An Introduction to Processing

A recap on Processing

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Recap on Processing

What is Processing?

Processing is a programming language, development environment, and online community …

What is Processing?

Processing is a programming language, development environment, and online community …

…can be used to develop static or interactive online material and data visualisations.

…is often used by visual artists.

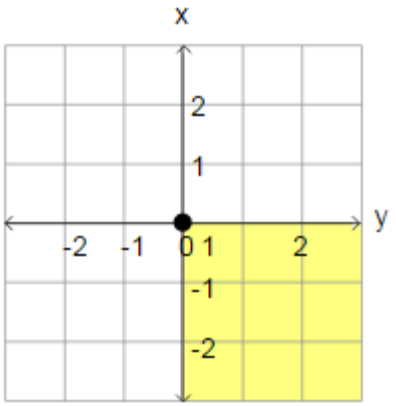
…produces visual and interactive representations of programming code.

What is Processing?

- Different programming languages can be used with Processing e.g. :
  - Java: we are using this language.
  - JavaScript
  - Python
  - CoffeeScript
  - Etc.

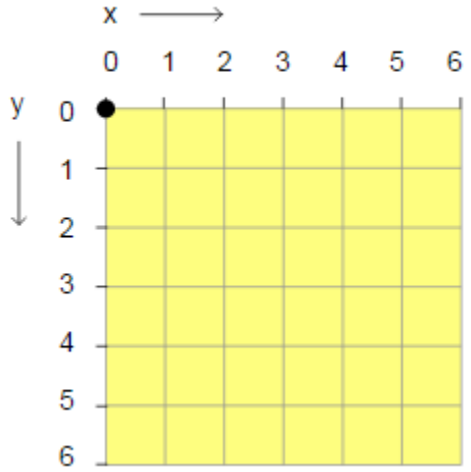
Coordinate System in Computing

In Geometry,
we use this type of
coordinate system:



point (0,0) is in the centre.

In Computing, we use this type of coordinate system to represent the screen:

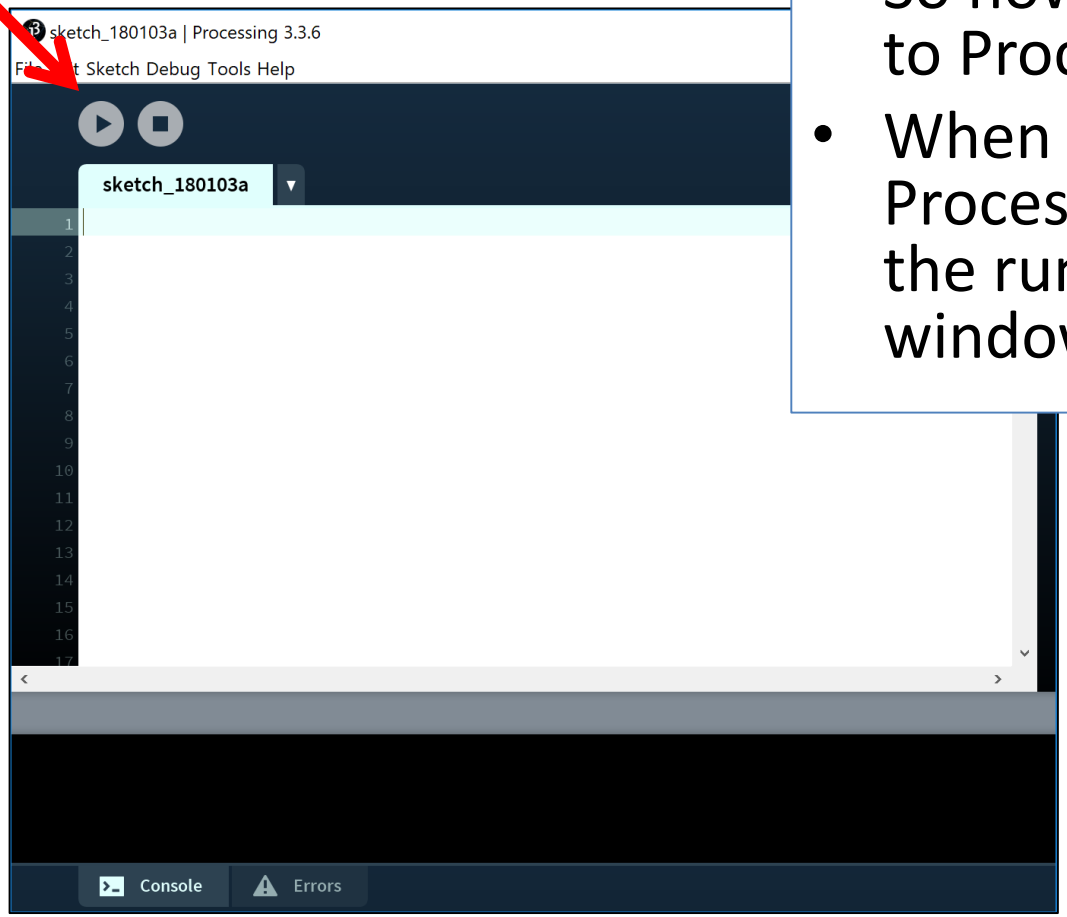


point (0,0) is in the top left hand corner. Each number is a pixel.

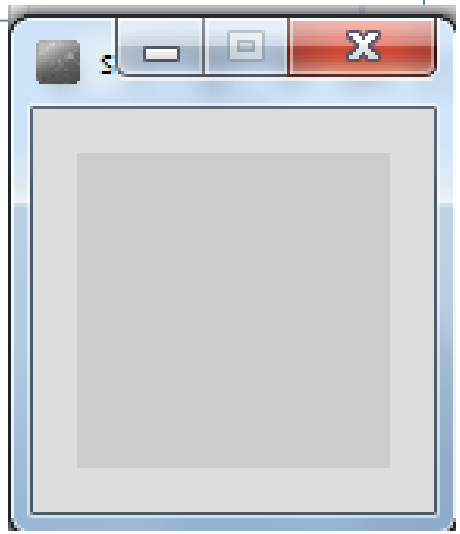
https://processing.org/

Coordinate System in Computing

Run button



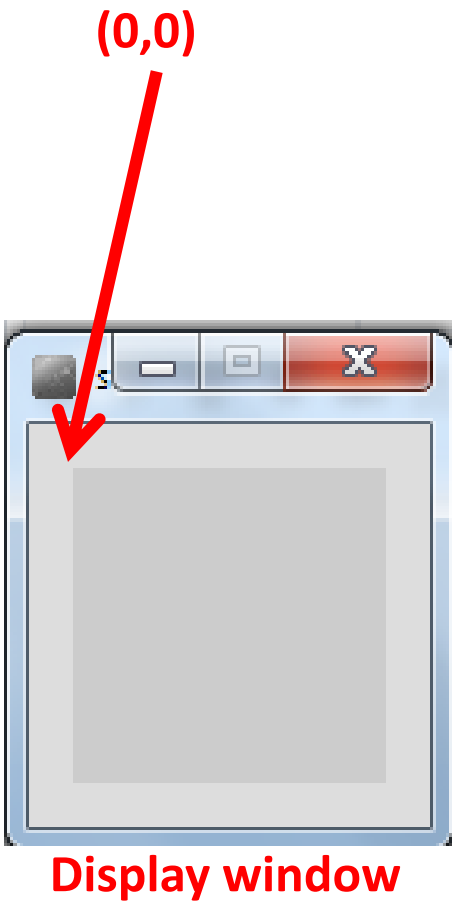
- So how does this relate to Processing?
- When you open Processing and click on the run button, a display window pops up.



