

Hello  
World



# Intro Kickstart-kursus i programmering 2025

Daniel Spikol

[ds@di.ku.dk](mailto:ds@di.ku.dk)

DIKU Københavns Universitet



KØBENHAVNS  
UNIVERSITET

# The Team

- Daniel Spikol
- Alexander Mittet
- Casper Brahe Rützou
- Ida Marie Grøn Nielsen
- Jeppe Fræhr Møller
- Mathilde Parlo
- Viktoria Silke Sofia Strandbygaard

# Inclusive DIKU

- Welcome to DIKU. Our goal is to promote excellence in computer science education and research.
- To strive for a respectful, inclusive, diverse environment and encourage open and critical academic discussion.
- We strive to create a welcoming and respectful environment.

## OPEN & ACCOMMODATING

Being open and respectful of differing opinions, viewpoints, and experiences



## INCLUSIVE

Focusing on what is best not just for us as individuals, but for the overall community

## CONSTRUCTIVE

Giving and accepting constructive feedback



## RESPONSIBLE

Accepting responsibility and apologizing to those affected by our mistakes, and learning from the experience

## RESPECTFUL

Respecting DIKU's facilities by following the current regulations of the Faculty of Science and DIKU



# Velkommen!

- Presentation of Activities
- Why and what is the Kickstart course?

