\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CSCI 381-26 Project 7: Medial Axis + Distance Transform Language: JAVA

Name: Akshar Patel

Due date: Soft copy: 3/27/2020

Hard copy: 3/27/2020

Submission date: Soft copy: 3/29/2020

Hard copy: 3/29/2020

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Part 1: Algorithm**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

I. main (…)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

step 0: inFile 🡨 open input file

numRows, numCols, minVal, maxVal 🡨 read from inFile

dynamically allocate zeroFramedAry with extra 2 rows and 2 cols

dynamically allocate skeletonAry with extra 2 rows and 2 cols

open outFile\_1, outFile\_2

Step 1: skeletonFileName 🡨 argv[1] + “\_skeleton”

Step 2: skeletonFile 🡨 open ( skeletonFileName )

Step 3: decompressedFileName 🡨 argv[1] + “\_decompressed”

Step 4: decompressFile 🡨 open (decompressedFileName)

step 5: setZero (zeroFramedAry)

setZero (skeletonAry)

Step 6: loadImage (inFile, zeroFramedAry) // begins at zeroFramedAry (1,1)

Step 7: compute8Distance (zeroFramedAry, outFile1) // Perform distance transform

Step 8: skeletonExtraction (zeroFramedAry, skeletonAry, skeletonFile, outFile1)

// perform lossless compression

Step 9: skeletonExpansion (zeroFramedAry, skeletonFile, outFile2)

// perform decompression

step 10: Output numRows, numCols, newMinVal, newMaxVal to decompressFile

Step 11: ary2File (zeroFramedAry, decompressFile)

Step 12: close all files

**Part 2: Source code**

import java.io.\*;

import java.util.\*;

class Main {

    public static int numRows, numCols, minVal, maxVal;

    public static int newmin = 99999, newmax = 0;

    public static int[][] zeroFramedAry, skeletonAry;

    static void setZero(int[][] Ary){

        for(int i = 0 ; i < numRows + 2 ; i++){

            for(int j = 0 ; j < numCols + 2 ; j++){

                Ary[i][j] = 0;

            }

        }

    }

    static void loadImage (Scanner file, int[][] Ary){

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                Ary[i][j] = file.nextInt();

            }

        }

    }

    static void prettyprint(int[][] Ary, PrintWriter file){

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                if(Ary[i][j] == 0){

                    file.print("   ");

                }

                else{

                    file.print(Ary[i][j] + " ");

                }

            }

            file.println();

        }

    }

    static void compute8Distance(int[][] Ary, PrintWriter file){

        fistPass\_8Distance(Ary);

        file.println("-----1st pass distance transform-----");

        prettyprint(Ary, file);

        secondPass8Distance(Ary);

        file.println("\n"+"-----2nd pass distance transform-----");

        prettyprint(Ary, file);

    }

    static void fistPass\_8Distance(int[][] Ary){

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                if(Ary[i][j] > 0){

                    int a = Ary[i-1][j-1], b = Ary[i-1][j], c = Ary[i-

1][j+1], d = Ary[i][j-1];

                    Ary[i][j] = Math.min(Math.min(a, b), Math.min(c, d)) + 1;

                }

            }

        }

    }

    static void secondPass8Distance(int[][] Ary){

        for(int i = numRows ; i > 0 ; i--){

            for(int j = numCols ; j > 0 ; j--){

                if(Ary[i][j] > 0){

                    int e = Ary[i][j+1], f = Ary[i+1][j-

1], g = Ary[i+1][j], h = Ary[i+1][j+1], x = Ary[i][j];

                    Ary[i][j] = Math.min(x, 1+Math.min(Math.min(e, f), Math.min(g, h)));

                }

                if(newmin > Ary[i][j]){

                    newmin = Ary[i][j];

                }

                if(newmax < Ary[i][j]){

                    newmax = Ary[i][j];

                }

            }

        }

    }

    static void skeletonExtraction(int[][] Ary, int[][] skAry, PrintWriter skfile,

PrintWriter file){

        computeLocalMaxima(Ary, skAry);

        file.println("\n"+"-----Local maxima-----");

        prettyprint(skAry, file);

        extractLocalMaxima(skAry, skfile);

        skfile.close();

