Quests in a Competitive Event

April 15, 2021

1 Unlock Strategy

We divide the quest into 20 subsets of quests. Each subset should contains 5 quests and contains exactly 1 quest from $\{Q_{81}, \cdots, Q_{100}\}$. For example, subset 1 could be $\{Q_1, Q_{39}, Q_{50}, Q_{79}, Q_{81}\}$ and subset 2 could be $\{Q_2, Q_{38}, Q_{49}, Q_{78}, Q_{82}\}$. We unlock new quests randomly. If a team finished a subset of quests, we unlock a new subset of quests choosing from remaining subsets randomly and uniformly.

2 Explanation

We divide the quest into 20 subsets that each subset contains a quest from $Q_{81}, \cdots, Q_{100}$ for the reason that T_1 has expectation time nearly 48 hours to complete all quests and every team can complete at least 1 subset of quests and with high probability complete at least 2 subsets of quests. We unlock new quests randomly to make sure each quest could be completed by as many teams as possible.

3 Experiment

We implemented the event under our unlock strategy. We found that each subsets of quests completed by at least 7 teams with high probability. With high probability, the event would last at least 44 hours.