Display window

Coordinate System in Computing

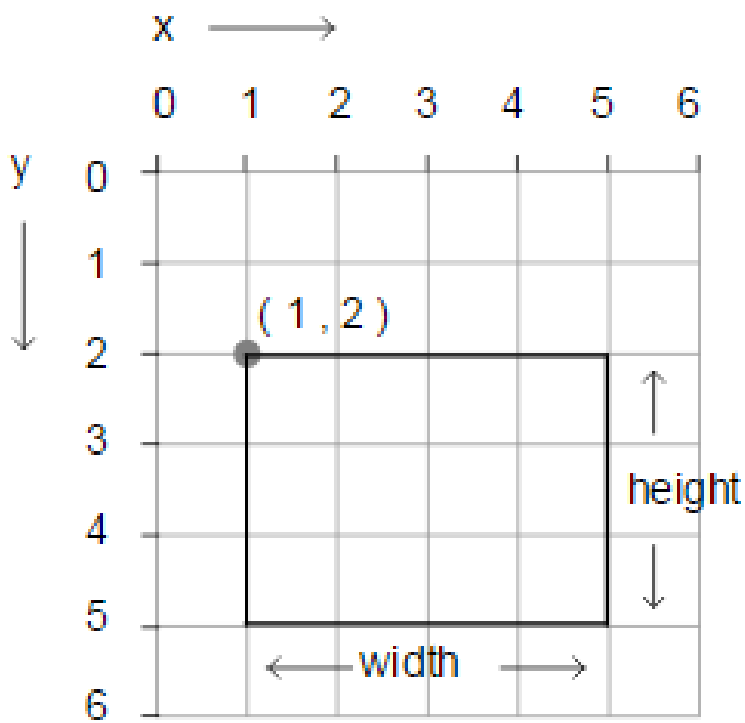
- The display window is where your code is run/ displayed.
- It follows the rules of the Computing coordinate system i.e. the top left hand corner is (0,0).
- A point (10,20) is 10 pixels to the right of (0,0) and 20 pixels below (0,0).



Functions in Processing

- Processing comes with several pre-written functions that we can use.
- A function comprises a set of instructions that performs some task.
- When you call the function, it performs the task.
- We will now look at functions that draw the following shapes:
  - Rectangle, square, line, oval and circle.

rect()



rect(x , y , width , height) ;

Example: rect (1 , 2 , 4 , 3) ;

https://processing.org/

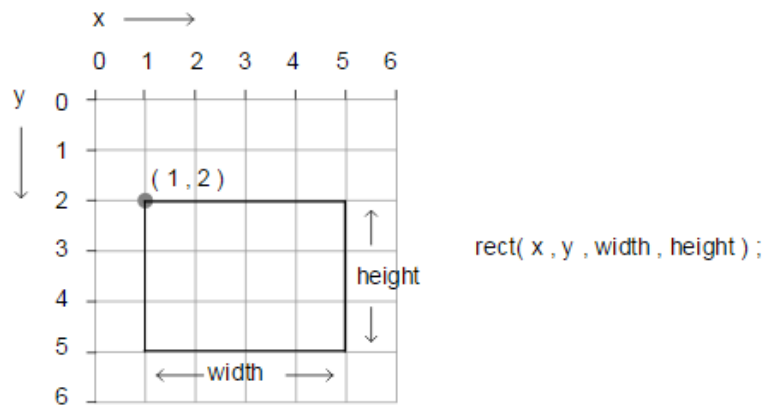
rect() – drawing a rectangle

sketch_180103a | Processing 3.3.6

File Edit Sketch Debug Tools Help

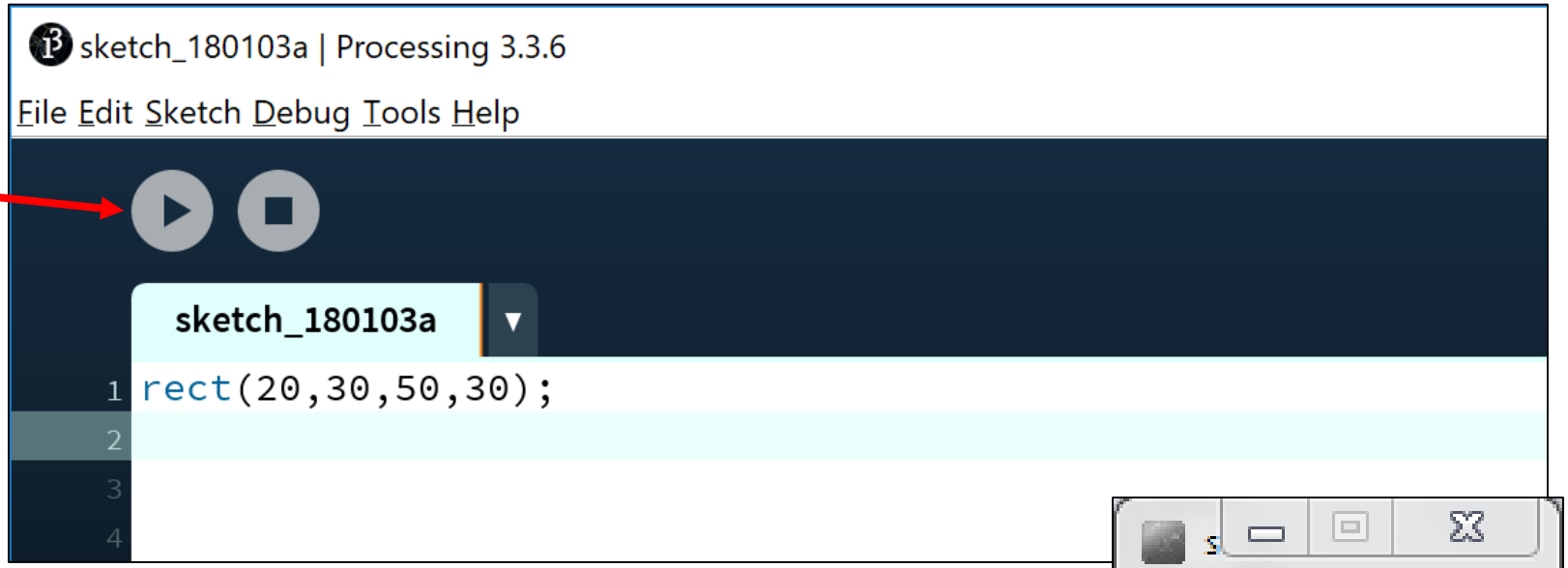
sketch_180103a

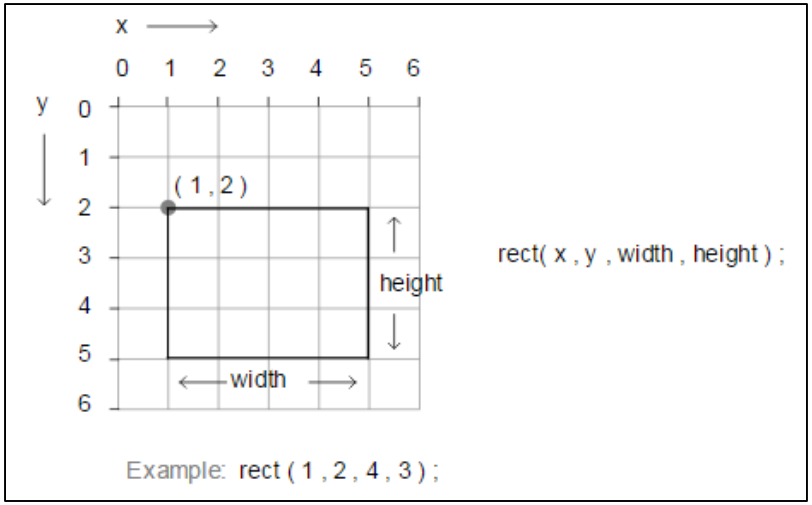
```
1 rect(20,30,50,30);
2
3
4
```

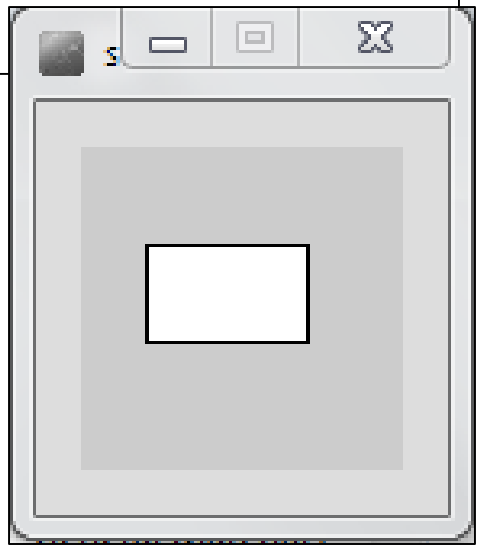


rect() – drawing a rectangle

Click to Run







rect() – drawing a square

sketch_180103a | Processing 3.3.6

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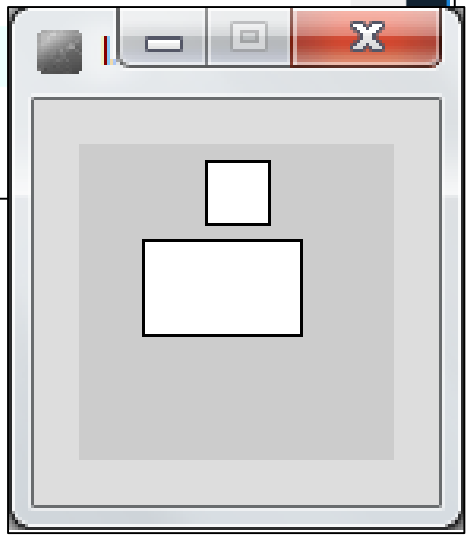
Java ▼

