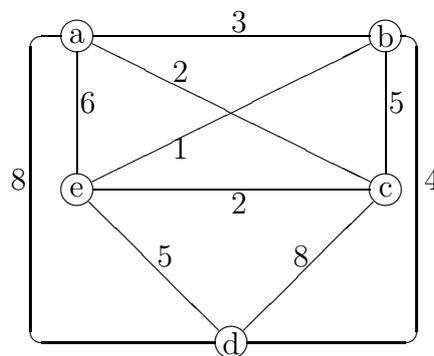1. Simulate the behaviour of the Lin–Kernighan 2-opt heuristic on the TSP instance
   below (this is the same instance as used in Problem 1 of last week's tutorial),
   starting with the initial candidate route *abcde*.

2. Consider the MAX CUT optimisation problem discussed in Problem 2 of last
   week's tutorial. Write down in pseudocode a Simulated Annealing method for
   optimising the objective function of this problem. Indicate in particular what is
   the neighbourhood relation you are using for the candidate solutions. Note also
   that MAX CUT is a maximisation problem, not minimisation as assumed in the
   general presentation of Simulated Annealing given at the lectures.

3. Consider the simulated annealing approach to solving the MAX CUT problem, as
   discussed above. What kind of cooling schedules would the simulated annealing
   convergence theorem presented at this week's lecture suggest in the case of a
   3-regular input graph with n nodes? (3-regular $\equiv$ every node has exactly 3
   neighbours.)

4. Draw the search space corresponding to the 3-SAT formula

   $$(x_1 \vee x_2 \vee x_3) \wedge (\bar{x}_1 \vee x_2 \vee x_3) \wedge (x_1 \vee \bar{x}_2 \vee x_3) \wedge (x_1 \vee x_2 \vee \bar{x}_3) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3)$$

   as a cube, and mark down at the corners of this cube the values of the objective
   function indicating the number of unsatisfied clauses at each point (= truth
   assignment). Trace the progress of a WalkSAT search with $p = 0$ along the
   corners of the cube, starting at initial point $(x_1, x_2, x_3) = (0, 0, 0)$.