

# Programming

## Using Processing

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# What Is Programming?

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- Telling a computer what to do, step by step
- Like giving instructions to a very literal friend
- Computers are fast, powerful... but zero common sense

**You:** “Make tea.”

**Computer:** **Error:** no instructions for picking up kettle.”



# Why Learn Programming (fun reasons)?

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- Build games, apps, music generators, animations
- Control robots, drones, LEDs, VR worlds
- Make your own cheats/tools/mods
- Create stuff nobody has ever made before
- It's like magic, but real



# Why Learn Programming(serious reasons)?

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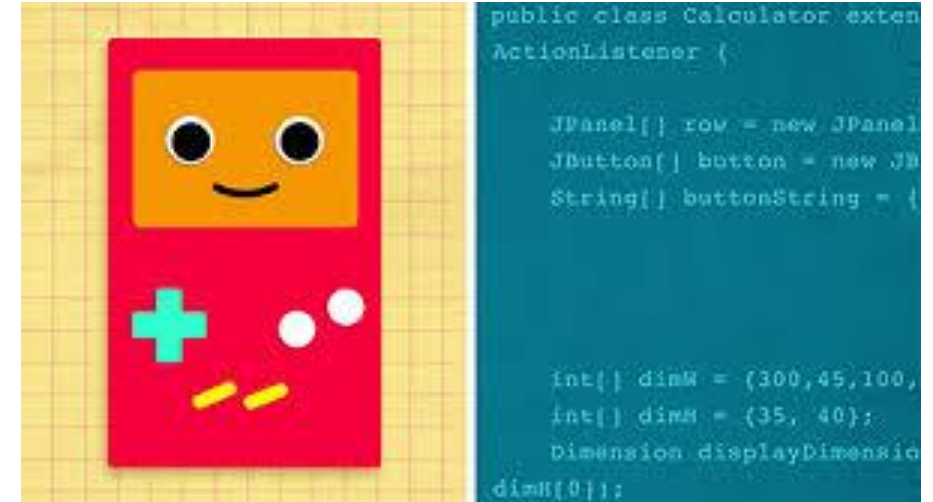
- Every industry needs developers
- High-paying, flexible jobs
- Huge shortage of skilled programmers in Ireland & worldwide
- Great for problem-solving and thinking clearly
- Opens doors to AI, cybersecurity, gaming, data science, engineering, etc.



# Where Is Programming Used?

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- Netflix recommendations
- Snapchat filters
- Spotify playlists
- Instagram stories
- Self-driving cars
- Games (Fortnite, FIFA, Minecraft)
- Even toaster ovens & traffic lights



# How Programming Changes the World

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- **Apps built by students** - TikTok started by college-age developers
- **Websites and Mobile Apps** - over 1.7 billion websites on the internet
- **Digital Assistants** - Siri, Alexa, Google Assistant
- **Exploring Space** - Artemis program, where Python is being used to get a better idea of the moon
- **Solving Business Challenges**
- **Transportation & Accommodation** – Uber, booking.com



# What You'll Do Today

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- **Today, you'll become programmers.**
  - Use Processing (Java) Draw shapes & animations
  - Make something move



# Introduction to Processing



# What is Processing?

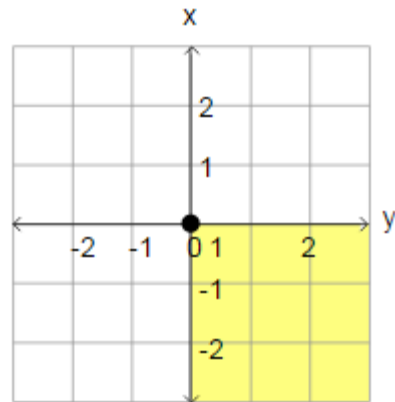
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- **Processing** is a programming language, development environment, and online community
- ...can be used to develop static or interactive online material and data visualisations.
- ...is often used by visual artists.
- ...produces visual and interactive representations of programming code.

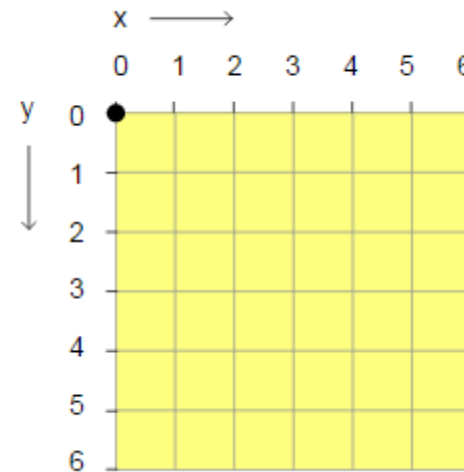
# Coordinate System in Computing

In Geometry,  
we use this type of  
coordinate system:



point (0,0) is in the  
centre.

