Another look at an idea of Amin and Slater

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Suppose that G is a finite simple graph and f is a function from V(G) into the set {even,odd}; f is a *parity assignment* to V(G). In a definition due to A.T. Amin and P.J. Slater, proposed at this conference in 1992, a subset S of V(G) is an f-*neighborhood-dominating set* iff for each vertex v of G, |N[v] intersect S| has parity f(v). (In this case, S *realizes* f.) If such an S exists for every parity assignment to V(G), G is declared to be an All Parity Realizable (APR) graph.

Amin and Slater were (impishly?) aware that f-neighborhood-dominating sets are not necessarily dominating. This raises a number of questions, such as: for which graphs G is there a **dominating** f-neighborhood-dominating set in G for every parity assignment f to V(G)? [Spoiler alert: no, wait, I'm not going to spoil it for you. False alarm.] Besides this we will consider: given G and an integer q > 2, for which assignments g of congruence classes mod q to the vertices of G can there be subsets of V(G) "realizing" g, in the sense analogous to that of Amin and Slater, in the case q = 2?