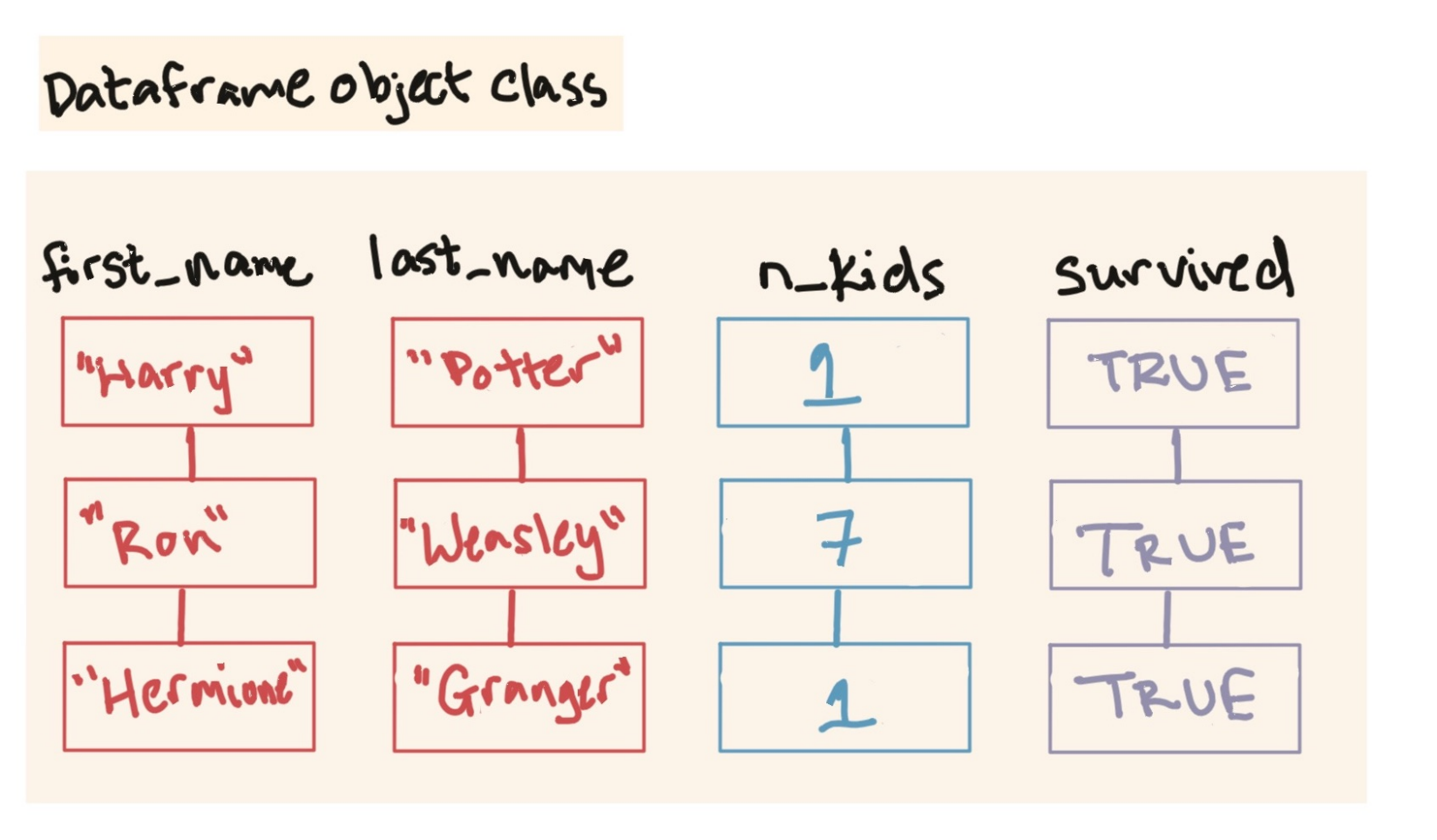
Preliminaries in R

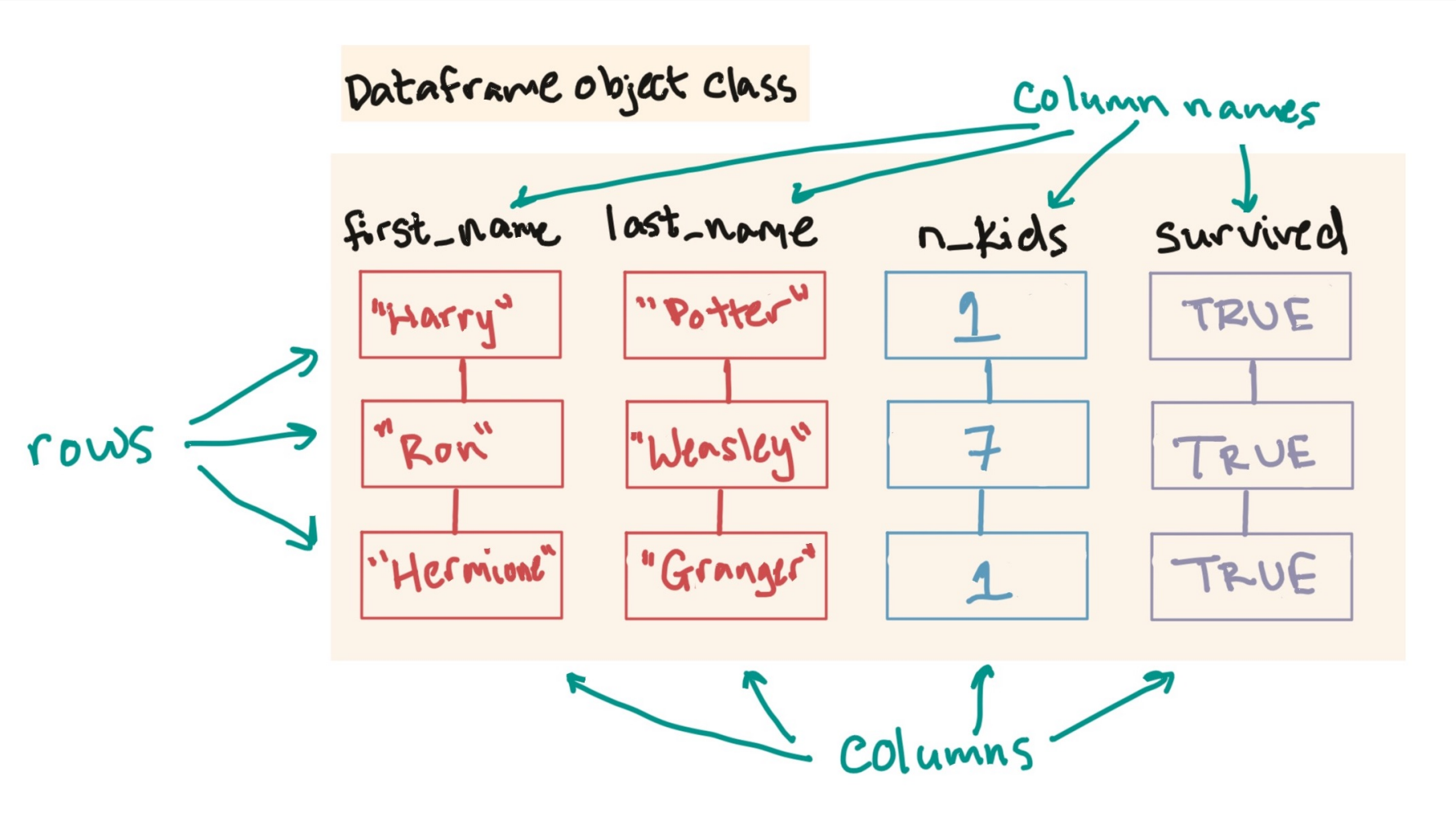
Dataframes

Structure of dataframe objects



A **dataframe** combines one or more vectors of the same length stuck together side-by-side.

Structure of dataframe objects



A dataframe contains **rows** and **columns**, and each column has a **column name**.

Creating dataframes

We'll be working with a specific class of dataframe called a **tibble**.

You can create tibble dataframe using the `tibble` function from the `tibble` package.

