Functions & Interactivity

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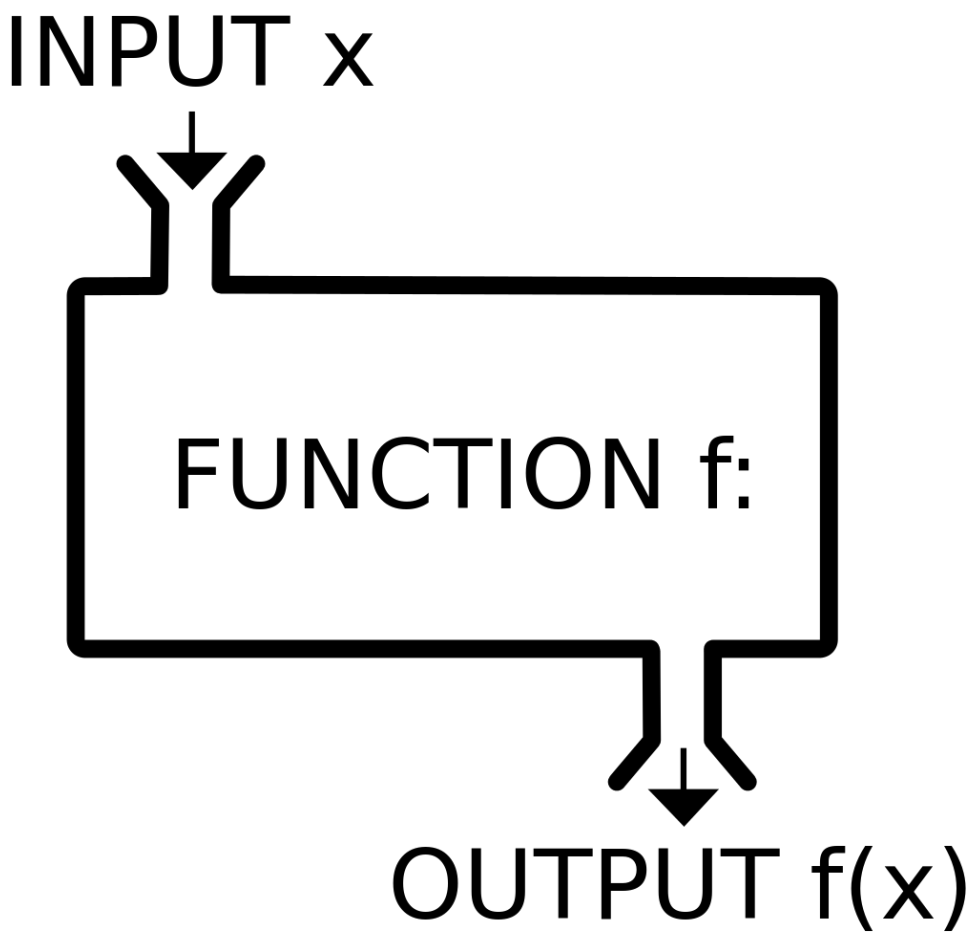
Learning Goals

- What is a function and why is it useful?
- What is a keyword?
- What is the difference between implementing and calling a function?
- How are the x and y values for arcs and rectangles different in p5.js?



Functions

- "Chunk" code into meaningful tasks/instruction sets.
- Allow for code to be repeated more easily

In p5.js,

- **setup()** is called when the program is first run, just like Arduino
- Arduino has **loop()** that infinitely repeats, in p5.js, we use **draw()**

Try it: `random()` and `draw()`

1. Duplicate your creature sketch to creatureV2
2. Move everything in **`setup()`** *EXCEPT creating the canvas and setting the background* to a new function called **`draw()`**
3. Set the background to a random color (explore **`background()`** and **`random()`** in the docs)
4. Try moving the background to **`draw()`** and see what happens. Why does this happen?

