Animation

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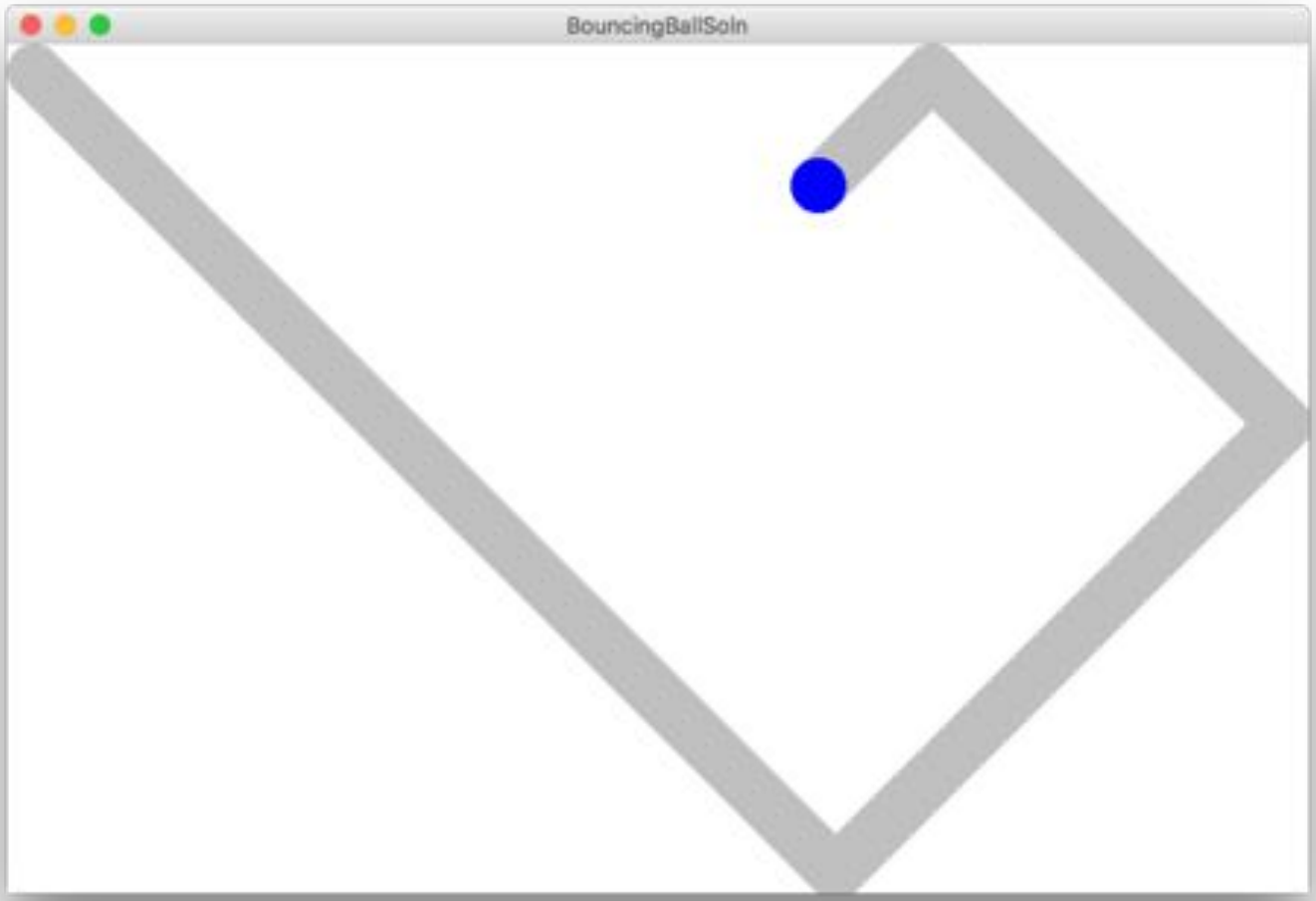
CS106A, Stanford University

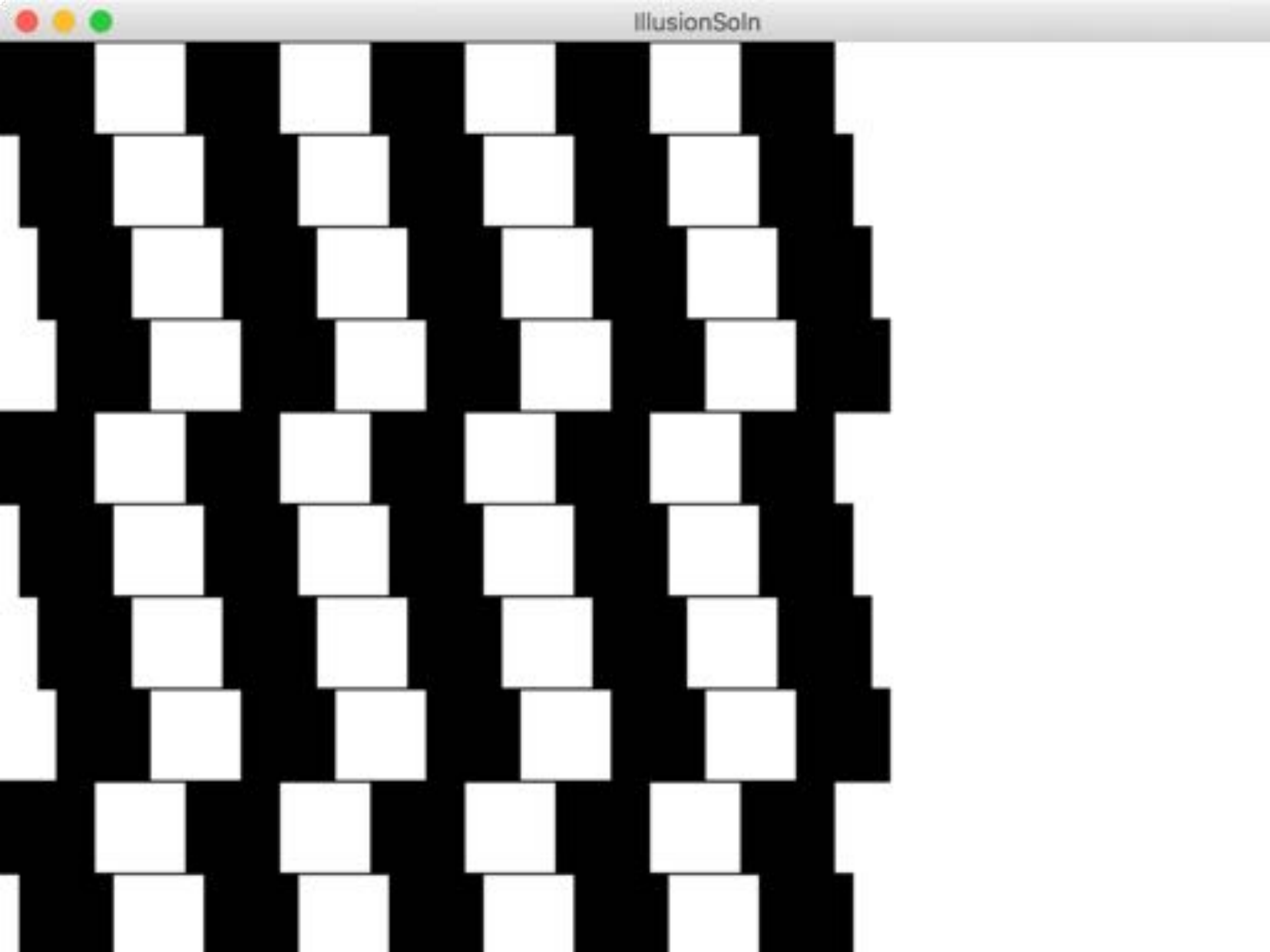
This is Method Man. He is part of the Wu Tang Clan. ☺

