

Review:

Intro

- Population vs sample, parameter vs estimate, types of variables
- Descriptive statistics vs inferential statistics
- Central limit theorem
- Type I & II errors, statistical power
- Observational study vs experiment

t-tools

- Z-test, one sample t-test
- Two independent sample t-test
- Paired t-test
- Assumptions for t-tools
- Welch - test
- Non-parametric way for paired/independent two-sample comparison
- Statistical significance vs practical significance.
- P-value vs confidence interval

One-way ANOVA:

- Compare several groups; One-way ANOVA model; assumptions; null hypothesis & alternative
- Planned and unplanned comparisons; linear combination of group means; contrast; multiple comparison;
- Extra-sum-of-squares F test; full (separate mean) model vs reduced model

Simple linear regression

- Simple linear regression; assumptions; residuals; confidence interval or band; prediction interval or band,
- Extra-sum-of squares; Simple linear regression vs ANOVA=> lack of fit test
- R^2 in simple linear regression model fitting; R^2 vs slope,

Multiple linear regression:

- Multiple linear regression; what does “linear” mean? What does “multiple” means?
- Data exploration; assumptions; inferences about the coefficients
- Polynomial structure? Dummy variable?
- Extra-sum-of-squares; complicated linear regression or reduced linear regression?

Conceptual questions from each chapter