

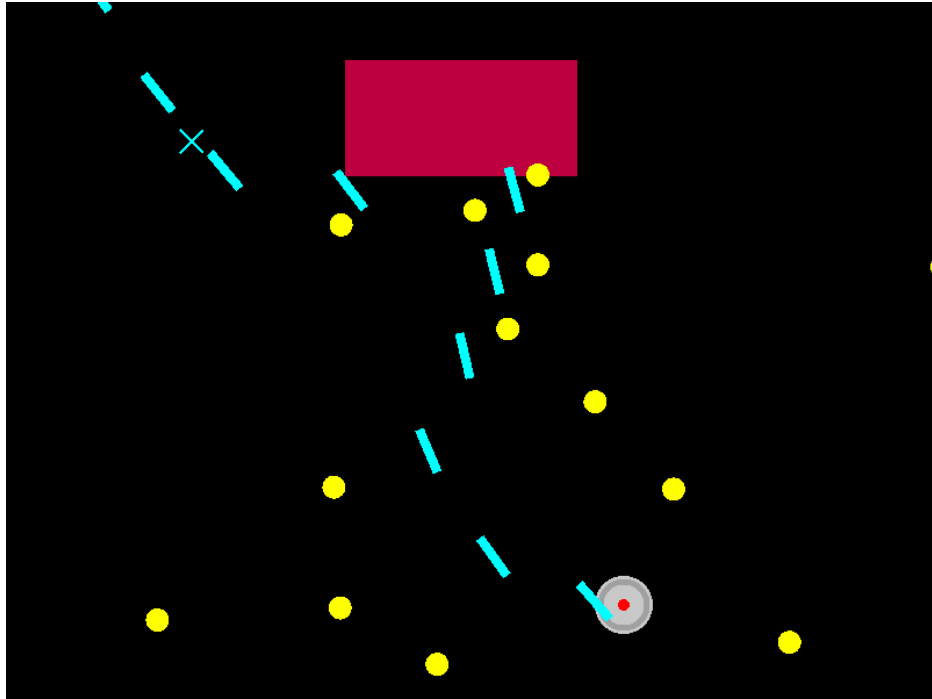
Low-Level Game Development

Prototype Games

High Level



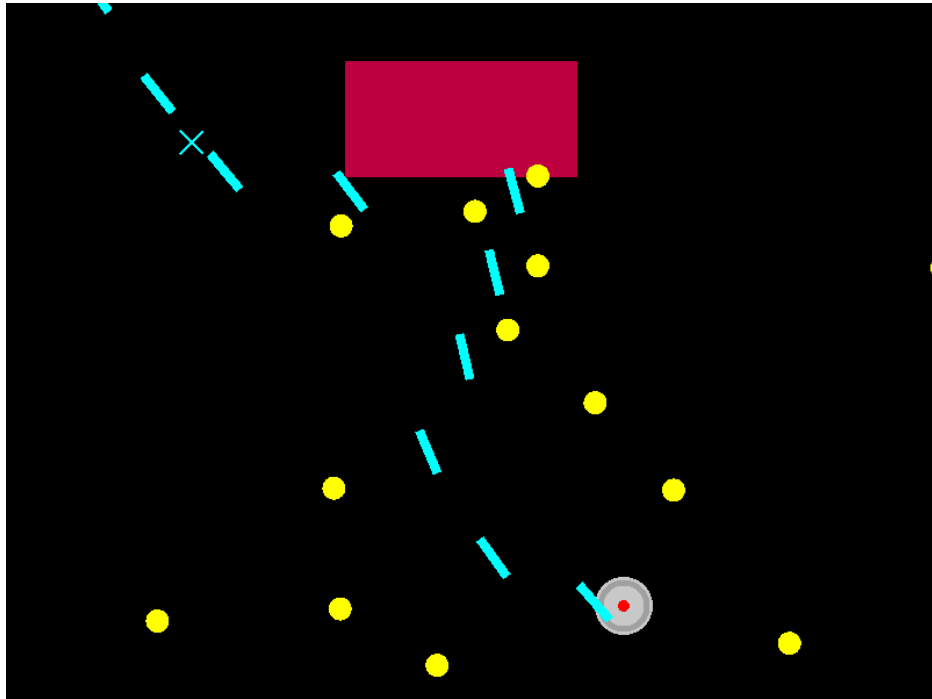
Low Level

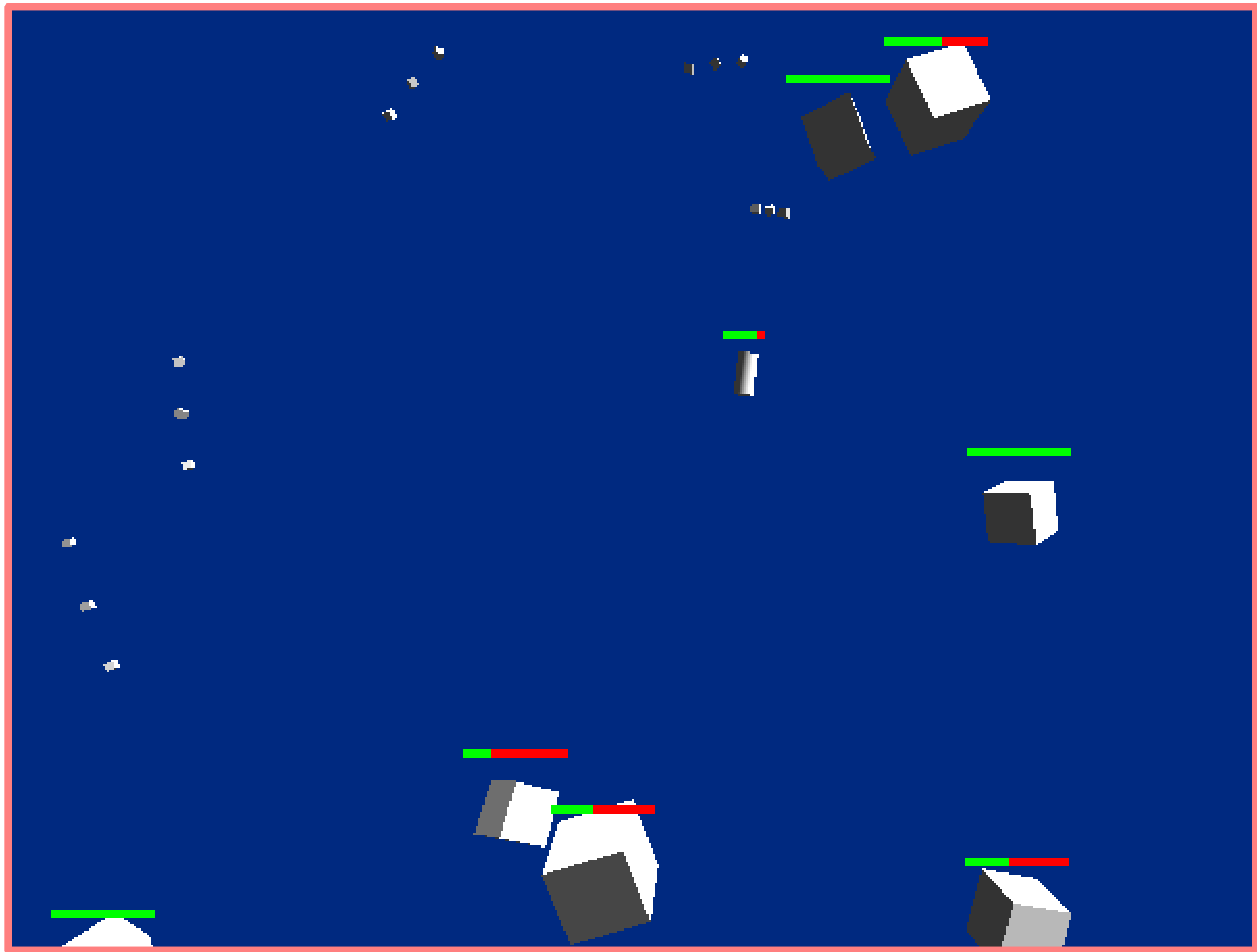


High Level

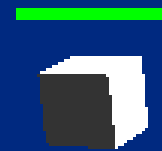
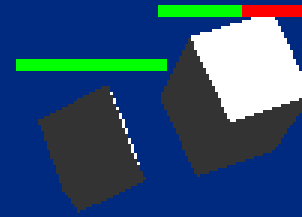
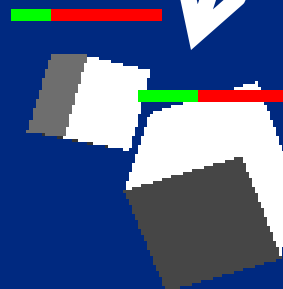


