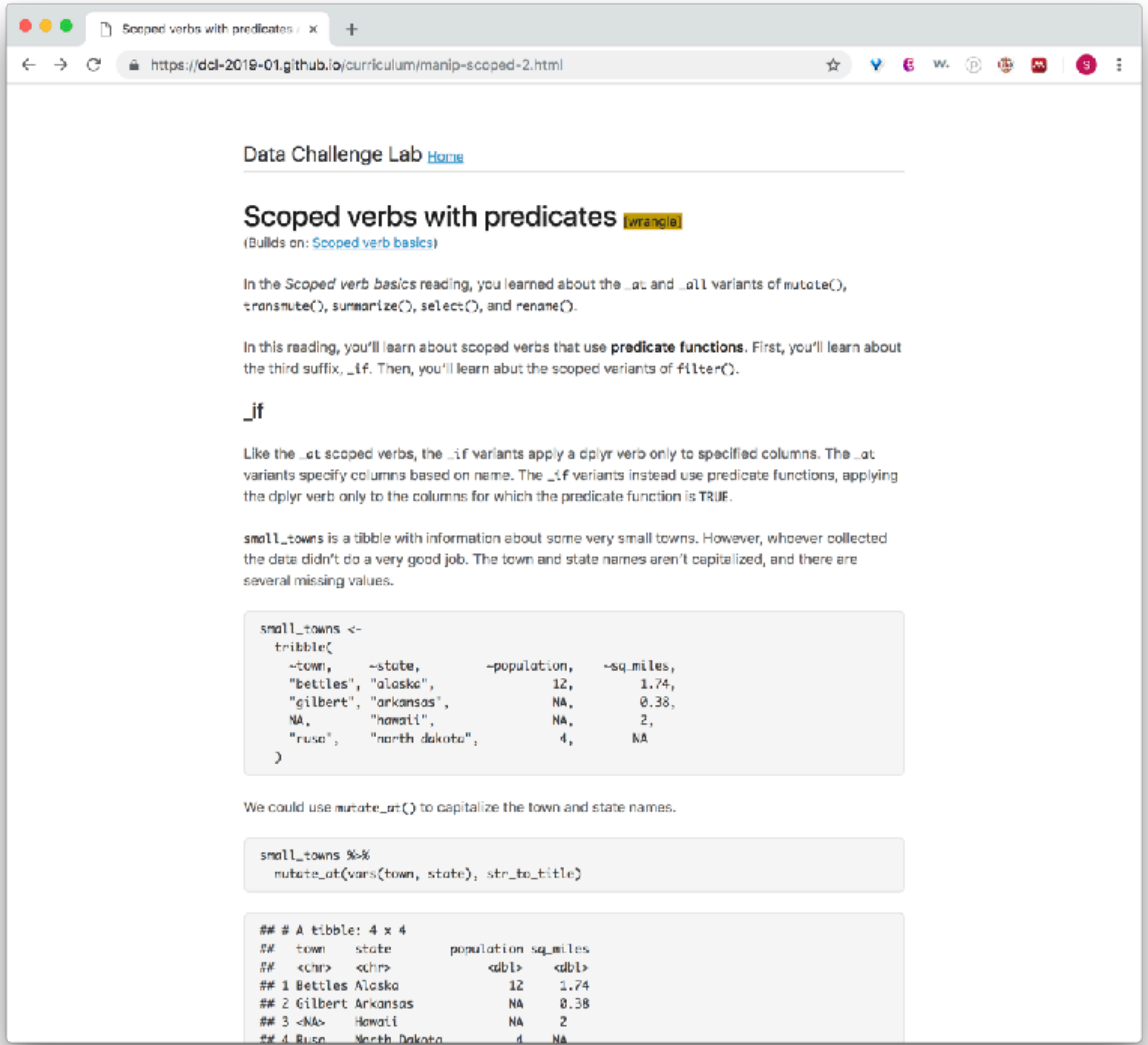
```
x <-
  tibble(
    number_1 = c(1, 1, 51),
    number_2 = c(3, 42, NA),
    letter = c("w", "x", "w")
  )

x
```

```
## # A tibble: 3 x 3
##   number_1 number_2 letter
##      <dbl>    <dbl> <chr>
## 1        1        3 w
## 2        1       42 x
## 3       51       NA w
```

We can use `summarize()` to find the number of distinct values for each variable.

```
x %>%
  summarize(
    number_1 = n_distinct(number_1),
    number_2 = n_distinct(number_2),
```

https://dcl-2018-04.github.io/curriculum/manip-scoped.html


Scoped verbs with predicates
https://dcl-2019-01.github.io/curriculum/manip-scoped-2.html

Data Challenge Lab Home

Scoped verbs with predicates [wrangle]

(Builds on: Scoped verb basics)

In the *Scoped verb basics* reading, you learned about the `_at` and `_all` variants of `mutate()`, `transmute()`, `summarize()`, `select()`, and `rename()`.

In this reading, you'll learn about scoped verbs that use **predicate functions**. First, you'll learn about the third suffix, `_if`. Then, you'll learn abut the scoped variants of `filter()`.

