

算法与数据结构

慕课网《算法与数据结构》

讲师：liuyubobobo

版权所有 liuyubobobo
侵权必究

为什么要学习算法？

慕课网《算法与数据结构》

讲师：liuyubo

版权所有，侵权必究

为什么要学习算法？



PIXAR



Microsoft



BLIZZARD
ENTERTAINMENT



ORACLE®



網易
NETEASE
www·163·com



UBER



滴滴出行
滴滴一下 美好出行

因为算法无处不在

慕课网《算法与数据结构》
讲师：liuyubo
版权所有，侵权必究

wiring-blink

.pioenvs

lib

readme.txt

src

main.cpp

.clang_complete

.gcc-flags.json

.gitignore

.travis.yml

platformio.ini

README.rst

main.cpp

```
1  /*
2   * Blink
3   * Turns on an LED on for one second,
4   * then off for one second, repeatedly.
5   */
6  #include "Arduino.h"
7
8  void setup()
9  {
10    Serial.begin(9600);
11    // init
12    pinMode(LED_BUILTIN, HIGH);
13
14    // test linter
15    uint8_t i;
16    call_undefined();
17
18    void loop()
19    {
20      // turn the LED on (HIGH is the voltage level)
21      digitalWrite(LED_BUILTIN, HIGH);
22      // wait for a second
23      delay(1000);
24      // turn the LED off by making the voltage
25      // LOW
26      digitalWrite(LED_BUILTIN, LOW);
27    }
28  }
```

platformio.ini

```
1 ; Project Configuration File
2 ; Docs: http://docs.platformio.org/en/latest/
3
4 [env:uno]
5 platform = atmelavr
6 framework = arduino
7 board = uno
8
9 [env:nodemcu]
10 platform = espressif
11 void 0
12
13 [env:teensy]
14 platform = teensy
15 framework = arduino
16 board = teensy31
17
18 [env:lpmsp430g2553]
19 platform = timsp430
20 framework = energia
21 board = lpmsp430g2553
22 build_flags = -D LED_BUILTIN=RED_LED
23
24
```

GCC warning: unused variable 'i' [-Wunused-variable] at line 15 col 11 in src/main.cpp

GCC error: 'call_undefined' was not declared in this scope at line 16 col 18 in src/main.cpp

PlatformIO: Build File 2 Project 2 2 Issues src/main.cpp* 10:11 + LF UTF-8 C++ develop □ +5, -1

All

Images

News

Videos

Books

More ▾

Search tools



About 127,000,000 results (0.67 seconds)

algorithm

/'alɡərɪð(ə)m/

noun

a process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
"a basic algorithm for division"



Translations, word origin, and more definitions

Feedback

Algorithm - Wikipedia, the free encyclopedia

<https://en.wikipedia.org/wiki/Algorithm> ▾

In mathematics and computer science, an algorithm (/ælɡərɪðəm/ AL-gə-ri-dhəm) is a self-contained step-by-step set of operations to be performed. Algorithms perform calculation, data processing, and/or automated reasoning tasks.

[List of algorithms](#) · [Algorithm engineering](#) · [Category:Algorithms](#) · [Sorting algorithm](#)

What is an algorithm and why should you care? | Intro to Algorithms ...



<https://www.khanacademy.org/.../algorithms/...algorithms/.../what...> ▾

what is an algorithm one definition might be; a set of steps to accomplish a task you might have an algorithm ...