Low Level





Physics Engine



Game Objects

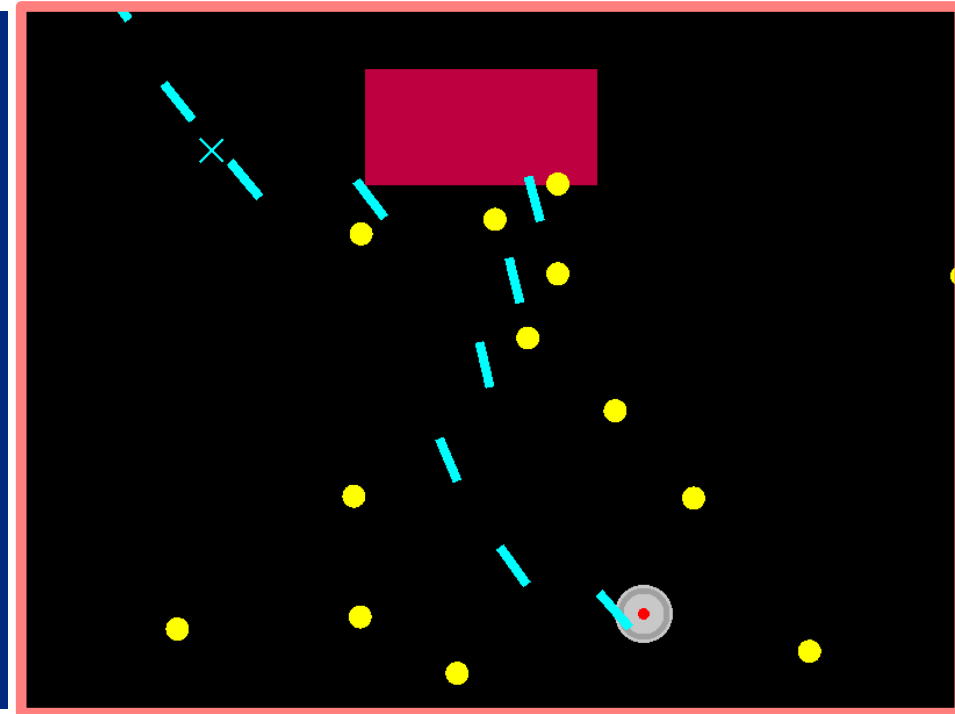
Physics Engine

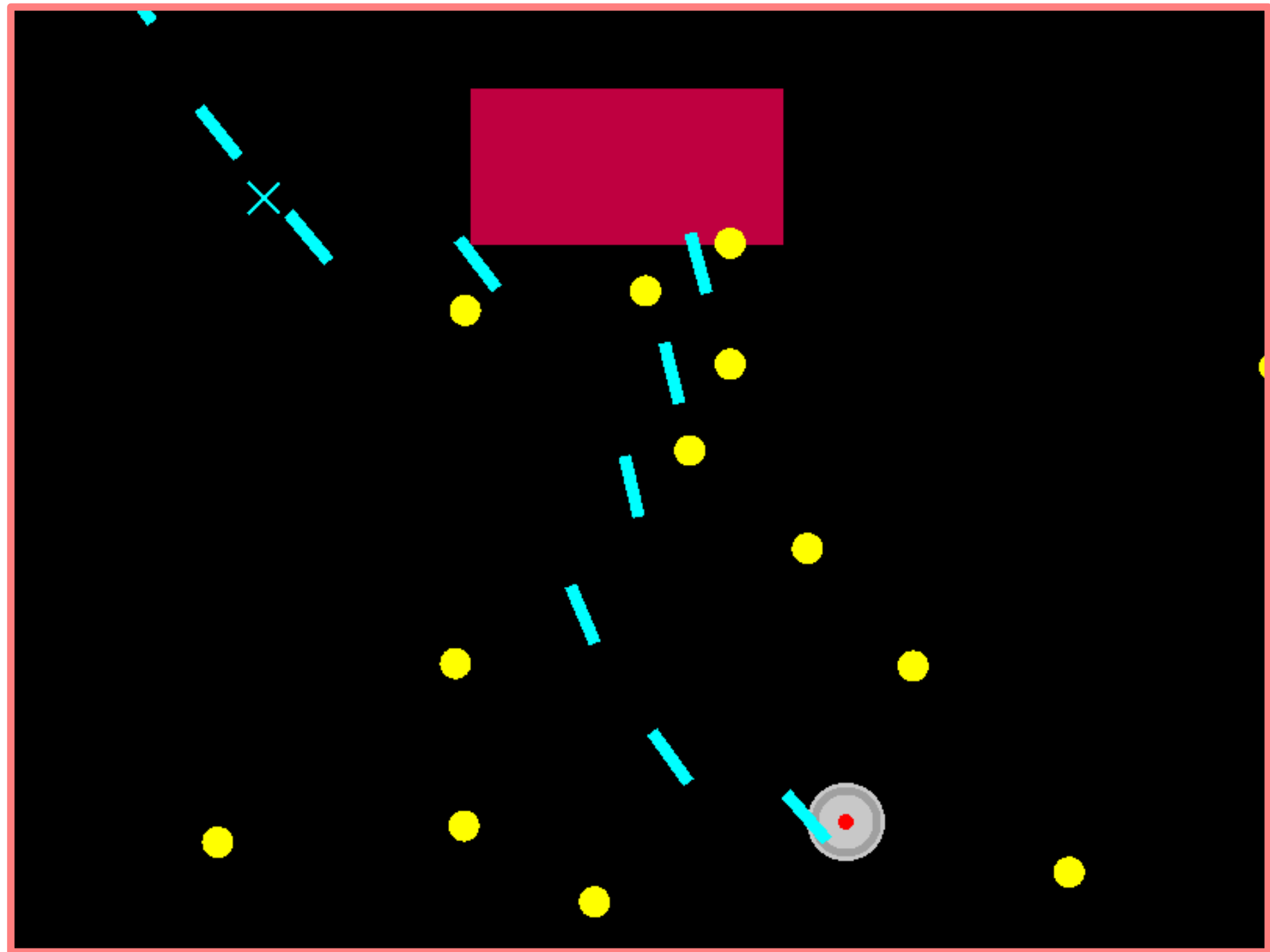


High Level

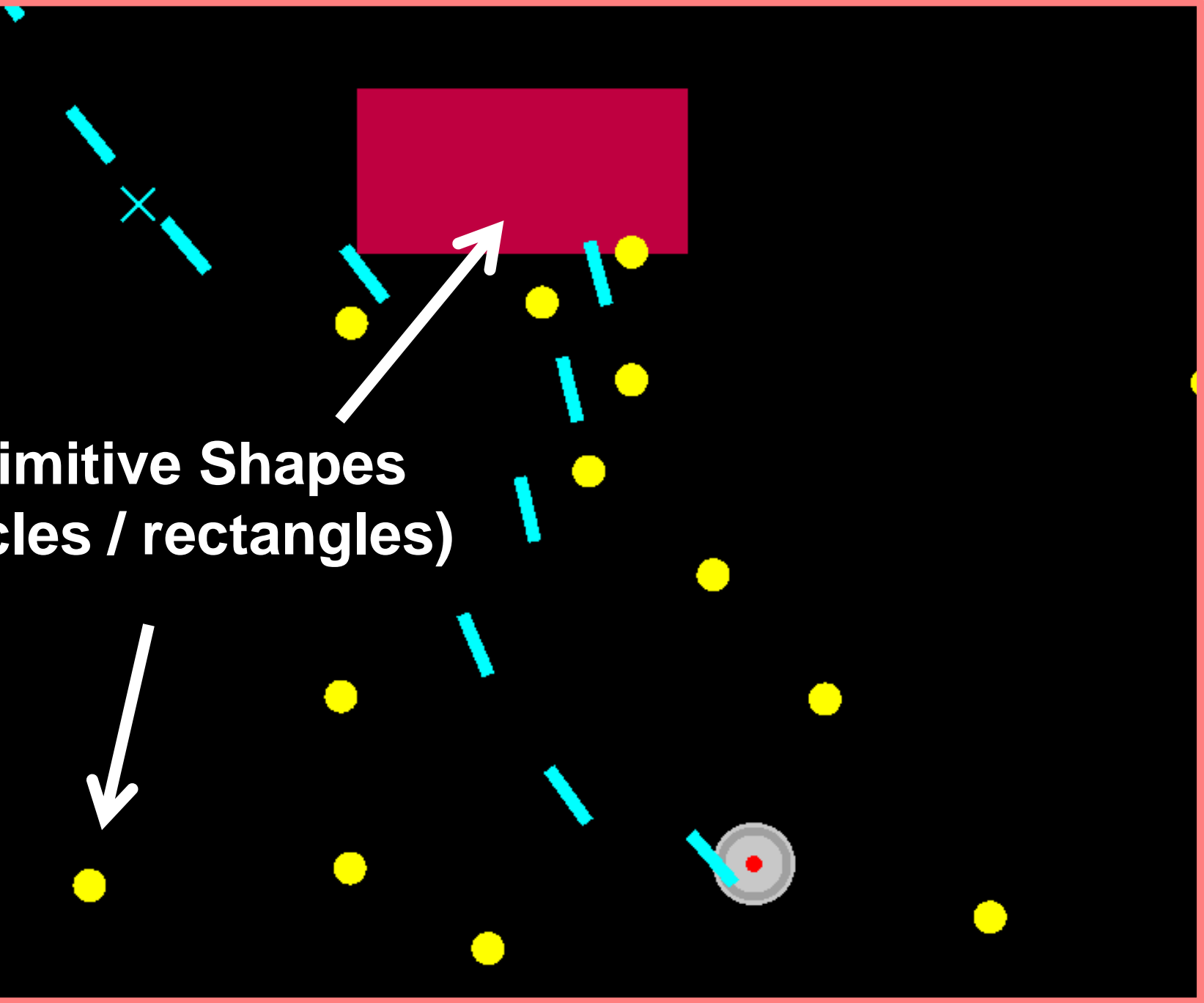


Low Level



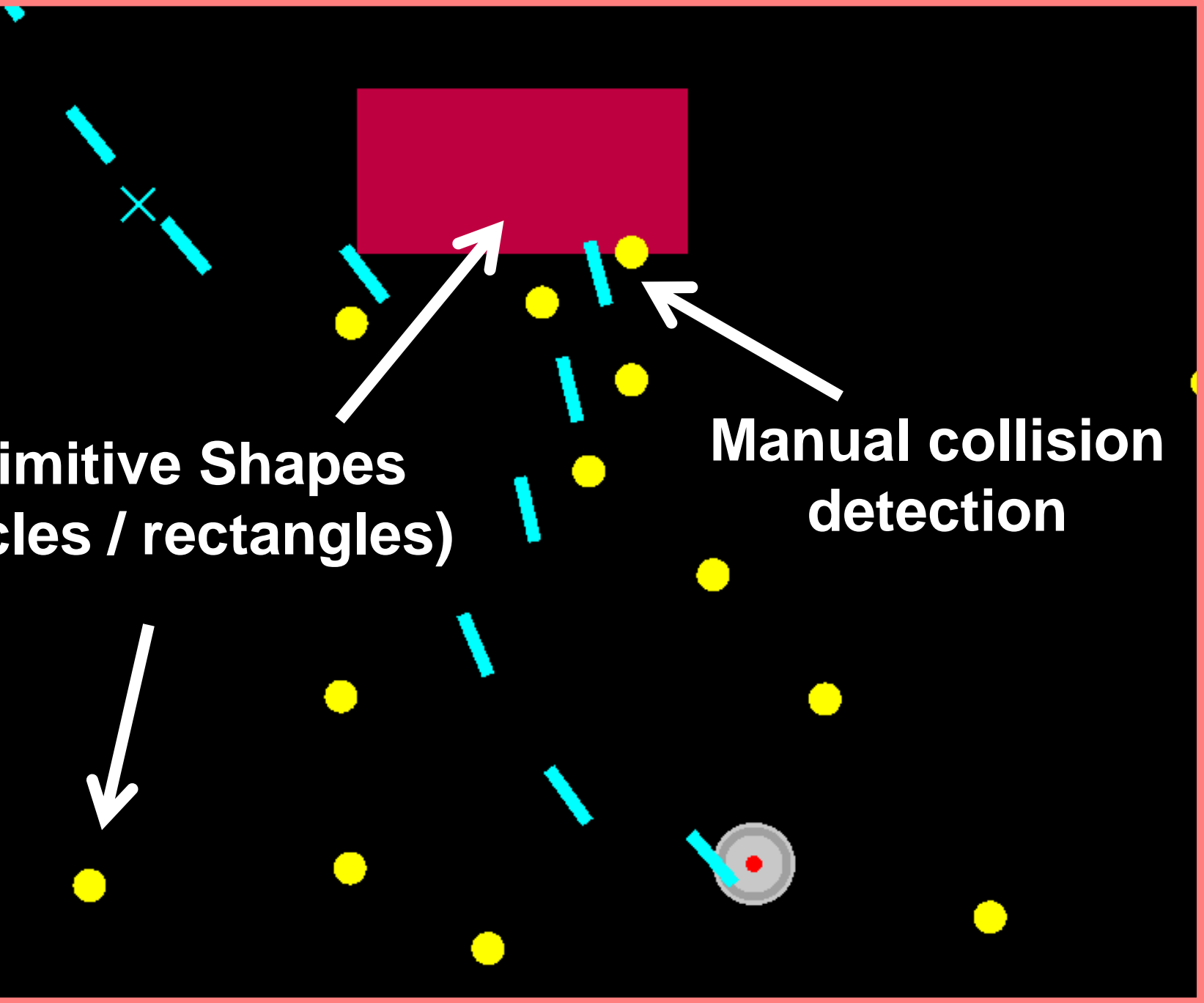


**Primitive Shapes
(circles / rectangles)**



**Primitive Shapes
(circles / rectangles)**

**Manual collision
detection**



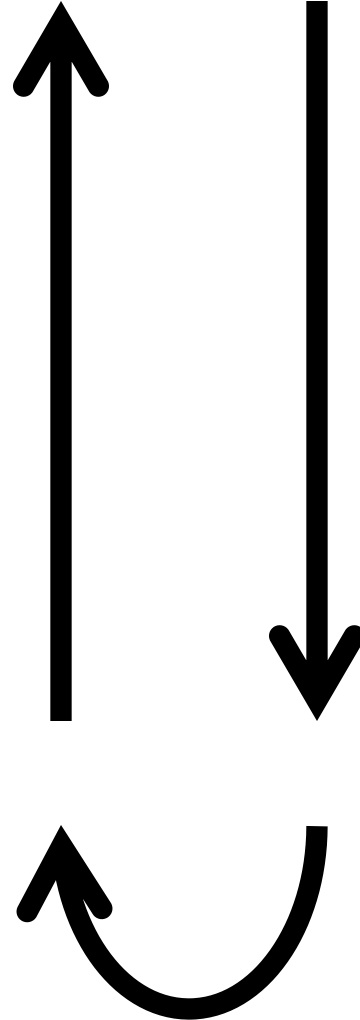
Display



DISPLAY

Infinite while loop

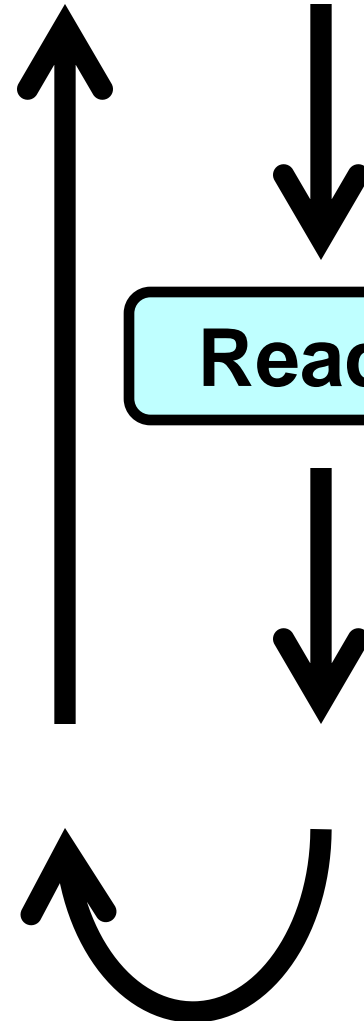
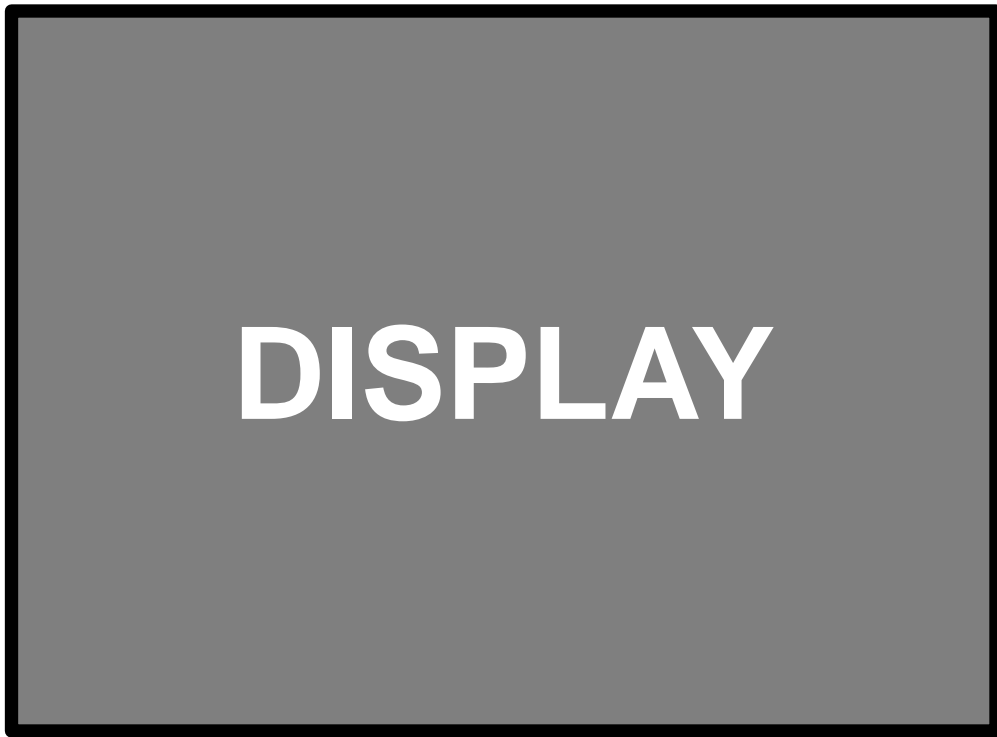
DISPLAY



