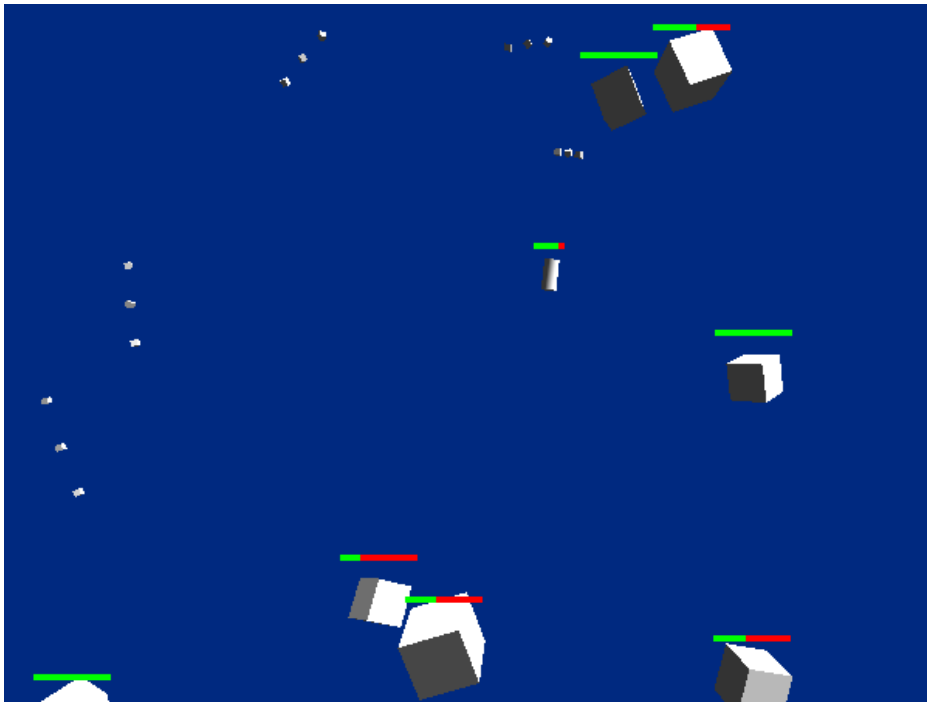
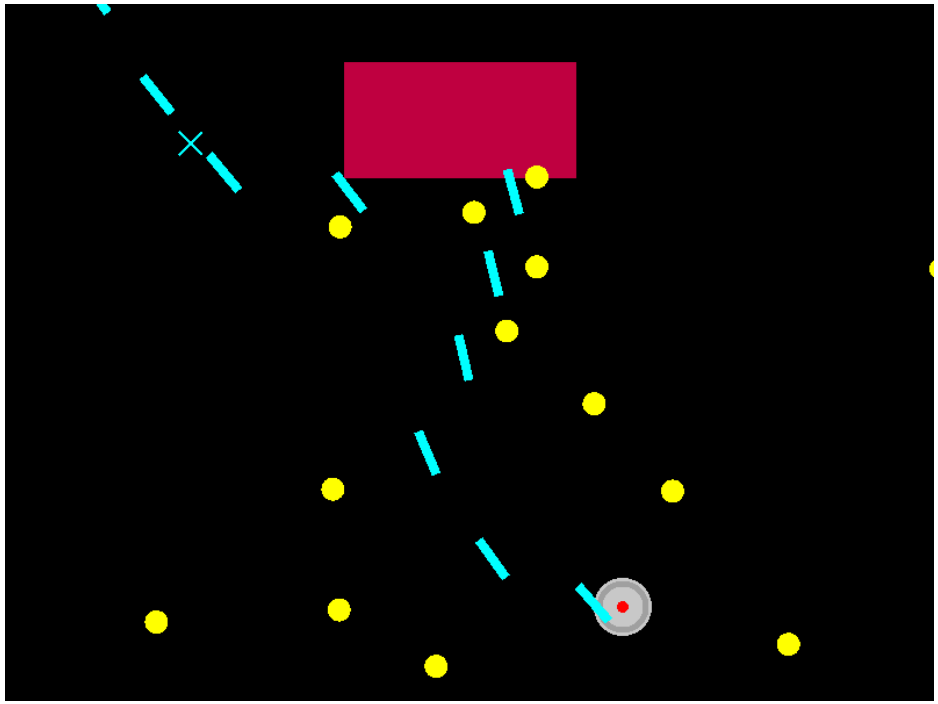
Low-Level Game Development

