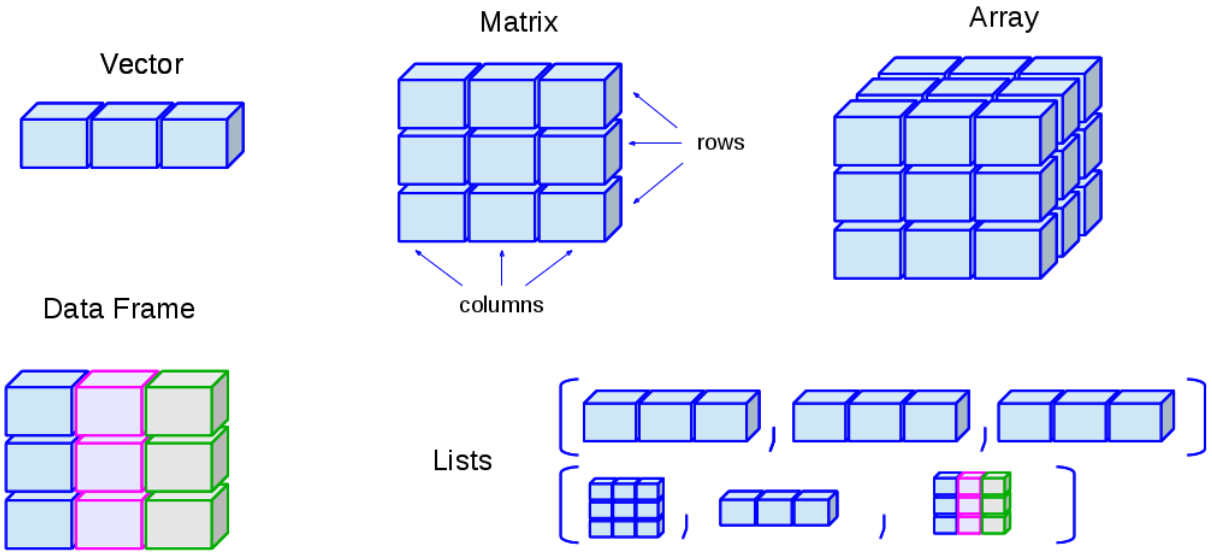
Recap

STA 326 2.0 Programming and Data Analysis with R

Data structures



- Explicit coercion
- Combining objects
- Name elements
- Subsetting
- tibble and factor
- dataframe vs tibble
- Simplifying vector creations

Simple mathematical and statistical functions

R can be used as a simple calculator.

Operator	Description
+	addition
-	substraction
*	multiplication
^	exponentiation (5^2 is 25)
%%	modulo-remainder of the division of the number to the left by the number on its right. (5%%3 is 2)

Some more maths functions

Operator	Description
abs(x)	absolute value of x
log(x, base=y)	logarithm of x with base y; if base is not specified, returns the natural logarithm
exp(x)	exponential of x
sqrt(x)	square root of x
factorial(x)	factorial of x

Basic statistic functions

Operator	Description
mean(x)	mean of x
median(x)	median of x
mode(x)	mode of x
var(x)	variance of x
scale(x)	z-score of x
quantile(x)	quantiles of x
summary(x)	summary of x: mean, minimum, maximum, etc.

Probability distribution functions

- **d** prefix for the **distribution** function
- **p** prefix for the **cummulative probability**
- **q** prefix for the **quantile**
- **r** prefix for the **random** number generator

Logical operations

Logical operator	less than
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
==	exactly equal to
!=	not equal to
!x	Not x
x	y
x & y	x AND y
isTRUE(x)	test if X is TRUE

Matrix operations

- Matrix multiplication
- Transpose
- ets

Handling missing observations

```
is.na
```

Writing functions with R

```
function_name <- function(inputs){

<FUNCTION BODY>

}
```

Programming styles

- base R
- tidyverse
- pipe operator %>%

Import and Export data

- readr functions

Data Visualization

- qplot
- ggplot

Data Transform and Data Wrangling

- `tidyr` and `dplyr` functions

Reproducible reporting

- Rmarkdown

Random number generation

- built-in functions in R

Statistical modelling and Inference

- Regression analysis
- Hypotheses testing

You can update this with all the topics we discussed.