

An Introduction to Processing

Static drawings and more

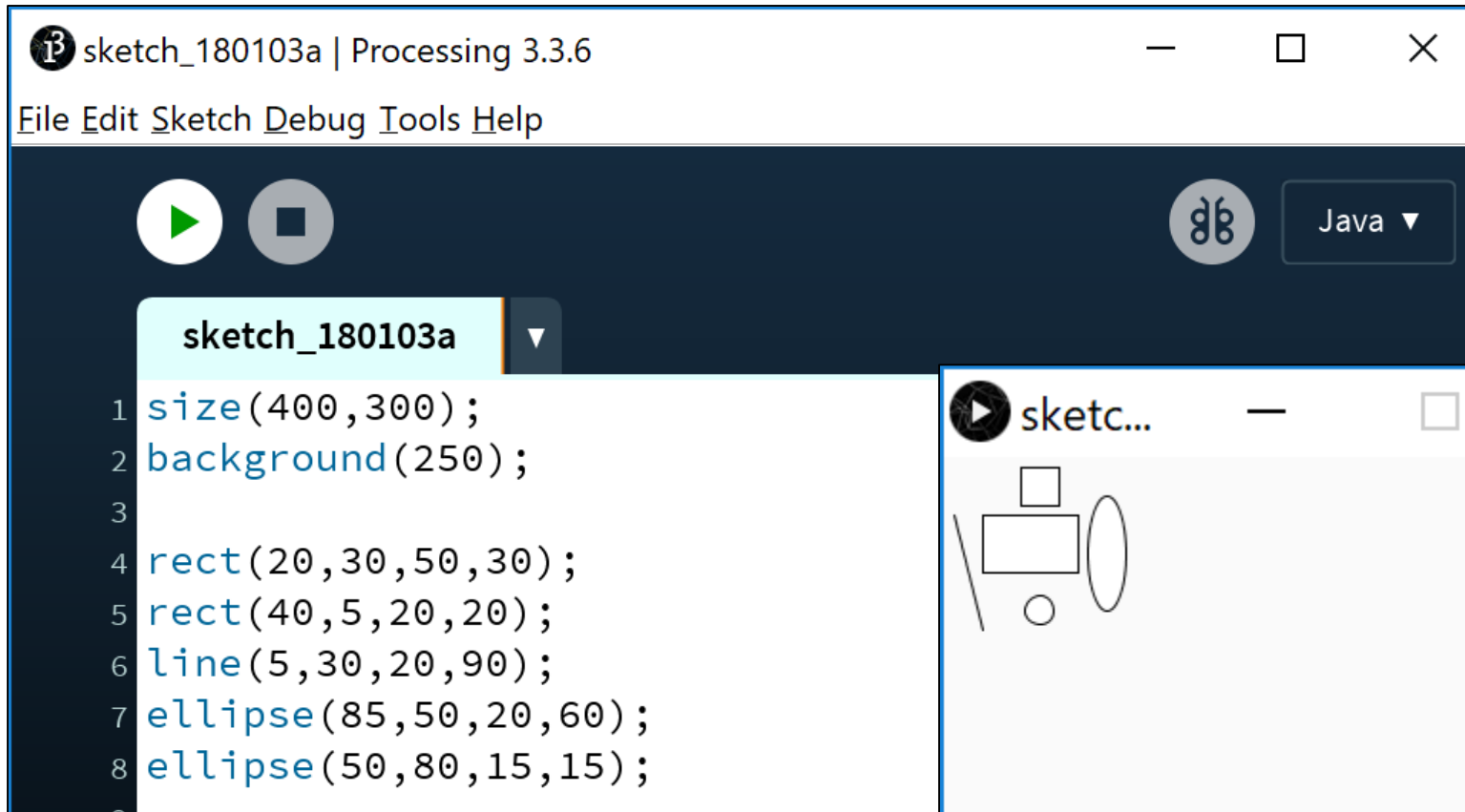
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Static drawing – an example



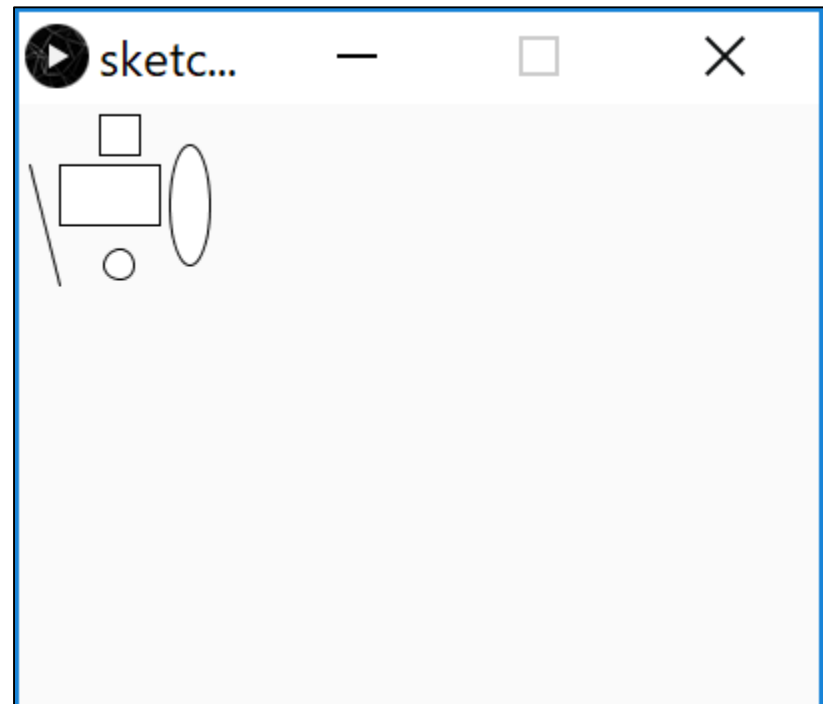
The image shows two overlapping windows from the Processing IDE. The top window is the sketch window, titled "sketch_180103a | Processing 3.3.6". It features a dark blue header with a play button, a stop button, a logo, and a "Java" dropdown menu. Below the header is a light blue tab labeled "sketch_180103a". The main area of the sketch window is white and contains a simple line drawing of a face-like shape composed of several geometric primitives: a small square at the top, a larger rectangle below it, a diagonal line on the left, a small circle below the rectangle, and a vertical oval on the right.

