문제 1,2) NumberOfIslands

Problem

Given a 2d grid map of '1's (land) and '0's (water), count the number of islands. An island is surrounded by water and is formed by connecting adjacent lands horizontally or vertically. You may assume all four edges of the grid are all surrounded by water.

```
Example 1:
Input:
11110
11010
11000
00000
Output: 1

Example 2:
Input:
11000
11000
00100
00011
Output: 3
```

1. NumberOfIsland

dfs

Problem

- {'1','1','1','0','1'},
  {'1','1','0','0','0'},
  {'1','1','0','0','1'},
  {'0','0','0','0','1'}

1은 육지, 0 은 바다

Example

Input: J = "aA", S = "aAAbbbb" **Output:** 3

Note

S and J will consist of letters and have length at most 50.
The characters in J are distinct

NumberOfIslands_BFS(바비큐)

Problem

```
{'1','1','1','0','1'},          1은 육지, 0 은 바다
{'1','1','0','0','0'},          Output :3
{0',0','0','0','1'},
{'0','0','0','0','1'}
```

Example

```
{00, 01, 02, 03, 04},
{10,  11, 12,  13, 14},
{20, 21, 22, 23, 24},
{30, 31, 32, 33, 34},

queue(0,0)    0-1, 01, 10, -10
```

문제3,4,5) Maximum Depth Of BinaryTree

Problem

Given a binary tree, find its maximum depth.

The maximum depth is the number of nodes along the longest path from the root node down to the farthest leaf node.

Note: A leaf is a node with no children.

Example:

Given binary tree [3,9,20,null,null,15,7],

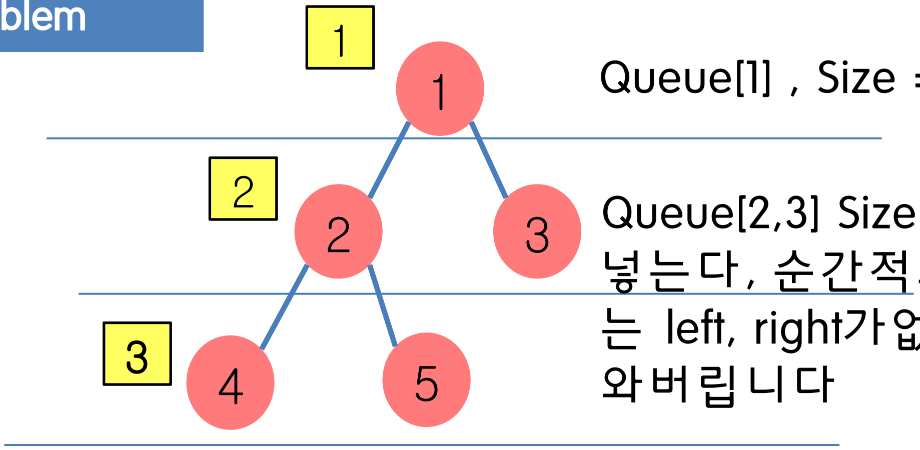
```
    3
   / \
  9  20
    /  \
   15   7
```

return its depth = 3.

Maximum Depth Of BinaryTree

BFS-queue

Problem



Queue[1] , Size =1, left, right 검색해서 Queue에 넣는다

Queue[2,3] Size =2 , 2일때 left, right 검색해서 Queue에
넣는다, 순간적으로 [3, 4, 5] 가됩니다. 3을 빼서검색할
는 left, right가없습니다. For문에서 size=2를 만족해서 나
와버립니다