# Overall Plan for the week

Day 1 Mon	6h 00m	⋮	Day 2 Tues	6h 00m	⋮	Day 3 Weds	6h 00m	⋮	Day 4 Thurs	6h 00m	⋮	Day 5 Fri	6h 00m	⋮																																																																																																																																	
<table border="1"> <tr><td>⌚ 09:00</td><td>Welcome and Introduction</td><td>15m</td></tr> <tr><td>09:15</td><td>Greeting Activity</td><td>15m</td></tr> <tr><td>09:30</td><td>Team Building and Icebr...</td><td>1h 30m</td></tr> <tr><td>11:00</td><td>Installation, wifi, setup, e...</td><td>1h 00m</td></tr> <tr><td>⌚ 12:00</td><td>Lunch</td><td>45m</td></tr> <tr><td>12:45</td><td>Intro to Processing</td><td>20m</td></tr> <tr><td>13:05</td><td>Worksheet: #0 The First ...</td><td>1h 00m</td></tr> <tr><td>14:05</td><td>Worksheets 1 to 3</td><td>50m</td></tr> <tr><td>14:55</td><td>Wrap up</td><td>5m</td></tr> </table>	⌚ 09:00	Welcome and Introduction	15m	09:15	Greeting Activity	15m	09:30	Team Building and Icebr...	1h 30m	11:00	Installation, wifi, setup, e...	1h 00m	⌚ 12:00	Lunch	45m	12:45	Intro to Processing	20m	13:05	Worksheet: #0 The First ...	1h 00m	14:05	Worksheets 1 to 3	50m	14:55	Wrap up	5m	15:00		<table border="1"> <tr><td>⌚ 09:00</td><td>Intro to setup/draw + glo...</td><td>15m</td></tr> <tr><td>09:15</td><td>Hello and Intro to peer p...</td><td>15m</td></tr> <tr><td>09:30</td><td>Break</td><td>15m</td></tr> <tr><td>09:45</td><td>Worksheet #3</td><td>1h 00m</td></tr> <tr><td>10:45</td><td>Worksheet # 4</td><td>1h 15m</td></tr> <tr><td>⌚ 12:00</td><td>Lunch</td><td>45m</td></tr> <tr><td>12:45</td><td>Worksheet: # 5</td><td>1h 15m</td></tr> <tr><td>14:00</td><td>Break</td><td>15m</td></tr> <tr><td>14:15</td><td>Peer Feedback and Codil...</td><td>40m</td></tr> <tr><td>14:55</td><td>Wrap up</td><td>5m</td></tr> </table>	⌚ 09:00	Intro to setup/draw + glo...	15m	09:15	Hello and Intro to peer p...	15m	09:30	Break	15m	09:45	Worksheet #3	1h 00m	10:45	Worksheet # 4	1h 15m	⌚ 12:00	Lunch	45m	12:45	Worksheet: # 5	1h 15m	14:00	Break	15m	14:15	Peer Feedback and Codil...	40m	14:55	Wrap up	5m	15:00		<table border="1"> <tr><td>⌚ 09:00</td><td>Intro talk on Conditionals</td><td>30m</td></tr> <tr><td>09:30</td><td>Break</td><td>10m</td></tr> <tr><td>09:40</td><td>Worksheet #4 and #5</td><td>1h 50m</td></tr> <tr><td>11:30</td><td>Peer Feedback Practice</td><td>30m</td></tr> <tr><td>⌚ 12:00</td><td>Lunch</td><td>45m</td></tr> <tr><td>12:45</td><td>Projects and Brainstormi...</td><td>30m</td></tr> <tr><td>13:15</td><td>Project Time Brainstormi...</td><td>1h 40m</td></tr> <tr><td>14:55</td><td>Wrap up</td><td>5m</td></tr> </table>	⌚ 09:00	Intro talk on Conditionals	30m	09:30	Break	10m	09:40	Worksheet #4 and #5	1h 50m	11:30	Peer Feedback Practice	30m	⌚ 12:00	Lunch	45m	12:45	Projects and Brainstormi...	30m	13:15	Project Time Brainstormi...	1h 40m	14:55	Wrap up	5m	15:00		<table border="1"> <tr><td>⌚ 09:00</td><td>Creative Coding Valkarie...</td><td>30m</td></tr> <tr><td>09:30</td><td>Worksheets #5-6 &amp; Proj...</td><td>1h 00m</td></tr> <tr><td>10:30</td><td>Break</td><td>15m</td></tr> <tr><td>10:45</td><td>Worksheets</td><td>1h 15m</td></tr> <tr><td>12:00</td><td>Lunch</td><td>45m</td></tr> <tr><td>12:45</td><td>Project Time and/or Wor...</td><td>35m</td></tr> <tr><td>13:20</td><td>Project Time and/or Wor...</td><td>40m</td></tr> <tr><td>⌚ 14:00</td><td>break</td><td>10m</td></tr> <tr><td>14:10</td><td>Project Time and/or Wor...</td><td>45m</td></tr> <tr><td>14:55</td><td>Wrap up</td><td>5m</td></tr> </table>	⌚ 09:00	Creative Coding Valkarie...	30m	09:30	Worksheets #5-6 & Proj...	1h 00m	10:30	Break	15m	10:45	Worksheets	1h 15m	12:00	Lunch	45m	12:45	Project Time and/or Wor...	35m	13:20	Project Time and/or Wor...	40m	⌚ 14:00	break	10m	14:10	Project Time and/or Wor...	45m	14:55	Wrap up	5m	15:00		<table border="1"> <tr><td>⌚ 09:00</td><td>Summary of week</td><td>30m</td></tr> <tr><td>09:30</td><td>Project time</td><td>2h 30m</td></tr> <tr><td>12:00</td><td>Lunch</td><td>45m</td></tr> <tr><td>12:45</td><td>Final Project Prep</td><td>45m</td></tr> <tr><td>13:30</td><td>Presentations</td><td>1h 25m</td></tr> <tr><td>14:55</td><td>Good bye</td><td>5m</td></tr> </table>	⌚ 09:00	Summary of week	30m	09:30	Project time	2h 30m	12:00	Lunch	45m	12:45	Final Project Prep	45m	13:30	Presentations	1h 25m	14:55	Good bye	5m	15:00	
⌚ 09:00	Welcome and Introduction	15m																																																																																																																																													
09:15	Greeting Activity	15m																																																																																																																																													
09:30	Team Building and Icebr...	1h 30m																																																																																																																																													
11:00	Installation, wifi, setup, e...	1h 00m																																																																																																																																													
⌚ 12:00	Lunch	45m																																																																																																																																													
12:45	Intro to Processing	20m																																																																																																																																													
13:05	Worksheet: #0 The First ...	1h 00m																																																																																																																																													
14:05	Worksheets 1 to 3	50m																																																																																																																																													
14:55	Wrap up	5m																																																																																																																																													
⌚ 09:00	Intro to setup/draw + glo...	15m																																																																																																																																													
09:15	Hello and Intro to peer p...	15m																																																																																																																																													
09:30	Break	15m																																																																																																																																													
09:45	Worksheet #3	1h 00m																																																																																																																																													
10:45	Worksheet # 4	1h 15m																																																																																																																																													
⌚ 12:00	Lunch	45m																																																																																																																																													
12:45	Worksheet: # 5	1h 15m																																																																																																																																													
14:00	Break	15m																																																																																																																																													
14:15	Peer Feedback and Codil...	40m																																																																																																																																													
14:55	Wrap up	5m																																																																																																																																													
⌚ 09:00	Intro talk on Conditionals	30m																																																																																																																																													
09:30	Break	10m																																																																																																																																													
09:40	Worksheet #4 and #5	1h 50m																																																																																																																																													
11:30	Peer Feedback Practice	30m																																																																																																																																													
⌚ 12:00	Lunch	45m																																																																																																																																													
12:45	Projects and Brainstormi...	30m																																																																																																																																													
13:15	Project Time Brainstormi...	1h 40m																																																																																																																																													
14:55	Wrap up	5m																																																																																																																																													
⌚ 09:00	Creative Coding Valkarie...	30m																																																																																																																																													
09:30	Worksheets #5-6 & Proj...	1h 00m																																																																																																																																													
10:30	Break	15m																																																																																																																																													
10:45	Worksheets	1h 15m																																																																																																																																													
12:00	Lunch	45m																																																																																																																																													
12:45	Project Time and/or Wor...	35m																																																																																																																																													
13:20	Project Time and/or Wor...	40m																																																																																																																																													
⌚ 14:00	break	10m																																																																																																																																													
14:10	Project Time and/or Wor...	45m																																																																																																																																													
14:55	Wrap up	5m																																																																																																																																													
⌚ 09:00	Summary of week	30m																																																																																																																																													
09:30	Project time	2h 30m																																																																																																																																													
12:00	Lunch	45m																																																																																																																																													
12:45	Final Project Prep	45m																																																																																																																																													
13:30	Presentations	1h 25m																																																																																																																																													
14:55	Good bye	5m																																																																																																																																													

# Monday's Plan

- kl. 9:00-9:45 → Welcome and Introduction
- kl. 10:00-11:15 → Team Building Activities, Mini-Lecture, and Coding
- KL 11:15-12:00 → Processing Introduction
- kl. 12:00 - Lunch → Options (Bio Kantine...)
- kl. 12:45-13:30 → UP1 Intro to Processing
- kl. 13:30-15:00 → Team rooms - Intro to Processing
- kl. 14:45-15:00 → Check-in with your Teams

