**Arduino code for ping pong ball game**

**Youtube link:-**https://youtu.be/-dlXmIlm654

**Code:-**

#include <LiquidCrystal.h>

const int RS=12,EN=11,D4=5,D5=4,D6=3,D7=2;

LiquidCrystal lcd(RS,EN,D4,D5,D6,D7);

#include <Adafruit\_NeoPixel.h>

// LED for player 1

#define neoPixel1 0

// LED for player 2

#define neoPixel2 1

#define LEDs 1

Adafruit\_NeoPixel strip1 = Adafruit\_NeoPixel(LEDs, neoPixel1, NEO\_GRB + NEO\_KHZ800);

Adafruit\_NeoPixel strip2 = Adafruit\_NeoPixel(LEDs, neoPixel2, NEO\_GRB + NEO\_KHZ800);

//Start, pause button

#define start 13

// Player1 up push button pin

#define P1U 6

// Player1 down push button pin

#define P1D 7

// Player2 up push button pin

#define P2U 8

// Player2 down push button pin

#define P2D 9

// piezo electric crystal pin

#define piezo 10

//paddle1

byte paddle1[16] = {0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0}; // array to hold paddle1 LCD row-0&1 values

byte player11[8] = {0, 0, 0, 0, 0, 0, 1, 1}; // array to hold paddle1 LCD row-0 values

byte player12[8] = {1, 1, 0, 0, 0, 0, 0, 0}; // array to hold paddle1 LCD row-1 values

//paddle2

byte paddle2[16] = {0, 0, 0, 0, 0, 0, 16, 16, 16, 16, 0, 0, 0, 0, 0, 0};// array to hold paddle2 LCD row-0&1 values

byte player21[8] = {0, 0, 0, 0, 0, 0, 16, 16}; // array to hold paddle2 LCD row-0 values

byte player22[8] = {16, 16, 0, 0, 0, 0, 0, 0}; // array to hold paddle2 LCD row-1 values

//ball

byte ball[16] = {0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0}; // array to hold ball LCD row-0&1 values

byte ball1[8] = {0, 0, 0, 0, 0, 0, 0, 1}; // array to hold ball LCD row-0 values

byte ball2[8] = {0, 0, 0, 0, 0, 0, 0, 0}; // array to hold ball LCD row-1 values

int x = 0;//x-cursor for ball

int bounce = 0;//bounce-status of bounce(0-ball moves down ,1-ball moves up)

int v1 = 0, v2 = 0, v3 = 0;// variables used to check whether ball hits thecpaddle or not

char direction = 'L';// direction of ball-(L-left,R-right)

int score1 = 0, score2 = 0;//scores of player 1 and 2

boolean game = 0;// game starts/stop(stop-0,start-1)

int a = 0;

void setup() {

strip1.begin();

strip1.show();

strip2.begin();

strip2.show();

pinMode(P1U, INPUT);

pinMode(P1D, INPUT);

pinMode(P2U, INPUT);

pinMode(P2D, INPUT);

pinMode(start, INPUT);

pinMode(piezo, OUTPUT);

piezoSound(300);// sound for 50 ms

lcd.begin(16, 2);

lcd.clear();

lcd.setCursor(2, 0);

lcd.print("Arduino UNO");

lcd.setCursor(1, 1);

lcd.print("Ping Pong Game");

delay(1500);

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("Developed by:");

lcd.setCursor(0, 1);

lcd.print("PINKY SHERWANI");

delay(3000);

}

void loop() {

//executes this while loop untill start button is pressed

while (game == 0) {

for (a; a < 1; a++) {

for (int i = 0; i < 16; i++) {

if (6 <= i && i <= 9) {

paddle1[i] = 1;

paddle2[i] = 16;

}

else {

paddle1[i] = 0;

paddle2[i] = 0;

}

if (i == 7)ball[i] = 1;

else ball[i] = 0;

}

x = 8;

lcd.clear();

lcd.setCursor(3, 0);

lcd.print("Press start");

lcd.setCursor(3, 1);

lcd.print("button =>");