Prototype Games

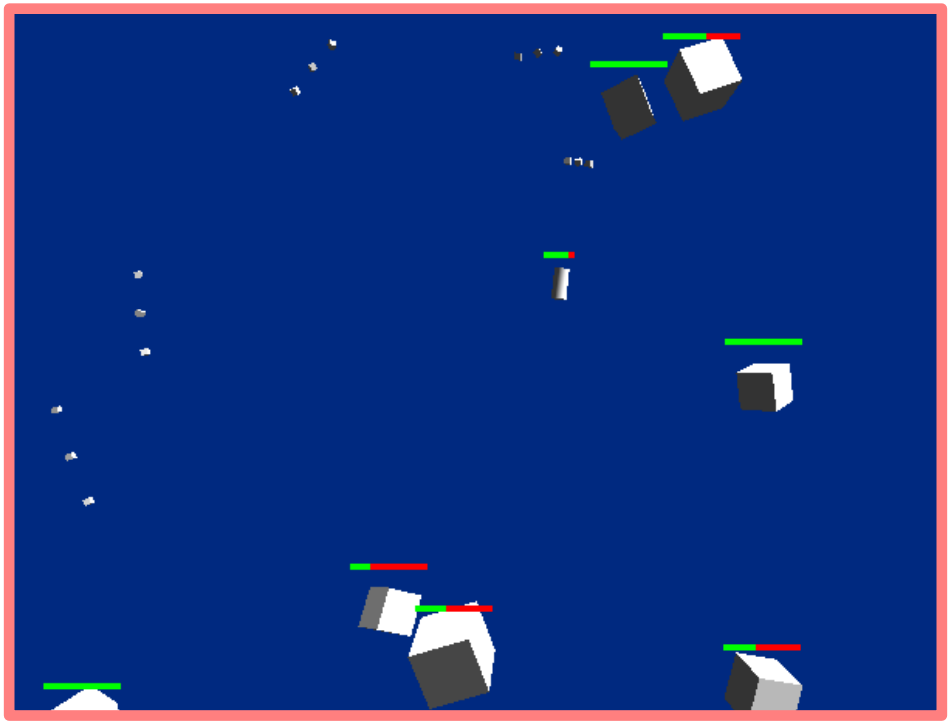
High Level



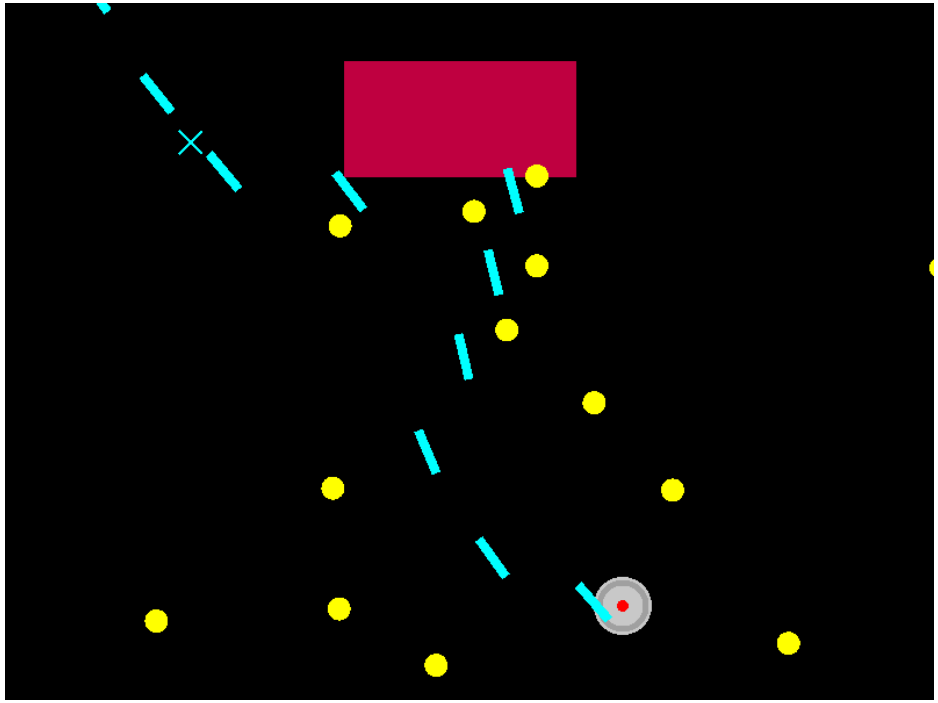
Low Level

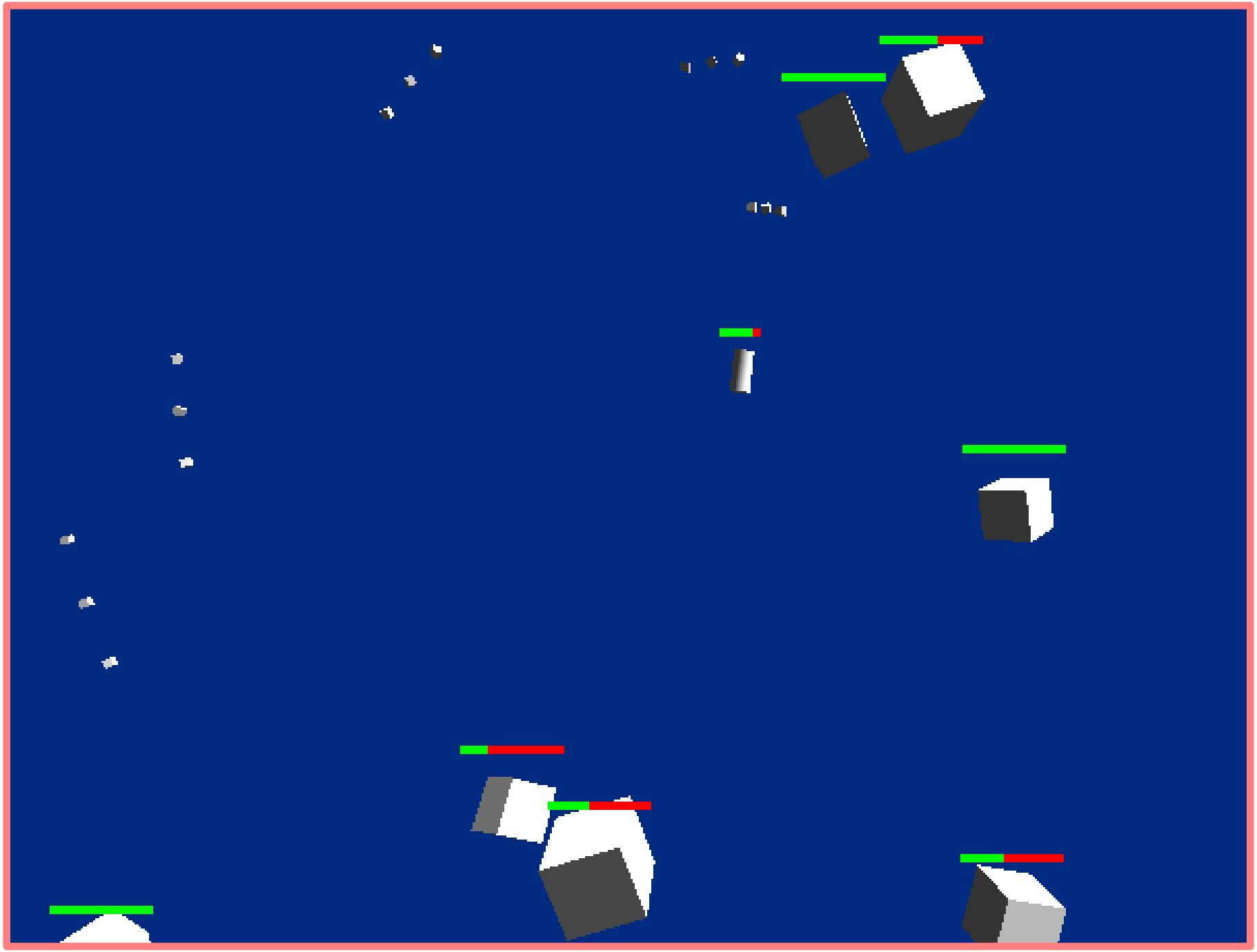


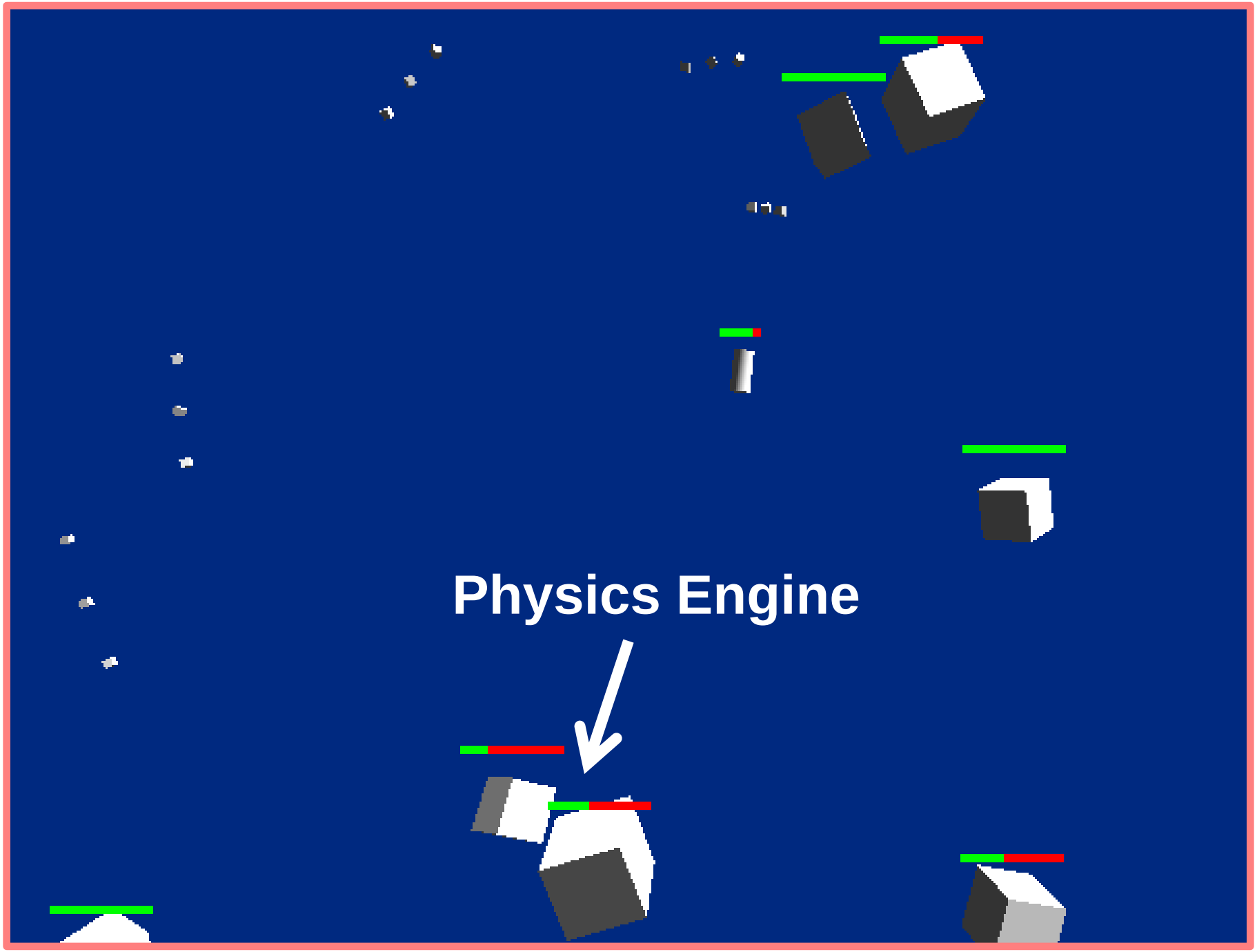
High Level

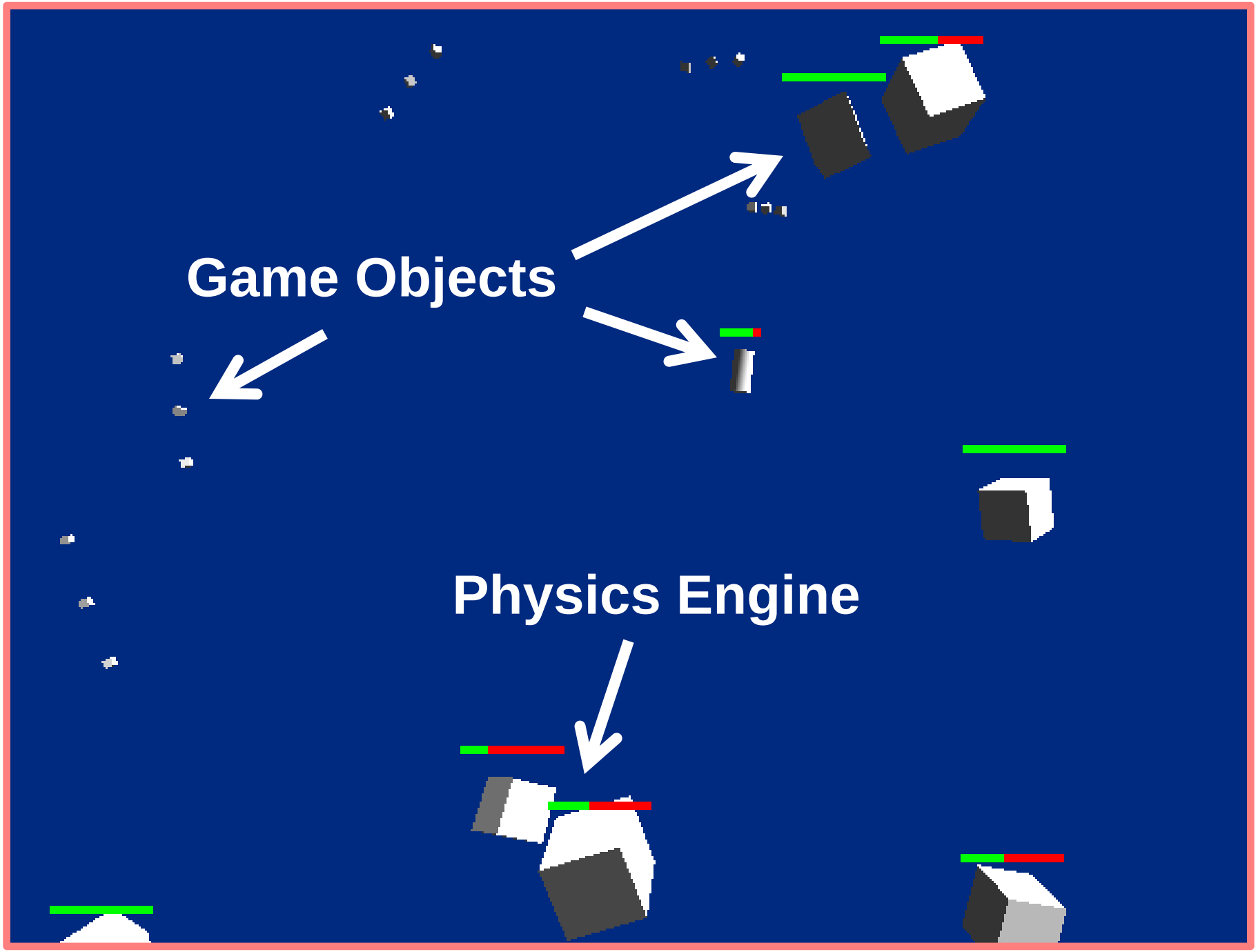


Low Level

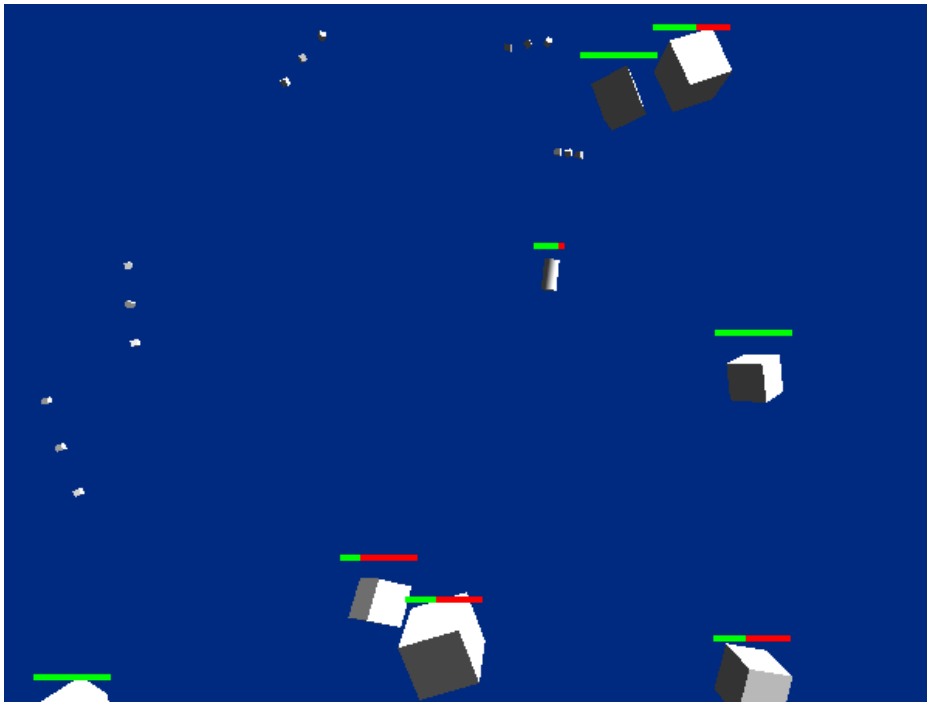




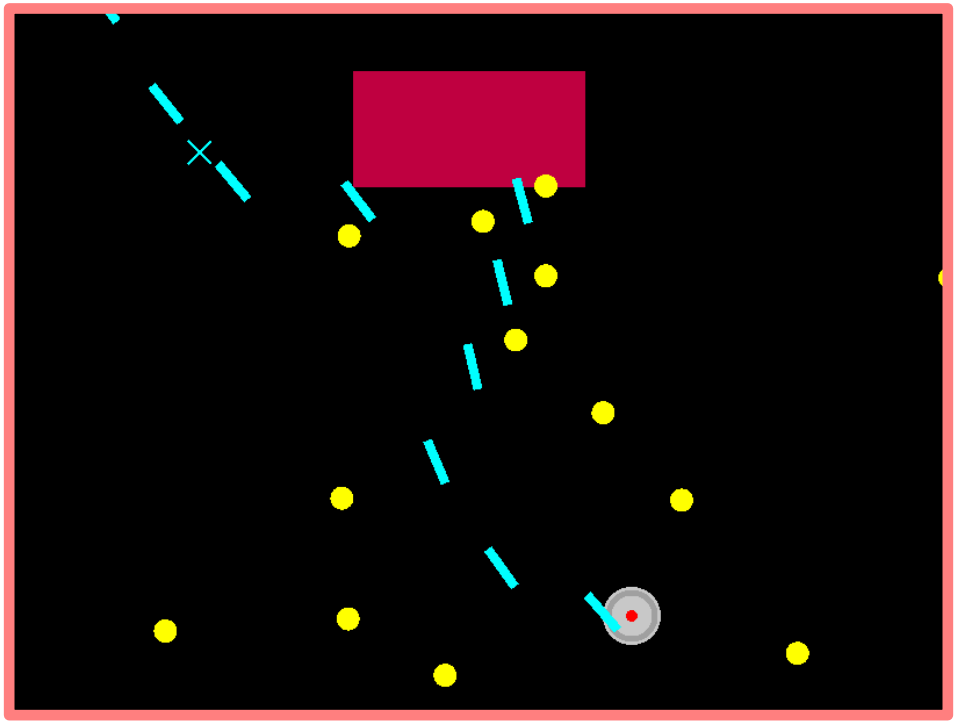