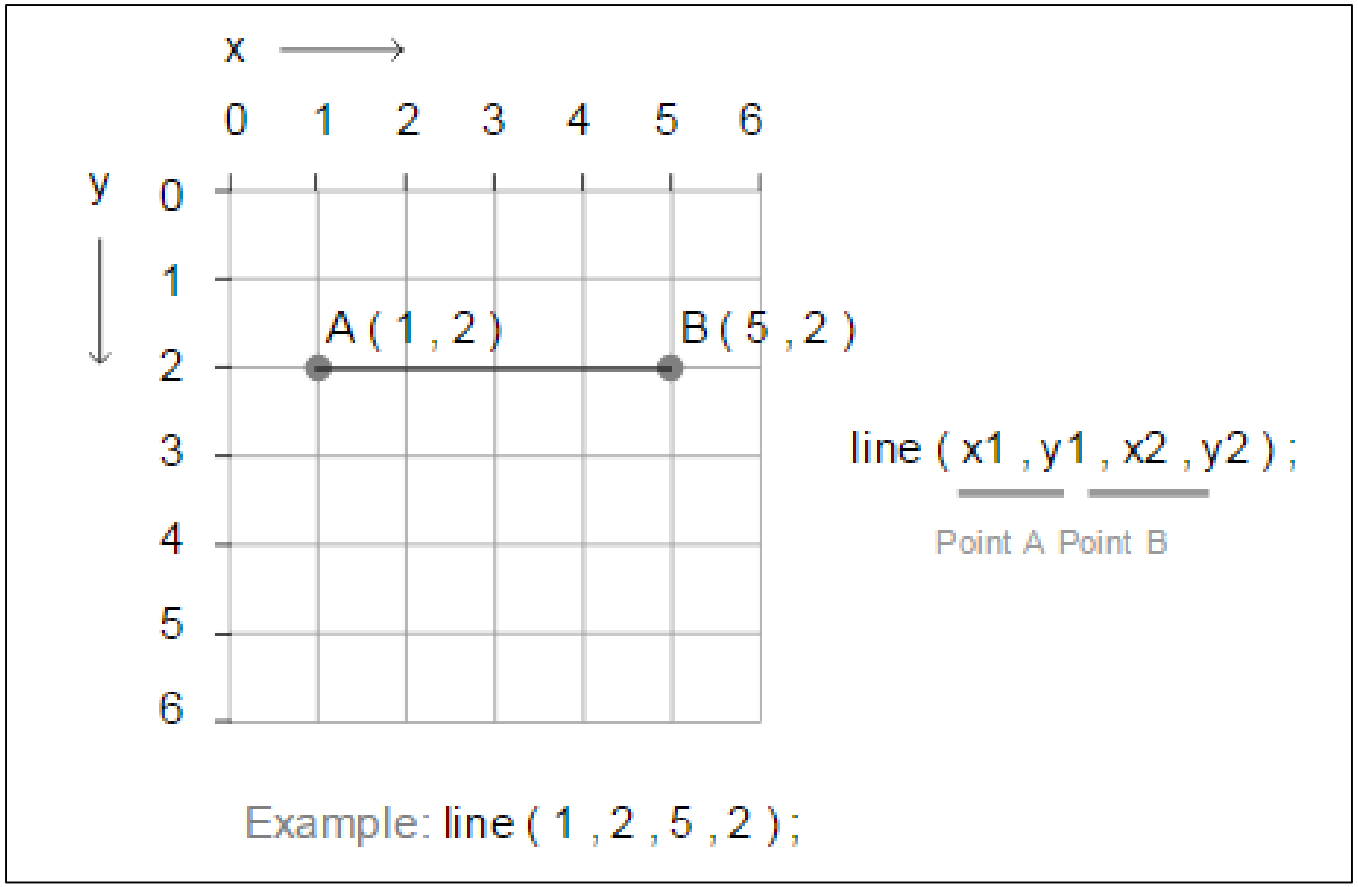
sketch_180103a

```
1 rect(20,30,50,30);
2 rect(40,5,20,20);
3
4
5
```



Note how each line of code has a semi-colon (;) at the end of it. This is called a statement terminator and must be included.

line()



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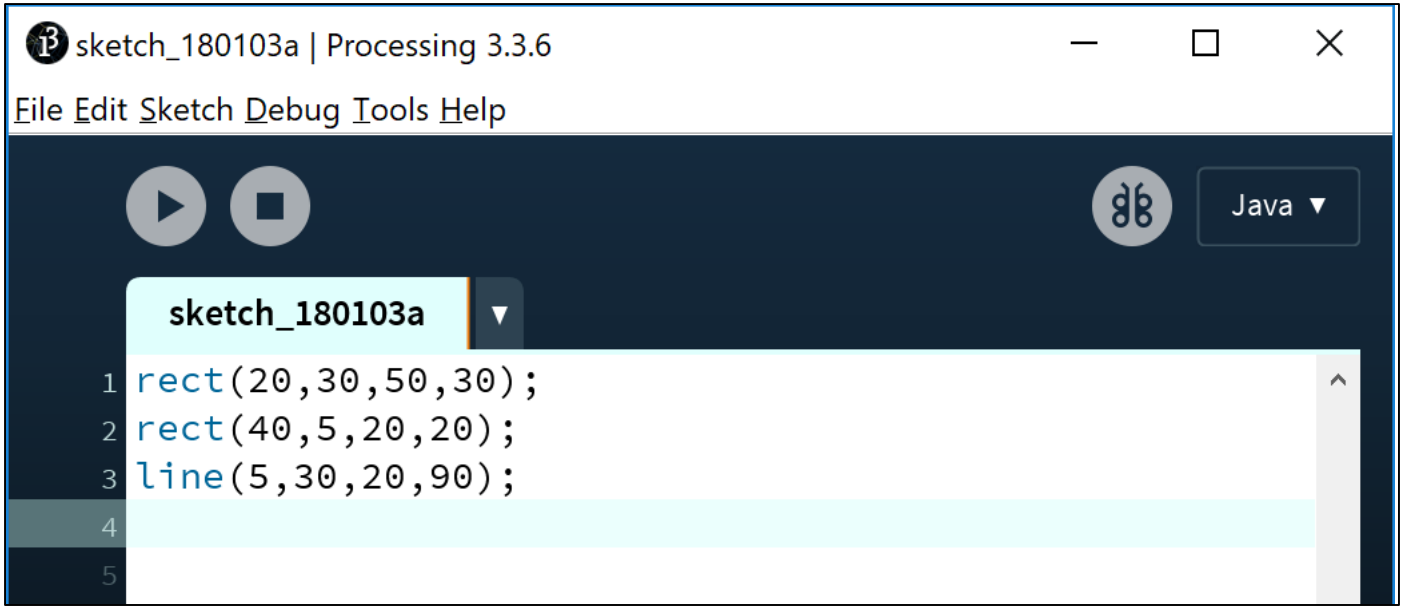
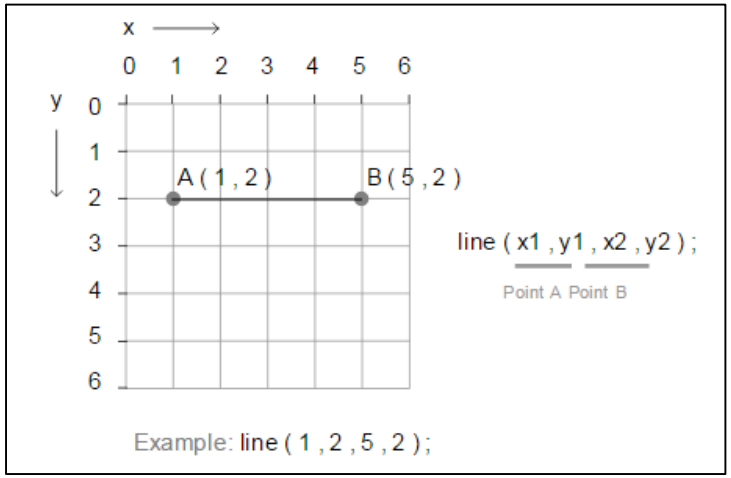
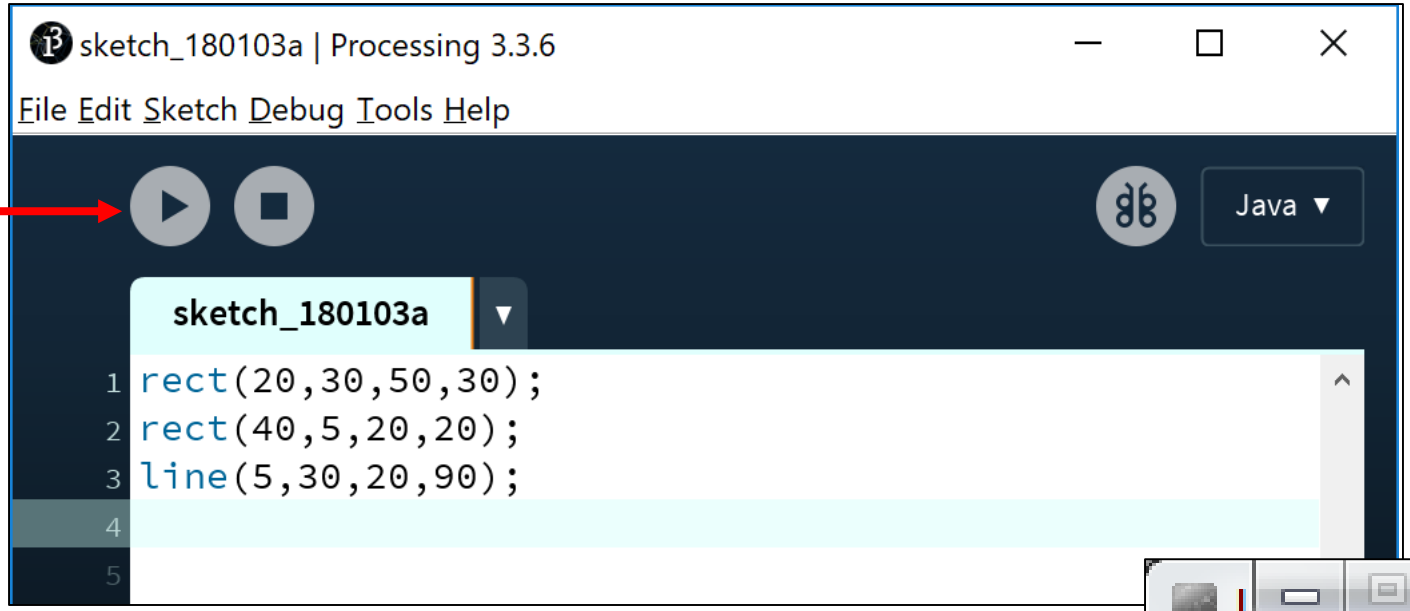
line () – drawing a line

