Project

Mahou DB

Disclaimer

- There is no guarantee that all I will be talking about is correct. Please be critically thinking.

General rules

- Know your responsibilities and what you are doing
- Know your teammates' progress and tell them yours

About Mahou DB

- A database with a few hundreds of lines of codes
- Completed during the last winter break

Aniplex. 魔法少女まどか☆マギカ

Before the project starts…

- What you can do and what you will be able to do
  - Programming languages, algorithms, data structures, tools, etc.
- What is your objectives
  - Gaining more hands-on experience
  - Or just want to date the girl in the team
- What time will you be available
  - The length of the project
  - The frequency and specific day for meeting in a week

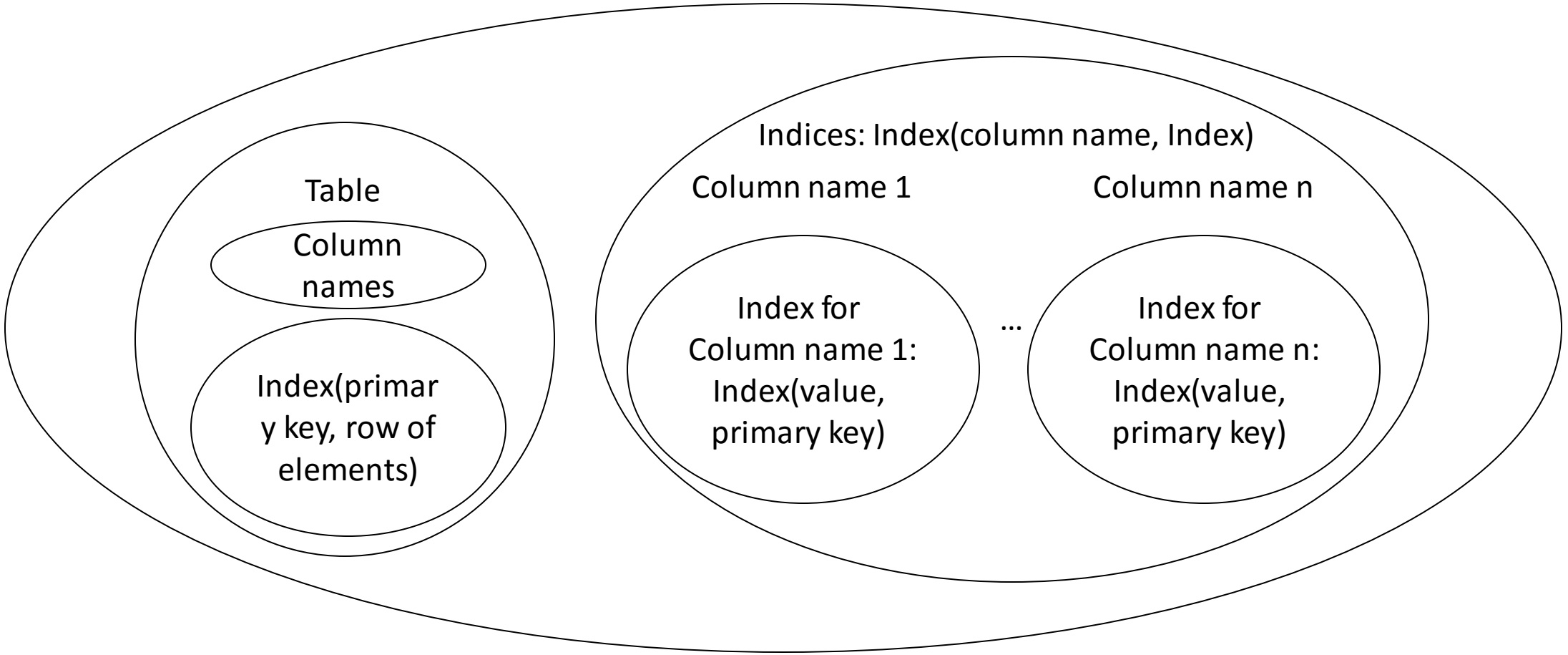
Design

- What technologies you all will use
  - Collaboration: Git, SVN, etc.
  - Programming language
  - …
- After the expected duration of completion, what will the project look like (can be README, Javadoc, etc)
- The responsibilities of each teammate.

