Java Development Homework 3

Due before 2024 April 17 9:00am

注意事項

1. OJ會在截止日期之後，評測同學的所交到 Moodle的程式碼，寫完程式後，請務必繳交到 Moodle。
2. OJ帶有程式相似度比對系統，抄襲程式者將會依校規處理。
3. 在繳交的作業中請不要有中文註解，避免造成編碼錯誤
4. 對於題目有任何問題，請聯繫助教。

Homework 5

Problem Description

Problem: Find the word in board

Description:

Given a (n x m) board and a target word, return true if the word can be formed while all characters in the board are either vertically or horizontally adjacent to each other, else return false.

Restrictions:

- Same letter cell could not be used more than once.
- The board and target word consists only of uppercase and lowercase letters.
- n >= 1, m >= 1 and target is a non-empty string.

Problem Description（中文）

Problem: 尋找文字

Description:

給予一個 n x m 的矩陣和一個目標字串，請回傳 true若每個目標字串的字元可以被矩陣上的字元組合起來，且每個字元需是相鄰且連續的，無法則回傳 false。

Restrictions:

- 矩陣上同一格只能被用到一次。
- 矩陣及目標字串只存在大寫及小寫字元。
- n >= 1, m >= 1 且 目標字串為非空字串。

Problem Description (Illustration)

A	R	G	E
T	N	H	O
X	C	K	U

- n = 3, m = 4 board,
- target word = “NCKU”
- output should be true

Problem Description (Illustration)

A	R	G	E
T	N	H	O
X	C	K	U

- n = 3, m = 4 board,
- target word = “NCKK”
- output should be false

Sample Input and Output

Keyboard Input	3 4 // n x m A R G E // Input of board T N H O // Input of board X C K U // Input of board NCKU // target word
Output	true

Keyboard Input	3 4 // n x m A R G E // Input of board T N H O // Input of board X C K U // Input of board NCKK // target word
Output	false

Notes:

- Input of board characters are separated by single whitespace.

Sample Input and Output（中文）

Keyboard Input	3 4 // n x m A R G E // 矩陣字元輸入 T N H O // 矩陣字元輸入 X C K U // 矩陣字元輸入 NCKU // 目標字串
Output	true

Keyboard Input	3 4 // n x m A R G E // 矩陣字元輸入 T N H O // 矩陣字元輸入 X C K U // 矩陣字元輸入 NCKK // 目標字串
Output	false

Notes:

- 矩陣字元輸入都皆以一個空白分開

Submission

Please archive your source code to STUDENT_ID.zip (download the example zip file from Moodle) and **upload to Moodle Homework 5** before deadline.

Your zip file should follow the following format.

STUDENT_ID.zip

|- src

|- META-INF

| |- MANIFEST.MF

All the source files (*.java) are put in the src directory.

The entry point (i.e. main class) of the program is specified in the MANIFEST.MF file.

No late submission is accepted.

Homework 6

Problem Description

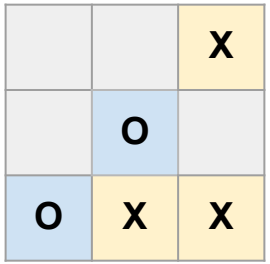
Tic-tac-toe, also known as noughts and crosses or Xs and Os, is a classic two-player strategy game. The game is typically played on a 3×3 grid board, where players take turns placing their marks in empty squares. One player uses crosses, and the other uses circles. The objective is for a player to create a line horizontally, vertically, or diagonally with their marks. If the board fills up without any player achieving a line, the game ends in a draw.

Given a string representing the state of a 3*3 board. Player one, who plays 'X', always goes first, followed by player two, who plays 'O'. Your task is to determine if the given board state could occur during a regular game.

Problem Description (Cont.)

Input Format (Please use java.util.Scanner to read the input.)

Given a string containing 9 characters representing the state of a 3*3 board, each character may be 'X', 'O' (the letter O), or '#' (representing an empty space where no one has placed a mark yet). For example, when inputting the string "##X#O#OXX", it represents the following board state:



Output Format

To figure out if the given board state could happen in a regular game, output "valid" if it conforms to expected gameplay, and "invalid" if it does not.

Problem Description (中文)

井字遊戲，又稱為井字棋或圈圈叉叉，是一種經典的二人玩家策略遊戲。遊戲通常在一個 3×3的方格棋盤上進行，每個玩家輪流在空格中放置自己的標記，一個玩家用叉，另一個用圈，目標是在水平、垂直或對角線上先連成一條線的玩家獲勝。如果棋盤填滿而沒有玩家達成連線，則遊戲以平局結束。

現在給定一字串作為 3*3棋盤的局面，玩家一必為先手，以 'X'放置標記，玩家二則以 'O'放置標記。請你判斷給定的局面是否在正常的井字遊戲過程中可達到。

Problem Description (中文)

輸入格式 (請使用java.util.Scanner讀取輸入)

給定含有9個字元的字串作為 3*3棋局的局面，每一個字元可能 為‘X’, ‘O’ (字母 O)或是 ‘#’(代表還未有人下在此空格)。舉例來說，當輸入一字串 ##X#O#OXX，則為下圖的局面：

		X
	O	
O	X	X

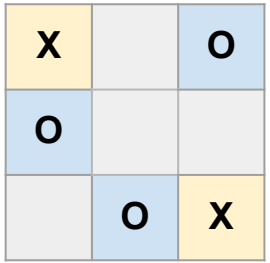
輸出格式

判斷給定的局面是否為正常遊戲過程中可能會出現，若為可能出現的局面則輸出 valid，若為不可能出現的局面則輸出invalid。

Sample Input and Output (1/4)

Keyboard Input	X#OO###OX
Output	invalid

輸入說明:

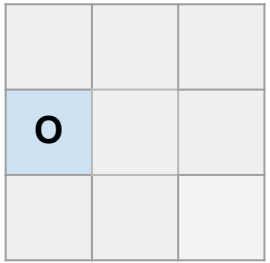


輸出說明:
invalid, 因為玩家二重複下棋, 玩家一與玩家二應輪流下棋。

Sample Input and Output (2/4)

Keyboard Input	###O#####
Output	invalid

輸入說明:

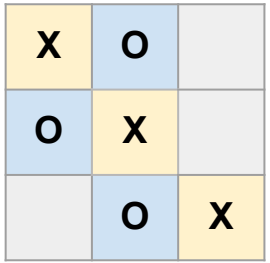


輸出說明:
invalid, 因為玩家一必為先手, 且以 'X'來下棋, 因此第一個棋為'O'的狀況不可能發生。

Sample Input and Output (3/4)

Keyboard Input	XO#OX##OX
Output	invalid

輸入說明:



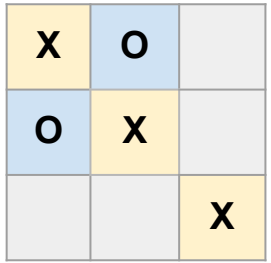
輸出說明:

invalid, 因為玩家二多下一局, 在第五回合時玩家一會獲勝, 因此不會再輪到玩家二下棋。

Sample Input and Output (4/4)

Keyboard Input	XO#OX###X
Output	valid

輸入說明:



輸出說明:
valid，為棋局中可能出現的局面。

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