Project 6: Breakout

Assignment Type: Game

Team Size: 1

Points: 50

Create the classic game of Breakout! The player's goal is to clear a grid of blocks using a paddle and a bouncing ball. Check class recording to see the game in motion. **Start from scratch with this one, don't start with my code!**

The ball should begin locked to the player paddle. After the player presses space, the ball should launch up, and move left or right depending on where the paddle is moving at time of launch. The ball should travel faster to the right the further to the right of the paddle it hits, and vice versa for the left side. **See diagram 1 for info.**

The ball should bounce off the left, right, and top of the screen.

- Hitting the top should set the ball to move down
- Hitting the left wall should set the ball to move right
- Hitting the right wall should set the ball to move left

Leaving the bottom of the screen is a failure state, and should reset the game.

If the ball hits a block, the block should disappear.

- Hitting block from bottom should set ball to move down
- Hitting block from top should set ball to move up
- Hitting block from left should set ball to move left
- Hitting block from right should set ball to move right

Additionally, the ball should speed up a little each time it destroys a block. Find a reasonable speed on your own.Destroying all the blocks should reset the game.

Grading

5 points - player paddle appears on screen, moves left and right, locked to the screen.

5 points - ball appears on screen, begins locked to player paddle

5 points - player presses space to launch ball, ball launches up, and left or right depending on direction the player is moving.

5 points - ball bounces off left right and top side of screen

5 points - ball bounces off paddle, traveling more to the left or right depending on where it hits the paddle. **See diagram 1 for info.**

5 points - grid of blocks appears on screen. Blocks must have a space between them.

5 points - ball destroys block upon colliding with it

5 points - ball bounces off blocks correctly

5 points - ball speeds up after block collision

5 points - destroying all blocks resets game, ball going off bottom of screen resets game