暴课网《算法与数据结构》
讲师：liuyubobobo
版权所有，侵权必究

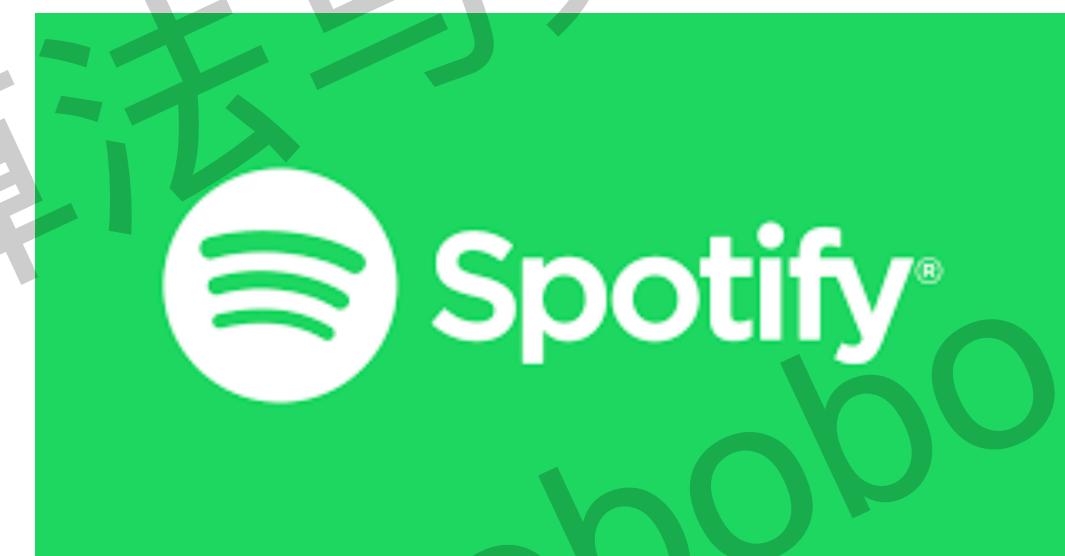
推荐算法

慕课网《算法与数据结构》

amazon



Google



eBay

LinkedIn

NETFLIX

YouTube



UBER



慕课网《算法与数据结构》

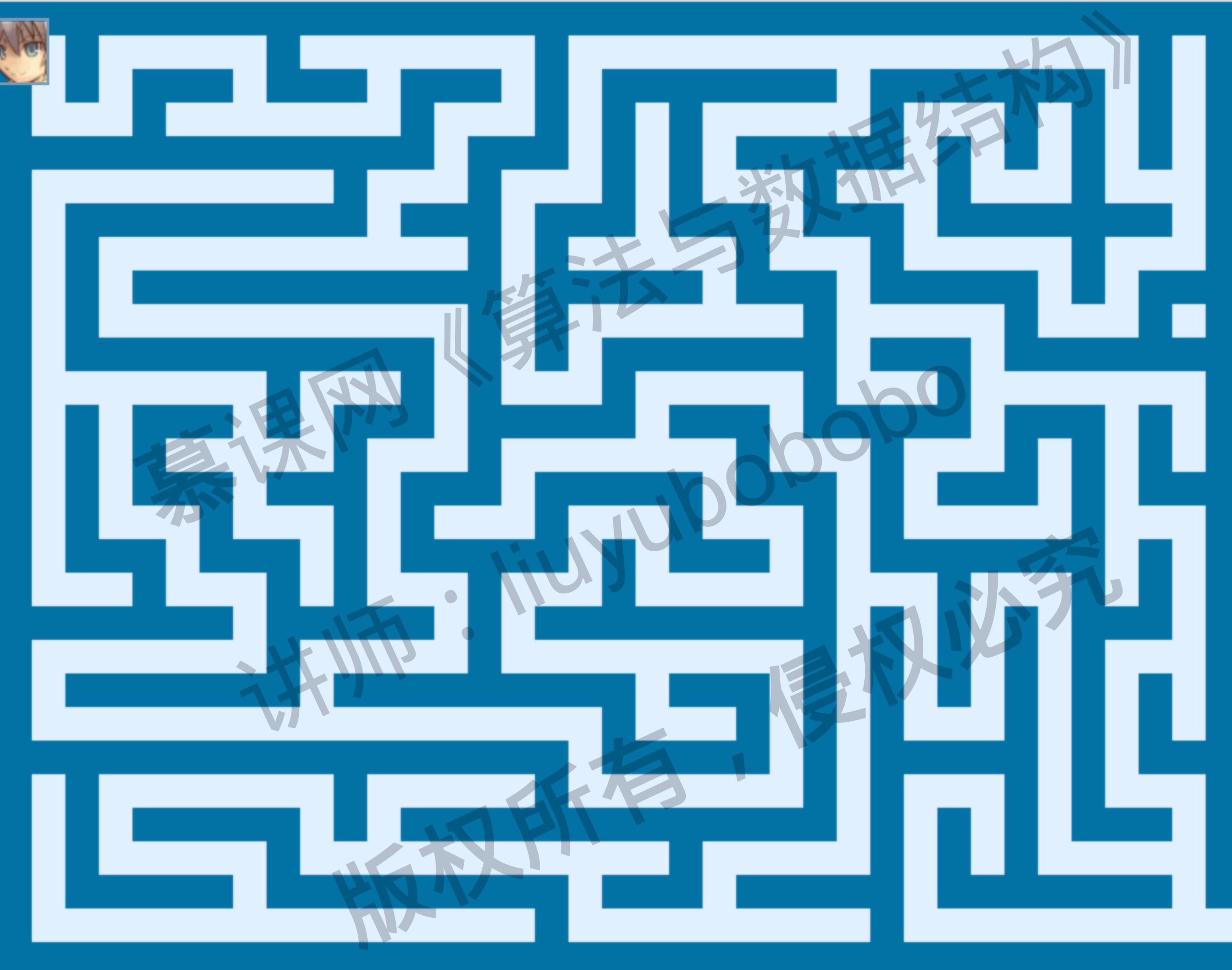
版权所有

片段：Zootopia

慕课网《算法与数据结构》
讲师：liuyubobobo
版权所有，侵权必究

片段：权力的游戏

慕课网《算法与数据结构》
讲师：liuyubo_bobo
版权所有，侵权必究

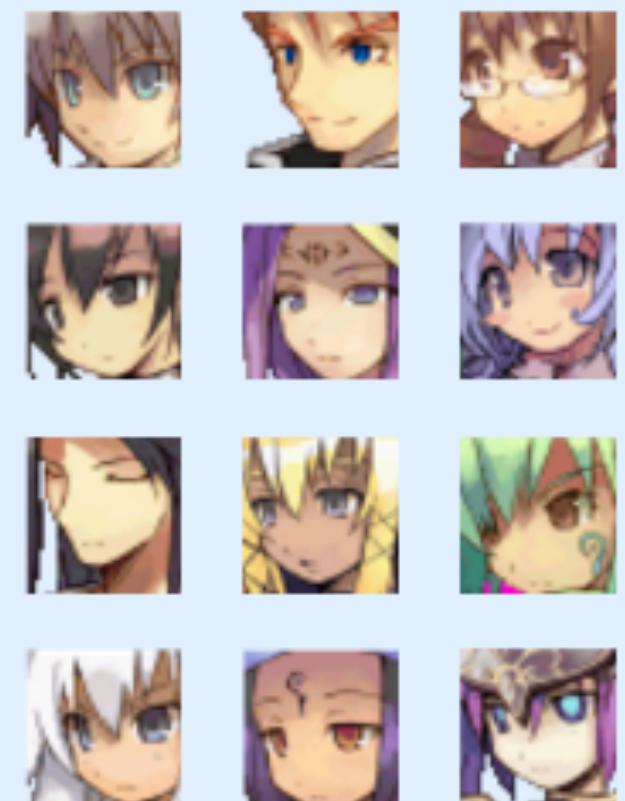


重新生成迷宫

生成迷宫 - (算法A)

生成迷宫 - (算法B)

