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⚔ ENERGY CLASH ⚔

A Strategic AI-Based Energy Allocation Game

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## **Problem Statement:**

This mini-project demonstrates an interactive AI-driven strategy game called 'Energy Clash'. Players allocate limited energy across multiple positions to compete against an AI opponent. The problem explores AI decision-making using a hill-climbing optimization approach.

## **Expected Result:**

A playable Python game where the AI adapts allocations each round, allowing human-AI competition through strategic energy management.

## **Theoretical Background:**

- Hill-Climbing Algorithm:
- Hill climbing is a heuristic search algorithm used for mathematical optimization. It iteratively improves a solution by making small local changes until no further improvement is possible.

## **Justification:**

- Chosen for its simplicity and adaptability for AI-based decision-making in low-complexity environments.

## **Example:**

- The AI adjusts previous round allocations slightly (+5, 0, -5) to balance and optimize its strategy.

## **Implementation and Code:**

The system consists of two classes: Human and AI. The AI applies a hill-climbing strategy to adjust its allocations. The human player interacts via console input.

## **GitHub Repository:**

- [https://github.com/Sindhuja-M-309/AI\\_mini\\_project-3rd\\_sem\\_-.git](https://github.com/Sindhuja-M-309/AI_mini_project-3rd_sem_-.git)
- Language: Python 3

List	Git-hub Repository Links
Implementation of Code Link	<a href="https://github.com/Sindhuja-M-309/AI_mini_project-3rd_sem_-.git">https://github.com/Sindhuja-M-309/AI_mini_project-3rd_sem_-.git</a>
Word Document Report Link	
PPT Link	

## **Output and Results:**

- - Console-based interface showing energy allocations.
- - AI adapts its strategy with each round.
- - Displays winner per cell and final round winner.

## **Future Enhancements:**

- - Add GUI using Tkinter or Pygame.
- - Introduce difficulty levels.
- - Visualize allocation strategy using Matplotlib.

## **References:**

1. Russell & Norvig, Artificial Intelligence: A Modern Approach.
2. GeeksforGeeks – Hill Climbing Algorithm.
3. Python Documentation (Classes & Random Module).
4. W3Schools – Python Basics.
5. Towards Data Science – AI Strategy Game Tutorials.