1     2  3  
/  \  /      \  
4    5        6  
                  \  
                   7  
输入是int[][] input, input*[0]是input[1] 的parent，比如 {{1,4}, {1,5}, {2,5}, {3,6}, {6,7}}会形成上面的图  
第一问是只有0个parents和只有1个parent的节点  
第二问是 两个指定的点有没有公共祖先  
第三问是就一个点的最远祖先，如果有好几个就只需要输出一个就好，举个栗子，这里5的最远祖先可以是1或者2，输出任意一个就可以  
  
时间很紧，一个钟头基本上说说oa的思路就过去一刻钟了，然后昨晚还要分析时间复杂度和空间辅助度*

List<Integer> findparent(int[][] edges){

If(edges==null || edges.length==0) {

Return new ArrayList<>();

}

Map<Integer,List<Integer>> map = new HashMap<>();

Map<Integer,Integer> indegreemap = new HashMap<>();

For(int[] edge : edges) {

List<Integer> list = map.get(edge[1]);

If(list == null) {

List = new ArrayList<>();

}

List.add(edge[0]);

Map.put(edge[1],list);

List = map.get(edge[0]);

If(list == null) {

List = new ArrayList<>();

}

Map.put(edge[0],list);

}

For(Map.Entry<Integer,List<Integer>> entry: indegreemap.entrySet()){

If(entry.getValue().size()==0) {

Res1.add(entry.getKey());

}else if (entry.getValue().size()==1) {

Res2.add(entry.getKey());

}

}

}

Private Boolean hascommon(int[][] edges, int a, int b) {

Set<Integer> a\_parent= new HashSet<>();

getall(map,a,a-parent);

Set<Integer> b\_parent = new HashSet<>();

getall(map,b,b\_parent);

For(int n: bparent) {

If(a\_parent.contains(n)) {

Return true;

}

}

Return false;

}

Private void getall(Map<Integer,List<Integer>> map, int a, Set<Integer> parent) {

List<Integer> list = map.get(a);

If(list == null || list.size()==0) {

Return;

}

For(int p : list) {

Parent.add(p);

Getall(map,p,parent);

}

}

Private void highestparent(Map<Integer,List<Integer>> map, int a, int[] p, int step) {

List<Integer> next = map.get(a);

if(step>p[0]) {

p[0]=step;

p[1]=a;

}

If(next!=null && next.size()>0) {

For(int pa:next) {

Highestparent(map,pa,p,step+1);

}

}

} *下面是我整理的地里所有的karat面筋，攒人品*

*以下内容需要积分高于 180 才可浏览*

*firend cycle  
1st Question: 输出所有的employee的friendlist -> 就是用一个map存起来然后打印就好了（这个是无向图，e.g: 1和2是朋友，2的列表里也要有1）  
2nd Question: 输出每个department里有多少人的朋友是其他部门的 ->也就是遍历一遍就好了. 涓€浜�-涓夊垎-鍦帮紝鐙鍙戝竷  
3rd Question: 输出是否所有employee都在一个社交圈 -> 我当时想的就是随便找一个点，用DFS遍历一遍，如果所有点都被遍历到就return true，不然就是false. 1point 3acres 璁哄潧  
  
  
算task和pretask輸出task by level的那題. Just calculate indegree, bfs  
是像這樣  
input = {  
{"cook", "eat"},   // do "cook" before "eat"  
{"study", "eat"},  
{"sleep", "study"}}  
  
output (steps of a workflow):  
{{"sleep", "cook"},.  
{"study"},  
{"eat"}}  
  
  
// We are working on a security sy*[*stem*](http://www.1point3acres.com/%E7%BE%8E%E5%9B%BD%E5%9B%BD%E5%9C%9F%E5%AE%89%E5%85%A8%E9%83%A82012%E5%B9%B4%E5%BA%A6%E6%9B%B4%E6%96%B0stem%E4%B8%93%E4%B8%9A%E5%90%8D%E5%8D%95-%E7%9C%8B%E7%9C%8B%E4%BD%A0%E7%9A%84%E4%B8%93%E4%B8%9A/)*for a badged-access room in our company's building.  
. 鐣欏鐢宠璁哄潧-涓€浜╀笁鍒嗗湴  
// Given an ordered list of employees who used their badge to enter or exit the room, write a function that returns two collections:  
.鐣欏璁哄潧-涓€浜�-涓夊垎鍦�  
// 1. All employees who didn't use their badge while exiting the room – they recorded an enter without a matching exit.*

