**DATA STRUCTURES**

**COURSE PROJECT: SNAKE GAME SIMULATOR**

**PROJECT UPDATE**

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**Project Overview:**

The Snake Game Simulator is a console-based game developed in C programming language. The game simulates the classic snake game where the player controls a snake to eat food pellets and avoid obstacles.

**Objective:**

The objective of this project is to design and implement a Snake Game Simulator using C, incorporating features such as:

- User-friendly interface

- Random food generation

- Score tracking

- Game over condition

**Methodology**

**1. Game Structure**

The game will consist of the following components:

- Game Loop: The main loop that controls the game flow.

- Game State: Data structures to store game-related information.

- Input Handling: Functions to handle user input.

- Game Logic: Functions to update game state.

- Rendering: Functions to display the game on the console.

**2. Data Structures**

- Snake: A struct to represent the snake's coordinates, direction, and length.

- Food: A struct to represent the food pellet's coordinates.

- Game Board: A 2D array to represent the game area.

**3. Game Loop**

1. Initialize game state.

2. Render the game board.

3. Handle user input.

4. Update game logic.

5. Check for collisions.

6. Update score.

7. Render updated game board.

8. Repeat steps 3-7 until game over.

**4. Game Logic**

- Snake Movement: Update snake coordinates based on direction.

- Food Consumption: Check if snake eats food; update snake length and food position.

- Collision Detection: Check for collisions with walls, self, or obstacles.

**5. Input Handling**

- Directional Input: Handle 'w', 'a', 's', 'd' keys to change snake direction.

**6. Rendering**

- Game Board Rendering: Print game board to console using ASCII characters.

- Snake Rendering: Print snake coordinates on game board.

- Food Rendering: Print food coordinates on game board.

**Game Features:**

The Snake Game Simulator includes the following features:

- Game Board: A 20x20 grid representing the game environment.

- Snake: A chain of characters ('O') representing the snake.

- Food: Randomly generated food pellets ('F') on the game board.

- Score: Tracks the player's score based on the number of food pellets eaten.

- Game Over: Ends the game when the snake collides with the wall or itself.

**Implementation:**

The game is implemented using the following C concepts:

- Arrays and structures for game board representation

- Functions for game logic, input handling, and score tracking

- Random number generation for food placement