# Intended Fun Outcomes

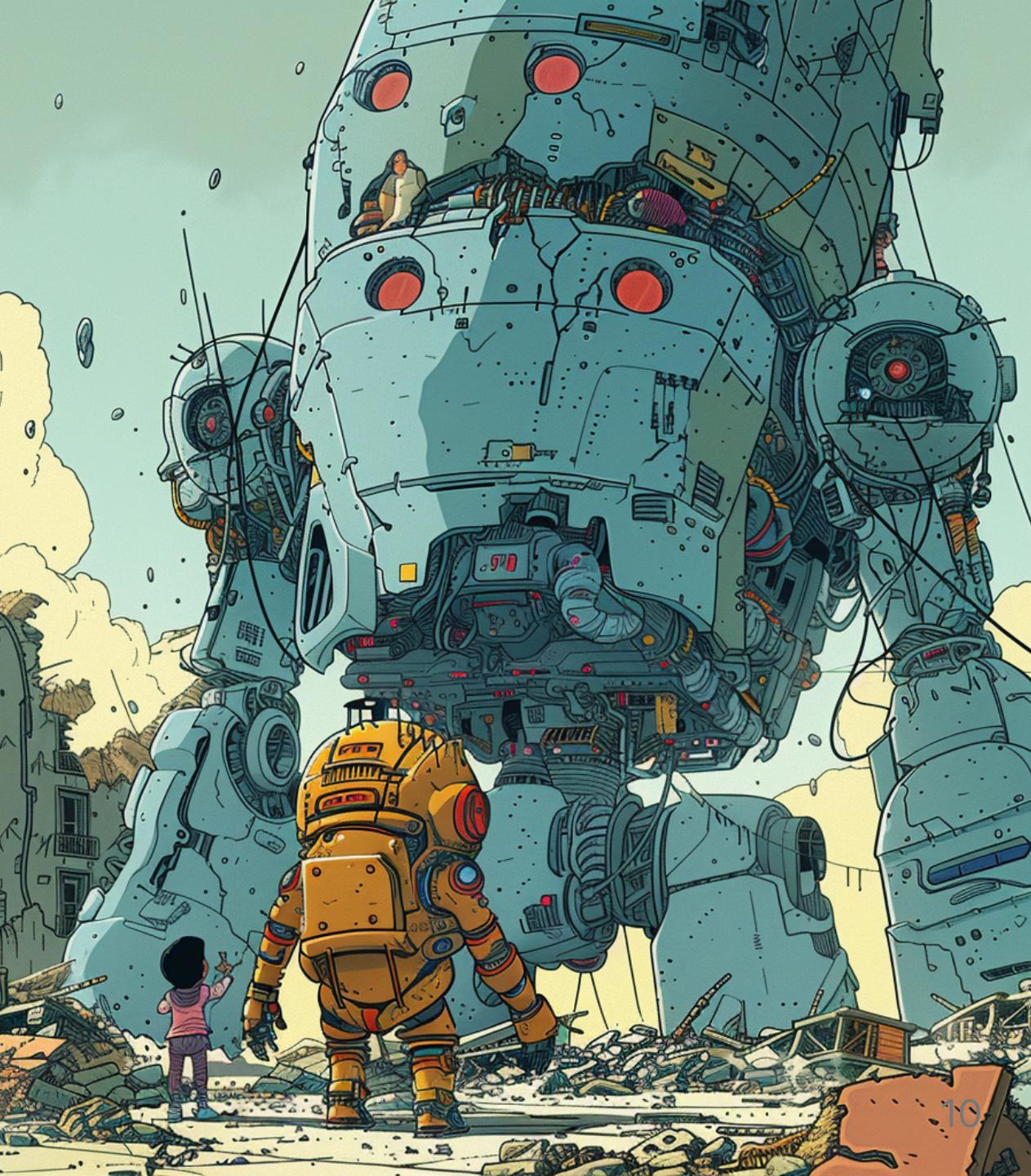
- Why IFOs and not Intended Learning Outcomes
  - Intended Learning Outcomes (ILOs) define what a learner will have acquired and will be able to do upon completing their courses and studies.

# Intended Fun Outcomes

- Meet people and collaborate
- Explore programming with a focus on creating games
- Have fun and take chances through creativity
- Take control of your education

# Meet people and collaborate

- Design Thinking
- Collaboration
- Reframing



# Teams and Instructors

- **Team Alpha:** Alex, Casper, and Ida → room Øv-1-0-10
- **Team Bravo:** eppe, Mathilde, and Viktoria → room Øv-1-0-18
- **Team Charlie:** → room Øv-1-0-22
- **Team Delta:** → room Øv-1-0-34

# Challenge Time

- Design Thinking
- Collaboration
- Reframing

# Time for a Team Challenge



# Marshmallow Challenge Reflection



- [TED TALK Tom Wujec](#)
- Constant prototyping as a problem-solving method.
- **Getting the Design Right and the Right Design** → Buxton, William (2007). *Sketching user experiences: getting the design right and the right design*. Amsterdam: Elsevier/Morgan Kaufmann

# Internet Access



## Aktiver KU-bruger

- Log på [mit.ku.dk](https://mit.ku.dk) med NemID og find midlertidig pinkode. Gå til [kunet.dk](https://kunet.dk) og tryk "Første gang du logger på".
- Log på med den midlertidige kode og CPR nummer uden bindestreg.
- Aflæs KU brugernavn (fx abc123) og angiv password.

## Eduroam WiFi

- Kræver KU bruger og password
- Log på med brugernavn: [abc123@ku.dk](mailto:abc123@ku.dk)

## Alternativt: KU Guest WiFi

- Opret 24 timers konto ved at indtaste navn, mail, mobilnummer.