Screenshot

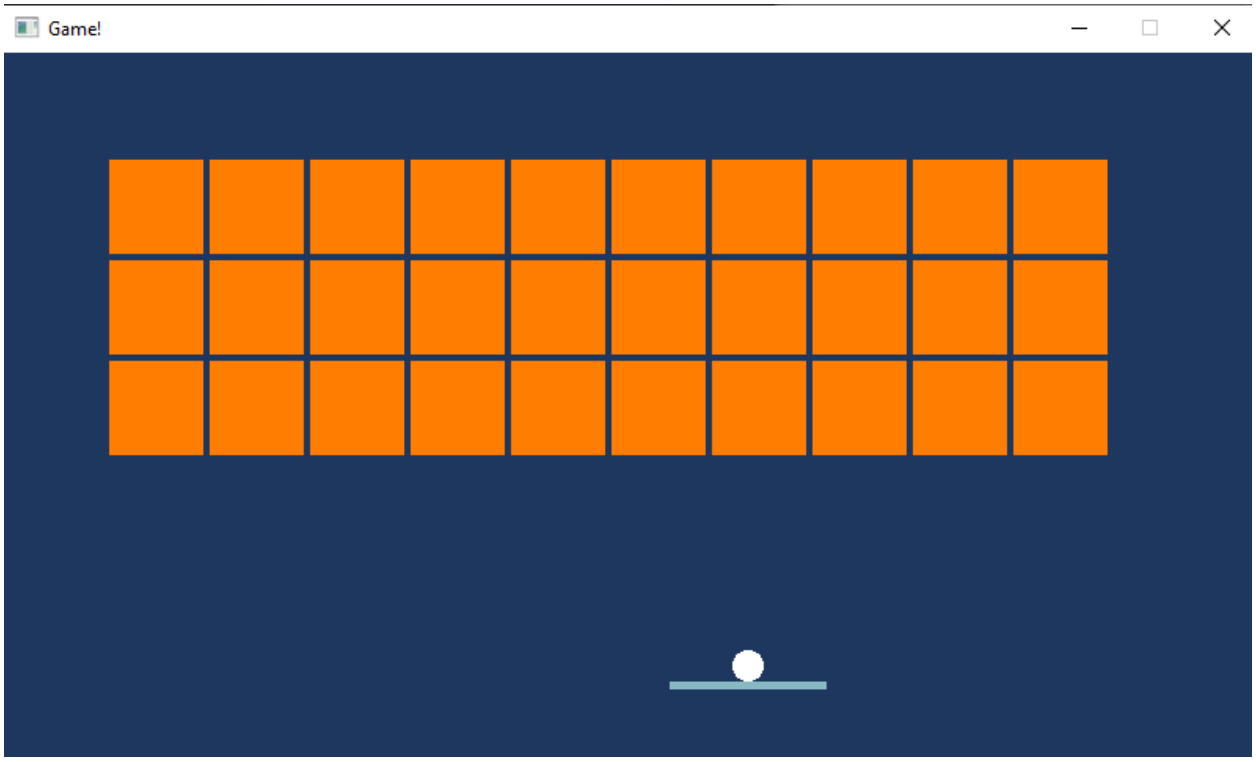
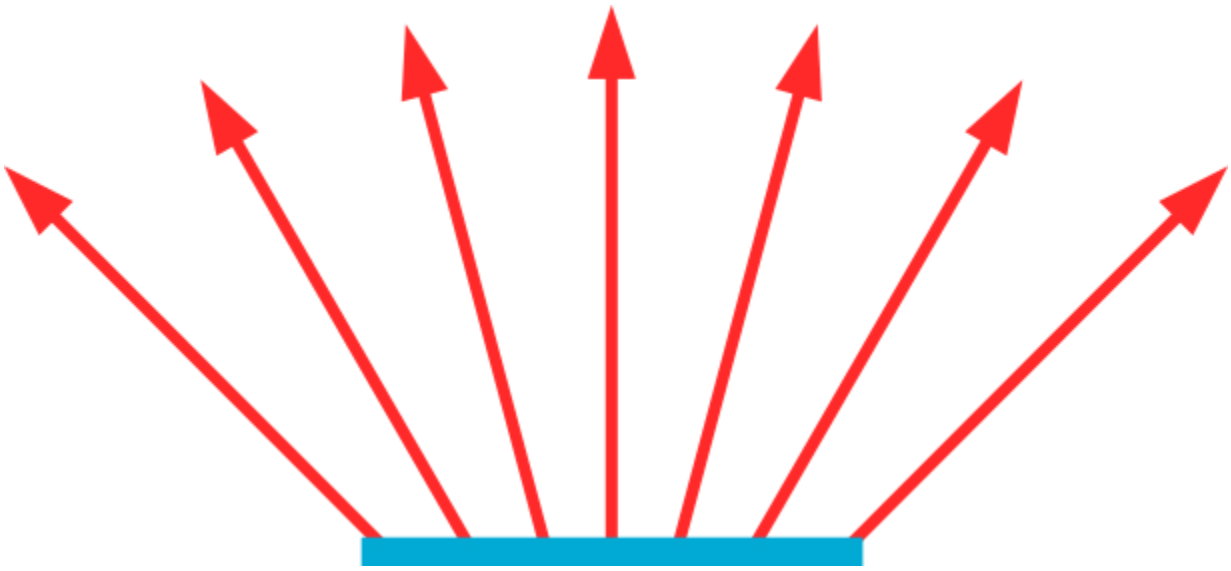


Diagram 1: Where Ball should bounce off paddle depending on collision point



Deliverables

1. Code
    a. Submit a .zip file with your go project.
2. Recording
    a. Record a win and loss of your game and upload to youtube. Submit a video.txt file with a link to your video. Make sure the video is not private!
    b. I recommend using OBS to record your footage.
3. Grade Sheet
    a. Fill out the grade sheet. If it matches what the grader gives you, then you receive +1 bonus point.
4. If you use online resources, upload an outside.txt document with links to all.

Tips For Success

This project is a little zestier than the rest!

- Tackle the project one step at a time.
    - Moving paddle => launching ball => bouncing ball off walls => off paddle => etc. Don't try to do the entire project at once!
    - I recommend getting the ball bouncing off the walls and paddle before doing anything related to blocks.
- To get the ball bouncing off the paddle correctly, you may want to use Go's math.Lerp() https://pkg.go.dev/poly.red/math#LerpInt
- While this program is more complex than usual, no single part of it is. If you find yourself writing a terribly confusing piece of code, stop it! Think then start over.