Project Proposal

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Link to GitHub: https://github.com/xiaolong-tian-19/final_game_project

1. Game Design

The 2D game I will be creating is an arcade game that gives a different game play feeling for flappy bird. As in the original flappy bird game, the player will control the flappy bird and attempt to fly through as many pipe obstacles as possible. Similarly, each successful pass will award the player one point. When the game is over, the player will be presented with different medals for their accomplishment. The original flappy bird game is known to be difficult and quite additive. The 2D game I will be creating would introduce a more accessible version. The gimmick of the 2D game will be features added to the flappy bird game. This majorly will be game mechanics particularly powerups and interactive elements, including, lives that the flappy bird could acquire, portals that transport the flappy bird to different portals, ~~dynamites that will destroy the next pipe obstacle(s)~~, pipes that moves instead of staying still on the spot.

1. Additional lives: they will appear between the obstacles as floating items. If the flappy bird touches them, the flappy bird acquires an additional life. When the flappy bird hits a pipe obstacle, one live is taken away from the flappy bird, and the game is only over when the flappy bird has zero lives left. This will give the player additional chances.
2. Portals: they will appear as elliptical objects with animation that gives the feeling of a portal and allow themselves to be identifiable as such. If the flappy bird chooses to enter a portal, it will transport the flappy bird to another portal, which is always ahead of the flappy bird and not behind. This will be an additional challenge that the player could use to boost up their scores.
3. ~~Dynamites: they will appear as floating items with different colors to signify how powerful they are. If the flappy bird touches the dynamite and acquire it, the dynamite will destroy the next pipe obstacle(s) depending on how powerful it is. When the pipe obstacles are destroyed, additional animation will accompany it to increase to visual effects.~~
4. Moving pipes: as the flappy bird is moving through the screens, the pipes will move up and down repeatedly. The gap between the pipes will stay the same. However, the position of the upper pipe will move up and down and the position of the lower pipe will follow otherwise. This will give a more dynamic feeling to the game.

I am also interested in including a day and night mode for the flappy bird game to induce a realistic feeling for the players. When the player is controlling the flappy bird, the screen will switch from day (light) to night (dark) and vice versa after a certain amount of time. This will also make the game more exciting to play because of the challenge with getting adjusted to the transition.

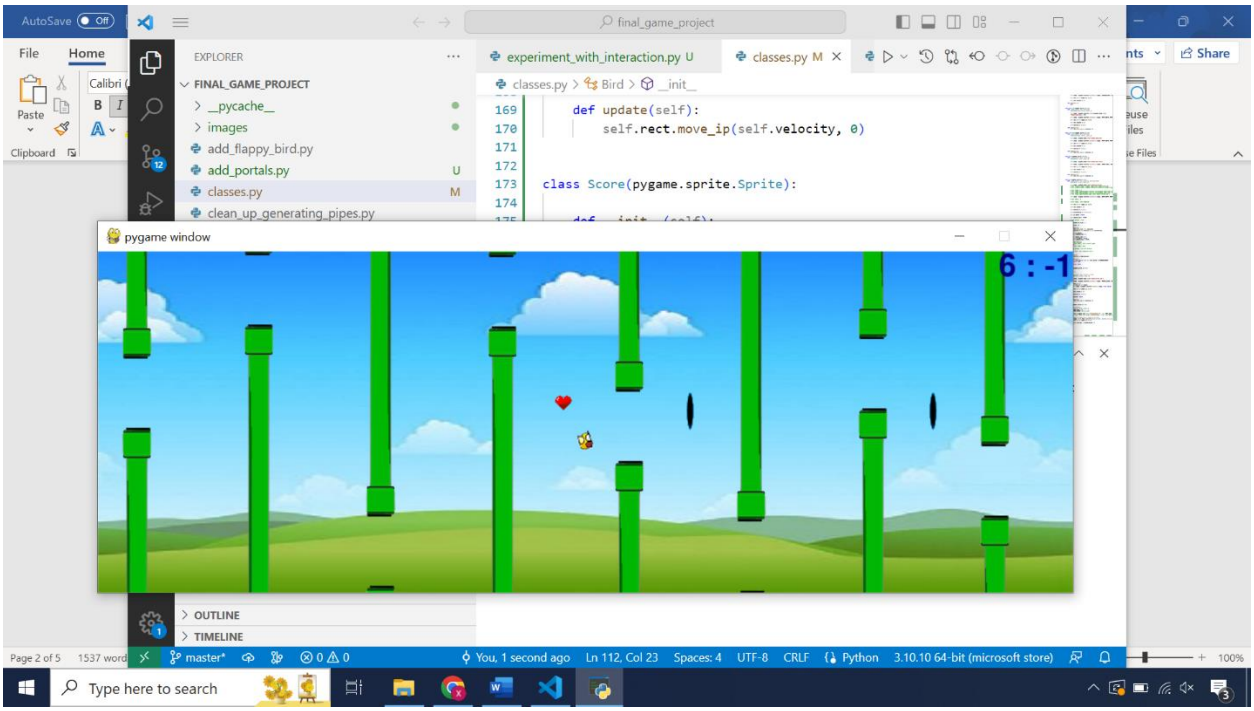

Figure 1 Game play of the current code.