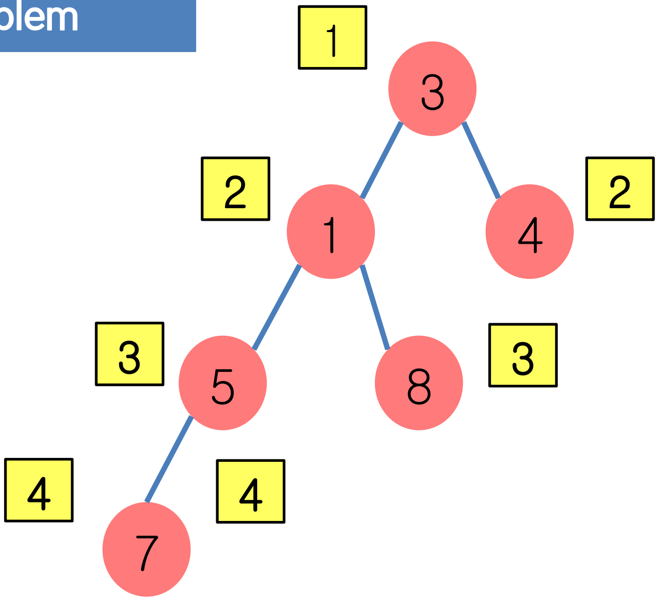
Queue[4,5] Size =2 , 4일때 left, right 가없습니다.
5일때도left, right가없습니다. For문에서 size=2를 만족하
서 나와버립니다

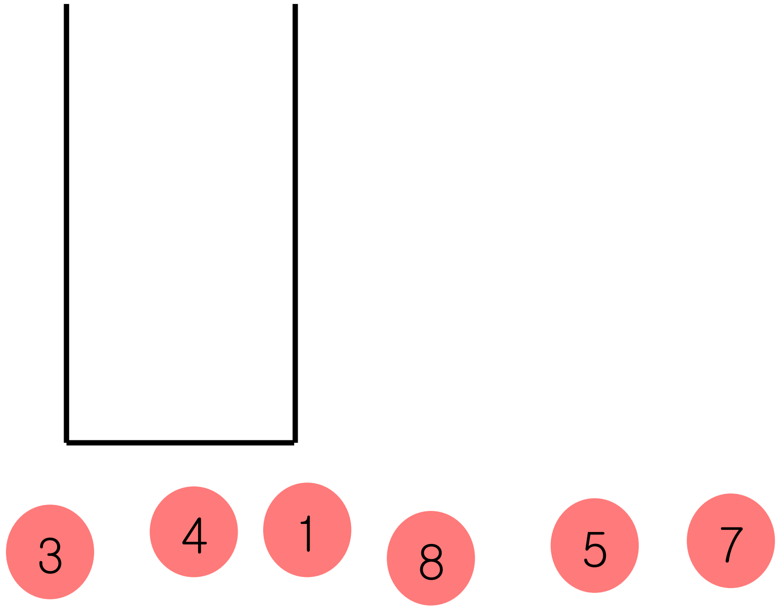
Queue[2,3]

