UNTITLED CIRCLE GAME

The Marvelous Moles: Joshua Kloepfer, Michael Borczuk, Daniel Sooknanan, Lia Nelson
SoftDev
P04 – Agar.io Design Document
2022-05-26
Time spent: 1.3 hours

Project Description:
We plan to create a game that mimics Agar.io, an endless game about growing bigger by eating other players.

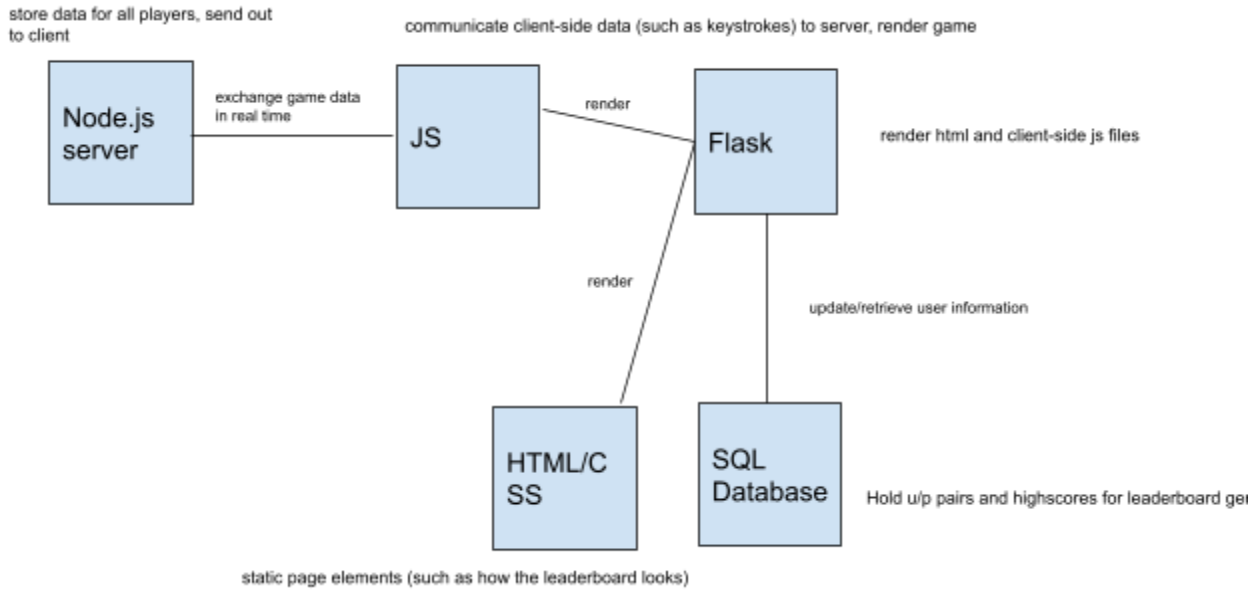
Players will be able to play on a multiplayer server with other players and eat their friends. They will also be able to login to save their highscores to a global leaderboard.

Target Ship Date:
6/13/2022

Program Components

- Node.js
    - We'll use Node.js to host our funny little web game and as the main means of communication between the user and the server
- Express.js
    - We'll be using Express.js to have a couple additional features to work with while using Node.js, which'll make our lives a tad bit easier.
- Socket.io
    - Allows us to emit messages and establish a two-way communication between the server and users
- Embedded Javascript Templates (EJS)
    - Similar to Jinja, EJS will let us utilize HTML templates while using Node

Component Map



We believe that using Node.js is efficient due to its ability for easy client-server communication. However, Node.js by itself is insufficient - we need something to render the HTML pages and client-side JS files. This is why we are using Flask in addition to Node.js. For now, the Flask app is in a standard /app folder and the Node.js app is in the root, but this will likely change.

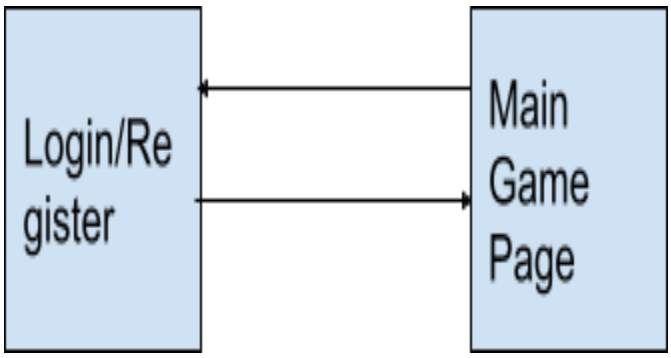
In addition, the droplet currently uses Apache to host the Flask app and NGINX to host the Node.js server. NGINX is necessary for the use of websockets (which facilitate client-server communication). However, we will look into hosting both Flask and Node.js using NGINX, since using two different server services is messy.

Database Organization

Username (text)	Password (text)	Highscore (int)

type (text; user, virus, agar)	mass (int)	xcoor (int; x-coordinate)	ycoor (int; y-coordinate)

Site Map



The game page has an overlay that is removed once you get placed into a game.

Roles

- Lia - game mechanics (JS), backend
    - js
    - Keeping track of coordinates
    - Determining when/how eating, ejections and splits occur
    - Spawning viruses, players and agar
- Michael - multiplayer (JS)
    - Setting up client-server connection
    - Making sure game mechanics work in multiplayer
    - Also working on certain game mechanics
- Daniel - front-end (HTML/CSS)
    - Login/Register page
    - Overlay for game page
    - Assets for game

- Joshua - database integration, game mechanics (JS, SQL)
    - Leaderboard
    - Other game mechanics that need implementation

Game Mechanics

- Press the arrow keys to move your blob.
- Press the *Space Bar* to split in two. One half will continue to move in the current direction but at the velocity of the new, smaller mass and the other half will shoot forward in that same direction before returning to the velocity of the new, smaller mass. Both masses will be controlled by the arrow keys and will recombine after one minute. Furthermore, when performing a split, all blobs being controlled will split.
- Press *W* to eject mass. This mass is a small portion of the blob and not controlled by the player.
- A cell at most 90% of your size is consumable. You will receive that 90% upon consumption.
- Viruses appear as large, spiky green blobs. A sufficiently large cell may eat one, but doing so will cause that large cell to split into 15 or fewer smaller blobs.
- Blobs will start with a mass of 10.
- New agar (with a value of 1) will spawn every 20 ms.
- A virus will spawn every minute.

https://www.digitaltrends.com/gaming/agario-game-guide/
https://agario.fandom.com/wiki/Virus