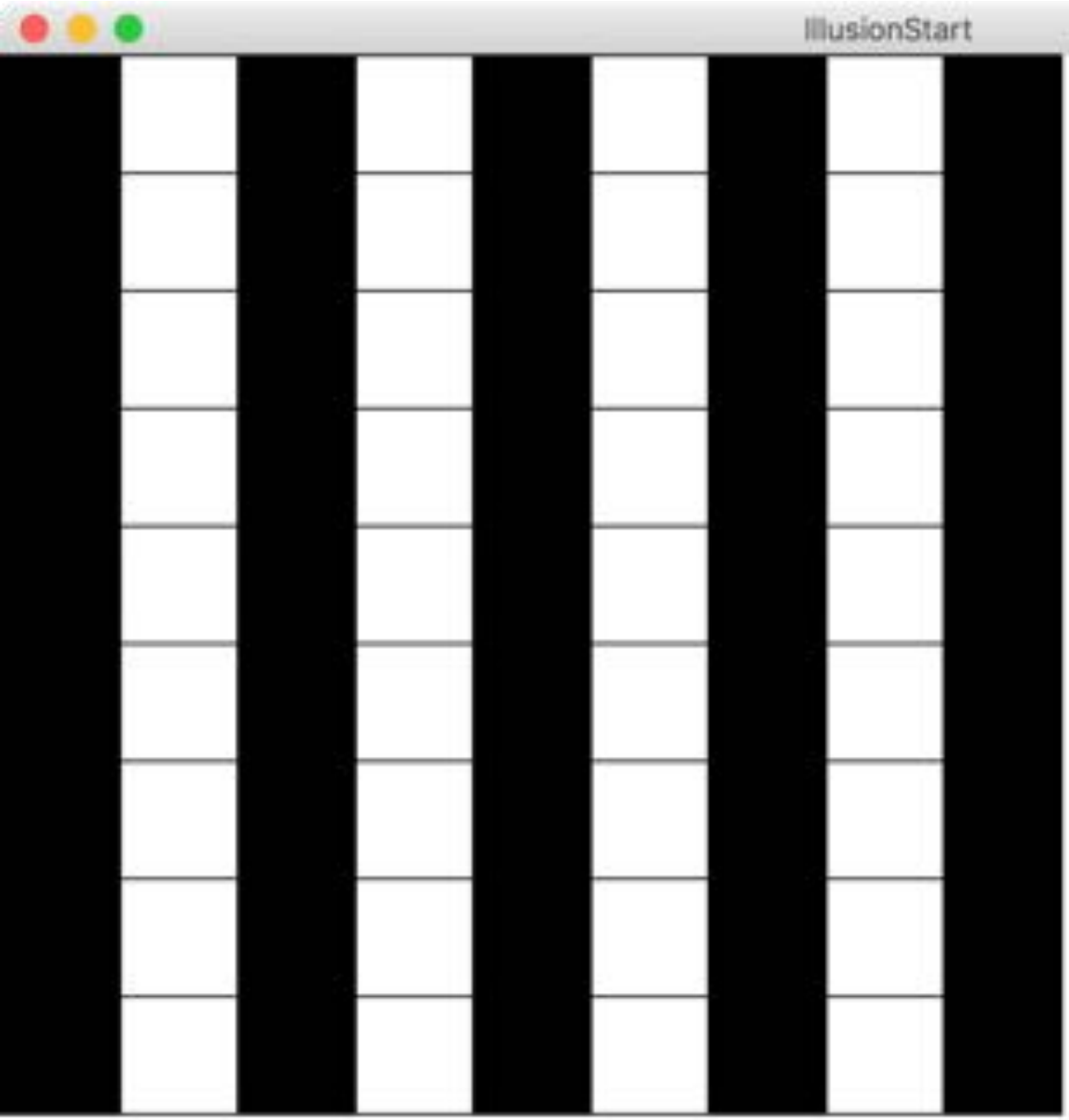
Learning Goals

1. Feel more confident debugging
2. Write animated programs

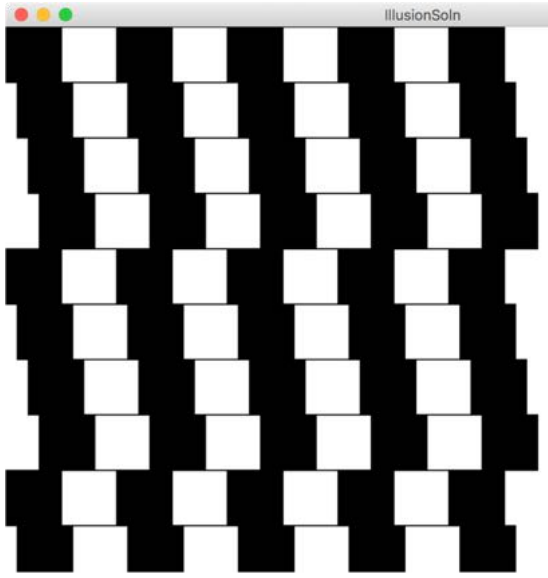
You will be able to write Bouncing Ball




IllusionSoln

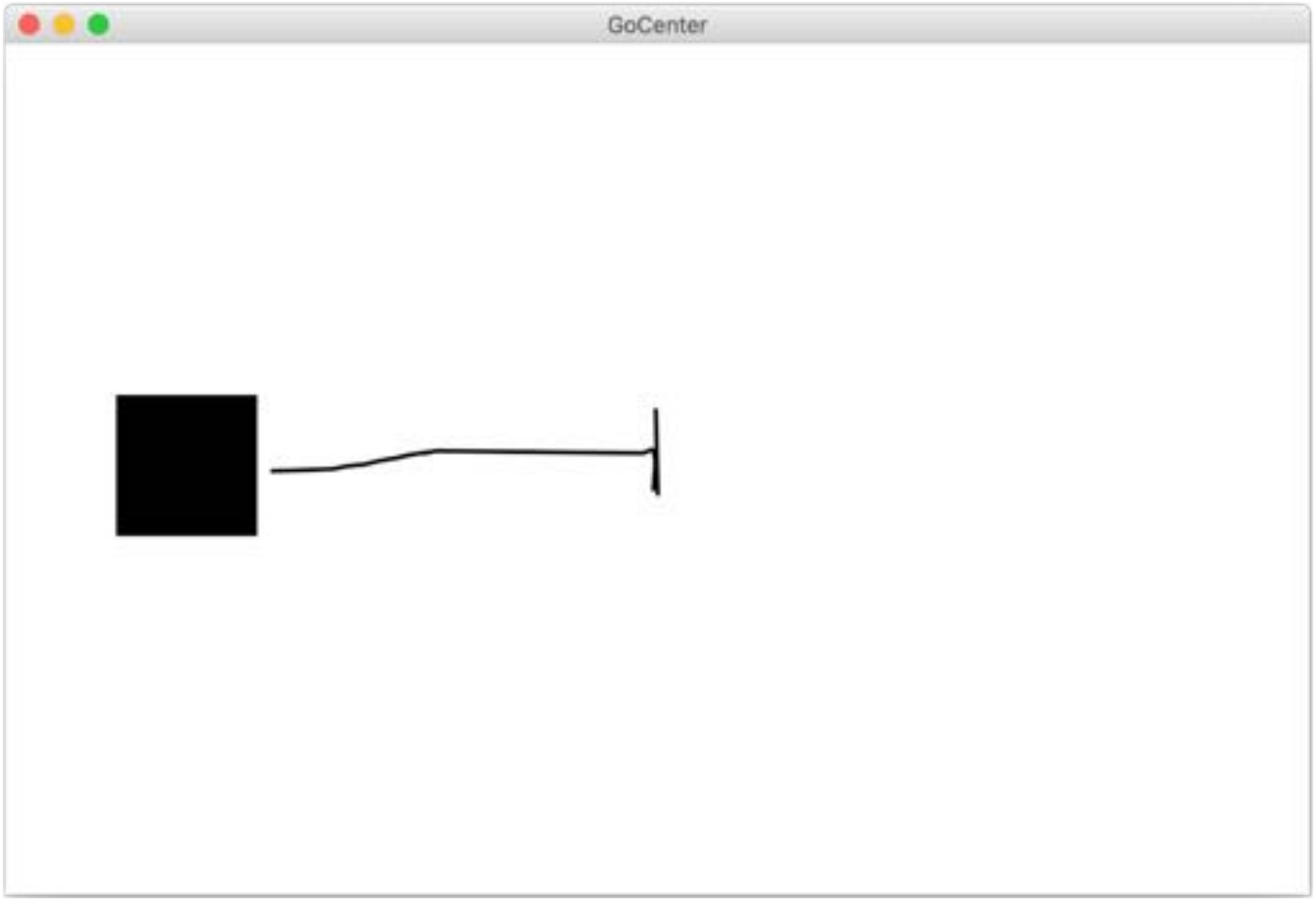


Goal



Great foundation

Move to Center



Animation Loop

```
private void run() {
    // setup

    while(true) {
        // update world

        // pause
        pause(DELAY);
    }
}
```

Animation Loop

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Make all the variables you need. Add graphics to the screen.

Animation Loop

```
private void run() {
    // setup

    while(true) {
        // update world

        // pause
        pause(DELAY);
    }
}
```

The animation loop is a repetition of heartbeats

Animation Loop

```
private void run() {
    // setup

    while(true) {
        // update world

        // pause
        pause(DELAY);
    }
}
```

Each heart-beat, update the world forward one frame

Animation Loop

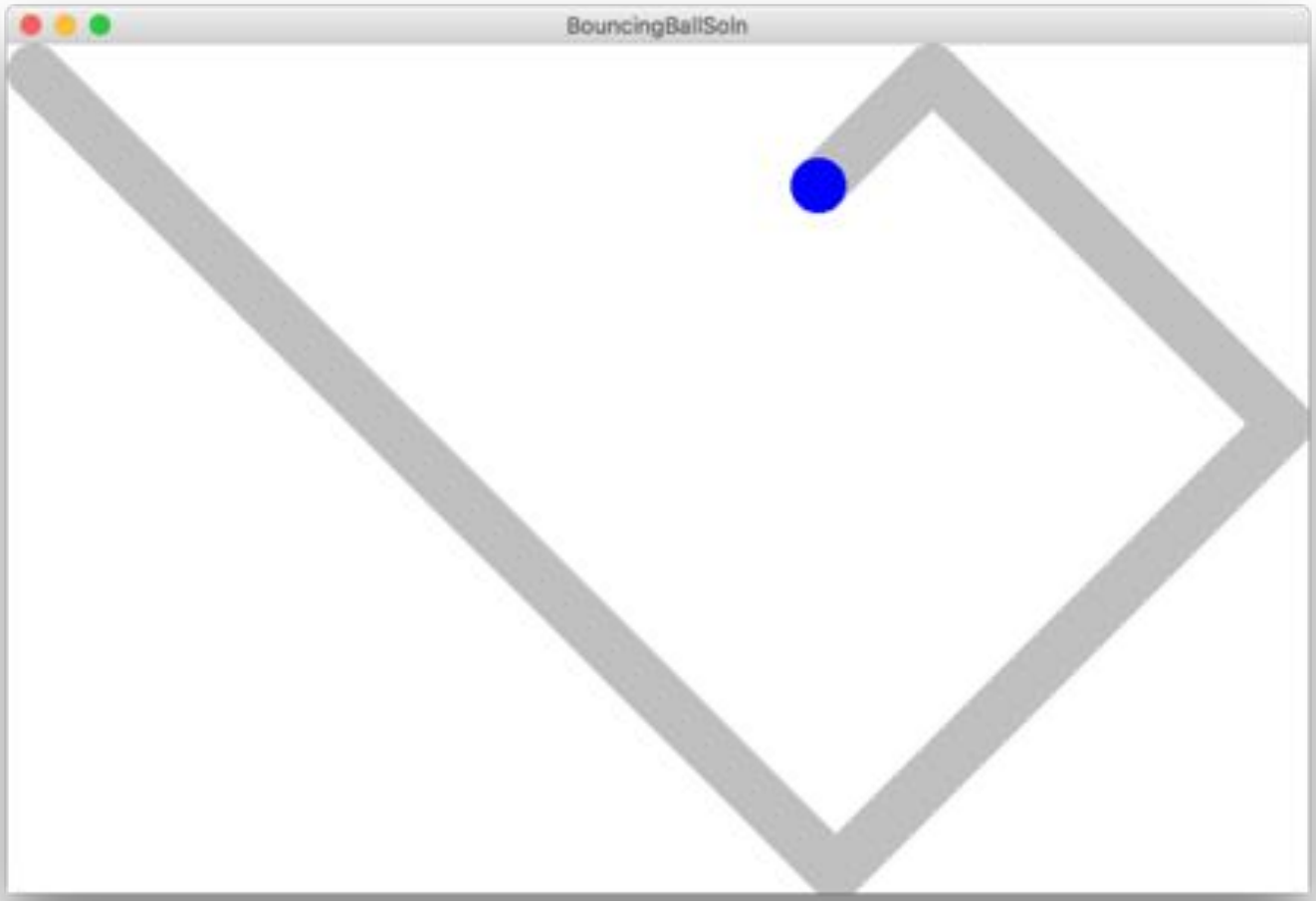
```
private void run() {
    // setup

    while(true) {
        // update world

        // pause
        pause(DELAY);
    }
}
```

