Code : 1  
package Topic\_09\_RecursionWithArrayList;

import java.util.ArrayList;

import java.util.Iterator;

import java.util.Scanner;

public class A\_GetSubSequence {

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

String str = s.nextLine();

ArrayList<String> res = gss(str);

System.out.println(res);

}

public static ArrayList<String> gss(String str) {

if (str.length() == 0) {

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

res.add("");

return res;

}

String charAtZero = String.valueOf(str.charAt(0));

String ros = str.substring(1);

ArrayList<String> result = gss(ros);

ArrayList<String> newResult = new ArrayList<String>();

for (int i = 0; i < result.size(); i++) {

newResult.add(result.get(i));

}

for (int i = 0; i < result.size(); i++) {

newResult.add(charAtZero + result.get(i));

}

return newResult;

}

}

/\*

Sample Input

abc

Sample Output

[, c, b, bc, a, ac, ab, abc]

\*/

Code : 2  
package Topic\_09\_RecursionWithArrayList;

import java.util.ArrayList;

import java.util.Scanner;

public class B\_GetKpc {

// 0 1 2 3 4 5 6 7 8 9

static String[] arr = { ".;", "abc", "def", "ghi", "jkl", "mno", "pqrs", "tu", "vwx", "yz" };

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

String str = s.nextLine();

ArrayList<String> res = getKpc(str);

System.out.println(res);

}

public static ArrayList<String> getKpc(String str) {

if (str.length() == 0) {

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

res.add("");

return res;

}

String charAtZero = String.valueOf(str.charAt(0));

String ros = str.substring(1);

ArrayList<String> result = getKpc(ros);

ArrayList<String> newResult = new ArrayList<>();

String getKeyPad = arr[Integer.valueOf(charAtZero)];

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

for (String s : result) {

newResult.add(String.valueOf(getKeyPad.charAt(i) + s));

}

}

return newResult;

}

}

/\*

Sample Input

78

Sample Output

[tv, tw, tx, uv, uw, ux]

\*/

Code : 3  
package Topic\_09\_RecursionWithArrayList;

import java.util.ArrayList;

import java.util.Scanner;

public class C\_GetStairPaths {

public static void main(String[] args) throws Exception {

Scanner s = new Scanner(System.in);

int n = s.nextInt();

System.out.println(getStairPaths(n));

}

public static ArrayList<String> getStairPaths(int n) {

if (n <= 0) {

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

if (n == 0) {

res.add("");

}

return res;

}

ArrayList<String> pathOne = getStairPaths(n - 1);

ArrayList<String> pathTwo = getStairPaths(n - 2);

ArrayList<String> pathThree = getStairPaths(n - 3);

ArrayList<String> oneRes = new ArrayList<String>();

ArrayList<String> twoRes = new ArrayList<String>();

ArrayList<String> threeRes = new ArrayList<String>();

ArrayList<String> paths = new ArrayList<String>();

for (String s : pathOne) {

paths.add(1 + s);

}

for (String s : pathTwo) {

paths.add(2 + s);

}

for (String s : pathThree) {

paths.add(3 + s);

}

return paths;

}

}

/\*

Sample Output for n=3

[111, 12, 21, 3]

Sample Output for n=5

[11111, 1112, 1121, 113, 1211, 122, 131, 2111, 212, 221, 23, 311, 32]

\*/

Code : 4  
package Topic\_09\_RecursionWithArrayList;

import java.util.ArrayList;

import java.util.Scanner;

public class D\_GetMazePaths {

public static void main(String[] args) throws Exception {

Scanner s = new Scanner(System.in);

int n = s.nextInt();

int m = s.nextInt();

System.out.println(getMazePaths(1, 1, n, m));

}

public static ArrayList<String> getMazePaths(int sr, int sc, int dr, int dc) {

if (sr == dr && sc == dc) {

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

res.add("");

return res;

}

ArrayList<String> hPaths = new ArrayList<String>();

ArrayList<String> vPaths = new ArrayList<String>();

if (sc < dc)

hPaths = getMazePaths(sr, sc + 1, dr, dc);//2

if (sr < dr)

vPaths = getMazePaths(sr + 1, sc, dr, dc);//1

ArrayList<String> paths = new ArrayList<String>();

for (String s : hPaths) {

paths.add("h" + s);

}

for (String s : vPaths) {

paths.add("v" + s);

}

return paths;

}

}

/\*

Sample Output for 3x3

[hhvv, hvhv, hvvh, vhhv, vhvh, vvhh]

\*/

Code : 5  
package Topic\_09\_RecursionWithArrayList;

import java.util.ArrayList;

import java.util.Scanner;

public class E\_GetMazePathsWithJumps {

public static void main(String[] args) throws Exception {

Scanner s = new Scanner(System.in);

int n = s.nextInt();

int m = s.nextInt();

System.out.println(getMazePathsWithJumps(1, 1, n, m));

}

public static ArrayList<String> getMazePathsWithJumps(int sr, int sc, int dr, int dc) {

if (sr == dr && sc == dc) {

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

res.add("");

return res;

}

ArrayList<String> paths = new ArrayList<String>();

//Horizontal moves

for (int ms = 1; ms <= dc - sc; ms++) {

ArrayList<String> hPaths = getMazePathsWithJumps(sr, sc + ms, dr, dc);

for (String s : hPaths) {

paths.add("h" + ms + s);

}

}

//vertical moves

for (int ms = 1; ms <= dr - sr; ms++) {

ArrayList<String> vPaths = getMazePathsWithJumps(sr + ms, sc, dr, dc);

for (String s : vPaths) {

paths.add("v" + ms + s);

}

}

//diagonal moves

for (int ms = 1; ms <= dr - sr && ms <= dc - sc; ms++) {

ArrayList<String> dPaths = getMazePathsWithJumps(sr + ms, sc + ms, dr, dc);

for (String s : dPaths) {

paths.add("d" + ms + s);

}

}

return paths;

}

}

/\*

Sample Output 2x2

[h1v1, v1h1, d1]

Sample Output 3x3

[h1h1v1v1, h1h1v2, h1v1h1v1, h1v1v1h1, h1v1d1, h1v2h1, h1d1v1, h2v1v1, h2v2, v1h1h1v1, v1h1v1h1, v1h1d1, v1h2v1, v1v1h1h1, v1v1h2, v1d1h1, v2h1h1, v2h2, d1h1v1, d1v1h1, d1d1, d2]

\*/