# Conceptual Design
# Bug Life

**Game Title:** OG Smash N' Dash

**Game Description:** Dive into the fast-paced world of *Tile Break Frenzy*, a thrilling arcade game that tests your reflexes and strategic thinking. Your mission is simple yet challenging: control a moving tile platform and keep a bouncing ball in play as long as possible.

## Product Identification

**Basic Functions of the Product:**

- The product is an arcade game where players control a moving base/paddle to keep a bouncing ball in play.
- It involves real-time interaction to move the base/paddle left or right to ensure the ball does not fall.
- Players aim to achieve the highest score by keeping the ball in space for as long as possible.

**Special Features of the Product:**

- Progressive Speed Mechanics: The ball accelerates as the game progresses, adding to the challenge.
- Power-Ups: Temporary boosts such as ball slowdown, extra lives, or special tile abilities.
- Obstacles: Obstacles that complicate gameplay and test the player's reflexes.
- Leaderboards: A competitive feature that tracks and displays high scores globally and among friends.
- Engaging Visuals and Music: High-quality soundtracks and visually appealing graphics to keep players entertained.

**Performance Targets:**

- Ensure smooth gameplay with minimal latency, maintaining at least 60 FPS (frames per second).
- Seamless response to user inputs for precise control.
- Stability and consistency across various device types and screen sizes.
- Quick load times and low memory usage to enhance user experience.

## Market Identification

**Target User Group:**

- Casual gamers who enjoy quick, engaging, and competitive gameplay.
- Young adults (ages 12–30) who are fans of arcade-style retro games.

**Size of the User Group:**

- Moderate (~100k users), with potential growth due to retro game revivals

**Competing Products:**

- Classic arcade games such as *Brick Breaker*, *Pong*, and *Bounce Ball*.
- Popular mobile arcades like *Doodle Jump* and *Flappy Bird*.

## System Description

**Major Functional Components:**

1) Game mechanics and Core Physics (Nishanth)
2) Graphics and Visual and Sound Effects (Sparsh)
3) User-Interface design (Scoreboards, Pause screens) and Database Management (Leaderboard History) (Tariq)
4) Additional game components like obstacles, level-ups and power-ups (Vasvi)

**Assembly of Functional Components:**

The first file will consist of ball mechanics which is going to have the movement of the ball and breaking the tiles. The second file will be consisting of visuals, sound effects and the ball and tile graphics of the game. The third file is going to be about the interface such as scoreboards, exiting the game, pausing the game and continuing it. Additionally, it will also has leaderboard history. The fourth file is basically going to be the additional parts such as leveling up the game, different obstacles and power ups. Finally, the Main File acts as the central hub, including header files from each module to call and integrate their functionalities, allowing for a cohesive game experience where all components work in harmony. Overall, the main file is not going to have additional functionalities and is going to use the sub-files' functionalities. This modular approach not only keeps the code organized and maintainable but also facilitates future expansions.