Design for Mahou DB

- Python
- Collaborate with Git
- With two components
  - Table
  - Index based on Red-Black Tree

Design for Mahou DB



Implementation and Debugging

- Again, who will be responsible for implementation or debugging
  - More specifically, who will be implementing or testing a specific function/method
- This process should follow the design to achieve the expected result
- Detecting the design defects

implementation for Mahou DB

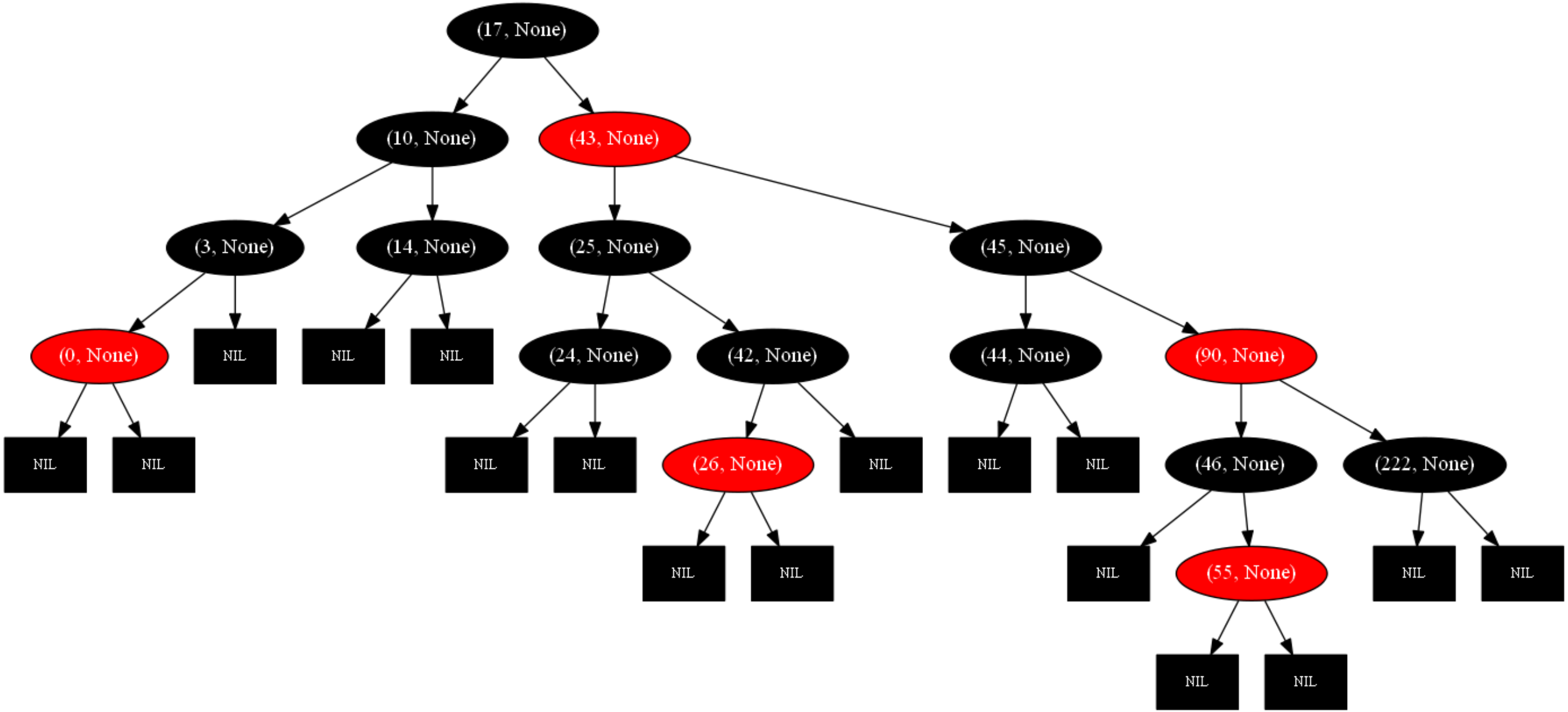
- Responsibility of implementation and debugging: Lok and Jimmy
  - More specifically: Lok implements add method, Jimmy implements remove method; or each of the members come up with a solution if it is an easy job

- PS; It can be decided right before that corresponding task is to be completed

implementation for Mahou DB

- Following the guideline
  - The properties should be maintained
  - Make sure that you are not doing duplicate tasks.