The bottom window is the code editor, titled "sketc...". It displays the following Java code:

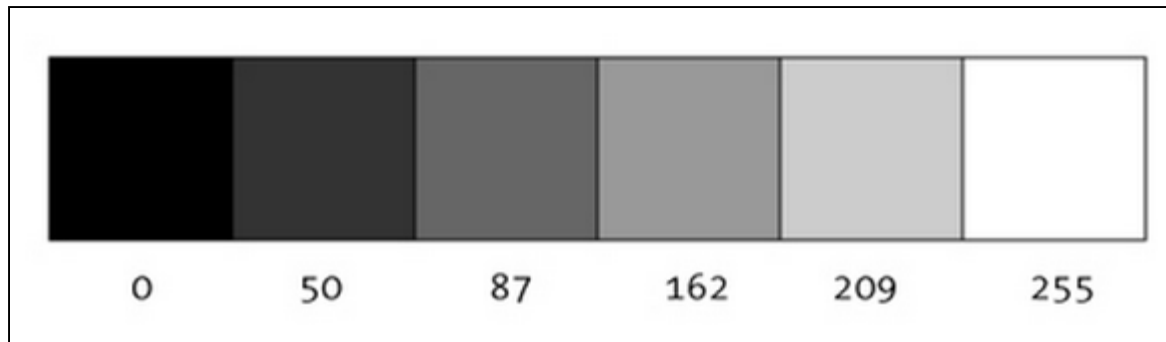
```
1 size(400,300);  
2 background(250);  
3  
4 rect(20,30,50,30);  
5 rect(40,5,20,20);  
6 line(5,30,20,90);  
7 ellipse(85,50,20,60);  
8 ellipse(50,80,15,15);  
9
```

Static drawing – an example

- Static drawings are those that don't change over time:
 - Once they are drawn, they don't change.
 - They don't respond to events e.g. a mouse moving over the sketch, a key being pressed, etc.

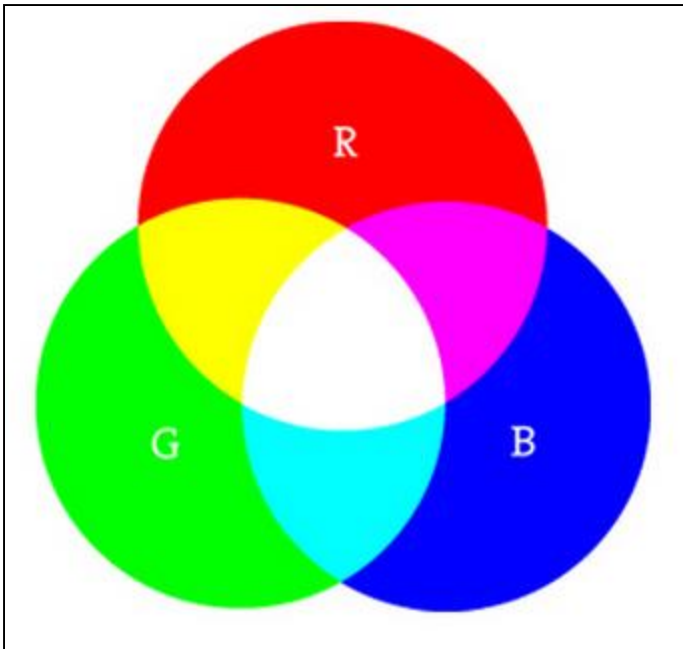


We looked at the Grayscale palette



“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.”