If you don't pause, humans won't be able to see it

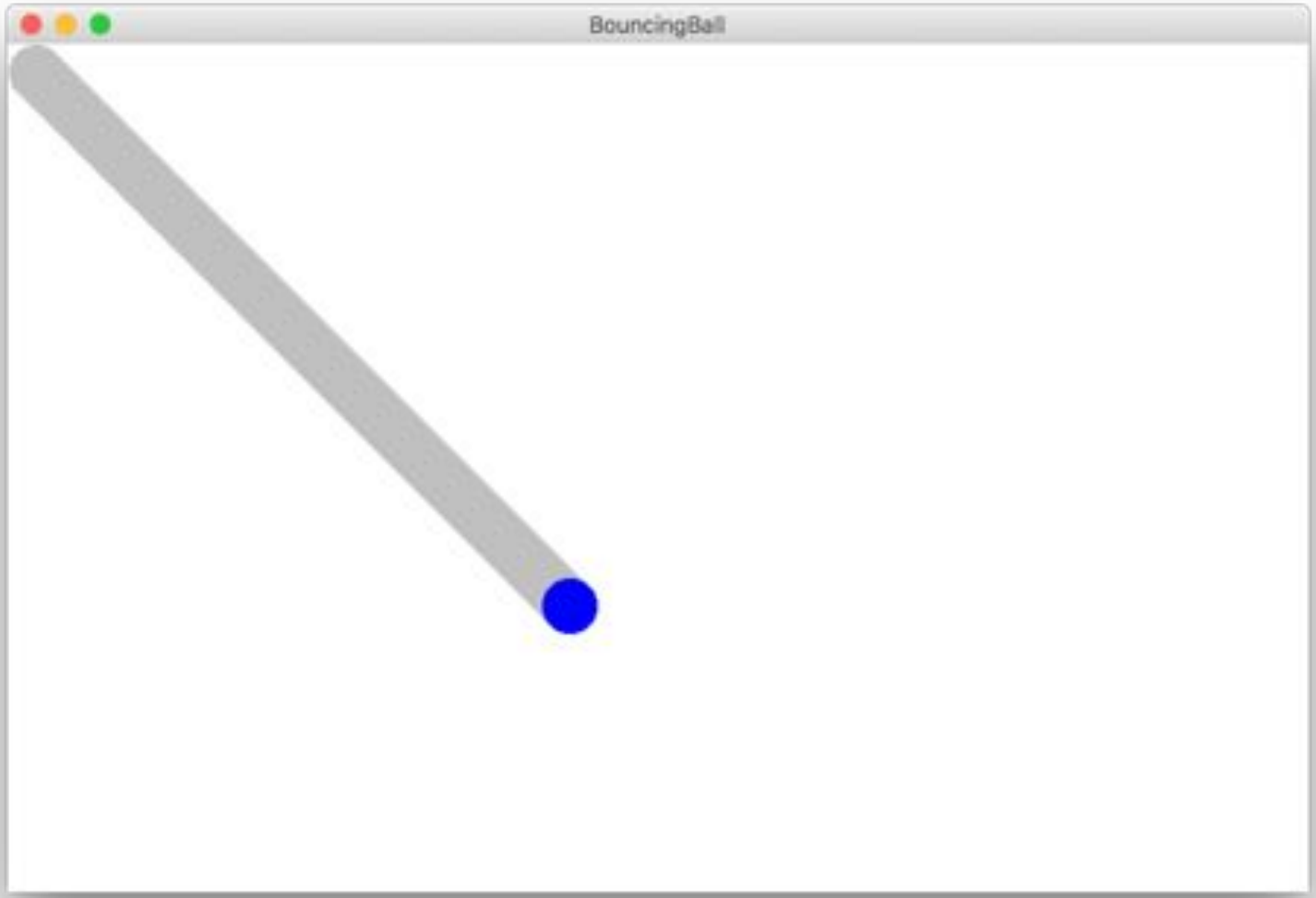
Move To Center

```
private void run() {
    // setup
    GRect r = makeRect();
    while(!isPastCenter(r))
        // update world
        r.move(1, 0);
        // pause
        pause(DELAY);
    }
}
```

