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PROJECT SPECIFICATION

The company Discre has requested your services as a developer to create a unique and engaging game called "Froggish." Froggish is a graph-based game designed to entertain and challenge players while also introducing them to fundamental graph data structures and algorithms like BFS, DFS, and Dijkstra's algorithm. The game aims to provide an enjoyable experience that combines fun and learning.

Purpose of the Game

Froggish is an adventure game where players take on the role of a cute and determined frog on a quest to find its way home. The objective is to guide the frog through various terrains, by strategically hopping on leaves and lotus flowers. The frog's energy is limited, and players must make wise choices to preserve its energy and successfully navigate through each level.

Game Overview

Levels

Froggish is made up of a single level, this level will handle two stations, which are the pot and the river.

- (Level 1): In this level, the frog begins its journey in a cozy flower pot filled with flowers and lotus leaves. The player's task is to guide the frog through a minimum of 50 jumps to reach a magic portal, where at the same level the river station changes, which is where his home is.

Energy Mechanism
- Leaves: Jumping on leaves consumes energy, with each leaf having a random energy cost ranging from 1 to 5. Players must make decisions on which leaves to jump on to minimize energy consumption.

- Lotus Flowers: Landing on lotus flowers replenishes the frog's energy, with each lotus providing a random amount of energy.

Objective
The ultimate goal in Froggish is to guide the frog through the graph of nodes, spanning from the starting lotus flower to the frog's home. This journey must be accomplished in a limited number of jumps. The player must manage the frog's energy wisely, considering the varying costs of leaves and the rewards of lotus flowers.

Technical Requirements

To develop Froggish according to Discre's requirements, the following technical specifications must be met:

- Graphic Interface: The game must be implemented using JavaFX, providing an engaging and user-friendly graphical interface for players.

- Graph Data Structure: The game must incorporate a graph data structure to represent the interconnected nodes that define the levels. These nodes will correspond to the positions of leaves, lotus flowers, and portals.

- Graph Algorithms: Implement BFS, DFS, and Dijkstra's algorithm within the game to compute optimal paths, assist with hint generation, and challenge players with graph-related puzzles.

Froggish is not only a source of entertainment but also an educational tool that introduces players to fundamental graph data structures and algorithms. By skillfully navigating the frog through different levels while optimizing energy consumption, players will gain a deeper understanding of these concepts in an enjoyable gaming experience. Discre believes that Froggish has the potential to offer an exciting and educational gaming experience to a wide audience.

Note: Players are provided with the option to seek hints during their journey. Hints show the best path to navigate through the level, helping players make informed decisions.