Physics Engine

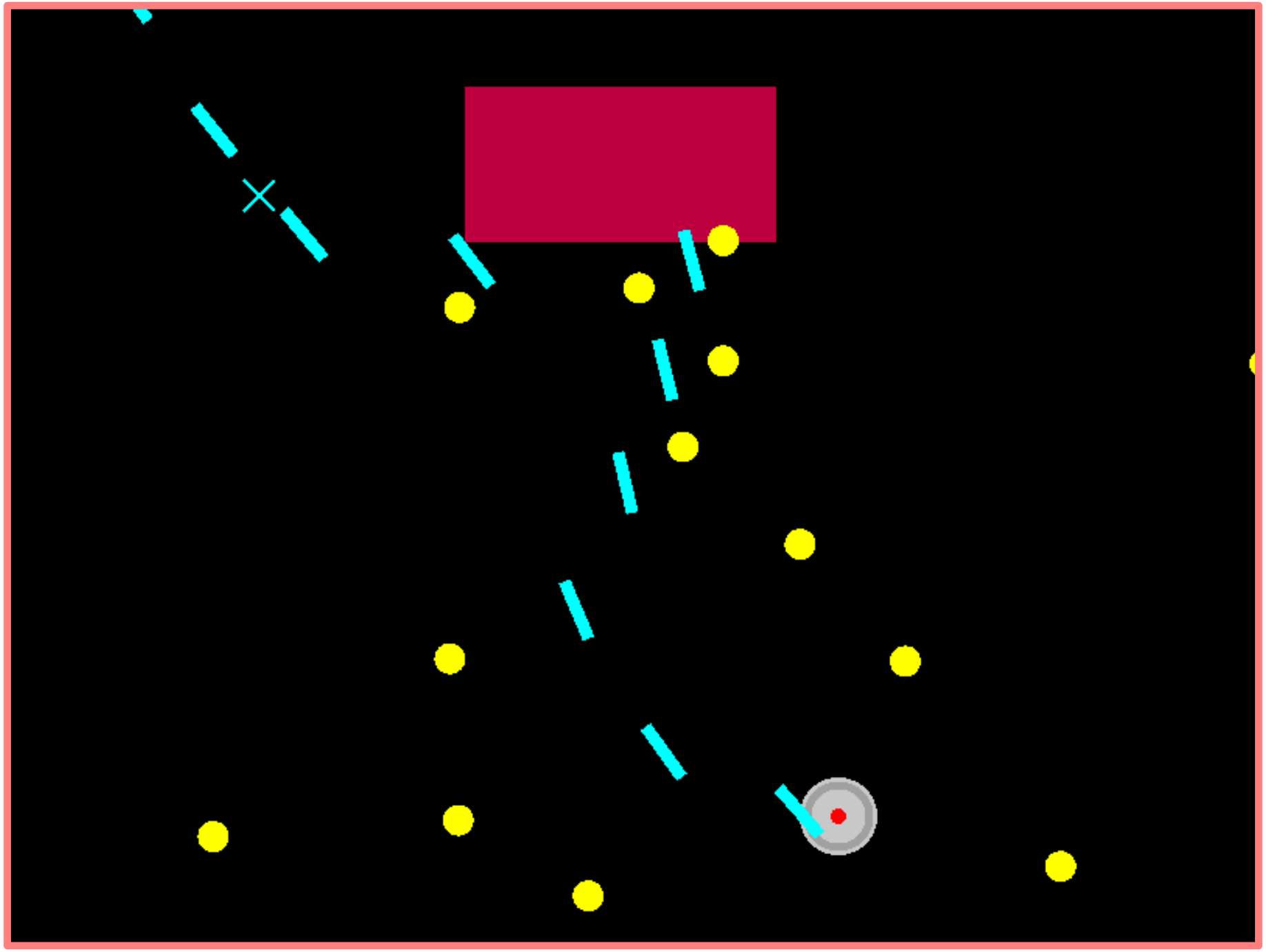

Game Objects
Physics Engine

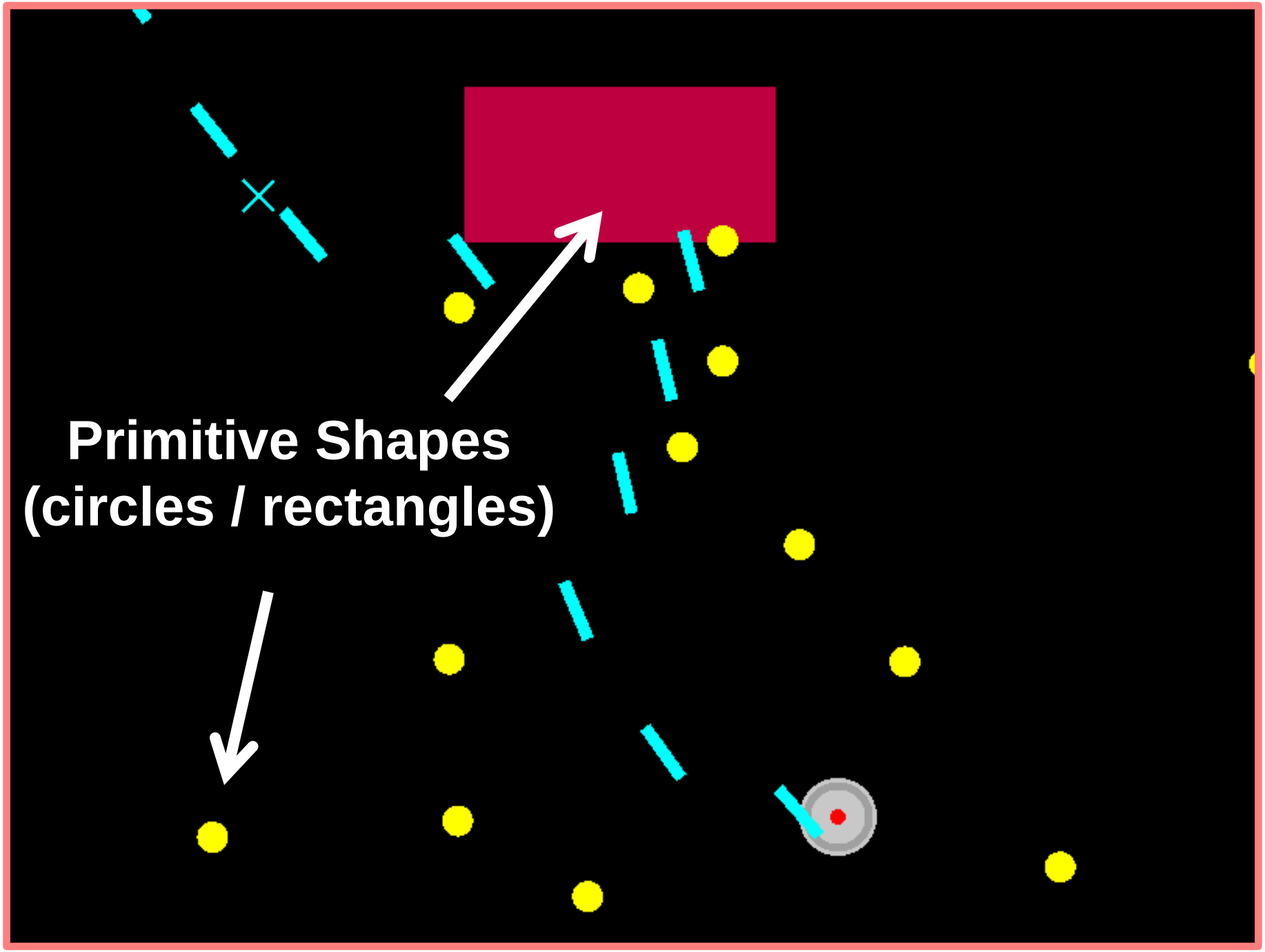
High Level

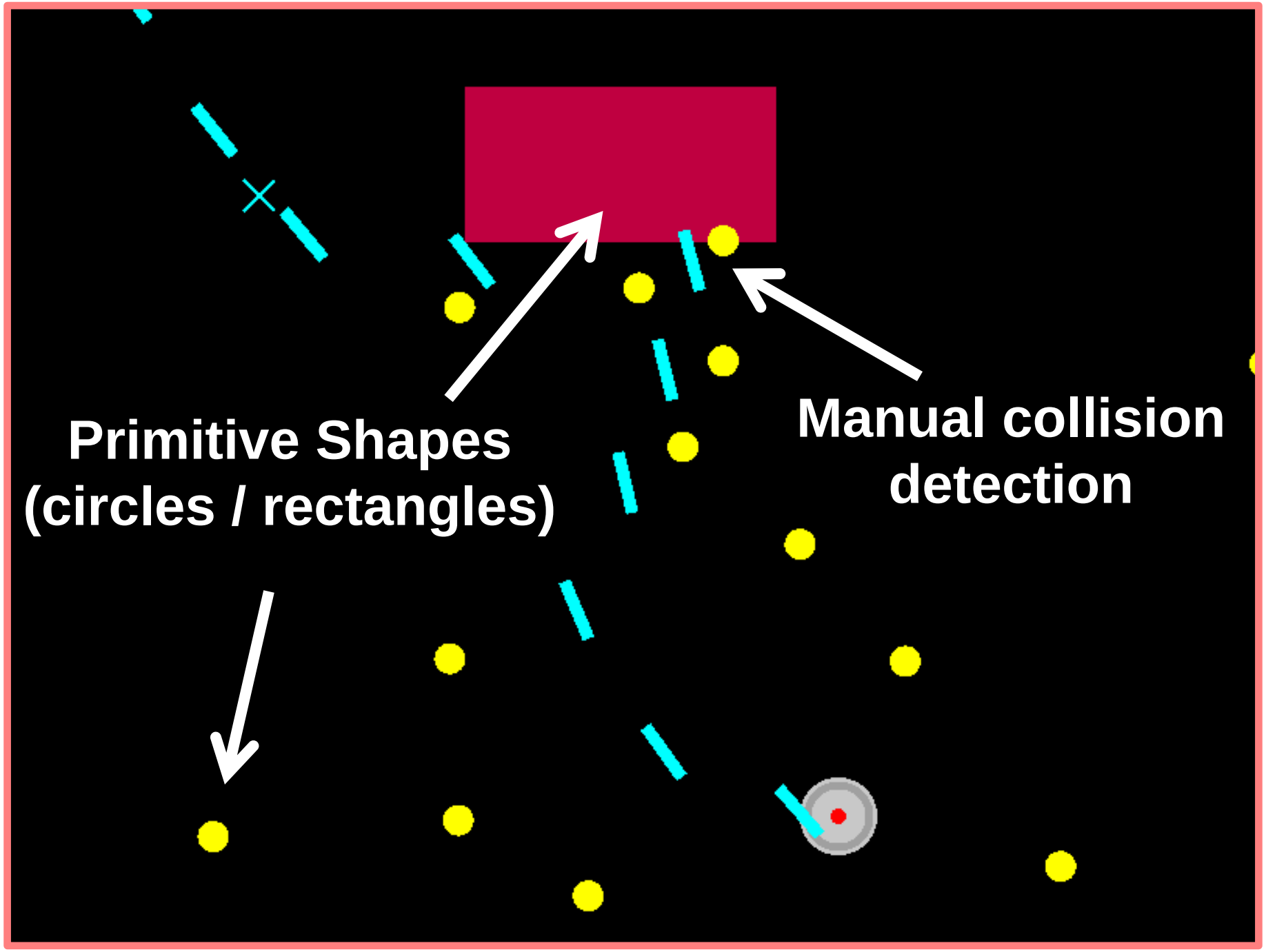


Low Level

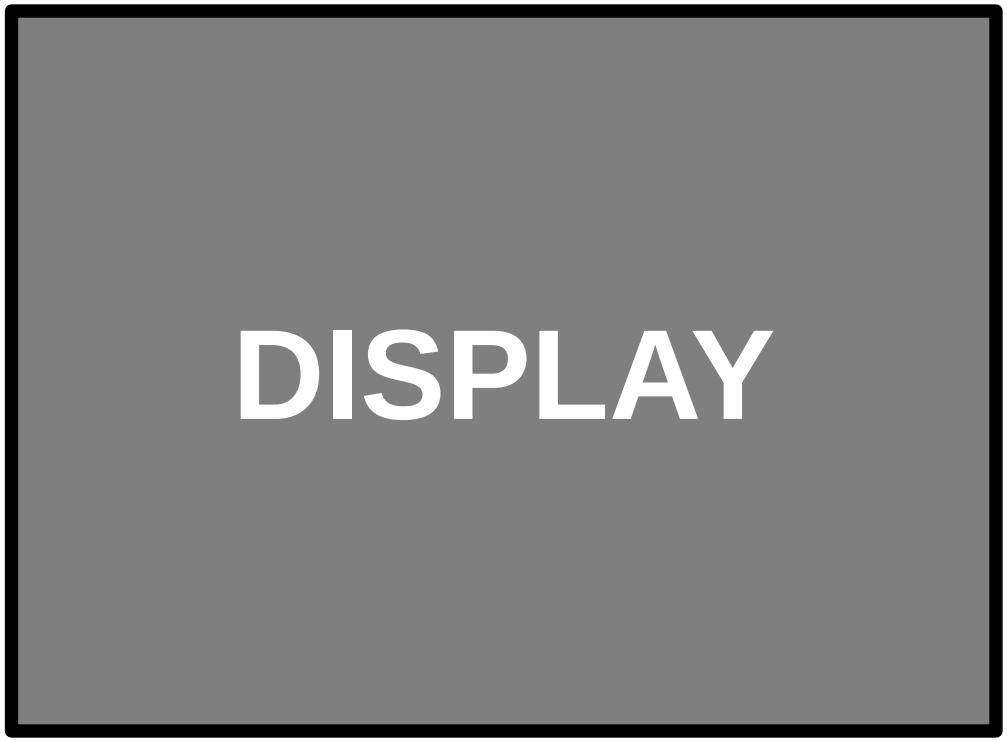


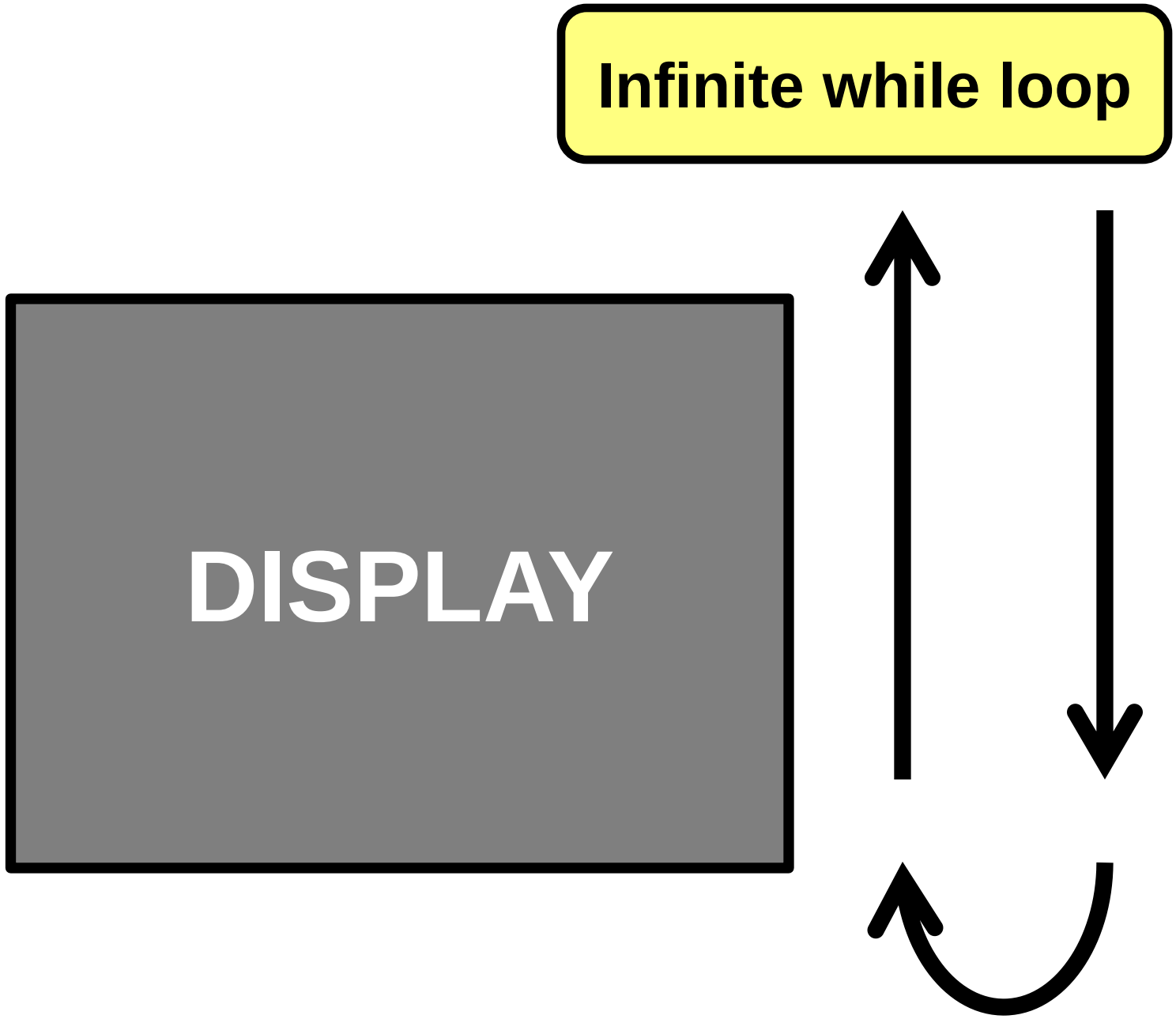


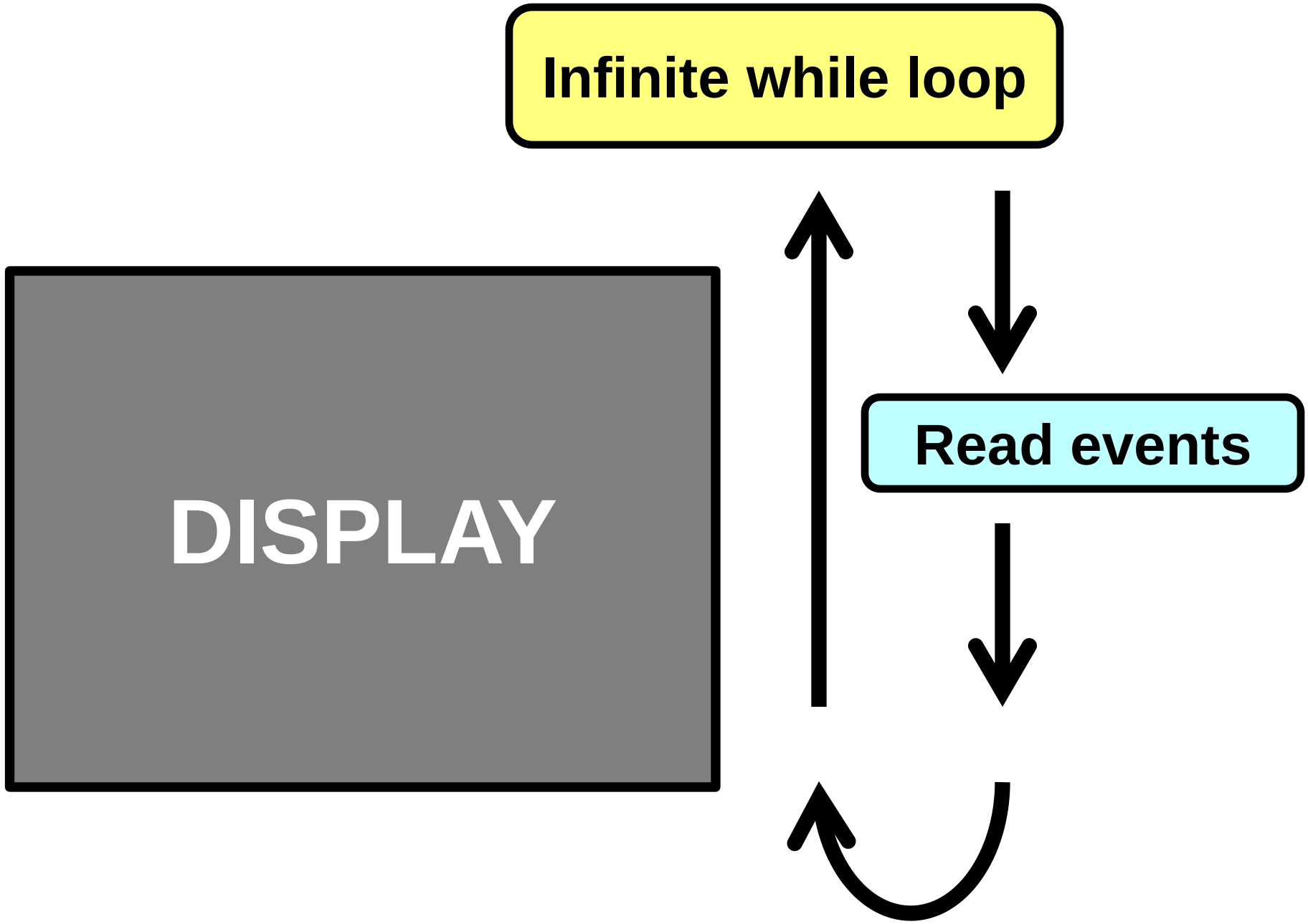

Primitive Shapes
(circles / rectangles)

