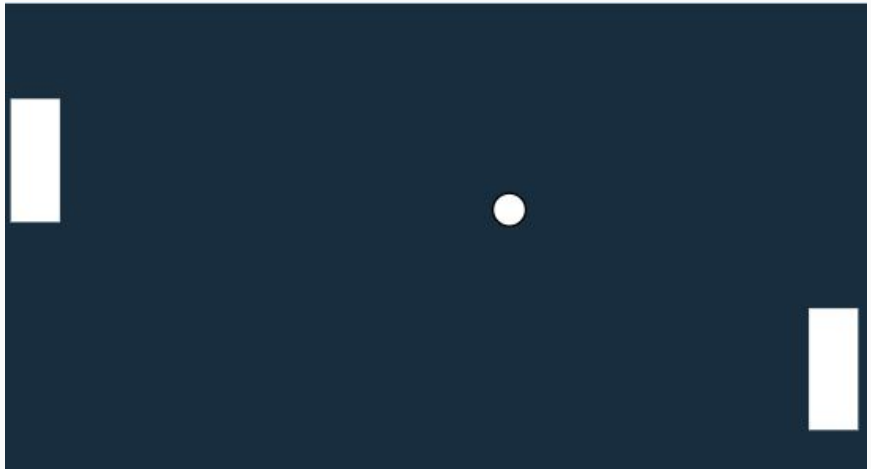
Pong Game
Workshop

Lab 05

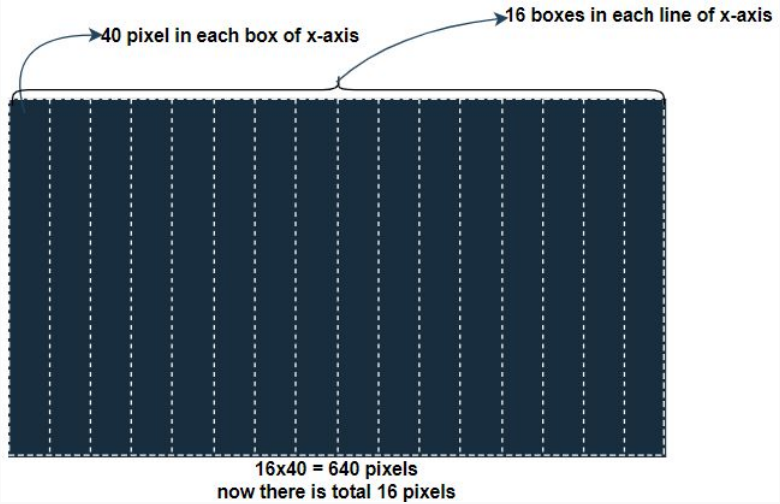
Introduction

Pong, an innovative electronic game introduced in 1972 by Atari, Inc., an American game manufacturer, stands as a pioneering creation in the realm of video games. Among the earliest of its kind, Pong gained immense popularity, playing a significant role in the inception of the video game sector. The classic Pong design featured two paddles enabling players to volley a small ball across a screen in a back-and-forth motion.



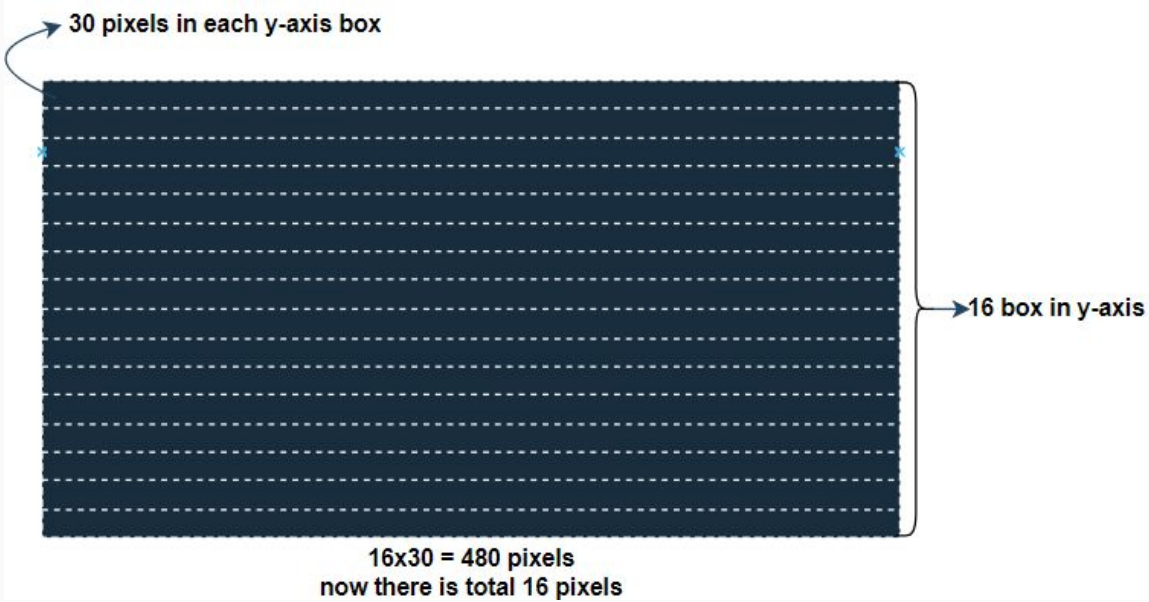
X-axis Scaling

We assume that the student has completed their last lab exercise or task. Now, we will scale our x-axis to 640. For instance, if we remove the least significant bit (LSB) from a counter that runs from 0 to 640, the value will be halved. For example, if our counter was 10 bits to hold a count up to 640, then counter_x[1:9] will hold a value of 320, counter_x[2:9] will hold 160, and similarly, counter_x[4:9] will hold values up to 40, as illustrated in the diagram below.



