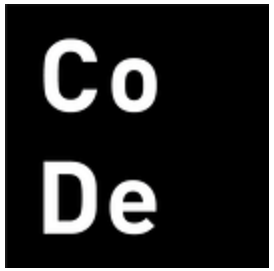


AY2021 ID2116 Wk04: Object/OOP/StateTransition

Agenda:

- Object Oriented Programming
  - JavaScript Object:
  - Class
- Designing behaviour of your program
  - State Transition / Finite State Machine
- Connecting micro:bit ↔ p5*js
  - Web USB
  - BlueTooth

Mid-Term Project: "Algorithmic Agent"

https://www.notion.so/clementzheng/Assignment-1-Algorithmic-Agent-b354abc36c2e42f6898a7dfd41c4fcc3

Object Oriented Programming with p5.js

https://www.w3schools.com/js/js_objects.asp

What is Object?

JavaScript Object Example:

```
let fruitObj = {
  key : value ,
  name: "orange",
  weight: 100,
  origin: "USA",
  eat: function() { print("Yummy!") },
  weigh: function() { print( this.weight + "g")}
}

// There are two ways to refer object's property value.
let val = objectName.name;           // val === "orange"
let val2 = objectName["name"];       // val2 === "orange"

fruitObj.eat();                      // printout "Yummy!"
fruitObje.weigh();                   // printout "100g"
```

Object Example 01: Light Bulb

https://editor.p5js.org/didny/sketches/o2xF4PK8f

Object Example 02: music player

Week04: In Class Challenge - JS Objects

Animated square example: https://editor.p5js.org/didny/sketches/uOopaKMHE

Emoji agent example: https://editor.p5js.org/clement.zheng/sketches/zT_2JkKot

Challenge

Choose one example:

1. First, modify the appearance and behavior of the object.
2. Second, try adding new properties and functions to the object. Upload your p5.js code to slack.

[Optional] Class
A template for creating objects:

Class is a type of function to generate an object (instance) from a template. By defining a Class of an object you can instantiate(spawn) the objects without rewriting the properties.

Class Example: Bulb Class

Here is an example of spawning two light bulbs with the same properties.

https://editor.p5js.org/didny/sketches/ZpW_tMZ0

[Wk04 Weekly Exercise] Define daily object as a JavaScript “Object”

- Pick a simple object around you and try defining it in JavaScript Object Style.
-