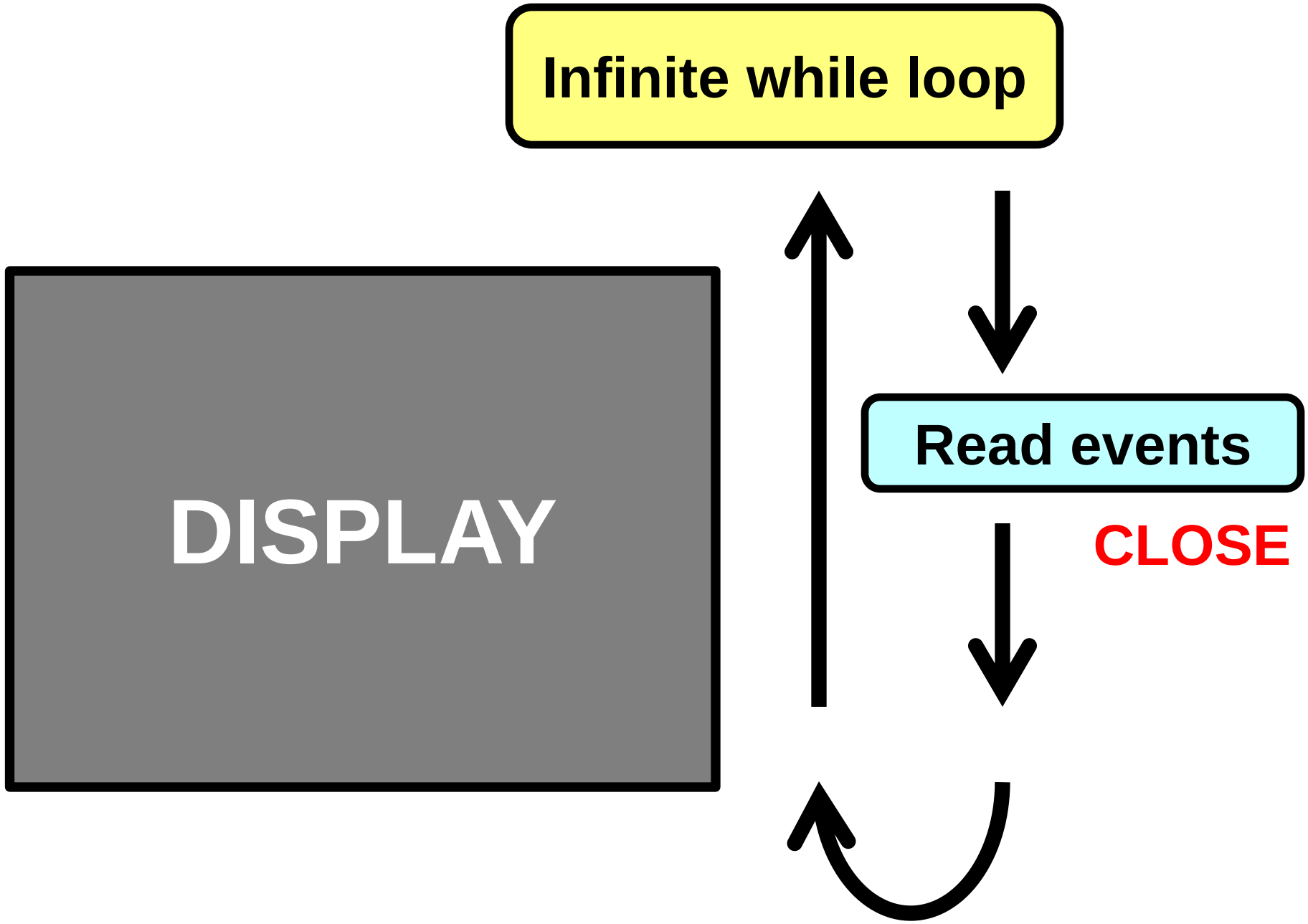

Primitive Shapes
(circles / rectangles)
Manual collision
detection

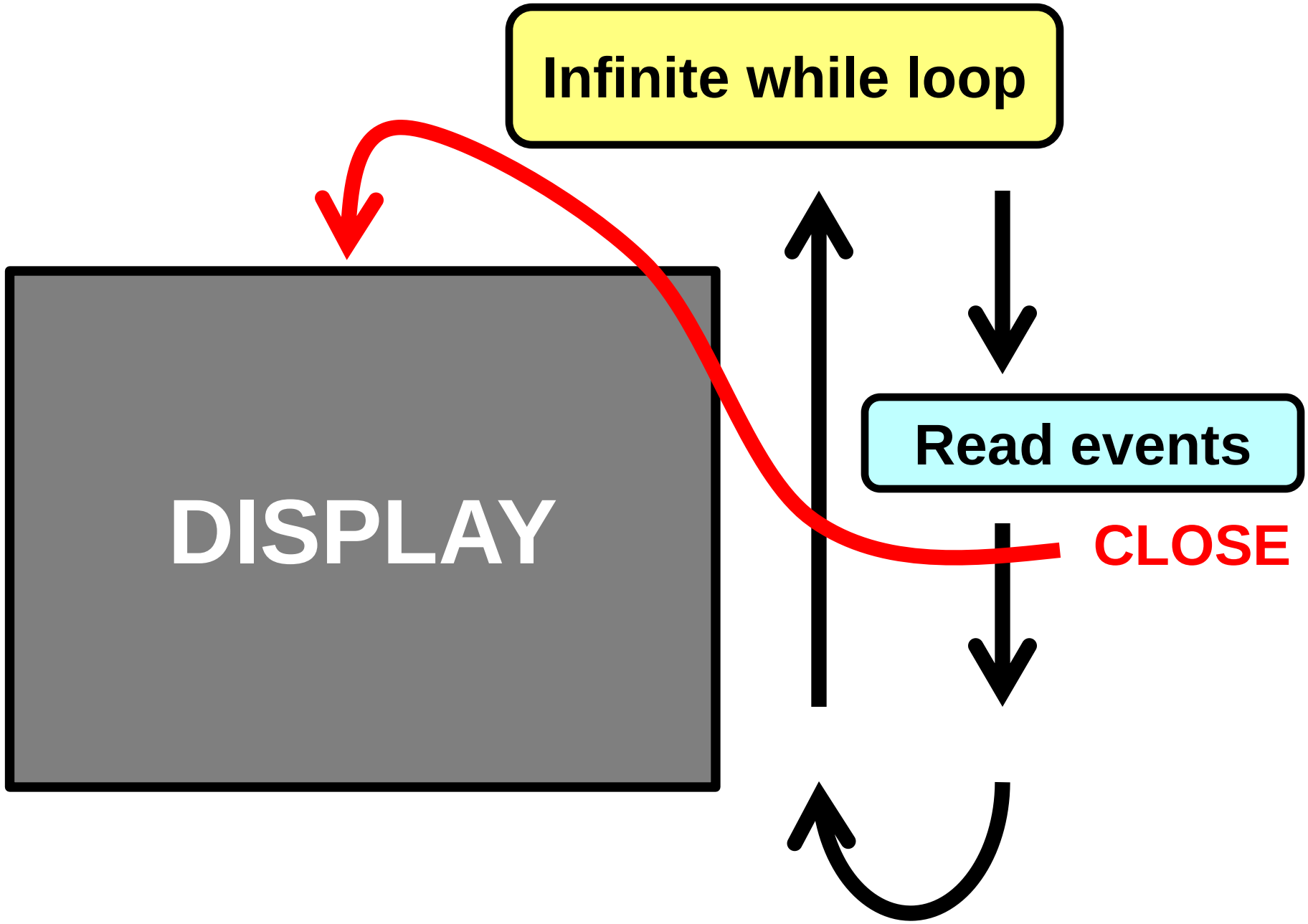
Display

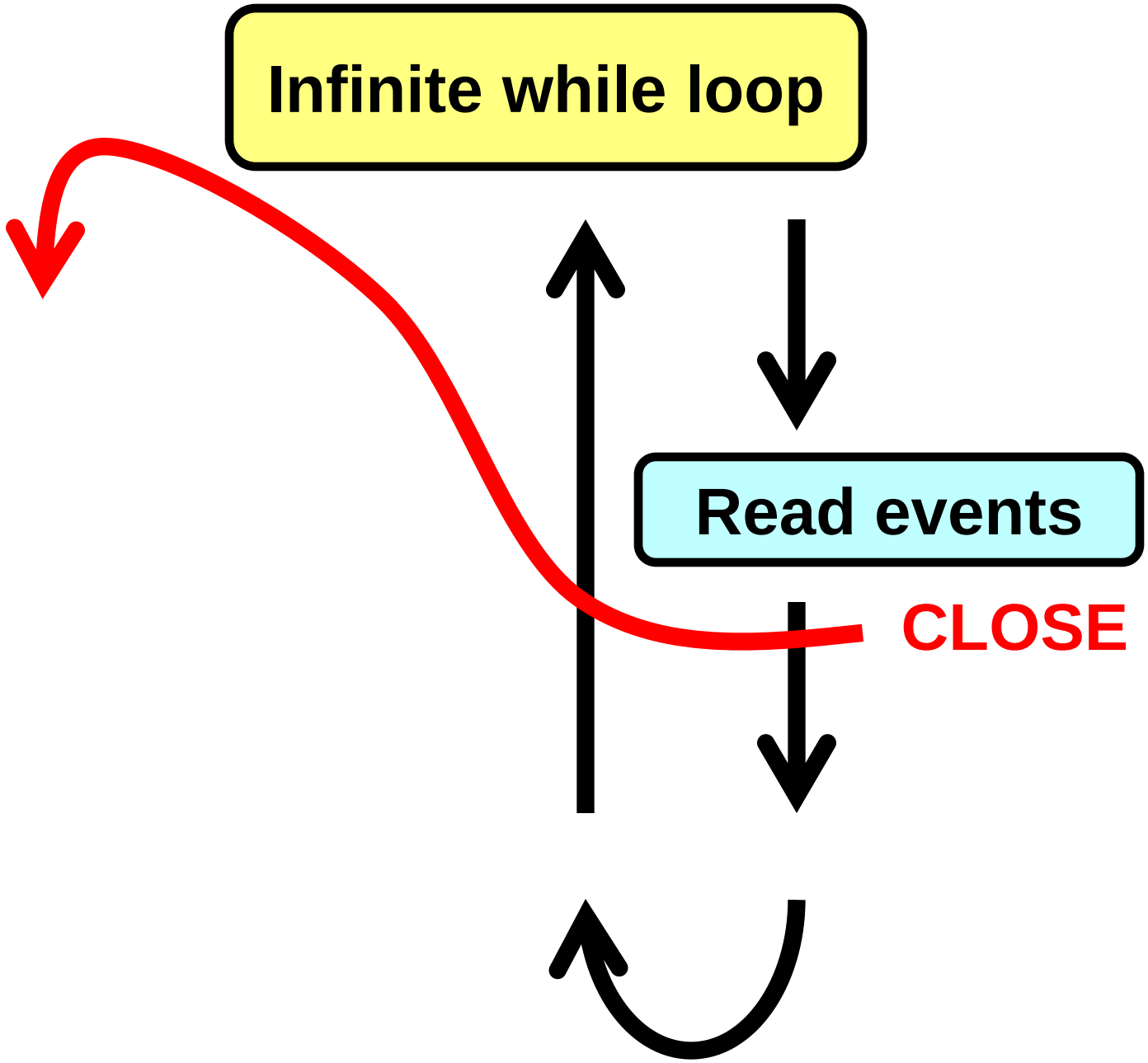

DISPLAY

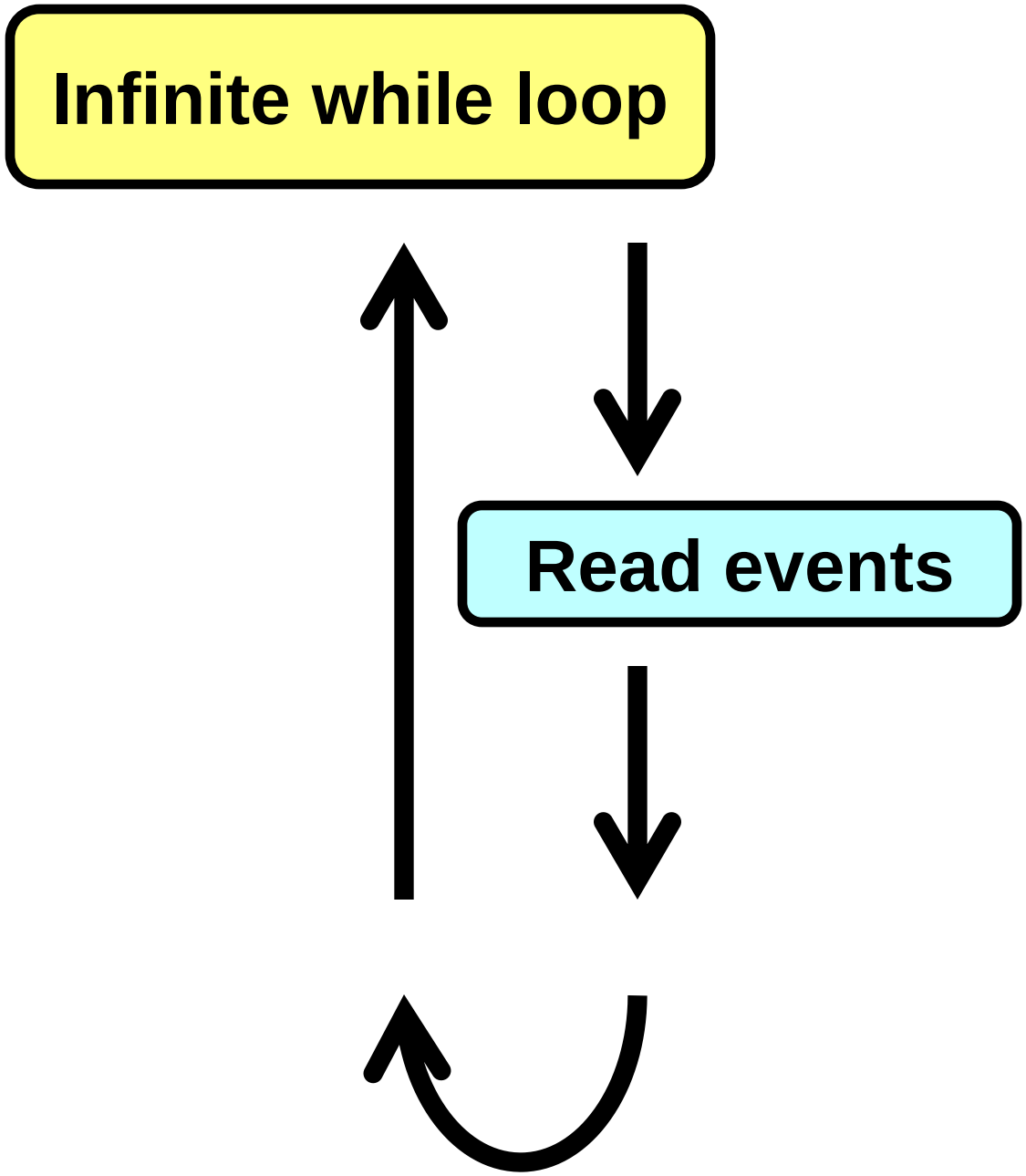

Infinite while loop
DISPLAY


Infinite while loop
DISPLAY
Read events


Infinite while loop
DISPLAY
Read events
CLOSE

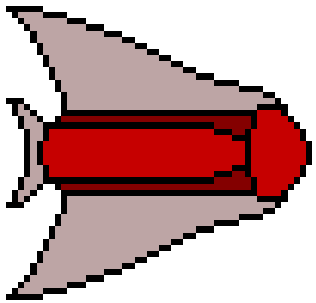

Infinite while loop
DISPLAY
Read events
CLOSE


Infinite while loop
Read events
CLOSE

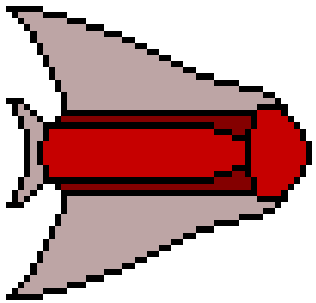

Infinite while loop
Read events

V0

Display



$x = 3, y = 5$

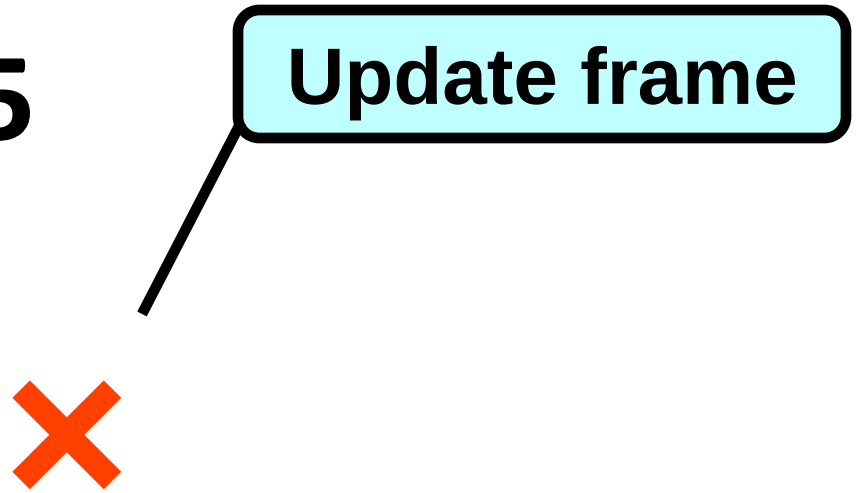


$x = 3, y = 5$

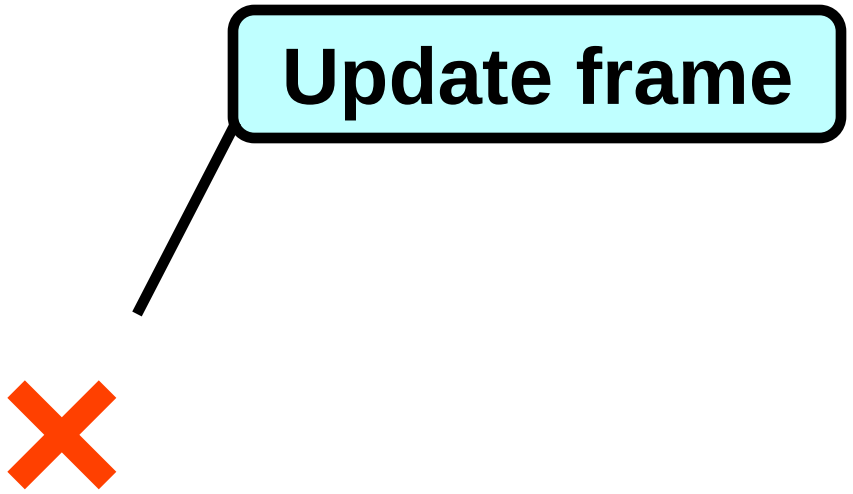
Update Frame

$x = 3, y = 5$

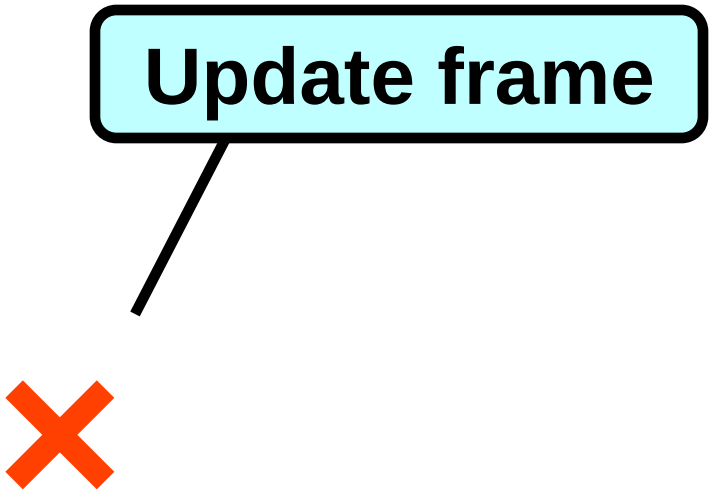
x = 4, y = 5



x = 5, y = 5