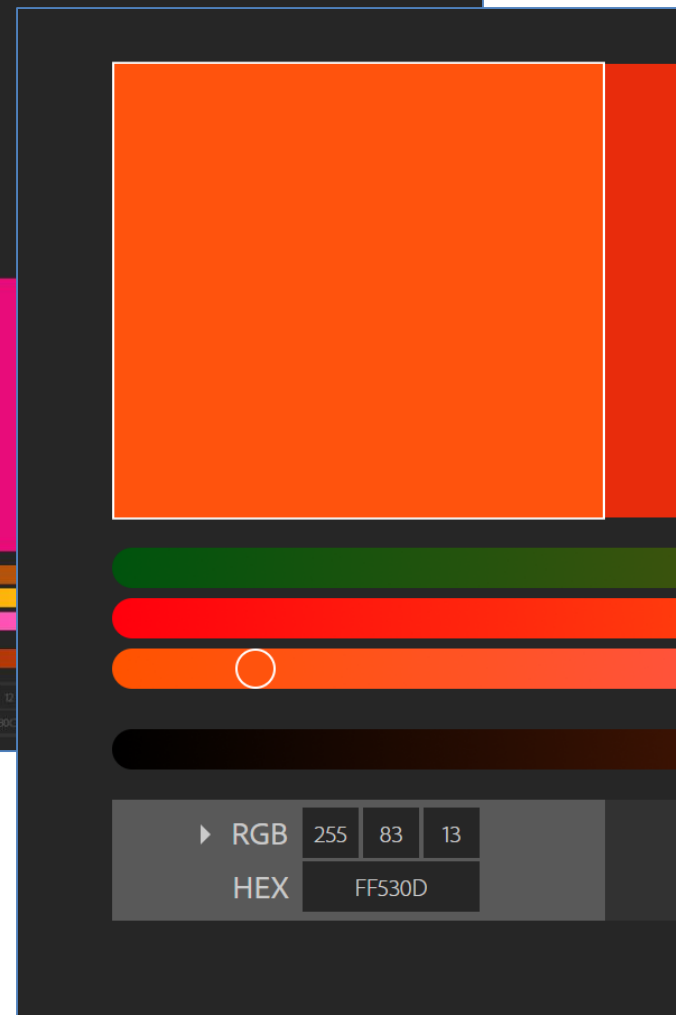
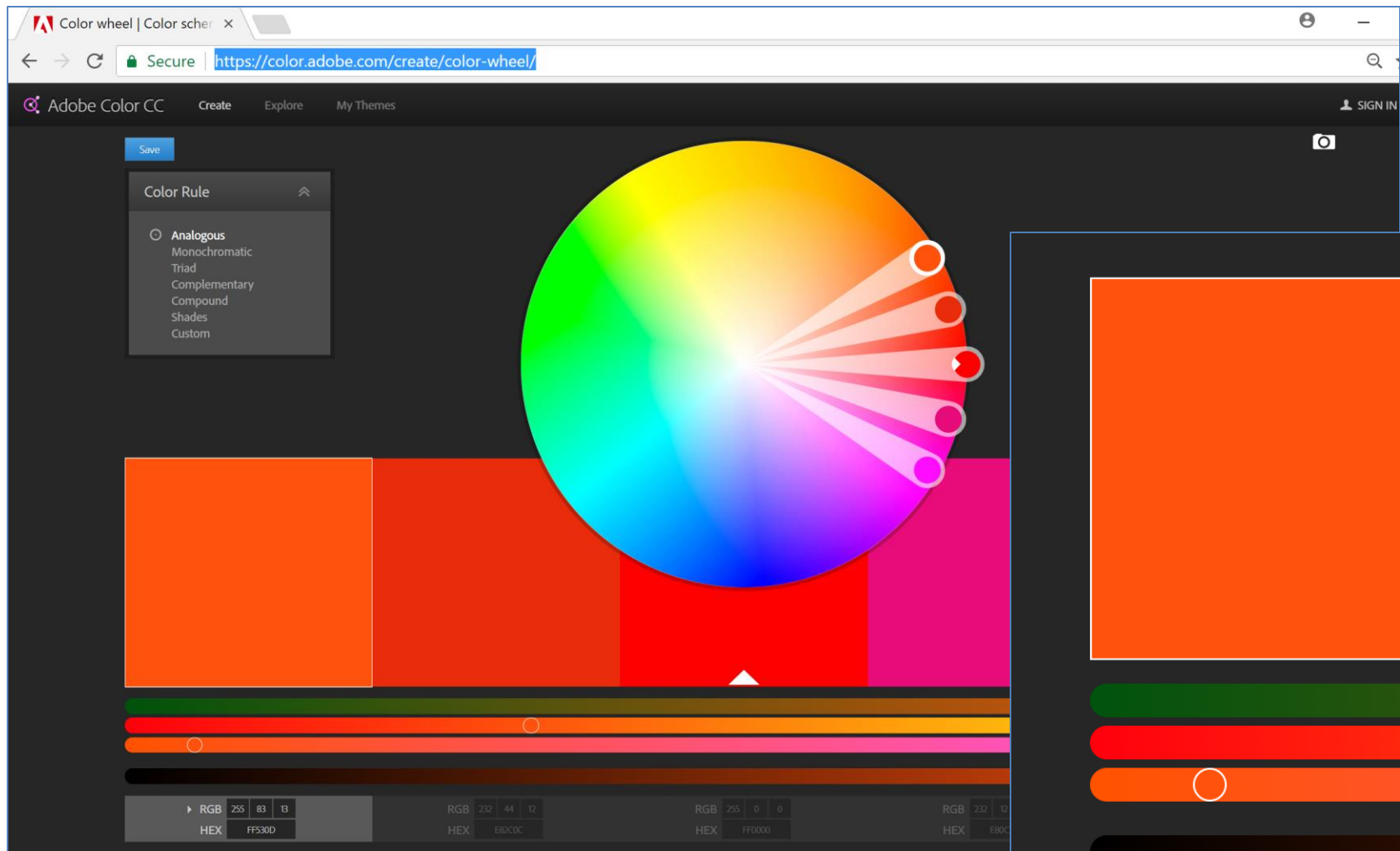
The RGB palette



Digital colours are made by mixing the three primary colours of light (red, green, and blue).