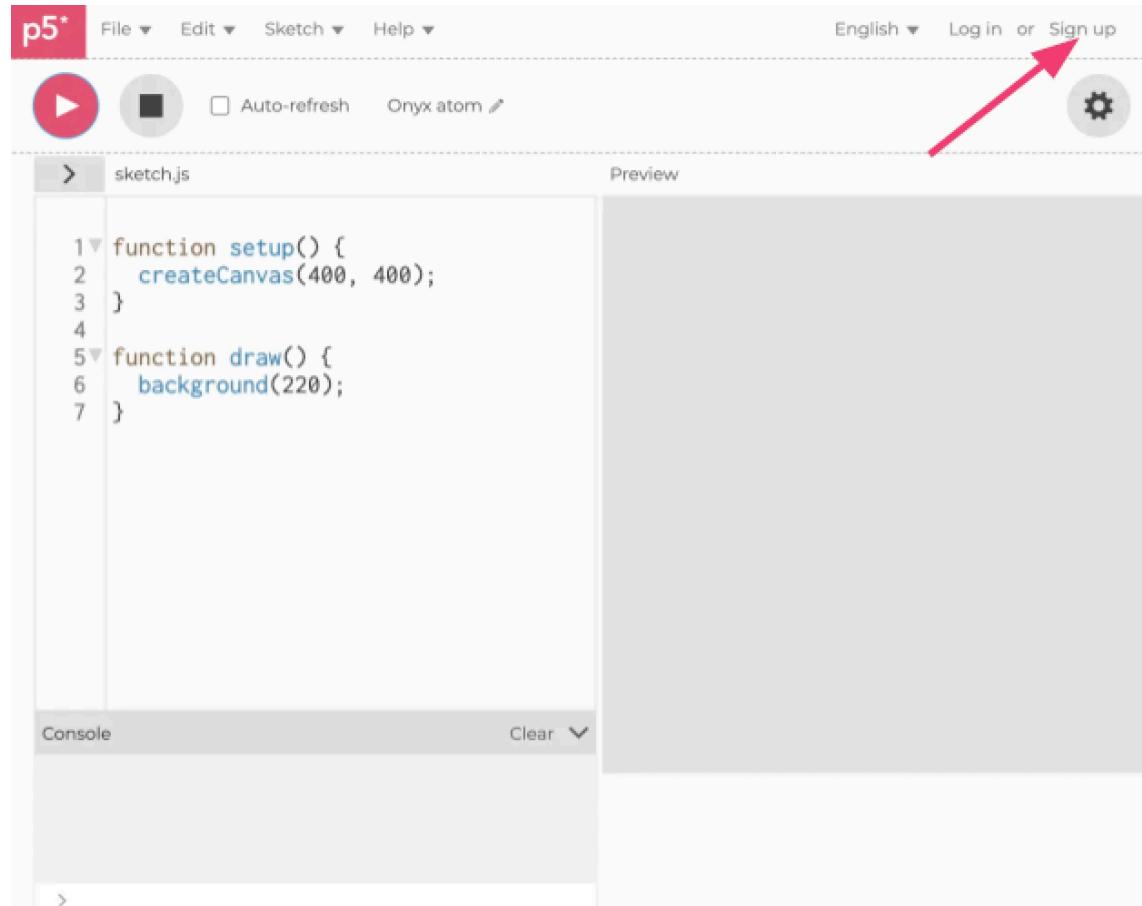
Installation af p5\*js

<https://p5js.org/>



# Web Editor Steps

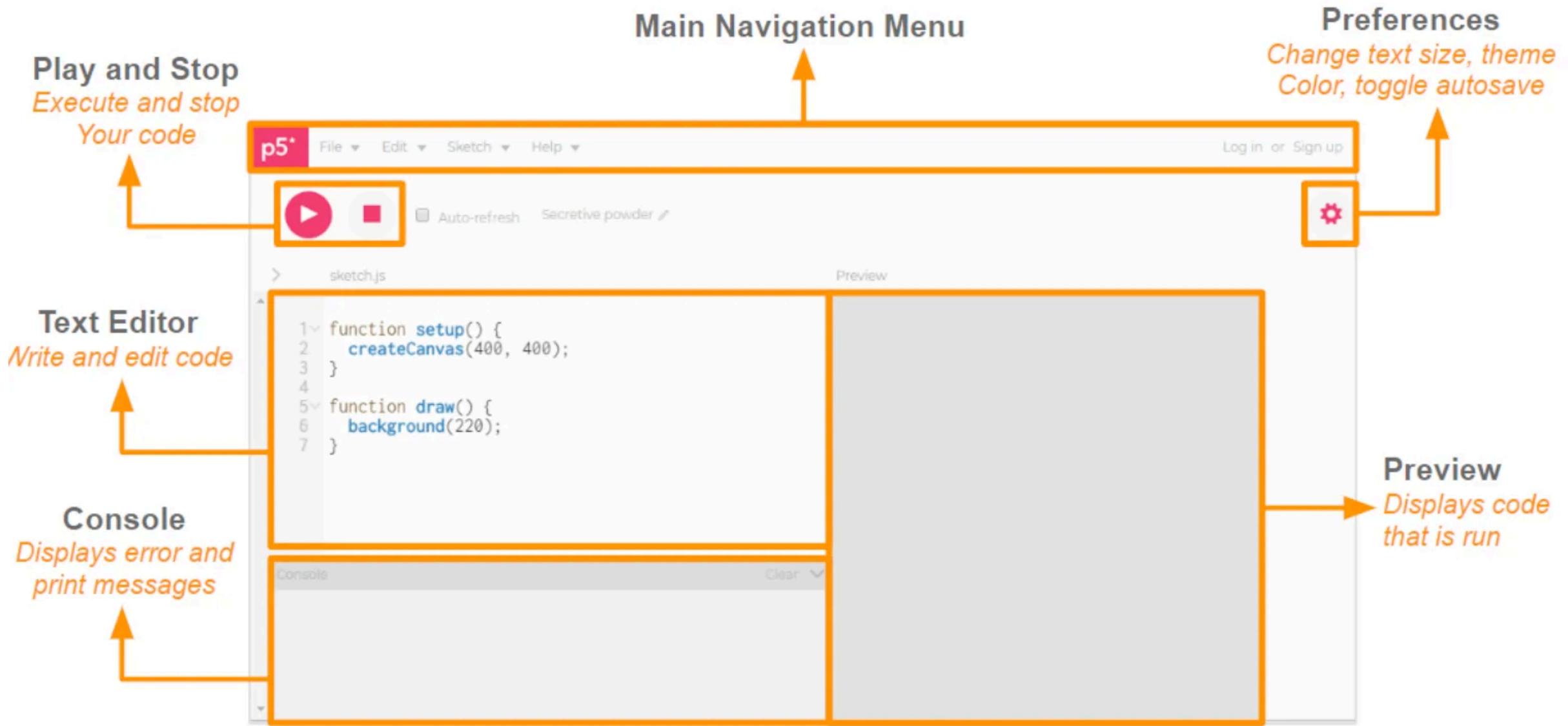
1. Access to the Internet  and web browser 
2. The p5.js Web Editor is a website where programmers can write, test, share, or remix p5.js programs without needing to download or configure a code editor on a computer. A code editor makes writing and reading code easier by organizing and coloring text in a way that helps programmers see different parts of the code.
3. See this [Tutorial](#) for getting up to speed if you want.

