MSSC 6000 - Homework 5

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1. For this problem, I chose to go with a simple tweak function. I would pick a random light and move it a little, I tried to make smaller moves as the number of generations got close to the end, so it would change less towards the end. For initial temperature, final temperature and number of generations I just used the method we learned in class. For the alpha, I chose 0.96 since it was not taking too long to run and was giving me pretty good results. For trials per generation, I chose to go for a 100, increasing this number did not give much better results and the speed of the code decreased drastically.

2. (a) An example of a "real-world" situation would be: The assignment of students to two distinct dormitories on a college campus. Consider a situation where there are n students and two dorms, A and B, each of which has a capacity of n/2. The objective is to limit the number of friendships that are split between the two dorms by splitting the students into two groups of similar size and assigning them to the two dormitories.

   We can represent the students as vertices in a graph, with an edge connecting two vertices if the associated students are friends. The vertices can then be partitioned into two subsets of equal size using the partition procedure outlined in the problem, with the goal of minimizing the number of edges (i.e., the number of friendships split between the two dorms) within each subset. The resulting partition can then be used to divide the students between the two dorms in a way that preserves as many friendships as possible.

   (b) I chose to go with a simple tweak function. I would two random vertices and swap them. For initial temperature, final temperature and number of generations I just used the method we learned in class. For the alpha, I chose 0.96 since it was not taking too long to run and was giving me pretty good results. For trials per generation, I chose to go for a 100, increasing this number did not give much better results and the speed of the code decreased drastically.

   (c) Submitted file