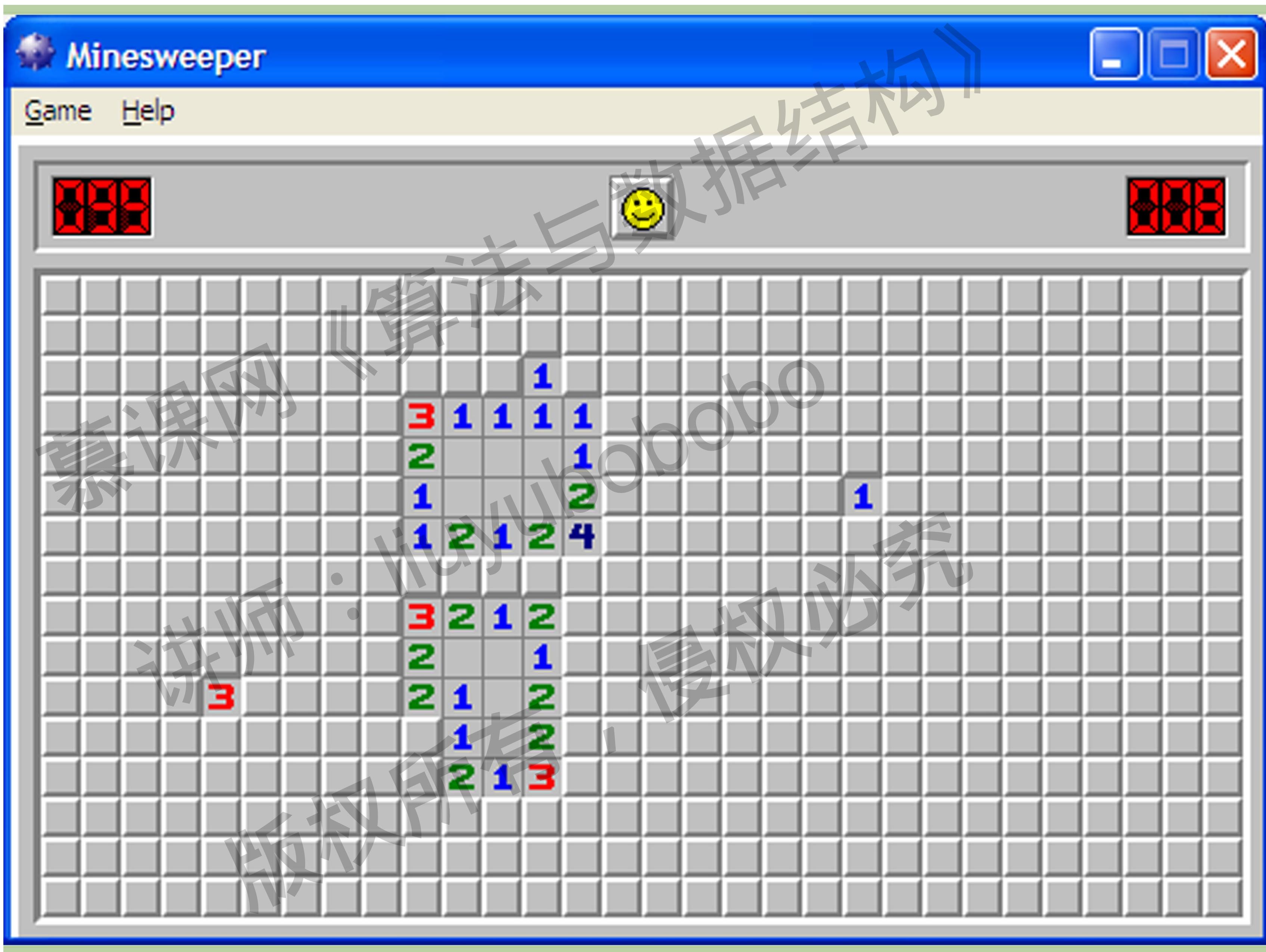
选择你的角色



骑士

操作：迷宫生成

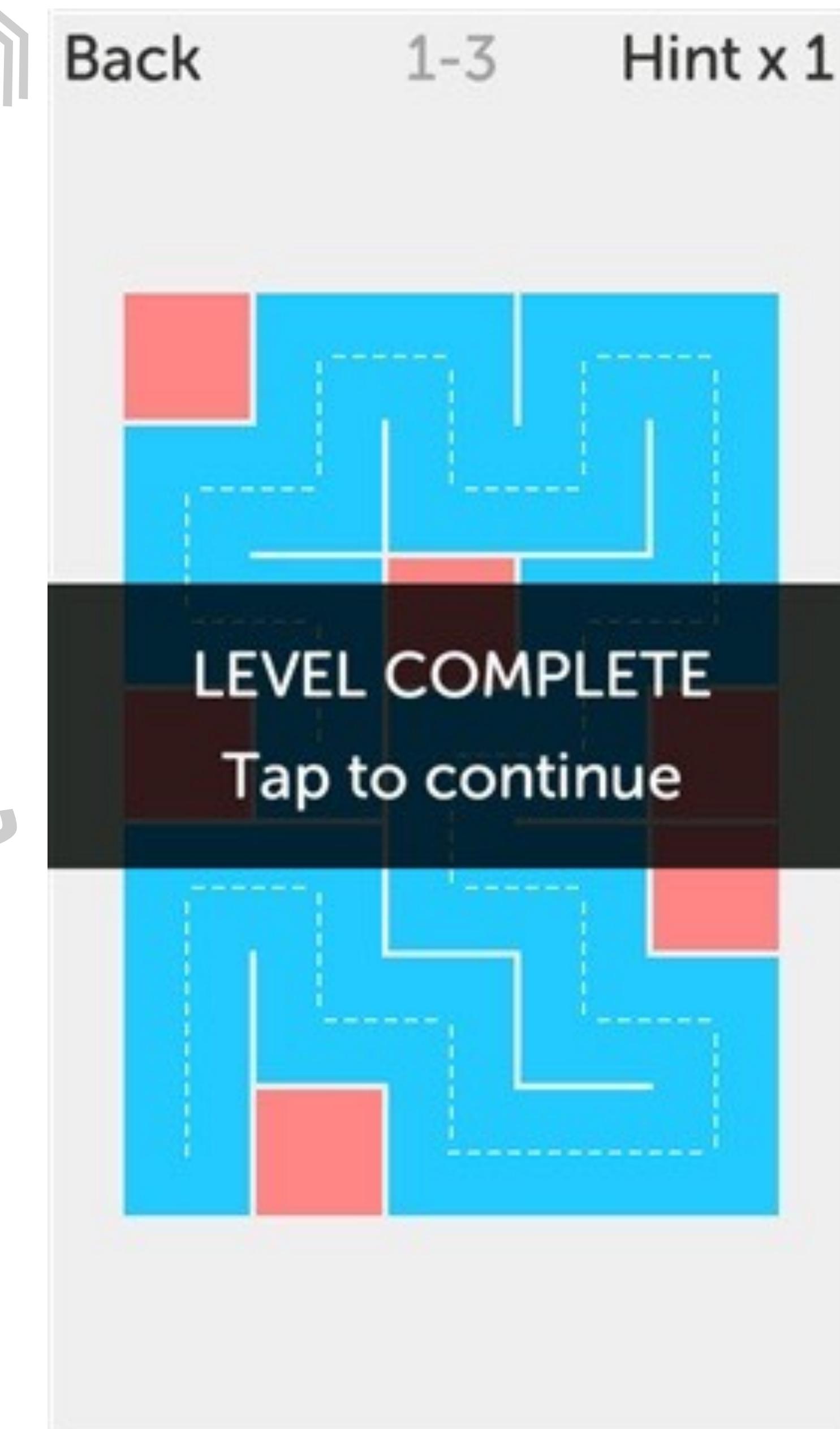