+1

Set<String> getlist(String[][] record) {

Set<String> seta = new HashSet<>();

Set<String> setb = new HashSet<>();

If(record == null || record.length == 0) {

Return new HashSet<>();

}

Map<String,Integer> map = new HashMap<>();

For(int[] r : record) {

Integer curr = map.get(r[0]);

If(r[1].equals(“enter”) {

If(curr == null || curr == 0) {

Curr = 1;

}else {

Seta.add(r[0]);

Curr = 1;

}

Map.put(r[0],curr);

}else if (r[1].equals(“exit”)) {

If (curr == null || curr<0) {

Setb.add(r[0]);

Curr = 0;

}else{

Curr = curr-1;

}

Map.put(r[0],curr);

}

}

} *// 2. All employees who didn't use their badge while entering the room  – they recorded an exit without a matching enter.  
exit = -1, enter = 1;  
// badge\_records = [  
//   ["Martha",   "exit"],-google 1point3acres  
//   ["Paul",     "enter"],.*[*1point3acres.com/bbs*](http://1point3acres.com/bbs) *//   ["Martha",   "enter"],  
//   ["Martha",   "exit"],  
//   ["Jennifer", "enter"],. more info on*[*1point3acres.com*](http://1point3acres.com/) *//   ["Paul",     "enter"],. From 1point 3acres bbs  
//   ["Curtis",   "enter"],  
//   ["Paul",     "exit"],. visit*[*1point3acres.com*](http://1point3acres.com/)*for more.  
//   ["Martha",   "enter"],  
//   ["Martha",   "exit"],  
//   ["Jennifer", "exit"],. 鐗涗汉浜戦泦,涓€浜╀笁鍒嗗湴  
// ]*

*// find\_mismatched\_entries(badge\_records). 鐣欏鐢宠璁哄潧-涓€浜╀笁鍒嗗湴  
// Expected output: ["Paul", "Curtis"], ["Martha"]  
/\*\*  
  
  
\* We want to find employees who badged into our secured room unusually often. We have an unordered list of names and access times over a single day. Access times are given as three or four-digit numbers using 24-hour time, such as "800" or "2250".  
  
\* Write a function that finds anyone who badged into the room 3 or more times in a 1-hour period, and returns each time that they badged in during that period. (If there are multiple 1-hour periods where this was true, just return the first one.)  
-google 1point3acres*Map<String,List<Integer>> map = new HashMap<>();

For(int[] r : records) {

List<Integer> list = map.get(r[0]);

If(list == null) {

List = new ArrayList<>();

}

List.add(convert(r[1]));

Map.put(r[0],list);

}

For(Map.Entry<String,List<Integer>> entry: map.entrySet()) {

List<Integer> list = entry.getValue();

If(list.size()>=3){

Collections.sort(list);

For(int i=0; i<list.size();i++) {

Int curr = list.get(i);

Int index = find(list,curr+60);

If(index-i>=3) {

Res.addAll(list,I,index);

Break;

}

}

}

} *\* badge\_records = [  
  
\* ["Paul", 1355],  
\* ["Jennifer", 1910],  
  
\* ["John", 830],  
  
\* ["Paul", 1315],  
  
\* ["John", 835],  
鏉ユ簮涓€浜�.涓夊垎鍦拌鍧�.   
\* ["Paul", 1405],  
  
\* ["Paul", 1630],  
  
\* ["John", 855],  
  
\* ["John", 915],  
  
\* ["John", 930],  
  
\* ["Jennifer", 1335],  
  
\* ["Jennifer", 730],  
  
\* ["John", 1630],  
  
\* ]-google 1point3acres  
  
\* <p>  
. visit*[*1point3acres.com*](http://1point3acres.com/)*for more.  
\* Expected output:  
  