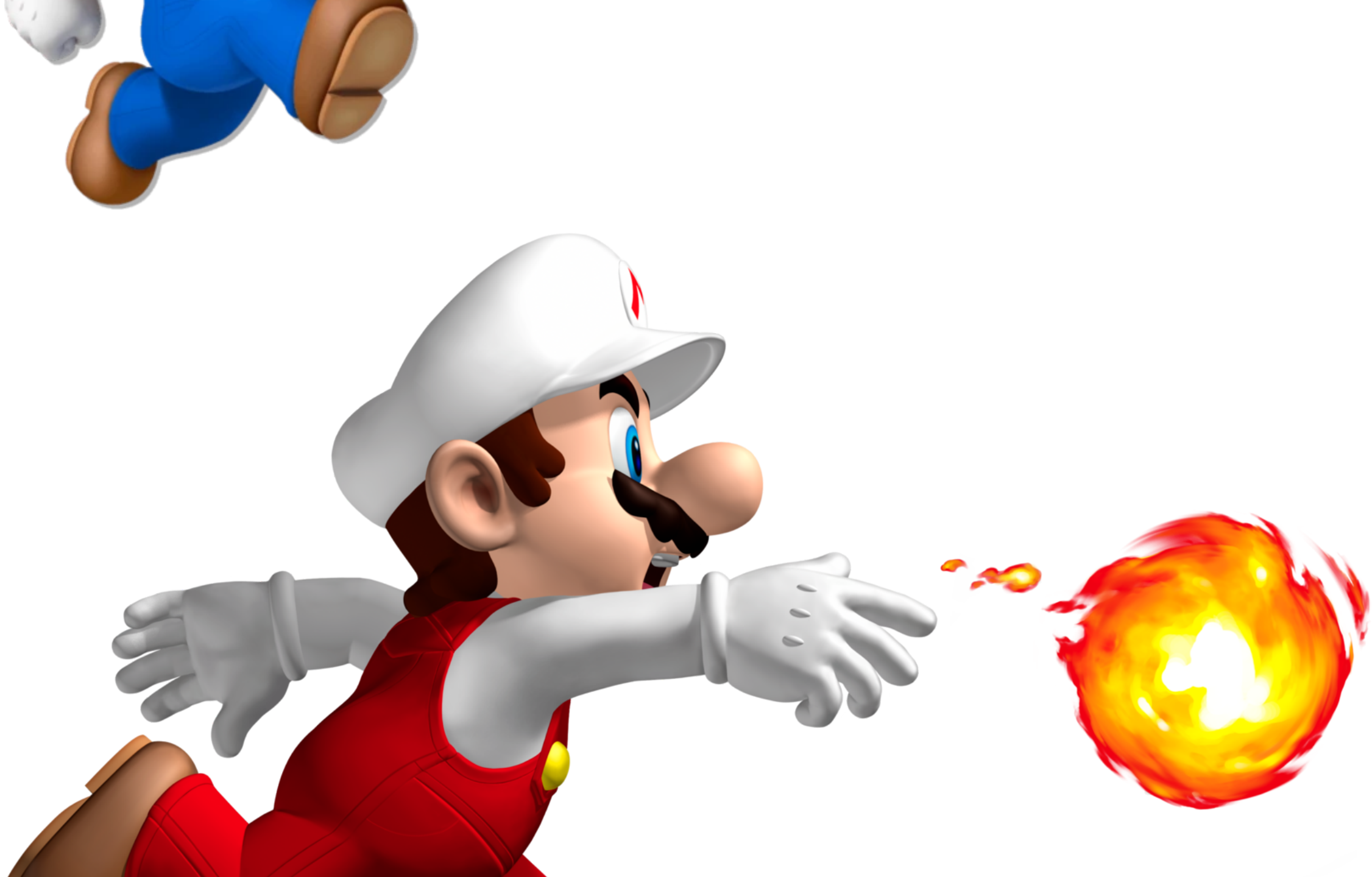
```
objectName = {
  property: "value",
  method: function() { "type what to do" }
}
```