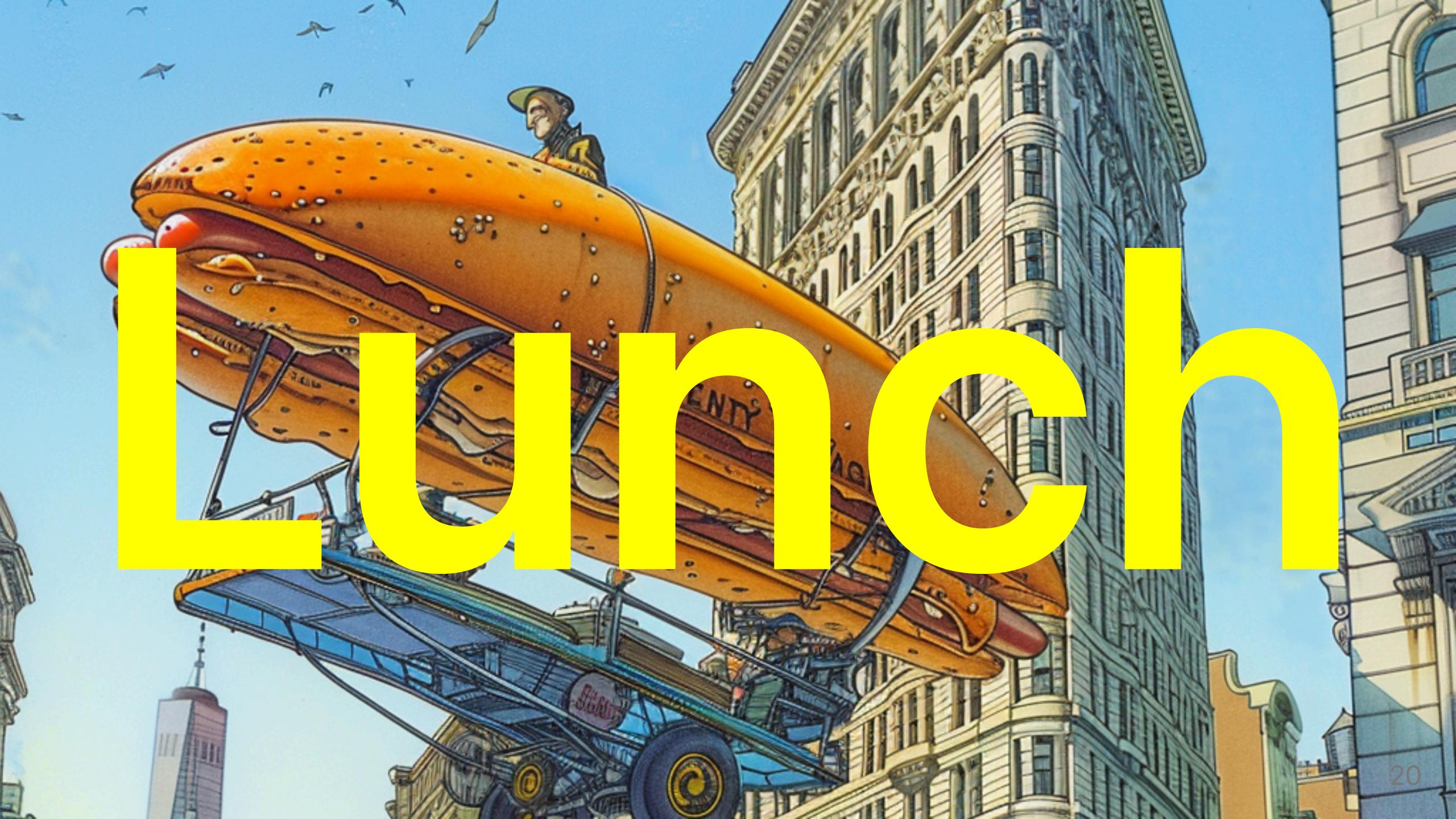


## P5 Sign up

1. You will want to save and share your files
2. You can sign-up with your Email, Google, or GitHub

# p5.js Web Editor Interface

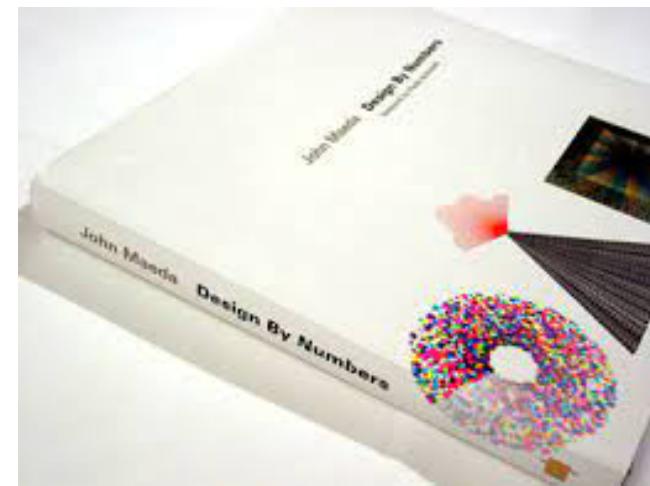


A surreal illustration featuring a massive sandwich flying through a city skyline. The sandwich is enormous, with a golden-brown bun, meat, cheese, and vegetables visible. A small figure of a man in a hat and jacket is perched on top of the sandwich. Below it, a blue roller coaster track curves through the air, with a train full of people. In the background, there are tall, detailed buildings, including one with a prominent arched window. The sky is a clear blue with a few birds flying. The word "Lunch" is overlaid in large, bold, yellow letters.

Lunch

