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Project Proposal: 2D Player Controlled Video Game

This project idea consists of a relatively simple platforming video game, primarily consisting of a two-dimensional multi-level platforming environment that the player is able to traverse and move around in. The player would be affected by gravity and would have a downward acceleration, which would be calculated by the player's position and height from the ground. Additionally, in order to interact with their environment, there would be a system for dealing with collisions in order to ensure that the player remains in areas that make logical sense, and such that interactions with other objects, such as potential enemies and interactive game items, are able to be detected by the program. In order to have different approaches to sections of the levels, modifiers such as different platform materials or items that the player can equip could modify the effect of gravity that the player feels, or how they move. These new variables would be used in the kinematics equations that the player would use to be drawn on the screen in the correct location.

1. What problem needs to be solved, and who is it being solved for?
    a. In this case, the largest obstacle is creating functions that imitate the movement of someone (player character) under the effect of gravity, and maintain a sense of momentum when moving (and do not stop immediately). This is being solved so that the player (user) has an intuitive experience when controlling their player.
2. How will program solve problem, and how will it report findings?
    a. The program will aim to solve the problem by implementing a rudimentary physics engine, making use of 2D kinematics in order to create a sense of realism when moving the player around (primarily in regard to gravity and momentum). It will "report" its findings by moving or drawing the player character appropriately in the game window.

The program will read in data through user input (keyboard control such as arrow keys) and respond by moving a player object on the screen. It will use the input in order to compute the correct calculations in order to determine where to move the player, and check if there are any limitations on movement (such as a collision with a wall or other object).

While other features could be implemented, the main focus of this proposal is to implement a two-dimensional movement system for a player controlled object, and to be able to construct a level that the player can interact with through collision detection.