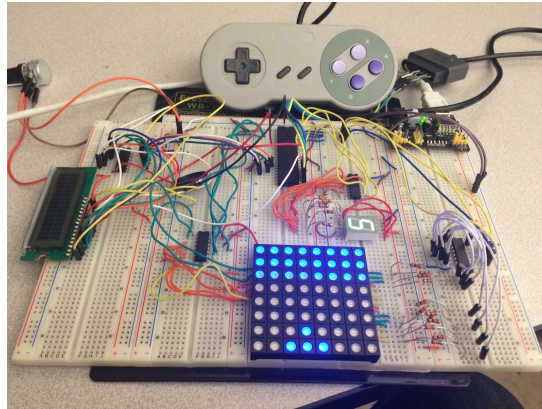


# Breakout

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My Game proposal was to recreate the game of Breakout. The game consists of having brick blocks on top of the screen and the user is able to move a paddle left to right on the bottom of the screen to hit a ball which is constantly moving attempting to hit the blocks on top of the screen. In this game i used an LED Matrix as my gameplay display and an original SNES controller to be able to control the paddle, the game menu and resetting the game. The main menu is shown on a small LCD screen which displays the menu that we navigate through and also displays the score while the game is in session.

## User guide:

*Rules:* The Rules of the game is to hit every block that is light up without loosing of all your lives;

*controls:*

DPad:

Left -----to move paddle to the left.

Right----- to move paddle to the Right.

B ----- to shoot the ball to begin the game.

Y-----to decrement the level in the main menu

X-----to increment the level in the main menu

start-----to initiate the game after setting up the level

start + select---to reset the game

## *Technologies and components used in Game*

- AVR Studio 6
- ATmega1284
- BreadBoard Wb -106
- 16x2 LED Display
- Speaker
- 330Ω resistors (24)
- Power adapter 6v 1A
- 7 Segment Display
- Shift Registers (3)
- 8x8 LED Matrix

## Sample Gameplay Video

<https://www.youtube.com/watch?v=Jg1kYLRmLL0>

## Source Files

Bit.h --- <https://drive.google.com/file/d/0B0thDQCQFrjsUnpxYWVQbnpKaU0/edit?usp=sharing>

Bits.h file has two functions that we were given in our course to access the bits individually. These functions are called Getbit() and Setbit()

Breakout.c

---<https://drive.google.com/file/d/0B0thDQCQFrjsVkNCSEVnNHNGczA/edit?usp=sharing>

Breakout.c is the main code that has all the game logic. it has all the state machines.

io.c -- <https://drive.google.com/file/d/0B0thDQCQFrjseVdlaUxqdzNyMFk/edit?usp=sharing>

io.h

-<https://drive.google.com/a/ucr.edu/file/d/0B0thDQCQFrjsVFV6T21SaDFvQUk/edit?usp=sharing>

io.c and io.h essentially has the functions that make the LCD screen display strings. These file was Given to us in our course and i did a few modifications to make it work with my game.

Matrix\_send.h

<https://drive.google.com/a/ucr.edu/file/d/0B0thDQCQFrjsbmVWdmc5Zm5Ma0E/edit?usp=sharing>

Matrix\_send has the functions that sends data out to the matrix using the shift registers and also has the functions to send data to the 7 segment and the controller.

System.h - <https://drive.google.com/file/d/0B0thDQCQFrjsWmlkVUszY1djEE/edit?usp=sharing>

System.h has all of the code that breakout.c interacts with from the design of the ball, paddle, blocks to the actual algorithm used for collision detection.

Task\_Scheduler.h

<https://drive.google.com/a/ucr.edu/file/d/0B0thDQCQFrjsX0NUUEpIRHpPakU/edit?usp=sharing>

Task\_scheduler.h is a simple code that creates a task scheduler which i use inside the breakout.c for concurrent programming.

Timer.h - <https://drive.google.com/file/d/0B0thDQCQFrjseG5tc3VOUjRxTVE/edit?usp=sharing>

Timer.h was a given file from our class that sets a timer to our program to be used with the synchronize state machines.

Game information such as Pinout information can be seen at

<https://drive.google.com/folderview?id=0B0thDQCQFrjsOEFfVGtvSIztQUk&usp=sharing>