Lecture Note on Terwilliger Algebra

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Contents

About this lecturenote

Setting

This note is created by `bookdown` package on RStudio.

1. Log-in to my GitHub Account
2. Go to RStudio/bookdown-demo repository: https://github.com/rstudio/bookdown-demo
3. Use This Template
4. Input Repository Name
5. Select Public - default
6. Create repository from template
7. From Code download ZIP
8. Move the extracted folder into a favorite directory
9. Open RStudio Project in the folder
10. Use Terminal in the buttom left pane
    - confirm that the current directory is the home directry of the project by pwd
11. (failed to proceed by ssh)
12. Use Console
    1. library(usethis)
    2. use_git()
    3. use_github() — Error
    4. gh_token_help()
    5. create_github_token(): create a token in the github page. Copy the token
    6. gitcreds::gitcreds_set(): paste the token, the token is to be expired in 30 days
13. Use Terminal
    1. git remote add origin https://github.com/icu-hsuzuki/t-alagebra.git
    2. git push -u origin main

    3. type in the password of the computer

14. Use GIT in R Studio

Access from Another Host

1. library(usethis)
2. use_git()
3. create_github_token()
4. gitcreds::gitcreds_set(): Replace these credentials

Chapter 1

Lecture 1

[Wednesday, January 20, 1993]style="float:right"

A graph (undirected, without loops or multiple edges) is a pair $\Gamma = (X, E)$, where

$$X = \text{finite set (of vertices)} \tag{1.1}$$
$$E = \text{set of (distinct) 2-element subsets of } X \text{ (= edges of) } \Gamma. \tag{1.2}$$

vertices x and $y \in X$ are adjacent if and only if $xy \in E$.

Example 1.1. Let Γ be a graph. $X = \{a, b, c, d\}$, $E = \{ab, ac, bc, bd\}$.

Set $n = |X|$, the order of Γ.

Pick a field K (= $\mathbb{R}$ or $\mathbb{C}$). Then $\mathrm{Mat}_X(K)$ denotes the K algebra of all $n \times n$ matrices with entries in K. (rows and columns are indexed by X)

Adjacency matrix $A \in \mathrm{Mat}_X(K)$ is defined by

$$A_{xy} = \begin{cases} 1 & \text{if } xy \in E \\ 0 & \text{else .} \end{cases} \tag{1.3}$$

Chapter 2

Lecture 2

Here is a review of existing methods.

Chapter 3

Lecture 3

We describe our methods in this chapter.

Math can be added in body using usual syntax like this

3.1 math example

p is unknown but expected to be around 1/3. Standard error will be approximated

$$SE = \sqrt{(\frac{p(1-p)}{n})} \approx \sqrt{\frac{1/3(1-1/3)}{300}} = 0.027$$

You can also use math in footnotes like this[1].

We will approximate standard error to 0.027[2]

[1] where we mention $p = \frac{a}{b}$

[2] p is unknown but expected to be around 1/3. Standard error will be approximated

$$SE = \sqrt{(\frac{p(1-p)}{n})} \approx \sqrt{\frac{1/3(1-1/3)}{300}} = 0.027$$

Chapter 4

Applications

Some *significant* applications are demonstrated in this chapter.

4.1 Example one

4.2 Example two

Chapter 5

Final Words

We have finished a nice book.