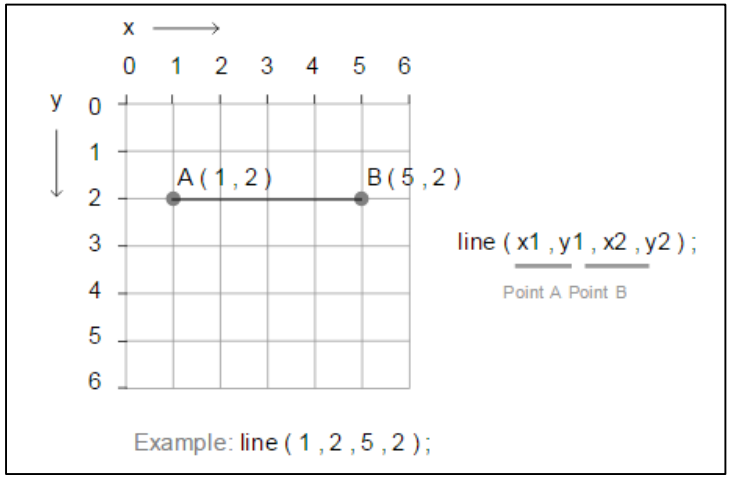


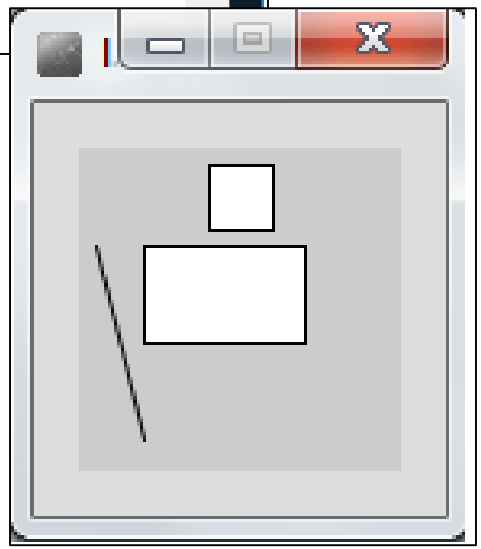


line () – drawing a line

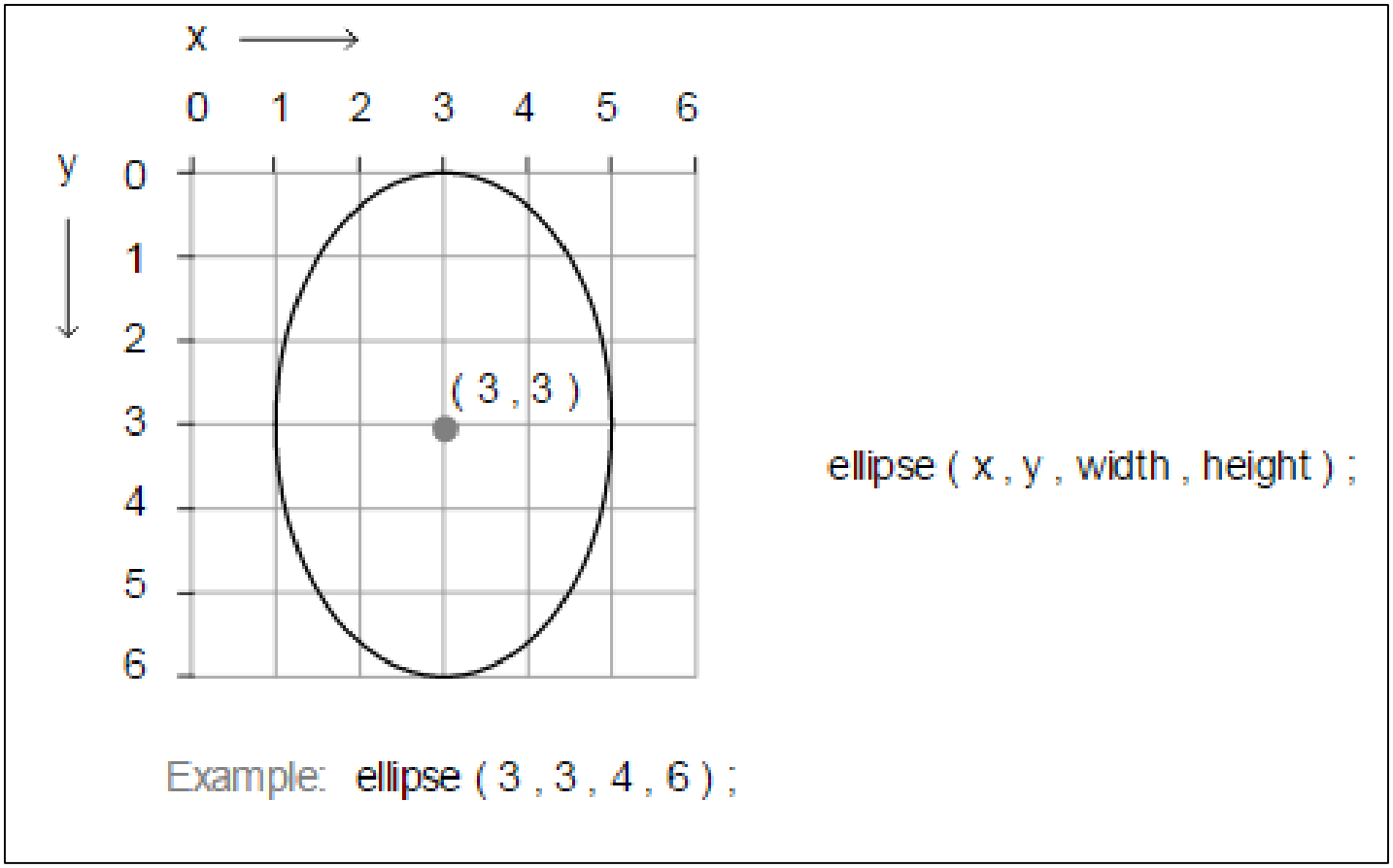
Click to Run







ellipse()



