

PHC 6099 Programming Basics for Biostatistics

FALL 2023 Final Project

Overall description: The goal of the final project is to develop an R package/Shiny app that will be useful to other statisticians and R users. The final R package/Shiny app and a short report of how to use the R package/Shiny app is due on Thur Dec 7 (11:59 pm).

R package/R Shiny app

Basic requirement

1. Prepare either a R package or a R/python Shiny app.
2. Topic: any functions or procedures you feel useful or interesting. This could be a method/model, a tool, a game, etc. The project topics in previous years can be found here https://caleb-huo.github.io/teaching/finalProject/finalProject_all.html.
3. Students can either form teams (at most 3 people for each team) by themselves or work individually. One team only need to submit one copy of report and R package/Shiny app.
4. Should be tested such that the instructor can directly install/run the R package/Shiny app.
5. Demonstrate how to use it in the final report.

Final Presentation

There is no final presentation.

Final Report and R package

Both final report and R package/Shiny app are due on Thur Dec 7 (11:59 pm).

Final Report

The final report can be word/html/PDF or any other format. Suggested to use Rmd (like HW) to write your final report since Rmd can integrate your code and result. If you present a R package in the final report, you need to demonstrate how to use your R package to generate your results (e.g., using Rmd). If you present a R Shiny app in the final report, you may need to use screenshot (or other similar methods) to demonstrate how to use the R Shiny app. 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 R package/Shiny app (R/python) and your workflow (similar to the R 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 outputs of your package. Please be organized and make sure your output is readable.
- Conclusion: conclusion, discussion and future work, if any.

Grading

All members in one team will have the same grade for the final project. The grading breakdown for the final report and R package is as follows:

R package/R(or python) Shiny app (50%):

- For R package: the instructors/TA must be able to install your package via tar.gz or GitHub
 - 15% for documentation of your R package.
 - 15% for at least one of the higher-level features, including (i) GitHub; (ii) Rcpp; (iii) Extraordinary effort: additional tools not addressed by this course, unusually sophisticated application of tools from course.
 - 10% Vignettes: a nice and overall introduction of your package.
 - 10% pass *R CMD check* without errors or warnings.
- For R/python Shiny app: the instructors/TA must be able to run your app via a server or tar.gz or GitHub. (One suggested server is <https://www.shinyapps.io>. For this server, there is 25 active hours/month for free basic usage. If your project is inactive for more than 15 min, it will enter the sleeping mode, so it won't charge extra hours)
 - 15% for documentations/descriptions about each module/function/button, nice appearance of the user-interface. The R Shiny app is easy to navigate.
 - 15% for extraordinary effort: additional tools not addressed by this course, unusually sophisticated application of tools from course.
 - 10% for including an example/dataset which could be used to walk through the R Shiny app.
 - 10% if there are no errors or warnings, when the instructor tests your R Shiny app.

Report (50%):

- 5% for your name, other team member names if you are working on a group.
- 5% for a title of your report. This title will be documented to inspire future students.
- 10% for introduction or motivation so we understand what is the problem.
- 10% for quality of writing (clarity, organization, flow, etc.)
- 10% for correctness and completeness of your proposed method.
- 10% for correctness and completeness of results by using the R package/R(python) Shiny app.

Again, the final R package/Shiny and a short report of how to use the R package/Shiny app is due on Thur Dec 7 (11:59 pm). One team only need to submit one copy of report (e.g., html file). They should be submitted electronically via canvas <https://elearning.ufl.edu>. The R package/Shiny can be either submitted as a tar.gz file, or can be directly prepared on GitHub. The R/python Shiny can also be hosted using a server (e.g., <https://www.shinyapps.io>). Make sure the instructor can properly install/run your R package/Shiny app.