Maximum Depth Of BinaryTree

DFS stack

Problem





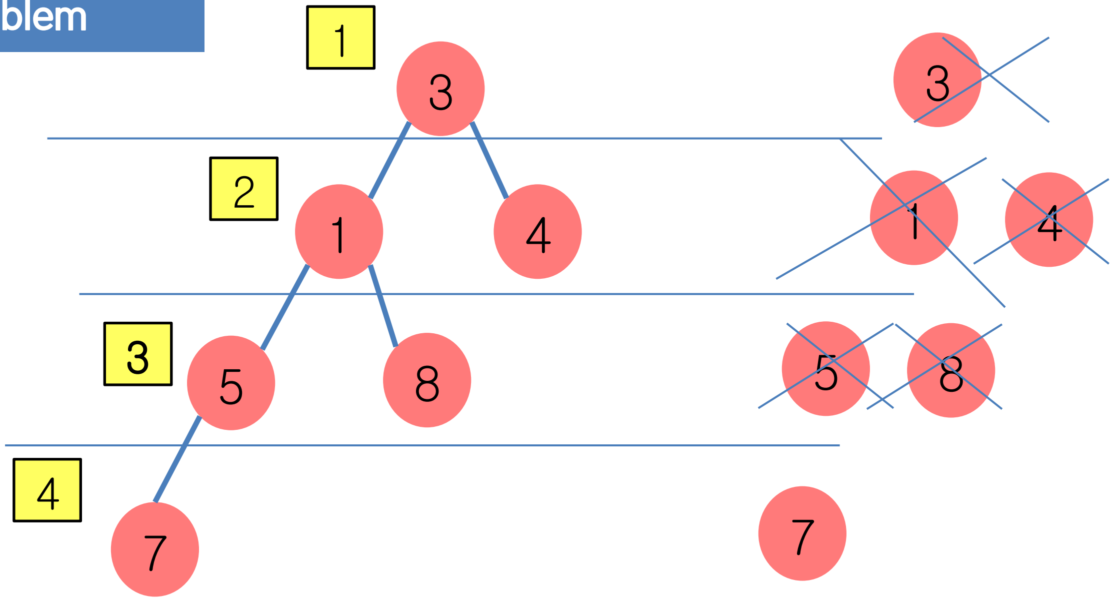
Example

1. DFS방식 스택을 이용한다.

Maximum Depth Of BinaryTree

BFS-queue

Problem



Example

1. Queue 방식, 근접해서 한칸씩
2.

문제 6) Max Area Of Islands

Problem

문제설명)
2차원배열 그리드가 0과 1 인 경우, 1이 육지(섬) 0이 바다입니다.
육지는 4 방향 (수평 또는 수직)으로 연결된 1 (육지를 나타냄)의 그룹입니다.
그리드의 네 모서리 모두가 물로 둘러싸여 있다고 가정 할 수 있습니다. 주어진 2D 배열에서 섬의 최대 면적을 찾으십시오.
(섬이 없으면 최대 면적은 0입니다.)

Note)
The length of each dimension in the given grid does not exceed 50

예제)

```
{{1,1,0,1,1},
 {0,1,1,0,0},
 {0,0,0,0,0},
 {1,1,0,1,1},
 {1,0,1,1,1},
 {1,0,1,1,1}};
```

island must be connected 4-directionally.
그래서 답은 8, 12는 안됨

Max Area Of Islands

Problem

{1, 1, 0, 1, 1},
{0, 1, 1, 0, 0}
{0, 0, 0, 0, 0}
{1, 1, 0, 1, 1}
{1, 0, 1, 1, 1}
{1, 0, 1, 1, 1}

1은 육지, 0 은 바다
Output :8

Example

{00, 01, 02, 03, 04},
{10, 11, 12, 13, 14},
{20, 21, 22, 23, 24},
{30, 31, 32, 33, 34},
{40, 41, 42, 43, 44},
{50, 51, 52, 53, 54},

1. Number of island
섬의 개수를 구한다.

2. Count 변수를 두고
4,2,4,8
max= Math.max(max, area);

문제 7) Word Ladder

Problem

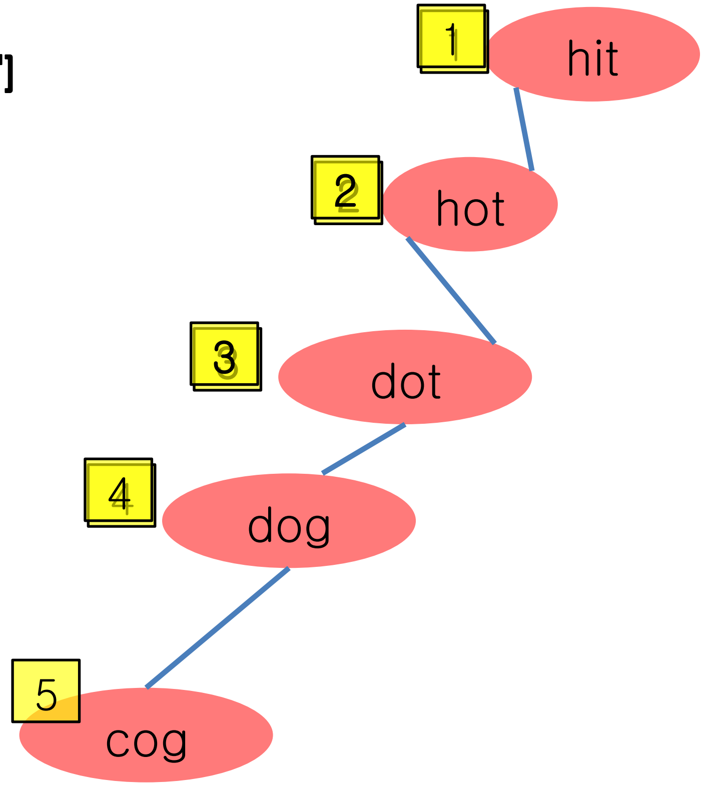
Given two words (*beginWord* and *endWord*), and a dictionary's word list, find the length of shortest transformation sequence from *beginWord* to *endWord*, such that:
Only one letter can be changed at a time.
Each transformed word must exist in the word list. Note that *beginWord* is *not* a transformed word.
Note:
Return 0 if there is no such transformation sequence.
All words have the same length.
All words contain only lowercase alphabetic characters.
You may assume no duplicates in the word list.
You may assume *beginWord* and *endWord* are non-empty and are not the same.
Example 1:
Input: beginWord = "hit", endWord = "cog", wordList = ["hot","dot","dog","lot","log","cog"]
Output: 5
Explanation: As one shortest transformation is "hit" -> "hot" -> "dot" -> "dog" -> "cog", return its length 5.

