1. $x_u + x_v = 1$
2. maximize $\sum x_u$
3. The optimum objective value of the program is always $\geq \frac{n}{2}$
   The linear program is always feasible, whether or not there exists a valid coloring for the given graph
4. The optimum objective value of the new linear program can be $< \frac{n}{2}$
   If there is no valid coloring, the new optimization problem is infeasible
   If any feasible solution, the x_v values for all the vertices v will be "integral" (i.e., they will be 0 or 1, no fractions)