    }

    static void computeLocalMaxima(int[][] Ary, int[][] skAry){

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                if(Ary[i][j] > 0 && isLocalMaxima(Ary, i, j) != 0){

                    skAry[i][j] = Ary[i][j];

                }

                else{

                     skAry[i][j] = 0;

                }

            }

        }

    }

    static int isLocalMaxima(int[][] Ary, int i, int j){

        int a = Ary[i-1][j-1], b = Ary[i-1][j], c = Ary[i-1][j+1], d = Ary[i][j-1];

        int e = Ary[i][j+1], f = Ary[i+1][j-1], g = Ary[i+1][j], h = Ary[i+1][j+1];

        int x = Ary[i][j];

        if(x >= a && x >= b && x >= c && x >= d && x >= e && x >= f && x >= g && x >= h){

            return 1;

        }

        else{

            return 0;

        }

    }

    static void extractLocalMaxima(int[][] skAry, PrintWriter skfile){

        skfile.println(numRows + " " + numCols + " " +  newmin + " " + newmax);

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                if(skAry[i][j] > 0){

                    skfile.println(i + " " + j + " " + skAry[i][j]);

                }

            }

        }

    }

    static void skeletonExpansion(int[][] Ary, Scanner skfile, PrintWriter file){

        setZero(Ary);

        load(skfile, Ary);

        firstPassExpension(Ary);

        file.println("-----1st pass Expansion-----");

        prettyprint(Ary, file);

        secondPassExpension(Ary);

        file.println("\n"+"-----2nd pass Expansion-----");

        prettyprint(Ary, file);

    }

    static void load(Scanner file, int[][] Ary){

        file.nextLine();

        while(file.hasNextInt()){

            Ary[file.nextInt()][file.nextInt()] = file.nextInt();

        }

    }

    static void firstPassExpension(int[][] Ary){

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                if(Ary[i][j] == 0){

                    int x = max\_neighbors(i, j, Ary) - 1;

                    if(Ary[i][j] < x){

                        Ary[i][j] = x;

                    }

                }

            }

        }

    }

    static void secondPassExpension(int[][] Ary){

        for(int i = numRows ; i > 0 ; i--){

            for(int j = numCols ; j > 0 ; j--){

                int x = max\_neighbors(i, j, Ary);

                if(Ary[i][j] < x){

                    Ary[i][j] = x - 1;

                }

            }

        }

    }

    static int max\_neighbors(int i, int j, int[][] Ary){

        int max = 0;

        for(int x = i - 1 ; x < i + 2 ; x++){

            for(int y = j - 1 ; y < j + 2 ; y++){

                if (Ary[x][y] > max) {

                    max = Ary[x][y];

                }

            }

        }

        return max;

    }

    static void ary2File(int[][] Ary, PrintWriter file){

        file.println(numRows+" "+numCols+" "+minVal+" "+maxVal);

        for(int i = 1 ; i < numRows + 1 ; i++){

            for(int j = 1 ; j < numCols + 1 ; j++){

                if(Ary[i][j] >=1 ){

                    file.print(1 + " ");

                }

                else{

                    file.print(0 + " ");

                }

            }

            file.println();

        }

    }

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

        Scanner inFile = new Scanner(new FileInputStream(args[0]));

        PrintWriter outFile1 = new PrintWriter(new FileOutputStream(args[1]));

        PrintWriter outFile2 = new PrintWriter(new FileOutputStream(args[2]));

        numRows = inFile.nextInt();

        numCols = inFile.nextInt();

        minVal = inFile.nextInt();

        maxVal = inFile.nextInt();

        zeroFramedAry = new int[numRows + 2][numCols + 2];

        skeletonAry = new int[numRows + 2][numCols + 2];

        String skeletonFileName = args[0];

        PrintWriter skeletonFile = new PrintWriter(skeletonFileName.substring(0,

skeletonFileName.indexOf(".")) + "\_skeleton"+ ".txt");

        String decompressedFileName = args[0];