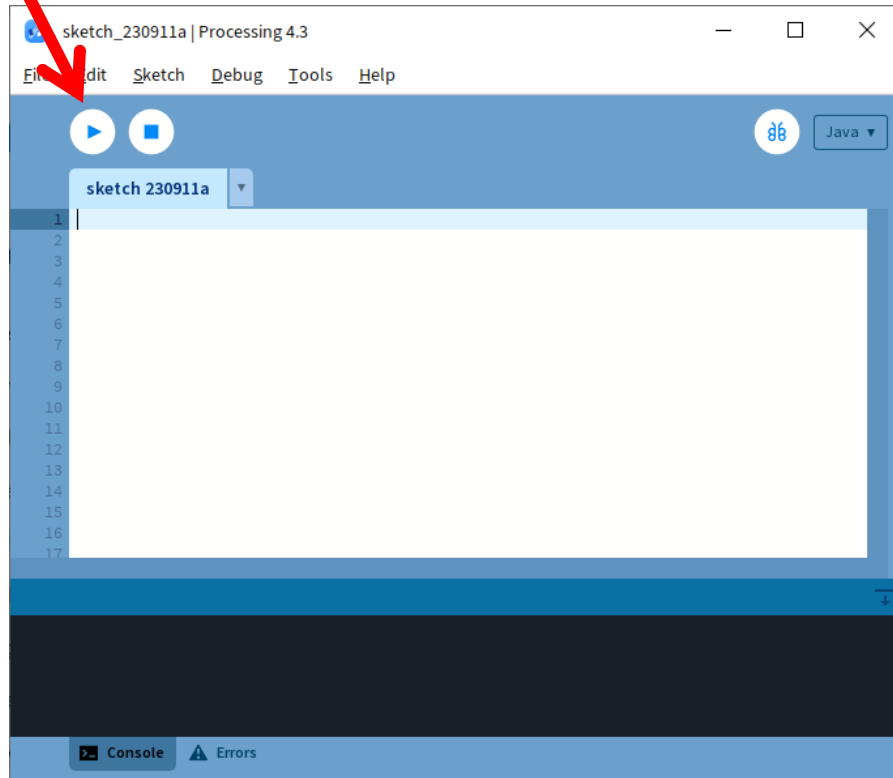
In Computing, we use this type of  
coordinate system to represent the  
screen:



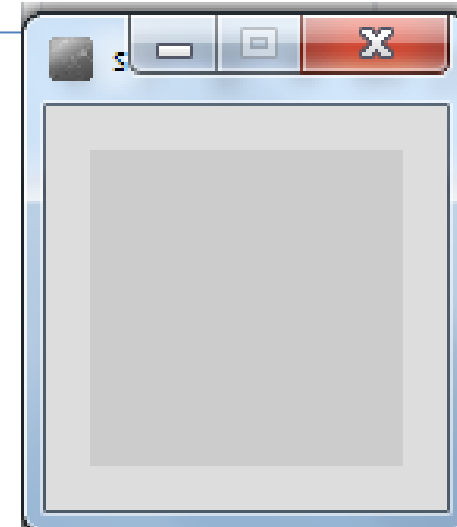
point (0,0) is in the top left hand  
corner. Each number is a pixel.

