AMS 597: Statistical Computing

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Individual Project

- Each student will write an R package implementing statistical methods described in the following paper "A Simple and Robust Method for Partially Matched Samples Using the P-Values Pooling Approach", Stat Med (2013)
  `https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3717400/`
- The pdf version of this paper is available at Blackboard (see ScientificPaper_ProjectSpring2021.pdf)

Individual Project

- This paper discussed several methods for handling partially matched samples
- E.g., Complete samples

Before Trt	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}
After Trt	y_1	y_2	y_3	y_4	y_5	y_6	y_7	y_8	y_9	y_{10}

- Partially matched samples

Before Trt	x_1	x_2	NA	NA	NA	x_6	x_7	x_8	x_9	x_{10}
After Trt	NA	NA	y_3	y_4	y_5	y_6	y_7	y_8	y_9	y_{10}

Individual Project

- You will write function(s) implementing
  - Liptak's weighted Z-test
  - Kim et al.'s modified t-statistic
  - Looney and Jones's corrected Z-test
  - Lin and Stivers's MLE based test under heteroscedasticity
  - Ekbohm's MLE-based test under homoscedasticity
- You will then wrap these up as an R package

Individual Project

- The R package has to be complete and contains a vignette describing how to use the R package
- The R package is due May 05, 2021 at 5:00 PM
- Submit your package as original source package (i.e., .tar.gz file) on Blackboard>Assignments>Project. Name your package PMlastname_version.tar.gz (version is generated automatically after you build your package successfully)
- Some of the grading criteria include:
  - ▶ Can the R package be installed successfully?
  - ▶ Is the R package implementing the required method correctly?
  - ▶ Has it considered all possible scenarios?
  - ▶ Is the R package user friendly (vignette, help files, warning messages, sample data, sample code)?
  - ▶ What is the computational speed?

Individual Project

- Some useful links:
- http://kbroman.org/pkg_primer/
- http://kbroman.org/Tools4RR/assets/lectures/08_rpack_withnotes.pdf
- https://hilaryparker.com/2014/04/29/writing-an-r-package-from-scratch/
- https://cran.r-project.org/doc/contrib/Leisch-CreatingPackages.pdf
- https://ourcodingclub.github.io/tutorials/writing-r-package/