

# Final Project

Overall description: The goal of the final project is to develop an R package that will be useful to other statisticians and R users. Students can either form groups (at most 3 people) themselves or work individually. Readable R documentations are necessary. Students will be encouraged to use higher level knowledge from the class to the R package. (E.g. Rcpp, vignette, OOP). Details instructions about the final project will be released on Mon Oct 16. A short in class presentation (5-10 min) is scheduled on Mon Dec 4 and Wed Dec 6, depending on the size of the class. The final R package and a short report of how to use the R package is due on Mon Dec 11 (11:59 pm). One team only need to submit one copy of report and R package.

## R package

### Basic requirement

1. Any functions or procedures you feel useful or interesting.
2. Package documentation should be complete and easy to understand.
  - a. Function descriptions
  - b. Argument and return value
  - c. Return values
3. Wrap up as a package and later demonstrate how to use it.

### Higher-level feature

1. Utilize Rcpp
2. Objective orientated programming
3. Writing vignette
4. Or other features you feel useful or advanced.

## Final Presentation

A short in class presentation is scheduled on Mon Dec 4 and Wed Dec 6. Each group can have 5-10 min to present their work depending on the number of the groups, and a very short Q&A session after the presentation. Grouping must be finalized Nov 27th. The presentation is group-based so there is no restriction that all students inside group have to present.

### Basic requirement

1. Rmd slides are encouraged.
2. Introduction: What problem your package will solve.
3. Incorporate your code (using the wrapped package) to demonstrate how do you solve the problem.
4. Show higher level feature, if any.

## Final Report and R package

Both final report and R package are due on Fri Dec 15

## R package

Should be tested such that the instructor can directly install the package.

## Final Report

Suggested to use Rmd (like HW) to write your final report since Rmd can integrate your code and result. In the final report, you need to demonstrate how to use your R package to generate your results. There is no page requirement for your final report, below are suggested format.

- Introduction: background info, literature survey, problem definition and motivation, etc, if any.
- Methods
  - Details of your proposed method
  - Describe your functions in the package and your workflow (similar to your package documentation but a bit more detailed description)
- Results
  - Describe the datasets (or simulation) you used to test your package, if there is any.
  - Show some output of your package. Please be organized and make sure your output is readable.
- Conclusion: Discussion and future work

The grading breakdown for the final report and R package is as follows:

R package (40%)

- 15% for documentation of your R package
- 15% for correctness and bug-free of your implementation
- 10% some higher-level features.

Presentation (20%):

- Since this is too short, there is no detailed rubric.

Report (40%):

- 10% for your name, other team member names if you are working on a group.
- 10% for introduction or motivation so I understand what is the problem.
- 10% for quality of writing (clarity, organization, flow, etc.)
- 10% for correctness and completeness of your proposed method and results by using the R package.

**Again, the final R package and a short report of how to use the R package is due on Mon Dec 11 (11:59 pm). One team only need to submit one copy of report and R package. They should be submitted electronically via canvas.**