Word Ladder

Problem

Input: beginWord = "hit", endWord = "cog",
wordList = ["hot","dot","dog","lot","log","cog"]

Output: 5
"hit" -> "hot" -> "dot" -> "dog" -> "cog",



Example

1. hit ait, hat , hia zit, hzt, hiz	Queue size 1 hot
2. hot aot hat hoa zot hzt hoz	Queue size 3 Dot,lot,hot
3. dot ,lot, hot log	Queue size 10 Dot,lot.hot,log..
4. 10개	33개

문제 8) Word Search

Problem

Given a 2D board and a word, find if the word exists in the grid.

The word can be constructed from letters of sequentially adjacent cell, where "adjacent" cells are those horizontally or vertically neighboring. The same letter cell may not be used more than once.

Example:

```
board =
[
  ['A','B','C','E'],
  ['S','F','C','S'],
  ['A','D','E','E']
]
```

Given word = "ABCCED", return true.
Given word = "SEE", return true.
Given word = "ABCB", return false.

WordSearch

Problem

{'A','B', C','E'},
{'S','F', 'C','S'},
{'A','D','E','E'}
String word = "ABCCED";

Output : true;

Example

1. Dfs 문제
2. 제한 조건 찾기
   'A' 를 찾았다면

   {00, 01, 02, 03},
   {10, 11, 12, 13},
   {20, 21, 22, 23},

  좌표, visited, word

문제 9) Remove Invalid Parentheses

Problem

Remove the minimum number of invalid parentheses in order to make the input string valid. Return all possible results.

Note: The input string may contain letters other than the parentheses (and).

Example 1:

Input: "()())()"
Output: ["()()()", "(())()"]
Example 2:

Input: "(a)())()"
Output: ["(a)()()", "(a())()"]
Example 3:

Input: ")("
Output: [""]

Remove Invalid Parentheses

Problem

Input: "(a)())()"
Output: ["(a)()()", "(a())()"]

Input: "()())()"
Output: ["()()()", "(())()"]

Ex) 012345
substring(0,3): 012
substring(3) : 345

Solution

0	1	2	3	4	5	6	7
(	a	)	(	)	)	(	)

1. Queue에 저장
2. 케이스별로 valid 체크
3. Brace 체크, 쌍으로 존재
4. newStr 큐에 저장

i=0 + a) ( )) ( )

i=2 (a + ( )) ( )

i=5 (a) ( ) + ( )

Remove Invalid Parentheses

0	1	2	3	4	5	6	7		
(	a	)	(	)	)	(	)	⇒	a)( )) ( )
(	a	)	(	)	)	(	)	⇒	
(	a	)	(	)	)	(	)	⇒	(a ( )) ( )
(	a	)	(	)	)	(	)	⇒	(a))) ( )
(	a	)	(	)	)	(	)	⇒	(a)( ) ( )
(	a	)	(	)	)	(	)	⇒	(a)( ) ( )
(	a	)	(	)	)	(	)	⇒	(a)( )))
(	a	)	(	)	)	(	)	⇒	(a)( )) (

Remove Invalid Parentheses

0	1	2	3	4	5	6
a	)	(	)	)	(	)

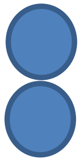
a) ( )) ( )

a) ( )) ( )

a) ( )) ( )

a ( )) ( )

a))) ( )



(a ( )) ( )

문제 10) Maze

Problem

There is a ball in a maze with empty spaces and walls. The ball can go through empty spaces by rolling up, down, left or right, but it won't stop rolling until hitting a wall. When the ball stops, it could choose the next direction.

