

Pre-class Learning Activities for Session 7

- Complete the following learning activities (listed below) before class.
- References are optional and not meant to be read from first page to last. Refer if necessary.
- You may be asked to volunteer/present your work for class participation points.
- If you presented your work in class, remember to email your work to instructor after class.
- You may be asked to provide comments/add-ons to work presented by students.

Learning Activities:

1. In NTULearn Main Site, watch Lecture Videos S7.1, S7.2 & S7.3.
2. Run Rscript cd4table1.R one line at a time and view the output.
3. Exercise 1: Bootstrap vs Standard Statistics in Table 2.
 - a. Correlation between Baseline and Year1 cd4.
 - b. Linear Regression with $Y = \text{Year1 cd4 count}$ and $X = \text{Baseline cd4 count}$.
Ref: <https://www.statmethods.net/advstats/bootstrapping.html>
 - c. Analysis of Difference in medical outcome (D):
 - i. Define $D = \text{Year 1 cd4} - \text{Baseline cd4}$.
 - ii. Is the Difference statistically significant? What is the business conclusion?
 - d. Create and save your answers in Table 2.

	Standard.Statistic ^{ci}	Bootstrap.Statistic ^{ci}
Correlation	NA	NA
CI for Correlation	NA	NA
b0	NA	NA
CI for beta0	NA	NA
b1	NA	NA
CI for beta1	NA	NA
D	NA	NA
CI for D	NA	NA

R References:

- Gareth James et. al. (2017) An Introduction to Statistical Learning, Section 5.2 The Bootstrap.
<https://www.statlearning.com/>
- <https://www.statmethods.net/advstats/bootstrapping.html>

Python References:

- <https://machinelearningmastery.com/a-gentle-introduction-to-the-bootstrap-method/>