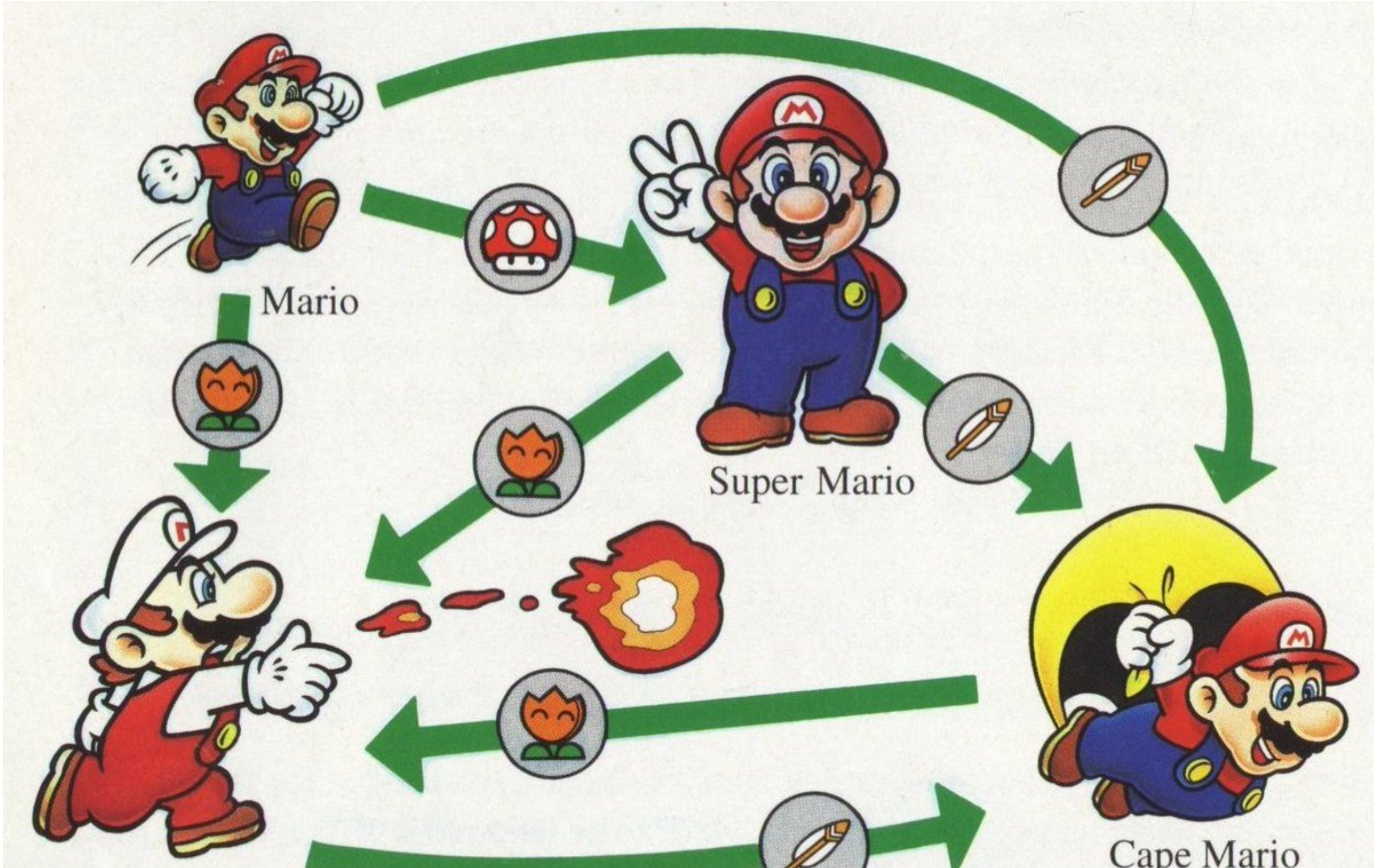
Example: Paper

```
paper = {
  size: A4
  owner: Yuta
  color: "white"
  draw: function(scribble) {"draw a scribble on the paper"}
  fold: function(time) { "fold the paper"}
  tear: function(num) { "teat the paper in to num of pices"}
}
```

