Interim Report
Team 21 - Toasty Bird
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Game Strategy

Our project aims to replicate the classic Flappy Bird game on the DE0-CV FPGA board using VHDL. The game is displayed on a VGA screen with 640x480 resolution and controlled via a PS/2 mouse. It includes two operational modes selected via push buttons: Training Mode and Single-Player Game Mode.

- **Training Mode:** The player practices with minimal difficulty. Game speed remains constant, and the game ends when life reaches zero.
- **Game Mode:** The game increases in difficulty over time. The scrolling speed increases every 5 points, making it more challenging.

Controls and Inputs:

- Mouse click controls the vertical position of the bird and starts the game.
- Push buttons toggle between game modes.
- DIP switches toggle score and health display
- 7-segments display shows the current height of the bird

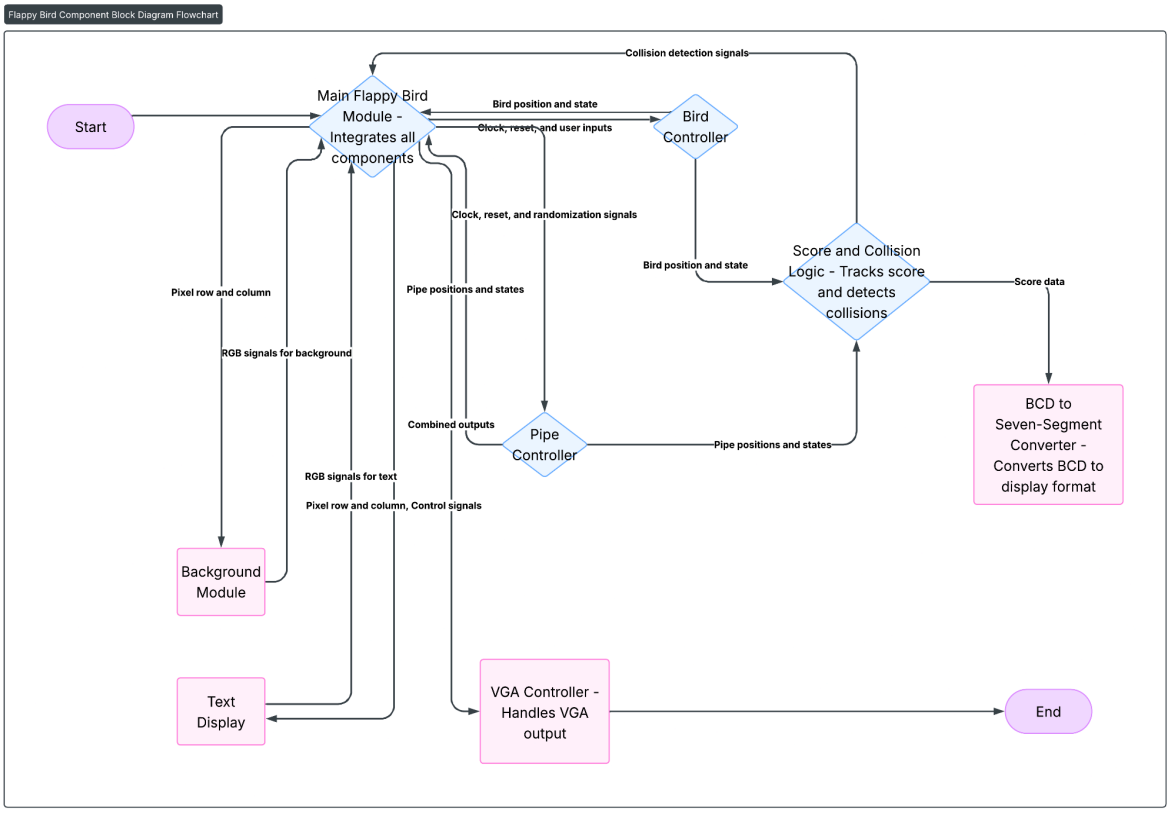
Game Elements:

- **Bird**: Controlled by the player; subject to gravity.
- **Pipes**: Randomly generated obstacles; hitting them reduces life.
- **Hearts**: Optional collectible items (planned).
- **Background/Graphics**: Simple pixel-based rendering using VGA.
- **Text Overlays**: Score, life percentage, mode labels, etc., displayed using a character ROM.
- **Height Display**: The bird's height is shown on the 7-segment display.
- **Text Control**: Switches enable or disable text overlays.

Planned Enhancements:

- Random pipe heights using an LFSR.
- Visual feedback upon collision (screen flashes or turns red).
- Visual on the height with the 7-segment display
- Random item spawning with a pseudo random code or LFSR

Block diagram



High Level Finite State Machine