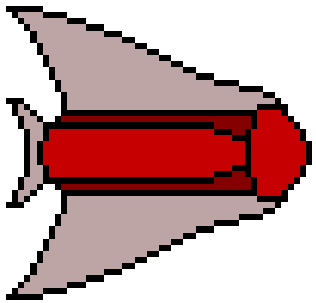
x = 6, y = 5



Draw Frame

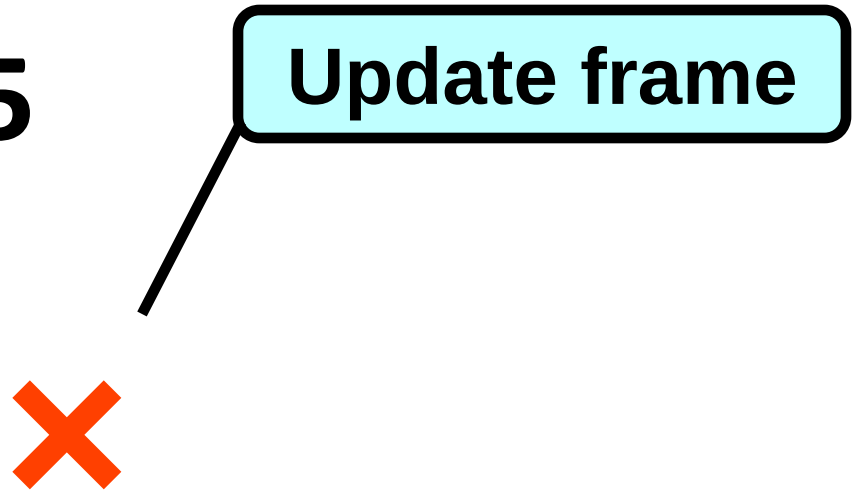
$x = 3, y = 5$

x = 3, y = 5

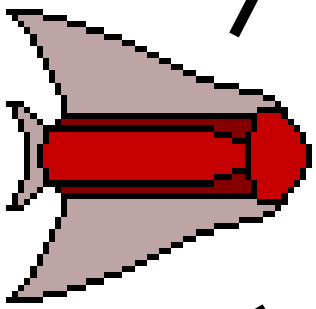


Draw frame

x = 4, y = 5



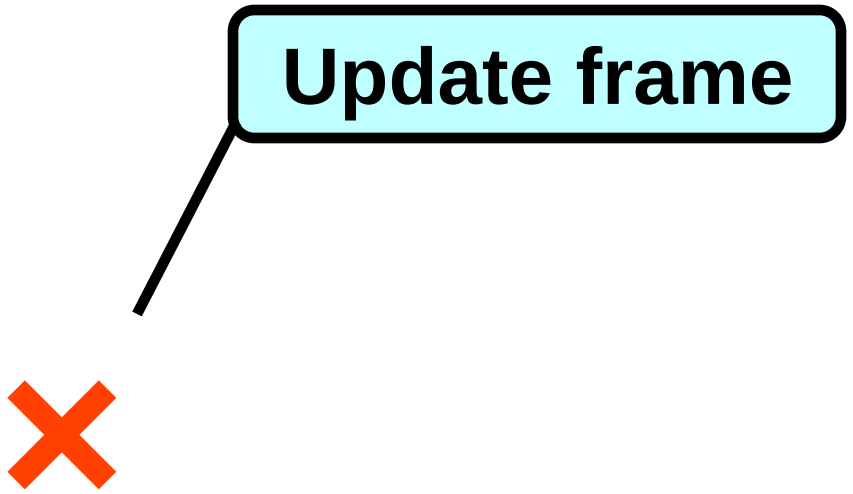
x = 4, y = 5



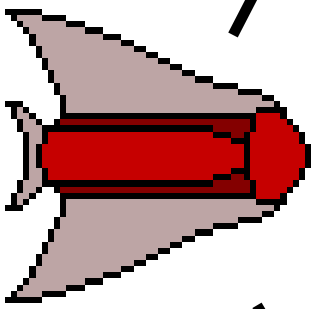
Update frame

Draw frame

x = 5, y = 5



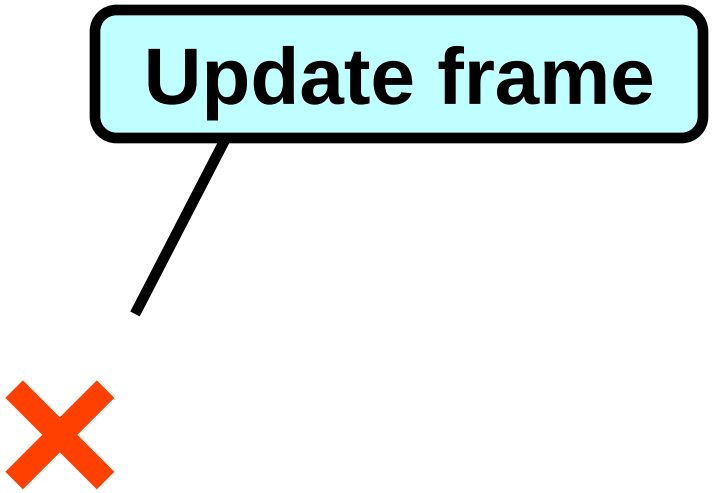
x = 5, y = 5



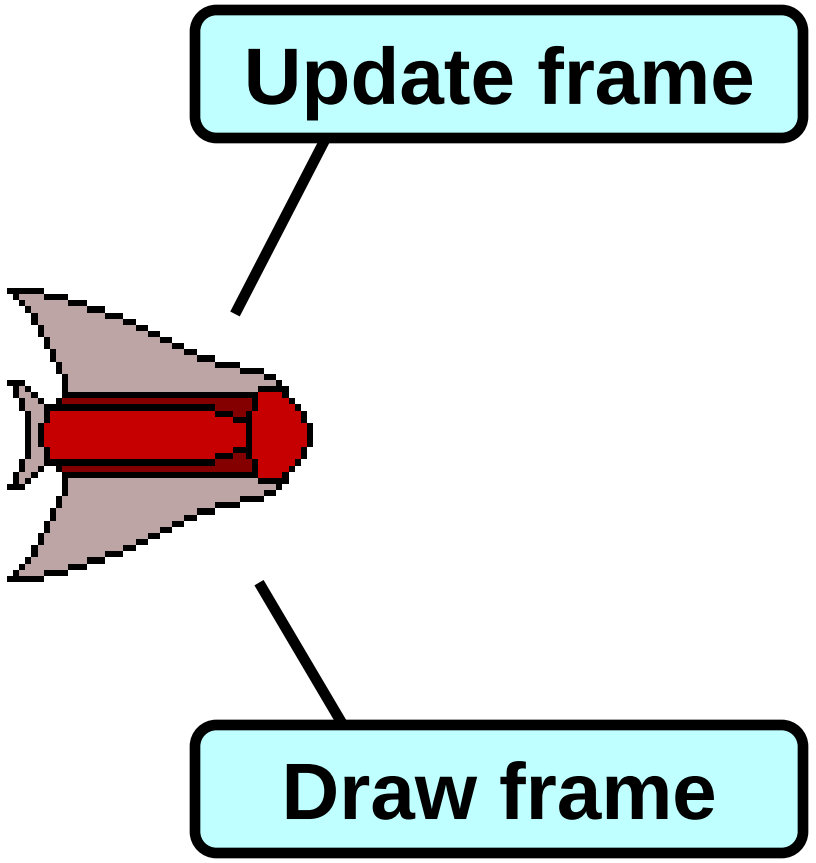
Update frame

Draw frame

x = 6, y = 5



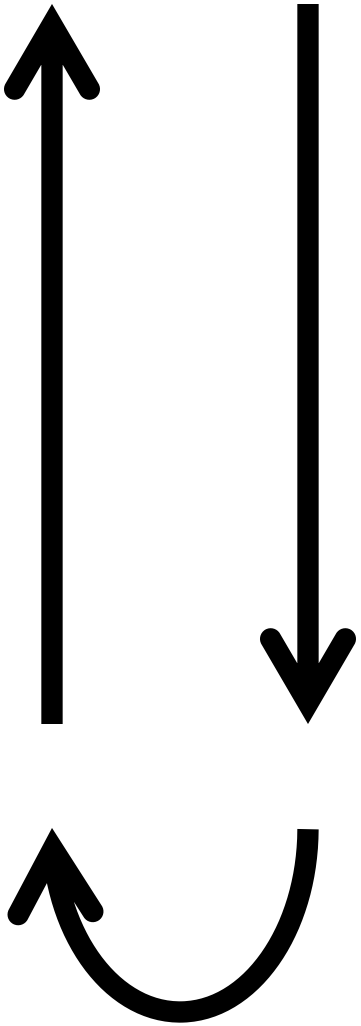
x = 6, y = 5

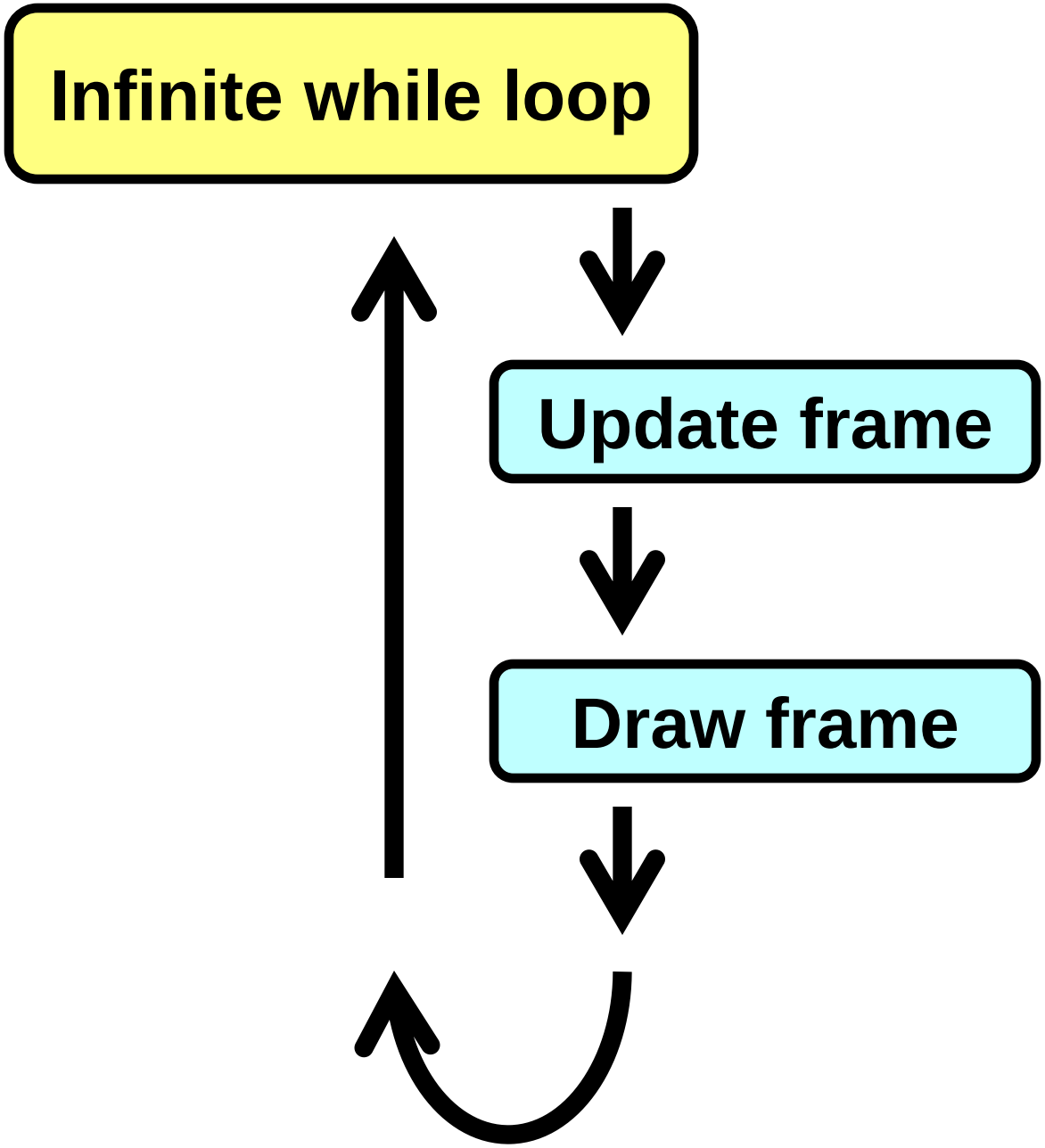


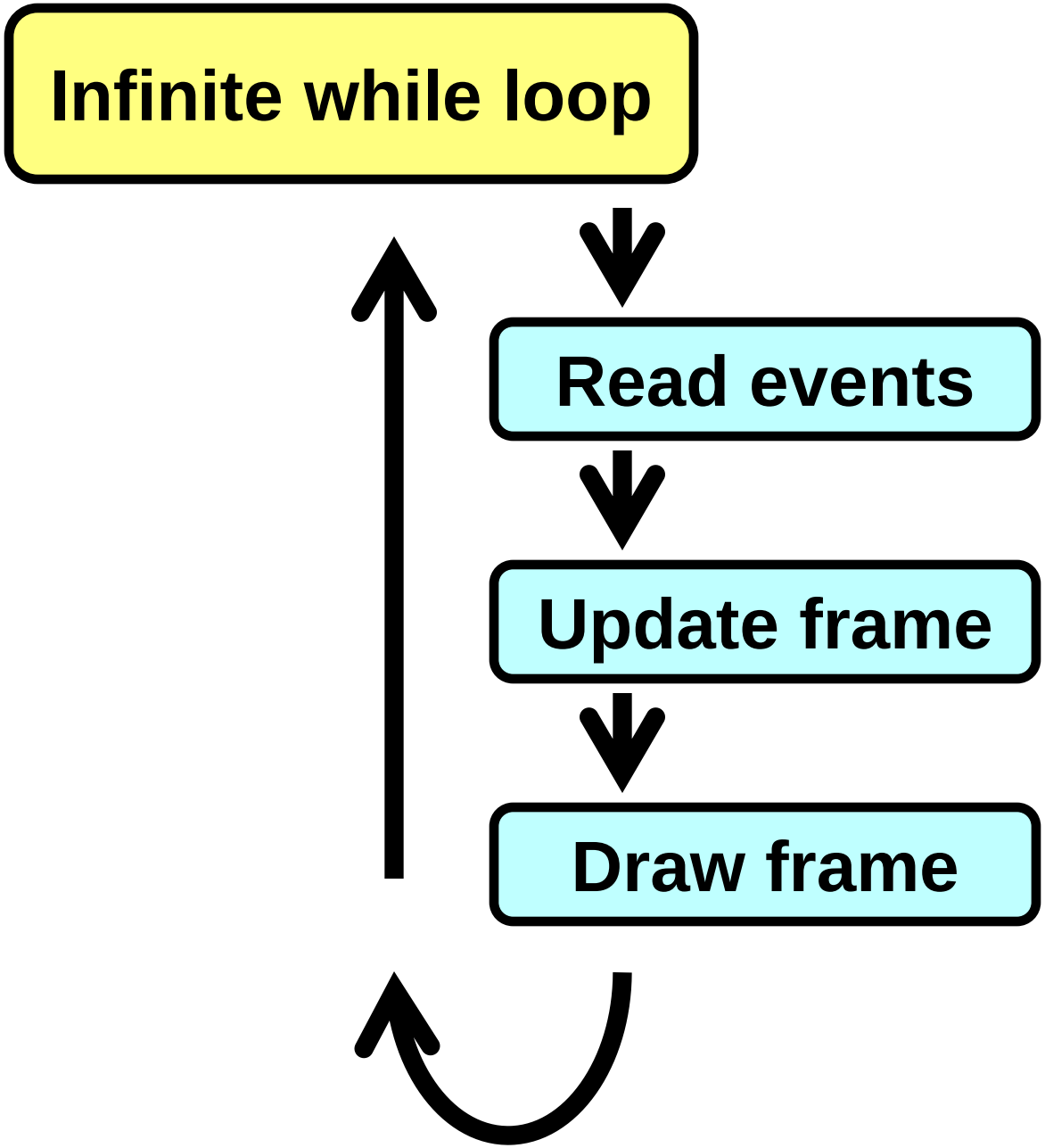
Structure

Infinite while loop

Infinite while loop

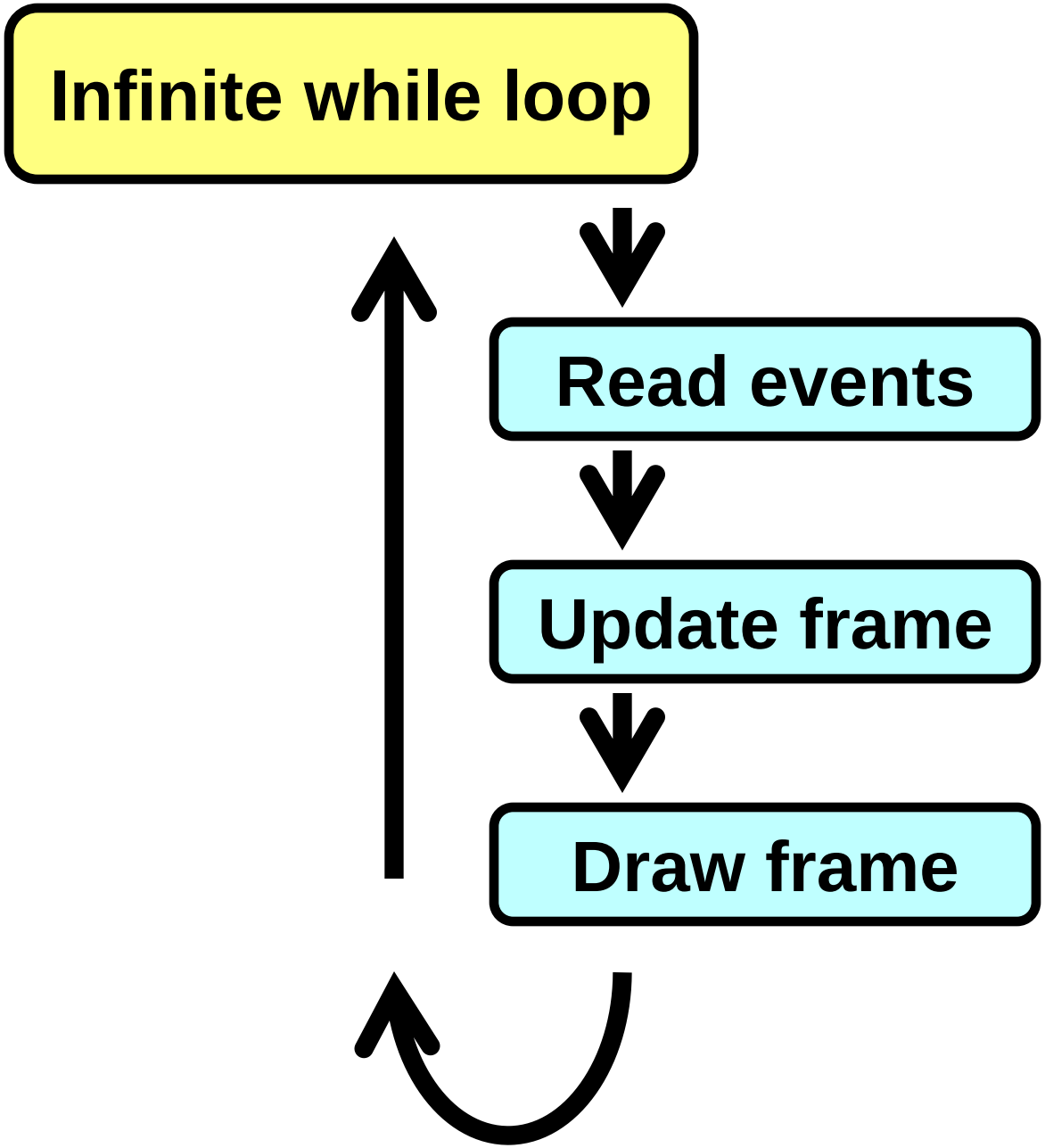


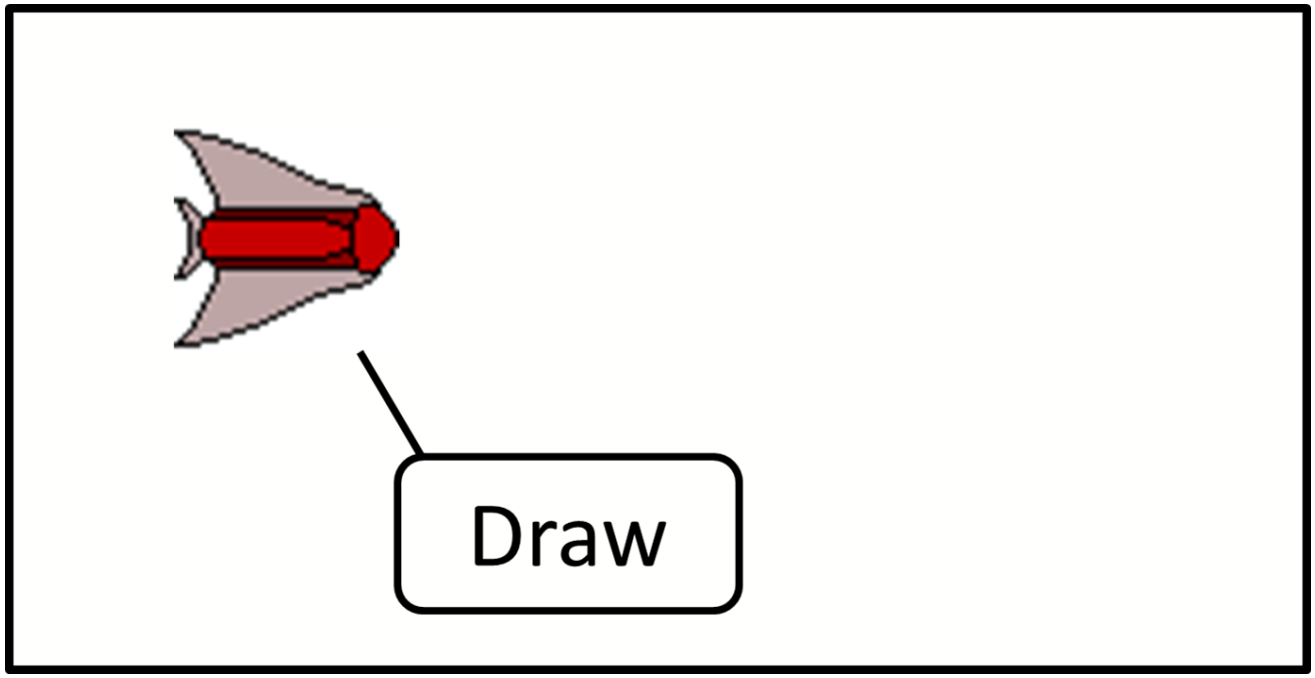

Infinite while loop
Update frame