# Processing History

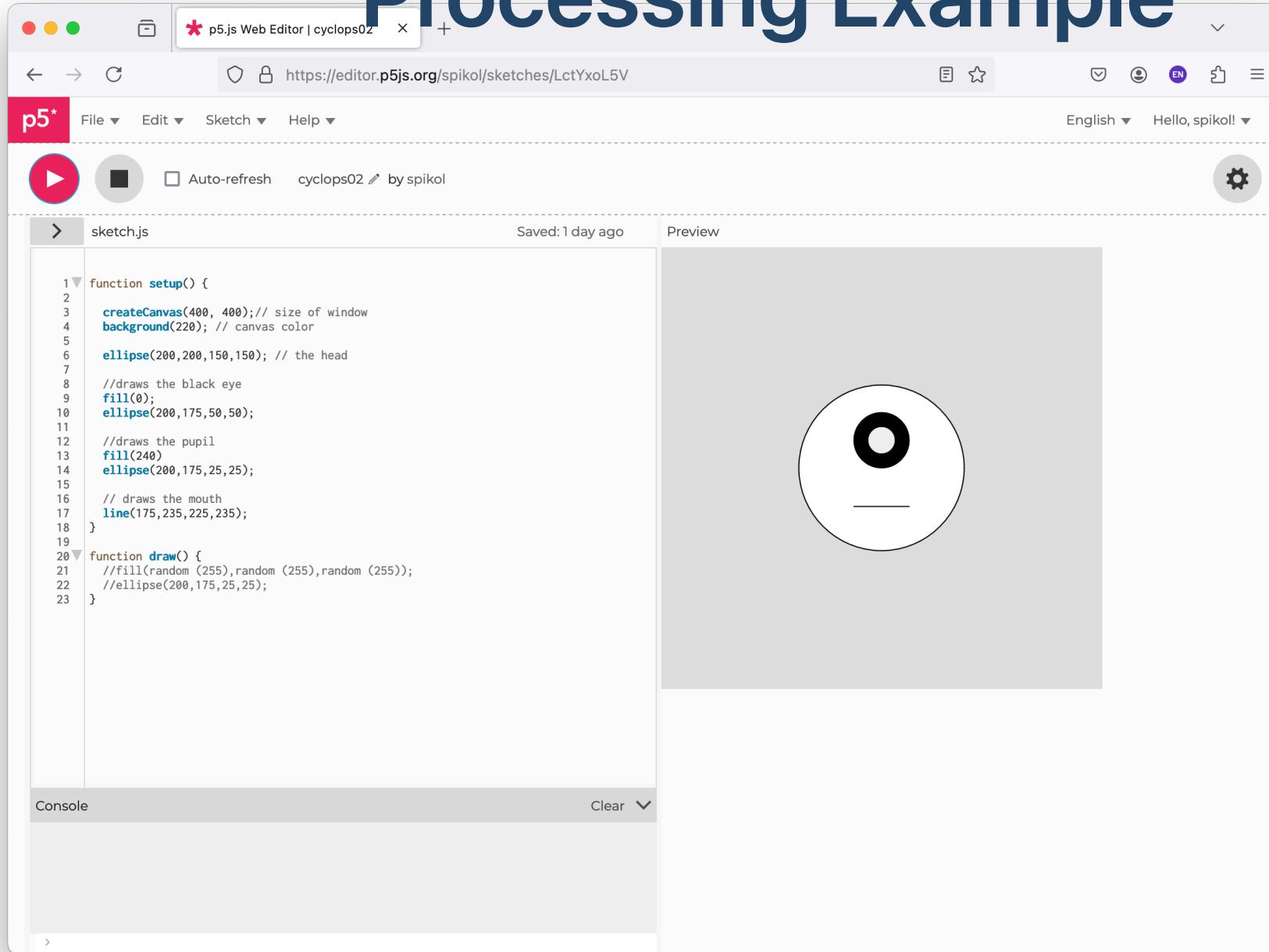
- M.I.T. Media Lab Casey Reas & Ben Fry
- Design By Numbers - Maeda, John. - Design by numbers / John Maeda.. - 1999. - ISBN: 0262133547
- Creative Programming



# What is Processing

- Processing is a flexible software sketchbook and a language for learning code. Since 2001, Processing has promoted software literacy within the visual arts and visual literacy within technology. Thousands of students, artists, designers, researchers, and hobbyists use Processing for learning and prototyping.
- Processing Development Environment → PDE
- Programs are called Sketches
- The PDE consists of a simple text editor for writing code, a message area, a text console, tabs for managing files, a toolbar with buttons for common actions, and a series of menus.

