

## Conditionals and Loops

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Time: Mon. 6:10 – 9:10pm

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Course website: <http://programming101.cs.nccu.edu.tw>

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# Recaps

- ▣ What's the difference between **static mode** and **dynamic mode**?
  - ▣ How to detect mouse press or key press?
  - ▣ Boundary detection
  - ▣ Slow down a bouncing ball
  - ▣ Press a key to toggle the animation on and off
  - ▣ Press a rectangle button
-

# Static mode vs Dynamic mode

## ▣ Static mode:

```
int x;  
  
size(300, 300);  
  
background(0);  
  
line(10,10,80,80);  
  
//execute statements  
//line by line
```

## ▣ Dynamic mode:

```
int x;  
  
void setup() {  
    size(300, 300);  
}  
  
void draw() {  
    //background(0);  
    ellipse(mouseX, mouseY, 80, 80);  
}
```

run once at the beginning

update forever


build-in variables

# Interrupted by Event

```
void setup() {  
    size(300, 300);  
    background(255);  
}
```


```
void draw() {  
}
```

```
void mousePressed() {  
    ellipse(mouseX, mouseY, 10, 10);  
}
```



triggered by mouse event

```
void keyPressed() {  
    background(255);  
}
```



triggered by keyboard event

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# Exercise: press mouse to draw

- Requirement:
  - draw a line while mouse pressed
  - stop drawing while mouse released

<https://gist.github.com/jonesfish/26a43cbe448f8dfa8a70>

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# Boundary detection

```
int x;

void setup() {
  size(300, 300);
  background(255);
  x = width;
}

void draw() {
  background(255);
  ellipse(x, height/2, 10, 10);
  x-=10;
  // move to the right side of the screen
  // when it hits the edge
}
```

```
if (x<0){
  x = width;
}
```

# Slow down a bouncing ball

- ▣ [https://github.com/shiffman/LearningProcessing/blob/master/chp05\\_conditionals/example\\_5\\_6\\_bouncingball/example\\_5\\_6\\_bouncingball.pde](https://github.com/shiffman/LearningProcessing/blob/master/chp05_conditionals/example_5_6_bouncingball/example_5_6_bouncingball.pde)
- ▣ Why it gets stuck when  
`xspeed = xspeed * -0.9;`

<https://gist.github.com/jonesfish/6675e53d7970a9486308>

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## Press a key to toggle the animation

- start from Boundary detection and add code to pause/start the animation by pressing a key

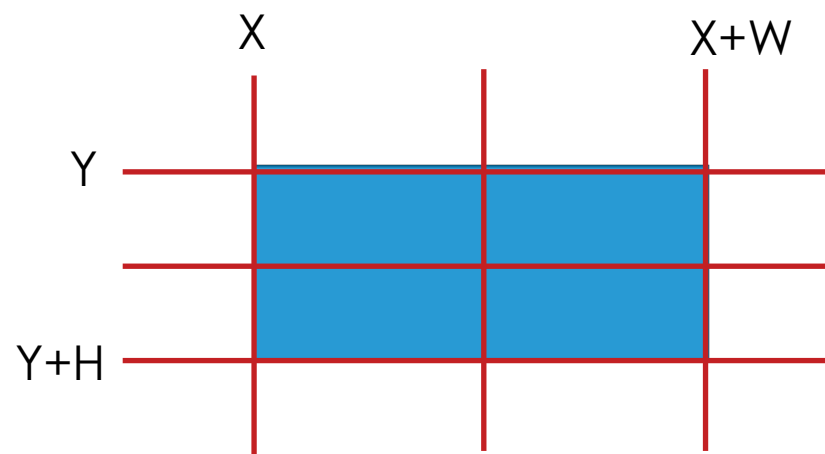
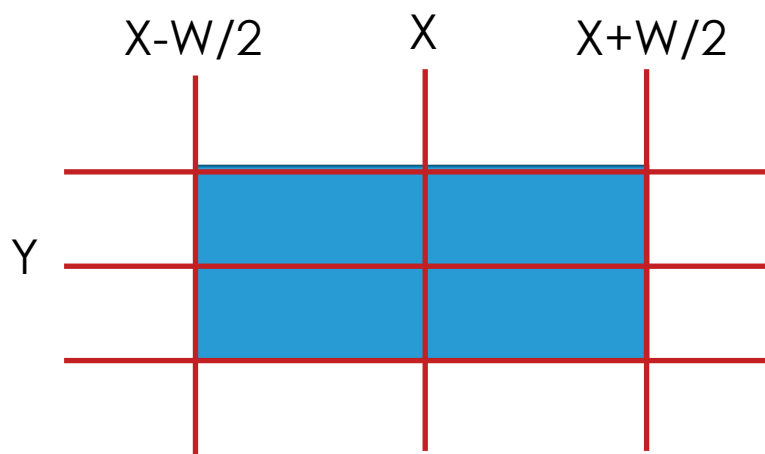
<https://gist.github.com/jonesfish/0fe3802be10f87af5148>

