**Documentation**

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**Game Concept and Overview:**

* Space Invaders is an arcade-style game where the player controls a spaceship and must avoid falling asteroids while shooting them down to protect the spaceship.
* The objective of the game is to survive for as long as possible, earning points by destroying asteroids and collecting coins.

**Gameplay Mechanics:**

* The player controls the spaceship using the arrow keys, allowing movement in all four directions.
* The spaceship shoots projectiles by pressing the space bar, destroying asteroids on contact.
* The game ends if the spaceship collides with an asteroid or falls down and runs out of health.
* The player earns points for each destroyed asteroid and collects coins for additional score bonuses.
* Periodically, a health power-up falls from above, which the player can collect to increase the spaceship's health.

**Game Progression and Levels:**

* The game does not have distinct levels. Instead, the difficulty gradually increases over time, introducing more asteroids and faster falling objects.
* The player's progress is measured by the score, displayed on the screen, which represents their performance compared to previous attempts.

**Characters, Entities, and Objects:**

* Spaceship: The main character controlled by the player. It can move in four directions and shoot projectiles to destroy asteroids.
* Asteroids: Falling from above, asteroids are the primary threat to the spaceship. The player must avoid colliding with them.
* Coins: Falling from above, coins can be collected by the spaceship, providing additional score bonuses.
* Health Power-up: Occasionally, a health power-up appears and falls from above. Collecting it increases the spaceship's health, extending its survival time.
* Speed Boosters: Occasionally, a speed booster appears and falls from above. Collecting it increases the spaceship’s speed.
* Shield: Occasionally, a shield appears and falls from above. Collecting it allows you to avoid asteroid damage till 2 hits.

**User Interface (UI):**

* Pause Screen: Displays the instructions and controls.
* Game Screen: Displays the spaceship, asteroids, coins, health bar, and score.
* Health Bar: Indicates the remaining health of the spaceship.
* Score: Shows the player's current score.
* High score: Shows the high score.
* Game Over Screen: Displays the game over text and offers options to restart the game or return to the main menu.

**Audio and Music:**

* Sound Effects: Provide sound effects for spaceship movement, shooting projectiles, asteroid destruction, coin collection, and power-up acquisition.
* Background Music: Choose engaging and dynamic music that enhances the gameplay experience.

**Testing and Quality Assurance:**

* Test various scenarios, such as spaceship movement, shooting accuracy, asteroid collision detection, power-up functionality, and overall game performance.
* Address any bugs, glitches, or inconsistencies discovered during testing.

**Development Timeline and Milestones:**

* Milestone 1: Game design and concept finalized, including mechanics, controls, and visual style.
* Milestone 2: Basic gameplay mechanics implemented.