Bouncing Ball

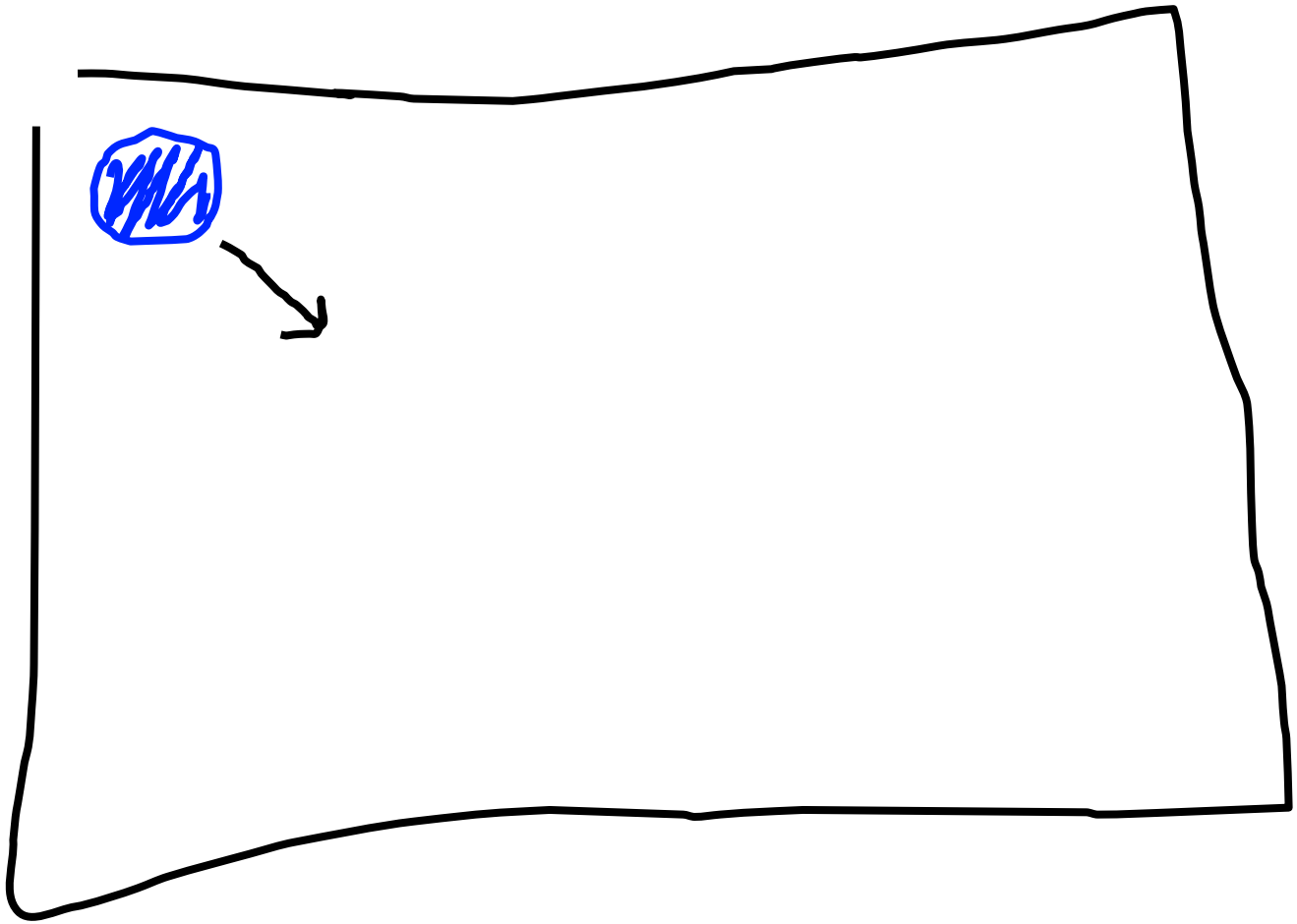


Milestone #1



Bouncing Ball

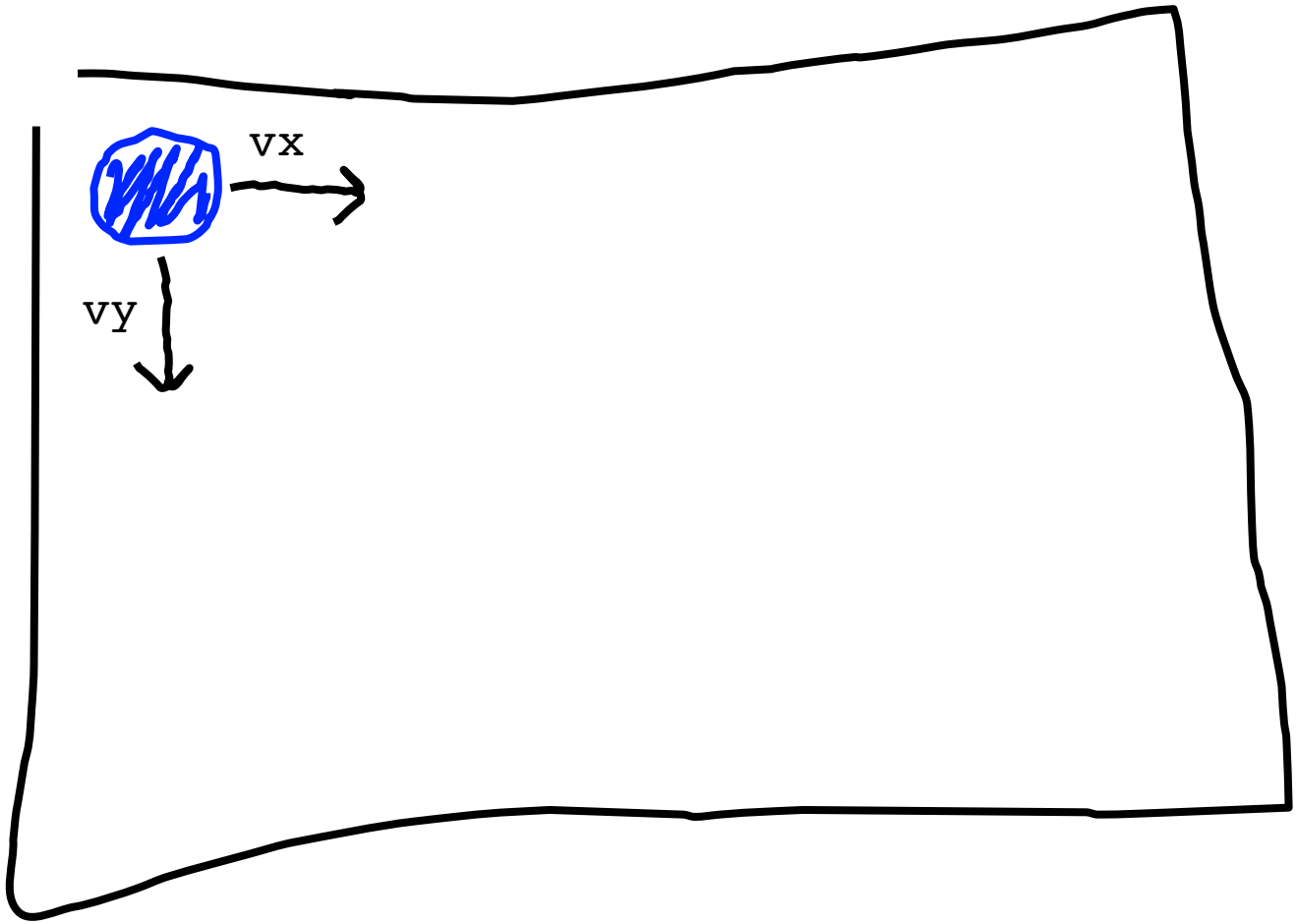
First heartbeat



Velocity: how much the ball position changes each heartbeat

Bouncing Ball

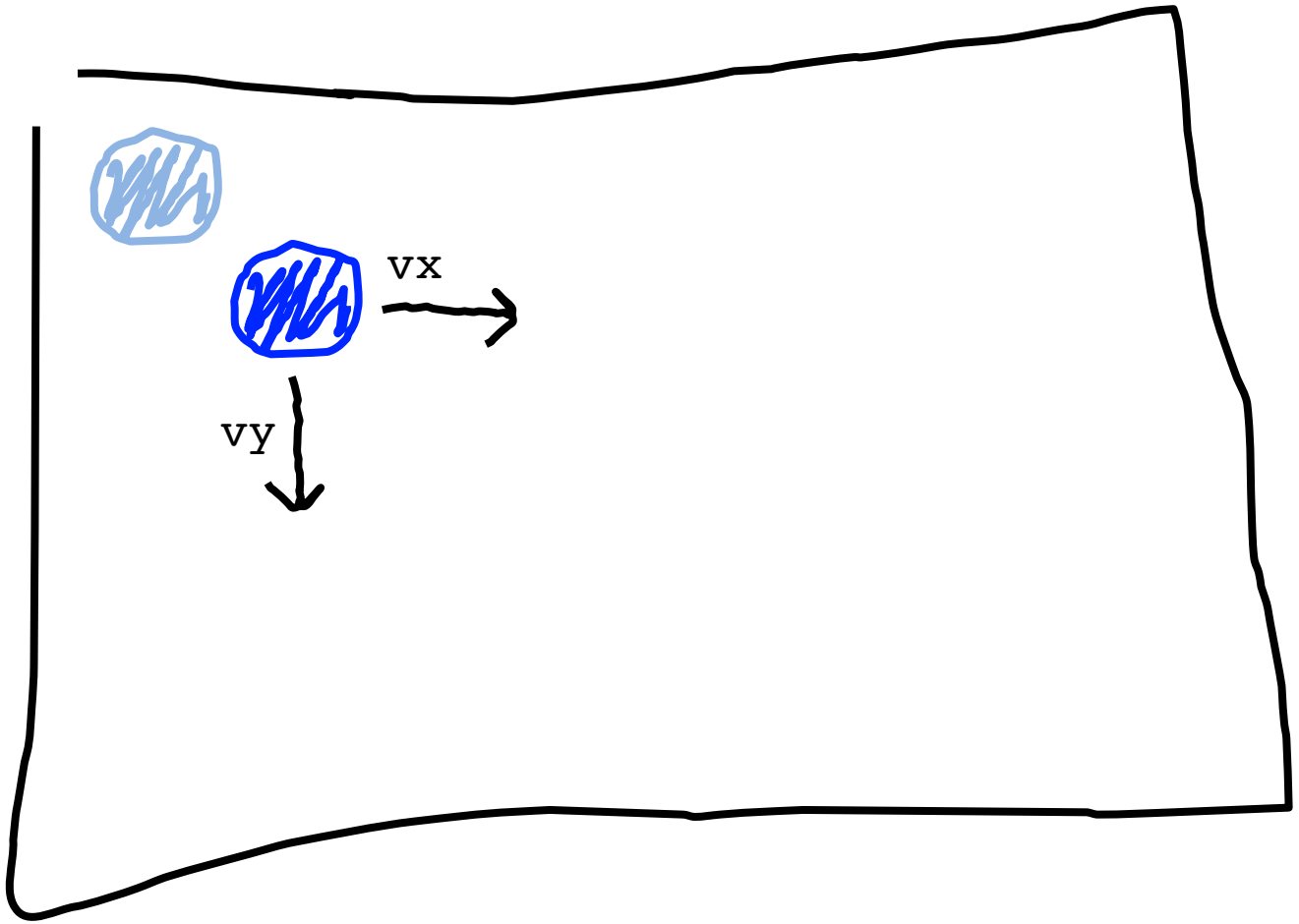
First heartbeat



