

Assembly Project: Breakout

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Name 2

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1 Instruction and Summary

1. Which milestones were implemented? Milestones 1-5 were implemented.

Easy: Player can launch the ball at the beginning of each attempt.

Hard: Player score is tracked by how many bricks have been broken on the bottom left with green pixels.

Bricks require multiple hits to be broken. Orange bricks require 3 hits, Purple bricks require 2 hits, Cyan bricks require 1 hit.

Lastly, the direction/speed of the ball changes based on the collision with the paddle. In the center, it bounces straight up. The bounce angle is more pronounced at the edges of the paddle. The first angle makes the ball go (1, 2) units in any direction. The sharper angle makes the ball go (1, 1) units in any direction.

2. How to view the game:

- (a) 4 pixels/unit
- (b) 128 pixel width
- (c) 128 pixel height
- (d) Controls: Space (launch ball), h (paddle left), l (paddle right)

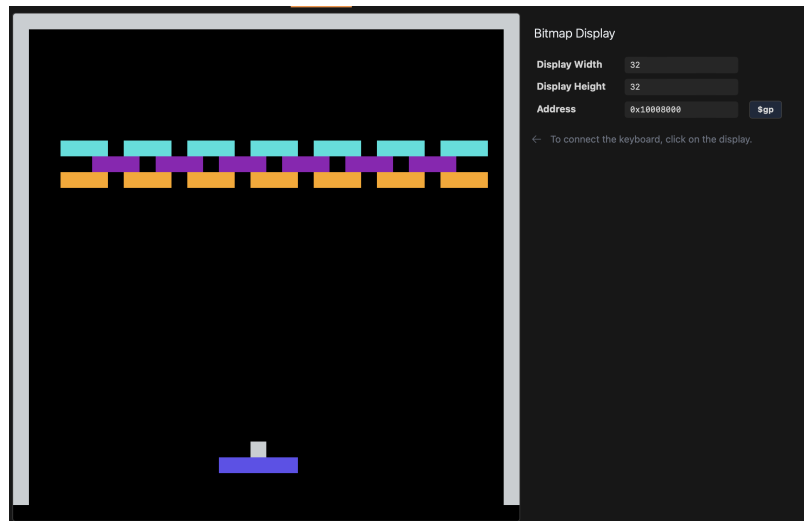


Figure 1: Static Background

```
#####
# Mutable Data
#####

game_started: .word 0

COLOURS:
.word 0xc9ced1 # Greenish-Grey (Walls and Baal)
.word 0x5e51ed # Blue (Paddle)
.word 0x000000 # Black (Erased)
.word 0x10e0dd # Cyan
.word 0x921db5 # Purple
.word 0xffa500 # Orange
.word 0x0ecca3 # Prismarine
.word 0xf5ec73 # Yellow (Unbreakable)

PADDLE_POS:
.word 13 # x
.word 28 # y

BALL_POS:
# .word 15 # x
# .word 27 # y
.word 15
.word 26

BALL_DIR:
.word 1 # change in x direction of the ball: dx
.word -1 # change in y direction of the ball: dy

BRICK_WIDTH: 3
BRICK_HEIGHT: 1

CURR_SCORE: 0
SLEEP_RATE: 200
```

Figure 2: Memory



Figure 3: While Playing

3. Game Summary:

- `game_started` is a flag that is used to check if the game has started by clicking 'Spacebar'.
- `COLOURS` are lined for the bricks, walls, paddle, ball and eraser.
- `PADDLE_POS` denotes the coordinates of the paddle.
- `BALL_POS` denotes the coordinates of the ball.
- `BALL_DIR` denotes the direction of the ball.
- `BRICK_WIDTH` denotes the brick width.
- `BRICK_HEIGHT` denotes the brick height.
- "How will the ball change directions when it collides?" Depending on what side of the ball gets collided, either the 'x' or 'y' velocity will get sign flipped.
- Paddle is 5x1.
- 1 level with 3 rows of bricks, however only one piece of the brick breaks off at a time.
- Ball is a 1x1 pixel for simplicity.
- Ball currently only goes in 8 directions. Planning to add more with milestone 4-5, although walls are prone to breaking and other bugs are present when scaling the ball direction vector.
- Note that in Figure 3 the gauge at the bottom fills up with distinguishable green pixels to indicate score tracking when any of the 20 bricks have been broken.
- `CURR_SCORE` keeps track of the current score.
- `SLEEP_RATE` denotes the time the game loop sleeps.

2 Attribution Table

Student 1 (Frederick and 1006986781)	Student 2 (Name and student number)
Milestone 1	Task
Milestone 2	Task
Milestone 3	Task
Milestone 4	Task
Milestone 5	Task
Task	Task