# Documentation for OS Project

## I/O System

**Overview:**

This code visually represents an Operating System's I/O system, focusing on how interrupts, DMA, and device controllers/drivers interact with the OS. It employs a simplified analogy for educational purposes, using a step-by-step animation to elucidate the I/O process.

**Code Structure:**

The code is structured in HTML, CSS, and JavaScript. HTML defines the page structure, CSS provides styling, and JavaScript orchestrates the animation sequence. The animate function is central to the animation flow, transitioning between different stages of the I/O process.

**Animation Flow:**

Process Initiates I/O Call:

The process icon signals an I/O call, initiating the animation sequence.

**OS Mediates:**

The OS icon takes charge, symbolizing the OS's role in managing I/O operations. The animation progresses through the OS, Driver, Controller, and DMA icons, illustrating the sequential flow of information.

**Interrupt Handling:**

An interrupt event occurs during the DMA transfer stage, introducing a surprise element (an acknowledgment is shown at the top of the screen).

**Task Resumption:**

After handling the interrupt, the animation returns to the OS, restarting the I/O process.

**Task Completion and Celebration:**

Upon successful completion of the entire I/O operation, a "Task complete" message is displayed. The celebration involves confetti raining down across the screen, providing a visual cue for the task's accomplishment.

**Educational Significance:**

This code is an interactive educational tool, offering a simplified yet conceptually accurate representation of I/O operations in an OS. It introduces core OS concepts like interrupts, DMA, and controllers in a visually engaging manner, making it accessible to learners at various levels. The animation's step-by-step progression aids in comprehending the intricacies of I/O systems.

## Synchronization

**Overview:**

This code is a visual representation of race conditions and semaphores.

**Code Structure:**

The code is structured in HTML, CSS, and JavaScript. HTML defines the page structure, CSS provides styling and animations while JavaScript alters the animation sequence.

**Educational Significance:**

# CPU Scheduling Algorithms

Within the dynamic domain of operating system process scheduling, users have the option to select from four unique scheduling algorithms, each tailored to meet certain operational requirements. The first option, "First Come First Serve," encourages a sequential execution strategy by ranking processes according to the order in which they arrive. By prioritizing the work with the shortest processing time, the "Shortest Job First" algorithm, on the other hand, prioritizes efficiency over speed in task completion and resource use.

The "Round Robin" technique, which distributes resources cyclically across processes in set time slices, is useful for individuals looking for a fair allocation of resources. By preventing any one process from controlling the system for an extended length of time, this promotes equitable resource distribution. Last but not least, the "Priority Scheduling" algorithm adds a prioritization component by giving processes priority according to predetermined priorities. This improves system responsiveness overall by enabling the timely completion of important activities.

Notably, the accessible table columns are constantly adjusted by the user interface based on the selected methodology. Every algorithm presents its own set of variables and factors to take into account, modifying the user interface to meet the particular requirements of the chosen scheduling approach. In addition, the output and results that the user sees are closely linked to the nuances of the selected algorithm, offering a customized and algorithm-specific summary of the system's functionality and job completion. The dynamic nature of this system ensures that users can engage with and understand the intricacies of different scheduling methodologies, fostering a more nuanced and informed decision-making process.