The GOval **move** method takes in
a change in x and a change in y

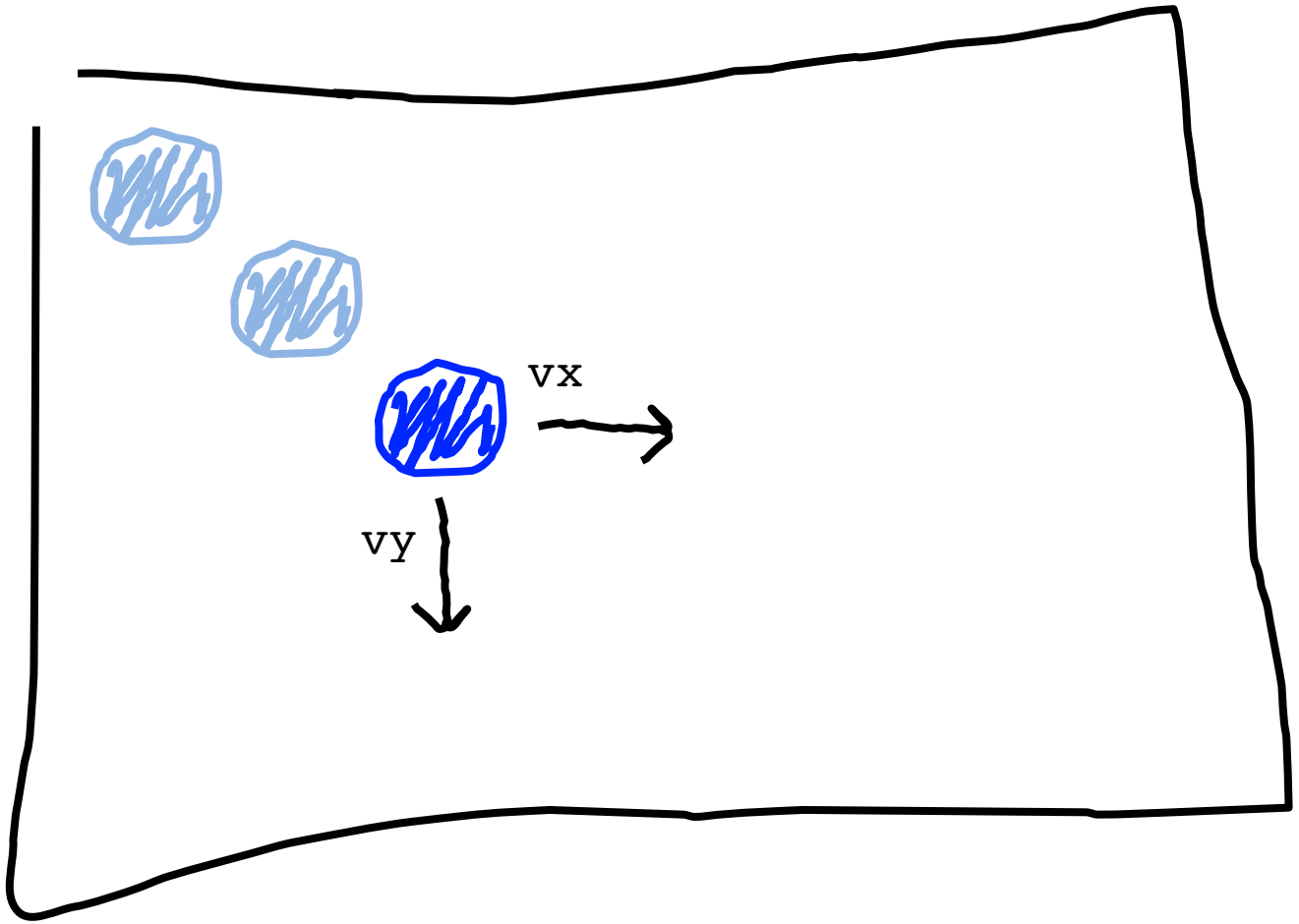
Bouncing Ball

Second heartbeat



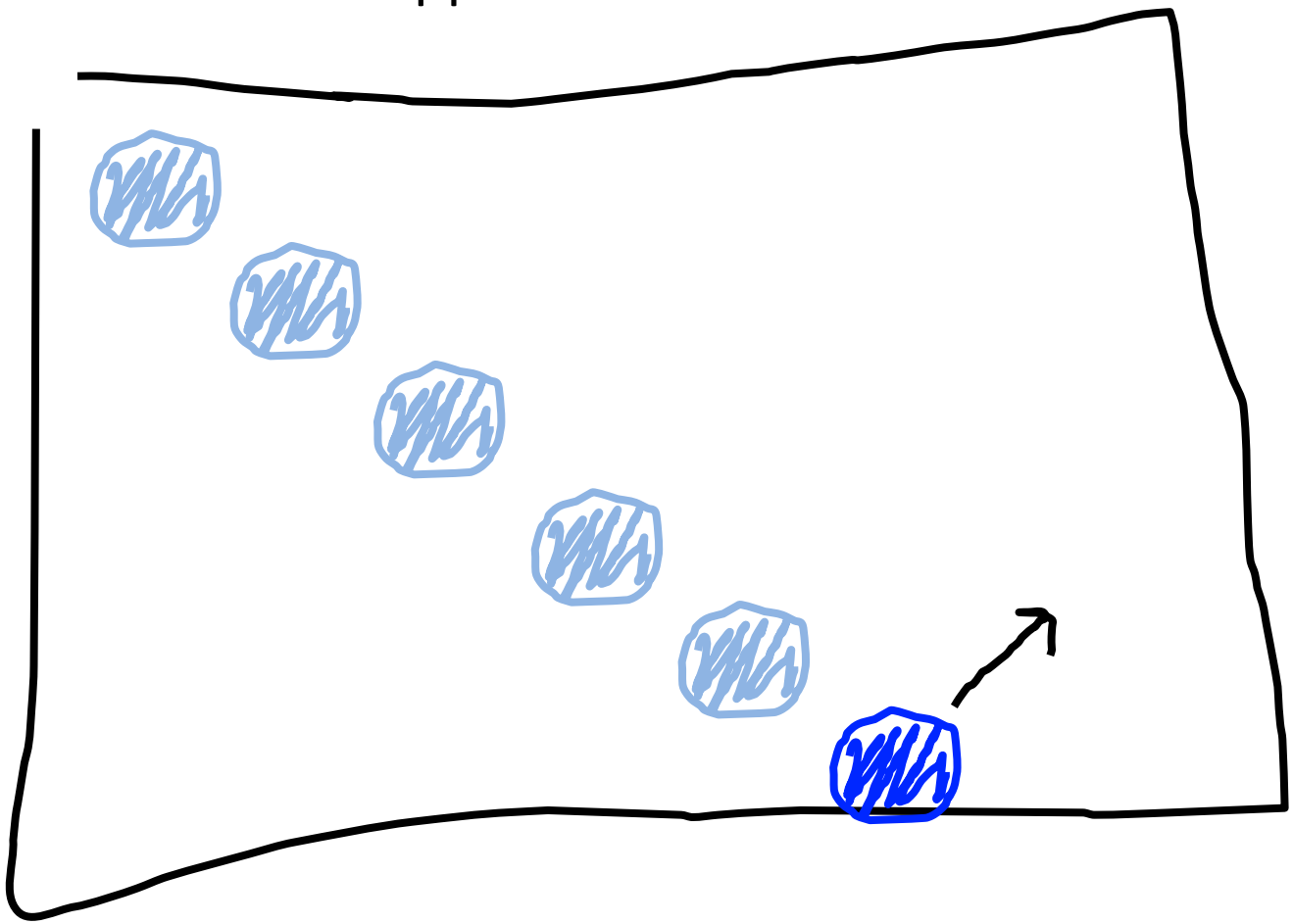
Bouncing Ball

Third heartbeat



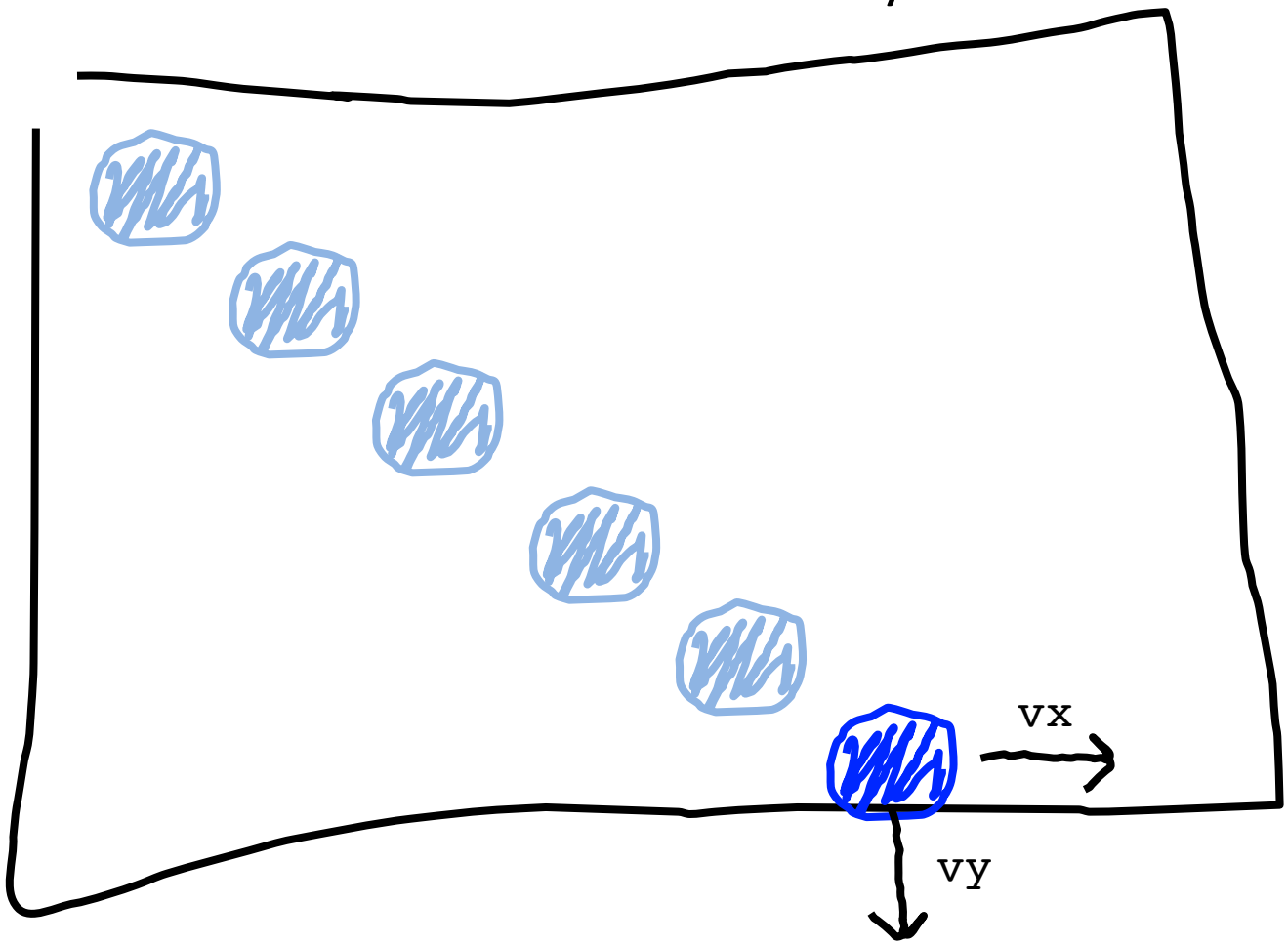
Bouncing Ball

What happens when we hit a wall?



