

# 2048 Mini-Game Prototype

For this assignment, I chose to recreate the popular mobile puzzle game 2048. I selected this game because of its simple yet engaging core mechanics, which rely on strategic thinking and planning. I wanted to choose a game I enjoy playing and 2048 is a fun and engaging strategy game. The goal of the game is to slide numbered tiles on a 4x4 grid to combine them and reach the 2048 tile. I recreated the core gameplay mechanics, including tile spawning, merging, and game state management, ensuring the game correctly handles the start, play, win, and restart states. The prototype supports increasing difficulty, allowing players to select between easy and hard modes, which changes the challenge of the game.

To differentiate my version of 2048, I added an original feature that gives players unlimited undo moves in easy mode, while hard mode disables this feature completely. This integrates with the difficulty system, allowing players to experiment with strategies when the game is easier, while maintaining the challenge for harder gameplay. This addition adds meaningful player choice and strategy without altering the core mechanics of the original game.

From a technical perspective, I focused on clean and modular code architecture, separating gameplay logic and UI. The user interface was designed for clarity and responsiveness, providing immediate visual feedback when tiles move or merge. I also included subtle animations and colour transitions to improve game feel and overall player experience.

For the bonus feature, I implemented a UI recreation to give visual feedback to players, while also implementing a high score system that tracks the top scores using persistent local storage. This adds a competitive element to the game, motivating players to improve their own performance.

During development, I utilised Generative AI tools, specifically ChatGPT, to help with troubleshooting code and brainstorming optimisations. AI is never my first choice, I first comb through YouTube videos and online forums for help with any roadblocks I encounter, leaving AI as a last resort. I faced challenges with managing tile spawning and merging logic efficiently in the new Unity 6 Input System and ensuring proper alignment of tiles on the grid. I addressed these issues by carefully debugging the movement and spawn logic when I felt stuck.

If I had additional time, I would add more polish to the visual design, add some background music, and expand the social features to include online leaderboards or daily challenges. Overall, this project demonstrates my ability to rapidly prototype an engaging mini-game while implementing creative enhancements, smooth controls, and solid technical architecture.