

Computer Science 107
Agent Based Modeling
Exam 1

Instructor: Mark Goadrich

February 22th, 2010
9 a.m. Wright 110

Read all questions carefully before beginning. You will have 50 minutes to complete this exam. You may have one 3" x 5" notecard. You are not allowed to use your notes, textbook or computer, except for websites listed on the final page. **Show all your work for full credit.** You are bound by the Honor Code for this exam, which you need to sign below.

Grade (out of 100) _____

Print Your Name _____

Honor Code

Signature _____

5 people answer the question "How many days does it take for Mercury to complete its orbit around the sun?" Their answers are 70, 84, 92, 94 and 102. The correct answer is 88.

Calculate the collective error and average individual error for the answers above.

What is the probability that the majority of a group of 5 people will correctly distinguish Coke and Pepsi in a taste test, if each person is correct 85% of the time?

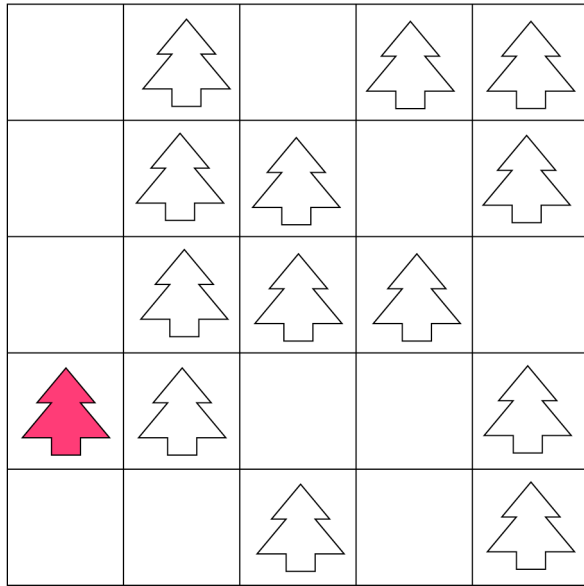
Devise and demonstrate a situation with four candidates in an election where a candidate who wins with the Borda Count method loses under the Instant Runoff method.

You have been appointed to the Student Government Election Committee, which is holding elections in March for new student body leaders. Which election method would you recommend using for these elections and why?

In relation to 1-dimensional Cellular Automata, verify or disprove that the reverse of rule 144 is rule 89.

If we change our definition of 1-dimensional Cellular Automata to use three colors instead of two, how many states could there be for a cell and its two neighbors?

How many rules are now possible?



FIRE



ALIVE

What is the density of trees in the forest shown above?

Following the rules for spreading fire discussed in class using all eight neighbors, will the fire spread to the opposite side of the forest?

What if only the N, S, E and W neighbors were used?