Infinite while loop

Read events

DISPLAY

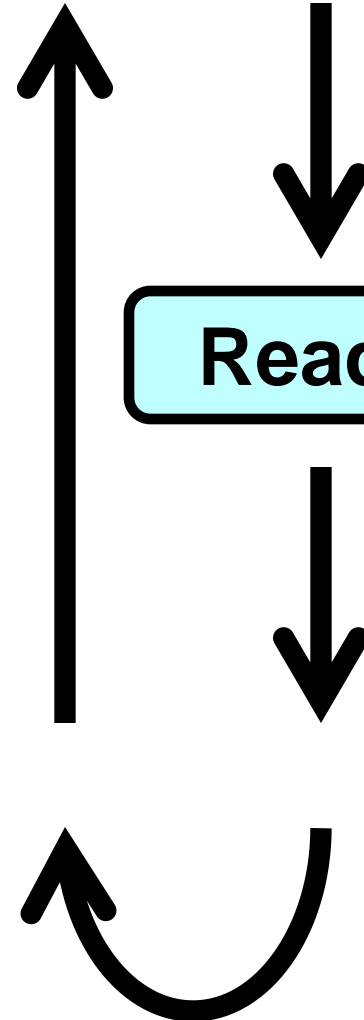
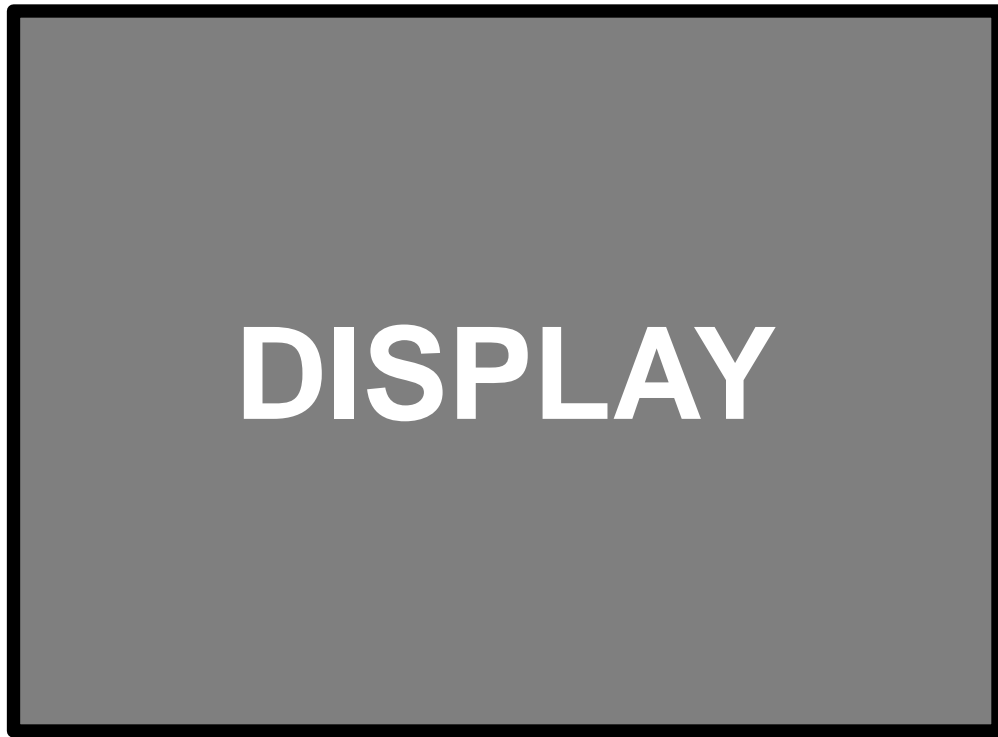