\* John: 830 835 855 915 930  
  
\* Paul: 1315 1355 1405.1point3acres缃�  
  
  
  
  
  
  
. visit*[*1point3acres.com*](http://1point3acres.com/)*for more.  
1     2    4  
\   /     / \  
   3     5   8  
    \    / \    \.鏈枃鍘熷垱鑷�1point3acres璁哄潧  
      6     7    9  
第一题：输出只有1个和0个parent的individual  
第二题是，任意给两个节点，给出他们共同的ancestor节点（可以有不只一个）。  
第三题是，任意给一个节点，找出离它最远的ancestor节点，可以是多个。第  
. Waral 鍗氬鏈夋洿澶氭枃绔�,  
  
Intuit 网上coding competition的一道题给一个矩阵，矩阵里的每个元素是1，但是其中分布着一些长方形区域， 这些长方形区域中的元素为0. 要求输出每个长方形的位置（用长方形的左上角元素坐标和右下角元素坐标表示）。  
example：  
input:  
[  
[1,1,1,1,1,1], . 涓€浜�-涓夊垎-鍦帮紝鐙鍙戝竷  
[0,0,1,0,1,1],  
[0,0,1,0,1,0],  
[1,1,1,0,1,0],  
[1,0,0,1,1,1]  
]  
output:. From 1point 3acres bbs  
[  
[1,0,2,1],  
[1,3,3,3],  
[2,5,3,5],  
[4,1,4,2]  
]  
如果 Matrix 中有多个由0组成的长方体，请返回多套值（前提每两个长方体之间是不会连接的，所以放心）. 不改变输入的做法  
不过还有第三问，就是connected components. 1point 3acres 璁哄潧  
第三问 基本上就是leetcode connected components,只不过是返回一个listoflist，每个list是一个component的所有点坐标  
那个图是1,01,0组成的矩阵，0组成的就是各种图形。跟前面关系的确不大  
如果矩阵里有多个不规则的形状，返回这些形状。这里需要自己思考并定义何谓“返回这些形状”*public List<List<Integer>> getrectangle(int[][] matrix) {

If(matrix == null || matrix.length == 0) {

Return new ArrayList<>();

}

Boolean[][] visit = new boolean[matrix.length][matrix[0].length];

List<List<Integer>> list = new ArrayList<>();

For(int i=0; i<matrix.length; i++) {

For(int j=0;j<matrix[0].length;j++) {

If(matrix[i][j]==0 && !visit[i][j]) {

Int[] coordinate=new int[4];

Coordinate[0]=I;

Coordinate[1]=j;

Coordinate[2]=I;

Coordinate[3]=j;

Dfs(matrix,i,j,visit,coordinate);

List.add(Arrays.asList(coordinate[0],coordinate[1],coordinate[2],coordinate[3]);

}

}

}

Return list;

}

Private void dfs(int[][] matrix, int row, int col, Boolean[][] visit, int[] coordinate) {

If(row<0 || row>=matrix.length||col<0||col>=matrix[0].length||visit[row][col]||matrix[row][col]!=0) {

Return;

}

Visit[row][col]=true;

Int[][] dirs.={{-1,0},{1,0},{0,1},{0,-1}};

Coordinate[0]=Math.min(coordinate[0],row);

Coordinate[1]=Math.min(coordinate[1],col);

Coordinate[2]=Math.max(coordinate[2],row);

Coordinate[3]=Math.max(coordinate[3],col);

For(int[] dir: dirs.) {

Int r = row+dir[0];

Int c=col+dir[1];

Dfs(matrix,r,c,visit,coordinate)

}

} *. 鍥磋鎴戜滑@1point 3 acres  
第一題是給你一個string例如"2+3-999"回傳計算結果int.鐣欏璁哄潧-涓€浜�-涓夊垎鍦�  
第二題加上parenthesis 例如"2+((8+2)+(3-999))"一樣回傳計算結果  
第三道题是加了变量名的。。会给你一个map比如{'a':1, 'b':2, 'c':3}，假设输入为"a+b+c+1"输出要是7，如果有未定义的变量，比如"a+b+c+1+d"输出就是7+d*