# Processing Example



The screenshot shows the p5.js Web Editor interface. At the top, the title bar reads "p5\* p5.js Web Editor | cyclops02" and the address bar shows the URL "https://editor.p5js.org/spikol/sketches/LctYxoL5V". The editor window has a red header bar with "File", "Edit", "Sketch", and "Help" menus. Below the header is a toolbar with a play button, a square button, and an "Auto-refresh" checkbox. The main area is titled "sketch.js" and shows the following code:

```
1 function setup() {
2   createCanvas(400, 400); // size of window
3   background(220); // canvas color
4
5   ellipse(200,200,150,150); // the head
6
7   //draws the black eye
8   fill(0);
9   ellipse(200,175,50,50);
10
11   //draws the pupil
12   fill(240)
13   ellipse(200,175,25,25);
14
15   // draws the mouth
16   line(175,235,225,235);
17 }
18
19 function draw() {
20   //fill(random(255),random(255),random(255));
21   //ellipse(200,175,25,25);
22 }
```

The preview window on the right displays a simple face with a white head, a black eye, a white pupil, and a thin black horizontal line for a mouth.

# Processing Parts 1

## 1. Basics of Processing IDE:

- **Interface:** The Processing IDE has a simple interface. There's an area for writing code, buttons for running and stopping sketches, and a message area below for error messages and other notifications.
- **Sketch:** In Processing, each project is called a "sketch". A sketch is a combination of code, data, and output.

## 2. Language:

Processing uses a variant of the Java language. It's designed to be beginner-friendly, with simpler functions and setup to create visual and interactive projects quickly.

## Structure of a Basic Sketch:

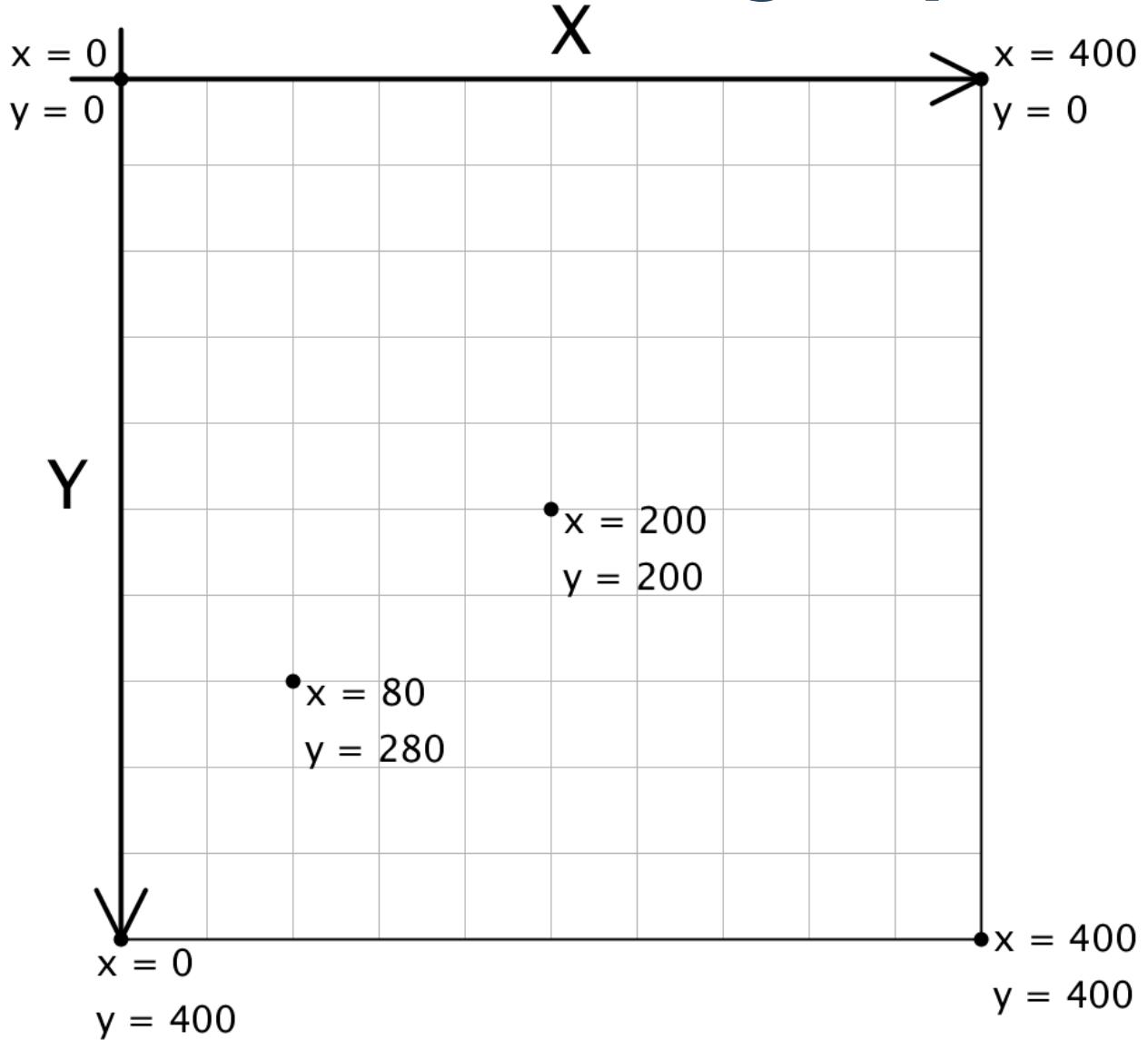
- **setup() function:** This is executed once when the sketch starts. It's commonly used to define initial environment properties such as screen size and background color.
- **draw() function:** This runs repeatedly after setup(). It's used for continuously running code, such as animation or checking for input.

