One-Button Game
Designing within tight constraints

Brief
Your challenge is to make a game whose interface is limited to a single button.

A button has two states: pressed and released. How can you design a core game mechanic solely using the changes between these states? These actions could control movement (running, jumping, flying), an action (attacking, transforming), or a change in the environment (gravity, weather, friction). For multiplayer games, your system may use one button per player. You are encouraged to think beyond making a "runner" game—the most common one-button game mechanic, in which the player's avatar jumps over pits and obstacles.

Learning Objectives
· Design and realize a game within tight design constraints
· Discuss, differentiate, and appraise the range of game mechanics possible with a single binary input
· Develop an aesthetic or narrative treatment that supports the play experience

Variations
· Keyboard emulators like the Makey-Makey allow the rapid construction of whimsical button controllers from household materials like bananas and Play-Doh. Using a keyboard emulator, construct a custom game controller that is part of a piece of clothing, furniture, or architecture.

· Convert a classic arcade game into a one-button game by "automating" (eliminating) interactions that are customarily under control of the player. For example, Space Invaders uses two sets of controls: one to move the player's laser cannon back and forth, and another to fire at descending aliens. It can be changed into a one-button game by making the cannon move back and forth on an automatic schedule.
· Modify the problem scope so that your game uses continuously valued data from a single sensor, such as a slider, knob, photoresistor, or microphone.

Making It Meaningful
The one-button game belongs to a classic category of games wherein user interaction is limited to a single binary input. As the popularity of Tiny Wings and Flappy Bird make evident, this category remains more relevant than ever, particularly in the context of small mobile devices. Yet today's bountiful computational resources tend to encourage a focus on sumptuous audiovisuals, making it easy to overlook how strict design constraints can counterintuitively produce engrossing experiences. As Andy Nealen, Adam Saltsman, and Eddy Boxerman have observed, much can be done with simple inputs, narrow decision spaces, and minimal graphics, as they help focus a designer on "the most relevant rules, mechanics and representations of a system, while still providing for an intractably large possibility space."[1]

Despite its minimal affordances, a single button can allow a surprisingly wide range of expressive interactions—and therefore, game design strategies—through the manipulation of timing. The duration of a button press, for example, can be used to regulate the amount of "energy" applied to a virtual game object (such as charging a battery or stretching a slingshot). A game mechanic may operate by counting how often a player presses the button within a unit of time (i.e., taps per second); measuring the precision of the player's rhythmic sensibility (i.e., how accurately they can achieve a pulse of periodic taps); or quantifying the player's feel for timing (whether their button taps are early or late, relative to another game event). Sequences of long and short button presses can even be used to communicate text through Morse code.

The provocative potential of the one-button game is unleashed when the controller is placed deliberately in the world and interpreted in new physical forms. As designers like Kaho Abe, Kurt Bieg, and Ramsey Nasser show, when attached to different parts of the body, novel multiplayer interactions can be choreographed and agilities tested. Taken together, these strategies outline ways in which a designer can savor tight constraints to make compelling and novel game play.