The American University in Cairo
School of Sciences and Engineering
Department of Computer Science and Engineering

Fundamentals of Computing II
CSE 1101
Course Project

The goal of this project is to create a Super-Mario-style game [1]. Your game design should follow these rules:

- The player controls the main character (Mario) using the keyboard. You are free to specify proper keyboard actions for your game, but they should include at least forward/reverse movements and jumping. You are free to specify more actions.
- The scene of the game should move as the player moves.
- There should be obstacles in the scene for the player to overcome. These should include static and moving obstacles.
- The game should include a scoring system that advances when the user achieves something. The score should be displayed on the screen all the time during gameplay. The score should not be reset upon finishing a level of the game.
- There must be a "life" feature implemented for the player. For example, a bar can be reduced when the player gets hit by certain obstacles. If the life of the player hits zero, the player must restart the level. If the player hits the maximum number of lives, a game-over message appears and the player has to restart from Level 1.
- The game should have at least 5 levels with increasing difficulty. You can vary the difficulty by adjusting speed, number of obstacles, types of obstacles, etc.

  Bonus: Additional features and power-ups that the player can use in higher levels will add up to 10% bonus added to the final grade.

[1] https://supermarioplay.com/

Game Flow:

- The game starts by displaying the scene in Level 1 and a message to click in order to start the game.
- Once the user clicks, the game-play starts. The scene should display the score of the user and level they are currently playing.
- Once the player finishes one level successfully, there should be a message displayed saying so. The game should then proceed to the next level.
- If the player finishes all levels successfully, the game should display a congratulatory message, and prompts the player to click in order to exit.

Milestones:

- Milestone 0: Submission of a complete UML diagram of the code. **Deadline: April 11th, 2025.**
- Milestone 1: Fully functioning Level 1 of the project. The UML diagram can be updated if modifications are made to the code after this milestone. **Deadline: April 17th, 2025.**
- Milestone 2: submission of complete final project. Part of your submission should be the final UML diagram of your code. **Deadline: May 10th, 2025.**
- **Please note that we will have project evaluations at the end of the semester. In these evaluations, teams will explain the code design and show the complete functionality of the game. We will also ask individual team members about their contributions to the project. Every team member is expected to participate in the coding tasks and be able to discuss their contributions. Every team member must be present in the final evaluations.**

THE DEADLINES FOR THE MILESTONES ARE FIRM.

Rules:

- Plagiarism will not be tolerated. Plagiarism checking will be done. Copying code from the internet or from your peers will be heavily penalized and violators will be reported to the academic integrity committee.
- You should use Object-Oriented Design in your code. You are free to use any data structures or algorithms you see fit.
- You should use the QT library for all GUI tasks.
- When submitting your milestones, please make sure that the paths of your project are properly set for the project to run on any machine, not just on your local environment. Please look up how to do that on the Internet as it depends on the environment you are using.

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By submitting this project, I affirm that I have followed AUC's Code of Academic Ethics and the work submitted is my own. I have not consulted unauthorized resources or materials nor collaborated with other individuals unless allowed.