

Vectorization and List Arithmetics



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Today we are going to learn...

1 Vectorization

2 Apply a function to some margins of a matrix or an array

3 List Arithmetics

Vectorization

- The traditional `for` and `while` loops
- The concepts of vectorization
- Avoid loops by using vectorization
- What can be vectorized?

Lab exercises

- Compare the efficiency of a “for” loop and vectorization for calculating element-wise matrix multiplication.
- Hint: `proc.time()`, `replicate()`

Apply a function to some margins of a matrix or an array

- `apply(X, MARGIN, FUN, ...)`

List Arithmetics

↪ Apply a function to the elements of a list

- `lapply(X, FUN, ...)`
- `rapply(object, f, how = c("unlist", "replace", "list"), ...)`

List Arithmetics

↳ Operators with many lists

- `mapply(FUN, ..., MoreArgs = NULL, SIMPLIFY = TRUE, USE.NAMES = TRUE)`
 - `mapply("+", list1, list2, list3, SIMPLIFY = FALSE)`
 - `mapply(function(x, y) abs(x)*log(abs(y)), list1, list2, SIMPLIFY = FALSE)`

Suggested reading

- Jones (2009): **Chapter 5.4**