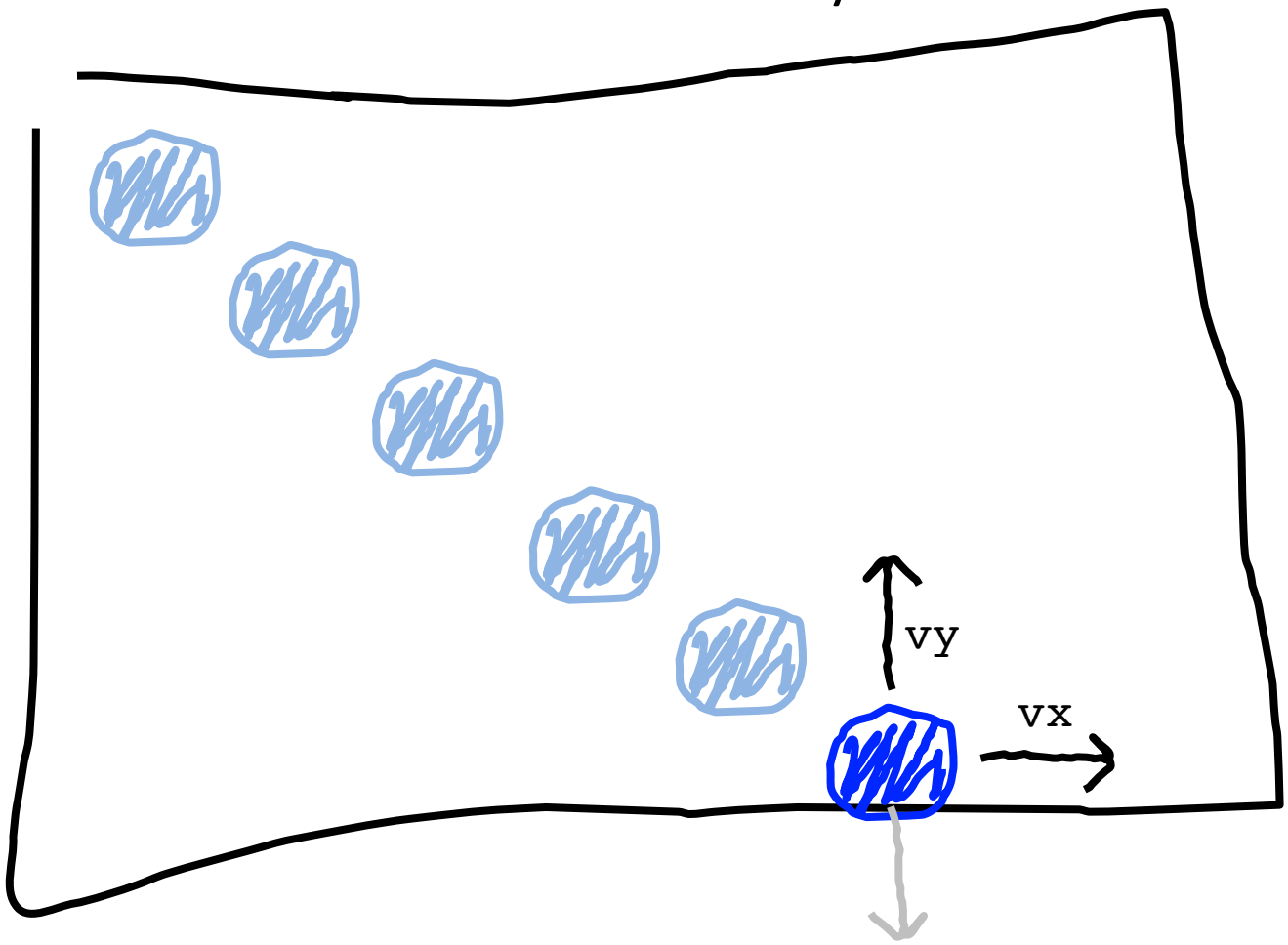
Bouncing Ball

We have this velocity



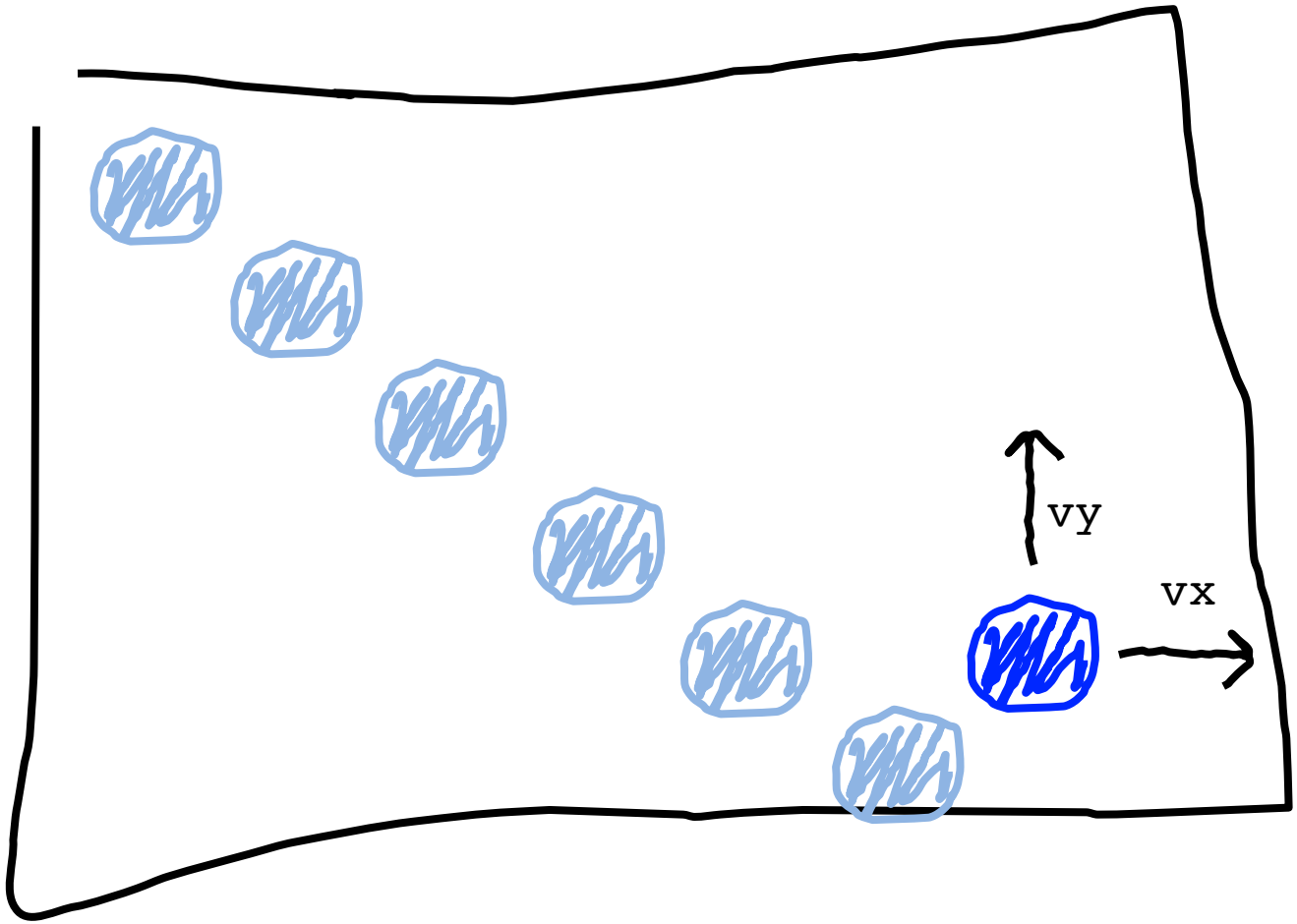
Bouncing Ball

Our new velocity

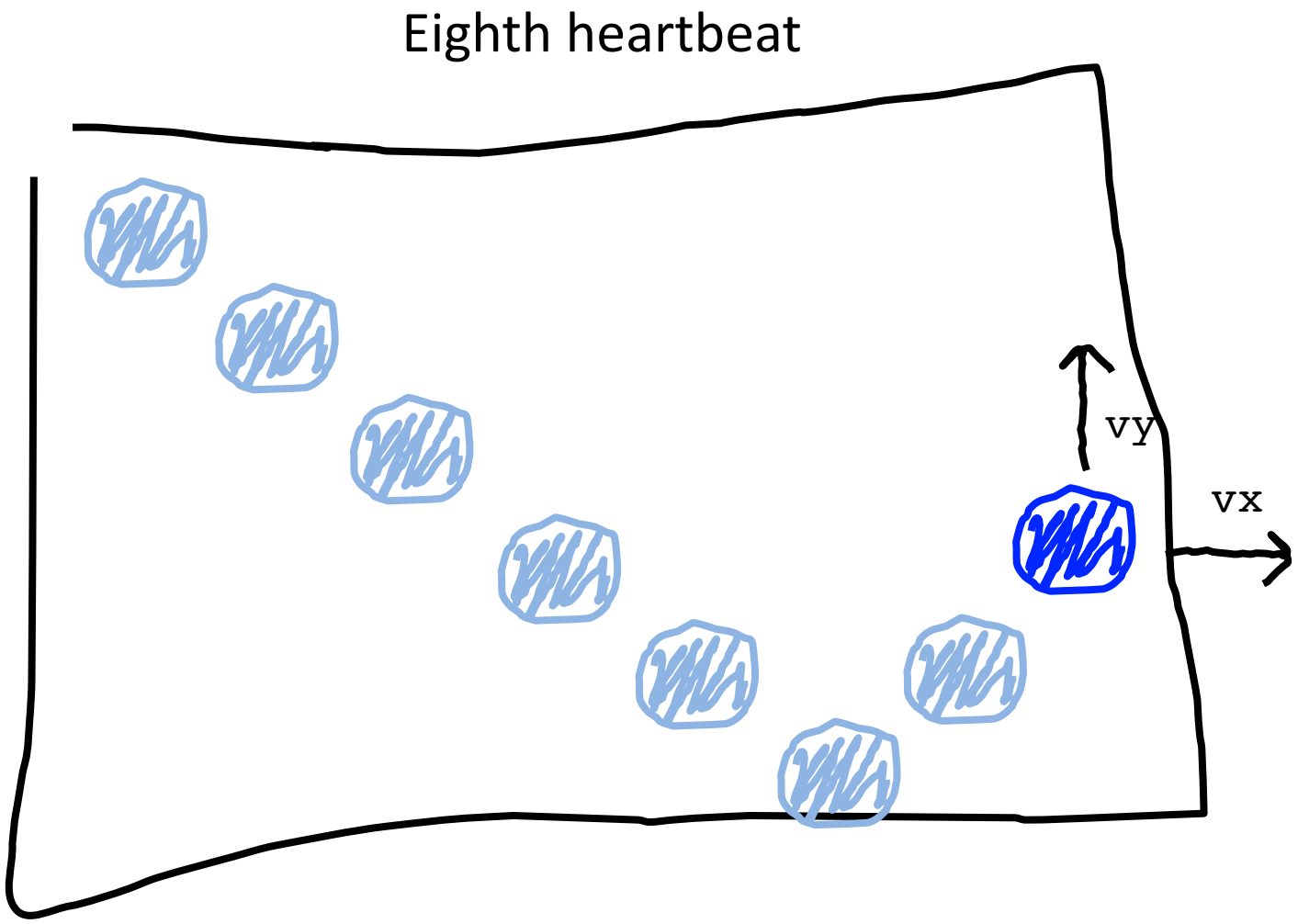


Bouncing Ball