“As with grayscale, the individual color elements are expressed as ranges from 0 (none of that color) to 255 (as much as possible), and they are listed in the order R, G, and B.”

<https://color.adobe.com/create/color-wheel/>



background() - syntax

background(grayscale)

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

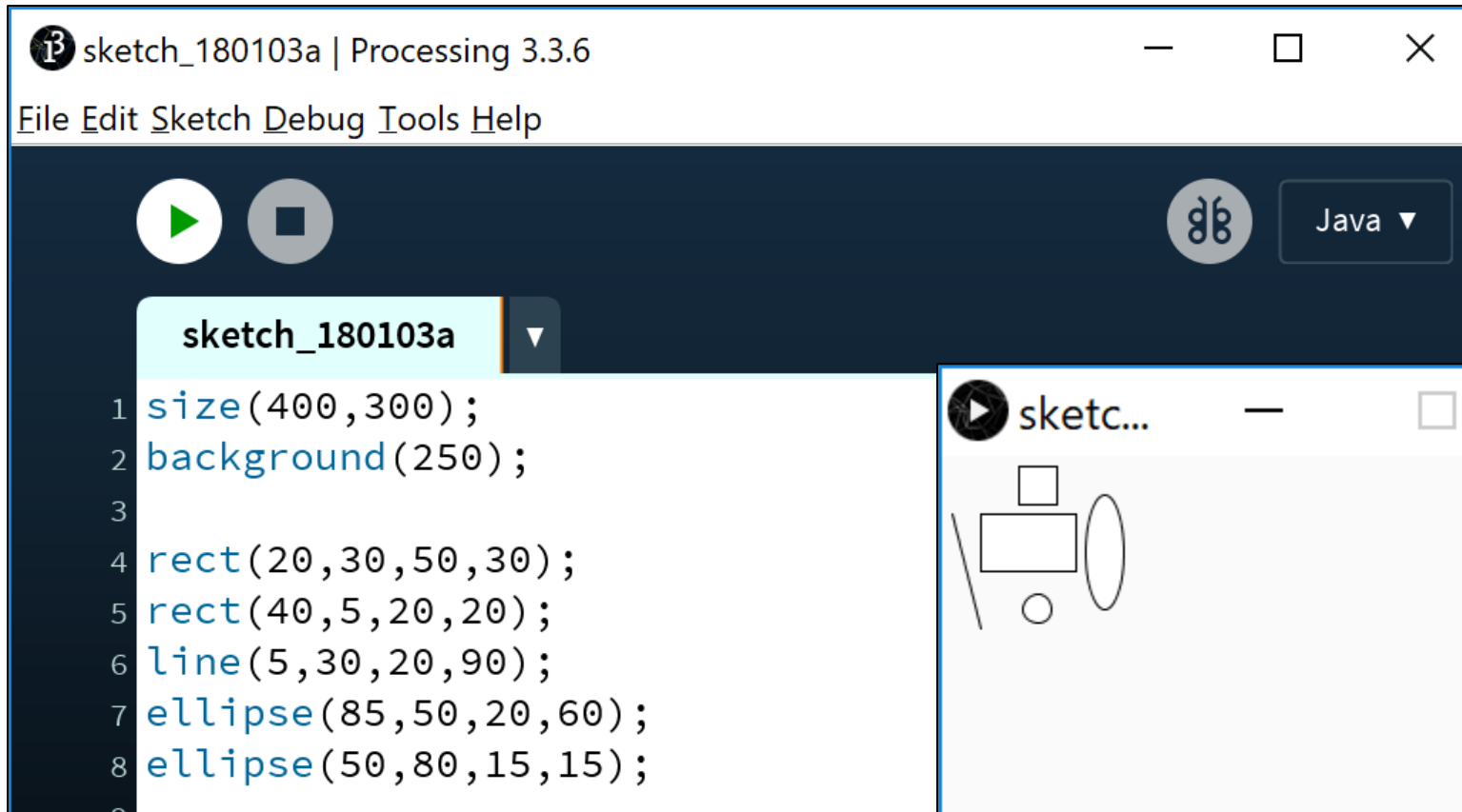
background(r, g, b)

r = red colour (a number between 0 and 255 inclusive)

g = green colour (a number between 0 and 255 inclusive)

b = blue colour (a number between 0 and 255 inclusive)

