Objective

The objective of this assignment is to enable students to design and develop a 2D interactive game using Unity, applying the core game development concepts covered in the module, while integrating required gameplay mechanics and creative enhancement.

Core Requirements

1. **Add a health system for the player.**

    Your health system should
    - Be displayed as a bar or number on the UI
    - Decrease their health value upon collision with an obstacle
      o   If player hits an obstacle, they should then pass through the obstacle and their health should be decremented.
    - Stop the player only when their health value is 0
    - Have a max health value
    - Correctly reset to its max health value when the game is restarted

2. **Add a score.**

    Your score should:
    - Be displayed as a number on the UI
    - Increment only when the player successfully goes through a hole in an obstacle
    - Reset to 0 when the game is restarted

3. **Add health packs**.

    Your health packs should:
    - Be a collidable object
    - Be destroyed upon collision with the player
    - Be destroyed shortly after if the player goes past them
      o   The implementation for this is up to you. This can be based on a fixed time interval, after the player passes the current tunnel, etc.
    - Increase the health value upon collision with the player, up to a max health value

4. **Add player projectile attacks.**

    Attacks should:
    - Create a projectile on left mouse click that shoot
    - The projectile is destroyed upon collision with anything and after a short duration
    - The projectile is created at the player/mouse position

5. **Add enemies.**

   Enemies should:
   - Be a collidable object
   - Be destroyed on collision with projectiles or the player
   - Increase the score on destruction by a projectile
   - Decrease the health value on collision with the player
   - Be destroyed shortly after if the player goes past them
     o Similar to the health pack, this can be implemented in a variety of ways.
   - The visual representation of the enemy is up to you…it can be simple.
     o Please make the enemy visually distinguishable from the health pack! This includes different colors and shapes.
   - However, many enemies spawned can be up to you, as long as it's reasonable for the player to pass them.
     o For this assignment, it's okay if the enemies spawn on top of the health packs (although issues like these should be addressed in the final project)

6. **Increase the player speed over time.**

   The player speed increase should:
   - Get faster over time, either directly based on time, the player score, etc.
     o It's up to you if you want the speed to increase forever, or cap at some threshold.
   - Increase at a rate that is noticeable but does not ramp up the difficulty too fast

7. **Add one creative modification that is unique to your game**.

   Some ideas:
   - Health bar decreases along a gradient of colors
     o The gradient should constantly update according to the player's current health (not just set the color based on certain thresholds)
   - Add screen shake on collision with barriers and enemies
   - Color of the walls change depending on player health
   - Add textures to the health packs and enemies

Possible Visual Modifications

Some potential ideas for some visual modifications could be:

- Health bar decreases along a gradient of colors
- Screen flashes red when the player collides with a wall
- Some indicators that the health pack was obtained
- Color of the walls updates according to the player's health

Submission Instructions

Windows .exe Build
- Include the .exe file and Data folder
- Must be playable on a Windows system without additional configuration

Zipped Unity Project Folder
- Submit the full Unity project folder zipped
- Must follow a clean folder structure
- All necessary scripts, assets, and scenes should be included
- Upload to a shared Google Drive folder and share the view-only link

Gameplay Demo Video
- Duration: **Up to 6 minutes**
- Demonstrate all required features (health, score, enemies, power-ups, creative feature, etc.)
- Screen recording with narration (optional but preferred)
- Use screen recording tools like **OBS**, **Game Bar**, or **QuickTime**
- If screen recording isn't possible, a steady phone video may be submitted as a last resort

Game Documentation (5 Marks)
Submit a PDF file including:
- Game Title
- Student Name and IT Number
- Summary of the Game Concept
- Description of how core features are implemented
- Screenshots of gameplay
- Control guide (keyboard/mouse input)
- Description of the creative feature
- Credits for any external assets/tools used
- Add the **video link to a text file** and include it in the Document

Reference:
- https://docs.unity3d.com/Manual/Quickstart2DCreate.html

Assessment Rubric

Criteria	Excellent	Good	Satisfactory	Poor	Marks
Health System (10 Marks)	Fully functional health UI; decreases on enemy hit; resets on restart	Mostly functional; minor UI or logic issues	Some features work; UI or reset issues present	Not functional or missing	10
Score System (10 Marks)	Score increases correctly; clear UI; resets on restart	Score increases but has minor bugs or unclear UI	Basic scoring works but lacks polish or reset	Scoring not implemented or ineffective	10
Health Packs (10 Marks)	Interactive health packs; restore health; disappear after use; visually distinct	Functional with minor visual or timing issues	Basic interaction present; no disappearance or unclear effect	Not functioning or not included	10
Projectile Attack (10 Marks)	Projectiles launch on input; hit enemies; destroy on contact; origin logic is correct	Mostly works; some bugs in direction or destruction	Basic projectile working but with major bugs	Feature not working or missing	10
Enemy Mechanics (10 Marks)	Enemies interact logically; damage player; destroyed on hit; award score; distinct appearance	Most features functional; some inconsistencies	Enemy presence is minimal or buggy	No enemies or no interaction logic	10
Speed Increment Feature (10 Marks)	Player speed scales with score/time; well-balanced and smooth	Speed changes but lacks refinement	Speed varies minimally or inconsistently	No speed variation	10
Creative Feature (10 Marks)	Innovative feature (e.g., screen shake, spell visual, particle FX); adds meaningful gameplay or visual impact	Creative element is present but basic	Attempt at creative feature made but poorly implemented	No creative addition	10
Visual Enhancements (10 Marks)	Game has polished visuals: animations, particle effects, UI design, lighting	Visuals are decent with some enhancements	Basic visuals only; minimal polish	No visual effort; raw or default assets	10
Code Quality & Stability (10 Marks)	Code is clean, well-structured, bug-free; game is stable	Some minor code inefficiencies; game mostly stable	Code is cluttered or repetitive; occasional crashes	Code is messy; unstable or unplayable	10
Demonstration & Submission (10 Marks)	Clear, complete demo video showing all features; correct format; good presentation	Demo video provided and mostly clear	Demo lacks clarity or misses some features	Missing demo or incomplete submission	10
Total					100