Draw frame

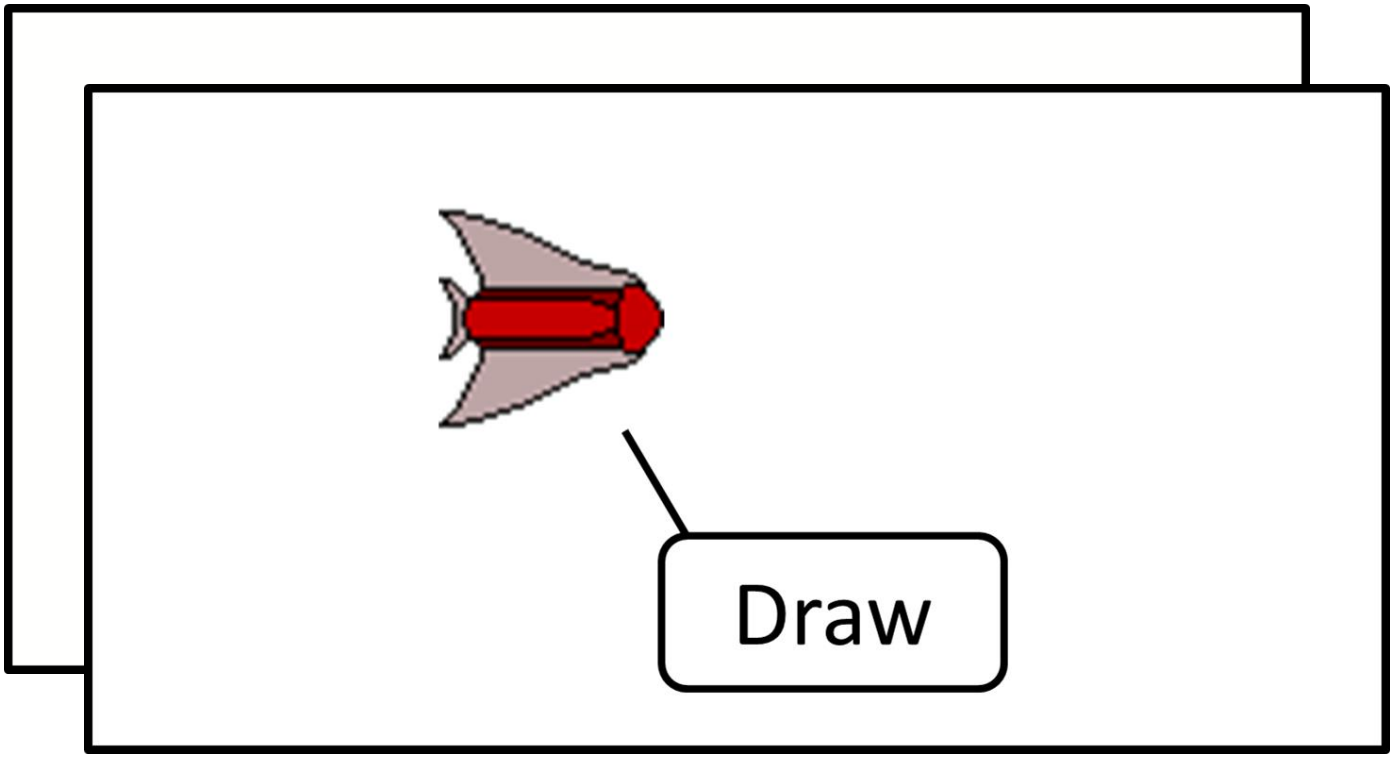

Infinite while loop
Read events
Update frame
Draw frame

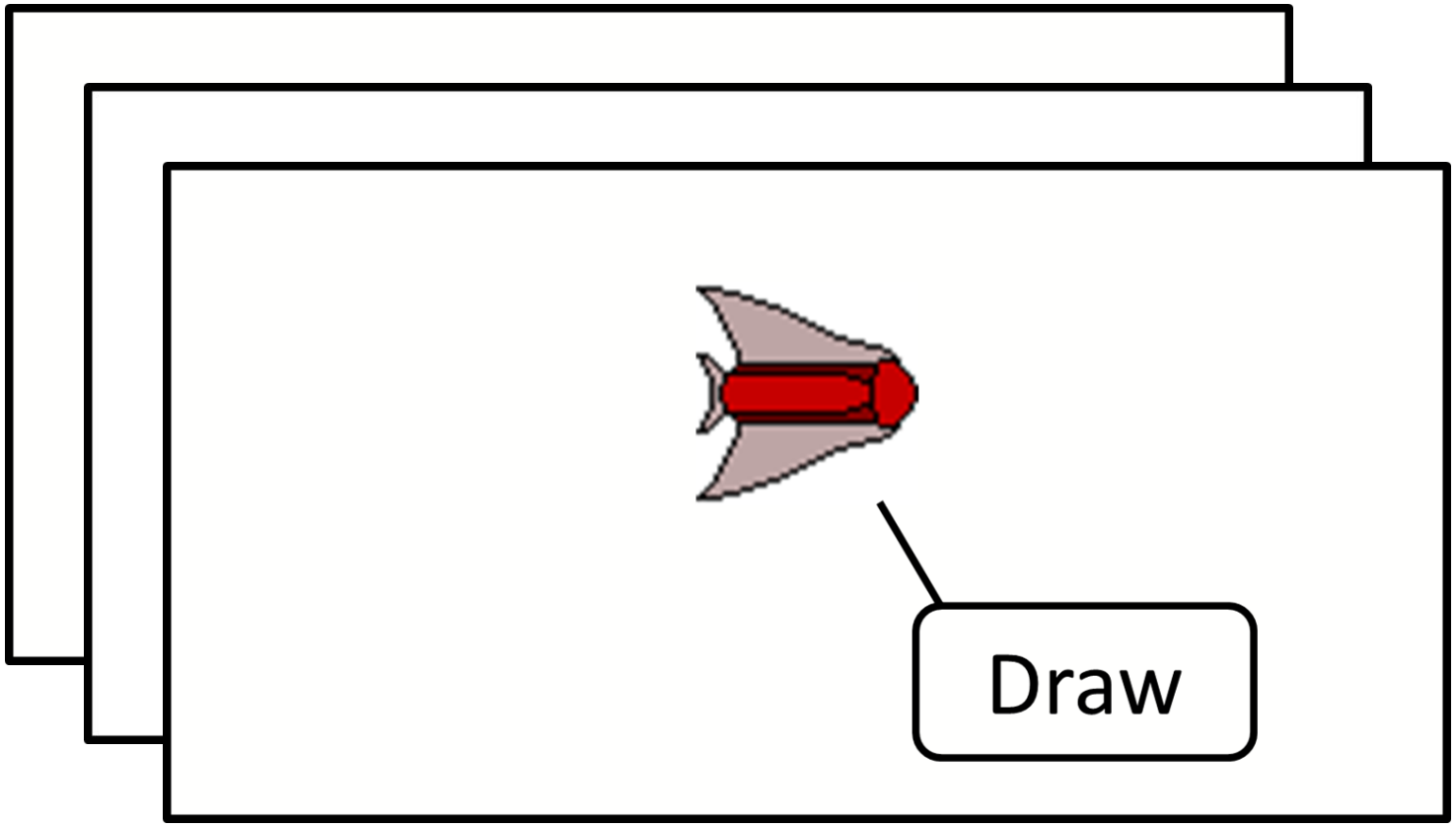
V1

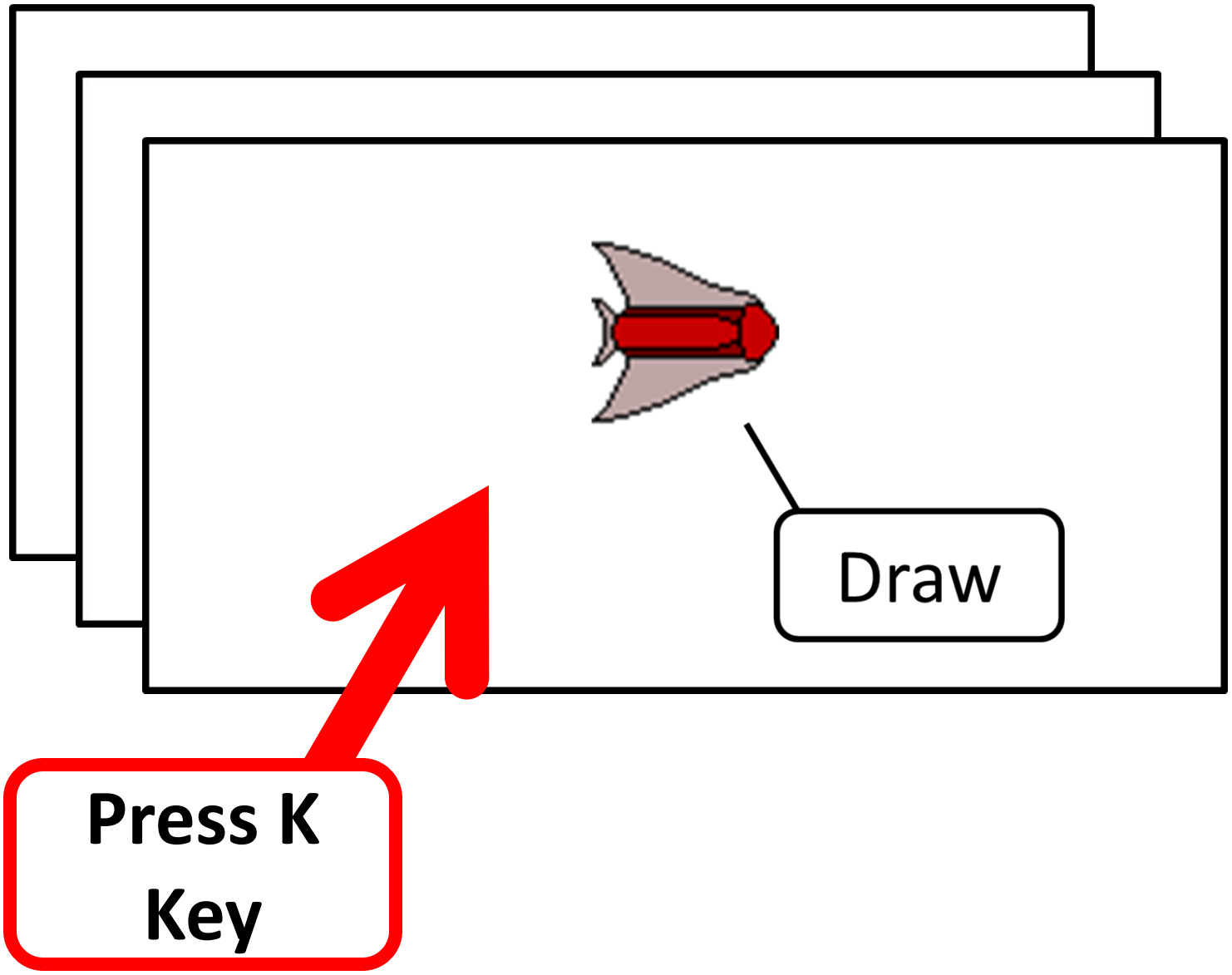
Update and Draw frames

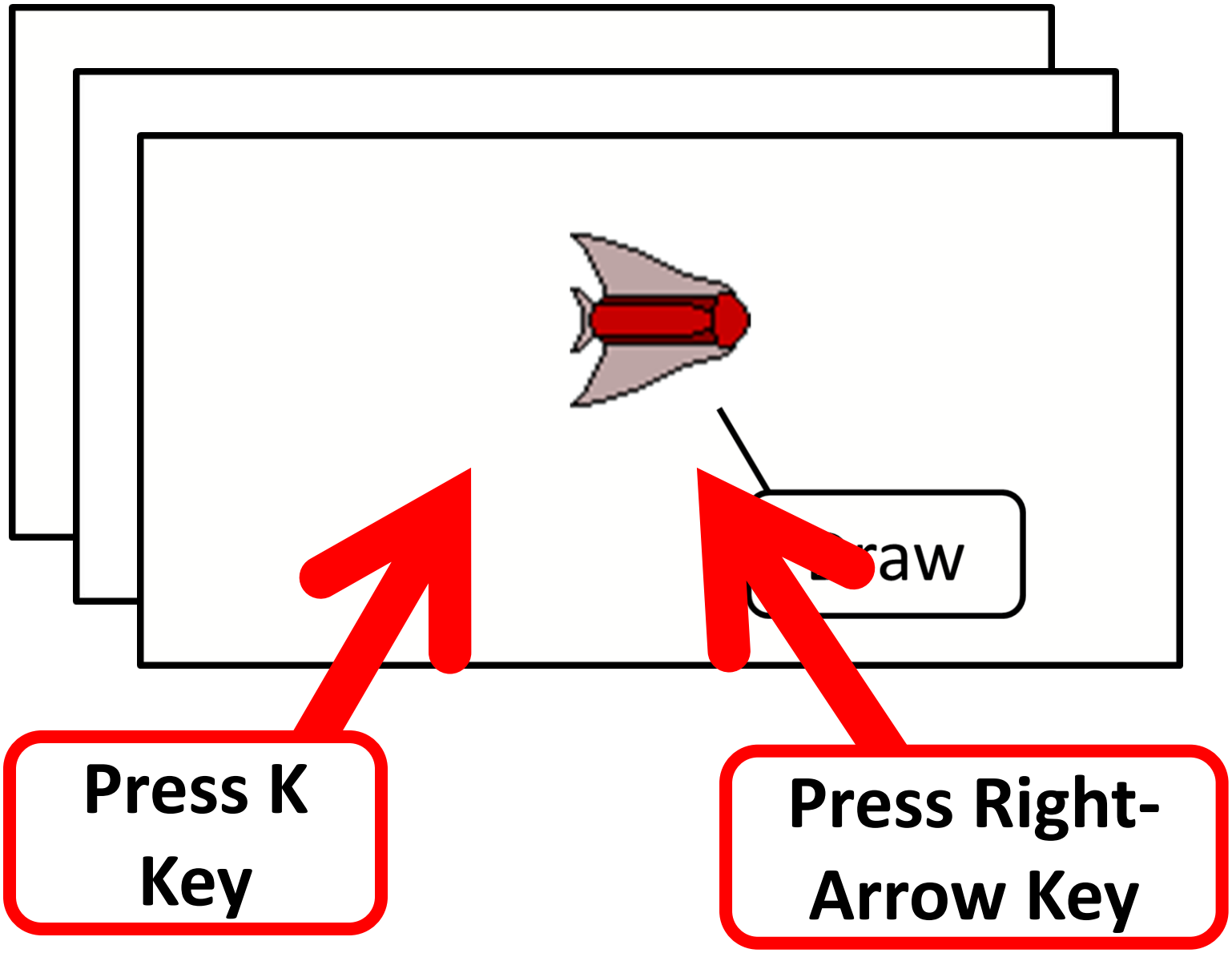

Infinite while loop
Read events
Update frame
Draw frame

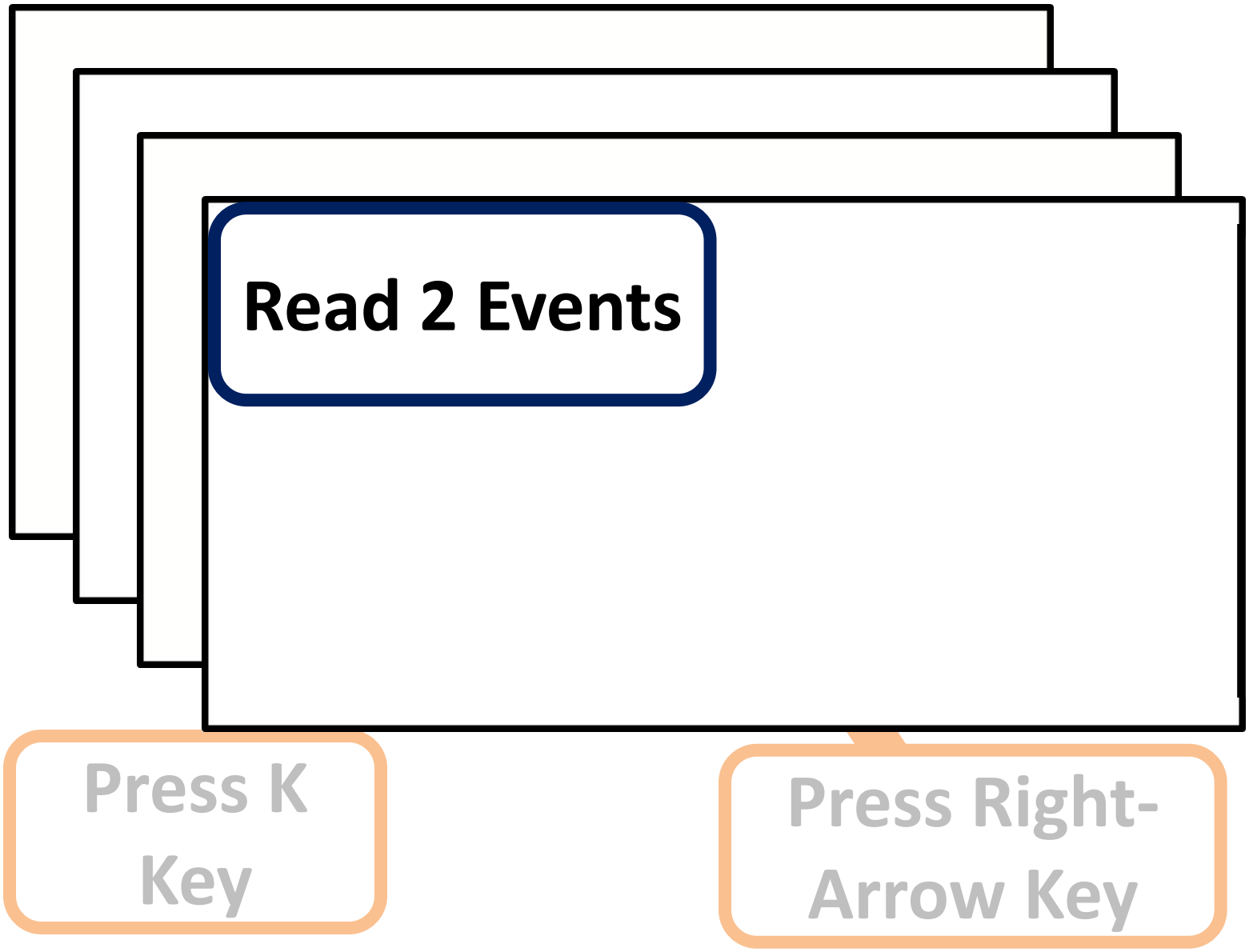

Draw

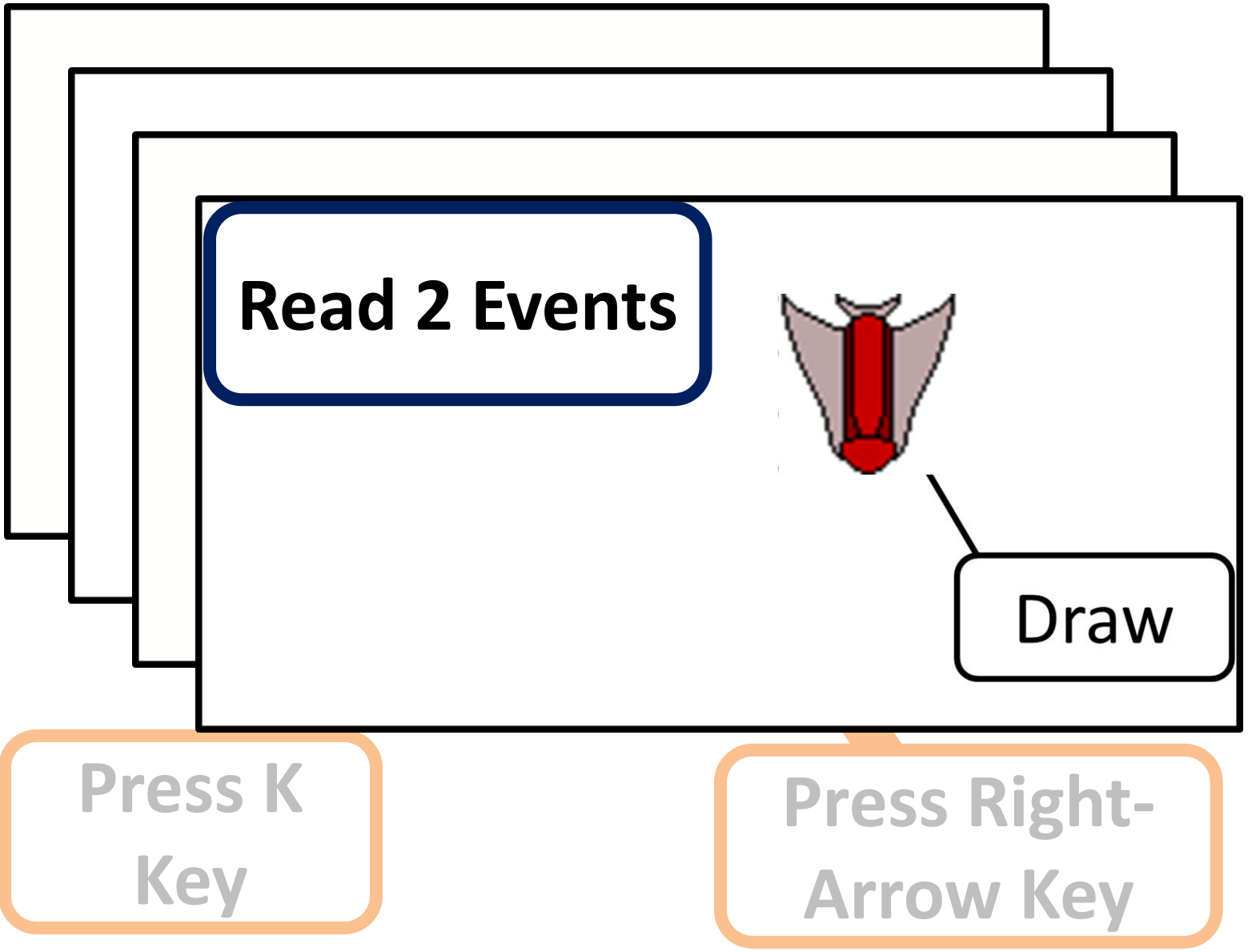

Draw

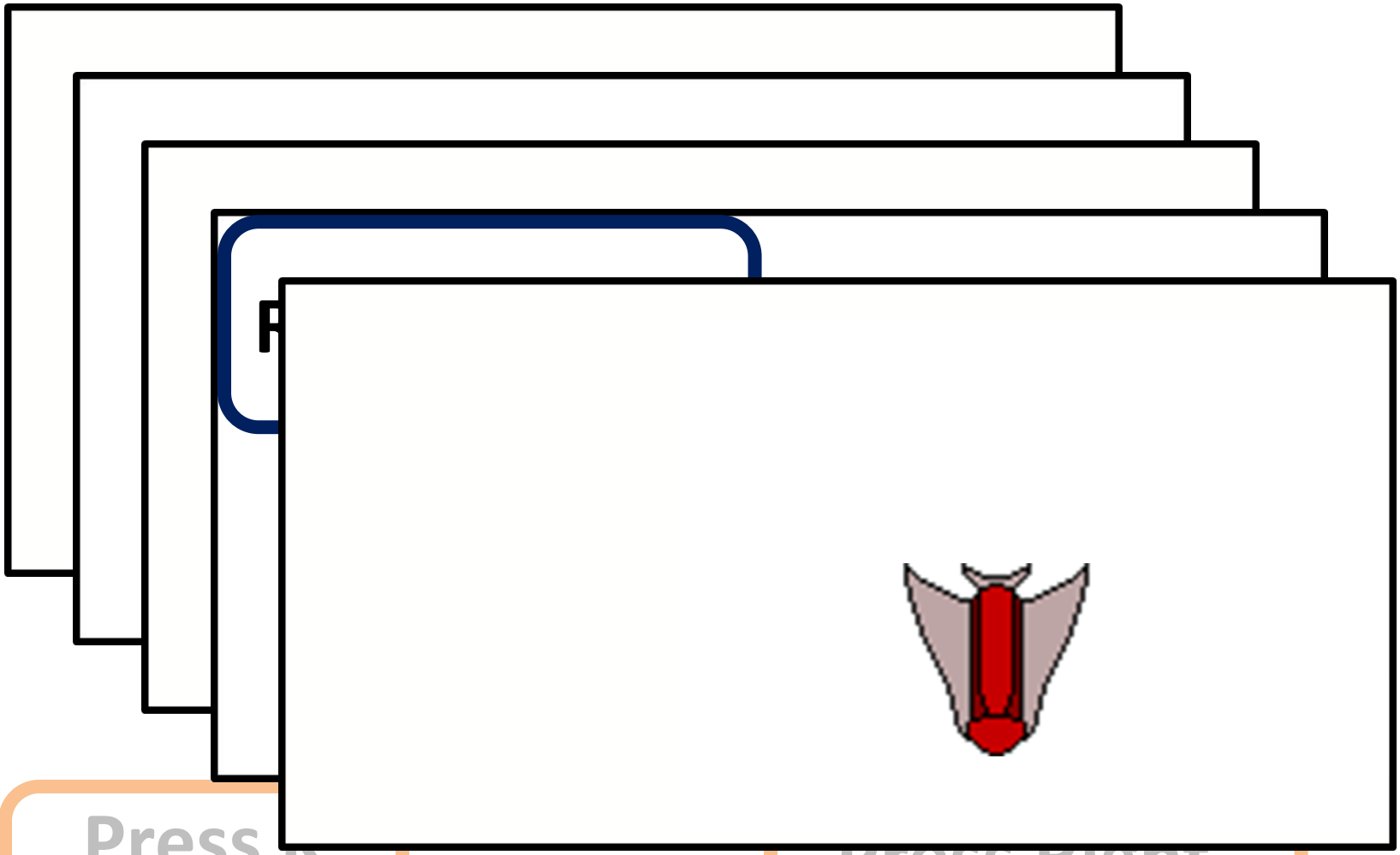

Draw


Draw
Press K
Key


raw
Press K Key
Press Right-Arrow Key

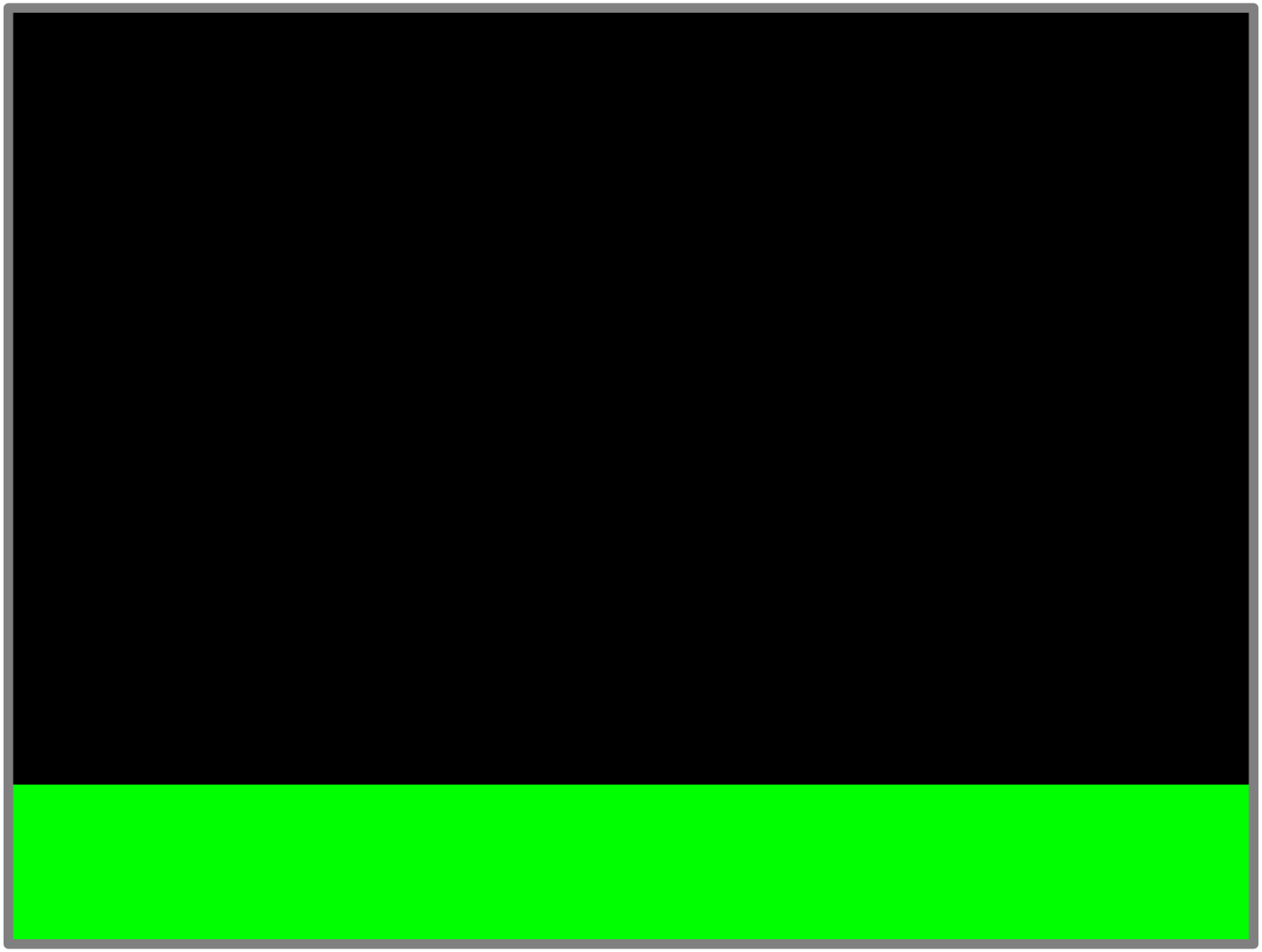

Read 2 Events
Press K Key
Press Right-Arrow Key


Read 2 Events
Draw
Press K Key
Press Right-Arrow Key


Press R
Key
Press Right-
Arrow Key

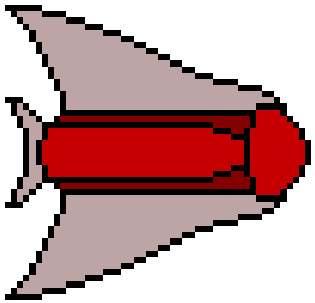
V2

Basic Keyboard Input



V3

Floor

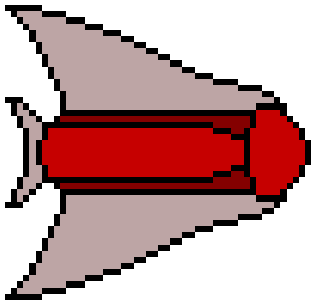