Designing behaviours of Objects

State Transition / Finite State Machine



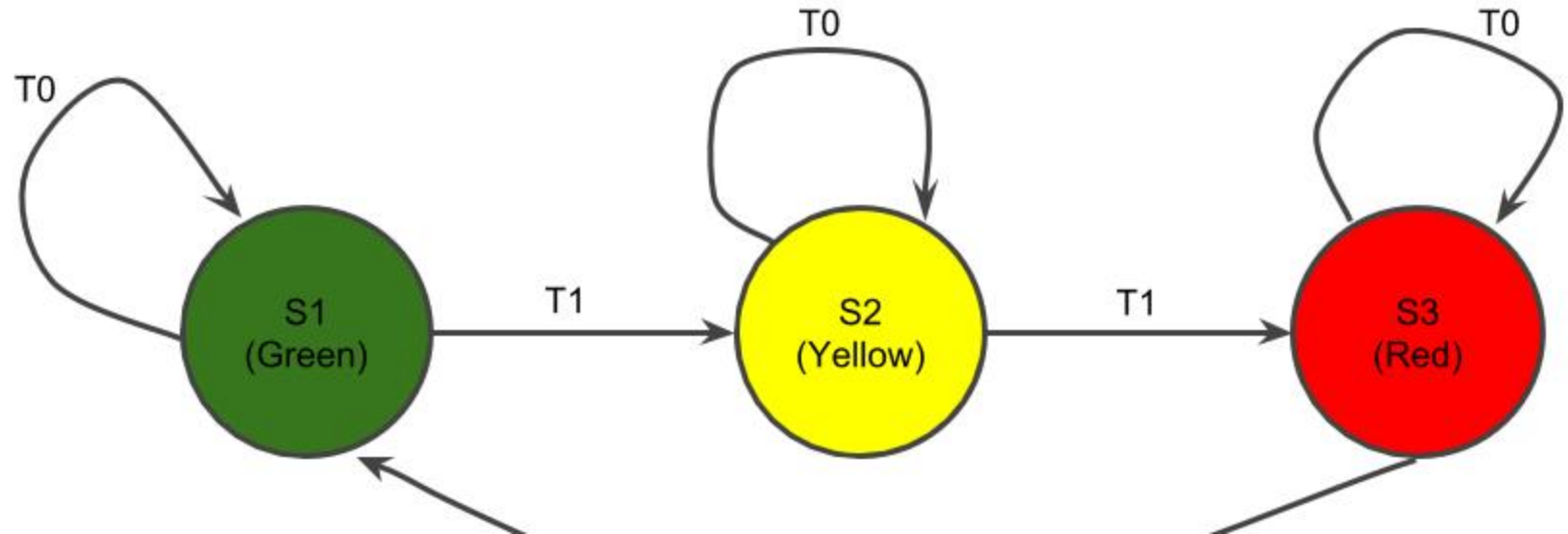

Mario
Super Mario
Cape Mario

Yellow

| (60 sec)

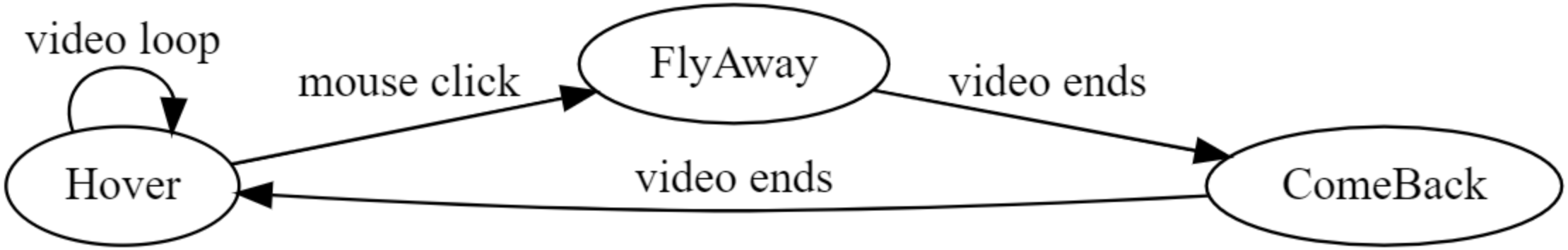
Red

Finite State Machine:
State Transition Diagram



Example3: p5*js Video Sequence Playback

https://editor.p5js.org/didny/sketches/aAzdj6k4



[Wk04 Assignment 1**]**

Define and draw a state transition diagram for the virtual pet

- Brainstorm ideas for your virtual pet. Make sure you review the assignment brief.
- Shortlist an idea.
- Plan out the states and transitions for your virtual pet idea.
    - Include the states and transitions of both virtual pet elements (p5.js), the physical interaction elements (micro:bit), and the communication between them.
- Draw a detailed state transition of your project idea.
- Submit to Slack a PDF that includes:
    - A project description of the virtual pet (no more than 200 words).
    - Any relevant illustrations.
    - The state transition diagram of the virtual pet.

Reference:

https://www.youtube.com/watch?v=-e5h4IGKZRY&&t=295s&ab_channel=TheCodingTrain

https://youtu.be/-e5h4IGKZRY?t=295s