



For a set of stations S , define $f_A(S)$ as the set of all stations such that if the train is placed on them, Arezou can play in a way that the train reaches one of the stations in S at some point regardless of Borzou's moves (therefore $S \subseteq f_A(S)$ by definition). We define $f_B(S)$ similarly.

Initially let $T = S$, and we iteratively add stations to T such that eventually T equals $f_A(S)$.

While there exists a station v that satisfies one of the following conditions, we add v to set T .

1. v is owned by Arezou, and there exists an outgoing track from v that leads to a station already in T .
2. v is owned by Borzou, and all of the outgoing tracks from v leads to the stations already in T . Similarly we can compute $f_B(S)$. Notice that both $f_A(S)$ and $f_B(S)$ can be computed iteratively in time $O(n + m)$.

Now let R be the set of all the charging stations. By definition, for every station $v \notin f_A(R)$, Borzou can win the game if the train is initially placed on v .

Therefore, we can solve the problem as follows:

1. If $f_A(R)$ is the set of all remaining stations, Arezou can win the game for all initial stations.
2. Otherwise:
 1. Let X be set of stations not in $f_A(R)$.
 2. Borzou can win the game if the initial stations is in $f_B(X)$.
 3. Remove $f_B(X)$ from the graph and solve the problem recursively.

This algorithm runs in time $O(nm)$.