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SoftDev1 pd9
P05: Fin
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Bloons TD Clone

Roles
Mohidul Abedin: Project Manager, Balancing, Gameplay
Brian Moses: Phaser, Gameplay
Eric Lam: Frontend
Jason Zheng: Backend

Description
Our objective is to create a browser-based Bloons TD clone using Phaser.js
that is intuitive for users to pick up and fun to play. We wanted to use
what we've learned about HTML5 canvases, drawing, and animation to create
an entertaining game. We will use Phaser.js as a framework for our Bloons
TD clone, complete with multiple maps, bloon types, towers, and
leaderboards.

Components
   - **Flask:** backend server framework
   - **SQL3/SQLAlchemy:** database storage
   - **Bootstrap:** frontend css framework. We are most familiar with this,
     and it will allow us to use bootstrap libraries.
   - **Phaser.js:** a powerful JS library for game design
   – **D3.js (potentially):** frontend javascript framework for creating
     graphs of map/player stats

Component Map
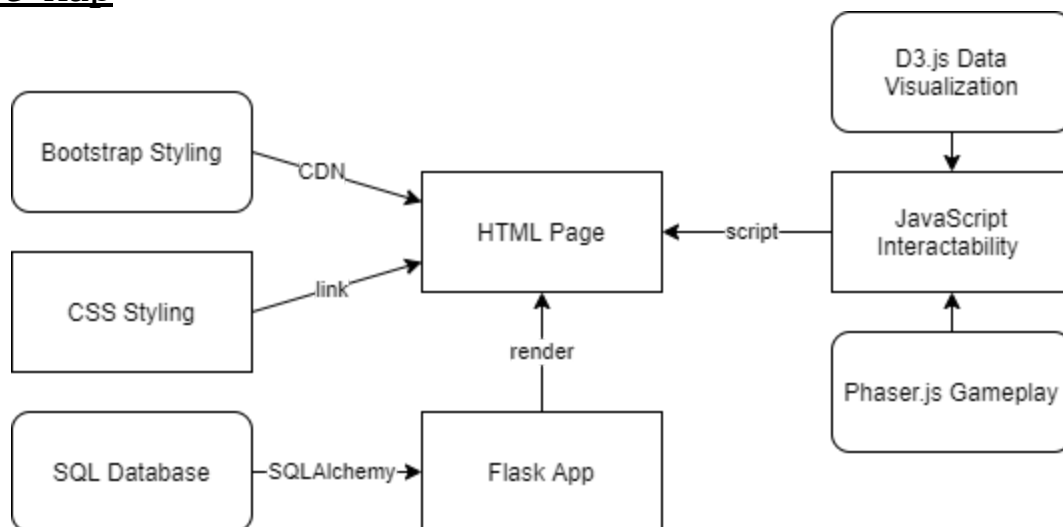
Sitemap
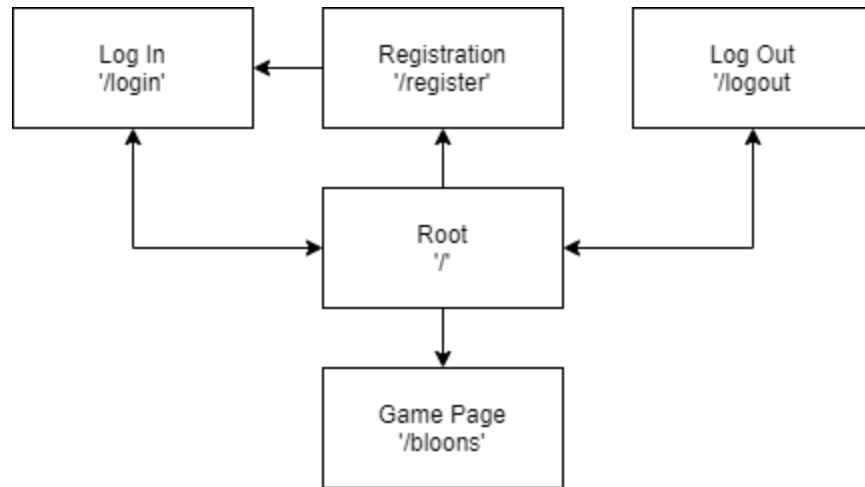
Game Elements

