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Computer Vision

Section:CSCI381-224

Project 0A

Binary and non-binary thresholding

Due date: 2/3/24

IV. SmithJ_Project0A_Main (…) // replace “SmithJ” with your last name and first name initial!!
****

step 0: inFile ←open argv [1] // i.e., ifstream inFile.open (argv [1])
thrValue ← cast argv [2] from string to integer // i.e., int (argv [2]) or (int) argv [2]
outFile1 ← open argv [3]
outFile2 ←open argv [4]
numRows ←read from inFile // i.e., inFile >> numRows
numCols ←read from inFile
minVal, maxVal← read from inFile
maxVal← read from inFile

step 1: outFile1 output numRows, numCols, 0, 1 to outFile1 // i.e., outFile1 <<
numRows etc. outFile2 output numRows, numCols, 0, maxVal to outFile2
step 2: processing (inFile, outFile1, outFile2, thrValue)
step 3: close all files

source code:

```
#include <iostream>
#include <fstream>
#include <cstdlib>
using namespace std;

int main(int argc, char* argv[]) {
   // step 0:
   // inFile open argv[1]
   ifstream inFile(argv[1]);

   if (!inFile.is_open()) {
      cout << "Unable to open file" << endl;
      exit(1);
   }

   // thrValue: cast argv[2] from string to integer
   //for this project, threshold value is 43
   int thrValue =atoi(argv[2]);

   // outFile1 open args[3]
   ofstream outFile1(argv[3]);
   if (!outFile1.is_open()) {
      cout << "Unable to open output file 1: " << argv[3] << endl;
      exit(1);
   }

   // outFile2 open args[4]
   ofstream outFile2(argv[4]);
   if (!outFile2.is_open()) {
```

```
        cout << "Unable to open output file 2: " << argv[4] << endl;
        exit(1);
    }

    // numRows, numCols, minVal, maxVal read from inFile
    int numRows, numCols, minVal, maxVal;
    inFile >> numRows >> numCols >> minVal >> maxVal;

    // step 1
    // outFile1 output numRows, numCols, 0, 1
    outFile1 << numRows << " " << numCols << " 0 1" << endl;

    // outFile2 output numRows, numCols, 0, maxVal
    outFile2 << numRows << " " << numCols << " 0 " << maxVal << endl;


    int pixelVal;
    int count = 0;

    while (inFile >> pixelVal) { //read one integer from inFile
        if (pixelVal >= thrValue) {
            //binary threshold
            outFile1 << "1 "; //write 1 follows 1 blank

            //non-binary threshold
            outFile2 << pixelVal << " "; //write pixelVal follows by 1 blank
        }
        else {
            outFile1 << "0 "; //write 0 follows by 1 blank
            outFile2 << "0  "; //wtire 0 follows by 2 blank
        }

        count++;

        if (count >= numCols) {
            outFile1 << endl;
            outFile2 << endl;
            count = 0;
        }
    }

    inFile.close();
    outFile1.close();
    outFile2.close();

    return 0;
}
```