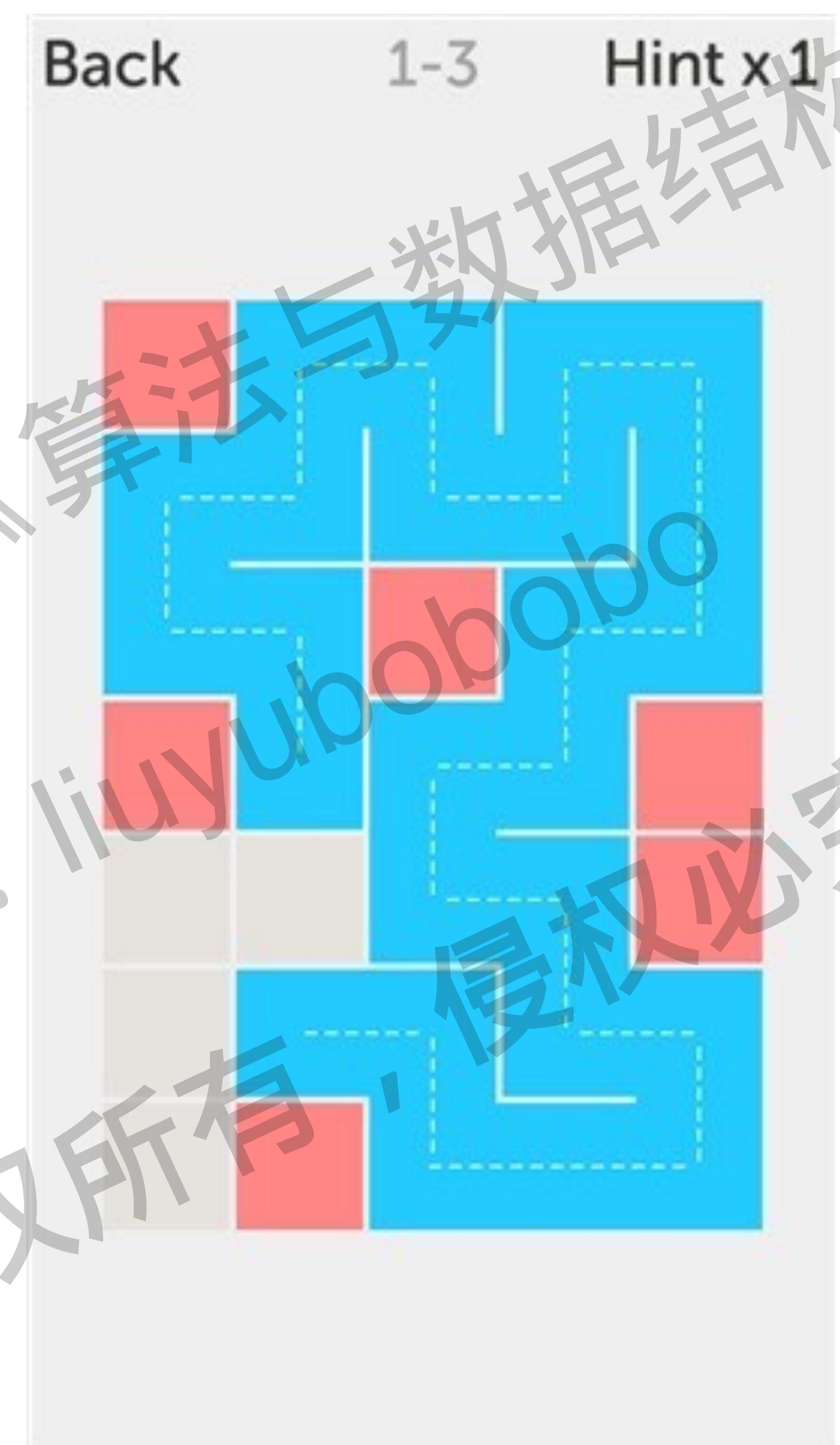
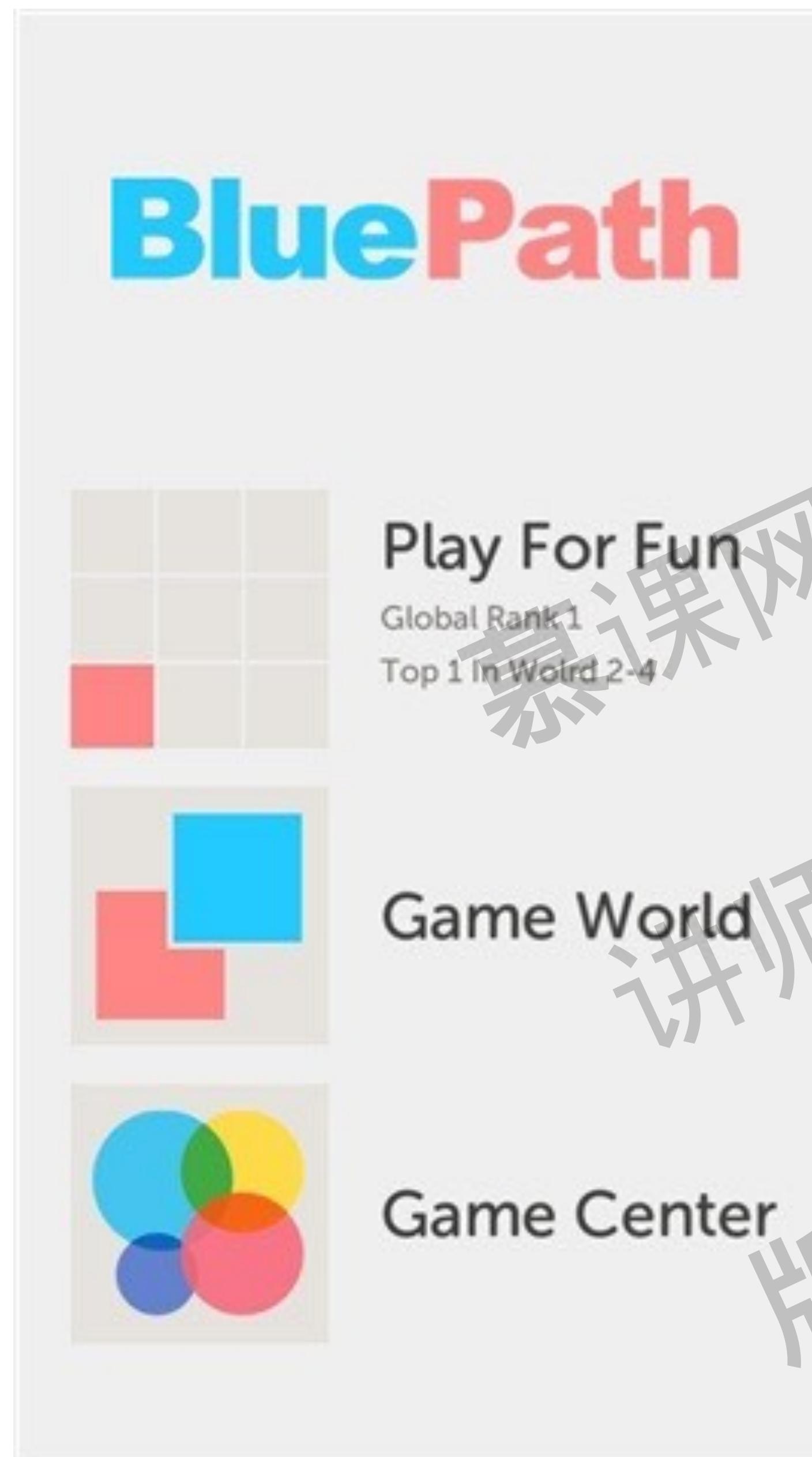
慕课网《算法与数据结构》
讲师：liuyubobobo
版权所有，侵权必究



