

# Breakout in MIPS

## Project Summary

I plan to create a simple clone of the Atari video game, Breakout. The player's goal is to break all the bricks in the 8x4 grid by bouncing a ball off the wall, the bricks, and the paddle. The player can move the paddle from left to right to adjust the ball's trajectory. If the ball goes below the paddle, the player will lose a life.

## Rules

The player has 5 lives. They must destroy all bricks (reach a score of 32) before running out of lives to win. The player loses if they fail to destroy the bricks before losing all their lives.

## MARS Configuration

- Connect the Keyboard and Display MMIO simulator. (Only the Keyboard is used.)
- Connect the Bitmap Display with a resolution of 256x256 and a unit width and height of 2

## User Interface

**Note:** After assembling the program and configuring the MARS peripherals, run the program. Remember to enter the dialog box of the keyboard simulator.

## Controls

There are three buttons for user control:

- Press the space bar to launch the ball. The player must do this to start the game or resume after losing a life.
- Press the 'A' key to move the paddle left.
- Press the 'D' key to move the paddle right.

## Information Displayed

### Control Instructions

The following instructions will be shown on the screen:

- PRESS SPACE
- <-A
- D->

### Scorecard:

On the right side of the screen will be the scorecard. The score is equal to the number of bricks destroyed.

## Lives left:

On the left side of the screen will be the count of lives left. The game is over if the count reaches 0.

## Game Won and Game Lost Messages

‘GAME WON!’ will be displayed when the player wins.

‘GAME LOST!’ will be displayed when the player loses.

## Audio (Optional)

You can use audio output (speakers, earphones, etc.) to listen to the game sound, but it is not necessary to play the game.