

## Basic Description:

For our project we created a simplified version of the game Pong. If one is not familiar with Pong, it is one of the earliest arcade games ever created. It was published in 1972 by the company Atari. The game consists of two “paddles” on opposite sides of a black screen and a virtual “ball”. Originally pong was created as a two player game with each player controlling a paddle which could be moved up or down the screen. If a given player was able to position their paddle in the path of the oncoming ball in time, the ball would bounce back across the screen at an appropriate angle for which it had “hit” the paddle. The ball was also capable of bouncing on the top and bottom of the screen. In the event that either player could not position their paddle to hit the ball back, then the player who last hit the ball received a point. This continued until either player reached a score of 11 and had thus won.

The mechanics are the same for our version of Pong and the original except that our version is only single player and lacks a computer to emulate a second player. Thus, in our version the player commits to achieving a high score each game. In order to start the game, one must set the Go switch to high (switch R2 must be up) while maintaining the reset switch low (switch V17 down). The player can reset the game and the score at any time by switching the reset switch to high (up). The top button (T18) is used to move the paddle up on the board and the bottom button (U17) is used to move the paddle down on the board. Since there is only one player, there is no opposing paddle on the other side of the screen. In order to score in our game of Pong one must bounce the ball against the opposing wall. There is no true win condition; however, if a player achieves a score greater than 9999 the scoreboard will roll over which is traditionally viewed as beating an unbeatable game. The only way a player loses in our pong game is if the ball misses the paddle controlled by the player. In this case the ball is stopped and the game is paused. The player may still move their paddle but they cannot hit the ball. To start the game again one can either reload the game from memory or flip the reset switch to high and then back to low (up and then back down). The player may pause the game by setting the Go switch back to low (down). An added feature of our pong game is that the ball will change to a random color after hitting the player’s paddle. The ball then transfers the previous color it was to the LED segment it hit. The color This game was created with an FPGA board and was programmed using iverilog.