# 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.

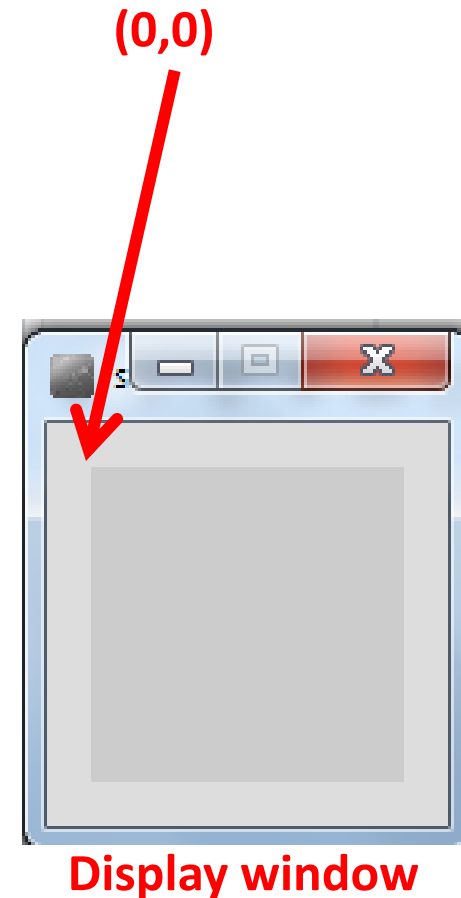


**Display window**

# Coordinate System in Computing

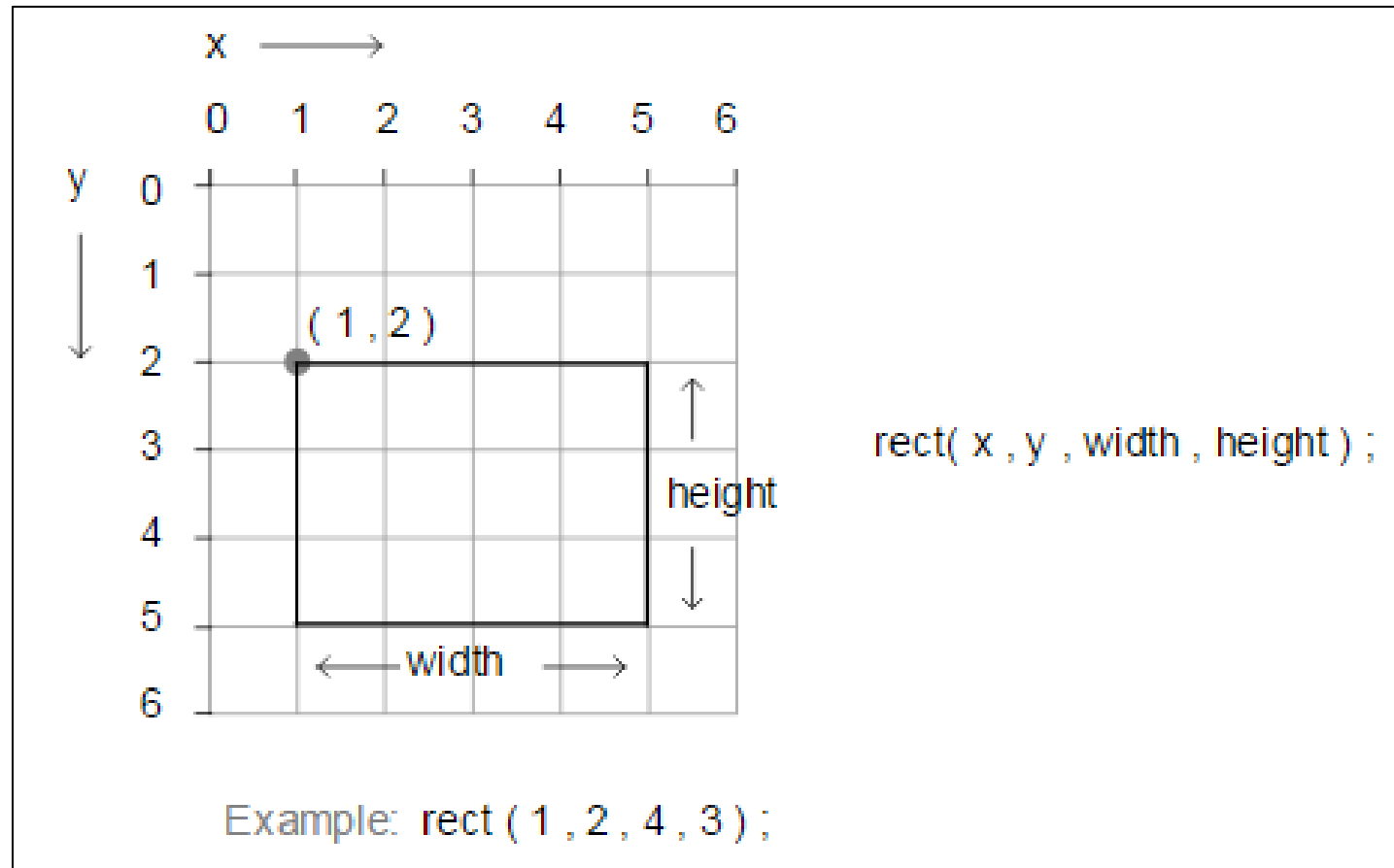
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- The display window is where your code is run/ displayed.
- It follows the rules of the Computing coordinate system i.e. the top left hand corner is (0,0).
- A point (10,20) is 10 pixels to the right of (0,0) and 20 pixels below (0,0).