Interactivity through Events

Consider the code here

- What is happening on Line 1?
- Line 8?
- Lines 11-13?
- What do you expect to see when you first run the program?
- What about after you push <enter> on the keyboard?

```
1  var bgColor = 255;
2
3  function setup() {
4    createCanvas(600, 600);
5  }
6
7  function draw() {
8    background(bgColor);
9  }
10
11 function keyPressed() {
12   bgColor = color(random(256),random(256),random(256));
13 }
```

keyPressed() is built-in function that you can find in the p5.js API

Move the Creature

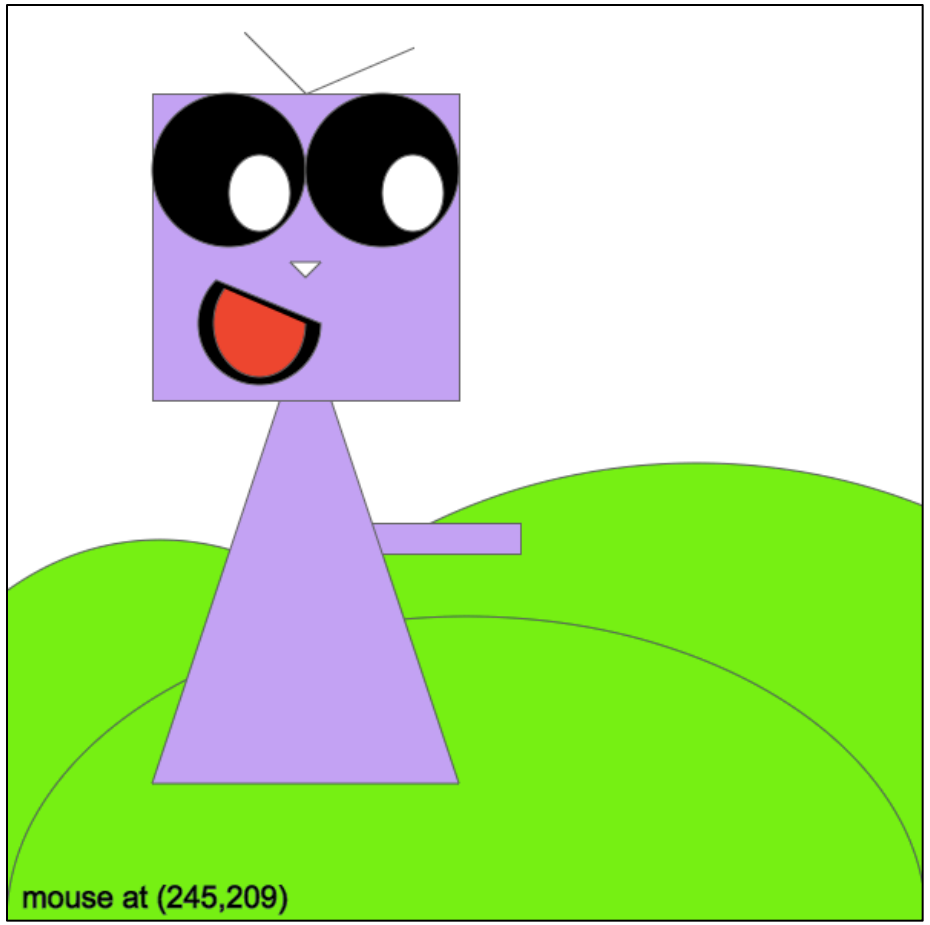
Let's try something using the fact that the **`draw()`** function is being called repeatedly…

- Add **`translate(mouseX, mouseY);`** at the top of **`draw()`** (inside the **`{}`**s though)
  - Note that **`mouse`** is written in lowercase letters, and the **`X`** and **`Y`** are uppercase; this is required, as these are keywords in p5.js
- After adding the code, run your program and move your mouse.
  - What happened?
  - Why?

Repeat a shape on the Canvas

- Let's create a background of rolling hills for our creature

```
8  function draw() {
9    background(255);
10   hill(-100,600,400,500);
11   hill(100,600,700,600);
12   hill(0,600,600,400);
13
14   // your creature code is here
15 }
16
17 function hill(x,y,w,h) {
18   fill(color(0,255,0));
19   arc(x+(w/2), y, w, h, PI, 0, PIE);
20 }
```



More about functions

- Define/implement
  - put stuff in the {}s
- Use/call
  - tell the function to execute
- Overriding
  - give a new definition/implementation to an inherited function