LC基础计算机题  
只有+ - 没有 \* or / 也不需要考虑空白  
  
follow up1 : with (, )  
只考虑 + - ，和leetcode原题一样  
做完这题大概剩下15分钟  
  
follow up2  
input string has +, - , (, ),  and 字符 / 字串变量  
code = {  
  e : 1,  
  y : 2,.

  temperature : 5  
}         
input string:  
(e + 8) - pressure + 3 - temperature  
--> 9 - pressure + 3 - 5  
--> 7 – pressure

Public int calculator(String input) {

If(input == null || input.length()==0) {

Return 0;

}

Int sum=0;

Int num=0;

Int sign = 1;

For(int i=0; i<input.length();i++) {

If(input.charAt(i)>=’0’ && input.charAt(i)<=’9’) {

Num=num\*10+input.charAt(i)-‘0’;

}else{

Sum=sum+num\*sign;

Sign=input.charAt(i)==’+’?1:-1;

Num=0;

}

}

Return sum;

}

Public int calculator(String input) {

If(input == null || input.length()==0) {

Return 0;

}

Int sum=0;

Int num=0;

Int sign = 1;

For(int i=0; i<input.length();i++) {

If(input.charAt(i)>=’0’ && input.charAt(i)<=’9’) {

Num=num\*10+input.charAt(i)-‘0’;

}else if(input.charAt(i)==’+’||input.charAt(i)==’-‘){

Sum=sum+num\*sign;

Sign=input.charAt(i)==’+’?1:-1;

Num=0;

}else if (input.charAt(i)==’(’) {

Stack.offerFirst(sum);

Stack.offerFirst(sign);

Sign=1;

Sum=0;

}else if (input.charAt(i)==’)‘) {

Sum=sum+sign\*num;

Int temp = stack.pollFirst()\*sum;

Sum=temp+stack.pollFirst();

Sign = 1;

Num=0;

}

}

Return num==0?sum:sum+sign\*num;

}

**public** String expresscalculator(String input, Map<String,Integer> map) {

**if**(input == **null** || input.length()==0) {

**return** "";

}

String simple = simplify(input,map);

**int** i = 0;

Deque<cell> stack = **new** LinkedList<>();

StringBuilder sb = **new** StringBuilder();

**int** num = 0;

**int** sum=0;

**int** sign = 1;

**while**(i<simple.length()){

**if**(isdigit(simple.charAt(i))) {

num=num\*10+simple.charAt(i)-'0';

i++;

}**else** **if** (simple.charAt(i)=='+'||simple.charAt(i)=='-'){

sum=sum+num\*sign;

sign=simple.charAt(i)=='+'?1:-1;

num=0;

i++;

}**else** **if** (ischar(simple.charAt(i))){

**if**(sign==1){

sb.append('+');

}**else**{

sb.append('-');

}

**while**(i<simple.length()&&ischar(simple.charAt(i))){

sb.append(simple.charAt(i));

i++;

}

}**else** **if** (simple.charAt(i)=='(') {

stack.offerFirst(**new** cell(sum,sign,sb.toString()));

sum=0;

sign=1;

sb = **new** StringBuilder();

i++;

}**else** **if** (simple.charAt(i)==')') {

cell prev = stack.pollFirst();

sum=sum+sign\*num;

**int** t = prev.sign\*sum;

num=0;

sum=prev.sum+t;

StringBuilder next = **new** StringBuilder();

next.append(prev.str);

**if**(sb.length()>0){

next.append(update(prev.sign,sb.toString()));

}

sb = next;

sign=1;

i++;

}

}

**if**(num!=0){

sum=sum+sign\*num;

}

sb.append('+');

sb.append(sum);

**return** sb.toString();

}

**private** String update(**int** sign, String s){

StringBuilder sb = **new** StringBuilder();

**if**(sign==1){

**return** s;

}**else**{

**for**(**int** i=0; i<s.length();i++){

**if**(s.charAt(i)=='+'){

sb.append('-');

}**else** **if** (s.charAt(i)=='-'){

sb.append('+');