- Debugging
  - A efficient way to debug: graph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implementation for Mahou DB

- Following the guideline
  - The properties should be maintained
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- Debugging
  - A efficient way to debug: graph
  - If the program crashes
  - If the properties can be maintained
    - Properties of the designated data structures
    - Behaviors of the functions
    - Tricky input

implementation for Mahou DB

- It may also requires new ideas on design during the process of implementation:

- Read/Write file: How to separate items when stored in the drive

implementation for Mahou DB

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- Read/Write file: How to separate items when stored in the drive
  - Naïve approach: use a space (0x20) to separate every element

implementation for Mahou DB

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- Read/Write file: How to separate items when stored in the drive
  - Naïve approach: use a space (0x20) to separate every element
  - What if within the strings the users stored, there are space characters?

implementation for Mahou DB

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- Read/Write file: How to separate items when stored in the drive
  - ~~Naïve approach: use a space (0x20) to separate every element~~
  - What if within the strings the users stored, there are space characters?
  - Find something the users do not use

implementation for Mahou DB

- UTF-8: Using 0xff (11111111)
- Store table only

FSS-UTF (1992) / UTF-8 (1993)[3]

Number of bytes	Bits for code point	First code point	Last code point	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
1	7	U+0000	U+007F	0xxxxxxx					
2	11	U+0080	U+07FF	110xxxxx	10xxxxxx				
3	16	U+0800	U+FFFF	1110xxxx	10xxxxxx	10xxxxxx			
4	21	U+10000	U+1FFFFF	11110xxx	10xxxxxx	10xxxxxx	10xxxxxx		
5	26	U+200000	U+3FFFFFF	111110xx	10xxxxxx	10xxxxxx	10xxxxxx	10xxxxxx	
6	31	U+4000000	U+7FFFFFFF	1111110x	10xxxxxx	10xxxxxx	10xxxxxx	10xxxxxx	10xxxxxx

Wikipedia

implementation for Mahou DB

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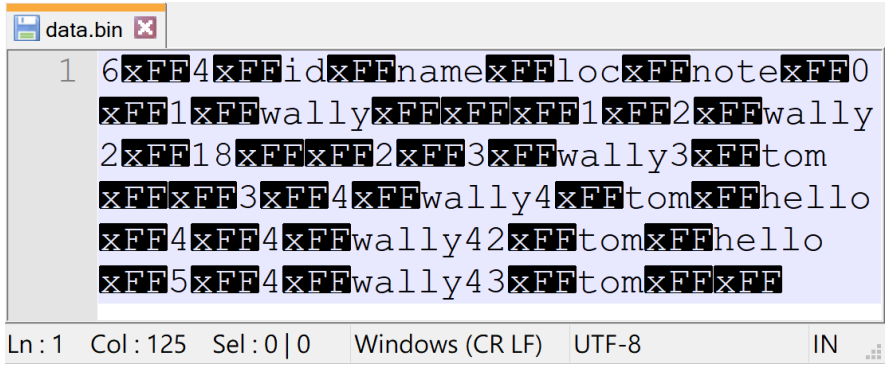

implementation for Mahou DB

- Detecting the defects of the design example
  - Redundant methods
  - Useful methods but designed with useless of insufficient parameters
  - …

Result

- The database was built
- Only the most fundamental functions are available
- Many advanced functions were not implemented
  - Mixed storing in memory and drive
  - …

Conclusion

- Life may not be perfect

Any Questions?

Thank you