background() - grayscale

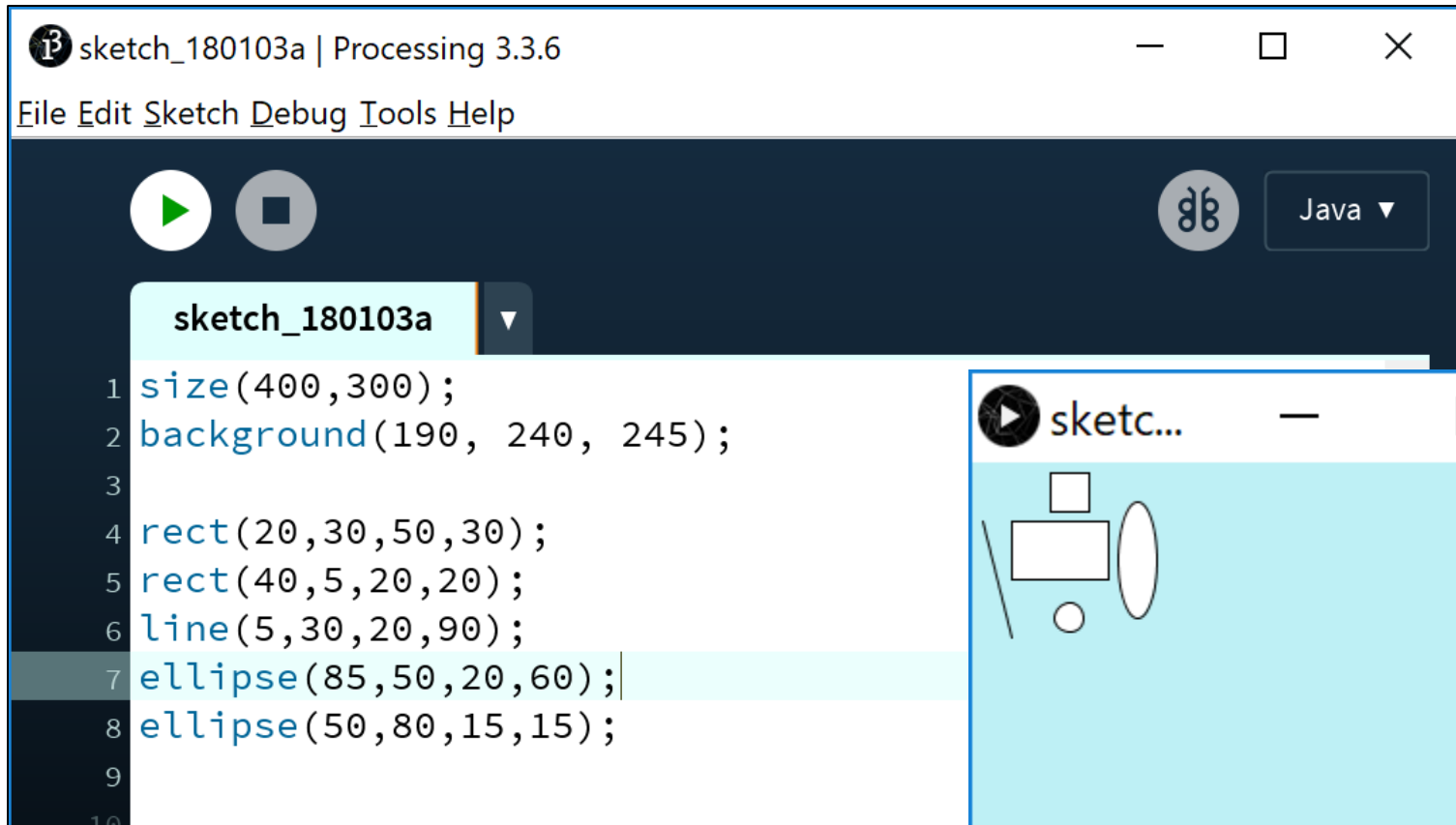


The image shows a screenshot of the Processing IDE. The main window is titled "sketch_180103a | Processing 3.3.6". The menu bar includes "File", "Edit", "Sketch", "Debug", "Tools", and "Help". The toolbar contains a play button, a stop button, a Java dropdown menu, and a sketch icon. The sketch name "sketch_180103a" is displayed in a dropdown menu. The code editor shows the following code:

```
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);
```

The sketch window, titled "sketc...", displays the rendered output of the code. It features a light gray background with several simple geometric shapes: a small square at the top center, a larger rectangle below it, a vertical line on the left side, a horizontal ellipse on the right side, and a small circle at the bottom center.

background() - RGB



The image shows a screenshot of the Processing IDE. The main window is titled "sketch_180103a | Processing 3.3.6". The menu bar includes "File", "Edit", "Sketch", "Debug", "Tools", and "Help". The toolbar contains a play button, a stop button, a Java logo, and a "Java" dropdown menu. The code editor shows the following code:

```
1 size(400,300);  
2 background(190, 240, 245);  
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);  
9  
10
```

The code is displayed in a dark-themed editor with a light blue selection highlight on line 7. A preview window titled "sketc..." is open in the foreground, showing a light blue background with a white sketch of a rectangle, a line, and two ellipses.

Syntax and Logic Errors



Syntax and Syntax Errors

- You will have seen the term **Syntax** mentioned above.
- Syntax are the rules you must follow when writing well-formed statements in a programming language.
- When you don't follow the rules, Processing will not run your code; instead you will get an error.
- Some syntax error examples are on the upcoming slides.