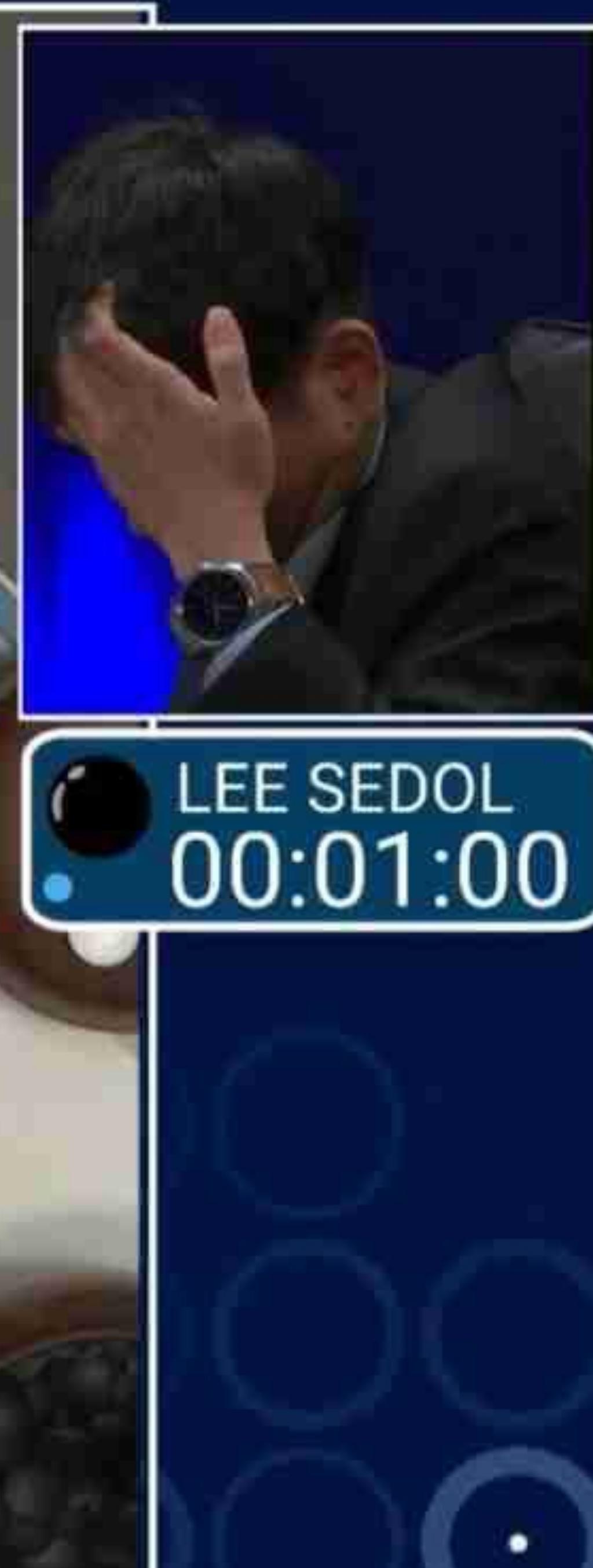
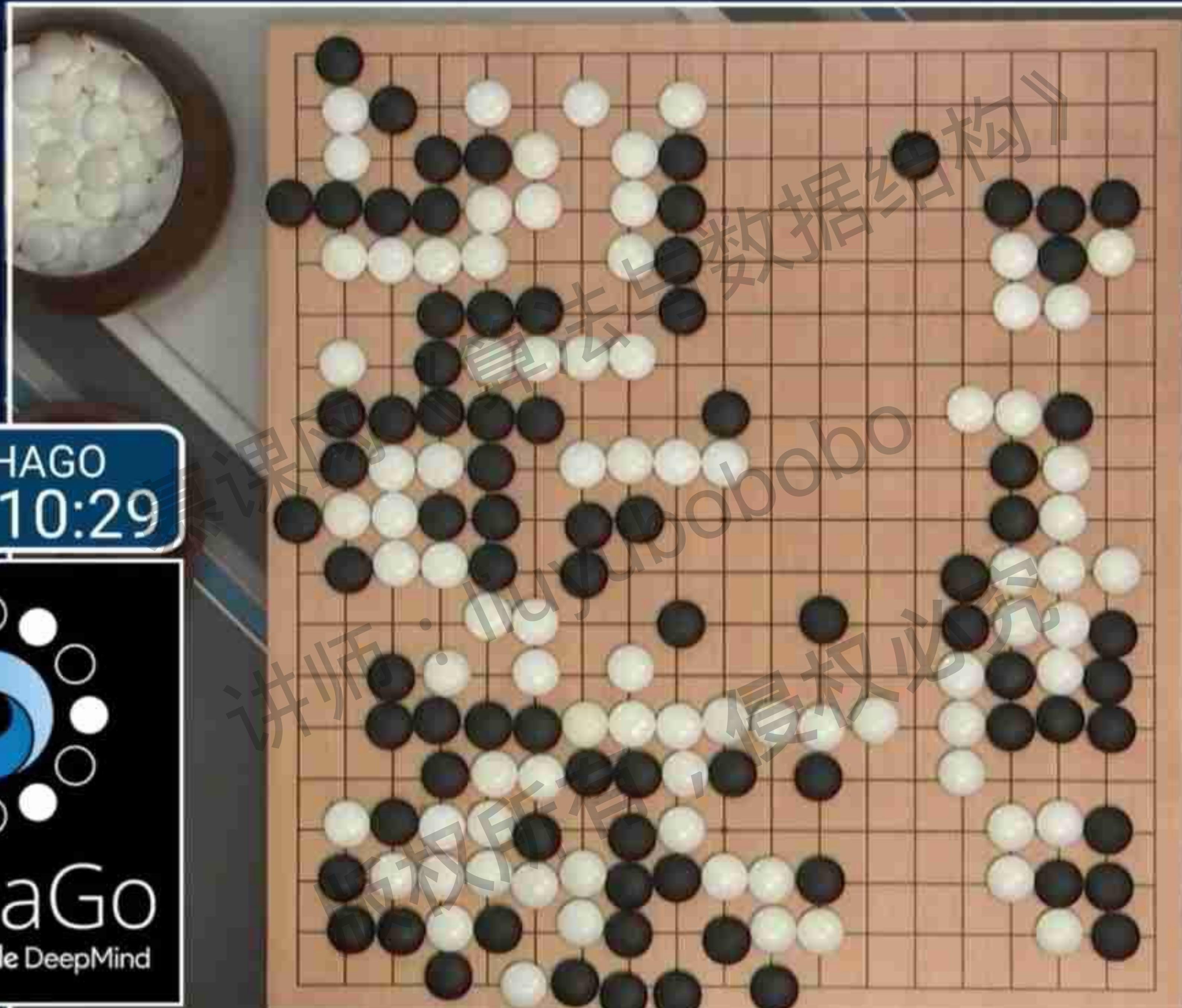
操作：课算法解决一个Puzzle类游戏 (暂时搁浅)