- inFile

```
46 46 1 63
1 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
2 1 2 3 4 55 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 43 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
3 1 2 3 44 5 1 42 3 4 45 51 2 3 4 5 1 2 3 4 5 1 2 58 4 5 1 2 53 4 5 1 2 3 4 45 11 2 43 4 5 41 2 3 4 5
4 1 2 3 4 5 1 2 3 4 5 51 2 3 4 5 1 2 3 4 5 1 2 58 4 5 1 2 63 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
5 1 62 3 4 5 1 2 43 4 5 1 2 3 4 5 1 2 3 4 5 1 2 5 4 5 1 2 53 4 35 1 2 3 4 5 41 2 3 4 5 1 2 3 4 5
6 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 41 4 5 1 2 3 4 5 1 2 3 4 5 51 2 3 4 55 51 2 3 4 5
7 1 2 3 4 5 1 2 3 44 5 1 2 3 4 5 8 2 3 4 5 1 2 38 4 5 1 12 3 44 5 1 2 3 4 5 1 2 61 4 5 1 2 3 4 5
8 1 2 3 4 5 1 2 53 4 5 1 2 3 4 5 1 2 3 4 5 1 42 53 44 5 1 2 3 4 4 1 2 3 4 55 1 2 3 4 5 1 2 3 4 5
9 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 48 38 48 5 1 2 3 44 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
10 11 2 43 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 48 4 48 48 48 1 2 43 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
1 1 2 3 4 5 11 2 3 4 5 1 2 3 4 5 1 2 3 4 48 33 41 4 41 48 48 2 3 44 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
2 1 2 3 4 4 1 2 3 4 5 1 2 3 4 5 1 2 3 48 48 48 4 8 48 48 48 48 48 3 4 5 19 2 3 4 5 1 2 3 14 5 1 2 3 4 5
3 1 2 3 4 5 5 2 3 4 5 1 2 3 4 5 1 2 4 38 44 8 8 34 41 4 38 37 38 41 35 1 2 3 4 5 1 2 3 44 5 1 2 3 4 5
4 41 32 33 34 37 38 39 31 30 32 34 35 34 35 38 40 48 60 63 60 48 41 38 35 34 32 31 30 28 25 28 24 22 20 18 8 6 13 4 5 1 2 3 14 5
5 1 21 3 4 5 1 2 3 4 5 1 2 3 4 5 1 48 48 48 48 10 48 48 48 34 48 48 48 48 48 5 1 2 3 4 5 1 2 3 4 5 1 32 3 4 5
6 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 48 48 48 48 48 48 48 48 48 48 48 48 48 48 4 48 48 1 2 3 4 5 1 2 3 4 55 1 2 3 4 5
7 1 2 3 14 5 1 2 3 4 5 1 2 3 4 48 48 48 41 42 43 41 42 43 4 48 48 46 48 48 48 48 2 3 4 51 1 2 3 4 5 1 2 3 4 5
8 1 2 3 4 5 1 2 3 4 5 1 2 3 48 41 48 44 48 8 45 48 4 48 48 48 48 48 48 48 48 4 4 48 3 4 5 1 2 3 4 5 1 2 3 4 5
9 1 2 3 4 15 1 12 3 4 5 1 2 48 48 48 48 60 48 48 48 48 48 61 62 48 48 48 48 8 7 48 48 48 4 5 1 2 3 4 5 1 2 13 4 5
10 1 2 3 4 5 1 2 3 4 5 1 48 48 48 5 48 48 48 3 48 48 48 48 48 6 48 48 47 48 8 48 48 48 48 48 5 1 12 3 4 5 1 2 3 4 5
1 1 52 3 4 5 1 12 3 4 5 48 48 58 48 48 48 48 48 48 28 38 48 48 48 48 48 48 48 8 48 48 28 28 38 28 18 1 2 3 4 5 11 2 3 4 5
2 1 2 3 4 5 1 2 3 4 48 48 58 48 48 48 40 48 47 48 48 48 41 48 42 48 52 48 4 38 5 48 48 48 38 38 28 18 3 4 5 1 2 3 14 5
3 61 22 23 24 27 38 29 31 30 32 34 35 34 35 38 40 48 60 63 60 48 41 38 45 34 39 31 30 28 25 28 24 22 20 18 18 16 13 4 5 1 2 3 4 5
4 1 2 3 4 5 1 2 48 48 48 48 48 48 4 48 48 48 48 58 58 58 38 38 58 48 58 58 28 24 44 48 48 48 38 38 43 28 18 4 5 1 2 3 4 5
5 1 2 48 41 48 42 48 43 8 48 60 48 48 48 48 41 42 48 43 48 46 48 45 48 40 48 4 3 48 30 48 48 48 8 48 48 38 38 4 2 8 8 8 4 5
6 1 2 3 4 5 1 2 48 48 48 48 48 48 8 48 48 63 48 63 4 48 48 48 4 48 48 48 8 4 48 48 48 48 48 18 48 48 48 4 5 1 2 3 4 5
7 1 2 3 4 5 1 2 3 48 48 8 48 48 42 48 48 18 48 48 48 48 63 48 48 48 48 48 48 8 8 48 48 48 5 48 48 48 3 4 5 1 2 3 4 5
8 1 2 3 4 5 13 2 3 4 48 48 62 48 55 48 48 48 4 37 8 48 48 48 54 48 58 48 48 4 42 8 48 48 48 48 48 2 3 4 5 11 2 3 4 5
9 1 2 3 4 5 1 2 3 4 5 48 48 48 48 48 48 48 8 28 38 48 48 4 48 48 48 1 48 48 6 4 38 4 48 48 48 48 1 2 3 4 5 1 2 3 4 5