}

// check whether the start button is pressed

if (digitalRead(start) == HIGH) {

lcd.clear();

lcd.setCursor(5, 0);

lcd.print("Player");

lcd.setCursor(0, 1);

lcd.print("1");

lcd.setCursor(15, 1);

lcd.print("2");

delay(2000);

for (int i = 3; i > 0; i--) {

lcd.clear();

lcd.setCursor(4, 0);

lcd.print("Be ready!");

lcd.setCursor(8, 1);

lcd.print(i);

if (i == 1)piezoSound(100);

delay(1000);

}

a = 0;

game = 1; //exits the while loop and starts the game

}

delay(100);

}

// game starts

//when P1U is pressed, the paddle1 moves up

if (digitalRead(P1U) == HIGH) {

paddle1Up();

delay(50);

}

//when P1D is pressed, the paddle1 moves down

if (digitalRead(P1D) == HIGH) {

paddle1Down();

delay(50);

}

//when P2U is pressed, the paddle2 moves up

if (digitalRead(P2U) == HIGH) {

paddle2Up();

delay(50);

}

//when P2D is pressed, the paddle2 moves down

if (digitalRead(P2D) == HIGH) {

paddle2Down();

delay(50);

}

//split paddle1 array into 2 arrays, paddle11 and paddle12

for (int i = 0; i <= 7; i++) {

player11[i] = paddle1[i];

}

for (int i = 0, j = 8; i <= 7, j <= 15; i++, j++) {

player12[i] = paddle1[j];

}

//split paddle2 array into 2 arrays, paddle21 and paddle22

for (int i = 0; i <= 7; i++) {

player21[i] = paddle2[i];

}

for (int i = 0, j = 8; i <= 7, j <= 15; i++, j++) {

player22[i] = paddle2[j];

}

//split ball array into 2 arrays, ball11 and ball12

for (int i = 0; i <= 7; i++) {

ball1[i] = ball[i];

}

for (int i = 0, j = 8; i <= 7, j <= 15; i++, j++) {

ball2[i] = ball[j];

}

lcd.createChar(0, player11);

lcd.createChar(1, player12);

lcd.createChar(2, player21);

lcd.createChar(3, player22);

lcd.createChar(4, ball1);

lcd.createChar(5, ball2);

lcd.clear();

lcd.setCursor(0, 0);

lcd.print(score1);

lcd.setCursor(0, 1);

lcd.print(score2);

lcd.setCursor(3, 0);

lcd.write(byte(0));

lcd.setCursor(3, 1);

lcd.write(byte(1));

lcd.setCursor(15, 0);

lcd.write(byte(2));

lcd.setCursor(15, 1);

lcd.write(byte(3));

lcd.setCursor(x, 0); // position of ball1, x is changed to move the ball on the display

lcd.write(byte(4));

lcd.setCursor(x, 1); // position of ball2, x is changed to move the ball on the display

lcd.write(byte(5));

// checks whether the ball hits the paddle1

if (x == 3) {

for (int b = 0; b < 16; b++) {

if (ball[b] != 0) {

v1 = ball[b];

v2 = paddle1[b];

}

}

// if ball hits paddle1, change direction of ball to R (right)

if (v1 == v2) {

direction = 'R';

score1 += 1;

piezoSound(10);

}

else {

lcd.clear();

lcd.setCursor(3, 0);

lcd.print("Game over");

lcd.setCursor(4, 1);

lcd.print("P2 won!");

// green LED glows for winner and red for looser with piezo electric crystal sound

for (int i = 0; i < 3; i++) {

strip1.setPixelColor(0, 255, 0, 0);

strip1.show();

strip2.setPixelColor(0, 0, 255, 0);

strip2.show();

piezoSound(500);

delay(500);

strip1.setPixelColor(0, 0, 0, 0);

strip1.show();

strip2.setPixelColor(0, 0, 0, 0);

strip2.show();

delay(500);

}

// set scores to 0 and restart the game

score1 = score2 = 0;

delay(1000);

game = 0;

}

}

// checks whether the ball hits the paddle2

if (x == 15) {

for (int b = 0; b < 16; b++) {

if (ball[b] != 0) {

v1 = ball[b];

v3 = paddle2[b];

}

}

// if ball hits paddle2, change direction of ball to L (left)

if (v1 == v3) {

direction = 'L';

score2 += 1;

piezoSound(10);