        PrintWriter decompressFile  = new PrintWriter(decompressedFileName.substring(0,

decompressedFileName.indexOf(".")) +"\_decompressed"+ ".txt");

        setZero(zeroFramedAry);

        setZero(skeletonAry);

        loadImage(inFile, zeroFramedAry);

        compute8Distance(zeroFramedAry, outFile1);

        skeletonExtraction(zeroFramedAry, skeletonAry, skeletonFile, outFile1);

        File skefile = new File(skeletonFileName.substring(0, skeletonFileName.indexOf

(".")) + "\_skeleton"+ ".txt");

        Scanner skeletonFile\_2 = new Scanner(skefile);

        skeletonExpansion(zeroFramedAry, skeletonFile\_2, outFile2);

        ary2File(zeroFramedAry, decompressFile);

        inFile.close();

        outFile1.close();

        outFile2.close();

        skeletonFile\_2.close();

        decompressFile.close();

    }

}

**Part 3: Output**

* **image1**

|  |  |
| --- | --- |
| **input file** | **outFile1** |
| **30 40 0 1**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0** | **-----1st pass distance transform-----**    **1 1 1 1 1 1 1 1 1 1**  **1 2 2 2 2 2 2 2 2 1 1**  **1 2 3 3 3 3 3 3 2 2 1 1**  **1 2 3 4 4 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 6 5 5 4 4 3 3 2 2 1 1**  **1 1 2 3 4 5 6 6 6 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 7 6 6 5 5 4 4 3 3 2 2**  **1 2 3 4 5 6 7 7 6 6 5 5 4 4 3 3**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 7 7 6 6 5 5 4 4**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 2 3 4 5 6 7 8 7 7 6 6 5 5**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1 2 3 4 5 6 7 8 8 7 7 6**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 2 3 4 5 6 7 8 8 8 7**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 2 3 4 5 6 7 8 9 8**  **1 2 3 4 5 6 6 6 6 6 6 5 4 3 2 1 1 2 3 4 5 6 7 8 9**  **1 2 3 4 5 6 7 7 7 7 6 5 4 3 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 4 4 4 4 4 4 4 4 4 4 4 4 3 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 5 5 5 5 5 5 5 5 5 5 5 5 4 3 2 1**  **1 2 3 4 5 6 7 8 8 7 6 6 6 6 6 6 6 6 6 6 6 6 6 5 4 3 2 1**  **1 2 3 4 5 6 7 8 8 7 7 7 7 7 7 7 7 7 7 7 7 7 6 5 4 3 2 1**  **1 2 3 4 5 6 7 8 8 8 8 8 8 8 8 8**  **1 2 3 4 5 6 7 8 9 9 9 9 9 9 9 1**  **1 2 3 4 5 6 7 8 9 10 10 10 10 10 2 1** |

