To me, being green is everything.

The Green Giant, on the importance of St. Patrick's Day to him.

Problem Party-Scheduling. Suppose you are Irish. You are trying to host a large-scale party in your home in Dublin, Ireland. You have a whole host of activities (dunk-the-brit, drink-a-pint(s), lucky-charms-eating-competition, etc.). You had your attendees fill out a google form about which activities they prefer, and now you must schedule your events. However, your attendees are incredibly churlish, so you would rather cancel the party if even a single attendee has two events they want to go to that are scheduled at the same time.

More formally, suppose there are n people $\{p_1, p_2, \ldots, p_n\}$, m time slots, k activities $A = \{a_1, \ldots, a_k\}$. Each person p_i is associated with a subset $L_i \subset A$ in which they would like to participate in. The problem is to decide if it is possible schedule all k activities in m time slots such that no person has 2 activities with a conflict, e.g., if person p_i wants to go to activity a_p and a_q, a valid solution should not schedule a_p and a_q in the same time-slot $r \in [m]$. Show that a polynomial time algorithm for this problem would imply a polynomial time algorithm for 3-coloring.

I am in a very Irish time in my life.

Justin Zhang, March 10, 2026

Problem Independent Set in Irish graphs (Ex. 13.9). Consider a special undirected graph $G = (V, E)$ known as a *Irish* graph, where each set $S \subseteq V$ has at most 20 neighbors outside of S [1]. The goal is to compute the largest independent set in G. Either (a), design and analyze a polynomial time algorithm (faster the better), or (b) prove that a polynomial time algorithm would imply a polynomial time algorithm for SAT.

Hint1: Let I be the largest independent set. What can you say about the size of $|V \setminus I|$?
Hint2: 2^{20} is still a constant.

[1] The first independent Irish parliament sat on January 21, 1919, so this is what I am counting as the Irish independence day. If this bothers you, you can replace 20 with 16 for St. Patrick's Day.