Infinite while loop

Read events

DISPLAY

CLOSE

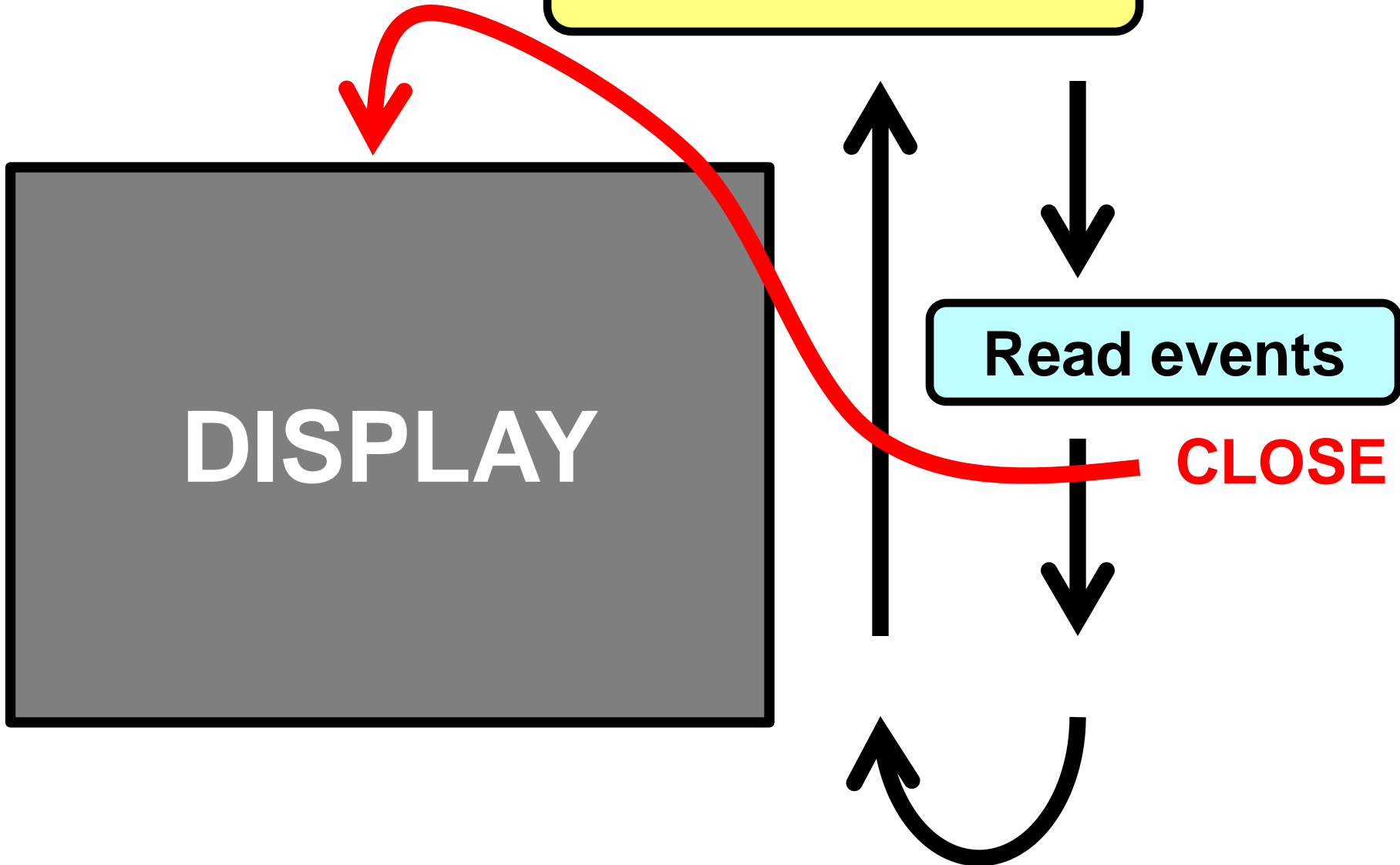


Infinite while loop

Read events

DISPLAY

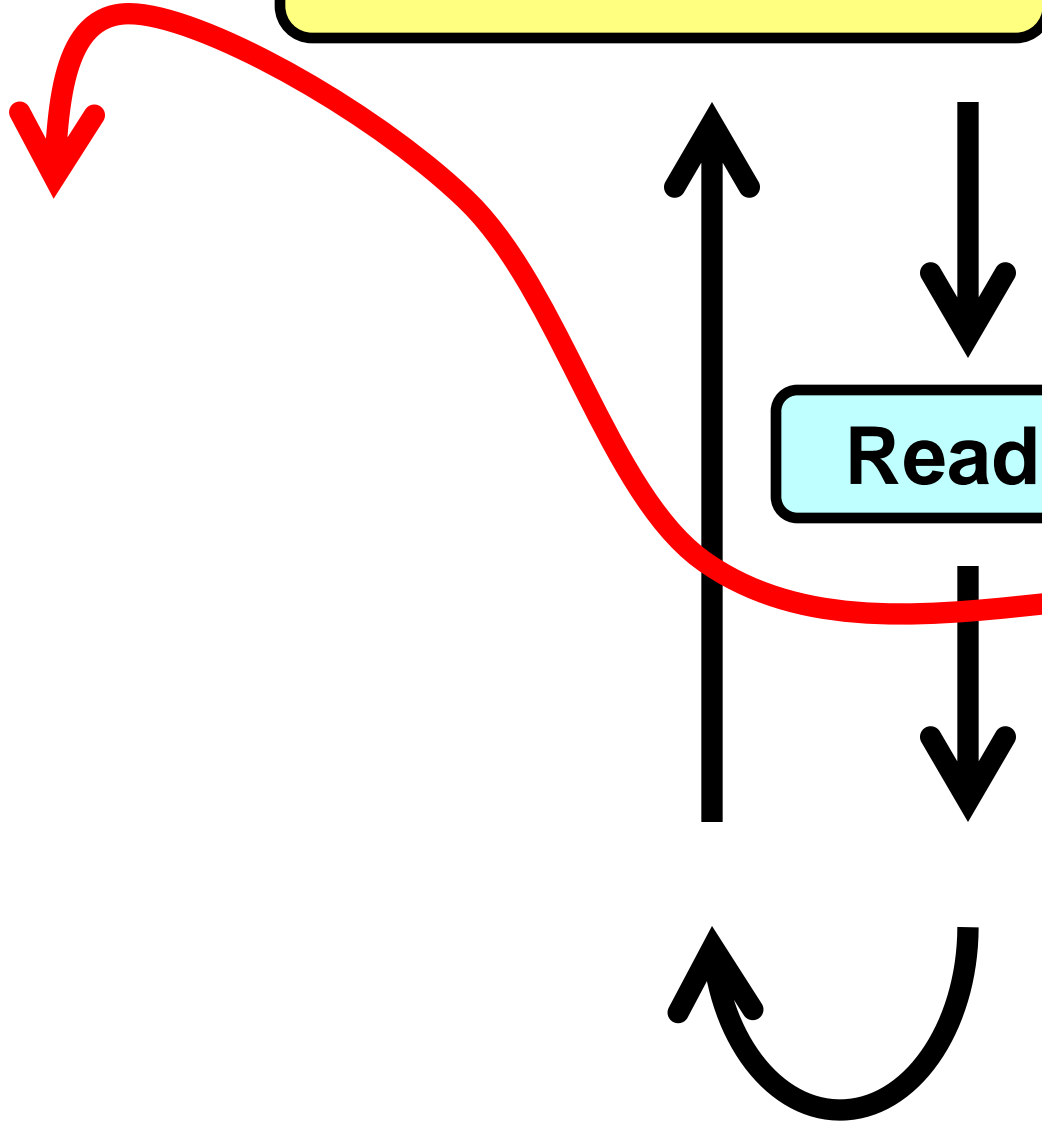
CLOSE



Infinite while loop

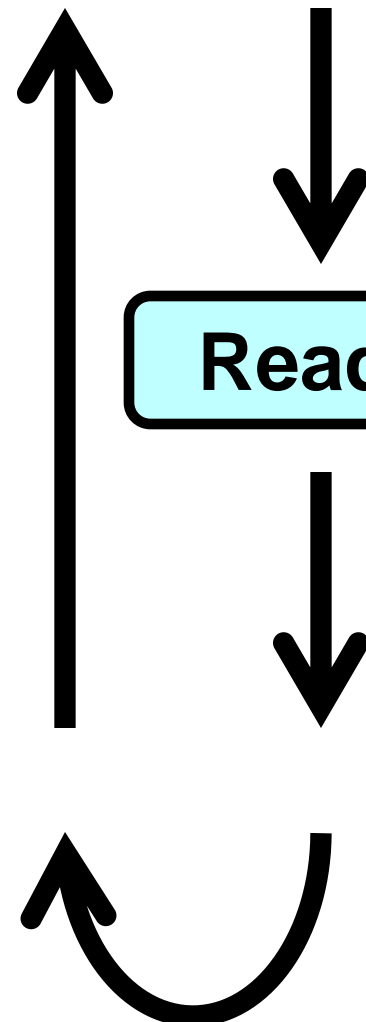
Read events

CLOSE



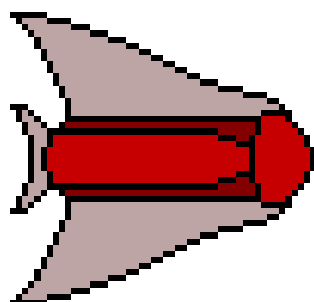
Infinite while loop

Read events

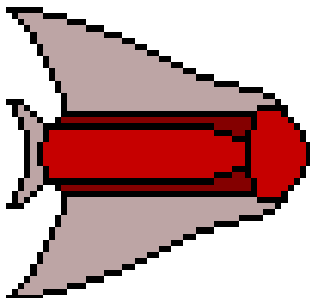


V0

Display



$x = 3, y = 5$



$x = 3, y = 5$



Update Frame

$x = 3, y = 5$



$x = 4, y = 5$

Update frame



$x = 5, y = 5$

Update frame



$x = 6, y = 5$

Update frame

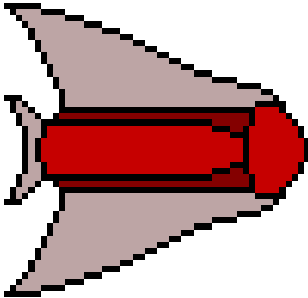


Draw Frame

$x = 3, y = 5$



$x = 3, y = 5$



Draw frame

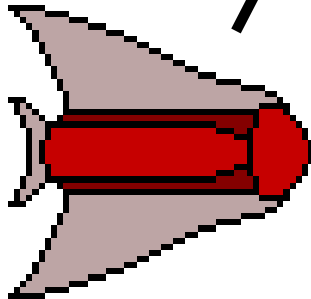
$x = 4, y = 5$

Update frame



$x = 4, y = 5$

Update frame



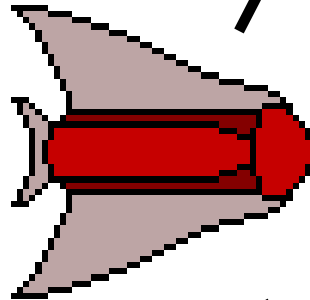
Draw frame

$x = 5, y = 5$

Update frame



$x = 5, y = 5$



Update frame

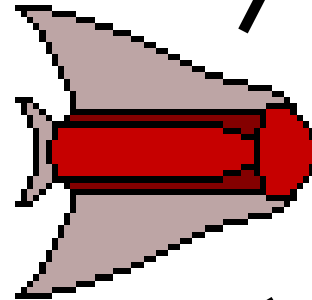
Draw frame

$x = 6, y = 5$

Update frame



$x = 6, y = 5$



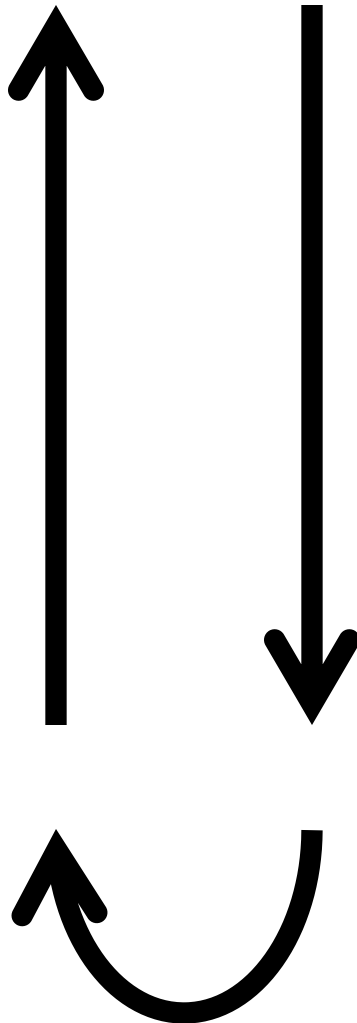
Update frame

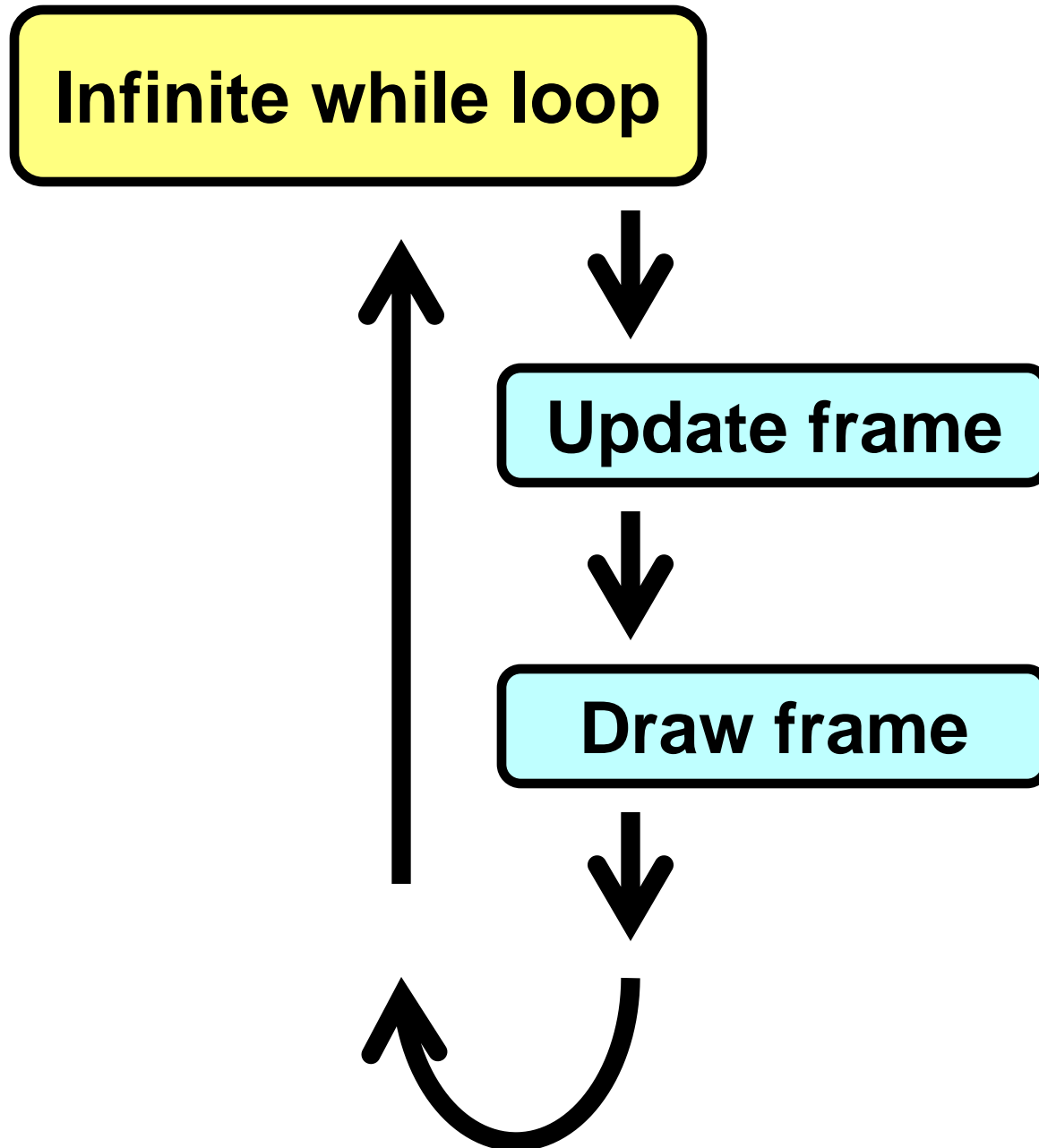
Draw frame

Structure

Infinite while loop

Infinite while loop



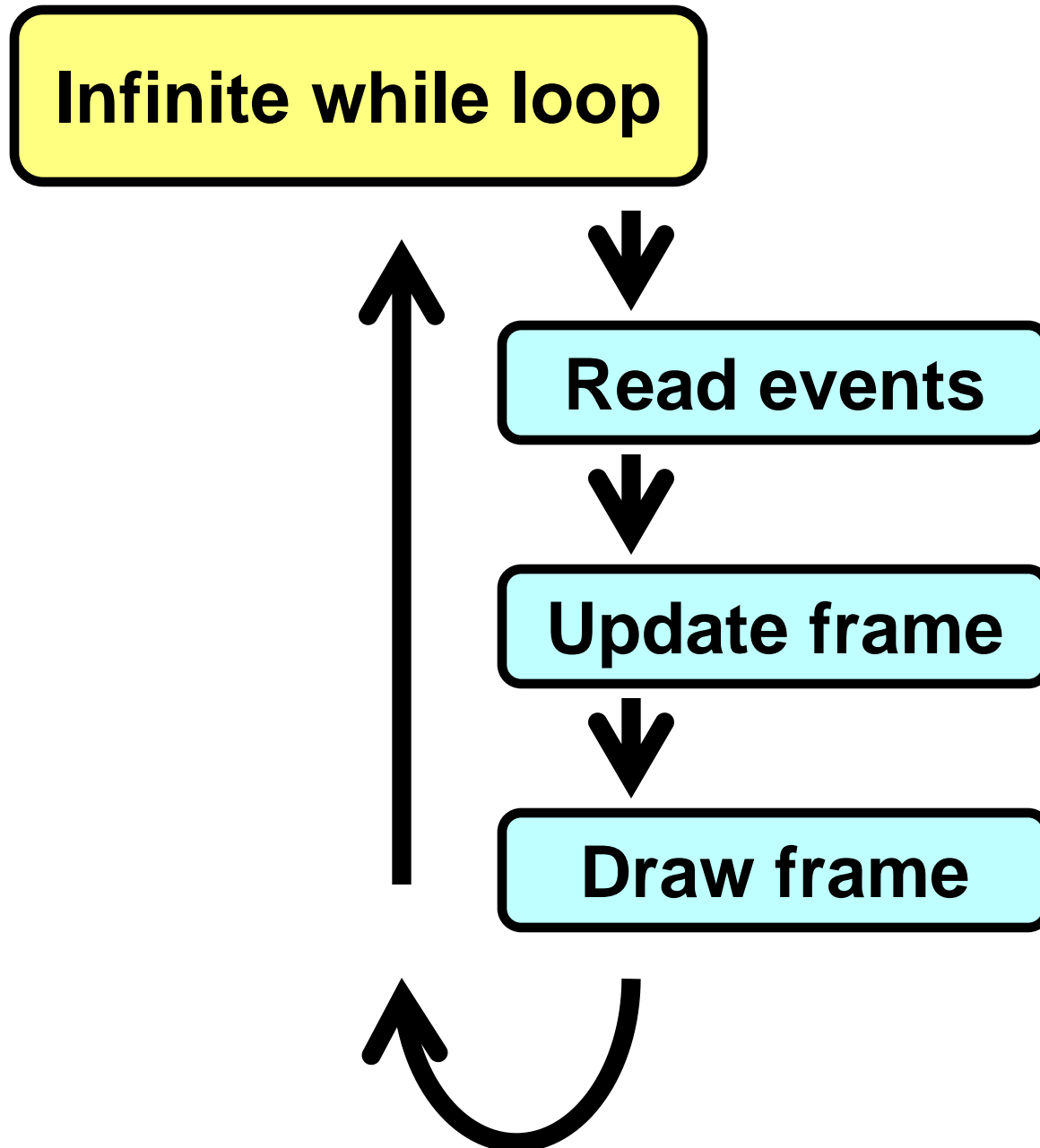


Infinite while loop

Read events

Update frame

Draw frame



V1

Update and Draw frames

Infinite while loop

```
graph TD; A[Infinite while loop] --> B[Read events]; B --> C[Update frame]; C --> D[Draw frame]; D --> A;
```

The diagram illustrates a continuous loop process. It begins with a yellow box labeled 'Infinite while loop'. An arrow points down to a light blue box 'Read events', followed by another arrow to 'Update frame', and a third to 'Draw frame'. A long vertical arrow on the left side points upwards from the bottom back to the 'Infinite while loop' box, and a curved arrow at the bottom indicates the loop's continuation.