}**else**{

sb.append(s.charAt(i));

}

}

}

**return** sb.toString();

}

**class** cell{

**int** sum;

**int** sign;

String str;

**public** cell(**int** s, **int** sign, String str){

**this**.sum=s;

**this**.sign=sign;

**this**.str=str;

}

}

**private** String simplify(String input, Map<String,Integer> map) {

StringBuilder sb = **new** StringBuilder();

**int** i = 0;

**while**(i<input.length()){

**if**(ischar(input.charAt(i))) {

**int** fast = i;

StringBuilder temp = **new** StringBuilder();

**while**(fast<input.length() && ischar(input.charAt(fast))){

temp.append(input.charAt(fast));

fast++;

}

String s = temp.toString();

**if**(map.containsKey(s)){

sb.append(map.get(s));

i=fast;

}**else**{

sb.append(s);

i=fast;

}

}**else**{

sb.append(input.charAt(i));

i++;

}

}

**return** sb.toString();

}

**private** **boolean** ischar(**char** c){

**return** c>='a' && c<='z';

}

**private** **boolean** isdigit(**char** c){

**return** c>='0' && c<='9';

}

*第一题：给广告在每个domain上被click的次数.*[*1point3acres.com/bbs*](http://1point3acres.com/bbs) *要求返回domain及其所有sub domain 被click的总次数  
输入：[  
           ["*[*google.com*](http://google.com/)*", "60"],  
           ["*[*yahoo.com*](http://yahoo.com/)*", "50"],. 鍥磋鎴戜滑@1point 3 acres  
           ["*[*sports.yahoo.com*](http://sports.yahoo.com/)*", "80"]  
         ]  
输出：[  
            ["com", "190"], (60+50+80)  
            ["*[*google.com*](http://google.com/)*", "60"],   
            ["*[*yahoo.com*](http://yahoo.com/)*", "130"] (50+80)  
            ["*[*sports.yahoo.com*](http://sports.yahoo.com/)*", "80"]  
         ]*

List<List<String>> countClick(String[][] array) {

If(array == null || array.length==0) {

Return new ArrayList<>();

}

Map<String,Integer> map = new HashMap<>();

for(int i=0; i<array.length; i++) {

String curr = array[i][0];

Int count = convert(array[i][1]);

Int j=curr.length()-1;

While(j>=0) {

While(j>=0 && curr.charAt(j)!=’.’) {

Sb.append(curr.charAt(j));

j--;

}

String temp = sb.toString();

Integer c = map.get(temp);

If(c == null) {

C=count;

}else{

C=c+count;

}

Map.put(temp,c);

If(j>=0 && curr.charAt(j)==’.’) {

Sb.append(curr.charAt(j));

j--;

}

}

}

List<List<String>> res = new ArrayList<>();

For(Map.Entry<String,Integer> entry : map.entrySet()) {

List<String> temp = new ArrayList<>();

String key = entry.getKey();

Integer value = entry.getValue();

Temp.add(key);

Temp.add(Integer.toString(value));

Res.add(new ArrayList(temp));

}

} *info*

*第二题：给每个user访问历史记录，找出两个user之间longest continuous common history  
输入： [  
             ["3234.html", "xys.html", "7hsaa.html"], // user1  
             ["3234.html", ''sdhsfjdsh.html", "xys.html", "7hsaa.html"] // user2  
           ], user1 and user2 （指定两个user求intersect）  
  
输出：["xys.html", "7hsaa.html"]-google 1po*

user0 = [ "/nine.html", "/four.html", "/six.html", "/seven.html", "/one.html" ]  
user2 = [ "/nine.html", "/two.html", "/three.html", "/four.html", "/six.html", "/seven.html" ]  
user1 = [ "/one.html", "/two.html", "/three.html", "/four.html", "/six.html" ]  
user3 = [ "/three.html", "/eight.html" ]. 鐣欏鐢宠璁哄潧-涓€浜╀笁鍒嗗湴  
  
Sample output:  
  
