

NAME: _____

CAS 2013 Quiz #2

2 points per correct answer + 1 point for turning in the quiz with your name on it
Grade is out of 10 points. 13 total points are possible (so there are 3 bonus points).

Write the correct answer for each question IN THE SPACE PROVIDED. Your answers should be based on Mitchell chapter 11 and the assigned Mitchell 1994 article.

1. The chapter and the article describe using a GA to evolve a CA that performs a task called “majority classification.” (Mitchell also refers to this task as $T_{1/2}$ and “density classification”).

True or False? The goal of this task is to reach a state of all 1’s in a finite number of generations if the initial configuration (IC, the bitstring chosen for the first time step of the CA) is majority 1s, or all 0’s if the IC is majority 0s.

True or False?: _____

2. The following are strategies to solve the task
- Local majority rules (transition to the state of most members of the local neighborhood)
 - The best strategies from Epoch 4
 - The GKL strategy

List THE LETTER of the strategies in order of lowest to highest fitness: _____

3. When $\lambda = 1/2$, half of the transition rules (1/2 of the lines in the rule table) will cause a transition to 1s and half will transition to 0s. Which is more likely to have $\lambda = 1/2$?
- A bit string chosen at random
 - A bit string after 5 generations of evolution
 - A bit string after 90 generations of evolution

Answer: _____

4. Mitchell’s experiments showed that crossover was important in
- Early generations
 - Late generations
 - No generations
 - All generations

Answer: _____

5. The article describes choosing the density of 1s in the initial configuration from a uniform distribution between 0 and 1. This is an impediment to GA performance in

- Early generations
- Late generations
- No generations
- All generations

6. The CAs evolved by GAs are examples of Wolfram Class IV CAs. True or False?: _____