《算法与数据结构》
讲师：liubobop
版权所有，侵权必究













Demo from the



Disney Research

THE Science BEHIND THE Magic

片段：live texture

慕课网《算法与数据结构》
讲师：liuyubobobo
版权所有，侵权必究





慕课网《算法与数据结构》
讲师：liuyubobobo
版权所有，侵权必究

DATA

REAL ECONOMIC WORLD PROJECT BECOMES

BETWEEN SYSTEMS RECORDS

SECOND NATIONAL DISTRIBUTED

INITIATIVE EXABYTES DEFINITION

MAKING PROCESSES

STORAGE INFORMATION

性能优化

慕课网《算法与数据结构》
讲师：liuyubo_bobo
版权所有，侵权必究



Keep favorite apps in memory

Background updates

Refreshed information

Instant launch

片段：iwatch 优化 – Auto Launch

慕课网《算法与数据结构》

讲师：liuyuxiangbobo

版权所有，侵权必究

我们每天都在接触算法

慕课网《算法与数据结构》

讲师：liuyunbobo

版权所有，侵权必究

学好算法，才能创造出更有意义的东西

讲师：liuyangbobo
版权所有，侵权必究
讲练课网《算法与数据结构》

课程简介

慕课网《算法与数据结构》
讲师：liuyupengbobo
版权所有，侵权必究

学习要求

语言： C++

拥有自己的编译环境

算法其实是和语言无关的

以后争取支持更多语言： Java, Python, Javascript, Swift...

课程Github: <https://github.com/liuyubobobo/Play-with-Algorithms>

学习要求

需要掌握最基础的语言知识

了解数组，链表，堆，栈等线性结构

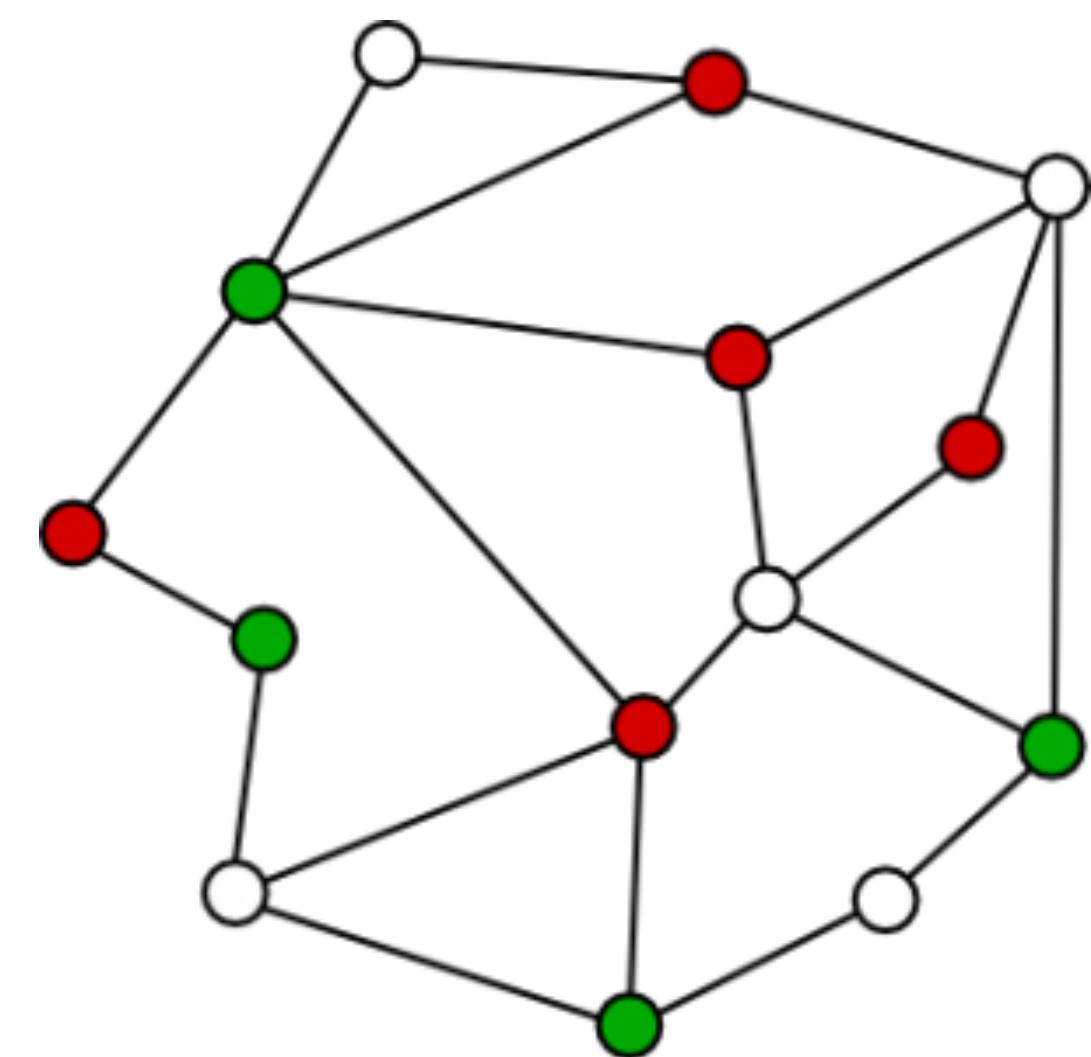
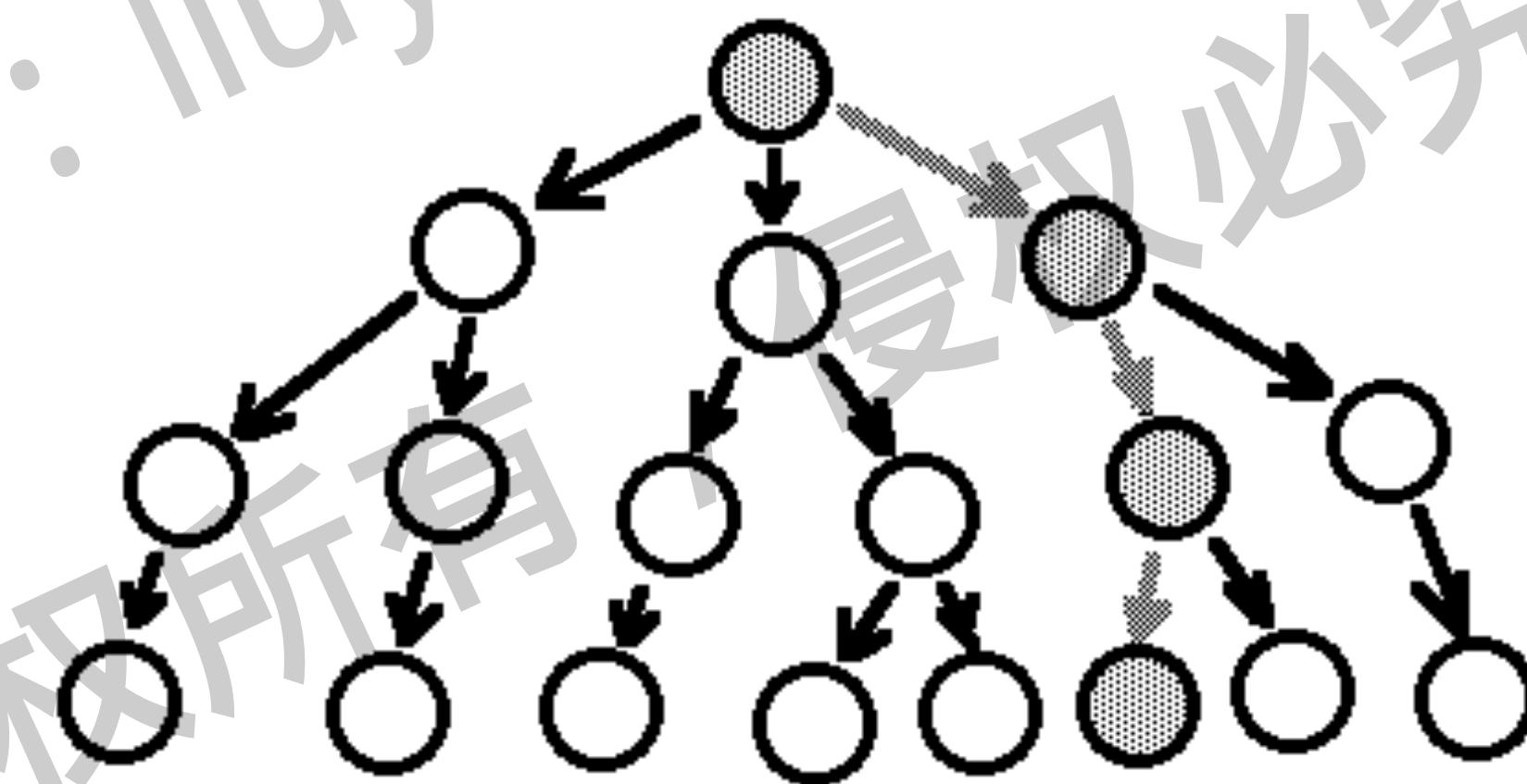
对基本算法知识有常识性了解：如递归、遍历、算法复杂度

