Candy Sandbox :: Yaying Liang Li (Blob), Joshua Kloepfer (Pillow), Thomas Yu (Perry), Mark Zhu (Bob the 3rd Jr.)

Software Development

P02 – Design Doc

03/08/2022

Livin' Ducky
(based off Duck Life)

Project Description

In New York City, it is illegal to own ducks outside of farmlands. That's why we bring the experience to you, from feeding your duck to increase its stamina to training it in running, swimming, and flying courses to boost its stats! Participate in randomly generated obstacle courses to increase your duck's skill levels, then race with other computer-generated ducks to claim the Master Duck title. Coins you collect during obstacle courses and win during races can be used to buy food or cosmetics, such as hats and skins based off the developers' duckies. It might be illegal to own ducks in New York, but modern problems have modern solutions!

Tasks

- Ducky Sprites: our duckies / original Duck Life sprites [Yaying]
- Animating Duck doing actions (eating animation, running animation, etc) [Yaying/Thomas]
- Abilities of Duck (ie. jump, crouch, move up, down, left, right for certain races) [Mark]
- Stats / Levels [Joshua]
    - Running, Swimming: stats correlate to speed
    - Flying: stats correlate to distance
- Games associated with each stat [Joshua]
- Different races (map-generation /obstacle course) [Thomas]

    - Background: infinitely scroll through background until new background spawns (“you’ve reached a new place yay!!”)
- Controls (Arrow keys) [Mark]
- Duck NPCs for races [Yaying]
- Multiple players can start a new game on computer
    - Can have multiple ducks per game
- Login button (save skins, stats) [Mark]
    - user does not need to be logged in to play game, but if they want their progress to be saved, they do
- HTML pages (home, register, login) and navigation bar [Thomas]
- Coin system (collected in races & training) [Mark]
- Food system (outside races; buy with coins) and stamina system (for training; determines when the training ends) [Joshua]
    - Feed duck more, stamina stat increases
- Cosmetic Shop: Different skins/hats, inspired by our duckies [Yaying/Thomas]
- ~~**Organic Polymer :)**~~
- ~~Suffering of high school students :,D~~ (Executive Decision)

Optional (if we have time)

- Sound
- Pause/Continue Button
- Climbing Race – future Duck Life games (past ver. 1) have it
- Kill the ducks option – continuum of Duck Life → Duck Death lawl

Program Components and How They Relate

- **Python:**
    - Set up database tables and update them (Users, Ducks, Cosmetics, Images)
    - Randomizer obstacle course

        - Randomly put coins and obstacles into training games

- **Flask: to run website**
    - Facilitates connection between backend and frontend
- **SQLite3:**
    - Database to store information (allows the user to save and continue)
    - **Users**:
        - Temporary row for user if user is not logged in → if not-logged in user quits game without logging in, pop temporary row out of db; if not-logged in user logs in after playing to save their progress, update temporary row to permanent row w/ proper info

Username (TEXT)	Password (TEXT)	Races Completed (INT)	Coins (INT)

    - **Ducks**:

Username of Account Duck is Linked to (TEXT)	Duck Name (TEXT)	Running Level (INT)	Swimming Level (INT)	Flying Level (INT)	Stamina (INT)	Cosmetics on Duck (STRING)

        - May separate the cosmetics column if there are too many that can be on at once [idt it'll be a problem; orig. games had hat / skin only]
    - Cosmetics:

Username	Cosmetic Item

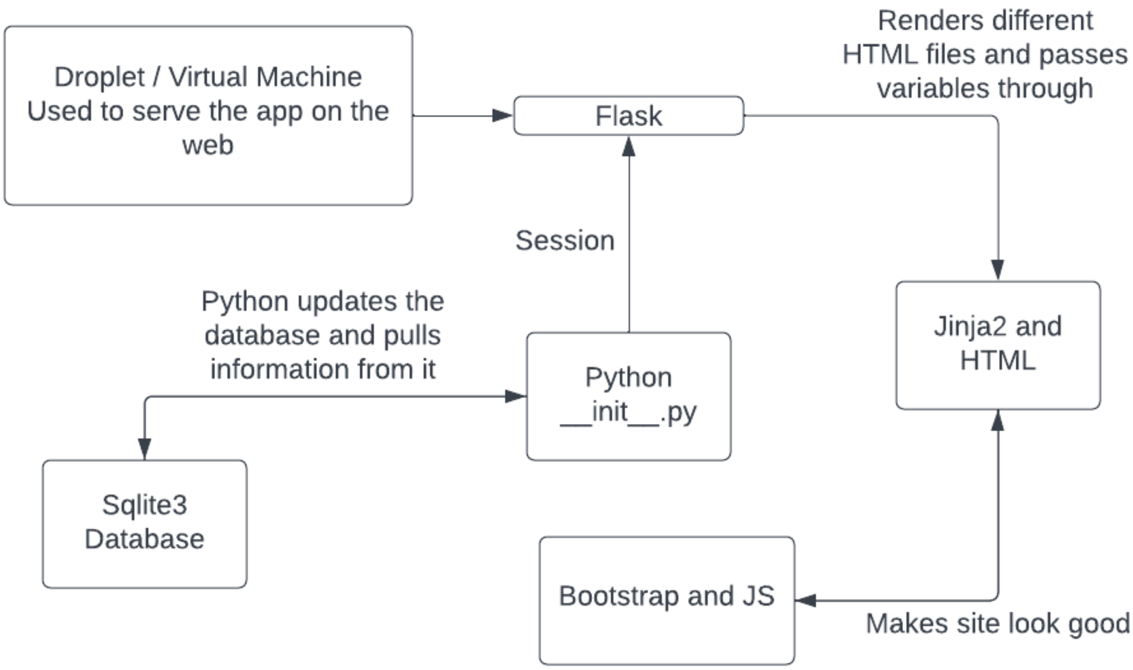
    - Images (in general, ie. backgrounds, duck images) to draw the game:

Image	Link to Image

        - Or images will be stored in a directory within the project to be accessed
- **DigitalOcean and Apache(Server):**

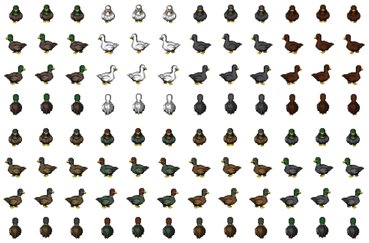
    - Allows the site to be run from the web rather than only local host
- **HTML: to set up the canvas and menu**
    - Home Page
        - Path to login, register, and game
        - New game and continue options
    - Login Page
    - Register Page
    - Game Page
- **JS: graphics for game**
    - Creates the animations for the game
        - Duck movement (hopping, swimming, and flying)
        - Background scrolling to the side (training games and races)
        - Picking up and moving the duck with the cursor
        - Duck eating food
- **Jinja2:**
    - Passes data from Python to the HTML file to be displayed
        - Duck levels/stats
        - Cosmetics
        - Navigation bar? (Register, Login, Play)
- **Bootstrap/CSS: to make the menu look nice**
    - Formatting for the login page and the game page

Component Map


Droplet / Virtual Machine Used to serve the app on the web
Flask
Renders different HTML files and passes variables through
Session
Jinja2 and HTML
Python updates the database and pulls information from it
Python __init__.py
Sqlite3 Database
Bootstrap and JS
Makes site look good

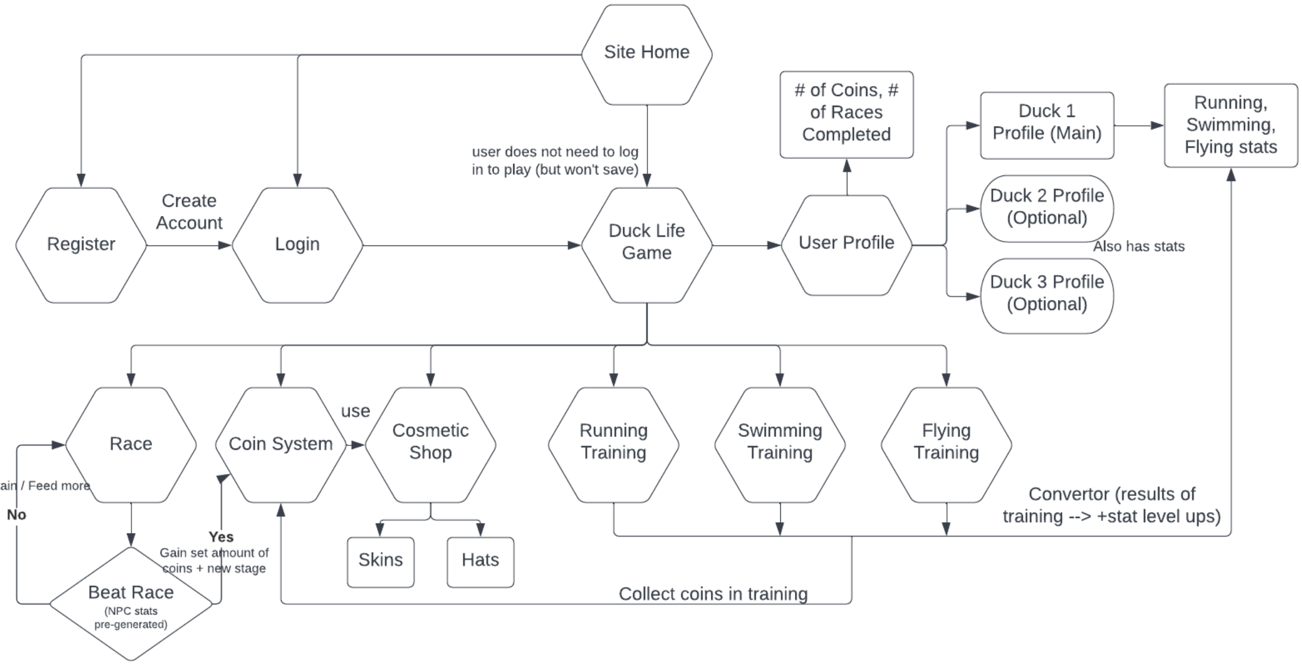
*JavaScript for animations as well (redraw canvas for background, crop through sprite sheets to represent frames in animation)

