Intro to Programming
Scratch #14h – Pong

Objective: Use the techniques you've learned in Scratch to finish a 3-level pong game. Then, add a start screen to Pong and make a harder version of the game.

1. Login to the Scratch website. You should already have a project called *scratch_14_example* that we completed in class.

    a. Open the *scratch_14_example* project.

    b. Do *File->Save as a copy*. The name of the project will change to *scratch_14_example copy*.

    c. Rename the project to *first_last_scratch_14*

    d. Do *File->Save now*

2. Get ready.

    a. Add a second **Ball** sprite. This sprite will only be used on level 2

    b. Create a variable called *Score* for **all** sprites. This variable should appear on the Stage when the green flag is clicked.

    c. The winner and loser screens we did in class were lame. Make better versions of these screens.

3. You have these requirements for the project:

    a. **Sounds**:

        i. Make a sound when a ball hits the paddle or a brick. You can use the same sound for the paddle and the brick or different sounds for each one of them. *Boing* is always a good sound. (Make sure to **start sound** and **not play sound** until done).

        ii. If the player wins, play a cheering sound (until done).

        iii. If the player loses, play a sad sound (until done).

        iv. Play music while the game is playing.

    b. **When a level starts, the ball(s):**

        i. stops other scripts in sprite (Levels 2 & 3)

        ii. switch cosume to one that hasn't been used yet

        iii. point in direction (pick random 20 to 70)

        iv. set x (pick random -200 to 200)

        v. set y (pick random -10 to 160) (Level 1 and 2) set y (pick random -10 to 0) Level 3

        vi. show

        vii. the forever loop

    c. **On the stage, when a level starts:**

        i. set speed to 0

        ii. wait 1 sec (level 1 & 2); wait 2 sec (level 3)

        iii. set speed to 10

        iv. Whatever loop is needed (timer countdown on levels 1 & 2, forever loop on level 3)

d. **Level 1**:

    i. Timer is set for 15 seconds.

    ii. One ball appears on the screen.

    iii. Speed increases by 3 every 3 seconds.

    iv. Score increases when the ball hits the paddle.

    v. Both *Time Left* and *Score* appear on the screen. Both variables are in large readout mode with labels on the Stage.

e. **Level 2**:

    i. Timer is set for 25 seconds.

    ii. Two balls appear on the screen. They must have different colors and the colors must be different from the ball on Level 1.

    iii. Speed increases by 3 every 5 seconds.

    iv. Score increases when either ball hits the paddle.

    v. Both *Time Left* and *Score* appear on the screen. Both variables are in large readout mode with labels on the Stage.

f. **Level 3**:

    i. Both the *Time Left* variable and the *Score* variable hide. Neither variable should appear on the screen. There is no timer in Level 3. Game plays until all bricks are gone.

    ii. One ball appears on the screen. It must have a different color from any of the balls on Levels 1 and 2.

    iii. 21 bricks appear on the screen with 3 rows and 7 columns. Each row has a different color brick.

    iv. Speed increases by 3 every 6 seconds.

    v. Score increases when the ball hits the paddle and when a brick is hit.

    vi. Level ends when all 21 bricks have been hit.

g. **Game Over**:

    i. The game is over if the player either loses or wins.

    ii. The *Score* variable appears on the screen when the game is over. It should have a label reading *Final Score*.

    iii. The *Time Left* variable does not appear on the screen when the game is over.

    iv. The player loses the game if any ball hits the **Death Line** in Level 1, 2, or 3

    v. The player wins the game if all 3 levels are completed successfully.

4. **All** sprites need to receive winner and loser broadcasts. When the game is over, all scripts should stop.

5. Now, add a Start Screen:

a. Create a backdrop that has directions for playing the game. There are 3 levels. Levels 1 and 2 are timed. In level 3 you must break all the bricks. Moving the mouse left and right will move the paddle.

b. Add sprites for *Easy* and *Hard*. You've done this before.

c. Add variables EASY, HARD, and Difficulty Level. You know how to do this.

d. The game starts when the user clicks *Easy* or *Hard*.

e. The *Score* and *Time Left* variables are hidden on the Start Screen.

6. The *Score* and *Time Left* variables show up on the stage when the game starts.

7. Make a harder version of the game.

a. Add a costume to the paddle. In this new costume, the paddle is shorter than the paddle created in class. A shorter paddle makes it harder to hit the ball.

b. If the user selects the EASY game, use the longer paddle. If the user selects the HARD game, use the shorter paddle. This should be set up on level 1 and doesn't need to change for the remainder of the game.

c. For the harder version of the game, add 2 additional costumes to the *Brick*, and add 2 additional rows to Level 3 so you'll see 5 rows and 35 bricks. You only need to change the value of the first repeat.