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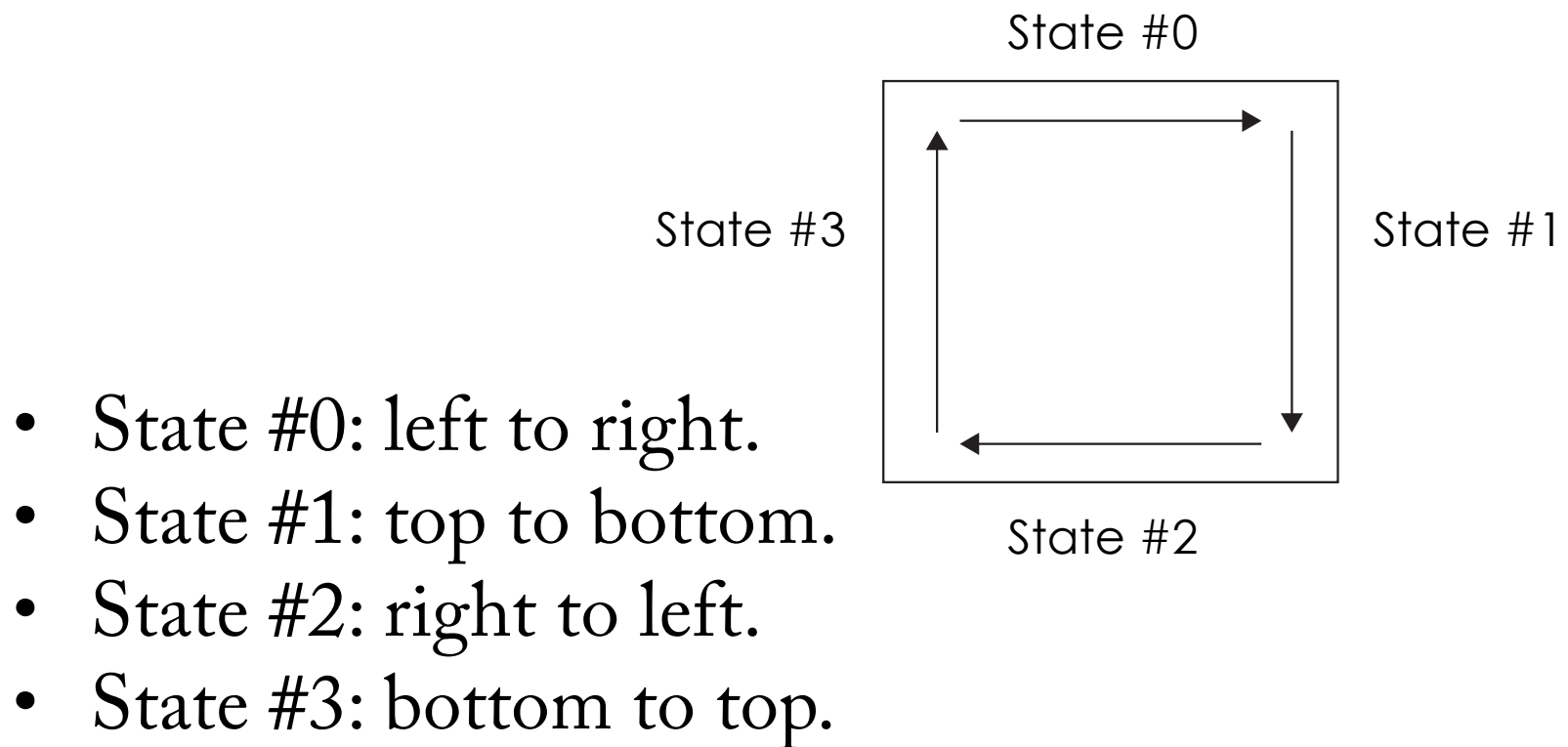
# Press a Button