**4. Running the Sketch:** The sketch is compiled and run when you click the "Run" button (or press Ctrl+R/Cmd+R). The visual output is displayed in a separate window.

# Enough Lecture: Today's IFOs

- You will get a sense of the PDE shortly
- How to **draw and color** with Processing
- What are **Variables** as simple as they get

# Drawing in p5



# Cartesian Coordinates in p5.js

## Canvas Grid:

- Origin (0, 0) is at the top-left corner.
- X-axis increases to the right.
- Y-axis increases downward.

## Using Coordinates:

- Position shapes using (x, y) coordinates.

## Example coordinates:

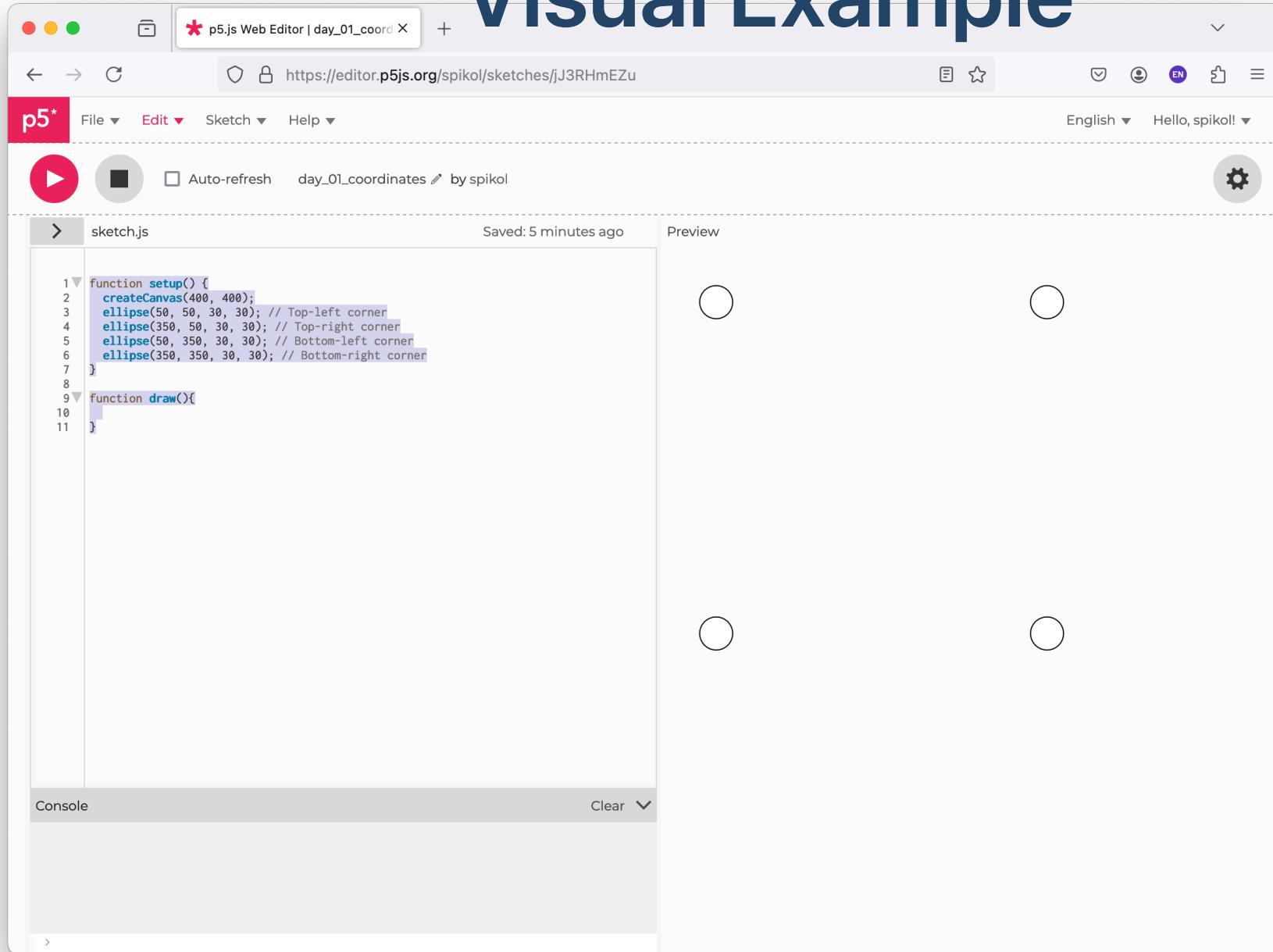
- (0, 0) - Top-left corner.
- (400, 400) - Bottom-right corner (for a 400x400 canvas).

# Code Example

```
function setup() {
  createCanvas(400, 400);
  ellipse(50, 50, 30, 30); // Top-left corner
  ellipse(350, 50, 30, 30); // Top-right corner
  ellipse(50, 350, 30, 30); // Bottom-left corner
  ellipse(350, 350, 30, 30); // Bottom-right corner
}

function draw(){
}
```

# Visual Example



# Variables

- At its core, a **variable in programming** is like a container or a storage box that holds data.
- **Variables** are names that hold **values**.
- Imagine you have a box in real life where you put an apple; you might label that box "fruit" so you know it contains a fruit. In programming, the box is the variable, the apple is the data, and the label "fruit" is the variable's name.
- Keep in mind that, unlike real life, if you put an orange into your variable.

# Scoping Variables

- **Global Variables:**
  - Declared outside any function.
  - Accessible from any part of the program.
- **Local Scope**
  - Variables declared within function or blocks