COP 3503 Recitation #3 INPUT/OUTPUT SPECIFICATION SEE THE CORRESPONDING ASSIGNMENT DESCRIPTION ON WEBOURSES

1) Write a recursive method to determine the number of 1s in the binary representation of a positive integer n. Here is the prototype:

// Precondition: n > 0.

public static int numOnes(int n);

Source Filename: NumOnes.java **Input Filename:** numones.in

Input Format: The file has one test case per line. A test case is an integer, n, for which the program

shall output the number of 1s in the binary representation of n.

SAMPLE INPUT:

63

64

65

19

SAMPLE OUTPUT:

6

1

2

3

2) Write a recursive method to determine the minimum value in an integer array. (Hint: Split the array in two halves.)

public static int minVal(int[] numbers);

Source Filename: ArrayMin.java **Input Filename:** arraymin.in

Input Format: The file has one test case per line. A test case is an array of integers, A, for which the

program shall output the minimum integer in A.

SAMPLE INPUT:

5 7 1 3 77 600 4 59 2 5

SAMPLE OUTPUT:

1

2

3) Consider a grid of nxn grid of integers like the following: ...

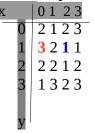
Source Filename: GridSearch.java **Input Filename:** gridsearch.in

Input Format: The file has one test case per line. A test case is a list of integers which take the

following format:

<start x> <start y> <end x> <end y> <n> <n x n integers giving the grid>

For example, consider the following grid, with starting coordinates (2, 1) and ending coordinates (0, 1).



The grid above corresponds to the following test case in the input file.

21014212332112212 1323

Output Format: For each test case, print *true* or *false* on a new line, if there is or there is not a path from (start x, start y) to (end x, end y), respectively.

SAMPLE INPUT:

 $\begin{smallmatrix}2&1&0&1&4&2&1&2&3&3&2&1&1&2&2&1&2&1&3&2&3\\2&3&0&3&4&2&1&2&3&3&2&1&1&2&2&1&2&1&3&2&3\end{smallmatrix}$

SAMPLE OUTPUT:

true false