https://processing.org/

ellipse() – drawing an oval

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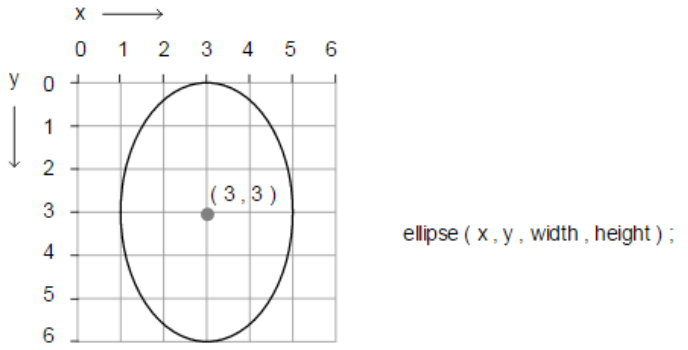
Java ▼

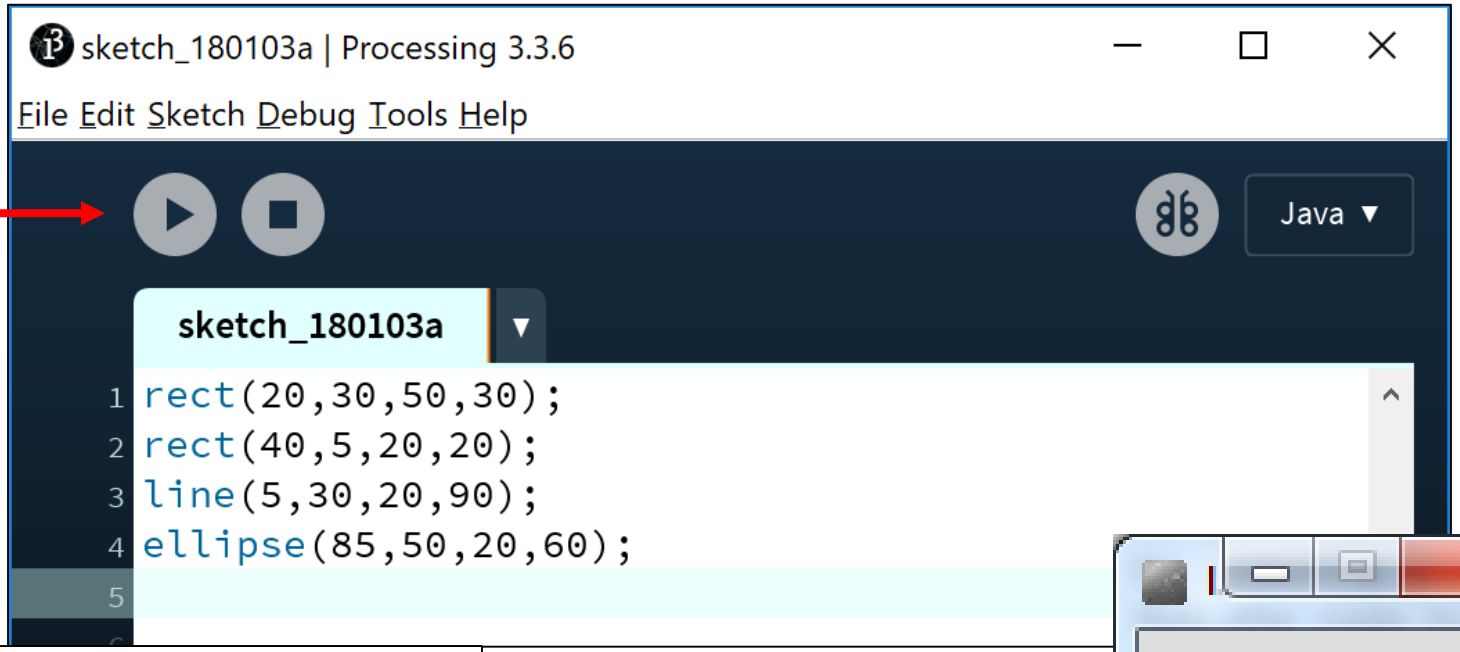
sketch_180103a

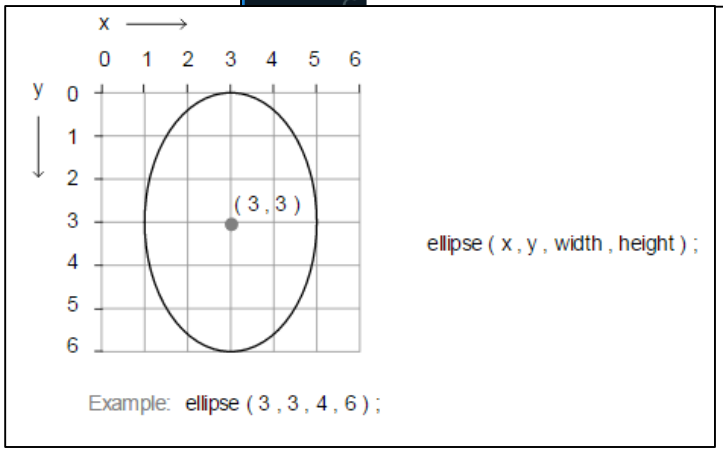
```
1 rect(20,30,50,30);
2 rect(40,5,20,20);
3 line(5,30,20,90);
4 ellipse(85,50,20,60);
5
```

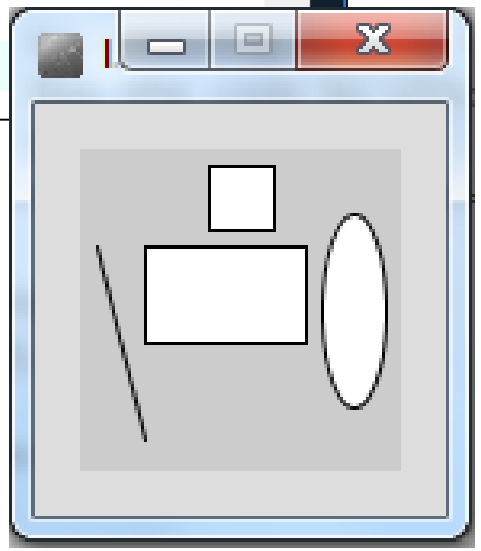


ellipse() – drawing an oval

Click to Run







ellipse() – drawing a circle

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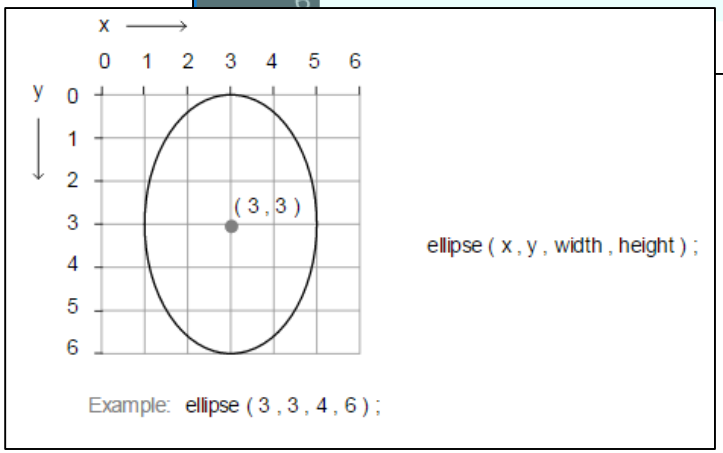
Java ▼

sketch_180103a

```
1 rect(20,30,50,30);
2 rect(40,5,20,20);
3 line(5,30,20,90);
4 ellipse(85,50,20,60);
5 ellipse(50,80,15,15);
6
```



