**Stable Matching**

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**1.代码**

#include <iostream>

#include <vector>

#include <queue>

#include <map>

#include <sstream>

using namespace std;

class Solution {

public:

vector<pair<char, char>> stableMatching(map<char, string>& HospitalPrefs, map<char, string>& StudentPrefs) {

vector<pair<char, char>> matches;

queue<char> bachelors;

map<char, char> currentMatches;

for (auto const& Hospital : HospitalPrefs) {

bachelors.push(Hospital.first);

}

while (!bachelors.empty()) {

char Hospital = bachelors.front();

bachelors.pop();

string const& prefs = HospitalPrefs[Hospital];

for (char Student : prefs) {

if (currentMatches.find(Student) == currentMatches.end()) {

currentMatches[Student] = Hospital;

break;

}

else {

string const& currentPrefs = StudentPrefs[Student];

char currentMatch = currentMatches[Student];

bool oldPreferred = false;

for (char preferredHospital : currentPrefs) {

if (preferredHospital == Hospital) {

break;

}

if (preferredHospital == currentMatch) {

oldPreferred = true;

break;

}

}

if (oldPreferred) {

currentMatches[Student] = Hospital;

bachelors.push(currentMatch);

break;

}

}

}

}

for (auto const& match : currentMatches) {

matches.push\_back(make\_pair(match.second, match.first));

}

return matches;

}

};

int main() {

cout << "请输入医院或学生的数量（1-1000): ";

int num;

cin >> num;

map<char, string> HoapitalPrefs;

map<char, string> StudentPrefs;

cout << "请输入医院和学生的偏好列表：" << endl;

char person;

string prefs;

for (int i = 0; i < 2\*num; i++) {

cin >> person >> prefs;

if (i < num ) {

HoapitalPrefs[person] = prefs;

}

else {

stringstream ss(prefs);

string prefList;

ss >> prefList;

char Hospital;

while (ss >> Hospital) {

StudentPrefs[Hospital] += prefList[0];

}

}

}

Solution solution;

vector<pair<char, char>> result = solution.stableMatching(HoapitalPrefs, StudentPrefs);

cout << "医院和学生稳定匹配的配对为：" << endl;

for (auto const& match : result) {

cout << "(" << match.first << "," << match.second << ")" << endl;

}

return 0;

}

**2.运行结果截图**



