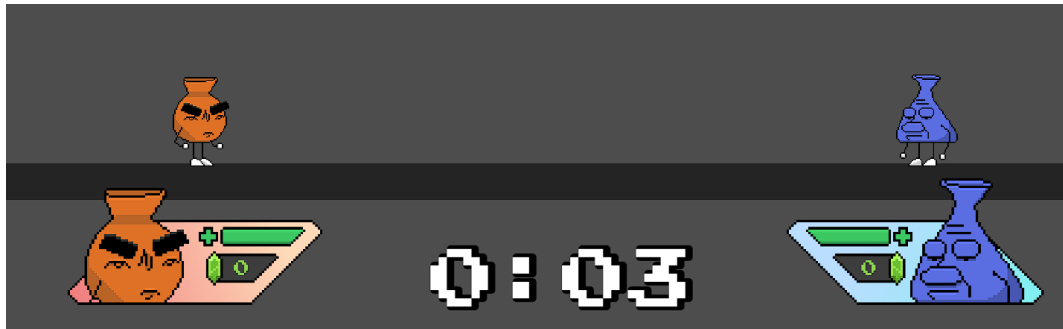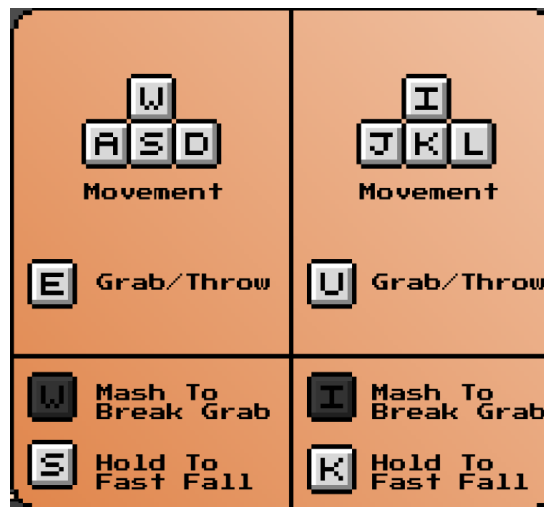# Cracked

Game Design Document

Overview

Cracked is a video game prototype designed by Naton Cai and John Pham. Cracked is a smash-style PVP game developed on the theme of smashing vases similar to video games such as Legend of Zelda.

When the game begins, a brief tutorial screen is displayed before both players are sentient vases with faces, arms, and legs, They spawn an equal distance away from each other on the stage with a 4-minute timer running. Each player's goal is to grab the other player and throw them until they break, collecting the gems that spew out from the inside of the player. The players have the ability to move left and right, jump, double jump, and fast fall. The winner is determined by the player with the most gems by the end of the 4-minute time span.

Style Guide

Game Art:

The intended style of the game art is pixel art. The characters and objects are represented by simple sprites, allowing for an indie game type of aesthetic. Another reason why this art style was chosen is because it was easy to keep the artstyle consistent and able to be generated at a fast pace.

Sound FX:

All the sound effects were created using Chiptone. The reason for this type of sfx is that it matches the art style of the game with the 8-bit sfx.

Music:

Background music All-Stars from the copyright-free album Game Over by PandaBeats

Mechanics

Health:

Health or HP is a representation of the character's physical well-being. HP will start at 30 and decrease as the player receives damage from being thrown and colliding with the walls. Once HP drops to 0, the player's vase shatters, dropping gems and immediately respawning with full HP so it can rejoin the fight.

Stamina:

Stamina is a representation of the vase's weariness over the course of the game. Stamina is separate from Health and directly manages how fast the opponent can throw the player. Starting at 700 and maxing out at 3000. The higher the player's stamina the faster they are thrown as represented by this function:

$$Linear\_velocity = (stamina*direction, -500)$$

There are multiple methods to increase a player's Stamina. Damaging a player by colliding them with a wall increases their Stamina by x1.5. Recovering from a Grab also increases a player's Stamina by x1.5. Recovering from a throw however increases a Player's Stamina by x2.

