

Week5 Home work!

Task 1.

This is a real interview task!

We've met binary maze problem. Can you generalize it from binary maze to normal maze? Except for the changing from binary maze to a normal maze, all other conditions remain the same. Your task is still to find out the shortest path from a start point to an end point. You can assume all input is valid.

Task 2.

This is a real interview task! Again!

What you are given is a sentence like:

"I am happy and sad"

Please forget about how insane it is, just focusing on the following questions.

And then some substitutes of some words are provided as well:

{ {"happy", "glad"}, {"glad", "good"}, {"sad", "sorrow"} }

which means happy can be replaced by glad while glad can continuously substituted by good and so on.

Now, please write out all possible sentences with all substitutes. For example, by giving this specific case, your output should be like:

```
I am happy and sad
I am happy and sorrow
I am glad and sad
I am glad and sorrow
I am good and sad
I am good and sorrow
```

Tips: This is really a complex problem. What it tests are:

0. For C++ player, how to separate string into words
1. How to build graph for our substitution?
2. How to get all substitution for all words? It's actually a **Cartesian Product**, which can be completed by DFS.
3. How to make sentences correctly?