_if

Like the `_at` scoped verbs, the `_if` variants apply a dplyr verb only to specified columns. The `_at` variants specify columns based on name. The `_if` variants instead use predicate functions, applying the dplyr verb only to the columns for which the predicate function is `TRUE`.

`small_towns` is a tibble with information about some very small towns. However, whoever collected the data didn't do a very good job. The town and state names aren't capitalized, and there are several missing values.

```
small_towns <-
  tribble(
    ~town,      ~state,         ~population,    ~sq_miles,
    "bettles", "alaska",                12,         1.74,
    "gilbert", "arkansas",              NA,         0.38,
    NA,        "hawaii",                NA,         2,
    "ruso",    "north dakota",           4,        NA
  )
```

We could use `mutate_at()` to capitalize the town and state names.

```
small_towns %>%
  mutate_at(vars(town, state), str_to_title)
```

```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 Bettles Alaska               12     1.74
## 2 Gilbert Arkansas             NA     0.38
## 3 <NA>    Hawaii               NA     2
## 4 Ruso    North Dakota          4    NA
```

https://dcl-2019-01.github.io/curriculum/manip-scoped-2.html

```
small_towns <-
  tribble(
    ~town,     ~state,          ~population,    ~sq_miles,
    "bettles", "alaska",                12,         1.74,
    "gilbert", "arkansas",              NA,         0.38,
    NA,        "hawaii",                NA,         2,
    "ruso",    "north dakota",           4,        NA
  )

small_towns
```

```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 bettles alaska               12     1.74
## 2 gilbert arkansas             NA     0.38
## 3 <NA>    hawaii               NA     2
## 4 ruso    north dakota          4    NA
```

Simple case

```
small_towns %>%
  summarize(
    town = n_distinct(town),
    state = n_distinct(state),
    population = n_distinct(population),
    sq_miles = n_distinct(sq_miles)
  )
```

```
## # A tibble: 1 x 4
##    town state population sq_miles
##   <int> <int>      <int>    <int>
## 1     4     4          3        4
```

duplication!

Format

dplyr verb		*suffix*
mutate		**_all**
summarize	**+**	**_at**
filter		**_if**
rename		
...		

Simple case

```
small_towns %>%
  summarize_all(           )
```

```
## # A tibble: 1 x 4
##    town state population sq_miles
##   <int> <int>      <int>    <int>
## 1     4     4          3        4
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 bettles alaska               12     1.74
## 2 gilbert arkansas             NA     0.38
## 3 <NA>    hawaii               NA     2
## 4 ruso    north dakota          4    NA
```

_at

```
small_towns %>%
  mutate_at(                                    )
```

```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 Bettles Alaska               12     1.74
## 2 Gilbert Arkansas             NA     0.38
## 3 <NA>    Hawaii               NA     2
## 4 Ruso    North Dakota          4    NA
```

...

```
mutate_all(.tbl, .funs, ...)
```

```
small_towns %>%
  summarize_at(vars(population, sq_miles), median,            )
```

Anonymous functions

```
small_towns %>%
  summarize_all(~                ))
```

Anonymous functions

```
ugly_names <-
  tibble(
    Var.1 = c(1, 2),
    Var.2 = c(3, 4)
  )
```

```r
small_towns %>%
  mutate_at(vars(town, state), str_to_title)
```

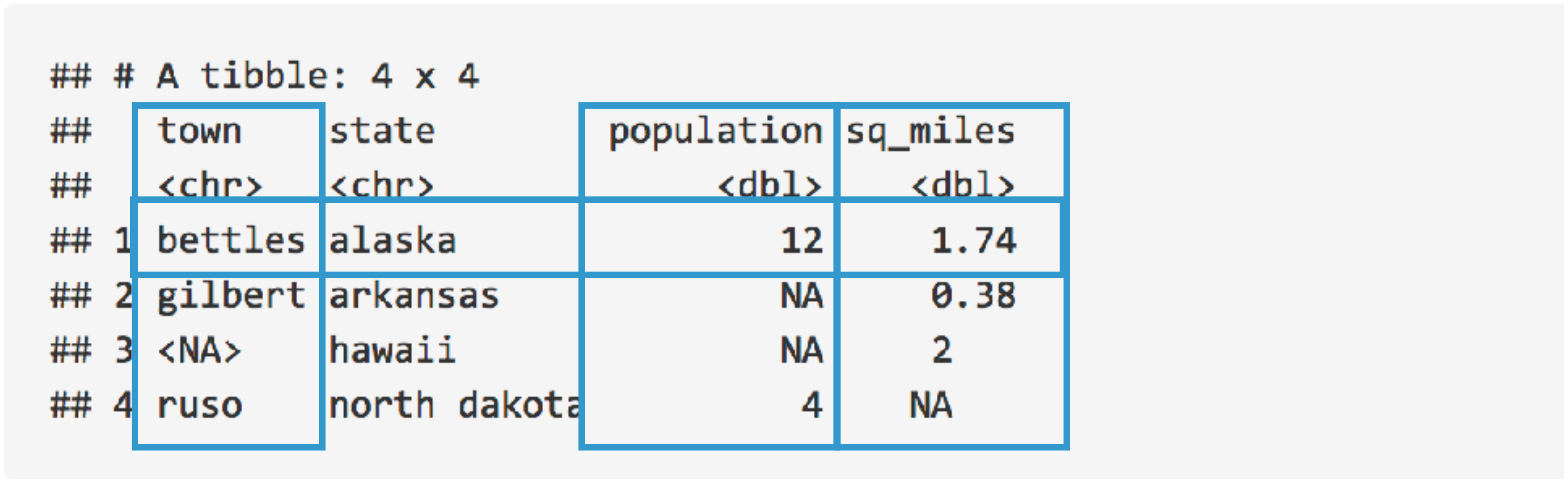
```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 Bettles Alaska               12     1.74
## 2 Gilbert Arkansas             NA     0.38
## 3 <NA>    Hawaii               NA     2   
## 4 Ruso    North Dakota          4    NA   
```

