Rankmaniac
Project Report

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1 Overview

2 Division of Work

- Ying-yu Ho:

- Jianchi Chen:

- Kexin Rong:

3 Strategy

3.1 Basic Strategy

Say there are p players in the game and we want s seeds. Our basic strategy is to calculate the degree of each node in the graph, and randomly choose s from the top $s \times p$ nodes with the largest degrees.

The rationales are the following:

1. We chose "degree" as a measure of a node's importance because it is intuitive that nodes with larger degrees are crucial points in the spread of epidemics.

2. We also incorporated randomization to avoid colliding with similar strategies from other teams.

3.2 8-player Strategy

3.3 Average distance centrality

We also tried to use the node's average distance to all other nodes as a centrality measure locally. The distances between any two nodes in the graph are computed by Floyd Warshall algorithm. If a node is not connected to all other nodes in the graph,

we discard it since this node is more likely to be not important.

Since Floyd Warshall algorithm takes $O(n^3)$, we were only planning to use it for graph with fewer nodes. We compared the results locally against the degree measure. The latter won by a large margin. Here are the results on graph with 100 nodes:

4   References