

Introduction

This project has been undertaken to implement the board game Kingdomino as a video game, playable by groups of 2 to 4 players.

Problem Statement

As we are making a video game, the goal is not to solve a problem but to provide an entertaining experience. Kingdomino itself is a fun game, so the challenge lies in the implementation. Our program will accurately run according to the rules of Kingdomino. It will have standard video game features, such as settings, AI opponents, and a save feature. It will have a simple, understandable GUI with audio effects. The game will be playable with multiple people. This will make Kingdomino into an enjoyable, fully functioning video game.

Stakeholders

Stakeholders	Key Interests
Players (in general)	Playing an enjoyable game
Developers	Generating and maintaining player interest in the game, meeting publisher specifications, facilitating future updates
Publisher	Maximizing profit from sales, preserving reputation of “Kingdomino” brand
Parents of Young Players	Keeping their children entertained, buying the game for a reasonable cost, protecting children from inappropriate content
Young Players	Having the game be easy to understand and play
Singleplayer Players	Being able to play the game alone, having challenging AI opponents
Multiplayer Players	Having a smooth multiplayer experience, being able to play with different numbers of players
Distributors	Maximizing profit from sales, having the game ready on time for release, having a standardized price and release schedule
Visually Impaired Players	Having different color palettes, having the visuals not rely on color to convey information
Boardgame / Video Game News Sources	Reviewing the game

Summary of System Features

- The system shall create a virtual game board
- The system shall place tiles and other play pieces upon the game board and keep track of their locations
- The system’s operations shall be in accordance with the rules of Kingdomino
- The system shall keep a randomly shuffled deck of tiles from which to draw
- The system shall set itself up upon the start of a new game
- The system shall draw tiles and allow players to select them at the start of each round

- The system shall allow players to take turns
- The system shall establish turn order, first randomly and later through selected tile order
- The system shall be able to check whether a tile can be placed in any given location
- The system shall end and declare a victor upon running out of tiles.
- The system shall display a GUI that shows the game board and facilitates player interaction
- The system shall have different color palettes that can be selected
- The system shall play background music during the game
- The system shall have volume settings
- The system shall be playable with groups of 2 or 4 players
- The system shall have an altered ruleset for 2 player games
- The system shall have a save function and a load save game function
- The system shall have AI opponents that can replace players
- The system shall have “easy” and “hard” difficulty settings for these AI opponents
- The system shall provide the user with the ability to quit the game or start a new game at any time
- The system shall have several optional gamemodes

Project Risks

- AI Opponents
 - The development of AI opponents is potentially very difficult. Making AI for video games is not easy to begin with, and we do not have any particular experience in the field. We will have to do research into established methods and do an analysis of Kingdomino’s rules and strategies.
 - This feature is not essential, but is of moderately high priority
- Music
 - We intend to make an original track for the game. This is only possible because a member of our team has a degree in music composition. Even so, this is a time-consuming task.
 - An audio playing system will have to be implemented, which will likely require some research into how this is done best in Java.
 - Music is not essential and is low priority. It will be dropped if we feel we do not have sufficient time.
- GUI – Game Board
 - The game board of Kingdomino is made up of one set of tiles per player, each arranged in a particular pattern. These tile sets do not intersect with each other. This essentially means that the game board is in fact 4 (or 2) separate, dynamically sized game boards that must be viewable to all players. Furthermore, the newly drawn tiles must be displayed each round. Arranging all of this on the screen using Java Swing may be difficult.
 - This task is essential and of the utmost priority
- Tile Placement
 - The ability to check whether a tile can be placed will be difficult, as it requires checking the terrain of the connecting edge, the size of the overall board, and whether it overlaps with another tile

- Also, it will be difficult to implement the tile selection process in the GUI, as we must represent placing a tile in every possible orientation and location as options for the user
- This is essential and of the utmost priority