学习路径

线性(排序)

树形结构

图形结构



请后期根据以后课程的动画展示，
选择一个示例放在这页。谢谢！

慕课网《算法与数据结构》
讲师：liuyubo
版权所有，侵权必究

白板编程

慕课网《算法与数据结构》
讲师：liuyubooboo
版权所有，侵权必究

数据结构的重要性

“I will, in fact, claim that the difference between a bad programmer and a good one is whether he considers his code or his data structures more important. Bad programmers worry about the code. Good programmers worry about data structures and their relationships.”

— Linus Torvalds (creator of Linux)



算法 = 数据结构？

Algorithms + Data Structures = Programs

From Wikipedia, the free encyclopedia

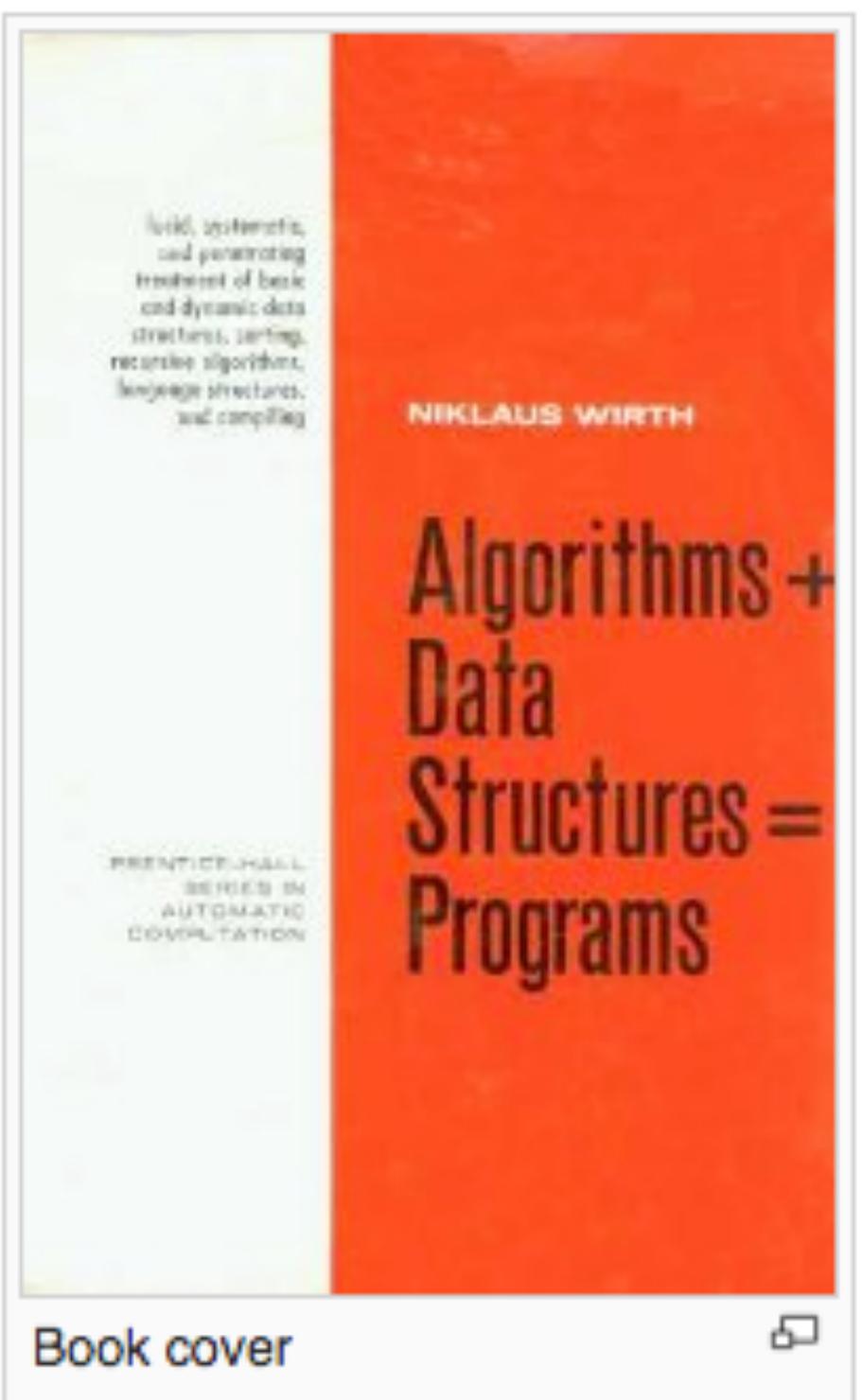
Algorithms + Data Structures = Programs^[1] is a 1976 book written by Niklaus Wirth covering some of the fundamental topics of computer programming, particularly that algorithms and data structures are inherently related. For example, if one has a sorted list one will use a search algorithm optimal for sorted lists.

