Project Description

Name
CodeHive

Description
As I'm performing the scaffolded project Bee Game my term project will have the features necessary because of this project. I'll make an interactive game about bees. The user controls a bee which moves across the mouse cursor during the game. The aim is to gather follower's pollen and then pollinate other followers to help make them grow. Some features like helper bees will appear in the game and act out everything the player does. Additionally, it will feature a resizable canvas, intelligent flower generation, and flower movements. Building the game's functionality will be helped by creating classes for the player, flowers, and helper bees. Ultimately however I will wish to then add customization of my own to create my very own distinctive characteristics and make my game really an experience.

Similar Projects

Google Doodle for Earth Day 2020

The scaffolded bee project got its inspiration from the Google Doodle for Earth Day 2020 which implements the same features as the scaffolded bee project. I feel that this project will be more similar than different compared to the Google Doodle for Earth Day 2020 bee game in the aspect of game functionality and the features that will be implemented into the game. However, implementing additional features of my own by the end of the project will provide it with a unique game experience compared to the Google Bee game. My focus will be mainly on achieving MVP, so my finished project will closely resemble the Google Bee game. I think the biggest difference that players will see between my game and Google's game is the user interface/graphics, due to the fact that Google most likely did not use CMU graphics in their game. I will make smaller additional improvements within the game, but as of right now, I feel that they would not make a huge difference within the course of the game. My game will still have the same functionality and goals.

Besides the Google Bee game, there aren't any other games which this inspiration could stem from. I could not find any other bee-focused games that are similar to this scaffolded bee project. The scaffolded project document talks about additional features that could be implemented within the game that could potentially push my project above MVP. Features that are under consideration include adding obstacles that the bee needs to avoid, adding more flower types with different behaviors, making the bees's motion more interesting, and adding a score counter. By the end of this project, these are the features that I believe will add to the uniqueness of my project. I will also take into consideration the ideas of my own and see where I could

implement them within the game. Not only will this make my project more interesting, but it will add to its uniqueness and separate from the Google Bee game.

Structural Plan

1. **Main File (beeGame.py)**
    a. The main functionality of my game
    b. Modules (if necessary) and classes
    c. Initializes the game
    d. Canvas setup
2. **Bee Class File (bee.py)**
    a. Base class for player bee and helper bees
    b. Will contain all the attributes of the bees (movement, speed, etc)
    c. Manages the animations for the bees
    d. Methods for interacting with the flowers
    e. Player bee and helper bee functionality
3. **Flower Class File (flower.py)**
    a. Flowers that scroll on the screen
    b. Will contain flower attributes (pollinator, color, etc)
    c. Animations of the flowers and their growth

Algorithmic Plan

Helper Bees

I think the trickiest part of this project will most likely be the implementation of the helper bees. I will have to find an algorithm that can automate them for choosing flowers, movement, and how they can coordinate with the player bee (not going for the same flower).

Choosing Flowers

Challenge: Bees being able to choose the most appropriate flower depending on the situation
Solution: I will implement a function within the Bee class that can choose available flowers and select the best one. This will require certain aspects such as, how close the bee is to the flower, the color of the flower, and whether or not the flower is pollinated.

Movement

Challenge: Functional movement for the helper bees (not random). Movement should also depend on the positions of the flowers and the player bee
Solution: Some type of algorithm that can decide the speed and the direction of the helper bee's movement. The distance the helper bee is from the flower will depend on how fast or slow the speed is.

Adding/Removing Flowers
Challenge: Being able to remove flowers and add new ones when needed
Approach: Use some type of list method for when flowers scroll off screen or when they scroll on screen

Player Bee and Helper Bee Coordination
Challenge: The helper bees have to know when a player gatherers a flower or pollinates a flower
Solution: Create an algorithm that updates the state of the flowers so helper bees know what to do