Given the ball's start position, the destination and the maze, determine whether the ball could stop at the destination.

The maze is represented by a binary 2D array. 1 means the wall and 0 means the empty space. You may assume that the borders of the maze are all walls. The start and destination coordinates are represented by row and column indexes.

Example 1:
Input 1: a maze represented by a 2D array
```
0 0 1 0 0
0 0 0 0 0
0 0 0 1 0
1 1 0 1 1
0 0 0 0 0
```
Input 2: start coordinate (rowStart, colStart) = (0, 4)
Input 3: destination coordinate (rowDest, colDest) = (4, 4)

Output: true

Maze1_BFS

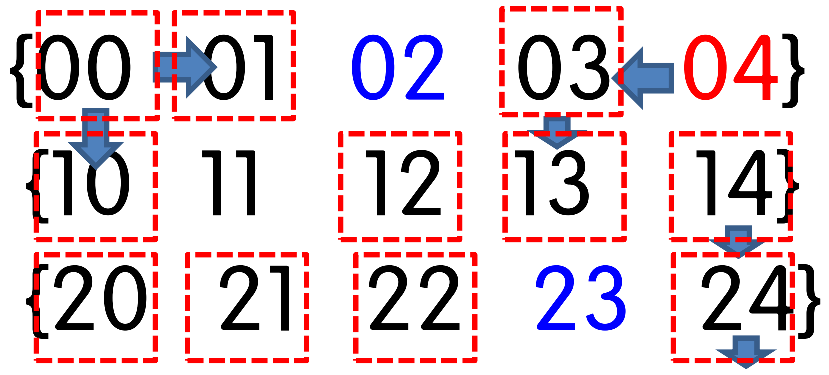
Problem

1 0 2 0 1
0 0 0 0 0
0 0 1 0 0

Input : start = (0, 4)
Input : destination = (4, 4)

결과값 : true left -> down -> left -> down -> right -> down -> right.

Example



1.벽면 인식후, 벽 앞 위치

Maze 1_DFS

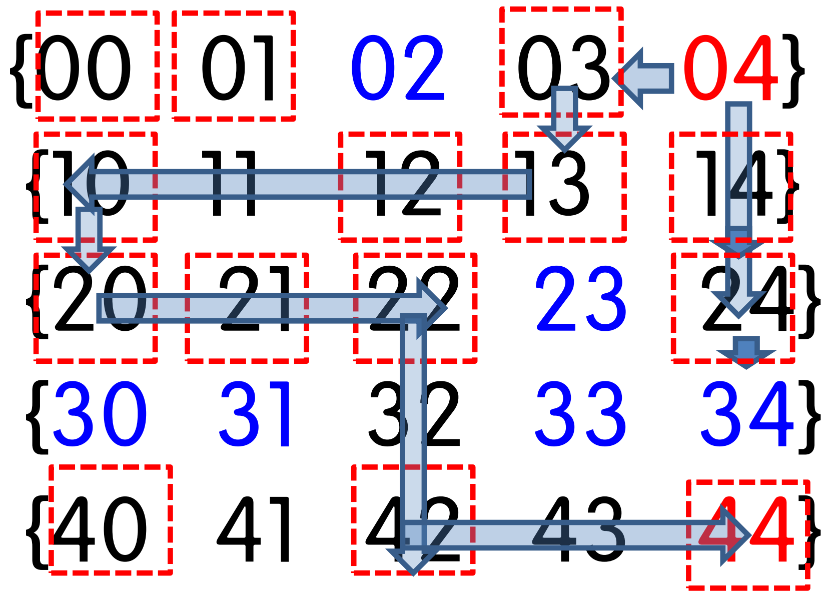
Problem

```
0 0 1 0 0
0 0 0 0 0
0 0 0 1 0
1 1 0 1 1
0 0 0 0 0
```

Input : start = (0, 4)
Input : destination = (4, 4)

결과값 : true

Example



1.벽면 인식후, 벽 앞 위치