10 1 2 3 4 5 1 2 3 4 5 1 48 48 48 48 48 3 48 48 48 48 48 48 48 18 48 48 48 48 48 48 48 48 8 4 48 48 5 1 2 3 4 5 1 12 3 4 5
1 21 42 53 24 27 28 29 31 30 32 34 35 34 35 38 40 48 60 63 60 48 41 38 35 34 32 31 30 28 25 28 24 32 20 18 8 6 3 4 5 1 2 3 14 5
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3 11 2 3 4 5 1 2 3 4 5 1 2 3 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 48 8 4 3 4 5 1 2 3 4 5 1 2 3 4 5
4 1 2 3 4 15 1 2 3 4 5 1 2 3 4 48 48 41 42 43 48 40 48 42 48 43 48 44 48 28 48 48 2 3 4 5 1 2 3 4 55 1 2 3 4 5
5 1 2 3 42 55 1 42 3 4 5 1 2 3 4 5 34 44 41 34 24 34 34 41 34 34 42 34 34 24 4 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
6 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 48 48 58 4 1 28 41 1 48 2 4 8 48 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
7 1 2 3 4 5 1 2 3 4 5 13 2 3 4 5 1 2 48 48 8 48 34 35 41 48 48 8 48 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
8 1 2 3 4 51 1 2 3 4 5 1 2 3 4 5 1 2 3 48 38 48 38 8 1 48 38 48 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
9 1 2 3 4 5 1 12 3 4 5 1 2 3 4 5 1 2 3 4 48 48 48 48 48 48 48 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
10 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 48 48 18 48 48 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
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2 1 2 3 48 5 1 2 3 4 55 51 12 3 4 5 1 2 3 4 5 1 42 48 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
3 1 2 3 4 45 51 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 48 4 5 1 2 3 4 5 1 2 3 63 5 1 2 3 4 5 1 2 3 4 5
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5 1 2 3 4 5 11 2 3 44 5 1 2 3 4 5 1 2 3 4 5 1 2 48 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
6 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
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-outFile1

46 46 0 1

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0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

-outFile2

```
46 46 0 63
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 55 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 43 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 44 0 0 0 0 0 45 51 0 0 0 0 0 0 0 0 0 0 0 58 0 0 0 0 53 0 0 0 0 0 0 45 0 0 43 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 51 0 0 0 0 0 0 0 0 0 0 0 58 0 0 0 0 63 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 62 0 0 0 0 0 43 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 53 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 51 0 0 0 55 51 0 0 0 0
0 0 0 0 0 0 0 0 0 44 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 44 0 0 0 0 0 0 0 0 61 0 0 0 0 0 0 0
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0 0 0 43 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 48 0 48 48 48 0 0 43 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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0 0 0 0 48 0 0 0 0 0 55 51 0 0 0 0 0 0 0 0 0 0 0 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 45 51 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 48 0 0 0 0 0 0 0 0 0 0 63 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 48 0 0 0 0 0 0 0 0 0 59 0 0 0 0 43 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 44 0 0 0 0 0 0 0 0 0 0 0 0 0 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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