Read events

Update frame

Draw frame



Draw



Draw



Draw



Draw

**Press K
Key**



Draw

**Press K
Key**

**Press Right-
Arrow Key**

Read 2 Events

**Press K
Key**

**Press Right-
Arrow Key**

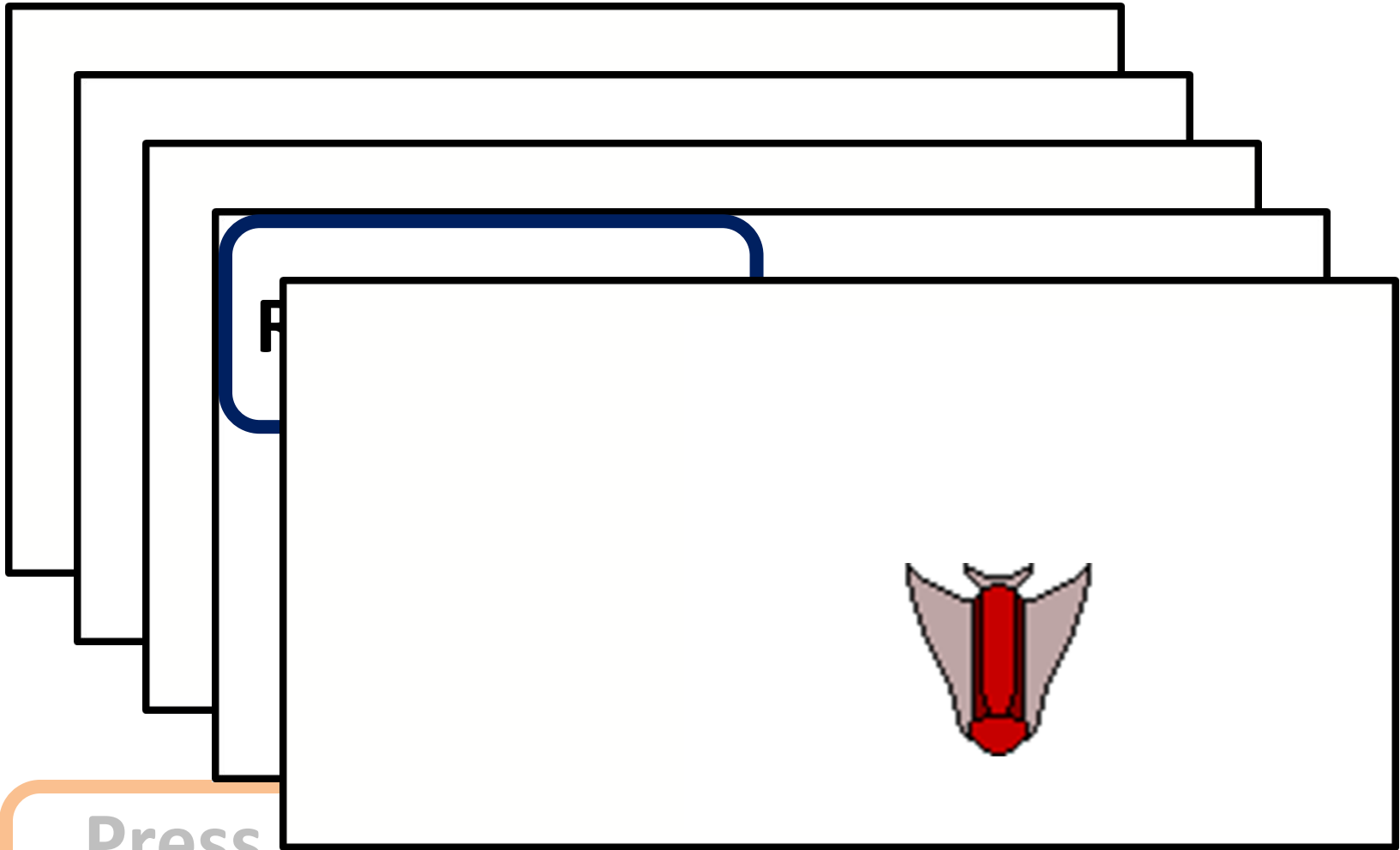
Read 2 Events



Draw

Press K
Key

Press Right-
Arrow Key

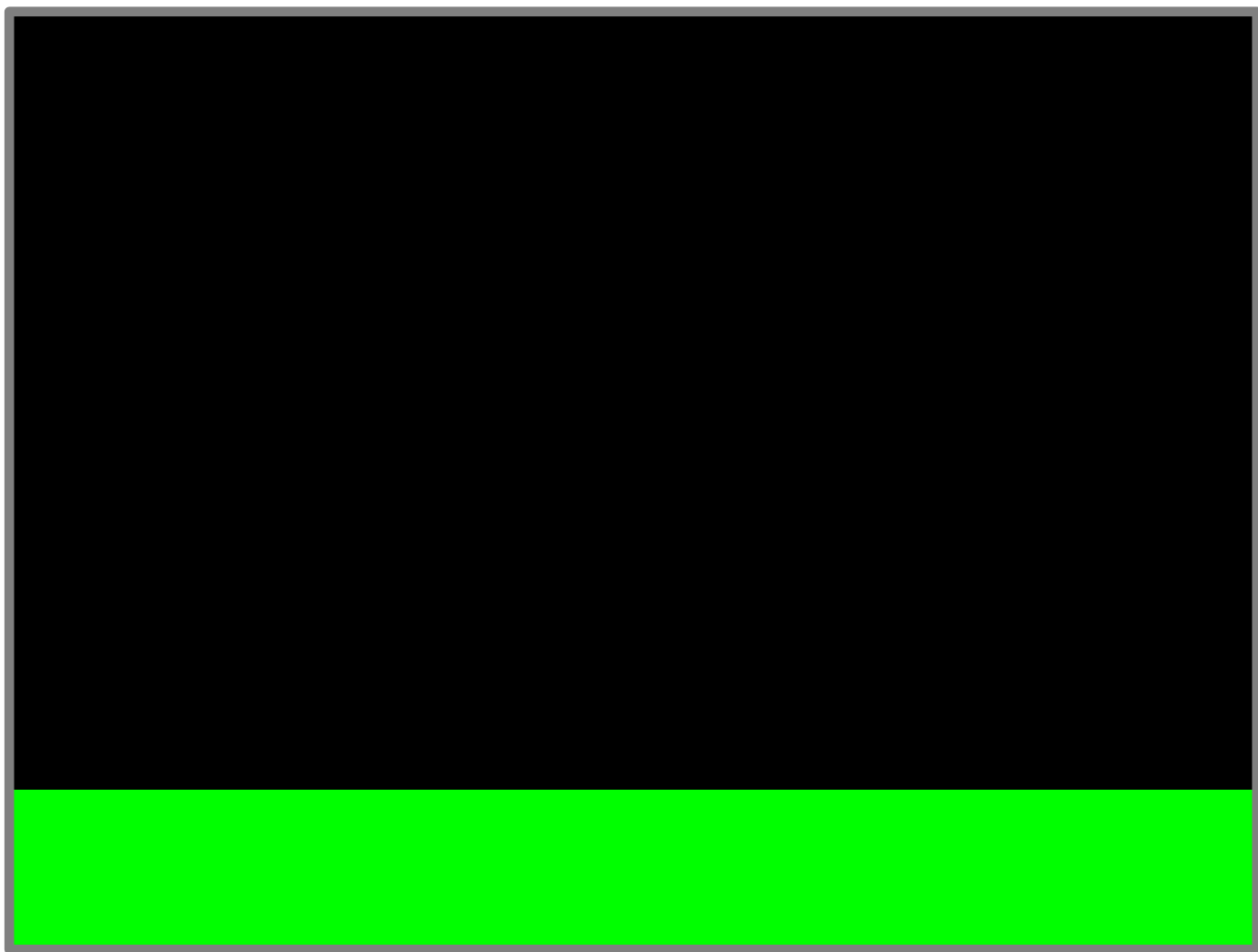


Press R
Key

Press Right-
Arrow Key

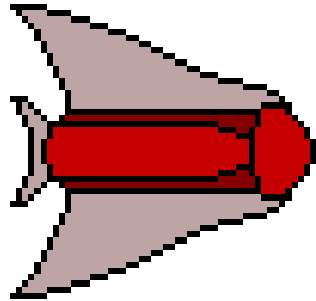
V2

Basic Keyboard Input



V3

Floor

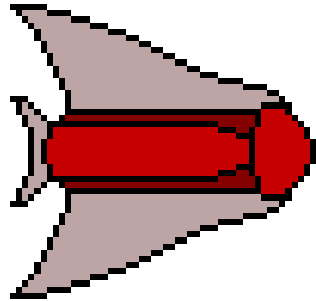


int x