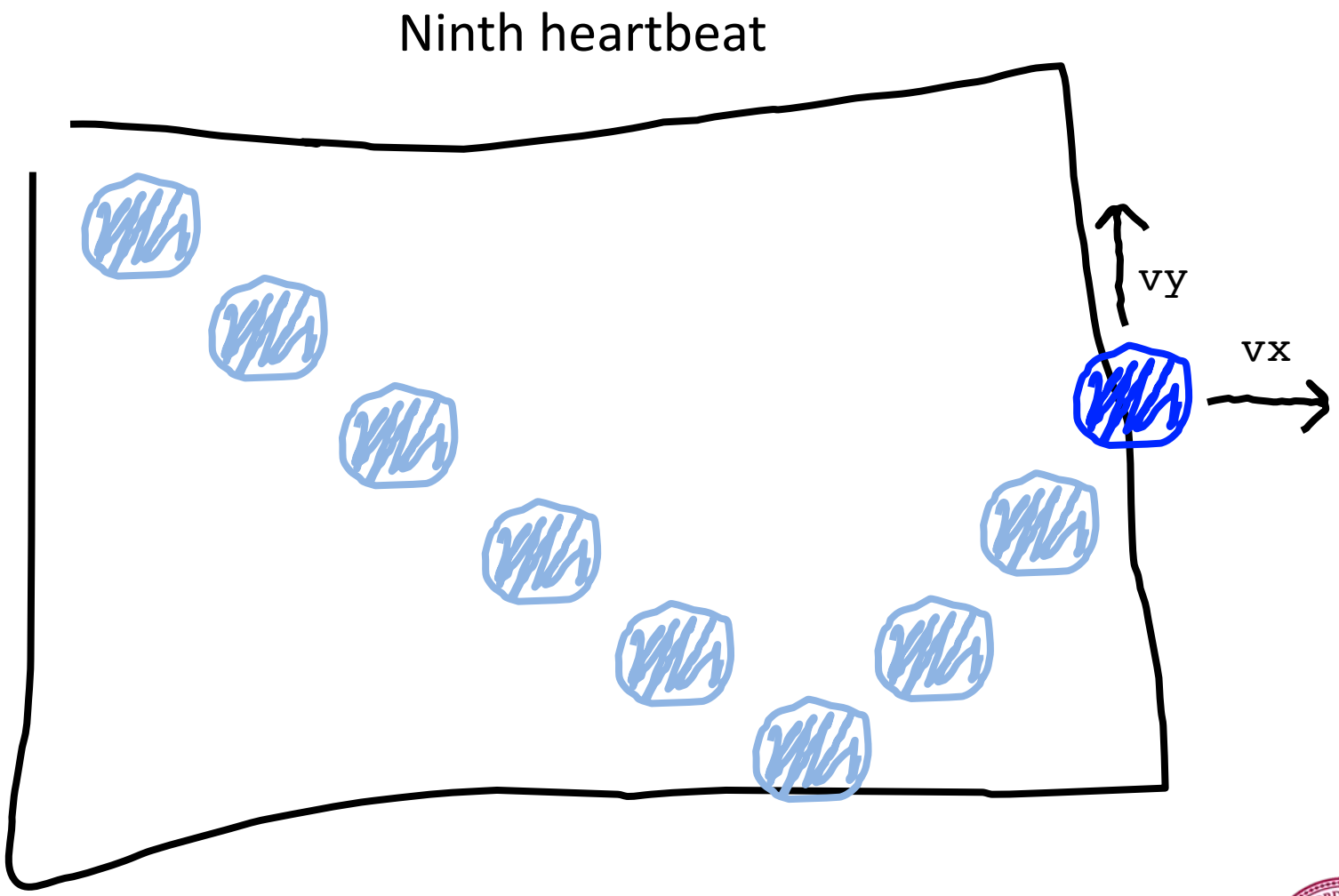
Seventh heartbeat



Bouncing Ball

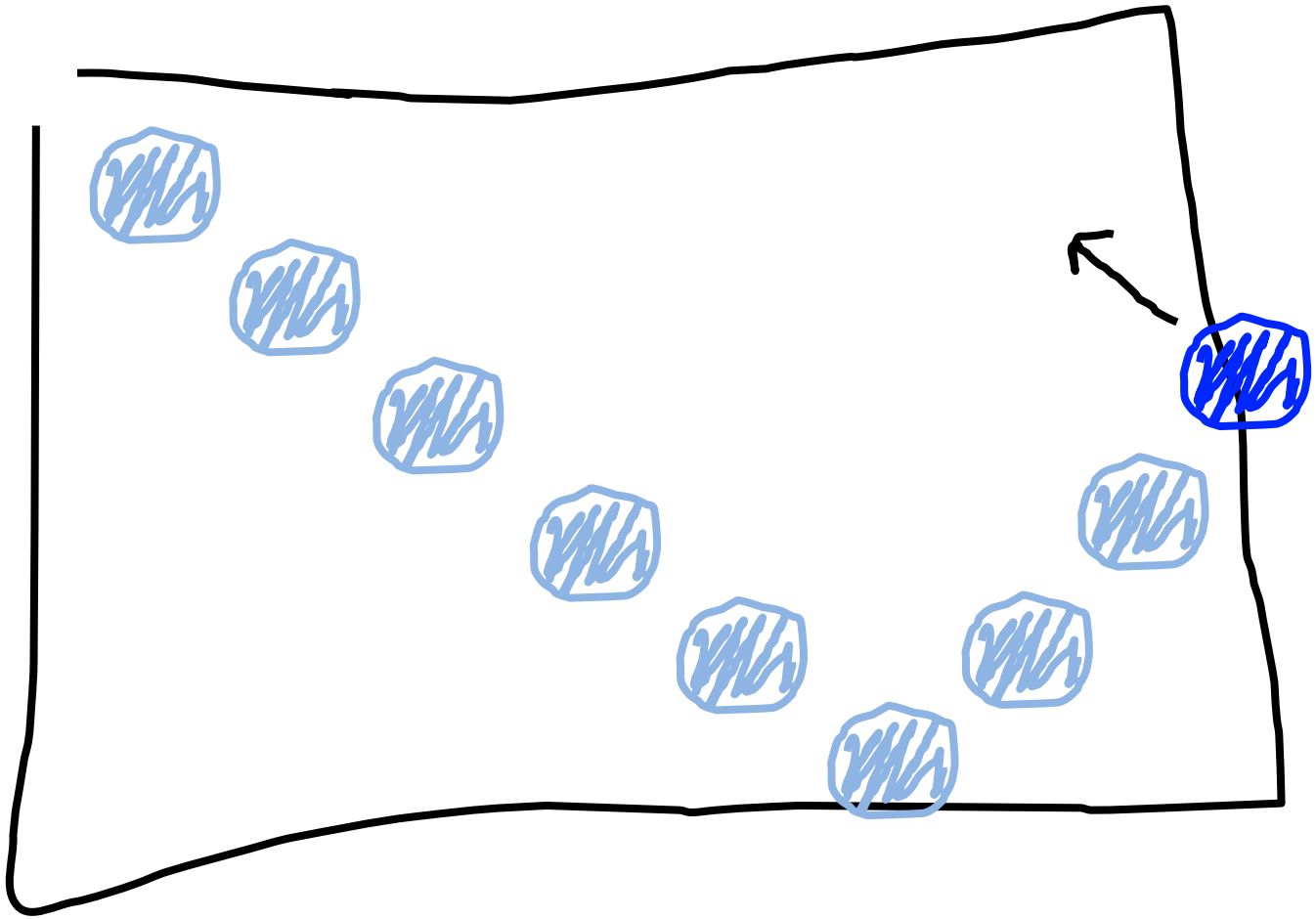


Bouncing Ball



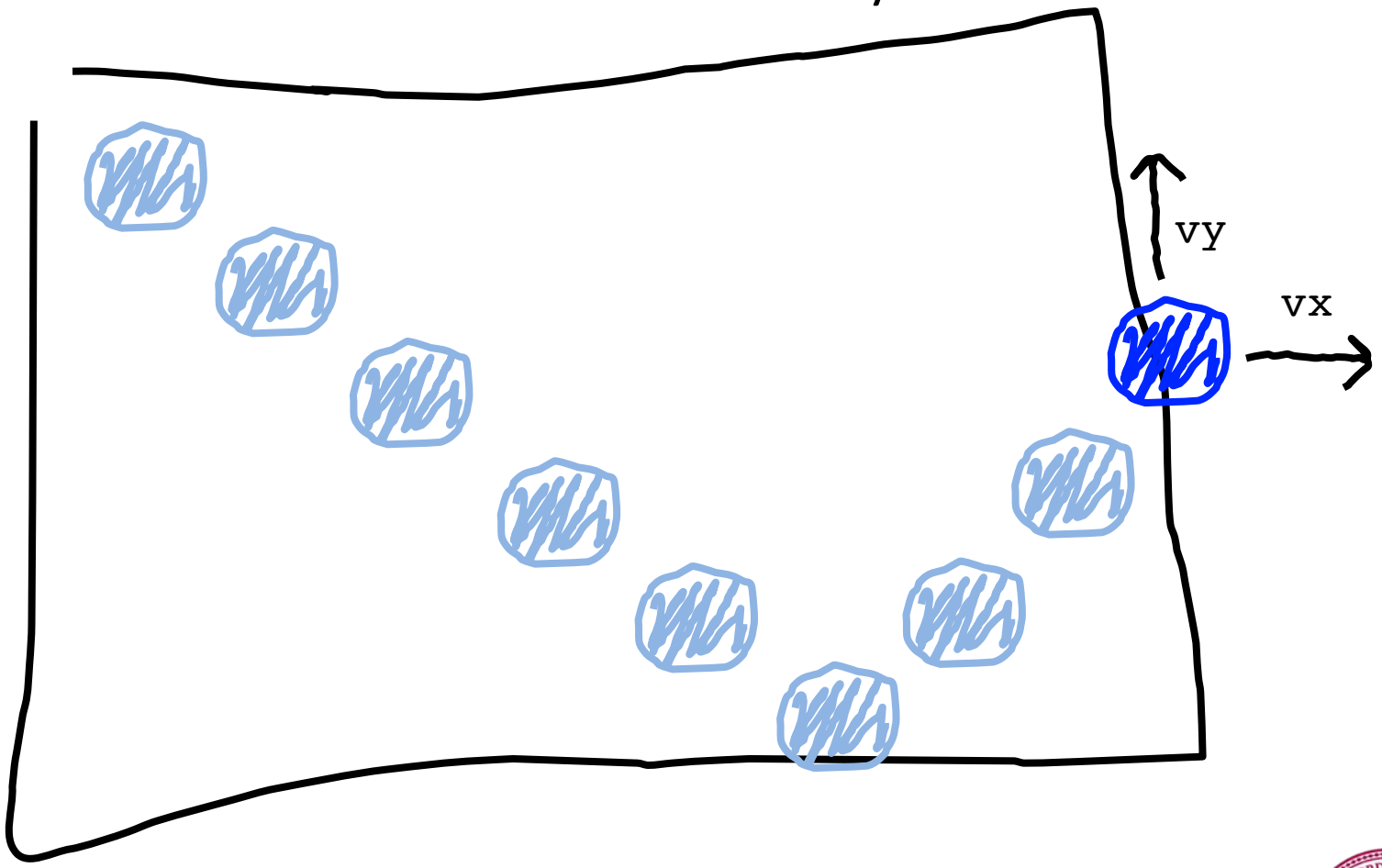
Bouncing Ball

We want this!