The book was one of the most influential computer science books of the time and, like Wirth's other work, was extensively used in education.^[2]

The Turbo Pascal compiler written by Anders Hejlsberg was largely inspired by the "Tiny Pascal" compiler in Niklaus Wirth's book.

Chapter outline [edit]

- Chapter 1 - Fundamental Data Structures
- Chapter 2 - Sorting
- Chapter 3 - Recursive Algorithms
- Chapter 4 - Dynamic Information Structures
- Chapter 5 - Language Structures and Compilers
- Appendix A - the ASCII character set
- Appendix B - Pascal syntax diagrams



无法覆盖所有的数据结构和算法

堆：斐波那契堆？

树：线段树？

图：网络流？

算法思想?

分治算法 - 归并排序, 快速排序...

贪心算法 - 最小生成树...

动态规划 - 最短路径 ...

递归搜索 - 树形结构...

面试问题

慕课网《算法与数据结构》
讲师：liuyubooboo
版权所有，侵权必究

每个细分领域都是算法

图形学

图像学

机器学习

人工智能

数据挖掘

操作系统

编译原理

网络安全

虚拟现实

高性能计算

让我们一起体会算法之美



Computer programming is an art, because it applies accumulated knowledge to the world, because it requires skill and ingenuity, and especially because it produces objects of beauty. A programmer who subconsciously views himself as an artist will enjoy what he does and will do it better.

— Donald Knuth —

AZ QUOTES

其他

欢迎大家关注我的个人公众号：是不是很酷

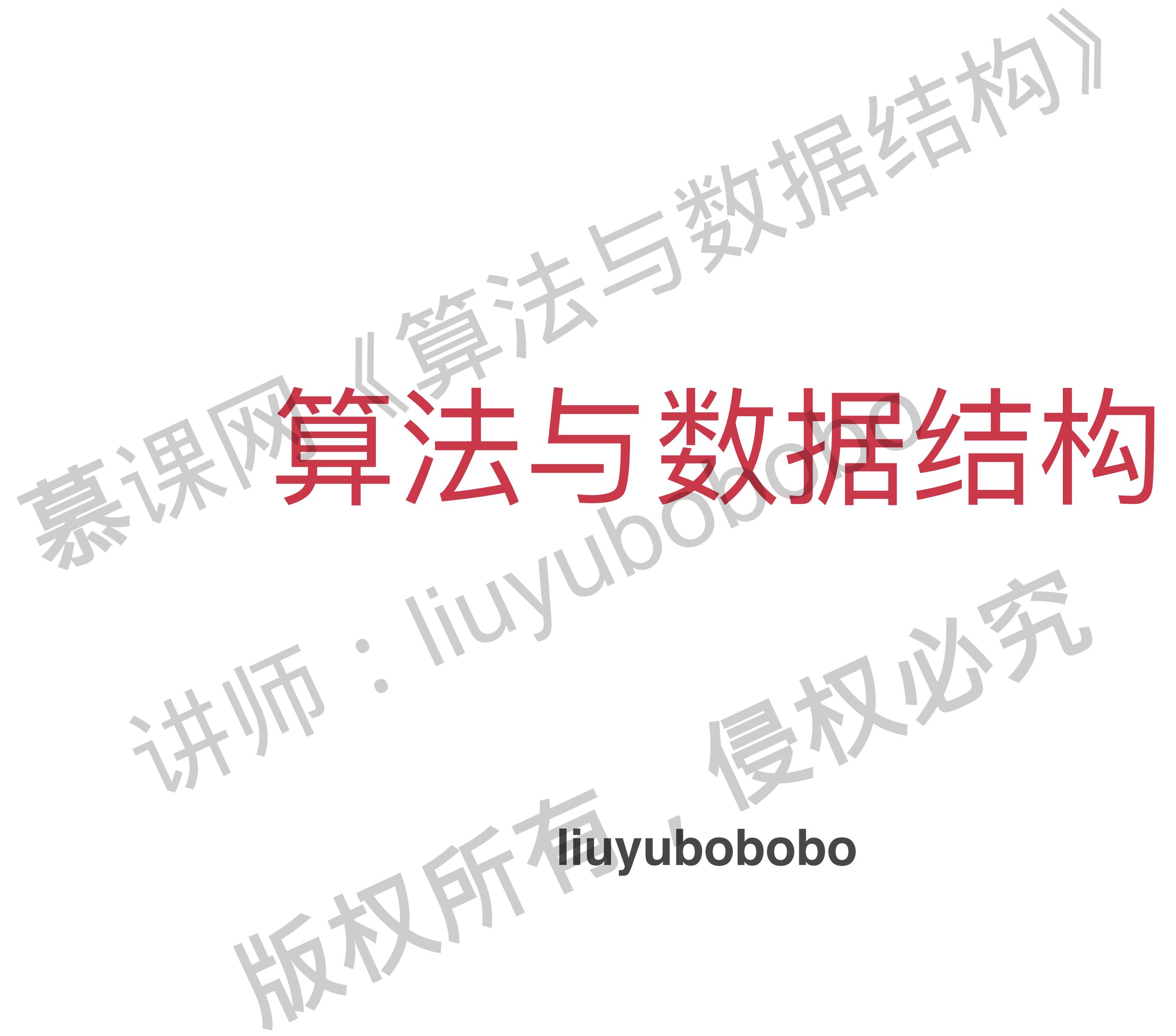


慕课网

讲师

版木

《算法与数据结构》



算法与数据结构