int x

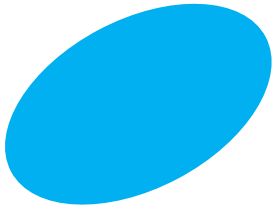
int y

int vx

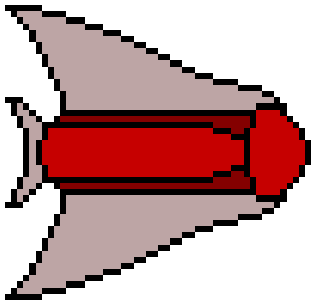
int vy



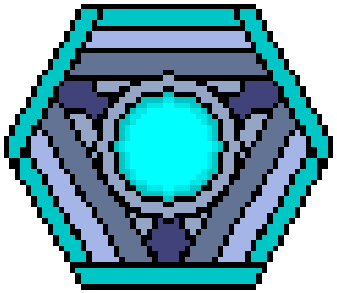
int x
int y
int vx
int vy



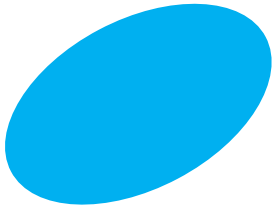
int x
int y
int vx
int vy



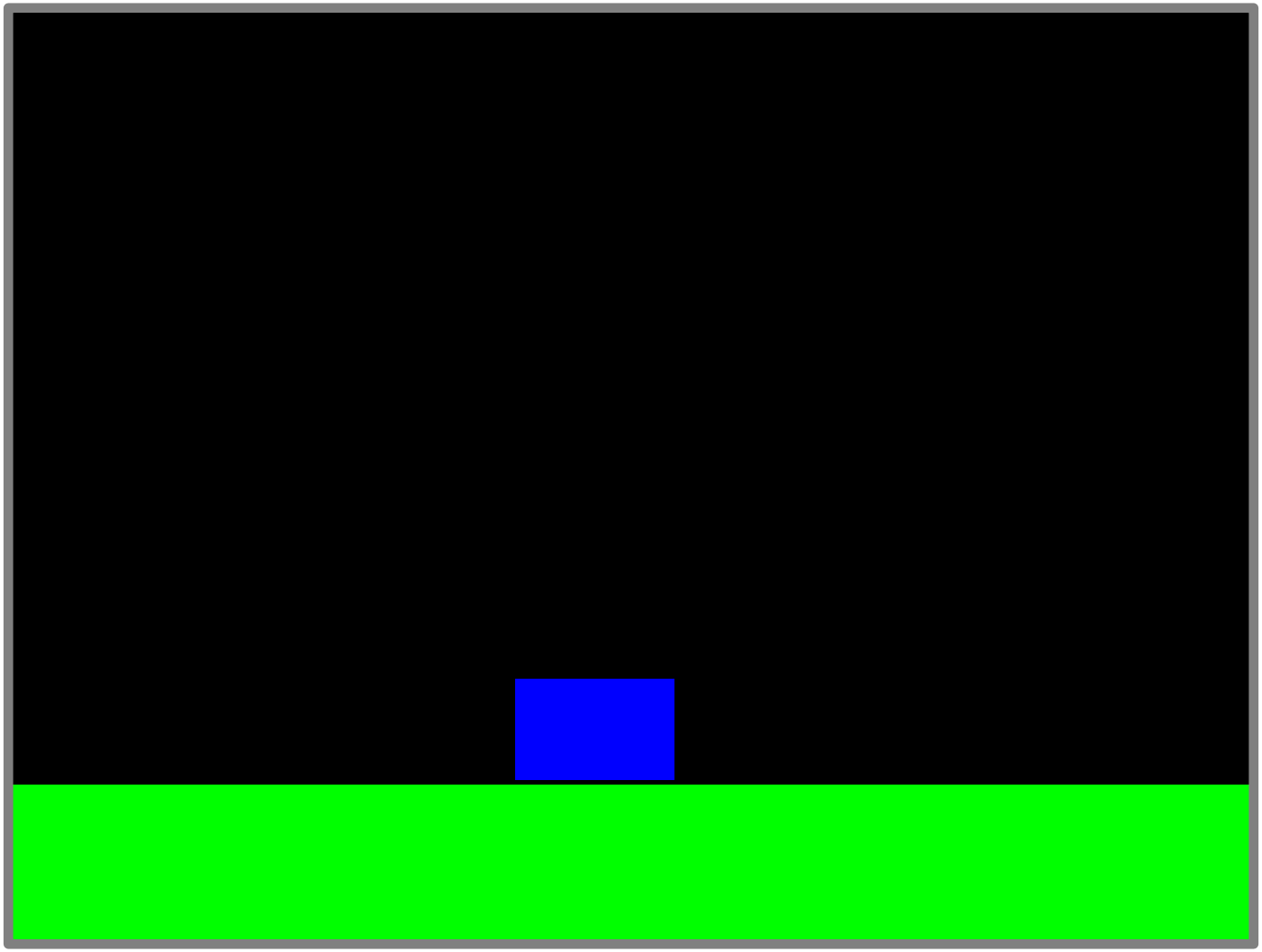
int x
int y
int vx
int vy

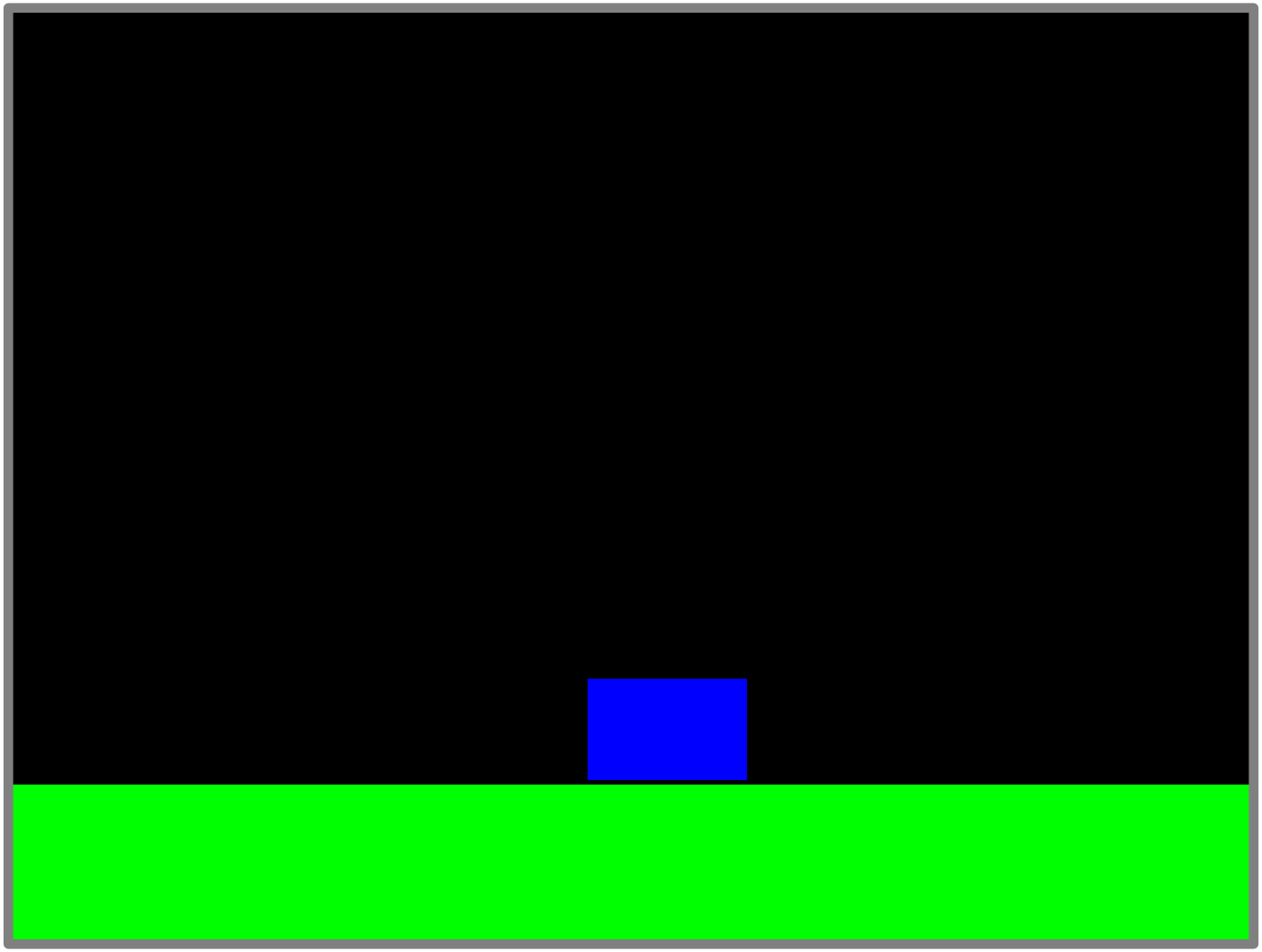


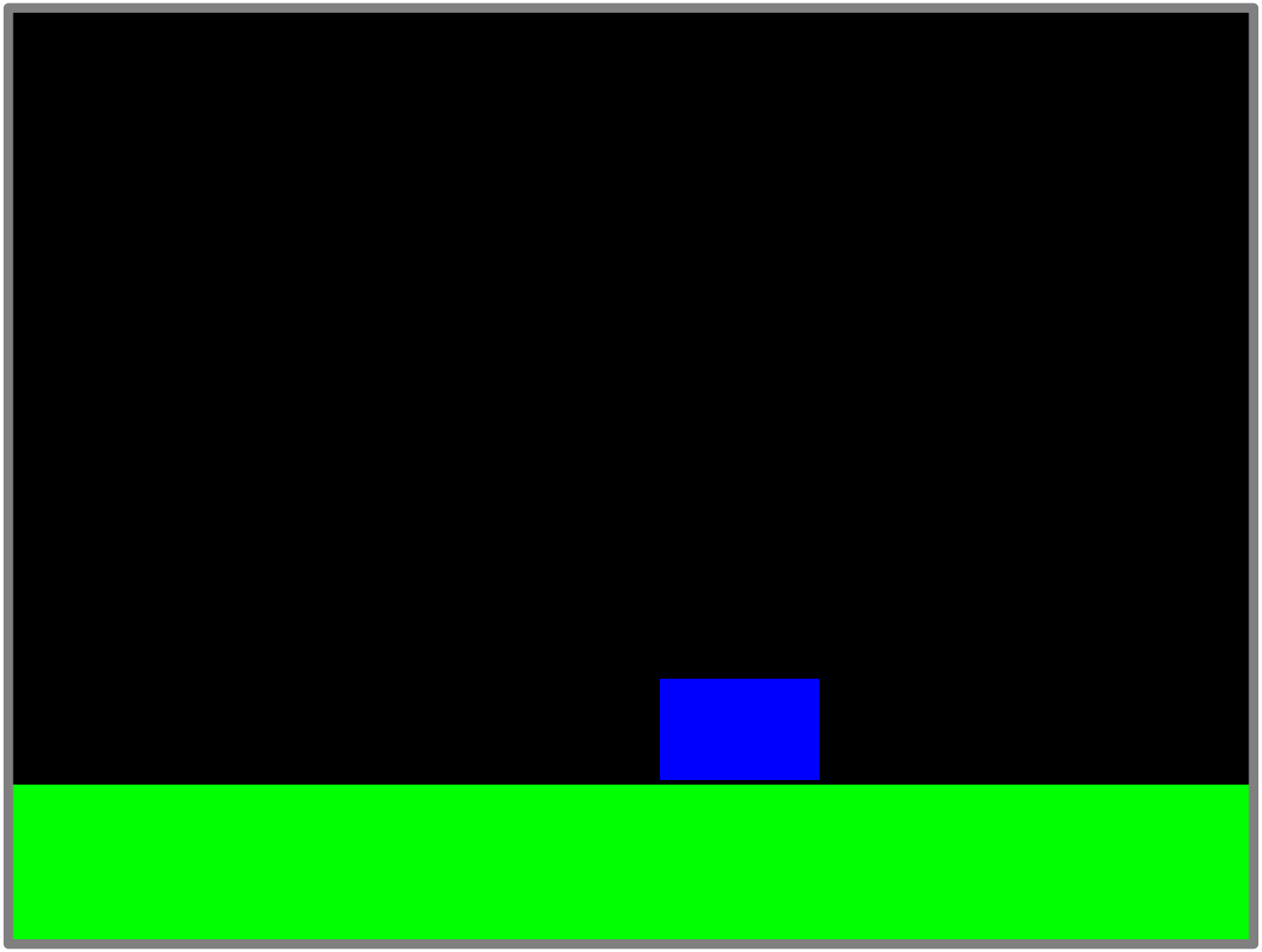
int x
int y
int vx
int vy



int x
int y
int vx
int vy

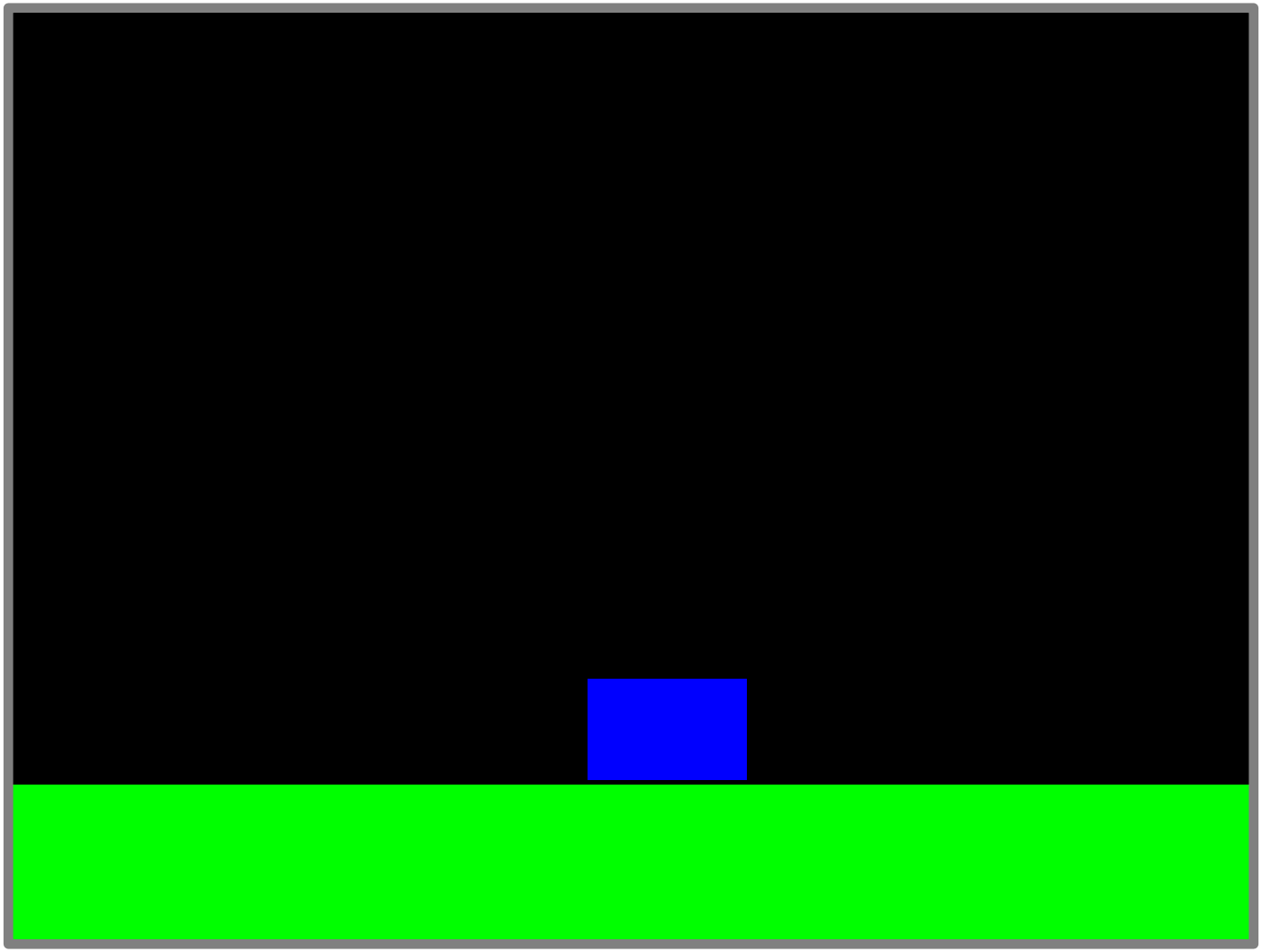


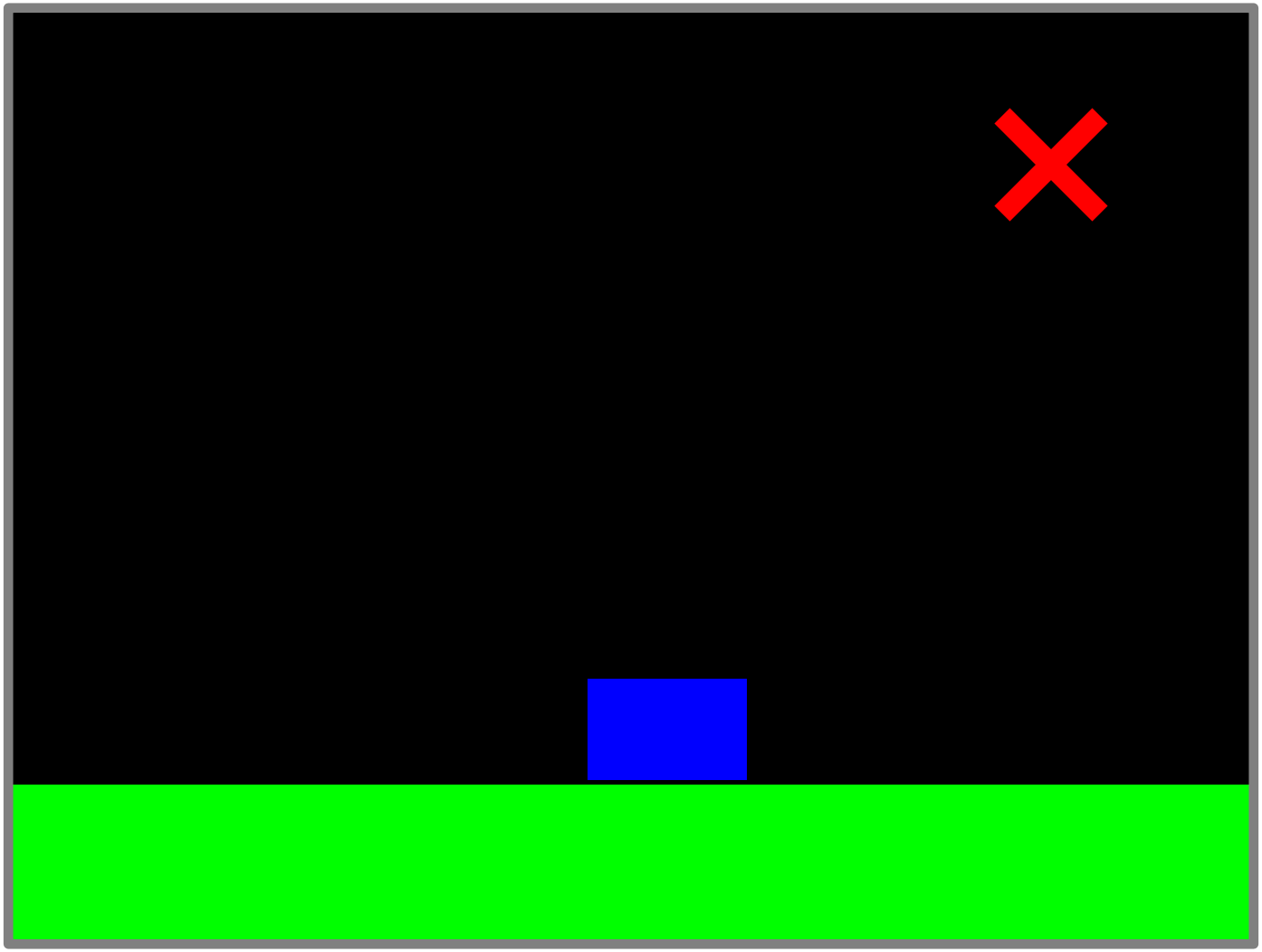


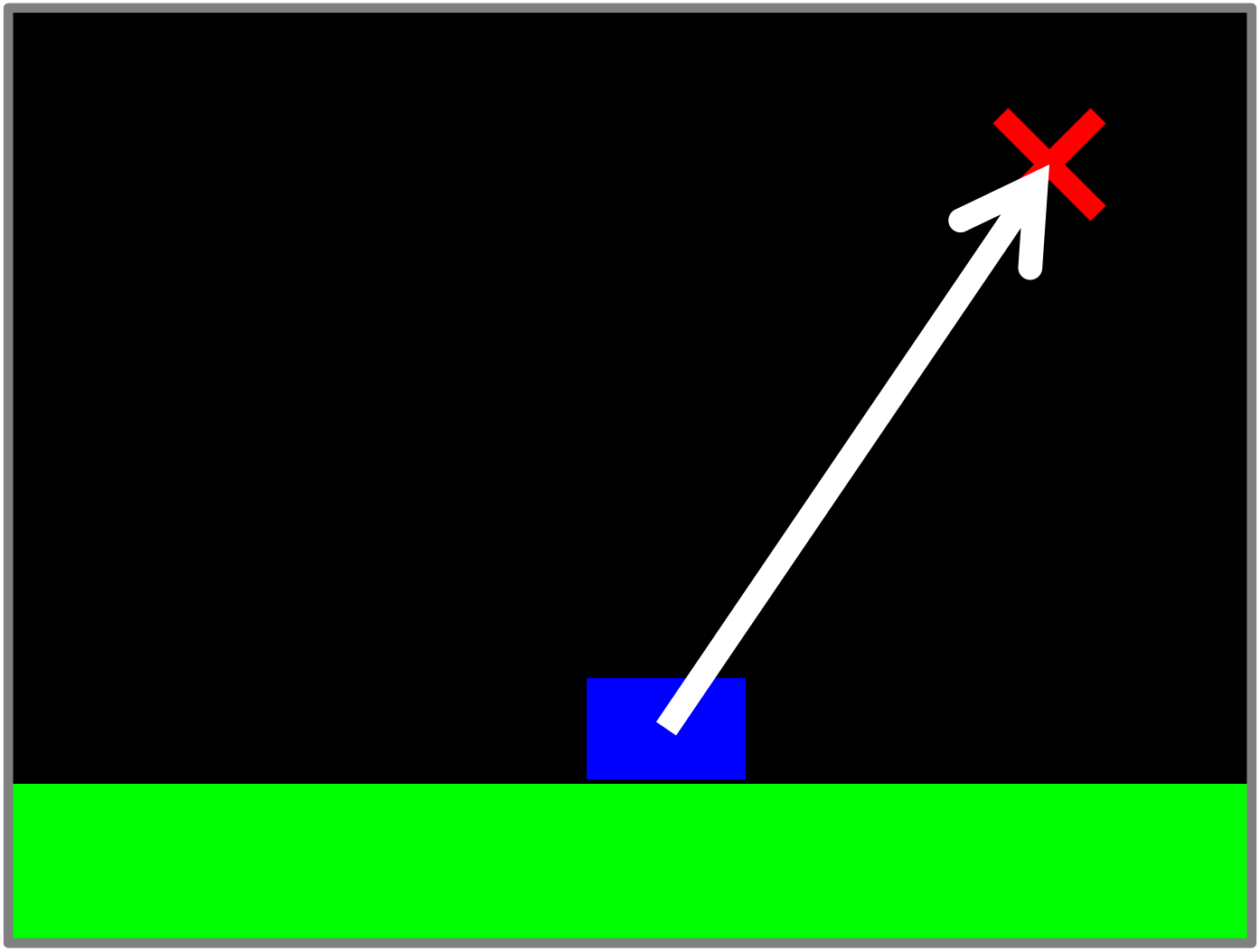


V4

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

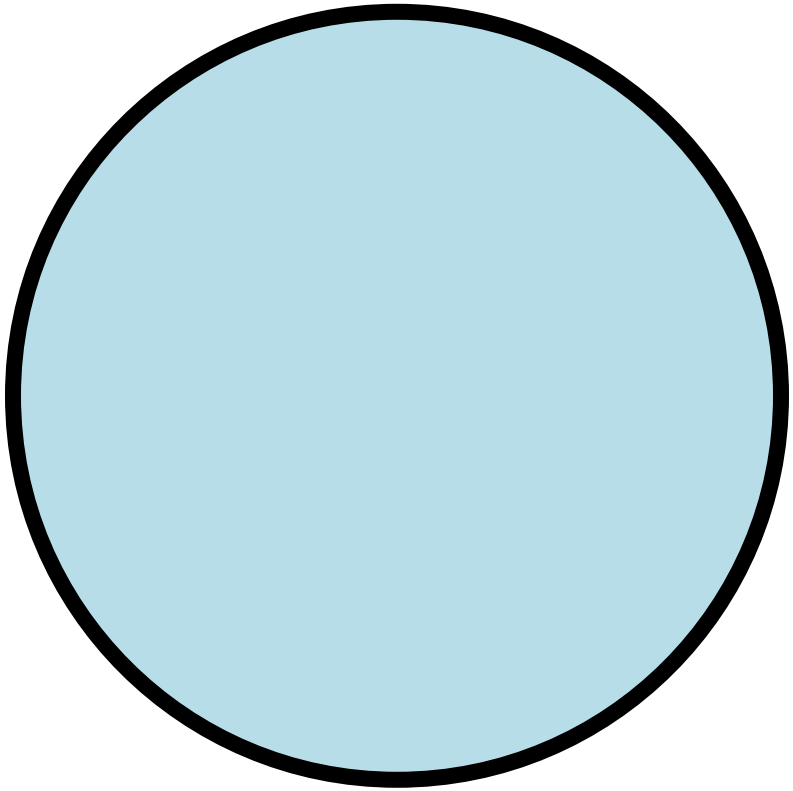
Physics:

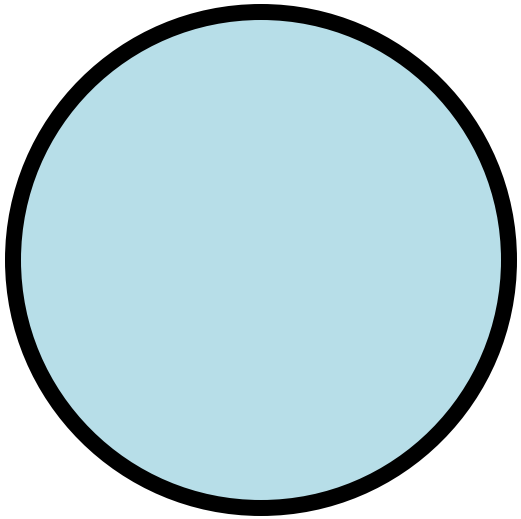
```
vx += ax
vy += ay
x  += vx
y  += vy
```