However, most often you will create a dataframe by reading in data from a file—most datasets will not be short enough that you want to enter them by hand in R.

We'll look at both methods of creating dataframes.

Creating dataframes

The format for creating a tibble dataframe using the `tibble` function is:

```
## Generic code
library(package = "tibble")
[name of object] <- tibble([1st column name] =
                                    [1st column content],
                           [2nd column name] =
                                    [2nd column content],
                           etc.)
```

Creating dataframes

```
library(package = "tibble")
hp_data <- tibble(first_name = c("Harry", "Ron", "Hermione"),
                  last_name = c("Potter", "Weasley", "Granger"),
                  n_kids = c(1, 7, 1),
                  survived = c(TRUE, TRUE, TRUE))
hp_data
```

```
## # A tibble: 3 x 4
##   first_name last_name n_kids survived
##   <chr>      <chr>      <dbl> <lgl>
## 1 Harry      Potter         1 TRUE
## 2 Ron        Weasley        7 TRUE
## 3 Hermione   Granger        1 TRUE
```

Creating dataframes

You can also create dataframes by joining together vector objects you previously created, as long as they have the same length and line up:

```
main_characters <- c("Harry", "Ron", "Hermione")
n_kids <- c(1, 7, 1)
hp_data <- tibble(first_name = main_characters,
                  last_name = c("Potter", "Weasley", "Granger"),
                  n_kids = n_kids,
                  survived = c(TRUE, TRUE, TRUE))
hp_data
```

```
## # A tibble: 3 x 4
##   first_name last_name n_kids survived
##   <chr>      <chr>      <dbl> <lgl>
## 1 Harry      Potter         1 TRUE
## 2 Ron        Weasley        7 TRUE
## 3 Hermione   Granger        1 TRUE
```

Creating dataframes

Usually, instead of creating a dataframe from vectors, you'll read one in from data on an outside file, for example using `read_csv` from the `readr` package.

For example, to read in a dataset from a csv file called "daily_show_guests.csv":

```
library(package = "readr")
daily_show <- read_csv(file = "daily_show_guests.csv",
                       skip = 4)
```

Creating dataframes

This has read data in from the external file into a dataframe object in my R session:

```
ls()
```

```
## [1] "daily_show"      "hp_data"         "main_characters" "n_
```

Dataframes

You can use the functions `dim`, `nrow`, and `ncol` to figure out the dimensions (number of rows and columns) of a dataframe:

```
dim(x = daily_show)
```

```
## [1] 2693    5
```

```
nrow(x = daily_show)
```

```
## [1] 2693
```

```
ncol(x = daily_show)
```

```
## [1] 5
```

Dataframes

Base R also has some useful functions for quickly exploring dataframes:

- `str`: Show the structure of an R object, including a dataframe
- `summary`: Give summaries of each column of a dataframe.

Extracting values from dataframes

The `dplyr` package has two functions for extracting data from dataframes by position: `slice` to extract rows based on their row position and select to extract columns based on their column position.

Extracting values from dataframes

For example, if you wanted to get the first two rows of the `hp_data` dataframe, you could run:

```
library(package = "dplyr")
slice(.data = hp_data, c(1:2))
```

```
## # A tibble: 2 x 4
##   first_name last_name n_kids survived
##   <chr>      <chr>      <dbl> <lgl>
## 1 Harry      Potter         1 TRUE
## 2 Ron        Weasley        7 TRUE
```

Extracting values from dataframes

If you wanted to get the first and fourth columns, you could run:

```
select(.data = hp_data, c(1, 4))
```

```
## # A tibble: 3 x 2
##   first_name survived
##   <chr>      <lgl>
## 1 Harry      TRUE
## 2 Ron        TRUE
## 3 Hermione   TRUE
```

Extracting values from dataframes

You can compose calls from both functions. For example, you could extract the values in the first and fourth columns of the first two rows with:

```
select(slice(.data = hp_data, c(1:2)), c(1, 4))
```

```
## # A tibble: 2 x 2
##   first_name survived
##   <chr>      <lgl>
## 1 Harry      TRUE
## 2 Ron        TRUE
```