Syntax Errors

The spelling of the background function must be identical to the spelling below (case sensitive!).

```
sketch_180103a | Processing 3.3.6
File Edit Sketch Debug Tools Help

sketch_180103a
1 size(400,300);
2 Background(190, 240, 245);
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);
9
10
11
12
13

The function "BackGround(int, int, int)" does not exist
```

background(r, g, b)

r = red colour (a number between 0 and 255 inclusive)

g = green colour (a number between 0 and 255 inclusive)

b = blue colour (a number between 0 and 255 inclusive)

Syntax Errors

*The background function has too many **arguments** passed to it i.e.*

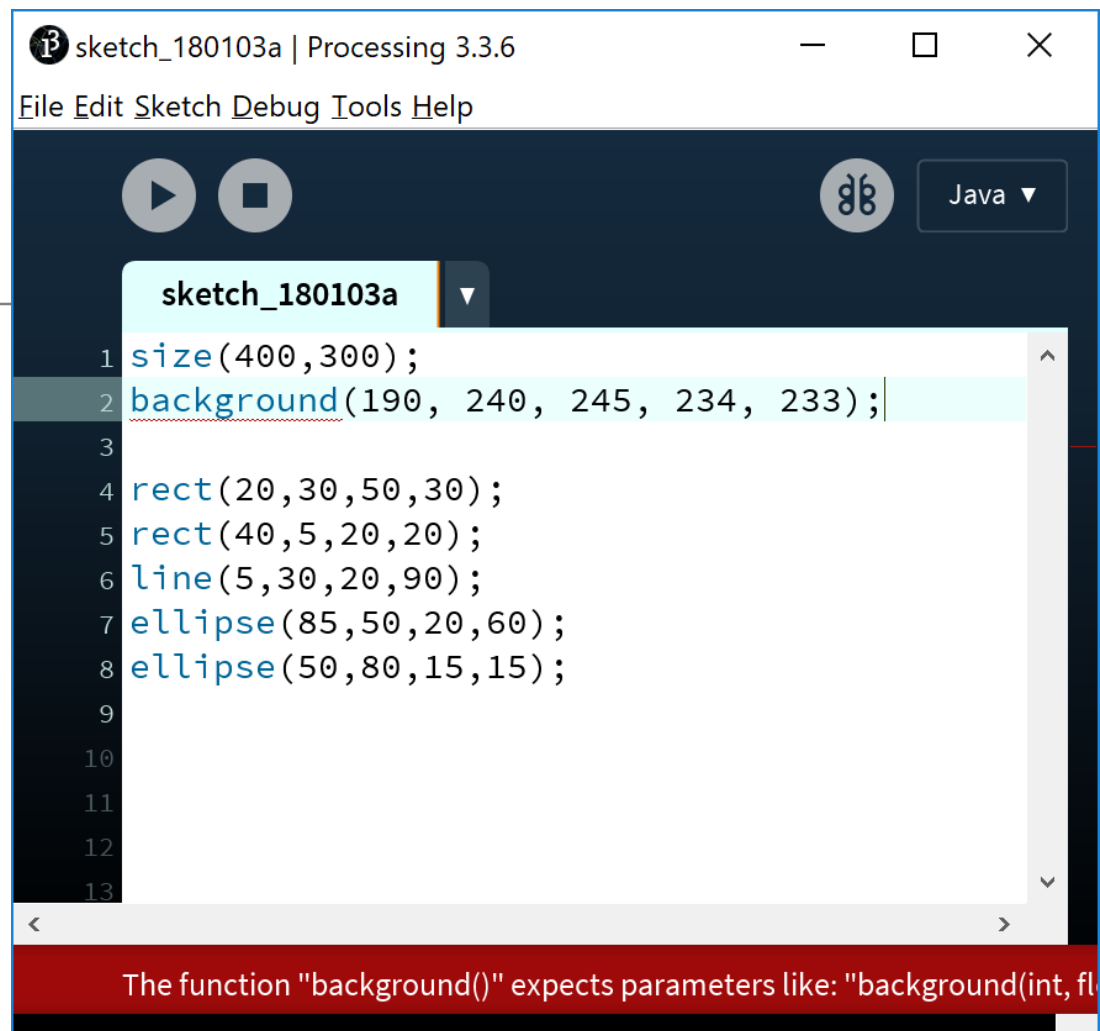
- *RGB version is defined with 3 **parameters**.*
- *Grayscale version is defined with 1 **parameter**.*

background(r, g, b)

r = red colour (a number between 0 and 255 inclusive)

g = green colour (a number between 0 and 255 inclusive)

b = blue colour (a number between 0 and 255 inclusive)



The screenshot shows the Processing IDE interface. The title bar reads "sketch_180103a | Processing 3.3.6". The menu bar includes "File", "Edit", "Sketch", "Debug", "Tools", and "Help". The code editor displays the following code:

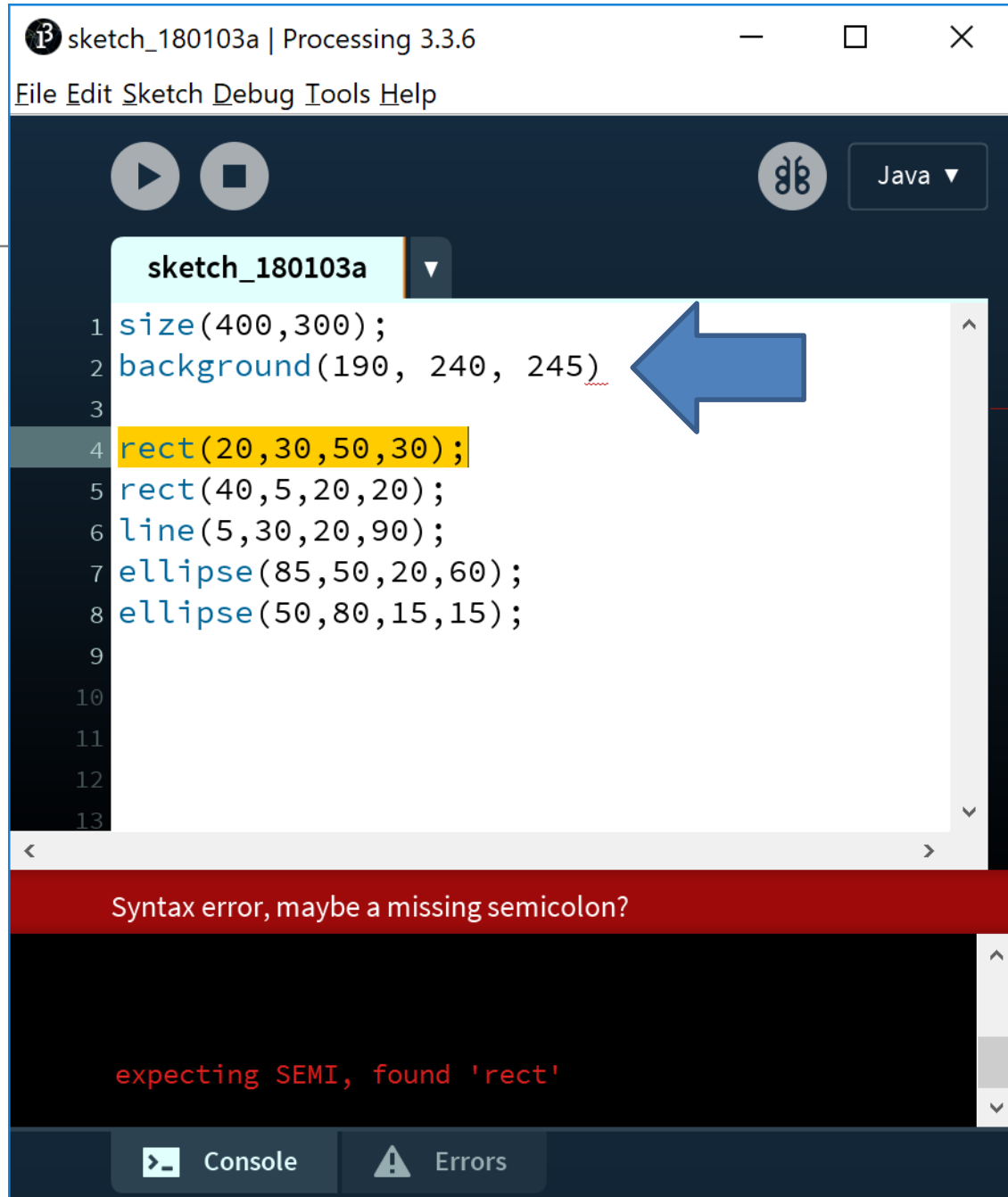
```
1 size(400,300);
2 background(190, 240, 245, 234, 233);
3
4 rect(20,30,50,30);
5 rect(40,5,20,20);
6 line(5,30,20,90);
7 ellipse(85,50,20,60);
8 ellipse(50,80,15,15);
9
10
11
12
13
```

The line `background(190, 240, 245, 234, 233);` is highlighted in light blue. A red error message at the bottom of the IDE states: "The function 'background()' expects parameters like: 'background(int, fl".

Syntax Errors

The semi-colon (;) is missing at the end of the statement.

Java needs a statement terminator for each line!



The screenshot shows the Processing IDE window titled "sketch_180103a | Processing 3.3.6". The menu bar includes "File", "Edit", "Sketch", "Debug", "Tools", and "Help". The interface features a toolbar with a play button, a stop button, and a "Java" dropdown menu. The main editor displays the following code:

```
1 size(400,300);  
2 background(190, 240, 245);  
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);  
9  
10  
11  
12  
13
```

A blue arrow points to the end of line 4, where the semi-colon is missing. Below the code editor, a red error message reads: "Syntax error, maybe a missing semicolon?". At the bottom of the IDE, the "Errors" panel shows the message: "expecting SEMI, found 'rect'".

Logic Errors

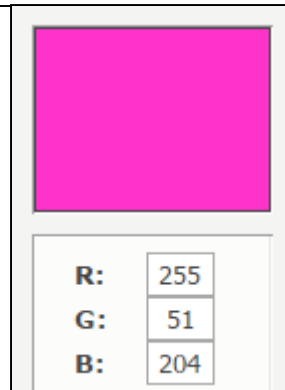
In computer programming, a **logic error** is a bug in a program that causes it to operate incorrectly, but not to terminate abnormally (or crash). A **logic error** produces unintended or undesired output or other behaviour, although it may not immediately be recognised as such.