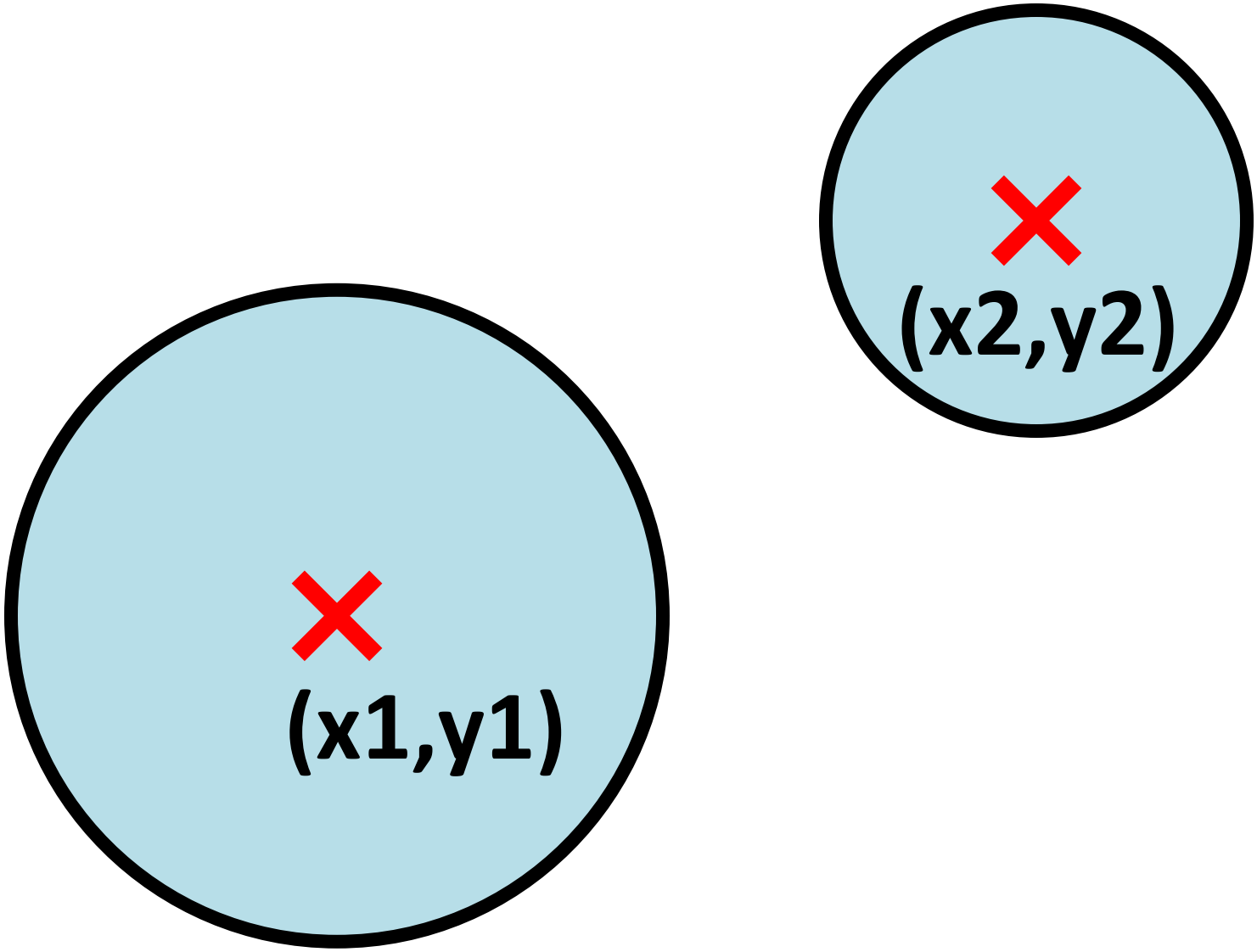
every frame

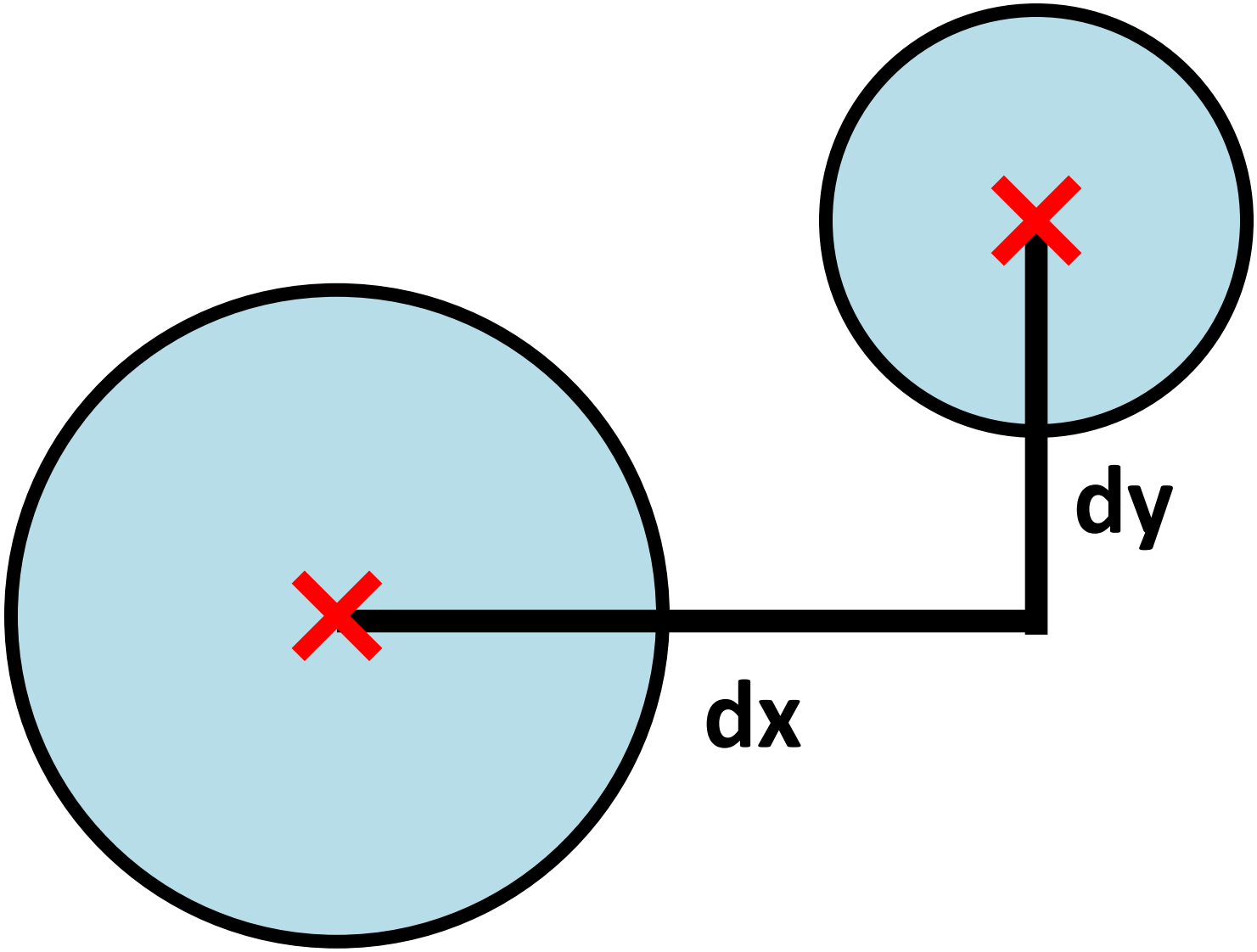
V6

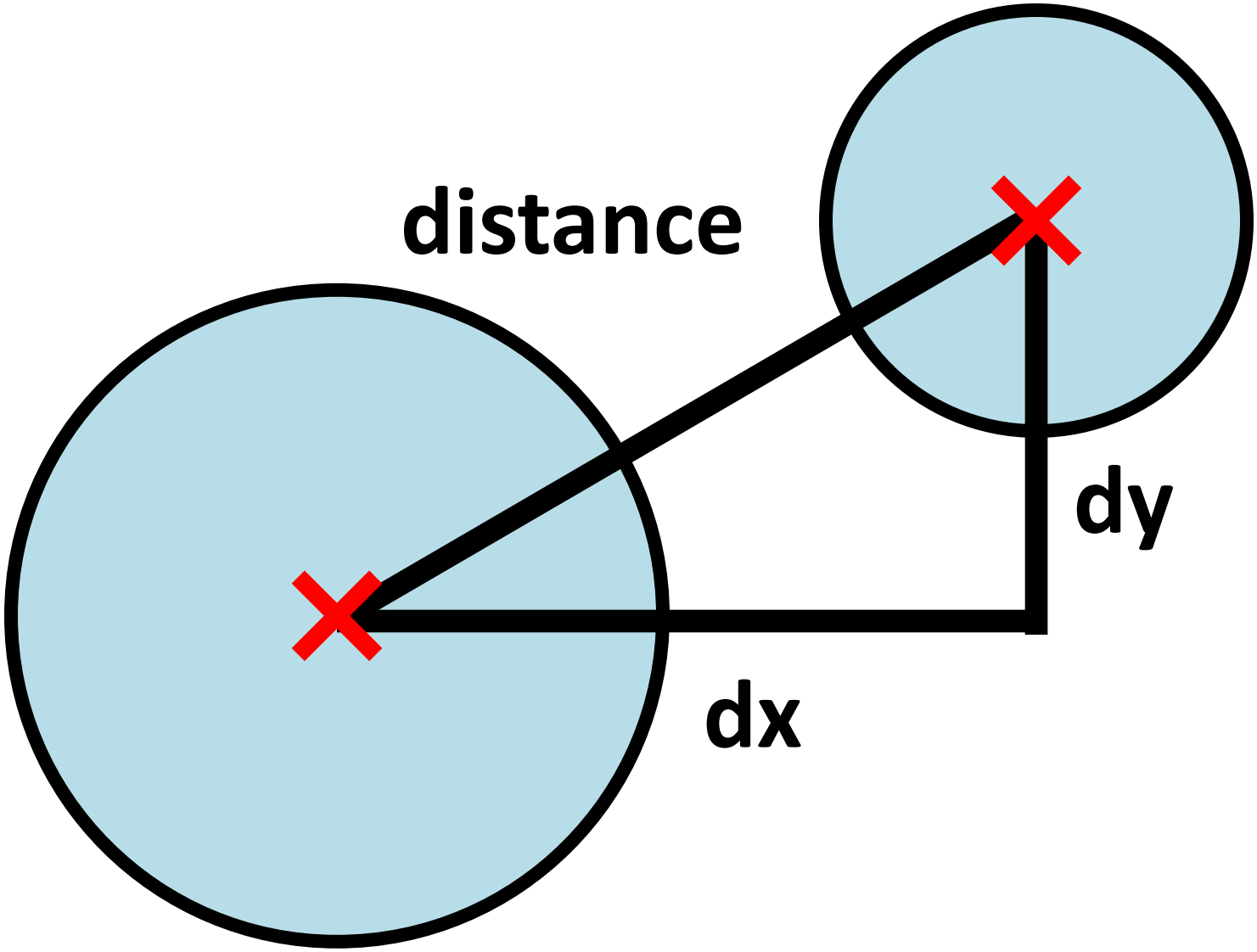
Enemies

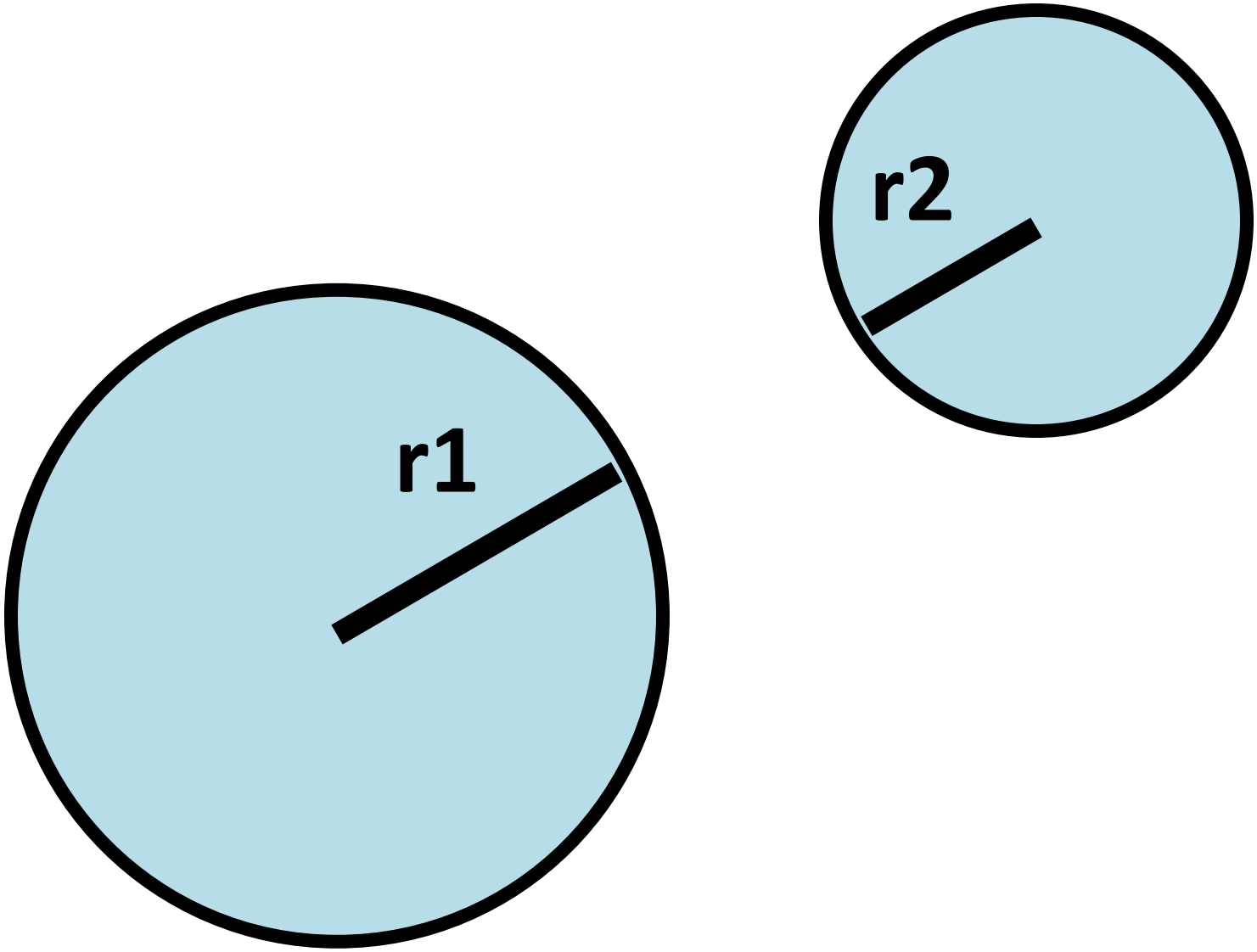


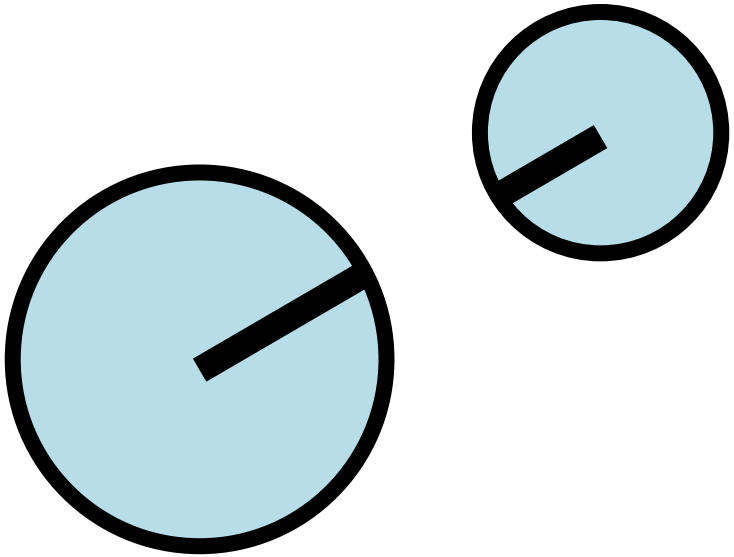


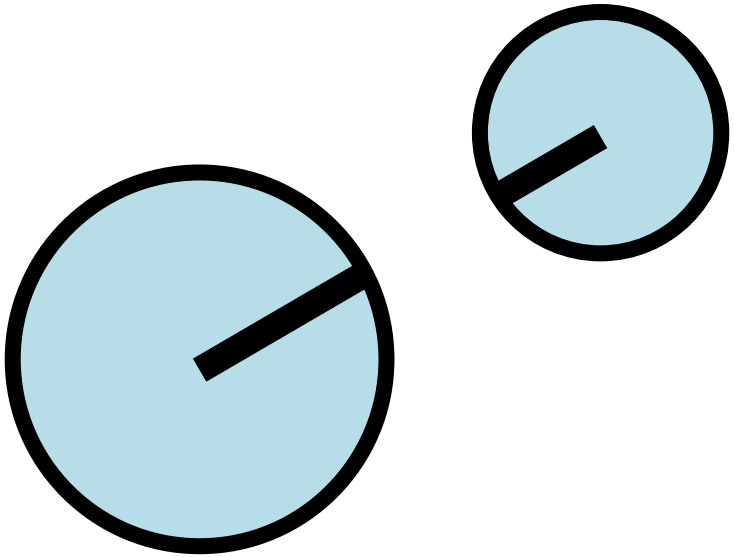

(x2,y2)
(x1,y1)


dy
dx

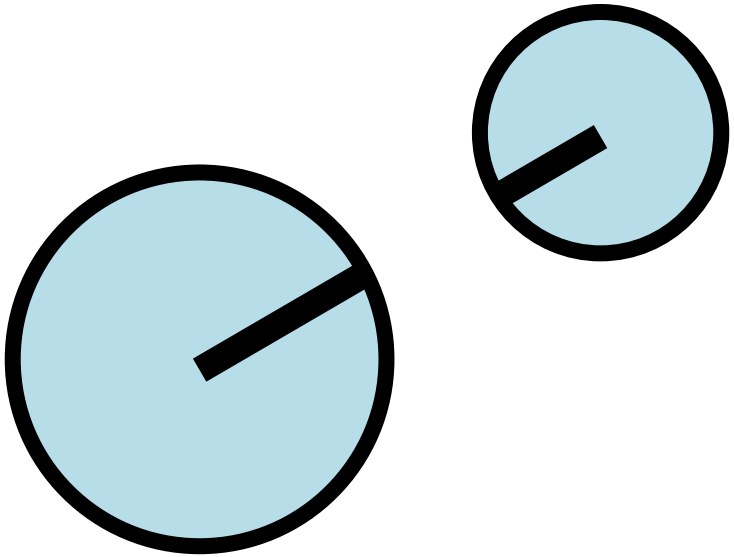

distance
dy
dx


r2
r1

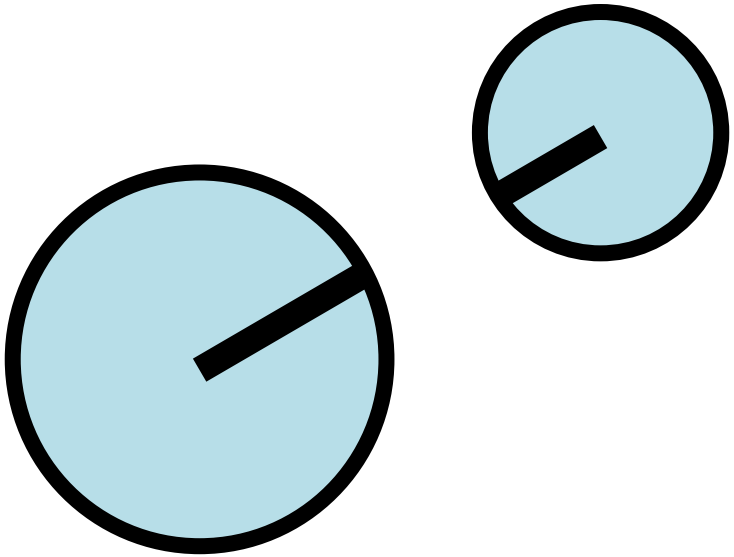




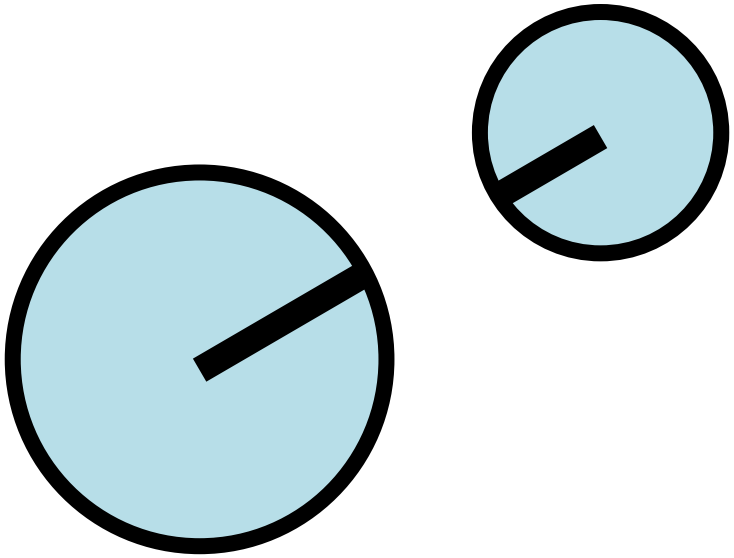
$$dx = x1 - x2$$



$$dx = x1 - x2$$
$$dy = y1 - y2$$



$$dx = x1 - x2$$
$$dy = y1 - y2$$
$$r = r1 + r2$$



$$dx = x1 - x2$$

$$dy = y1 - y2$$

$$r = r1 + r2$$

$$dx*dx + dy*dy <= r*r$$

V7

Collision Detection

V8

Restart Game

End

ACKNOWLEDGEMENT

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