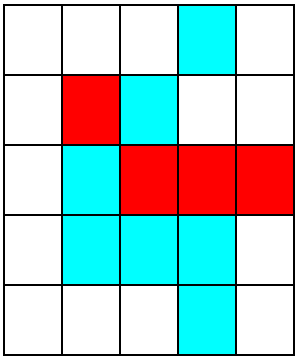
HW 1 Model Thinking MA 2040/CS 2040 Spring 2017

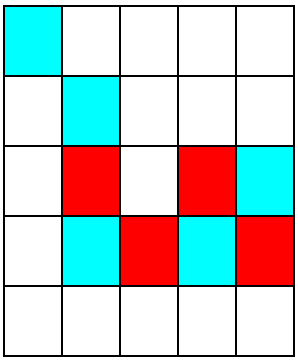
Homework 1

Your answers should include explanations and your supporting work.

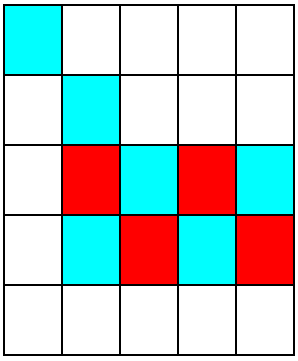
1. What are the reasons we model?
2. What are the four possible solution types?
3. Schelling Model: With a threshold of 30% what would happen to the red squares (assume the blue squares do not change)? Is there a tip (exodus or genesis)?



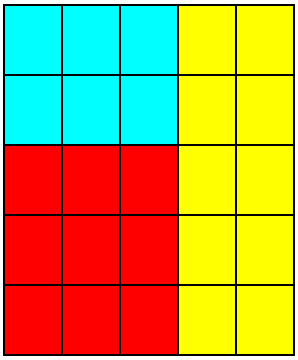
4. Schelling Model: With a threshold of 30% what would happen to the red squares (assume the blue squares do not change)?



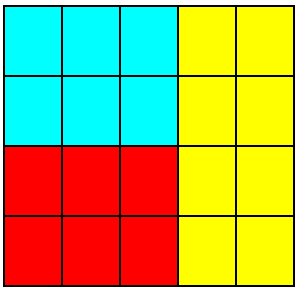
The center blue square just moved into the neighborhood. With a threshold of 30% what would happen to the red squares (assume the blue squares do not change)? Is there a tip (exodus or genesis)?



5. Grannovetter Model. Assume there are ten people per block, the red squares contain 10 rich, 0 poor, the blue squares contain 0 rich, 10 poor and the yellow squares are 5 rich 5 poor. Compute the index of dissimilarity.



6. Grannovetter Model. Assume there are ten people per block, the red squares contain 10 rich, 0 poor, the blue squares contain 0 rich, 10 poor and the yellow squares are 7 rich 3 poor. Compute the index of dissimilarity.



7. For the standing ovation model assume we have an audience of N=1000 peopole with a threshold of 70. If the shows quality is Q = 55 and the error is E = [-20,20] using Signal = Quality + Error find what percent of the audience will stand.
8. Give your own examples of a peer effect and of sorting (homophily)?
9. What type of data do we need to determine peer effect versus sorting?