- Press a button to clear the screen
  - start from previous exercise: mouse drawing



<https://gist.github.com/jonesfish/93156f276a702bb13b21>

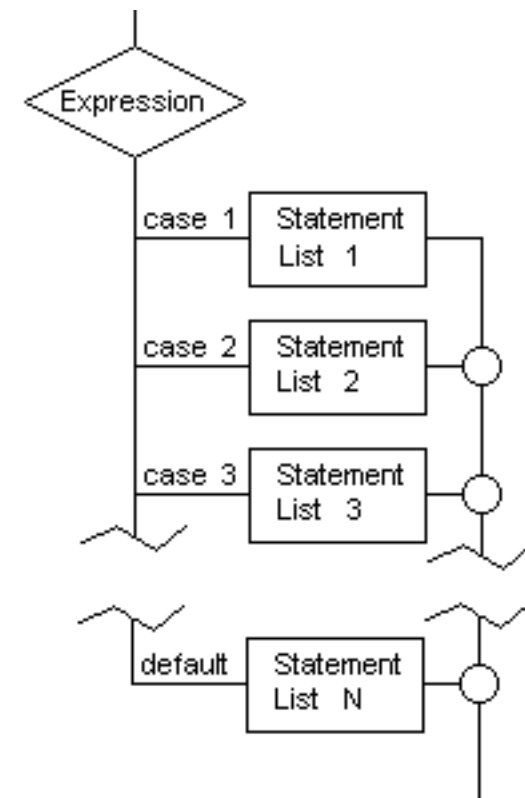
# State machine





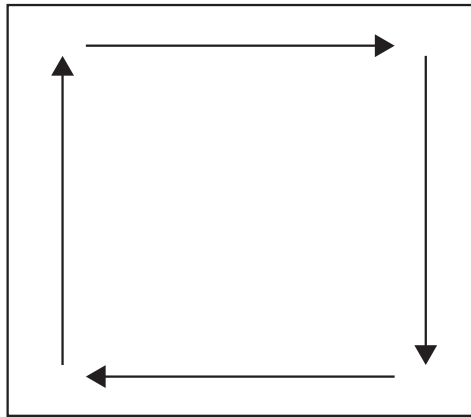
# switch statements

```
switch ( expression ) {  
  if      case cond1:  
    do something...;  
    break;  
  elseif  case cond2:  
    do something...;  
    break;  
  else    default:  
    do something...;  
    break;  
}
```



```
char grade = 'B';  
switch(grade){  
    case 'A':  
        println("Great job - you are getting an A");  
        break;  
    case 'B':  
        println("good job - you are getting a B");  
        break;  
    case 'C':  
        println("average - you are getting a C");  
        break;  
    case 'D':  
        println("work harder - you are getting a D");  
        break;  
    case 'F':  
        println("I'm sorry - you are failing");  
        break;  
    default:  
        println("Invalid data");  
        break;  
}
```

## Exercise: Square following edge



Rewrite squareEdge.pde with "Switch statement"

5mins

# Lottery

```
int rnd;  
  
rnd = (int)random(6)+1;  
  
println(rnd);  
  
switch (rnd){  
    case 1:    case 2:    case 3:  
        println("win");  
        break;  
    default:  
        println("lose");  
}
```

Example: lottery

# Keyboard control

```
void keyPressed() {  
  if (key == CODED) {  
    switch( keyCode )  
    {  
      case UP:  
        ySpeed -= thrustY;  
        break;  
  
      case DOWN:  
        ySpeed += thrustY;  
        break;  
    }  
  }  
}
```

<https://gist.github.com/jonesfish/44308c500987d7d93d25>

<https://gist.github.com/jonesfish/9513b11ef926adec637d>