

Class and Function Definitions

Class AIPlayer

The `AIPlayer` class represents an artificial intelligence player in a game, inheriting from the `Player` class. It has methods for placing ships, firing at the opponent, and taking turns.

Methods

- `__init__(difficulty, player_name, fleet)`: Initializes the AI player with a given difficulty level, player name, and fleet of ships.
- `place_ships()`: Automatically places the ships for the AI on the board by randomly generating positions and orientations.
- `fire()`: Decides where the AI will fire based on its difficulty level, using different strategies for 'Easy', 'Medium', and 'Hard' modes.
- `fire_random()`: Fires at a random location chosen from the list of possible moves.
- `fire_near_last_hit()`: Fires at a location adjacent to the last successful hit, used in Medium difficulty.
- `cheat_fire()`: In Hard mode, the AI cheats by knowing exactly where the opponent's ships are and fires directly at them.
- `get_adjacent(x, y)`: Finds and returns a list of valid adjacent positions to the given (x, y) coordinate.
- `take_turn(fleet_type)`: Executes the AI's turn, determining a firing position and attacking the opponent.

Explanation of Key Functions

`fire()`

The `fire()` method determines where the AI will fire based on its difficulty level. It uses the following strategies:

- 'Easy' mode: purely random firing using `fire_random()`.
- 'Medium' mode: targeted firing after a hit using `fire_near_last_hit()`, otherwise reverts to random firing.

- 'Hard' mode: AI cheats and knows the location of ships using `cheat_fire()`.

`fire_near_last_hit()`

The `fire_near_last_hit()` method fires at a location adjacent to the last successful hit. It first checks if there are any adjacent moves available. If there are, it chooses one of the adjacent moves. If not, it reverts to random firing using `fire_random()`.

`cheat_fire()`

The `cheat_fire()` method is used in Hard mode, where the AI cheats by knowing exactly where the opponent's ships are. It scans the opponent's board for any ship and fires directly at it.

`get_adjacent(x, y)`

The `get_adjacent(x, y)` method finds and returns a list of valid adjacent positions to the given (x, y) coordinate. It filters out positions that are out of bounds or already attacked.

`take_turn(fleet_type)`

The `take_turn(fleet_type)` method executes the AI's turn, determining a firing position and attacking the opponent. It updates the hits and misses counters and displays the opponent's board after the AI takes a turn.