Predicate functions

```
small_towns %>%
  mutate_if(is.character, str_to_title)
```

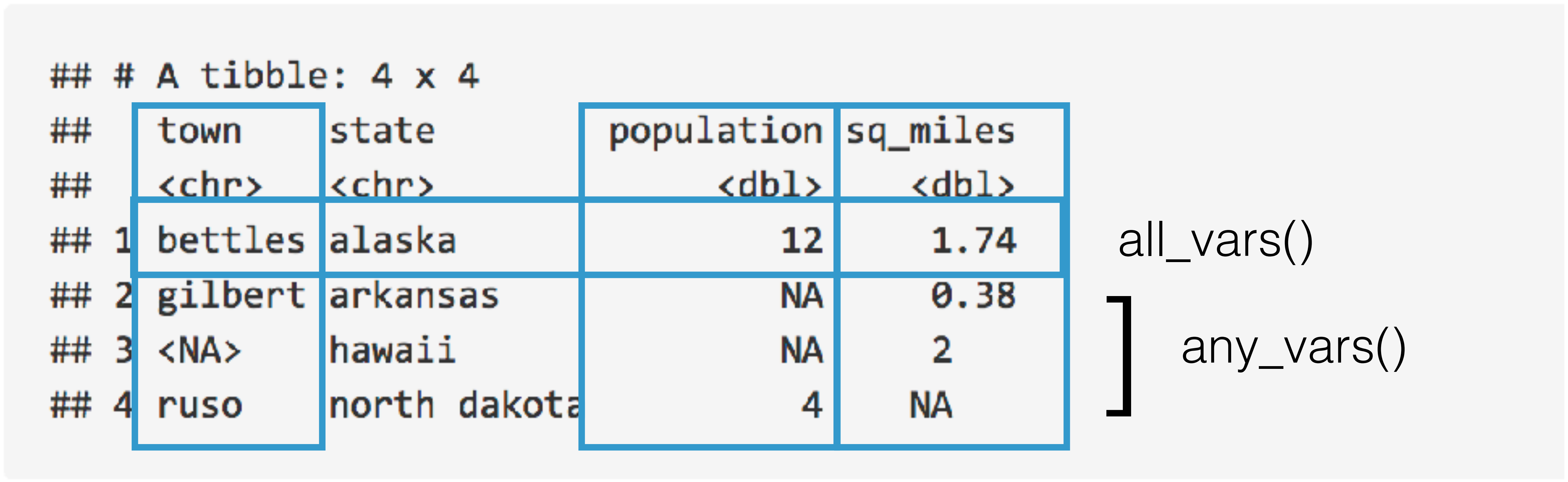
```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 Bettles Alaska               12     1.74
## 2 Gilbert Arkansas             NA     0.38
## 3 <NA>    Hawaii               NA     2   
## 4 Ruso    North Dakota          4    NA   
```

filter()



```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 bettles alaska               12     1.74
## 2 gilbert arkansas             NA     0.38
## 3 <NA>    hawaii               NA     2
## 4 ruso    north dakota          4    NA
```

any_vars(), all_vars()



```
## # A tibble: 4 x 4
##   town    state        population sq_miles
##   <chr>   <chr>             <dbl>    <dbl>
## 1 bettles alaska               12     1.74
## 2 gilbert arkansas             NA     0.38
## 3 <NA>    hawaii               NA     2
## 4 ruso    north dakota          4    NA
```

any_vars(), all_vars()

```
small_towns %>%
  filter_at(vars(town, population, sq_miles), all_vars(!is.na(.)))
```

filter_if()

```
small_towns %>%
  filter_if(is.numeric, all_vars(!is.na(.)))
```

Readings

https://dcl-2019-01.github.io/curriculum/manip-scoped.html

https://dcl-2019-01.github.io/curriculum/manip-scoped.html

https://dcl-2019-01.github.io/curriculum/function-predicate.html

https://dcl-2019-01.github.io/curriculum/function-anonymous.html

https://github.com/skaltman/slides/blob/master/manip-scoped-reference.md

Slides

https://github.com/skaltman/slides/

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