HIT137

Group Assignment 3 (30% Mark)

You are required to create a GitHub repository and add all your group mates to it (make sure to keep it public, not private). You should do this before you start the assignment.

All the answers and contributions should be recorded in GitHub till you submit the assignment.

Submission Guidelines:

- **Include your GitHub Repository link in a text file "github_link.txt".**
- **Zip all the programming files and outputs and "github_link.txt" and upload them to Learline.**

Question 1

You will develop a desktop application that demonstrates your understanding of Object-Oriented Programming principles, GUI development using Tkinter, and image processing using OpenCV.

You have the flexibility to design any user interface, provided it effectively supports all required functionality.

Functional Requirements

1. Image Loading
    a. Select and load images, from the local device
    b. Display the loaded image in the application window
2. Image Cropping
    a. Draw a rectangle using mouse interaction for image cropping
    b. Provide real-time visual feedback of the selection area while drawing
    c. Display the cropped result alongside the original image
3. Image Resizing
    a. Slider control for resizing the cropped image
    b. Update the display in real-time as the user moves the slider
4. Allow saving of the modified image

Optional

- Implement additional image processing features
- Add keyboard shortcuts
- Implement undo/redo functionality

Question 2

Create a simple “side-scrolling” 2D game using Pygame. The game should allow the player to control a character with the ability to run, jump, shoot projectiles. The game should have enemies, collectibles, and 3 levels. It should also have a scoring system, health, and lives.

Functional Requirements

The game should include the following, but not limited to:

- Player class (movements, speed, jump, health, lives) - Methods
- Projectile Class (movements, speed, damage) – Methods
- Enemy Class (.....) – Methods
- Collectible Class (health boost, extra life, etc.,)
- Level Design (3 Levels), Add boss enemy at the end.
- A Scoring system based on enemies defeated, and collectibles collected, health bar for players, and enemies.
- Implement a game over screen with the option to restart

Optional

Create a dynamic camera that follows the players smoothly.

You have three game ideas, select one and implement the above requirements.

- A game with human-like characters (hero, enemy)
- A game with an animal (Hero) and human characters (Enemy).
- A tank-based game navigating through a battlefield to engage with enemy tanks or something