Damage:

Damage is a representation of the physical harm inflicted on the player's vase. Damage only occurs when a thrown player first collides with the walls, floor, or ceiling. Damage is inflicted directly to health and based on the distances traveled when thrown. This is represented by these formulas:

$$travel\_distance = current\_position - start\_position$$
$$damage = (abs(travel\_distance.x) + abs(travel\_distance.y))/150 + 3$$

Gems:

Gems are the main victory condition for the game. The player that collected the most gems by the end of the game wins so the goal of each player is to collect as many gems as possible. To do this a player must first throw their opponent until their Health drops to 0. On death a player will explode, spawning 1-5 gems in the process. Each player can touch the gems to pick them up.
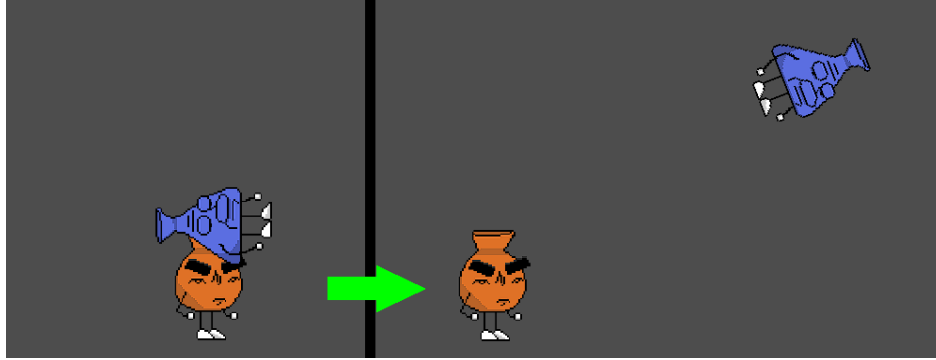

Grab:

Grabbing other players is the main method of dealing damage in this game. Currently grabbing it has 4 frames of startup, 4 active frames, and 20 frames of recovery. This would enable some players to effectively punish players who are mashing the button too much. Additionally, movement inputs are not read while in the Grab animation, and ground velocity is stopped, air velocity is kept though. Below is an image of the hurtbox (in blue) and the hurt box (in red):
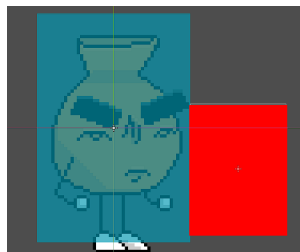
When a player's hurtbox contacts another player's hitbox, the first player is grabbed. When grabbed the player is lifted up upon the second player's head. The second player can then throw the grabbed player, sending them flying in the direction the second player is facing, potentially having the thrown player collide with a wall.

Recovering:

When Grabbed, a player naturally recovers from being grabbed and thrown. When grabbed if the player has not been thrown in 5 seconds, they jump to their feet and recover from the grab. A thrown player also recovers within 5 seconds but these timers are not shared. A player can speed up their recovery time by rapidly pressing their Up button with each press decreasing the time by 0.1 seconds.
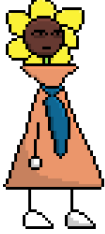
Grab Teching:

Grab teching is a mechanic ported from many traditional fighting games. If both players attempt to grab each other and both their hitboxes contact the opposing player's hurtbox, neither player is grabbed and both are pushed back by a distance

Controls

	P1	P2
Jump/Resist	*W Key*	*I Key*
Fast Fall	*S Key*	*K Key*
Left	*A Key*	*J Key*
Right	*D Key*	*L Key*
Grab/Throw	*E Key*	*U Key*

Characters and Assets

Player 1 (Mega Brow)	Player 2 (Stone Face)	Player 3 (NOT IMPLEMENT)

Block Diagram