import java.io.BufferedReader;

import java.io.FileReader;

import java.io.IOException;

public class Diametrul {

public static final int PLUS\_INFINIT = Integer.MAX\_VALUE;

public static final int MINUS\_INFINIT = Integer.MIN\_VALUE;

public static int diametrul(int[][] A) {

int[][] S = simetrizare(A);

int[][] D = distante(S);

int[] E = excentricitati(D);

return maxim(E);

}

public static int[][] simetrizare(int[][] A) {

int[][] B = new int[A.length][A.length];

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

for (int j = i + 1; j < A.length; j++) {

B[i][j] = B[j][i] = Math.max(A[i][j], A[j][i]);

}

}

return B;

}

public static int[][] distante(int[][] A) {

int[][] D = new int[A.length][A.length];

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

for (int j = 0; j < D.length; j++) {

D[i][j] = PLUS\_INFINIT;

}

D[i][i] = 0;

}

int[][] AP = copy(A);

boolean modificat = false;

int p = 1;

do {

modificat = false;

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

for (int j = 0; j < A.length; j++) {

if ((D[i][j] == PLUS\_INFINIT) && (AP[i][j] != 0)) {

D[i][j] = p;

modificat = true;

}

}

}

AP = inmultire(AP, A);

p++;

} while (modificat && p <= A.length);

return D;

}

public static int[][] copy(int[][] A) {

int[][] B = new int[A.length][A.length];

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

for (int j = 0; j < B.length; j++) {

B[i][j] = A[i][j];

}

}

return B;

}

public static int[][] inmultire(int[][] A, int[][] B) {

int[][] AB = new int[A.length][A.length];

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

for (int j = 0; j < AB.length; j++) {

AB[i][j] = 0;

for (int k = 0; k < AB.length; k++) {

AB[i][j] += A[i][k] \* B[k][j];

}

}

}

return AB;

}

public static int[] excentricitati(int[][] D) {

int E[] = new int[D.length];

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

E[i] = maxim(D[i]);

}

return E;

}

public static int maxim(int[] V) {

int m = MINUS\_INFINIT;

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

m = Math.max(V[i], m);

}

return m;

}

public static void main(String[] args) {

int n = -1;

int[][] A = null;

BufferedReader reader = null;

String line = null;

if (args.length != 1) {

System.err.println("Fiserul de intrare nu a fost specificat");

System.exit(1);

}

try {

reader = new BufferedReader(new FileReader(args[0]));

line = reader.readLine();

if (line == null)

throw new Exception("Fisierul " + args[0] + " este vid");

n = Integer.parseInt(line);

if (n <= 0)

throw new Exception("n trebuie sa fie strict pozitiv");

A = new int[n][n];

for (int i = 0; i < n; i++) {

line = reader.readLine();

if (line == null)

throw new Exception("Lipseste linia " + i);

String[] tokens = line.split(" ");

if (tokens.length != n)

throw new Exception("Numar de elemente incorect pe linia "

+ i);

for (int j = 0; j < n; j++)

A[i][j] = Integer.parseInt(tokens[j]);

}

} catch (Exception e) {

System.err.println(e.getMessage());

System.exit(2);

} finally {

if (reader != null) {

try {

reader.close();

} catch (IOException e) {

}

}

}

System.out.println("Diametrul = " + diametrul(A));

}

}