[Logic error - Wikipedia, the free encyclopedia](https://en.wikipedia.org/wiki/Logic_error)

en.wikipedia.org/wiki/Logic_error

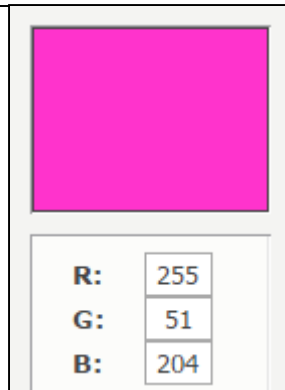
Logic Errors

Say we wanted a pink background for our display window.

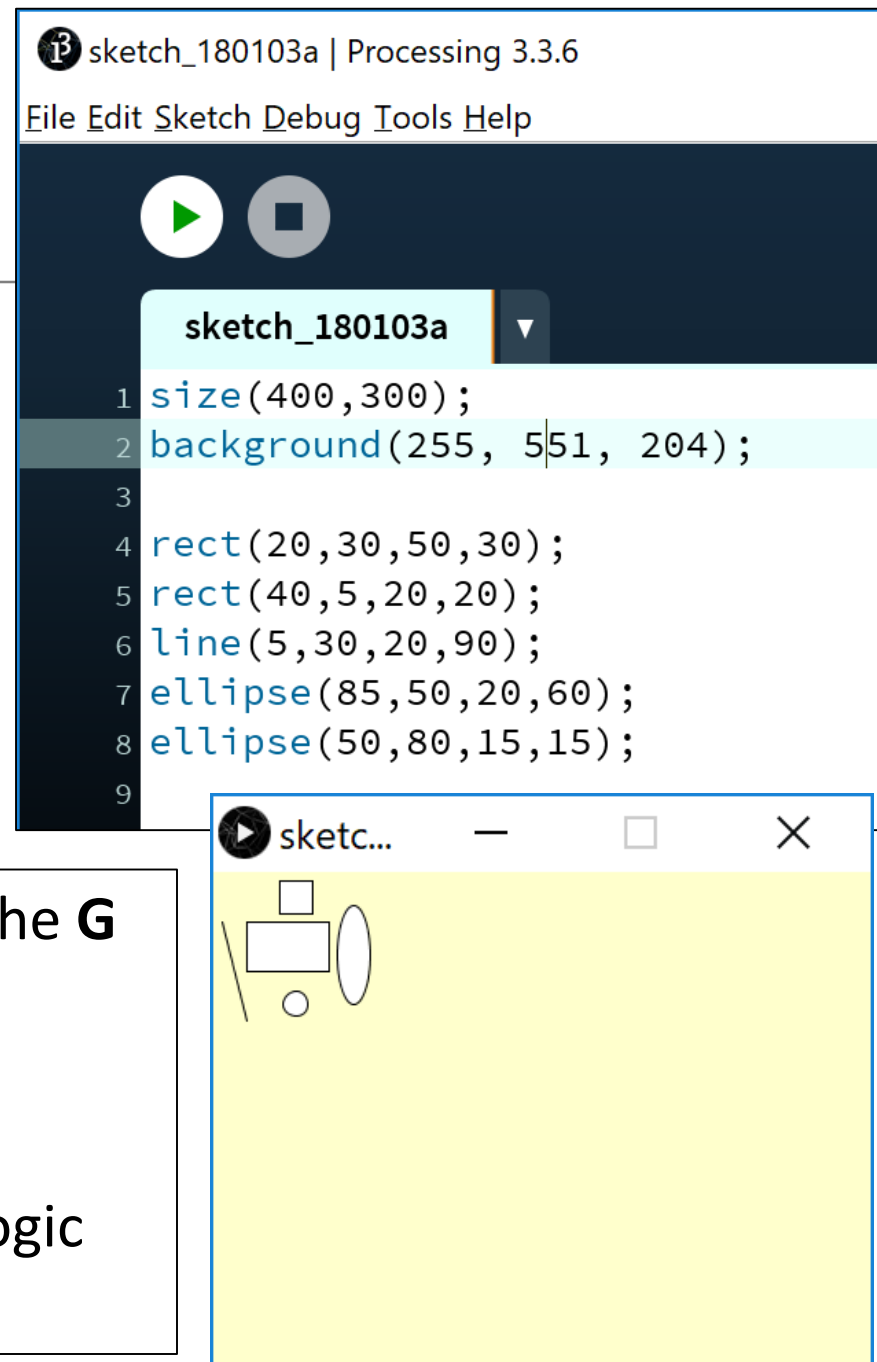


Logic Errors

Say we wanted a pink background for our display window.



- However, we incorrectly enter the **G** colour as 551 instead of 51.
- We now have a yellowish background.
- This is an example of a simple logic error.



sketch_180103a | Processing 3.3.6
File Edit Sketch Debug Tools Help

```
sketch_180103a  
1 size(400,300);  
2 background(255, 551, 204);  
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);  
9
```

sketc... — □ ×

The screenshot shows the Processing IDE interface. The code editor displays the following code: `size(400,300);`, `background(255, 551, 204);`, `rect(20,30,50,30);`, `rect(40,5,20,20);`, `line(5,30,20,90);`, `ellipse(85,50,20,60);`, and `ellipse(50,80,15,15);`. The `background` function call is highlighted. Below the code editor, a preview window titled "sketc..." shows a yellowish background with a simple line drawing of a car.

Questions?