}

else {

lcd.clear();

lcd.setCursor(3, 0);

lcd.print("Game over");

lcd.setCursor(4, 1);

lcd.print("P1 won!");

// green LED glows for winner and red for looser with piezo electric crystal sound

for (int i = 0; i < 3; i++) {

strip1.setPixelColor(0, 0, 255, 0);

strip1.show();

strip2.setPixelColor(0, 255, 0, 0);

strip2.show();

piezoSound(500);

delay(500);

strip1.setPixelColor(0, 0, 0, 0);

strip1.show();

strip2.setPixelColor(0, 0, 0, 0);

strip2.show();

delay(500);

}

// set scores to 0 and restart the game

score1 = score2 = 0;

delay(1000);

game = 0;

}

}

// if direction is L, move ball to left

if (direction == 'L') {

for (int b = 0; b < 16; b++)

if (ball[b] == 16) x -= 1;

if (bounce == 0)

ballLeftDown();

else

ballLeftUp();

}

// if direction is R, move ball to right

if (direction == 'R') {

for (int b = 0; b < 16; b++)

if (ball[b] == 1) x += 1;

if (bounce == 0)

ballRightDown();

else

ballRightUp();

}

}

void paddle1Up() {

if (paddle1[0] != 1) {

int temp = paddle1[0], i;

for (i = 0; i < 16; i++)

paddle1[i] = paddle1[i + 1];

paddle1[i] = temp;

}

}

void paddle1Down() {

if (paddle1[15] != 1) {

int temp = paddle1[15], i;

for (i = 15; i > 0; i--)

paddle1[i] = paddle1[i - 1];

paddle1[i] = temp;

}

}

void paddle2Up() {

if (paddle2[0] != 16) {

int temp = paddle2[0], i;

for (i = 0; i < 16; i++)

paddle2[i] = paddle2[i + 1];

paddle2[i] = temp;

}

}

void paddle2Down() {

if (paddle2[15] != 16) {

int temp = paddle2[15], i;

for (i = 15; i > 0; i--)

paddle2[i] = paddle2[i - 1];

paddle2[i] = temp;

}

}

void ballLeftDown() {

if (ball[15] == 0) {

int temp = ball[15], i;

for (i = 15; i > 0; i--)

ball[i] = ball[i - 1];

ball[i] = temp;

ballLeft();

}

else {

bounce = 1;

piezoSound(10);

}

}

void ballLeftUp() {

if (ball[0] == 0) {

int temp = ball[0], i;

for (i = 0; i < 15; i++)

ball[i] = ball[i + 1];

ball[i] = temp;

ballLeft();

}

else {

bounce = 0;

piezoSound(10);

}

}

void ballRightDown() {

if (ball[15] == 0) {

int temp = ball[15], i;

for (i = 15; i > 0; i--)

ball[i] = ball[i - 1];

ball[i] = temp;

ballRight();

}

else {

bounce = 1;

piezoSound(10);

}

}

void ballRightUp() {

if (ball[0] == 0) {

int temp = ball[0], i;

for (i = 0; i < 15; i++)

ball[i] = ball[i + 1];

ball[i] = temp;

ballRight();

}

else {

bounce = 0;

piezoSound(10);

}

}

void ballRight() {

for (int b = 0; b < 16; b++) {

if (ball[b] != 0) {

if (ball[b] == 16)ball[b] = 8;

else if (ball[b] == 8) ball[b] = 4;

else if (ball[b] == 4) ball[b] = 2;

else if (ball[b] == 2) ball[b] = 1;

else if (ball[b] == 1) ball[b] = 16;

}

}

}

void ballLeft() {

for (int b = 0; b < 16; b++) {

if (ball[b] != 0) {

if (ball[b] == 1)ball[b] = 2;

else if (ball[b] == 2) ball[b] = 4;

else if (ball[b] == 4) ball[b] = 8;

else if (ball[b] == 8)ball[b] = 16;

else if (ball[b] == 16)ball[b] = 1;

}

}

}

void piezoSound(int d) {

analogWrite(piezo, 20);

delay(d);

analogWrite(piezo, 0);

}

**Circuit:-**