ellipse() – drawing a circle

Click to Run

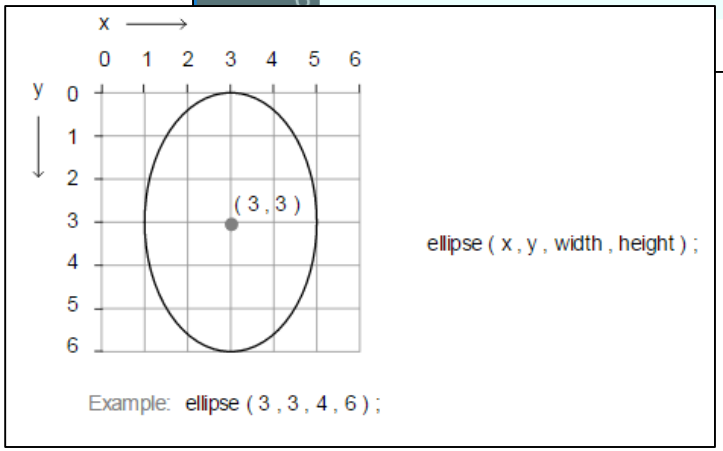
sketch_180103a | Processing 3.3.6

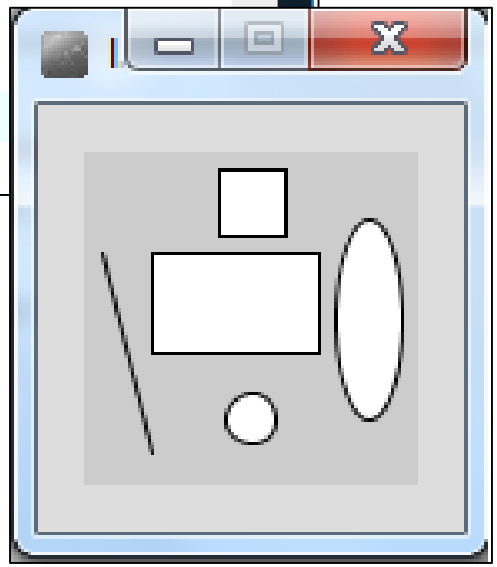
File Edit Sketch Debug Tools Help

Java

sketch_180103a

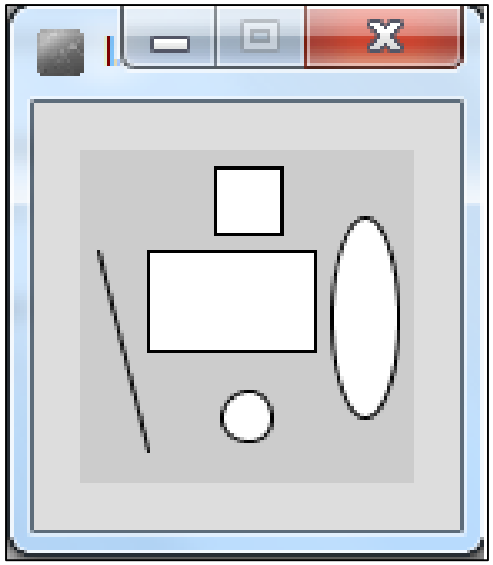
```
1 rect(20,30,50,30);
2 rect(40,5,20,20);
3 line(5,30,20,90);
4 ellipse(85,50,20,60);
5 ellipse(50,80,15,15);
```





Formatting the display window

- Our display window is looking fairly cramped.
- The default size of your display window is 100x100 pixels, which is quite small.



Formatting the display window

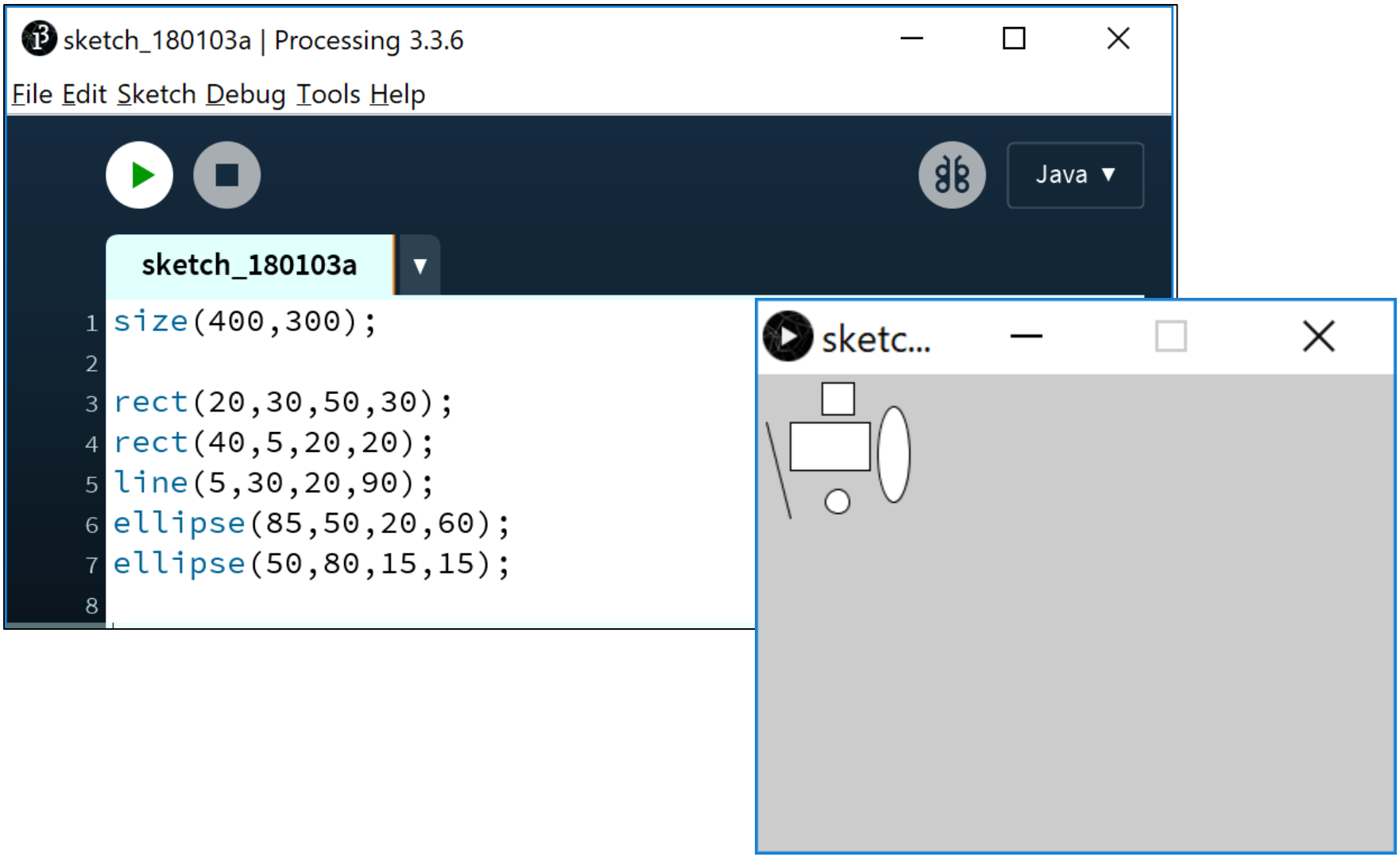
- We can change the size of the display window by calling the size function.
- When you use the size function in static drawings, it has to be the first line of code in your sketchbook.

size(w, h)

w = width of the display window

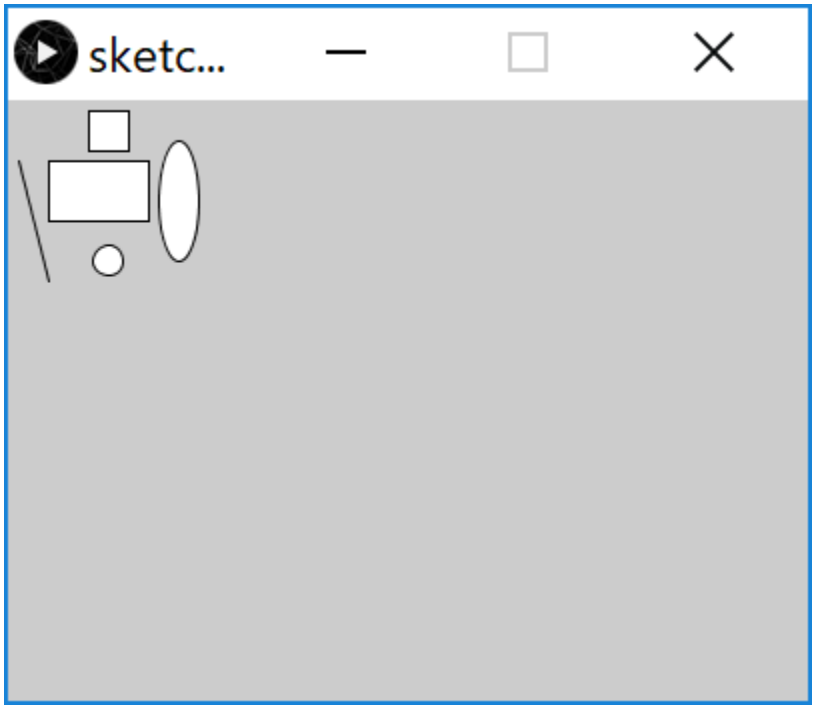
h = height of the display window

size()

