

# Project Proposal

## *Title:*

Number Guessing Game

## *Summary:*

The Number Guessing Game is an engaging and interactive artificial intelligence project that challenges players to guess a randomly generated number within a predefined range. The game offers multiple difficulty levels and features both single-player and multiplayer modes. Additionally, it includes a leaderboard to track player performance. The project provides hands-on experience in programming, algorithm design, and user interface development while demonstrating practical AI concepts such as optimized guessing techniques and player interaction analysis.

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## Tools and Technologies:

- **Programming Language:** Python.
- **Data Storage:** JSON for persistent leaderboard functionality.
- **IDE:** Visual Studio Code.

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## Expected Outcomes:

- A fully functional number guessing game with both single-player and multiplayer modes.
- Insights into algorithm efficiency and player performance.
- Enhanced teamwork and collaboration among group members.

## Modules and Functionality:

1. **Random Number Generator (Core):**
  - **Functionality:**

- Generates a random number within a specified range for each game session.
  - 2. **Guessing Algorithm Module:**
    - **Functionality:**
      - Provides feedback based on user guesses (“Too High” or “Too Low”).
      - Tracks guessed numbers and attempts.
  - 3. **User Interaction Module:**
    - **Functionality:**
      - Presents a main menu with options for single-player and multiplayer modes.
      - Allows players to choose difficulty levels (e.g., Easy or Hard).
      - Provides feedback and prompts for player input during gameplay.
  - 4. **Score and Evaluation Module:**
    - **Functionality:**
      - Tracks player performance, including the number of guesses and guessed numbers.
      - Saves and loads scores using a leaderboard stored in a JSON file.
      - Displays the leaderboard sorted by performance metrics.
  - 5. **Multiplayer Mode:**
    - **Functionality:**
      - Supports multiple players taking turns to guess the number.
      - Tracks individual player performance.
      - Declares a winner when the correct number is guessed.
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## Additional Features:

1. **Difficulty Levels:**
  - Easy: Range of 1-100 with 10 attempts.
  - Hard: Range of 1-100 with 5 attempts.
2. **Leaderboard:**
  - Displays player rankings based on the number of guesses.
  - Stores data persistently using a JSON file.
3. **Multilingual Feedback:**
  - Incorporates humor and colloquial expressions to enhance engagement.