0. **Bloons**
    - bloons will spawn from a specified location for each map
    - there will be multiple types of bloons with varying health and speed
        - potentially: special properties like armored, stealth
    - when a bloon loses all of its hitpoints, it turns into another type of bloon and gives the player money and score
        - exception is the smallest type, the red bloon, which doesn't spawn additional bloon
    - bloons will follow a path from the start point to the end point
    - when bloons reach the end point, they inflict damage on the player's lives and disappear
1. **Towers**
    - several towers will be available for placement in a sidebar
    - user can click and drag towers to be placed on valid locations
        - we will determine which locations are valid by:
            - coloring invalid locations white in photoshop
            - export new map as a png
            - use a python script to convert png into a 2d array of colors
            - convert 2d array to a boolean array, based on whether value at a location is white or not
            - when user attempts to place a tower on a pixel, it references the 2d array
    - towers cost a certain amount of money to place
    - different towers fire different projectiles at different frequencies
2. **Projectiles**
    - fired by towers towards bloons

- can pierce through a specified number of bloons before disappearing, inflicting damage
3. **Levels**
   - each level spawns bloons of a certain level and at a certain frequency
   - player gains an increasing amount of gold and score for each level completed
4. **Maps**
   - Different maps will have varying paths and obstacles
   - Shorter maps introduce challenge by giving your towers less time to pop all the bloons
   - Different path and obstacle arrangements will make placing towers more difficult
5. **Lives**
   - player starts with a certain amount of lives depending on difficulty
   - when lives hit 0, the game ends and the player's ending score is logged

Database Schema
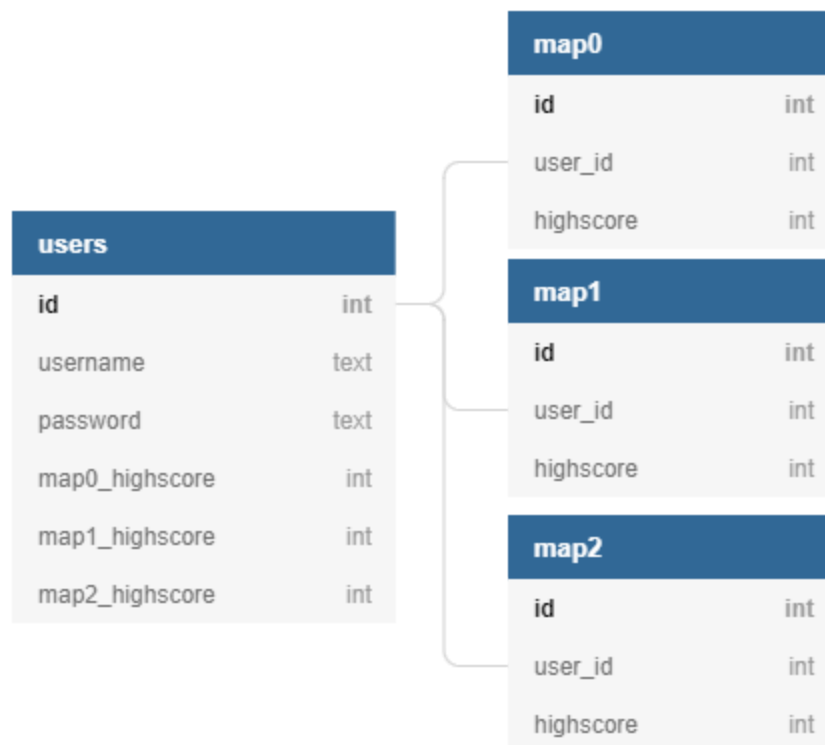
- **users** – A table for all registered users. It keeps track of their highscore in each map they played
- **map0, map1, map2** – keeps track of all the players that played this map and their highscore