Timeline Plan

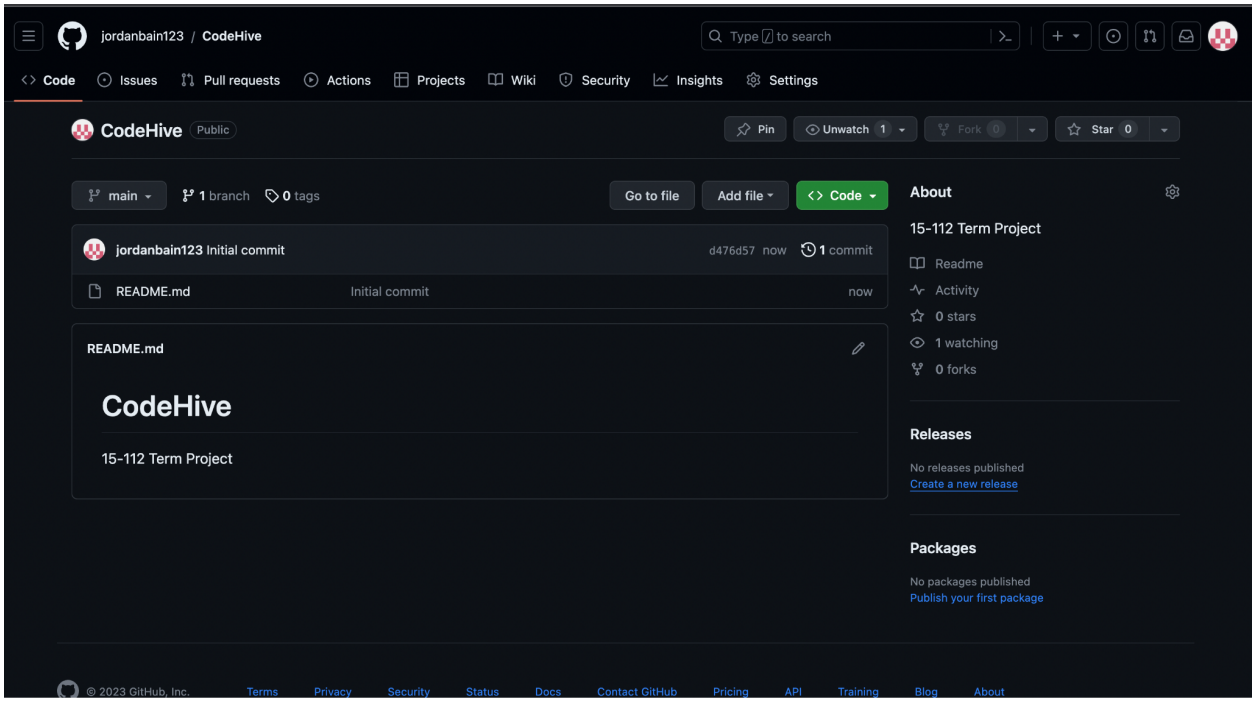
Weeks 11-12
1. Project setup
2. Classes (player class, bee class)
3. Basic functions
4. Game functions
5. Flower pollination and gathering
6. Removing/Adding flowers

Weeks 13-14
1. Testing/Adjusting
2. Implementing new features
3. Debugging (if necessary)
4. Submission

Version Control Plan

Version Control Software
I will be using the GitHub repository to back up my code. Since this means that my code will be stored in the cloud, it will make it easier for me to get past versions of my code which will prove efficient if I ever need to go back to old code to debug my game. I chose to use GitHub because it is easy to navigate and has a cloud-based repository, so my backups will not be on my computer. I will be able to manage my code changes and have easy access to version history. For me, I feel like GitHub is the best option for the term project.

Image of Repository



Module List

N/A

Storyboard

PDF

TP1 Update

No changes have been made to my design process as of yet. But as of right now, everything has been stored in one main Python file. By the time I complete all my functions, I will split up my code into multiple Python files to increase organization. One problem that I am facing right now is the growth of the flowers once the bee touches an unpollinated flower after gathering pollen from a pollinator. The problem that I am having is when I have multiple flowers gathered they all grow and get removed from the pollen inventory in the top left when the player bee touches the unpollinated flower.

TP2 Update

To reach MVP I need to refine my helper bees as well as add actual images for the bees instead of just yellow circles. Adding pollen under the helper bees is something I need to do as well.

There is also a slight problem with my growth function for the flowers which needs to be fixed. Once the gathered flower leaves the screen, the pollen in the pollen inventory grows to its max size but does not get removed from the list. I think this has to do with my matching logic. Once the gathered flower is off the screen it gets removed and so nothing is matched to it anymore. Which is probably why the flower that was initliazized to matching it does not get removed from the pollen inventory list in the top left corner.