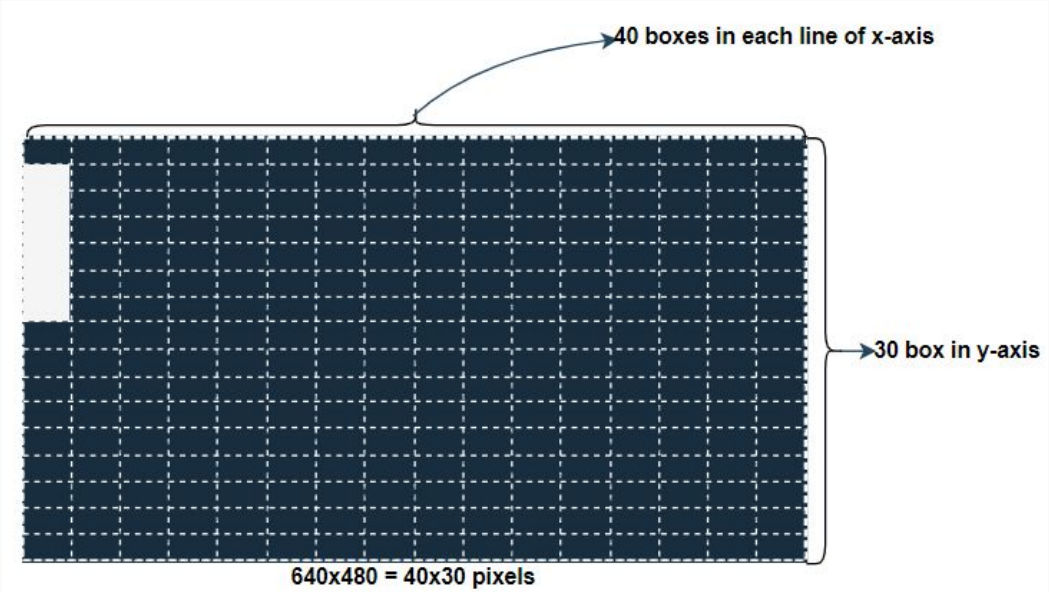
Y-axis Scaling

Now, we will scale our y-axis to 480. For instance, if we remove the least significant bit (LSB) from a counter that runs from 0 to 480, the value will be halved. For example, if our counter was 9 bits to hold a count up to 6480, then counter_y[1:8] will hold a value of 240, counter_y[2:8] will hold 120, and similarly, counter_y[4:9] will hold values up to 30, as illustrated in the diagram below.



Drawing paddle

Now, let's draw a paddle, and the diagram below represents our final resolution after scaling both on the y-axis and x-axis for simplicity. So, if we keep counter_x at 1 and counter_y at 6 and say, "Display on this condition; otherwise, display zero," we can easily draw our paddle. Likewise draw paddle 2 and ball.



Movement Of ball and paddle

Now, let's delve into how we move the paddle and determine the speed of its movement along the x-axis and y-axis, as well as how much it will move.

The crucial point to remember is that the paddle moves solely along the y-axis while the x-axis remains constant. For instance, for a paddle at x-axis = 1,

Let's consider the height of our paddle. If we set our paddle's height as 6, then assuming our Y_location is zero, the paddle will display from Y_location up to Y_location + paddle_height. Additionally, the condition for the counter_y should be less than (Y_location + paddle_height < 30) to ensure that the paddle doesn't go out of the screen.

Movement Of ball and paddle

Now, regarding the speed, we can create a counter that increments until it reaches its maximum value, say 12500 (this value can vary). Upon completion of this counter, we increment the counter_y of our paddle for movement.

For this movement, we can create a button that, when pressed, continuously increments the counter until both the movement counter and speed counter reach their maximum values, shifting our paddle to the next scale.

Movement Of ball and paddle

Now, the ball moves along both the x-axis and y-axis. For this, we can apply the following logic: the ball starts from the middle, and as it reaches its limit along the y-axis, it begins to decrement the counter_y. Similarly, when it reaches the location at y-axis 0, it starts incrementing again. Concurrently, the counter for the x-axis keeps running in parallel, following the same pattern.

Source Code as a Reference: Github Abdul Muheet Ghani

Exercise

Adding the logic for count the points of each player and when it’s reaches to 5 points game will be reset.

Testimonial

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Sponsored By:

Edmund from Symbiotic EDA. for sponsoring FPGA.

Thanks:

Lushay Lab (They've provided crucial resources and guidance throughout the project), Also thanks to Slidesgo.

Future Work

This is version 1.0 of our course. We will continue this training and very soon release further versions. For any questions or to stay connected with us.

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