Day 4 Cheatsheet

Data Summarization

Functions

Library/Package	Piece of code	Example of usage	What it does
Base `R`	`min(x)`	`min(x)`	Returns the minimum value of all values in an object `x`.
Base `R`	`sum(x)`	`sum(x)`	Returns the sum of all values (values must be integer, numeric, or logical) in object `x`.
Base `R`	`mean(x)`	`mean(x)`	Returns the arithmetic mean of all values (values must be integer or numeric) in object `x` or logical vector `x`.
Base `R`	`log(x)`	`log(x)`	Gives the natural logarithm of object `x`. `log2(x)` can be used to give the logarithm of the object in base 2. Or the base can be specified as an argument.
Base `R`	`range(x)`	`range(x)`	Gives the min and max for object `x`.
Base `R`	`sd(x)`	`sd(x)`	Gives the standard deviation for object `x`.
Base `R`	`sqrt(x)`	`sqrt(x)`	Gives the square root for object `x`.
Base `R`	`quantile(x)`	`quantile(x, probs = .5)`	Produces sample quantiles corresponding to the given probabilities `x`.
Base `R`	`summary(x)`	`summary(x)`	Returns a summary of the values in object `x`.
`dplyr`	`pull()`	`x_vect <- df %>% pull(x)`	Extract a single column into vector form. `pull()` is very handy before summary functions like `mean()`, `sum()`, etc.

Library/Package	Piece of code	Example of usage	What it does
dplyr	summarize()	df <- df %>% summarize(mean_x = mean(x))	Summarizes multiple values in an object into a single value. This function can be used with other functions to retrieve a single output value for the grouped values. summarize and summarise are synonyms in this package. However, note that this function does not work in the same manner as the base R summary function.
dplyr	distinct()	df %>% distinct(factor_name)	Display unique/distinct rows from a data frame or tibble
dplyr	n_distinct()	x_vect %>% n_distinct()	Counts the number of unique/distinct combinations in a set of one or more vectors.
dplyr	count()	df %>% count(factor_name)	Count the number of groups in a factor variable of a data frame or tibble
dplyr	group_by()	df %>% group_by(factor_name)	Groups data into rows that contain the same specified value(s)
dplyr	ungroup()	df %>% ungroup()	Undo a grouping that was done by group_by()
Base R	unique()	unique(df)	Returns a vector, data frame or array like x but with duplicate elements/rows removed.
Base R	rowSums()	rowSums(df)	Calculates sums for each row
Base R	colSums()	colSums(df)	Calculates sums for each column
Base R	rowMeans()	rowMeans(df)	Calculates means for each row
Base R	colMeans()	colMeans(df)	Calculates means for each column

- Many summarizing functions (e.g., mean(), sum()) have the argument na.rm = TRUE. This can be used to ignore missing data.

Data Classes

Major concepts

- **Character** - strings or individual characters, quoted
- **Numeric** - any real number(s)
- **Double** - a special subset of numeric that contains fractional values.
- **Integer** - any integer(s)/whole numbers
- **Factor** - categorical/qualitative variables
- **Logical** - variables composed of TRUE or FALSE
- **Date/POSIXct** - represents calendar dates and times
- **matrix** - Two-dimensional class of data where all rows and columns consist of the same data type.
- **data frame** - Two-dimensional class of data where all columns can be of different data types.
- **list** - Can be of varying dimensions and can hold any kind of data type. Can hold vectors, strings, matrices, models, list of other lists.

Functions

Library/Package	Piece of code	Example of usage	What it does
Base `R`	`as.numeric(x)`	`as.numeric(x)`	Coerces object x into numeric class. This type of function can be used to coerce object `x` into other data types, i.e., `as.character`, `as.numeric`, `as.data.frame`, `as.matrix`, `as.Date` etc.
`lubridate`	`ymd(x)`	`ymd("2024-01-31")`	Coerces character object x into date class. The format of the character object determines the function to use. Other examples include `mdy()`, `dmy()`, etc.

- `lubridate` is a powerful, widely used R package from "tidyverse" family to work with Date / POSIXct class objects

* This format was adapted from the cheatsheet format from AlexsLemonade.