**Software Requirements Specification (SRS) for "Wandering in the Woods" Game**

1. **Introduction**
   1. **Purpose**

This document describes the software requirements for the "Wandering in the Woods" game, a simulation designed to teach K-8 students’ computation, computational thinking, math concepts, and computer science through a tiered game experience.

* 1. **Scope**

The game will be divided into three versions tailored for different grade levels: K-2, 3-5, and 6-8. Each version offers increasing complexity and learning opportunities.

1. **General Description**
   1. **Game Overview**

Players are represented as characters "lost in the woods," navigating a grid-like forest. The objective is for players to find each other in the forest by moving through the grid cells.

* 1. **Users**

The primary users of this game are students in grades K-8. The game is also designed for educators to facilitate and guide the learning process.

1. **Functional Requirements**
   1. **Grades K-2**

* Grid: Square
* Players: 2, starting from diagonally opposite corners.
* Movement: Random
* Objective: Meet the other player.
* Visuals: Text graphics display upon meeting with accompanying music.
  1. **Grades 3-5**
* Grid: Customizable (square or rectangular).
* Players: 2-4, customizable starting positions.
* Movement: Random
* Objective: All players meet up.
* Mechanics: Players finding each other form groups and move together.
* Features: Display statistics such as longest run, shortest run, and average run.
  1. **Grades 6-8**
* Grid: Customizable.
* Players: Customizable number and starting positions.
* Movement: Customizable protocols (e.g., Random Walk, Edges First, Center Outwards).
* Objective: Conduct experiments to determine optimal meeting strategies.
* Features: Analyze how average run varies with grid size/shape and wandering protocol.

1. **Non-functional Requirements**
   1. **Usability**

The game interface should be intuitive and user-friendly, catering to the younger audience's needs. Audio cues, and clear instructions should be provided.

* 1. **Performance**

The game should run smoothly without noticeable lags or delays. Response to user actions should be immediate.

* 1. **Security**

The game should not require or store any personal information from the users.

* 1. **Portability**

The game is developed in Python and should be runnable on any system with the appropriate Python environment and libraries.

1. **System Features**
   1. **Main Menu**

Allows the user to select the game version based on their grade level.

* 1. **In-game Timer**

For tracking the time taken to complete objectives.

* 1. **Statistics Display**

To show game performance metrics like shortest run, longest run, and average run.

* 1. **Audio Features**

Background music and audio cues to enhance user experience.

1. **External Interface Requirements**
   1. **User Interface**

* Main menu with buttons for grade-level selection.
* Game grid displaying players and their movements.
* Audio and visual feedback upon meeting other players.
  1. **Hardware Interface**

No specific hardware interfaces beyond standard input (keyboard, mouse) and output (display, speakers).

* 1. **Software Interface**

The game uses the pygame library for graphics, audio, and input handling.

1. **Conclusion**

The "Wandering in the Woods" game offers an engaging and educational experience for students in grades K-8. The tiered approach ensures continuity in learning, with each stage introducing new challenges and concepts to the players.