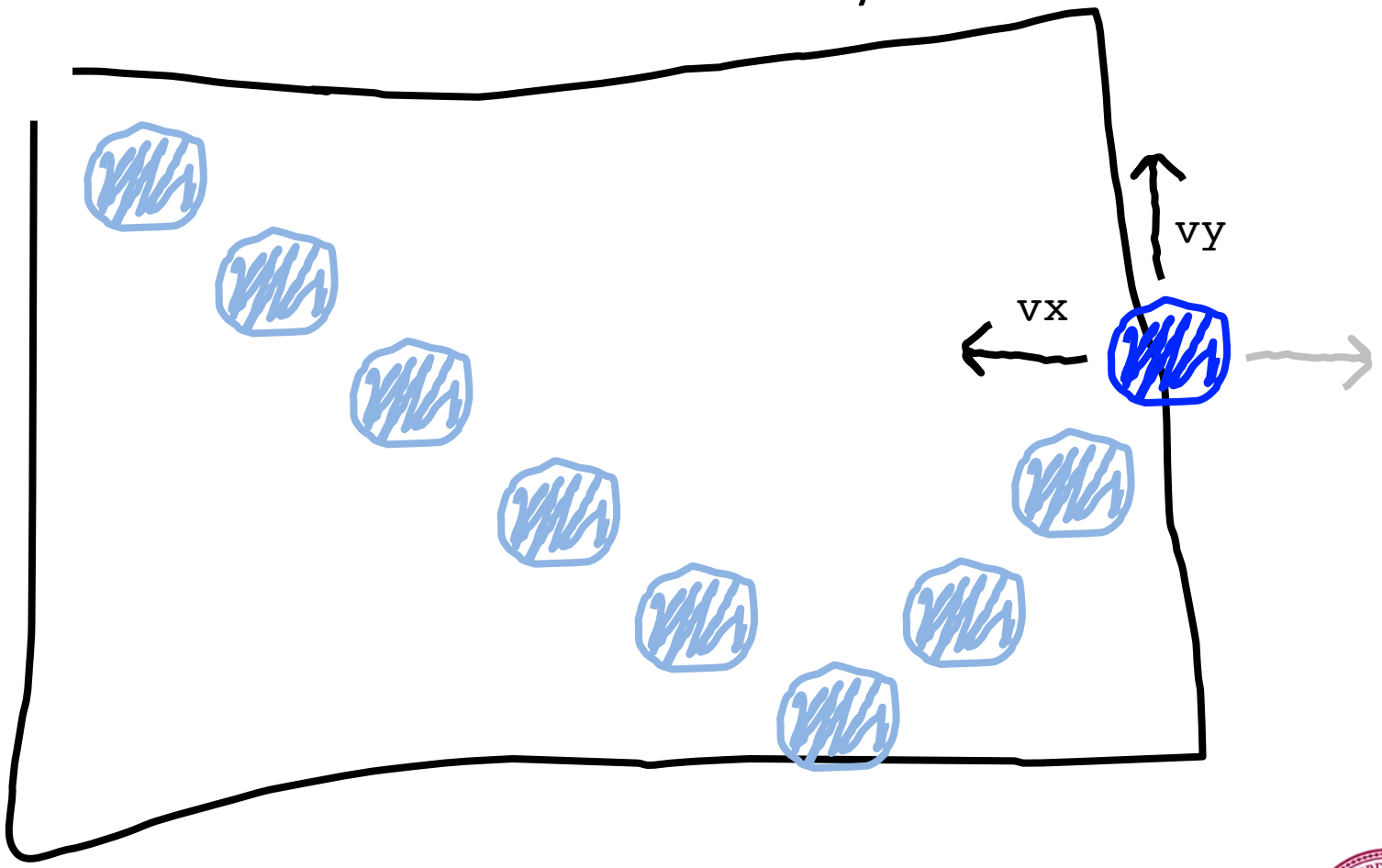
Bouncing Ball

This was our old velocity



Bouncing Ball

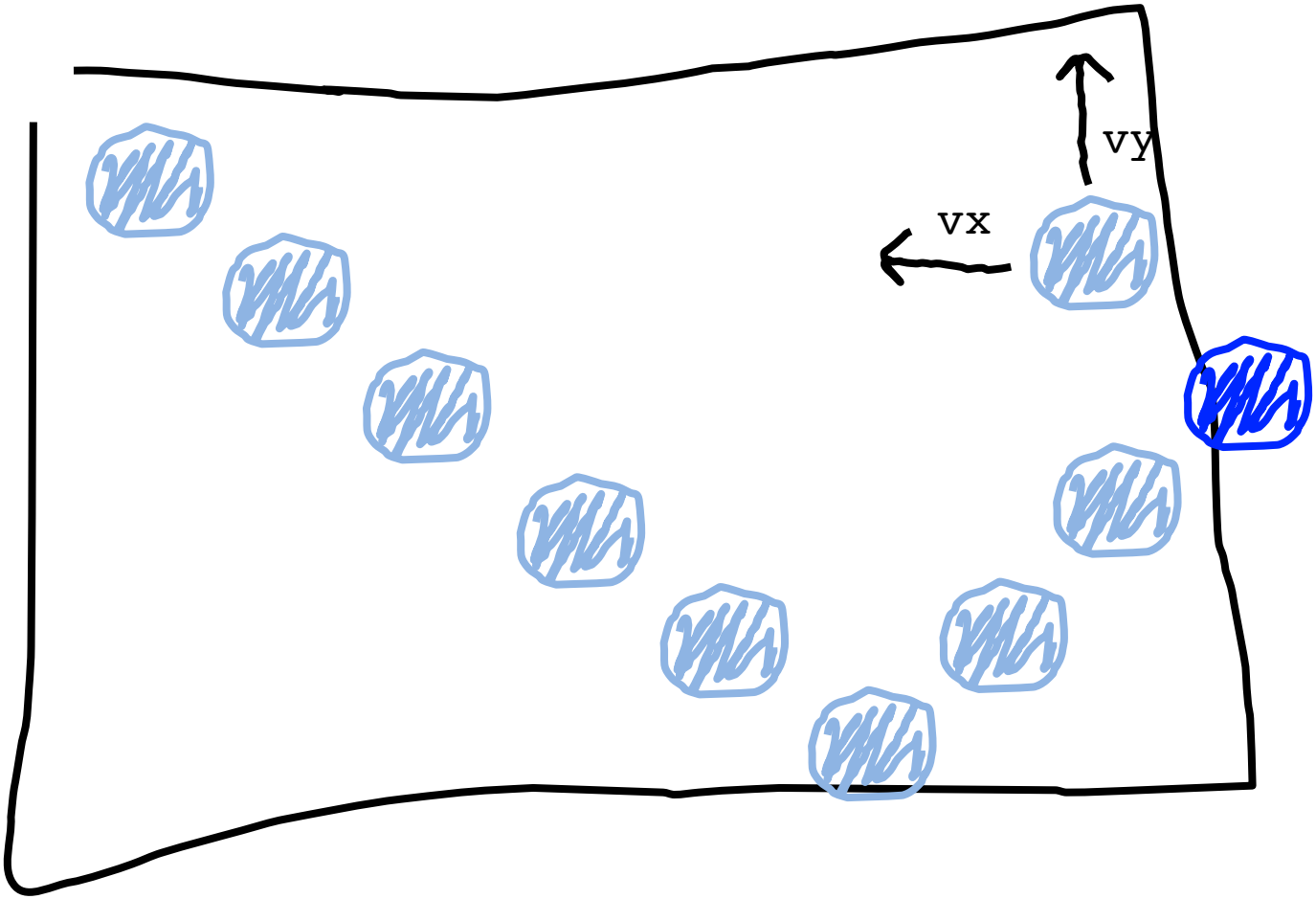
This is our new velocity



When reflecting horizontally: `vx = -vx`

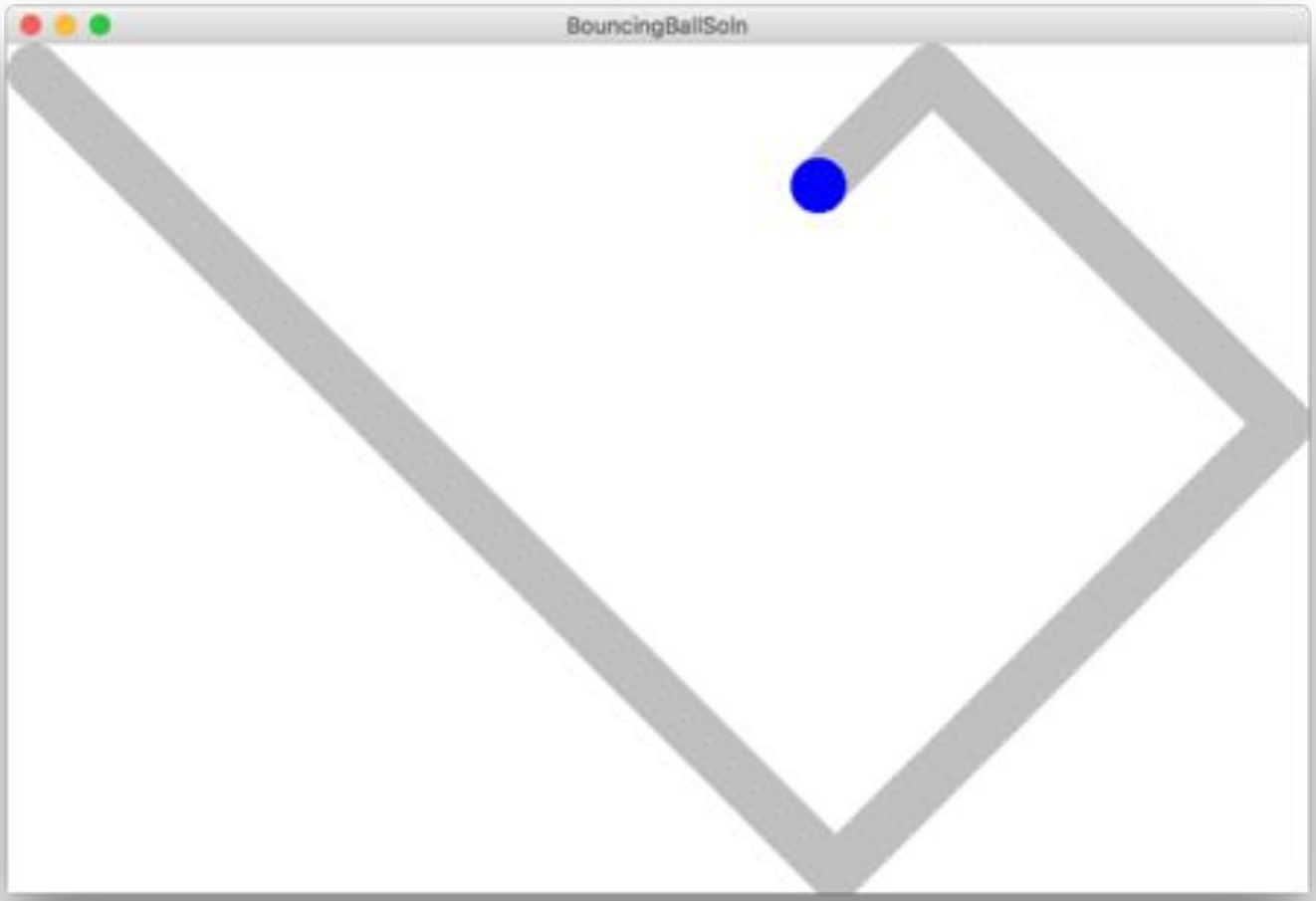
Bouncing Ball

Tenth heartbeat

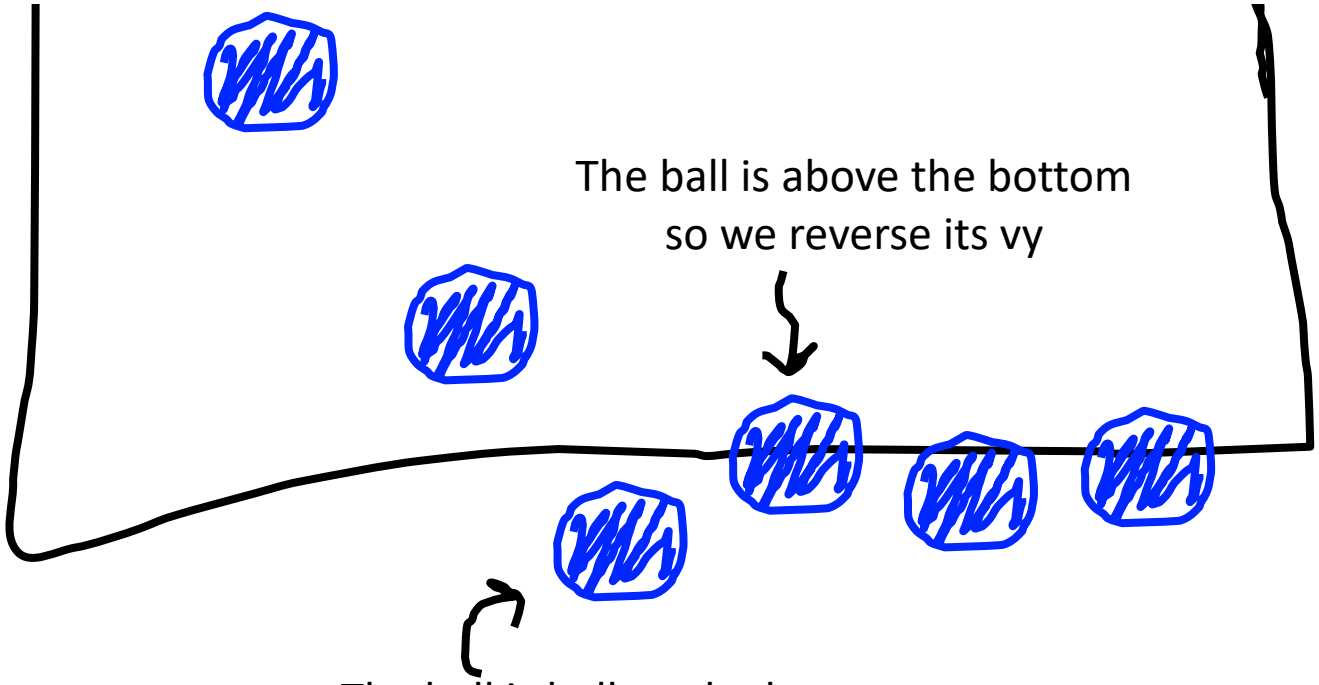


When reflecting horizontally: `vx = -vx`

Bouncing Ball



A Sticky Situation



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