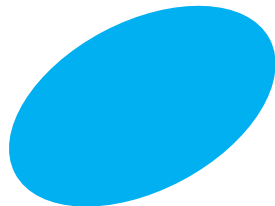
int y

int vx

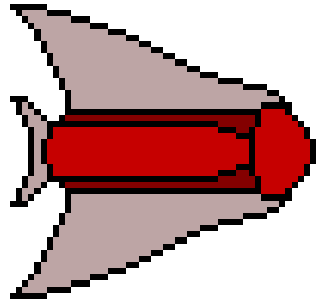
int vy



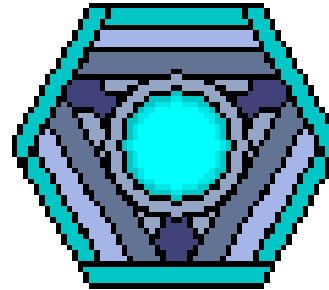
int x
int y
int vx
int vy



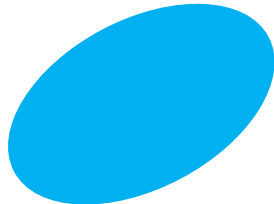
int x
int y
int vx
int vy



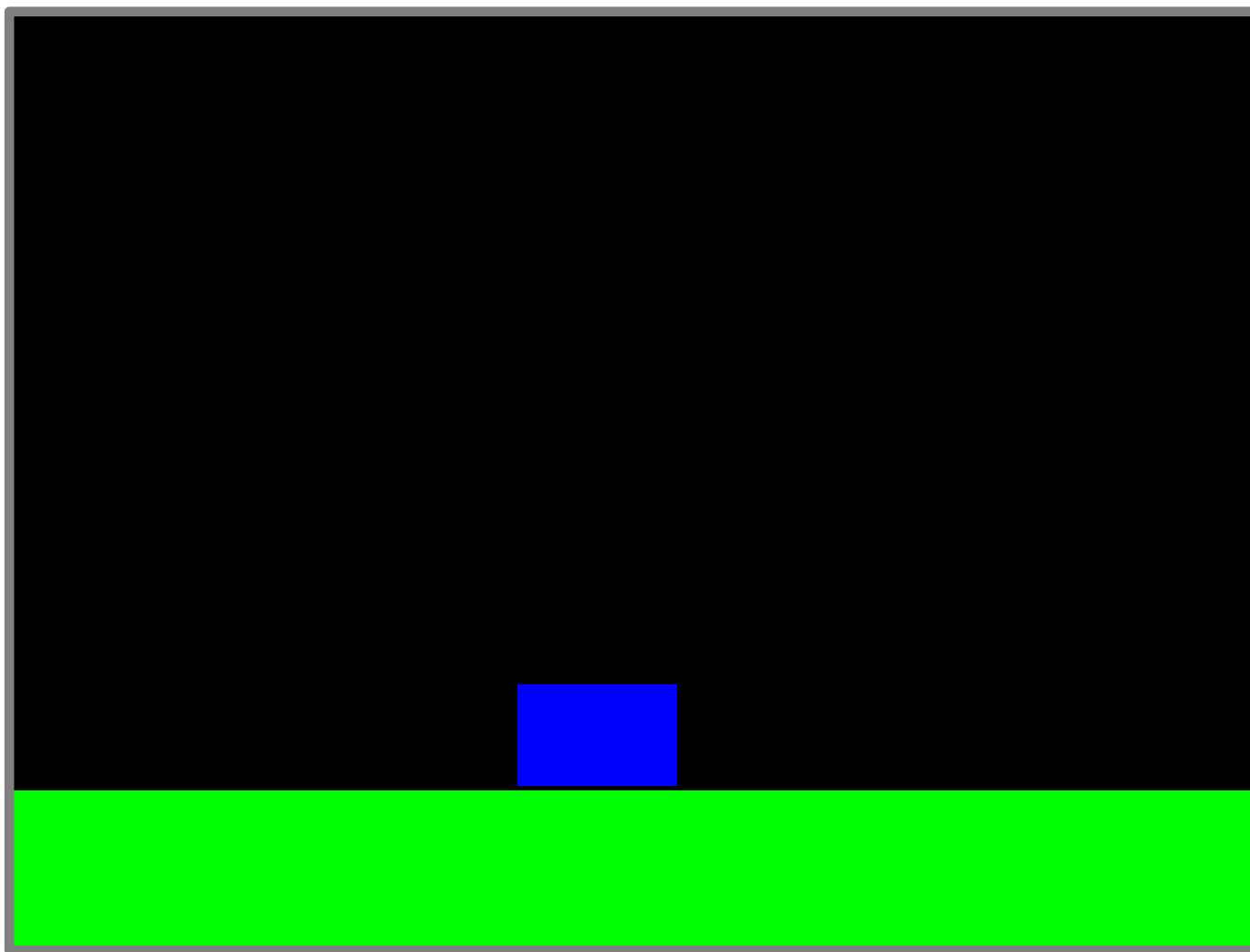
int x
int y
int vx
int vy

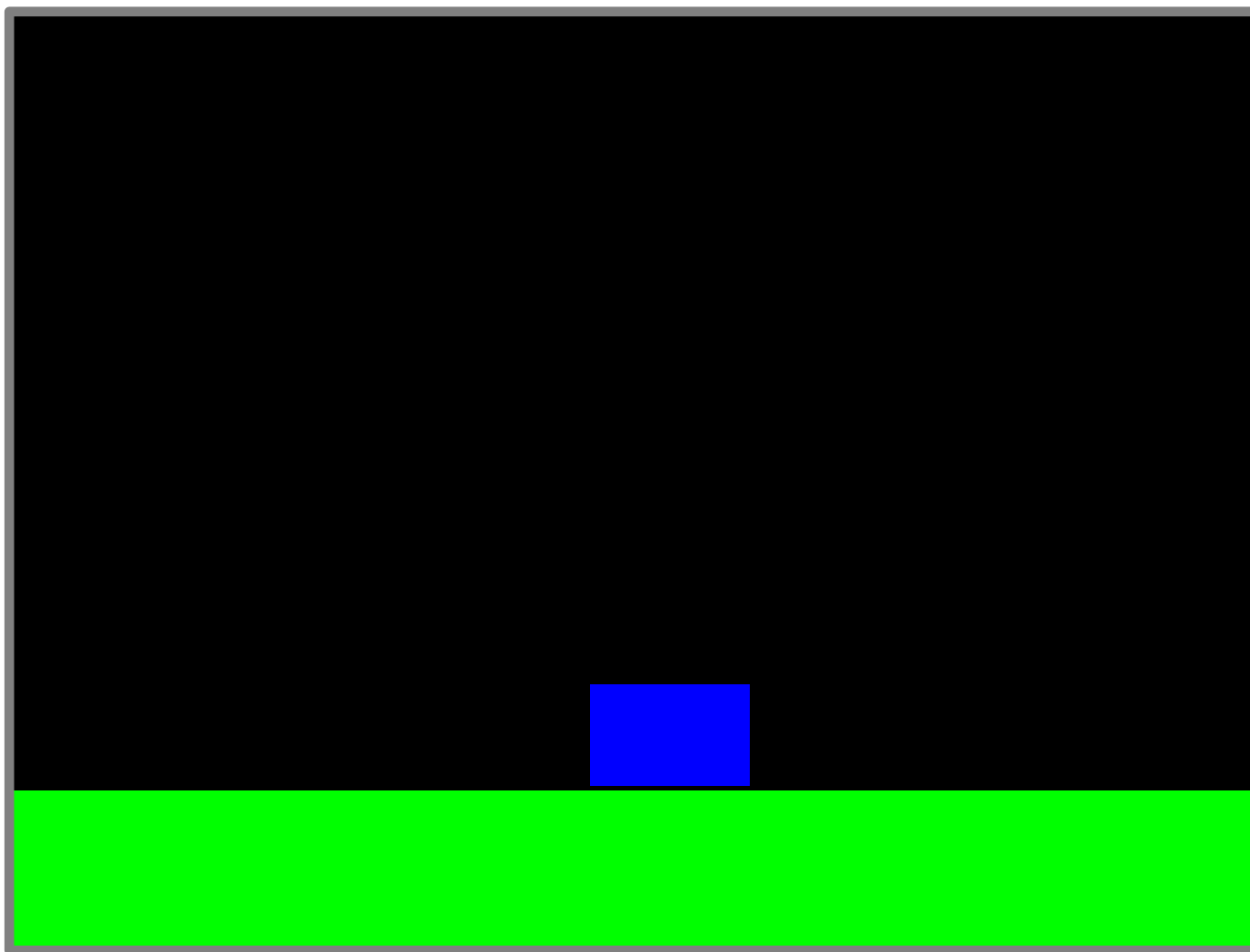


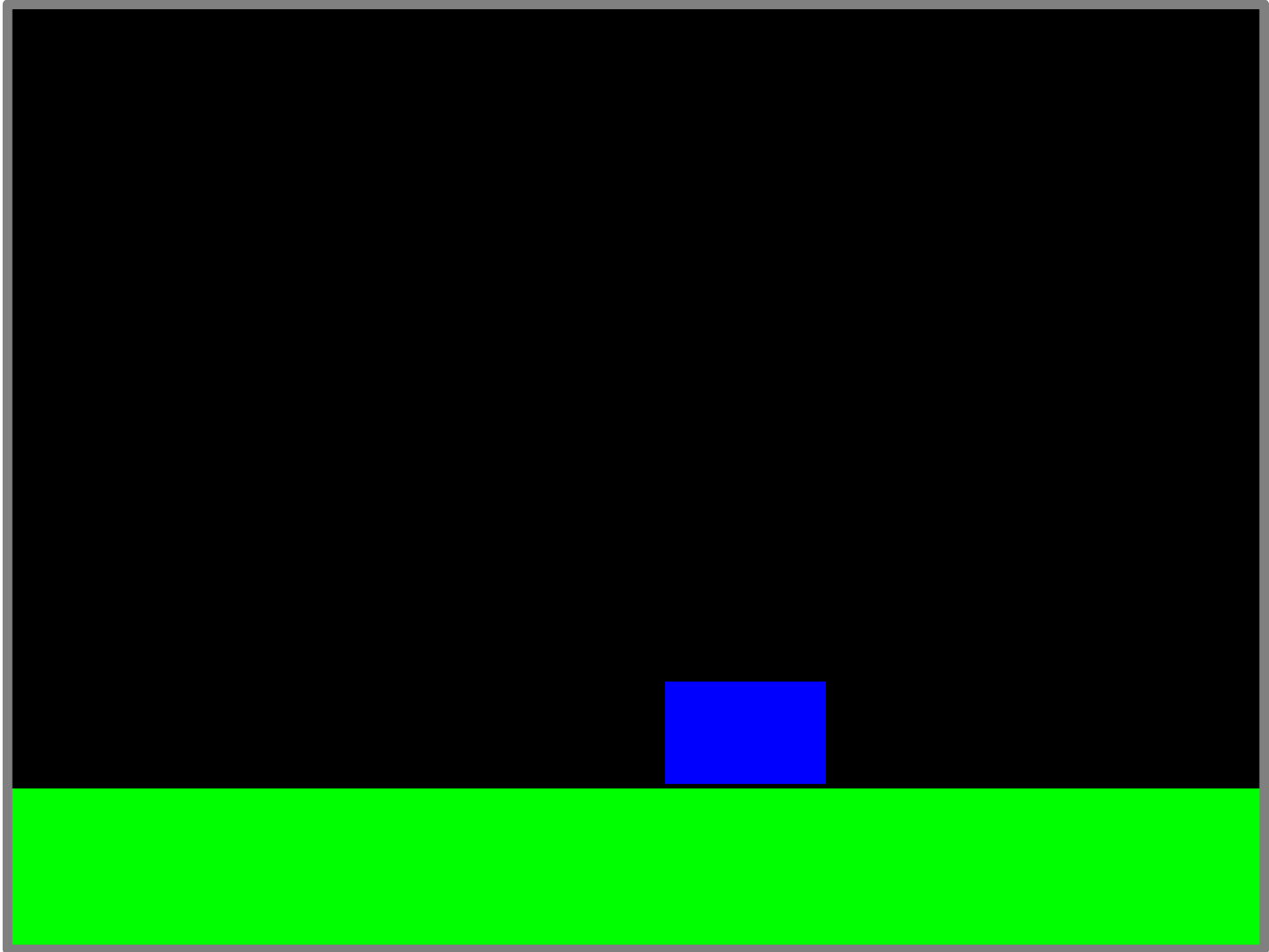
int x
int y
int vx
int vy



int x
int y
int vx
int vy

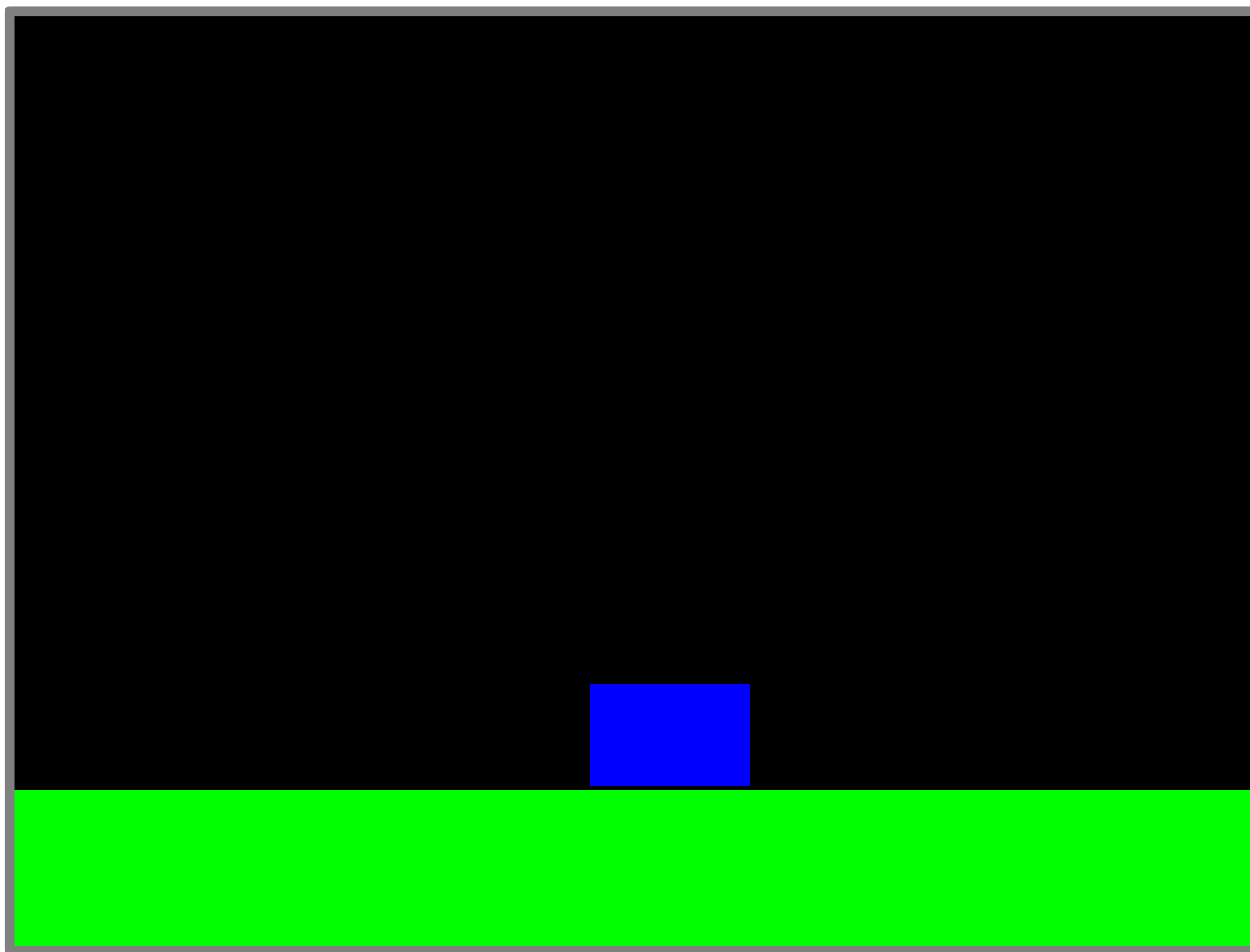


