Case Study Jungle Dash

Introduction

Jungle Dash is a simple endless runner game where the player runs along a jungle path aiming to achieve the highest possible score. The player uses keyboard controls to move left or right to avoid obstacles.

When the player hits an obstacle, a trivia question appears. If the player answers correctly, they receive a second chance to continue the run. If the player answers incorrectly, the game ends.

This game demonstrates software design principles, event handling, interaction with external data, and basic authentication.

Software Design Principles (Low Coupling & High Cohesion)

Main Components:

1. Player Class – Deals with player location and movement.
2. Obstacle Manager – Deploys and advances obstacles towards the player.
3. Game Controller – Manages the game state, scoring, collisions, and difficulty level.
4. UI Manager – Displays the score, the trivia question, and the game scenes.
5. Auth Module – Handles username login and stores high scores.
6. Low Coupling: The classes use functions and events to communicate with each other (e.g., a collision triggers a function rather than a direct dependency).
7. High Cohesion: Every module has a clear, single responsibility.

Event Driven Programming

The game depends on events to facilitate interaction:

- Movement Event: Keyboard control of player movement.
- Obstacle Spawn Event: Timer triggers random obstacle generation.
- Collision Event: Trivia question is triggered on collision.
- Trivia Answer Event: Determines whether the player continues or the program ends.
- Score Increase Event: The score rises the longer the player survives.

Interoperability

The Heart Game API is used to present trivia questions to the player when they collide with an obstacle.

The game can be extended to use an external service or JSON document to store scores.

This allows the game to interact with external systems outside of its core code.

Virtual Identity (Authentication)

The player enters a username before starting the game.

Scores are associated with this username to allow future leaderboard integration.

This establishes a simple virtual identity per session.

Game Features

1. Arrow keys control player movement to the left and right.
2. Randomly spawned obstacles appear and gradually accelerate.
3. A trivia question gives the player one additional chance after a collision.
4. Scoring: Points increase automatically over time as the player remains alive.
5. Game End: The game ends when the trivia question is answered incorrectly or after a set number of collisions. The final score and a restart option are displayed on a "Game Over" screen.
6. The user interface is clean and minimal.

Conclusion

Jungle Dash is a lean but complete endless runner game that demonstrates:

Software design with modular components.
Event driven interaction.
Trivia integration with an external API.
Basic authentication using usernames.