(user0, user2):  
   /four.html  
   /six.html  
   /seven.html  
  
(user1, user2):. visit [1point3acres.com](http://1point3acres.com/) for more.  
   /two.html  
   /three.html  
   /four.html  
   /six.html  
  
(user0, user3):  
   None. 鍥磋鎴戜滑@1point 3 acres  
  
(user1, user3):  
   /three.html*int3acres***public** List<String> lc(String[] one, String[] two){

**int**[][] dp = **new** **int**[one.length+1][two.length+1];

**int** max = 0;

**int** end = -1;

**for**(**int** i=1;i<one.length+1;i++){

**for**(**int** j=1; j<two.length+1;j++) {

**if**(one[i-1].equals(two[j-1])) {

dp[i][j]=dp[i-1][j-1]+1;

}**else**{

dp[i][j]=0;

}

**if**(dp[i][j]>max){

max = dp[i][j];

end = i-1;

}

}

}

List<String> list = **new** ArrayList<>();

**for**(**int** j=end; j>end-max;j--){

list.add(one[j]);

}

**return** list;

} *第一题：类似meeting rooms，输入是一个int[][] meetings, int start, int end, 每个数都是时间，13：00 =》 1300， 9：30 =》 930， 看新的meeting 能不能安排到meetings  
ex: {[1300, 1500], [930, 1200],[830, 845]}, 新的meeting[820, 830], return true; [1450, 1500] return false;*

Int[] start = new int[meetings.length];

Int[] end = new *第二题：类似merge interval，唯一的区别是输出，输出空闲的时间段，merge完后，再把两两个之间的空的输出就好，注意要加上0 - 第一个的start time*

Q1: 設計一個 sparse vector class  
  
sparseVector v = new sparseVector(100); //size constructor; size is 100.鐣欏璁哄潧-涓€浜�-涓夊垎鍦�  
    v.set(0, 1.0);  
    v.set(3, 2.0);  
    v.set(80,-4.5);  
  
    Sy[stem](http://www.1point3acres.com/%E7%BE%8E%E5%9B%BD%E5%9B%BD%E5%9C%9F%E5%AE%89%E5%85%A8%E9%83%A82012%E5%B9%B4%E5%BA%A6%E6%9B%B4%E6%96%B0stem%E4%B8%93%E4%B8%9A%E5%90%8D%E5%8D%95-%E7%9C%8B%E7%9C%8B%E4%BD%A0%E7%9A%84%E4%B8%93%E4%B8%9A/).out.println(v.get(80)); //should print -4.5  
    System.out.println(v.get(50)); //should print 0.0  
  
    try {  
       System.out.println(v.get(101)); //error -- index out of range  
       throw new IllegalStateException("We should not get here, an exception should have been thrown");. 涓€浜�-涓夊垎-鍦帮紝鐙鍙戝竷  
    } catch (IndexOutOfBoundsException t) {  
       // success  
    }  
. 1point 3acres 璁哄潧  
    System.out.println(v.toString()); //should print something like [1.0, 0.0, 0.0, 2.0, 0.0, ...]    
  
. 鐣欏鐢宠璁哄潧-涓€浜╀笁鍒嗗湴  
  
Q2:  
  
Add these operations to your library: Addition, dot product, and cosine. Formulae for each are provided below; we’re more interested in you writing the code than whether you’ve memorized the formula. For each operation, your code should throw an error if the two input vectors are not equal length.-google 1point3acres  
. 1point 3acres 璁哄潧  
Sample input/output:.鏈枃鍘熷垱鑷�1point3acres璁哄潧  
//Note: This is pseudocode. Your actual syntax will vary by language..鏈枃鍘熷垱鑷�1point3acres璁哄潧  
v1 = new vector(5)  
v1[0] = 4.0  
v1[1] = 5.0  
. from: [1point3acres.com/bbs](http://1point3acres.com/bbs)   
v2 = new vector(5)  
v2[1] = 2.0  
v2[3] = 3.0. From 1point 3acres bbs  
  
v3 = new vector(2)  
. from: [1point3acres.com/bbs](http://1point3acres.com/bbs)   
print v1.add(v2) //should print [4.0, 7.0, 0.0, 3.0, 0.0]  
print v1.add(v3) //error -- vector lengths don’t match  
  
print v1.dot(v2) //should print 10  
print v1.dot(v3) //error -- vector lengths don’t match  
  
print v1.cos(v2) //should print 0.433  
print v1.cos(v3) //error -- vector lengths don’t match  
  