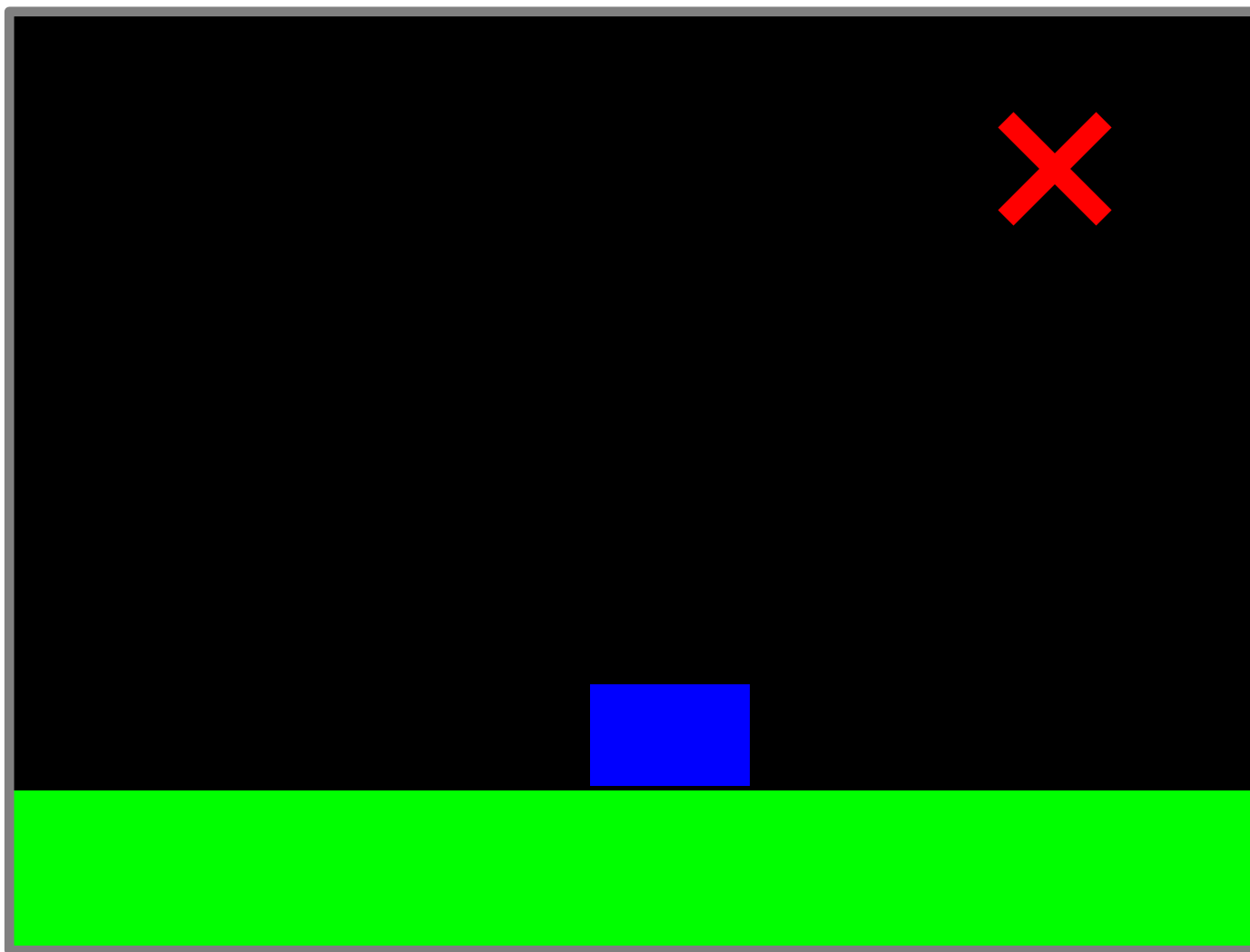


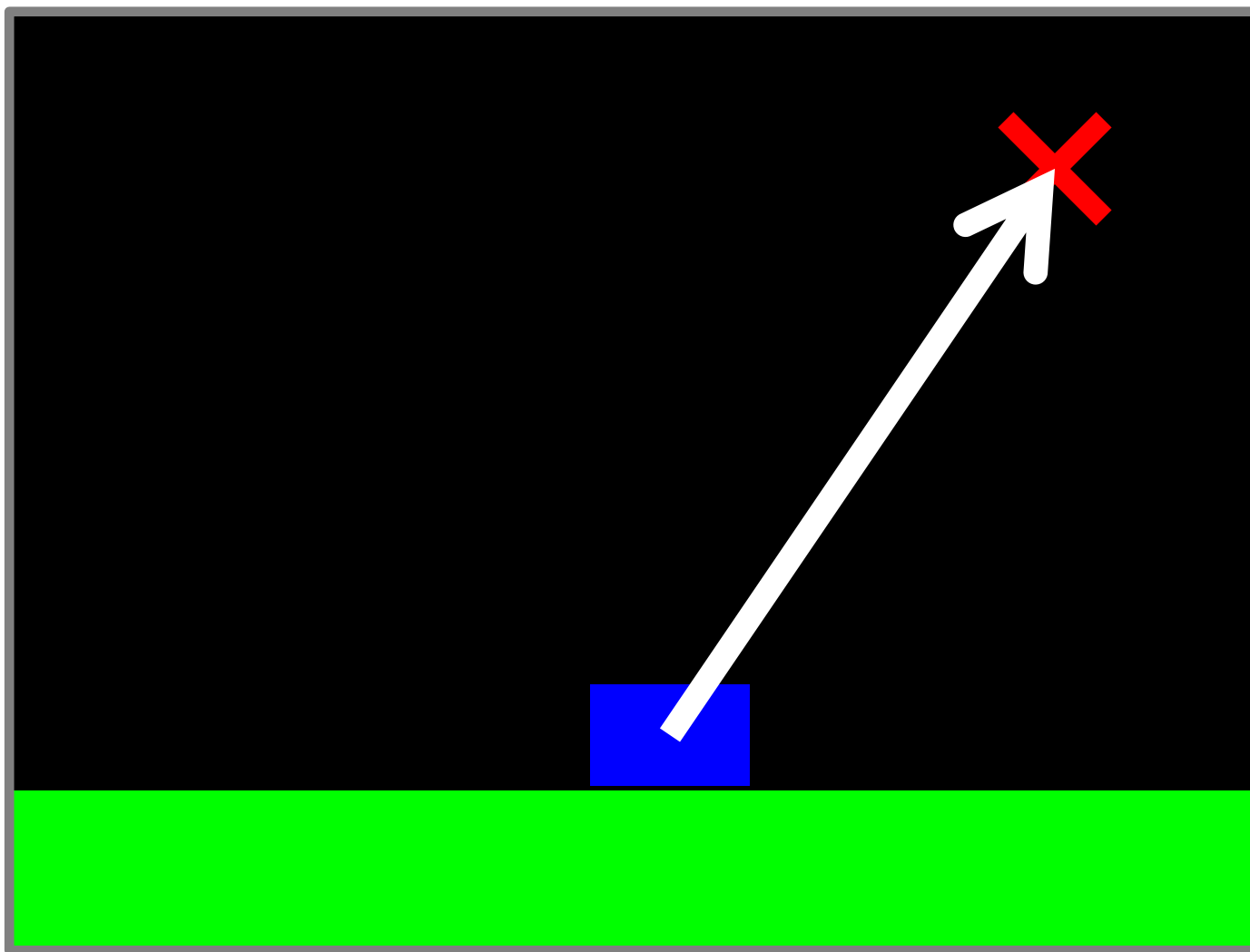


V4

Player Class

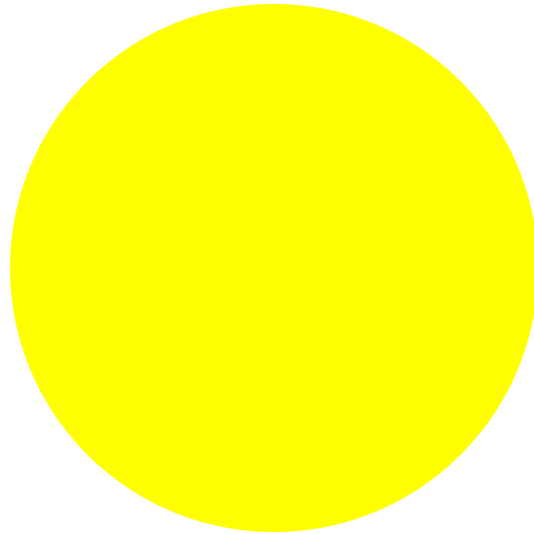






V5

Bullets



float x

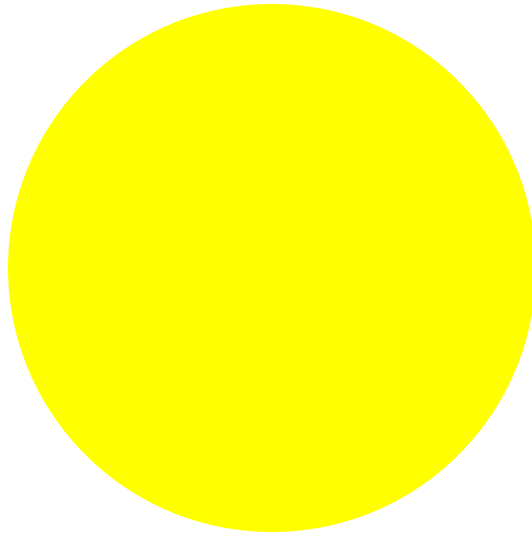
float y

float vx

float vy

float ax

float ay



float x
float y
float vx
float vy
float ax
float ay

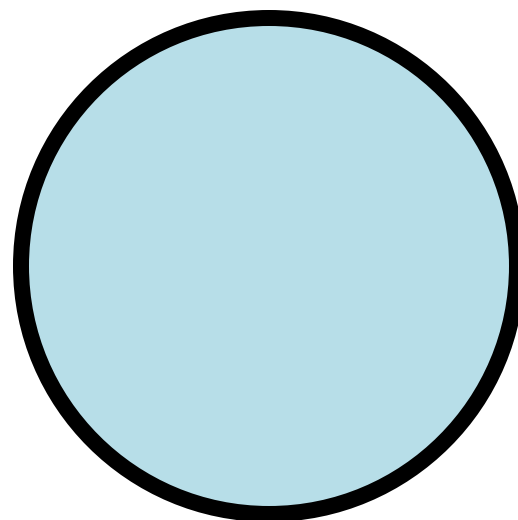
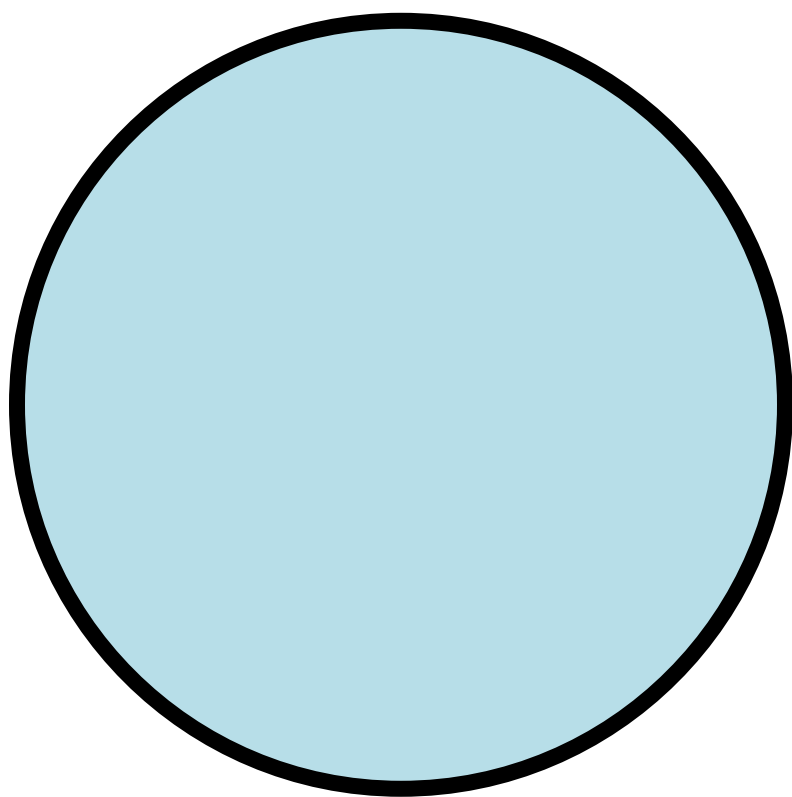
Physics:

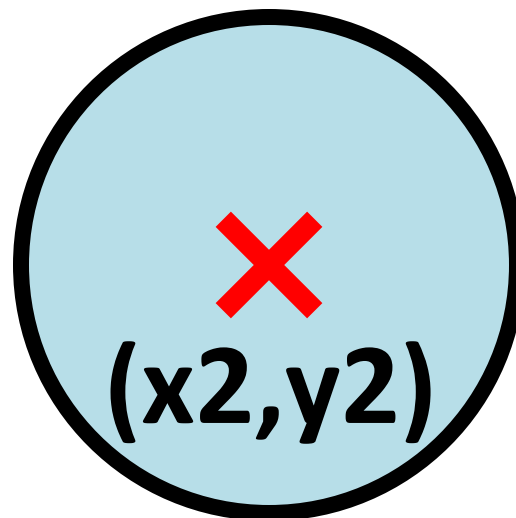
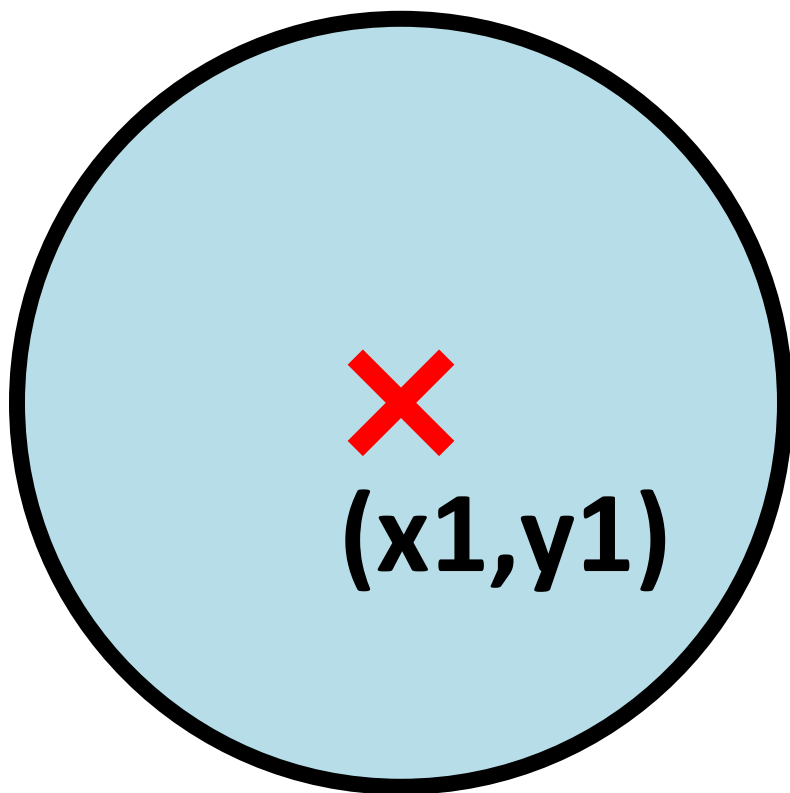
vx	+=	ax
vy	+=	ay
x	+=	vx
y	+=	vy