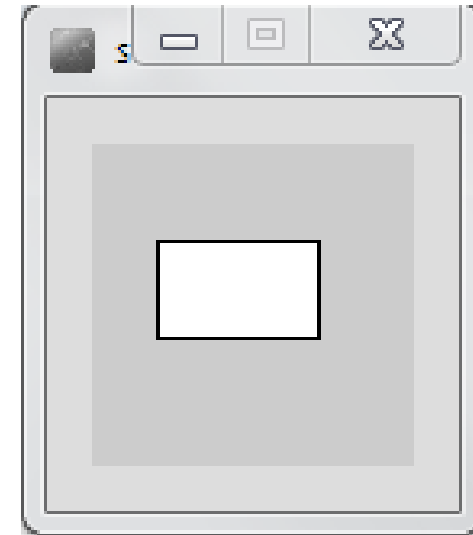
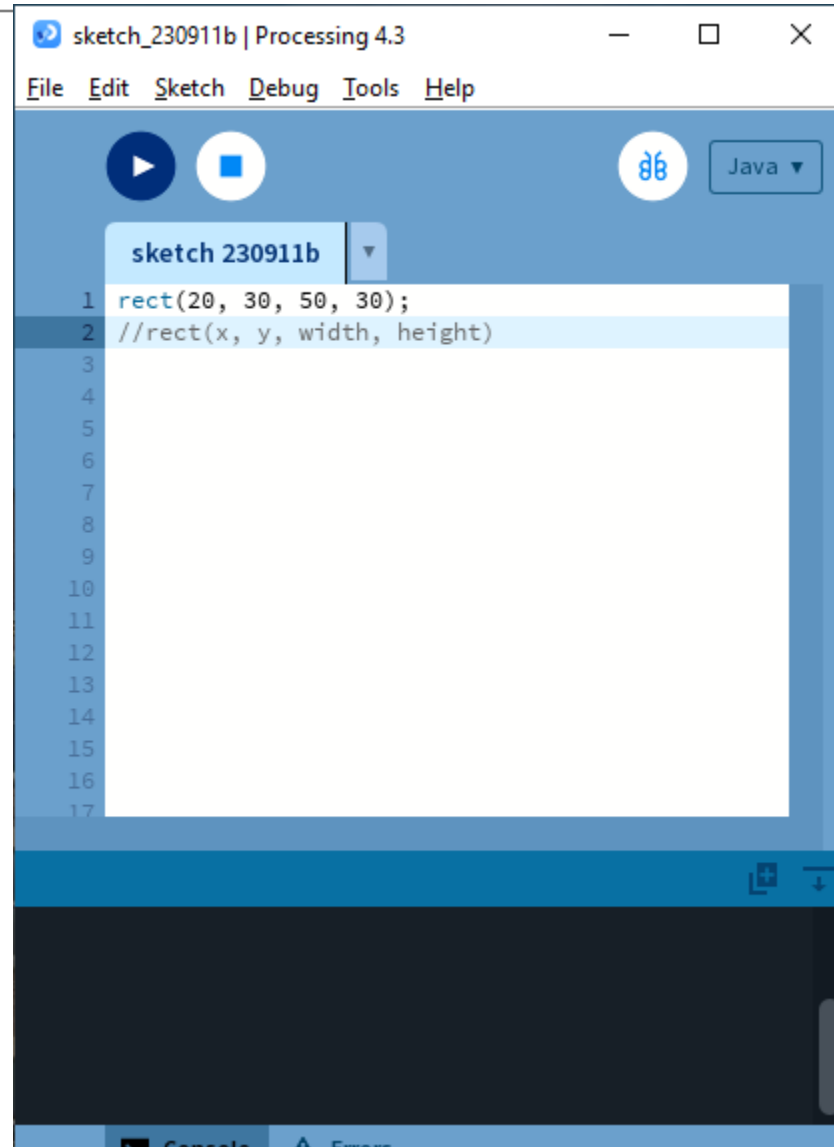