|  |  |
| --- | --- |
| **outFile1** | **outFile1** |
| **-----2nd pass distance transform-----**    **1 1 1 1 1 1 1 1 1 1**  **1 2 2 2 2 2 2 2 2 1 1**  **1 2 3 3 3 3 3 3 2 2 1 1**  **1 2 3 4 4 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 6 5 5 4 4 3 3 2 2 1 1**  **1 1 2 3 4 5 6 6 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 5 5 4 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 5 4 4 3 3 3 2 2 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 3 4 5 5 4 4 3 3 2 2 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 2 3 4 5 4 4 3 3 2 2 1 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1 2 3 4 4 4 3 3 2 2 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 2 3 3 3 3 3 2 2 1 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 2 2 2 2 2 2 2 1 1**  **1 2 3 4 5 6 6 6 6 6 6 5 4 3 2 1 1 1 1 1 1 1 1 1 1**  **1 2 3 4 5 6 7 7 7 7 6 5 4 3 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 3 4 5 6 7 7 7 7 6 5 4 4 4 4 4 4 4 4 4 4 4 4 4 3 2 1**  **1 2 3 4 5 6 6 6 6 6 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1** | **-----Local maxima-----**            **5 5**    **6**  **6 6 5**  **1 6 6 5 5 4 3 2 1**  **6**    **5 5**  **5**            **8 8**  **8 8**  **8 8**  **4 4 4 4 4 4 4 4 4 4 4 4** |
| **outFile2** | **outFile2** |
| **-----1st pass Expansion-----**          **4 4 4 4 3 2 1**  **3 4 5 5 4 3 2 1**  **2 3 4 5 5 5 4 3 2 1**  **1 2 3 4 5 6 5 5 4 4 3 2 1**  **1 2 3 4 5 6 6 5 5 4 4 3 3 2 2 1 1**  **1 1 2 3 4 5 6 6 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 5 5 4 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 5 4 4 3 3 3 2 2 1 1**  **1 2 3 4 5 5 4 4 3 3 2 2 2 1 1**  **1 2 3 4 5 4 4 3 3 2 2 1 1 1**  **1 2 3 4 4 4 3 3 2 2 1 1**  **1 2 3 3 3 3 3 2 2 1 1**  **1 2 2 2 2 2 2 2 1 1**  **1 1 1 1 1 1 1 1 1**  **7 7 7 7 6 5 4 3 2 1**  **6 7 8 8 7 6 5 4 3 2 1**  **5 6 7 8 8 7 6 5 4 3 2 1**  **4 5 6 7 8 8 7 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **3 4 5 6 7 7 7 7 6 5 4 4 4 4 4 4 4 4 4 4 4 4 4 3 2 1**  **2 3 4 5 6 6 6 6 6 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1** | **-----2nd pass Expansion-----**    **1 1 1 1 1 1 1 1 1 1**  **1 2 2 2 2 2 2 2 2 1 1**  **1 2 3 3 3 3 3 3 2 2 1 1**  **1 2 3 4 4 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 6 5 5 4 4 3 3 2 2 1 1**  **1 1 2 3 4 5 6 6 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 4 5 6 5 5 4 4 4 3 3 2 2 1 1**  **1 2 3 4 5 5 5 4 4 3 3 3 2 2 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 3 4 5 5 4 4 3 3 2 2 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 2 3 4 5 4 4 3 3 2 2 1 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1 2 3 4 4 4 3 3 2 2 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 2 3 3 3 3 3 2 2 1 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 2 2 2 2 2 2 2 1 1**  **1 2 3 4 5 6 6 6 6 6 6 5 4 3 2 1 1 1 1 1 1 1 1 1 1**  **1 2 3 4 5 6 7 7 7 7 6 5 4 3 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 3 4 5 6 7 7 7 7 6 5 4 4 4 4 4 4 4 4 4 4 4 4 4 3 2 1**  **1 2 3 4 5 6 6 6 6 6 6 5 4 3 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1** |
| **skeleton file** | **decompressed file** |
| |  |  | | --- | --- | | **30 40 0 8**  **6 27 5**  **6 28 5**  **8 28 6**  **9 28 6**  **9 29 6**  **9 31 5**  **10 22 1**  **10 28 6**  **10 29 6**  **10 31 5**  **10 32 5**  **10 34 4**  **10 36 3**  **10 38 2**  **10 40 1**  **11 28 6**  **13 27 5**  **13 28 5**  **14 27 5**  **20 11 8**  **20 12 8**  **21 11 8**  **21 12 8**  **22 11 8**  **22 12 8**  **23 17 4**  **23 18 4**  **23 19 4**  **23 20 4**  **23 21 4**  **23 22 4** | **23 23 4**  **23 24 4**  **23 25 4**  **23 26 4**  **23 27 4**  **23 28 4** | | **30 40 0 1**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**  **0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0** |