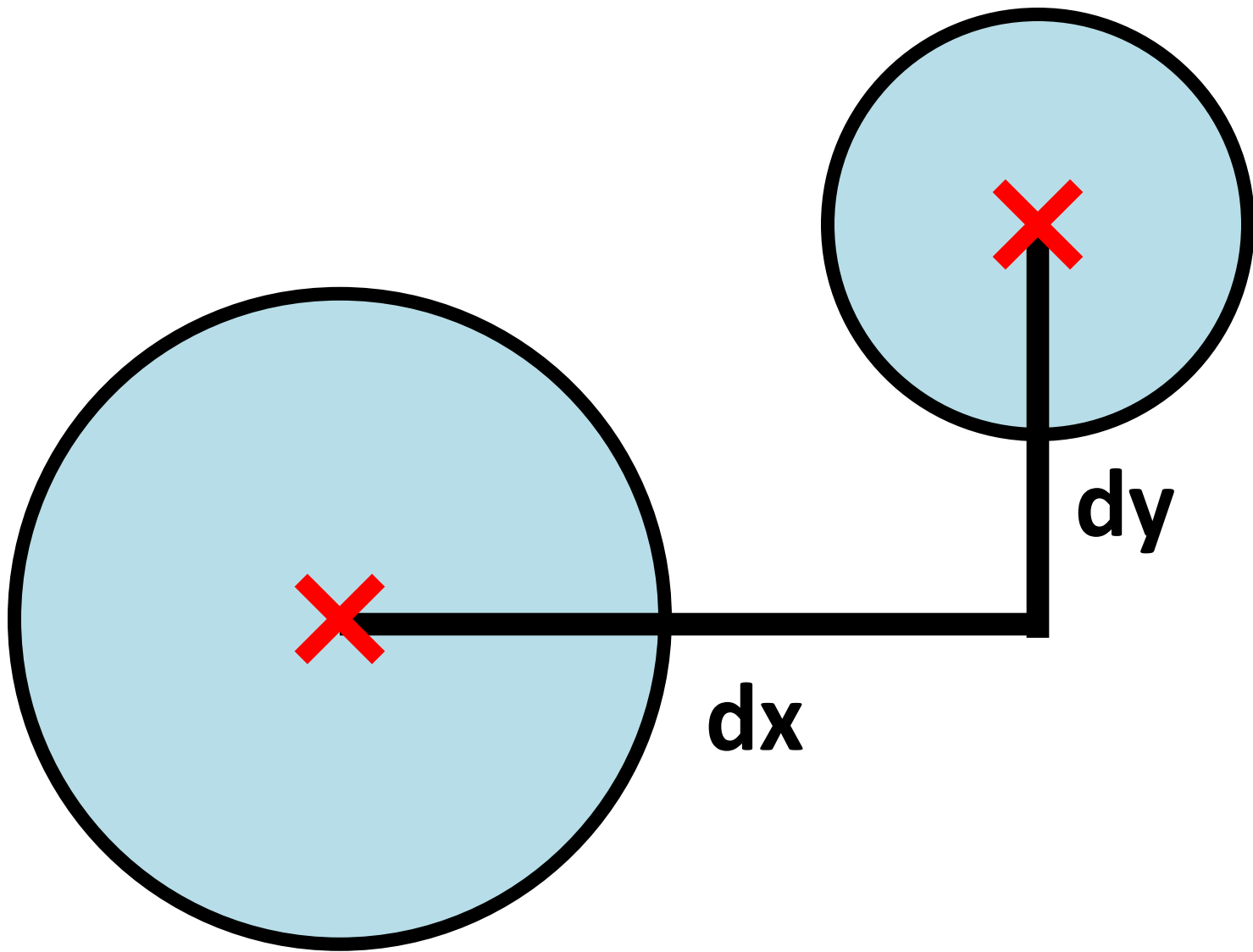
every frame

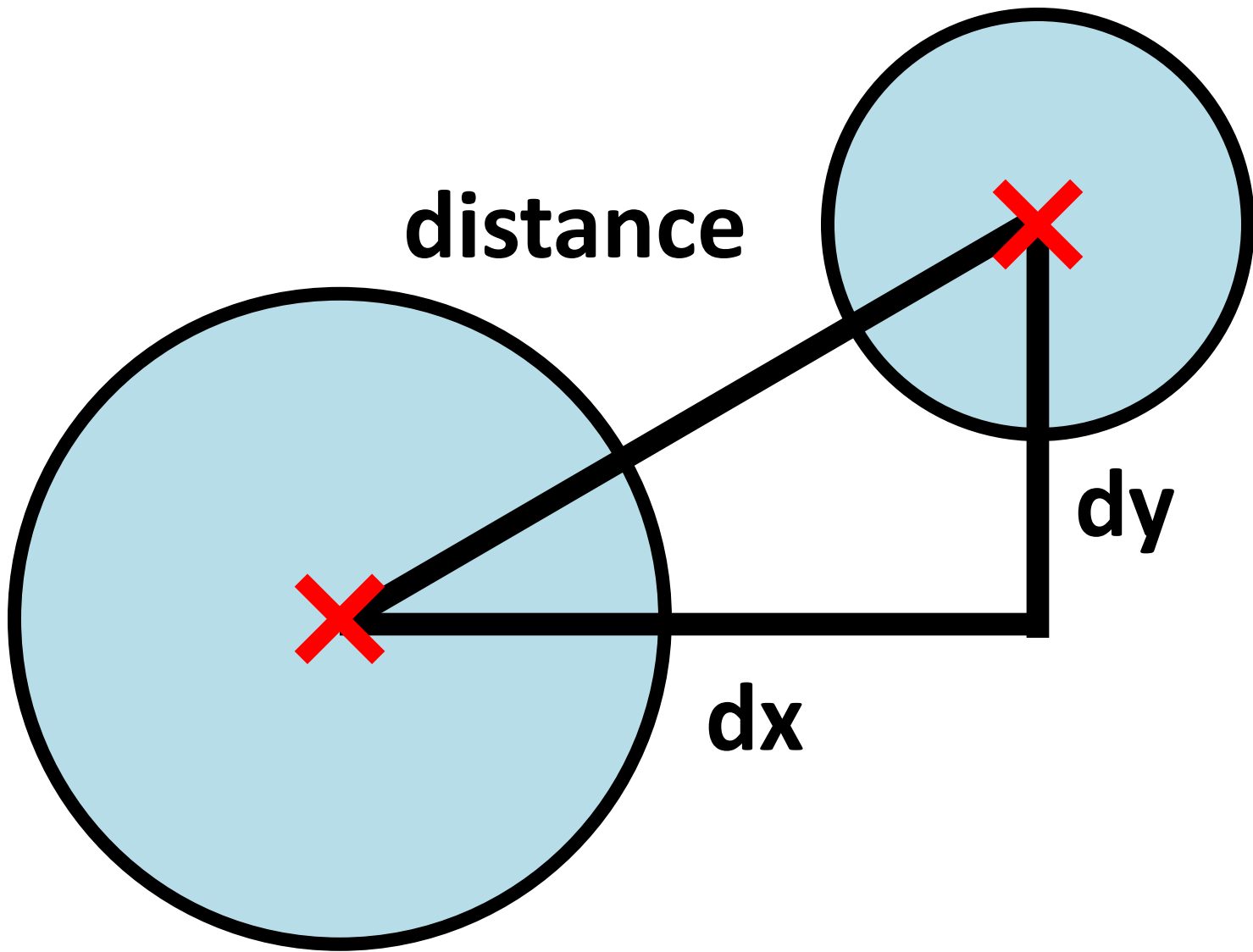
V6

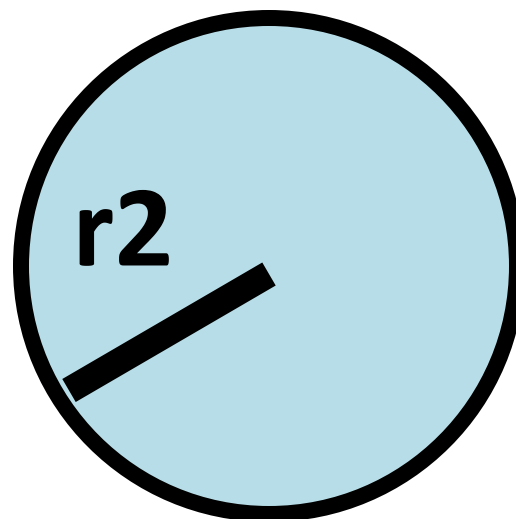
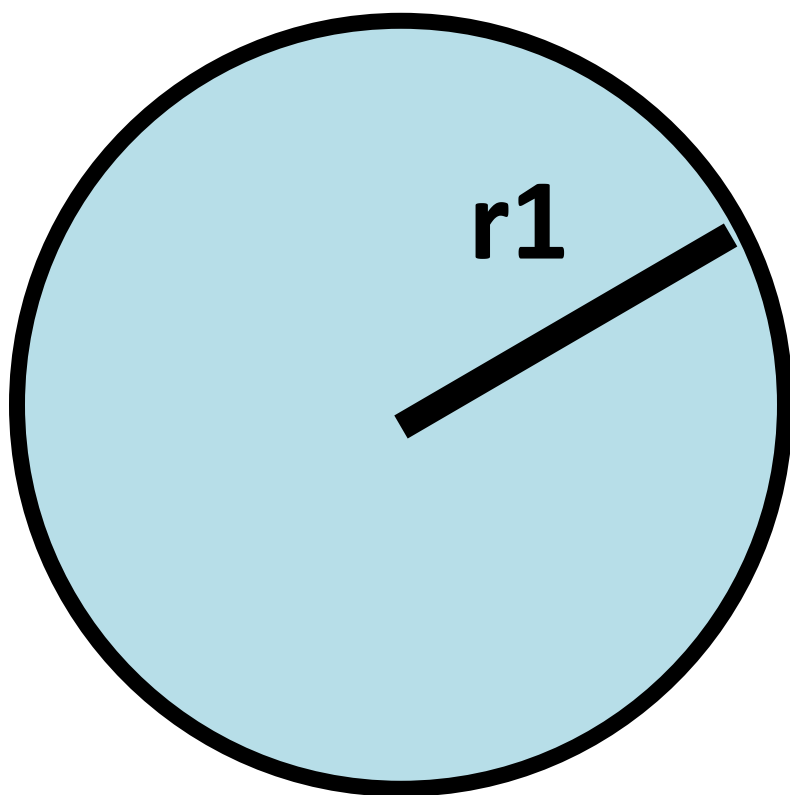
Enemies

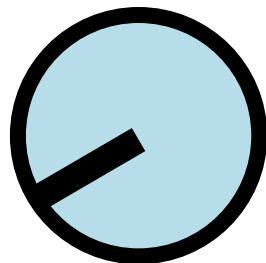
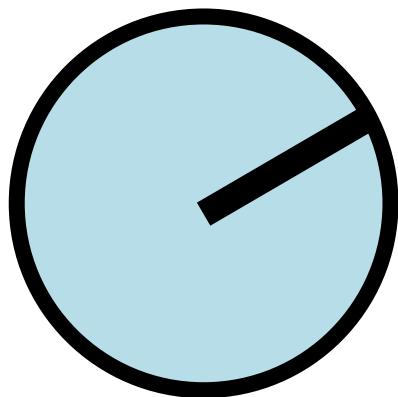


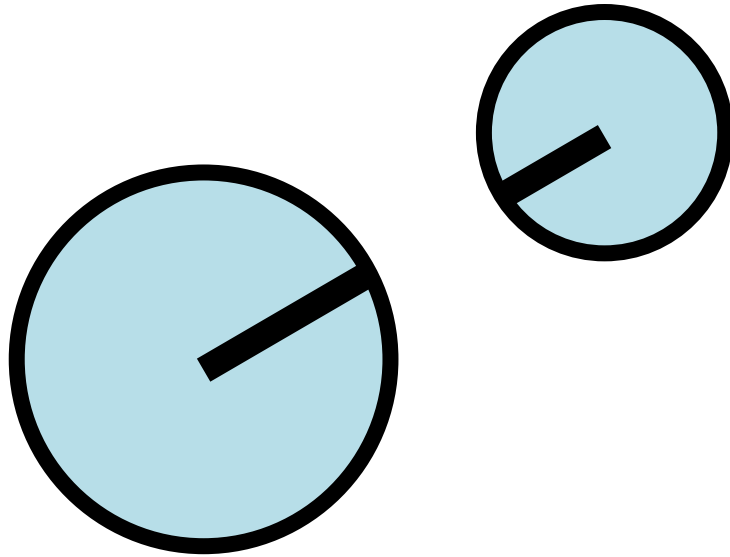




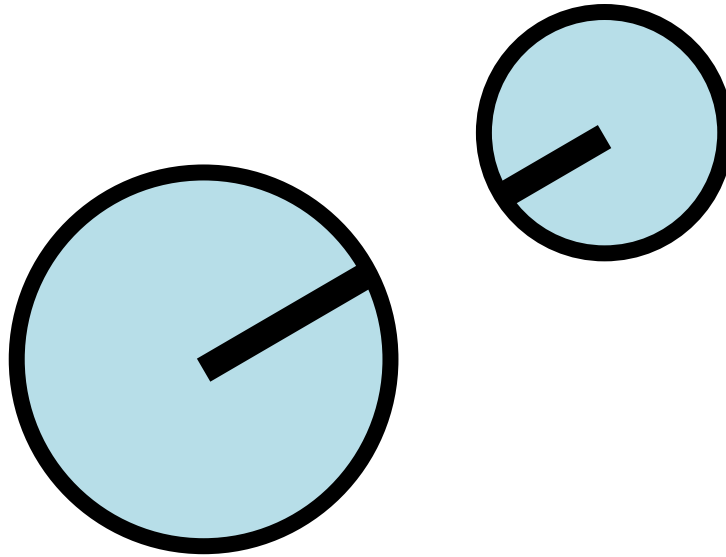






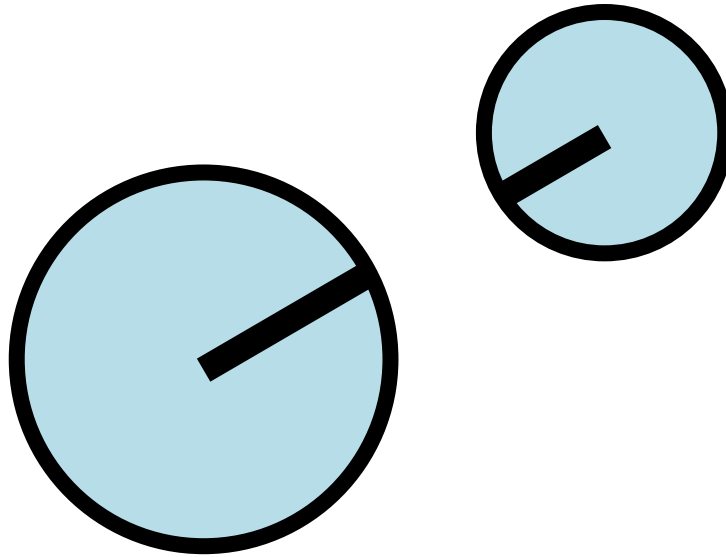


$$dx = x1 - x2$$



$$dx = x1 - x2$$

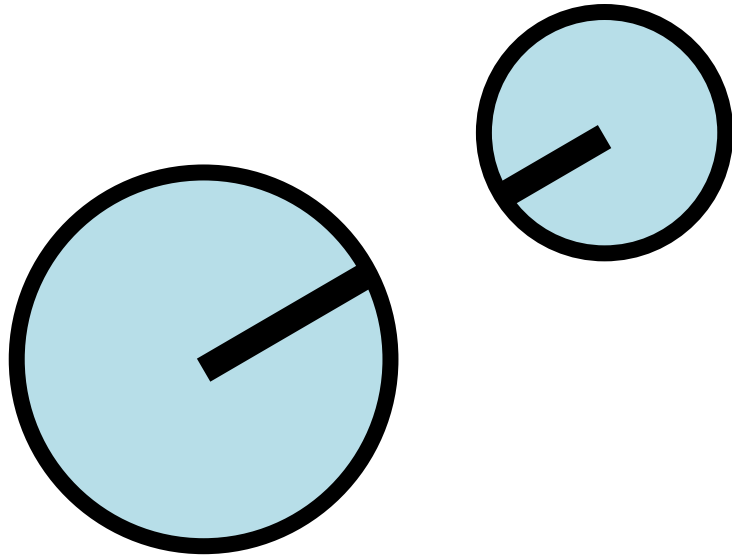
$$dy = y1 - y2$$



$$dx = x1 - x2$$

$$dy = y1 - y2$$

$$r = r1 + r2$$



$$dx = x1 - x2$$

$$dy = y1 - y2$$

$$r = r1 + r2$$

$$dx * dx + dy * dy \leq r * r$$

V7

Collision Detection

V8

Restart Game

End

ACKNOWLEDGEMENT

This presentation benefitted from

PowerPointLabs

a PowerPoint plugin for creating
better presentations with less effort.

PowerPointLabs
is available for free at
<http://PowerPointLabs.info>