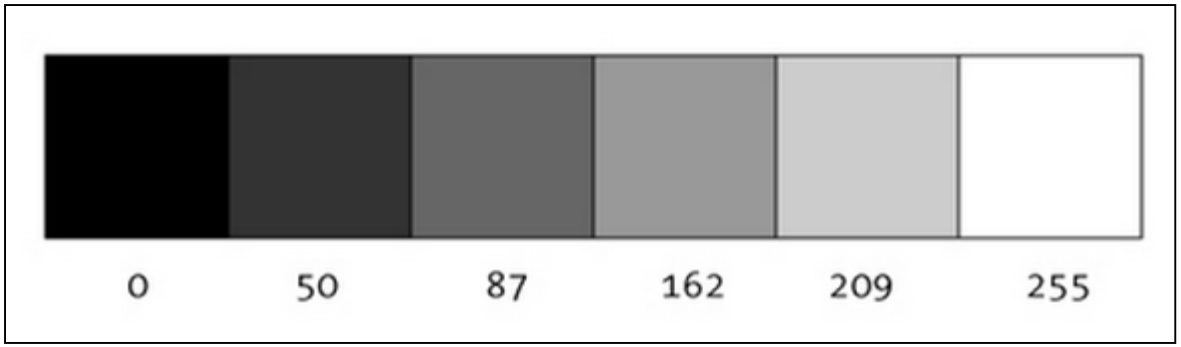

sketch_180103a | Processing 3.3.6
File Edit Sketch Debug Tools Help
Java
sketch_180103a
1 size(400,300);
2
3 rect(20,30,50,30);
4 rect(40,5,20,20);
5 line(5,30,20,90);
6 ellipse(85,50,20,60);
7 ellipse(50,80,15,15);
8
sketc...

Formatting the display window

- Our display window looks less cramped now.
- But maybe we want to change the default gray colour?
- We could use the background function to set the colour to something else.



A note on colour first…Grayscale



"0 means black, 255 means white. In between, every other number - 50, 87, 162, 209, and so on - is a shade of gray ranging from black to white."

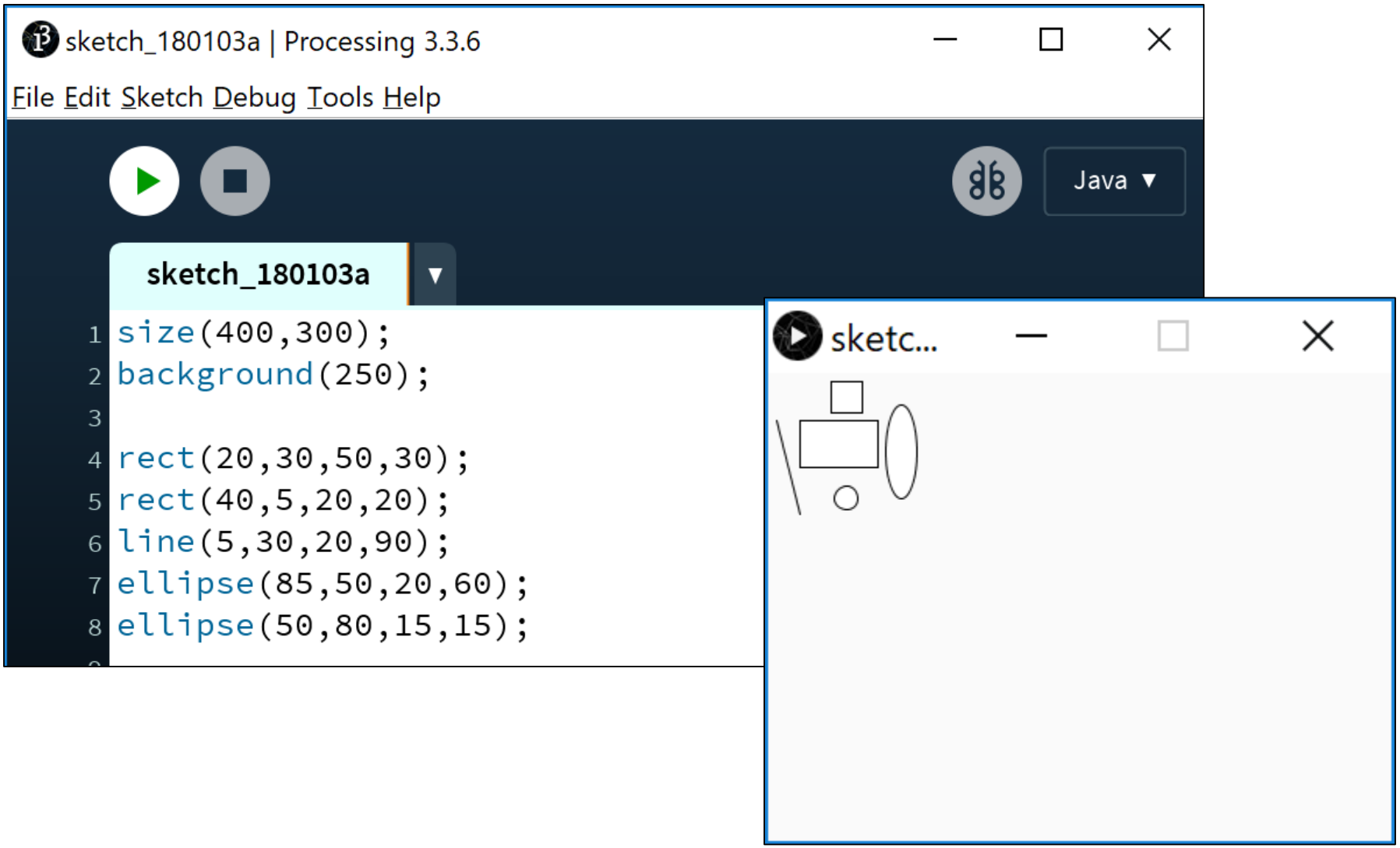
https://www.processing.org/tutorials/color/

background() - syntax

background(grayscale)

grayscale = grayscale colour (a number between 0 [black] and 255 [white] inclusive)

background()


sketch_180103a | Processing 3.3.6
File Edit Sketch Debug Tools Help
Java
sketch_180103a
1 size(400,300);
2 background(250);
3
4 rect(20,30,50,30);
5 rect(40,5,20,20);
6 line(5,30,20,90);
7 ellipse(85,50,20,60);
8 ellipse(50,80,15,15);
sketc...

Flow of Control

Problem Solving

Programming IS
problem solving.

Flow of Control in a Program

- Each program you write will typically have:

Sequence	Things that will be done in a particular order
Selection	Things that will be done conditionally
Iteration	Things that will be done repetitively

