

⚔️ **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
- Language: Python 3

List	Git-hub Repository Links
Implementation of Code Link	https://github.com/Sindhuja-M-309/AI_mini_project-3rd_sem_- .git
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.