* **image2**

**49 64 0 1**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

|  |  |
| --- | --- |
| **outFile1** | **outFile1** |
| **-----1st pass distance transform-----**        **1**  **1 1 1**  **1 1 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 3 4 4 5 5 6 5 5 4 4 3 3 2 2**  **1 2 3 4 5 5 6 6 6 5 5 4 4 3 3**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 6 6 5 5 4 4**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 2 3 4 5 6 7 6 6 5 5**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1 2 3 4 5 6 7 6 6**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 2 3 4 5 6 7**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 2 3 4 5**  **1 2 3 4 5 6 6 6 6 6 6 5 4 3 2 1 1 2 3**  **1 2 3 4 5 6 7 7 7 7 6 5 4 3 2 1 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 1 1 1**  **1 2 3 4 5 6 7 8 8 7 6 5 4 3 2 1 1 1 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 2 3 3 4 4 5 5 6 5 5 4 4 3 3 2 2**  **1 2 3 4 5 5 6 6 6 5 5 4 4 3 3**  **1 2 3 4 5 6 7 6 6 5 5 4 4**  **1 2 3 4 5 6 7 6 6 5 5**  **1 2 3 4 5 6 7 6 6**  **1 2 3 4 5 6 7**  **1 2 3 4 5**  **1 2 3**  **1** | **-----2nd pass distance transform-----**        **1**  **1 1 1**  **1 1 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 2 2 3 3 3 2 2 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1 1 2 2 3 2 2 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 1 2 2 2 1 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 1 2 1 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 1 1**  **1 1 1**  **1** |
| **outFile1** | **outFile2** |
| **-----Local maxima-----**        **1**    **2**    **3**    **4**    **5**  **1 2 3 4 5 5 5 4 3 2 1**  **5**    **4**    **3**    **5 5 5 5 5 5 5 5 2**  **5 5 5 5 5 5 5 5**  **1**  **1**    **2**    **3**    **4**    **5**  **1 2 3 4 5 5 5 4 3 2 1**  **5**    **4**    **3**    **2**    **1** | **-----1st pass Expansion-----**        **1**  **1 1 1**  **1 2 1**  **2 2 2 1**  **1 2 3 2 1**  **1 3 3 3 2 1**  **2 3 4 3 2 1**  **1 2 4 4 4 3 2 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **4 4 4 4 4 4 4 4 4 4 3 2 1 1 1 2 2 2 1 1**  **3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 1 2 1 1**  **2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1**  **2 2 2 1**  **1 2 3 2 1**  **1 3 3 3 2 1**  **2 3 4 3 2 1**  **1 2 4 4 4 3 2 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 1 1**  **1 1 1**  **1** |
| **outFile2** | **skeleton file** |
| **-----2nd pass Expansion-----**        **1**  **1 1 1**  **1 1 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 2 2 3 3 3 2 2 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1 1 2 2 3 2 2 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1 1 2 2 2 1 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 1 2 1 1**  **1 2 3 4 5 5 5 5 5 5 5 5 4 3 2 1 1 1 1**  **1 2 3 4 4 4 4 4 4 4 4 4 4 3 2 1 1**  **1 2 3 3 3 3 3 3 3 3 3 3 3 3 2 1 1**  **1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1**  **1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 5 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 4 4 3 3 2 2 1 1**  **1 1 2 2 3 3 4 3 3 2 2 1 1**  **1 1 2 2 3 3 3 2 2 1 1**  **1 1 2 2 3 2 2 1 1**  **1 1 2 2 2 1 1**  **1 1 2 1 1**  **1 1 1**  **1** | |  |  | | --- | --- | | **49 64 0 5**  **4 31 1**  **6 31 2**  **8 31 3**  **10 31 4**  **12 31 5**  **13 22 1**  **13 24 2**  **13 26 3**  **13 28 4**  **13 30 5**  **13 31 5**  **13 32 5**  **13 34 4**  **13 36 3**  **13 38 2**  **13 40 1**  **14 31 5**  **16 31 4**  **18 31 3**  **20 8 5**  **20 9 5**  **20 10 5**  **20 11 5**  **20 12 5**  **20 13 5**  **20 14 5**  **20 15 5**  **20 31 2**  **21 8 5**  **21 9 5**  **21 10 5**  **21 11 5**  **21 12 5**  **21 13 5**  **21 14 5**  **21 15 5**  **22 31 1**  **23 31 1**  **25 31 2**  **27 31 3**  **29 31 4**  **31 31 5**  **32 22 1** | **32 24 2**  **32 26 3**  **32 28 4**  **32 30 5**  **32 31 5**  **32 32 5**  **32 34 4**  **32 36 3**  **32 38 2**  **32 40 1**  **33 31 5**  **35 31 4**  **37 31 3**  **39 31 2**  **41 31 1** | |

* **decompressed file**

**49 64 0 1**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**