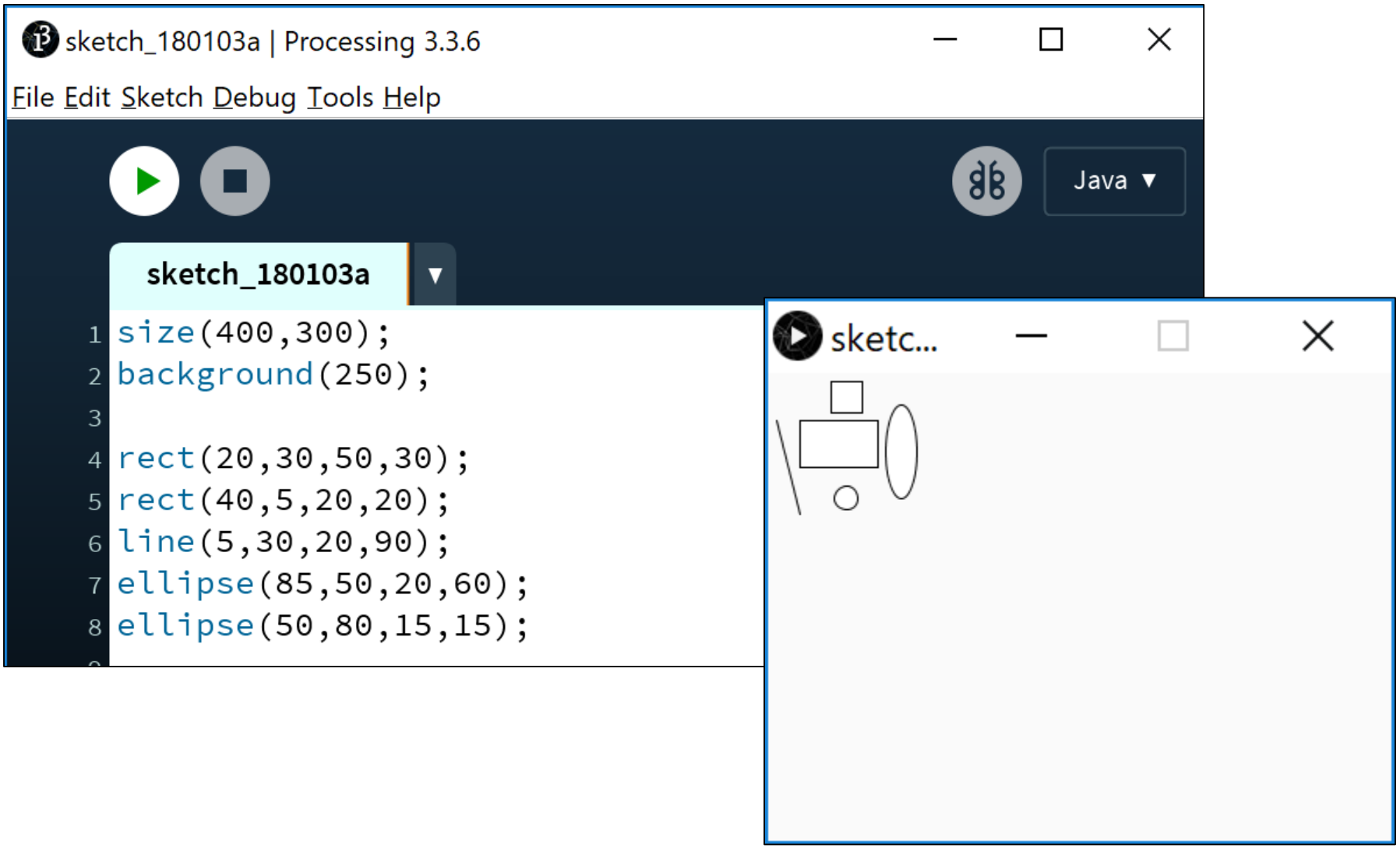
Flow of Control in a Program

- Each program you write will typically have:

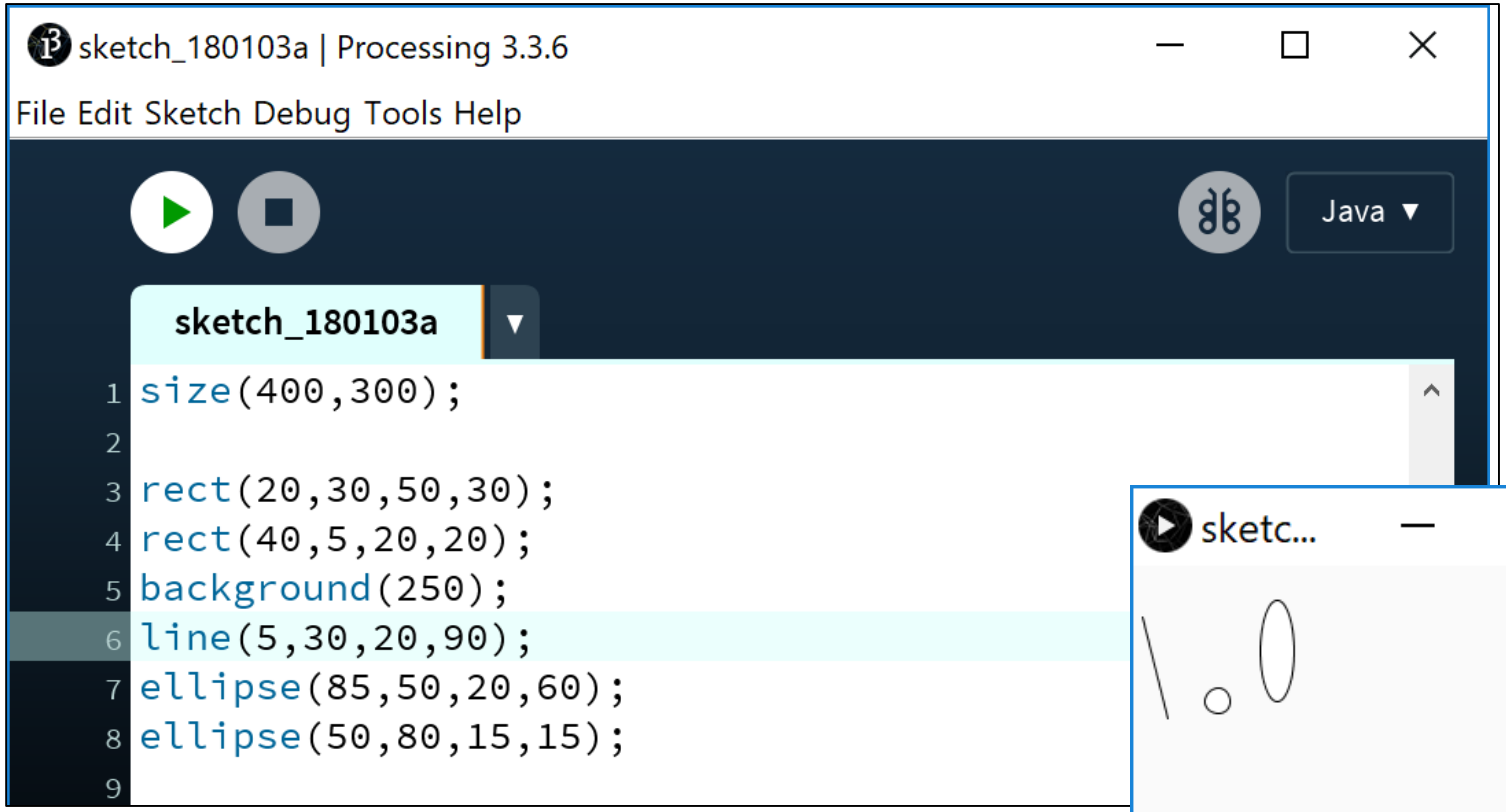
Sequence	Things that will be done in a particular order
Selection	Things that will be done conditionally
Iteration	Things that will be done repetitively

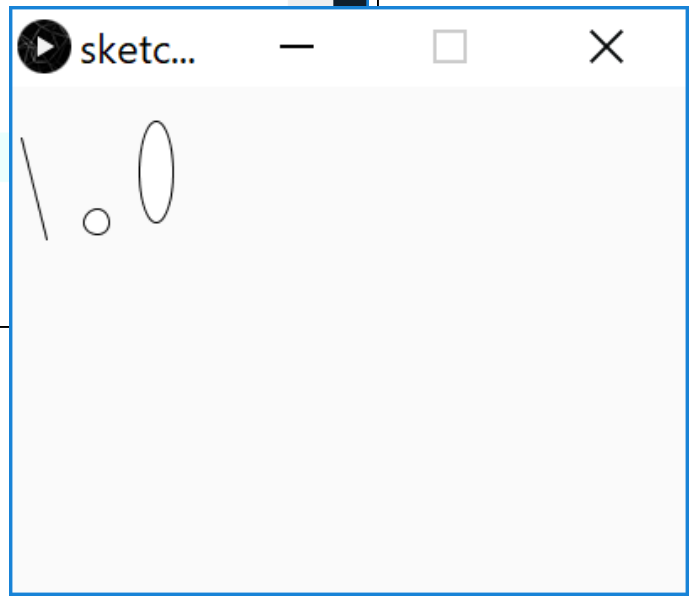
- During induction, we concentrated on ***Sequence***.
- We will cover ***Selection*** and ***Iteration*** in future weeks.

Sequence of Instructions – Example



Sequence of Instructions – Matters!!!





background(250) moved and is now fourth statement. What happened to the rectangle and square?

Questions?