2. Development Design

    1. Game's architecture: The game will be implemented using a model view controller architecture with a game loop. The models will consist of classes that represent the flappy bird, the pipe obstacles, the background, the top & bottom floors, and the each of the powerup that the player would acquire. A view will be used to display the models on the screen to the player. The controller will handle user inputs and updates the models. The game loop will initiate instances of the models and tie everything together.
    2. User interface: The user interface is relatively simple. At the beginning of the game, the player will be presented with a screen that ask them if they would like to get started. During the game, the flappy bird will descend and will only ascend if the player left clicks. At the end of the game, the player will be presented with a screen that shows the accomplishment, the medal, and an option to play again.
    3. Technical challenges: the greatest challenges I could think of are getting the motion and the movement of the flappy bird correctly. When the user clicks, the flappy bird must ascend based on some rules and produce animation accordingly. When the flappy bird descends, the animation must also change to reflect the motion of the flappy bird. Another technical challenge might be the playable placement of the powerups the player might acquire. Placing an entering portal where it is not possible to reach, such as right behind a pipe obstacle, and an exiting portal right in front of a pipe obstacle which might results in the player coming out of the portal and hitting right in front of the pipe obstacle might not be playable and sensible. On the other hand, the appearance of the powerups should

somewhat appears to be random and should not be hardcoded. The last challenge might be creating the portals themselves. When the flappy birds enter a portal and exits one, there should be a smooth transition, and an update of the game state.
To address these challenges, I think that there are plenty of resources that I could utilize. The motion and animation of the flappy bird might not be easy, but there are plenty of examples to look at. Placement of the powerups could be a challenge. I am not sure exactly how to solve it yet. However, such game mechanics is very common, and I think I should be able to find help on it.
Additional challenges include having a playable game. The mechanics of the game are currently working. However, I need to figure out the right size of the pipe, flappy bird, gaps between the pipes, distance between the pipes, number of pipes on the screen, etc. to make the game more playable. This will include trying different parameters to test out the game to see which works best.
Another challenge is having the animation working. It might be difficult to find the right animation graphics that fits well with the game. I believe that there are quite a few resources online for 2D games that I could use. I think I could use those resources to help me address this challenge.

3. Division of Labor
4. Timeline

~~Milestone 1: March 15~~
~~Tasks:~~
- ~~Create the background of the game~~
- ~~Create pipe obstacles~~
- ~~Create side scrolling of the game~~
- ~~Updated game document~~

~~Milestone 2: March 29~~
~~Tasks:~~
- ~~Create all the classes represent objects in the game~~
- ~~Create view, controller, and game loop~~
- ~~Create a functional version of the game that the player could replay as many times as desired~~
- ~~Updated game document~~

~~Milestone 3: April 12~~
~~Tasks:~~
- ~~Complete testing of the game~~
- ~~Add day/night mode for the game~~
- ~~Updated game document~~

Milestone 1: March 30
- Create the background of the game

- Create pipe obstacles
- Create side scrolling of the game
- Create all classes represent objects in the game
- Create view, controller, and game loop
- Updated game document

Milestone 2: April 12

- Add animation to the objects in the game – April 12
- Adjust the game parameters to make the game more playable – April 12
- Add moving pipes functionality to the game – April 10
- Add day/night mode for the game – April 8
- Allow the player to replay as many times as desired – April 8
- Updated game document – April 12

Final Game Submission: April 26

- Completed and polished game
- Completed game document

Part I: Updated Game Document

Changes to the game and development design: the changes to the game document are highlighted. The parts of the original game document that are deleted are strikethrough and highlighted in red, and the parts that are added are highlighted in green.

How has the game evolved since you started working on it: as I worked on the game, I realize that some of the original ideas are good, but others are not so good. In addition, new ideas come to mind that I believe will make the game play more interesting. Particularly, I think that the dynamite inserted into the flappy game would not make the play more enjoyable. However, moving pipes would seem a novel idea that would make the game more interesting.

An updated version of project timeline: old parts of the project timeline is strikethrough and highlighted in red, while the new parts are highlighted in green.

What tasks have been postponed or moved up: the task to replay games as many times as desired as been moved up. Furthermore, a few additional tasks have been added, such as adding animation to the objects in the game, adjusting the game parameters to make the game more playable, adding moving pipes functionality to the game, etc.

Any technical challenges encountered: the new technical challenges are highlighted in green.

How will these challenges impact the development timeline: a few of the tasks have been moved up to the next milestone, such as adding animation to the objects in the game, adjusting the game parameters to make the game more playable, etc. These tasks directly correspond to the challenges I have encountered.

Will the final game design need to change: yes, but only slightly. I am planning to add moving pipes to the game as an additional gimmick game mechanic.

Part II: Updated Project Timeline

See (4.) Timeline

Part III: Technical Challenges

See (2.) Game Development Design (3.) Technical challenges