  
Formulae:  
Addition  
a.add(b) = [a[0]+b[0], a[1]+b[1], a[2]+b[2], ...]  
. 鍥磋鎴戜滑@1point 3 acres  
Dot product  
a.dot(b) = a[0]\*b[0] + a[1]\*b[1] + a[2]\*b[2] + ...  
  
Cosine  
a.cos(b) = a.dot(b) / (norm(a) \* norm(b))  
//norm(a) = sqrt(a[0]^2 + a[1]^2 + a[2]^2 + ...). 鐣欏鐢宠

**public** String expresscalculator(String input, Map<String,Integer> map) {

**if**(input == **null** || input.length()==0) {

**return** "";

}

String simple = simplify(input,map);

**int** i = 0;

Deque<cell> stack = **new** LinkedList<>();

StringBuilder sb = **new** StringBuilder();

**int** num = 0;

**int** sum=0;

**int** sign = 1;

**while**(i<simple.length()){

**if**(isdigit(simple.charAt(i))) {

num=num\*10+simple.charAt(i)-'0';

i++;

}**else** **if** (simple.charAt(i)=='+'||simple.charAt(i)=='-'){

sum=sum+num\*sign;

sign=simple.charAt(i)=='+'?1:-1;

num=0;

i++;

}**else** **if** (ischar(simple.charAt(i))){

**if**(sign==1){

sb.append('+');

}**else**{

sb.append('-');

}

**while**(i<simple.length()&&ischar(simple.charAt(i))){

sb.append(simple.charAt(i));

i++;

}

}**else** **if** (simple.charAt(i)=='(') {

stack.offerFirst(**new** cell(sum,sign,sb.toString()));

sum=0;

sign=1;

sb = **new** StringBuilder();

i++;

}**else** **if** (simple.charAt(i)==')') {

cell prev = stack.pollFirst();

sum=sum+sign\*num;

**int** t = prev.sign\*sum;

num=0;

sum=prev.sum+t;

StringBuilder next = **new** StringBuilder();

next.append(prev.str);

**if**(sb.length()>0){

next.append(update(prev.sign,sb.toString()));

}

sb = next;

sign=1;

i++;

}

}

**if**(num!=0){

sum=sum+sign\*num;

}

sb.append('+');

sb.append(sum);

**return** sb.toString();

}

**private** String update(**int** sign, String s){

StringBuilder sb = **new** StringBuilder();

**if**(sign==1){

**return** s;

}**else**{

**for**(**int** i=0; i<s.length();i++){

**if**(s.charAt(i)=='+'){

sb.append('-');

}**else** **if** (s.charAt(i)=='-'){

sb.append('+');

}**else**{

sb.append(s.charAt(i));

}

}

}

**return** sb.toString();

}

**class** cell{

**int** sum;

**int** sign;

String str;

**public** cell(**int** s, **int** sign, String str){

**this**.sum=s;

**this**.sign=sign;

**this**.str=str;

}

}

**private** String simplify(String input, Map<String,Integer> map) {

StringBuilder sb = **new** StringBuilder();

**int** i = 0;

**while**(i<input.length()){

**if**(ischar(input.charAt(i))) {

**int** fast = i;

StringBuilder temp = **new** StringBuilder();

**while**(fast<input.length() && ischar(input.charAt(fast))){

temp.append(input.charAt(fast));

fast++;

}

String s = temp.toString();

**if**(map.containsKey(s)){

sb.append(map.get(s));

i=fast;

}**else**{

sb.append(s);

i=fast;

}

}**else**{

sb.append(input.charAt(i));

i++;

}

}

**return** sb.toString();

}

**private** **boolean** ischar(**char** c){

**return** c>='a' && c<='z';

}

**private** **boolean** isdigit(**char** c){

**return** c>='0' && c<='9';

}