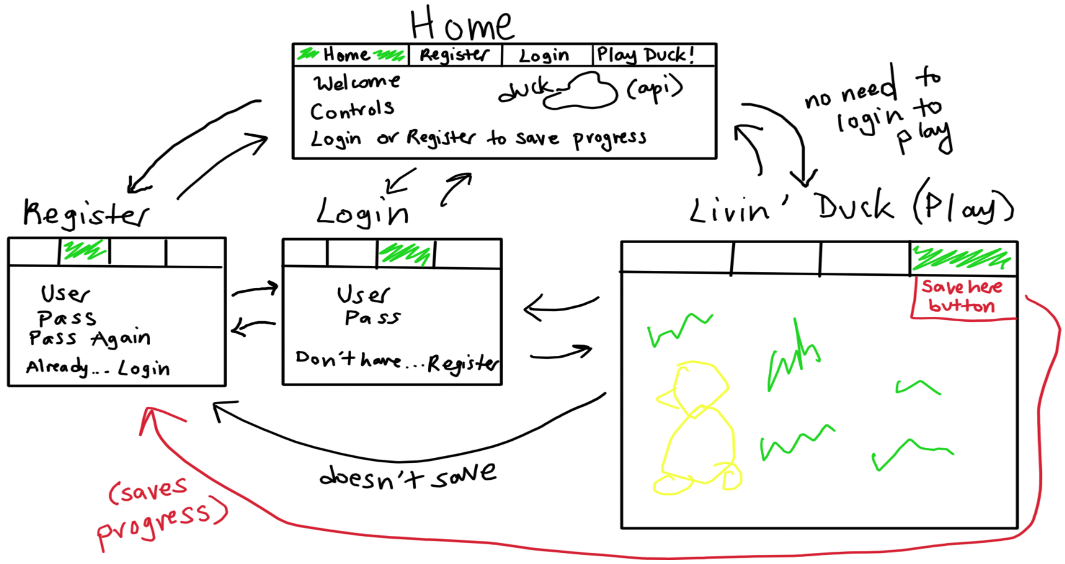
Possible Sprite Sheets to Use



https://rpgtileset.com/?s=duck

Sitemap


Site Home
Register
Create Account
Login
user does not need to log in to play (but won't save)
Duck Life Game
User Profile
# of Coins, # of Races Completed
Duck 1 Profile (Main)
Running, Swimming, Flying stats
Duck 2 Profile (Optional)
Also has stats
Duck 3 Profile (Optional)
Race
Coin System
use
Cosmetic Shop
Running Training
Swimming Training
Flying Training
Convertor (results of training --> +stat level ups)
Train / Feed more
No
Yes
Gain set amount of coins + new stage
Beat Race
(NPC stats pre-generated)
Skins
Hats
Collect coins in training



APIs

- Random Duck API - https://random-d.uk/api

FrontEnd Framework

- **Bootstrap** – navigation bar with containers and buttons easier to implement (in our opinions)

- All 4 members previously used bootstrap (++familiarity)

Breakdown of Tasks

- Frontend (HTML, CSS, Javascript)
  - Thomas
  - Yaying
- Backend (Databases, Python, Flask)
  - Joshua
  - Mark

Target Ship Date

***April 4th –** possible area of difficulty: getting familiar with sprite animations