8. Always do *File->Save now* before you log out of the Scratch website.

9. Now do *File->Save to your computer*.

10. Turn in your *first_last_scratch_14.sb3* file to *missblomeyer.com* in the usual way.
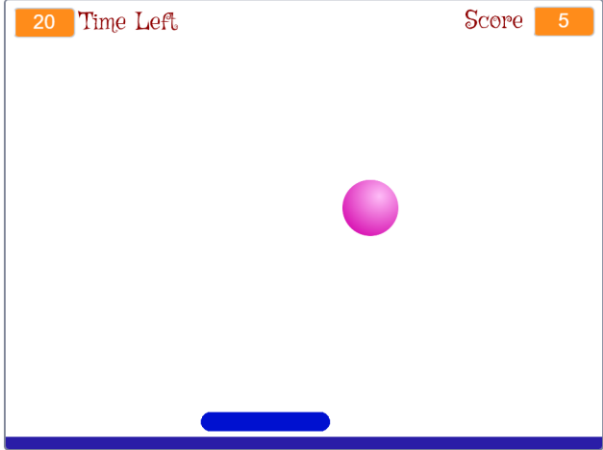
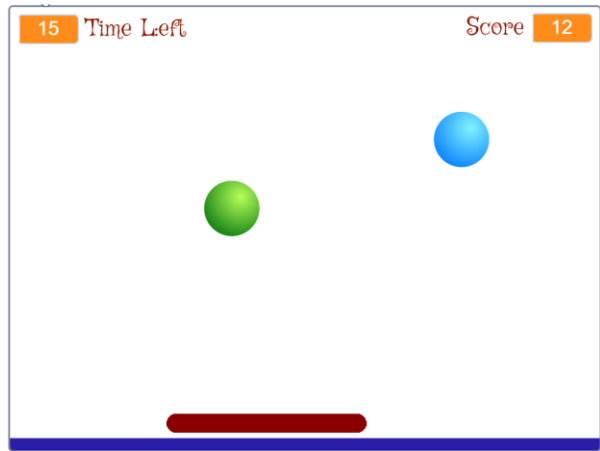**Sample Start Screen**

Sample Level 1 Screens

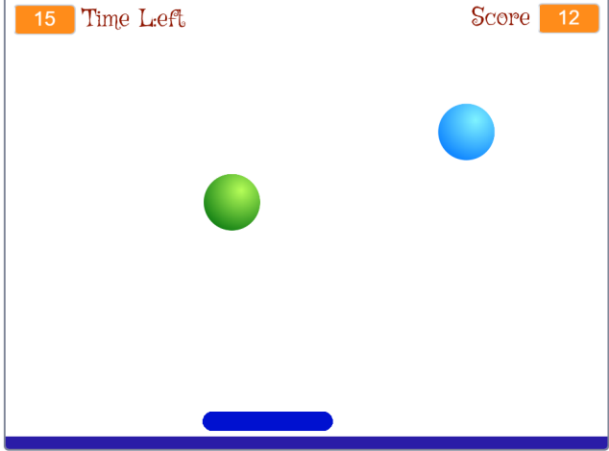**Easy Version**   **Hard Version**

| 20 | Time Left | | Score | 5 |

| 20 | Time Left | | Score | 5 |
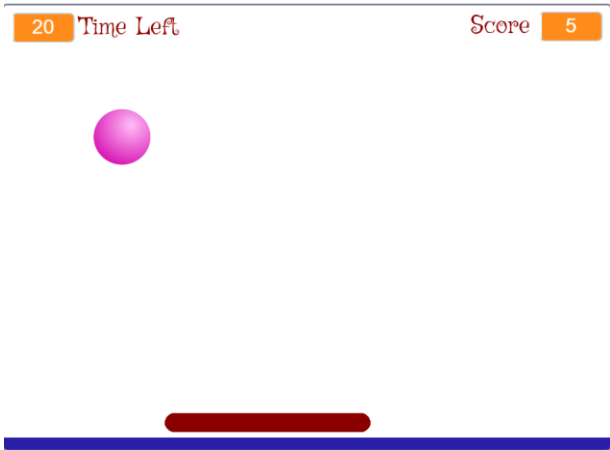
Sample Level 2 Screens

Easy Version   **Hard Version**

| 15 | Time Left | | Score | 12 |

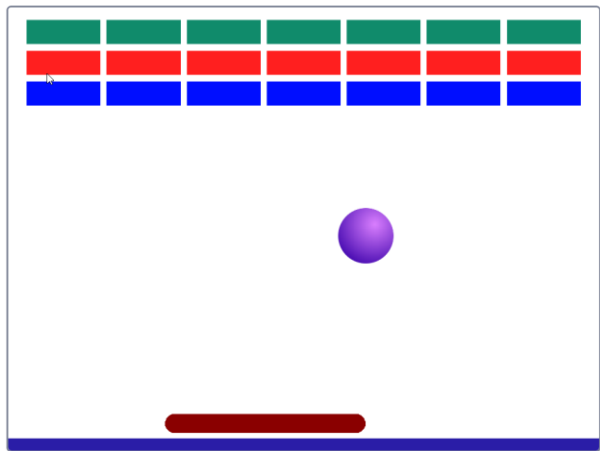| 15 | Time Left | | Score | 12 |

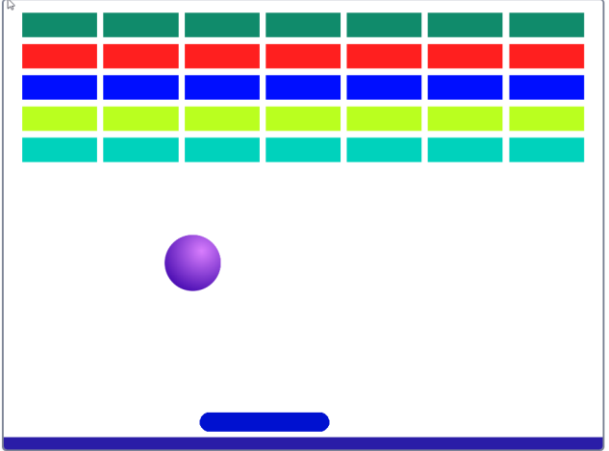# Sample Level 3 Screens

Easy Version   **Hard Version**

Sample Winner & Loser Screens

Final Score 47

YOU WIN!!!

Final Score 47

YOU LOSE!!!