Lab Mix Master Game Report

By

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Introduction

Lab Mix Master is an interactive educational game designed to reinforce basic computational thinking and user input validation while engaging users with a creative chemistry-themed challenge. Players assume the role of a chemist tasked with creating a precise mixture of two fictional elements, Altairium and Achiride, by guessing their correct proportions. The game emphasizes numerical reasoning and logic, providing immediate feedback to guide the player toward the solution.

Game Objective

The goal of the game is to mix 57% Altairium and 43% Achiride, ensuring the total percentage equals 100%. The player is prompted to input the percentages for each element through an intuitive interface. If the guess is incorrect, detailed feedback informs the player whether their proportions are too high or too low for each element. The game continues until the player achieves the correct combination.

Features and Functionality

1. Incorrect attempts trigger specific feedback, such as:
   - "Altairium: Too much! & Achiride: Not enough!"
   - "Altairium: Not enough! & Achiride: Too much!"
   - If the total percentage does not equal 100%, the game displays: "The total percentage must equal 100. Try again."
   - Invalid inputs (non-numeric or empty) are met with a clear error message.
2. When the player successfully guesses the correct proportions, the game transitions to a celebratory fireworks display with vibrant colors and congratulatory messages.
3. After a successful game, players are given the option to replay or exit the game. This ensures continuous engagement or a graceful exit.
4. The game utilizes the Turtle Graphics library for a visually appealing interface:
   - Background: A light blue screen for a clean, lab-inspired aesthetic.
   - Text Prompts: Clear, centered messages guiding the player throughout the game.
   - Fireworks: Visual effects triggered upon a successful attempt.

Technical Highlights

1. The game uses turtle.textinput to gather user inputs for Altairium and Achiride percentages. Numeric validation ensures robust error handling, preventing crashes from invalid inputs.
2. Conditional logic provides detailed feedback for each incorrect attempt, fostering a clear understanding of how to improve.
3. The celebratory fireworks are generated using Turtle Graphics. Randomized colors and sizes add variety, while multiple positions simulate a dynamic display.

4. Modular functions, such as display_message and firework_from_center, promote clean and maintainable code.
5. A restart prompt encourages replay, enhancing user engagement.

Conclusion

Lab Mix Master is an entertaining and educational game that merges computational thinking with a fun and interactive user experience. It leverages Turtle Graphics for an engaging interface while emphasizing logical reasoning and precise input handling. The game's modular design and replayability make it a versatile project for further enhancement and adaptation.