Problem

October 5, 2023

1 Problem.

Let $G = (L, R_0 \cup R_1, E)$ be bipartite graph. We think about the R_i vertices as the vertics that should applay 'logical-gate' X_i and a 'fake-gate' $X_{\bar{i}}$. Now let L' be additional vertices set at size $\Theta(|L|)$.

Claim 1.1. *There is a way to connect R_0, R_1 to L' such that:*

1. *Any vertex of R is connected by exactly single edge to L'.*
2. *(Strong.) The obtained graph is expnder. (Weak.) The expnasion of the new graph is not far way form the expnasion of the original graph.*
3. *(Computinal.) The reduction takes polynomial time.*