# rect()

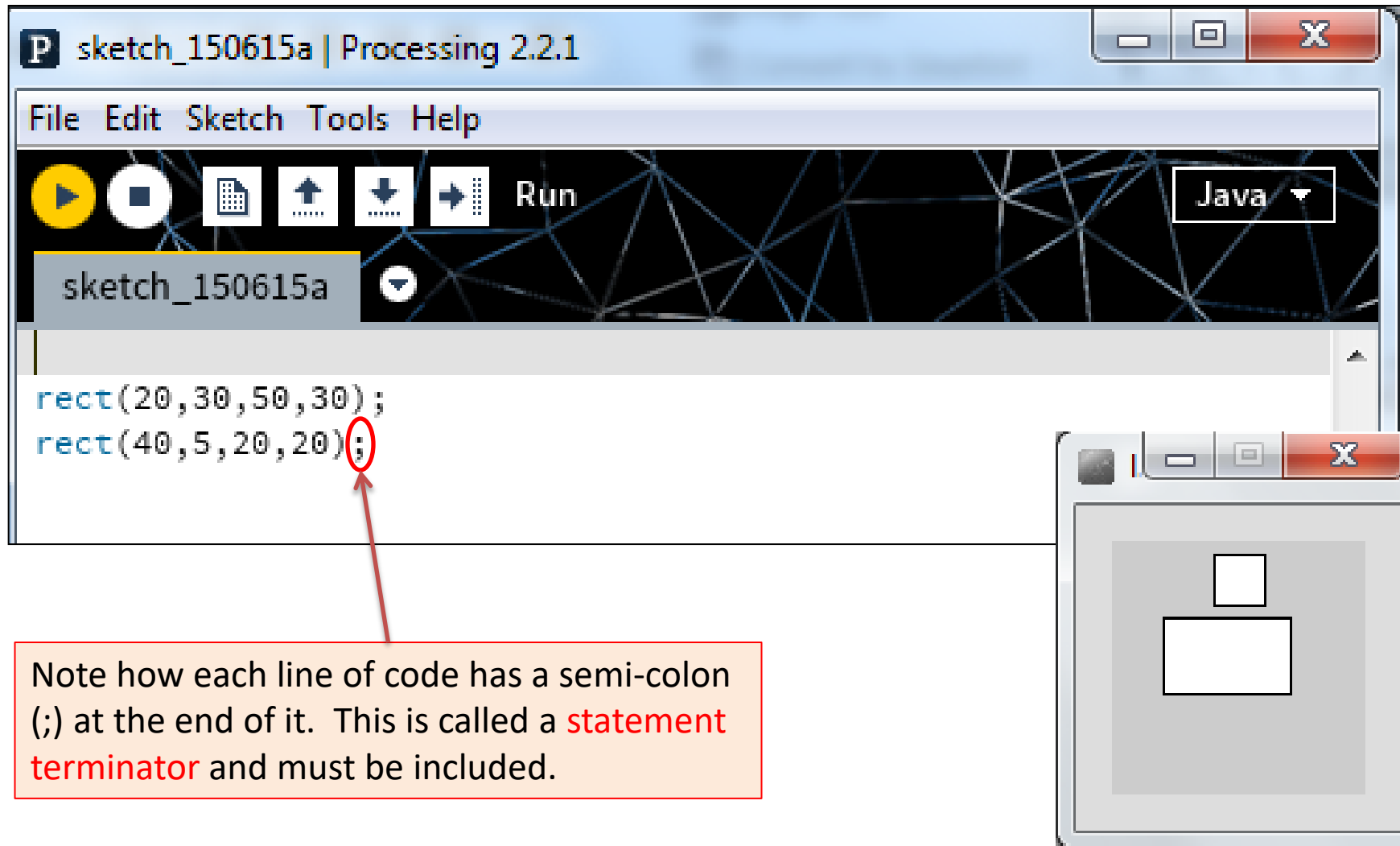
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# rect() – Drawing a Rectangle



# rect() – Drawing a Square



# rect() – Syntax

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`rect(x, y, w, h)`

`x` = x-coordinate of the upper left corner of the rectangle

`y` = y-coordinate of the upper left corner of the rectangle

`w` = width of the rectangle

`h` = height of the rectangle

- The rect function above defines four **parameters** i.e. x, y, w, h.
- When you call rect, you are expected to pass four numbers to it. These actual numbers are called **arguments**.
- rect uses these four numbers to render the rectangle on the display window.

To draw a square, the width and height must be the same value.

# Questions?

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