TREASURE HUNTER CHALLENGE DOCUMENTATION

OVERVIEW

The Treasure Hunter Challenge is a programming task where participants are required to write code for an agent in a game environment. The goal is for the agent to find and retrieve a treasure by navigating a randomly generated map with obstacles, stackable blocks, and walls.

CHALLENGE DESCRIPTION

- **Objective**: Write clean and functional code for an agent to navigate a map and retrieve a treasure.
- **Environment**: The map is randomly generated with obstacles, blocks, and walls. A tower with the treasure is placed somewhere on the map.
- **Task**: The agent must stack blocks to build a staircase to reach the treasure.

REQUIREMENTS

1. **Code Language**: The challenge starts with a JavaScript file, but a TypeScript solution is required.
2. **Testing Environment**: The challenge includes a testing environment. Performance metrics include the average number of turns and runtime for 100 maps.
3. **Time Estimation**: Participants should provide an estimate of the time spent on their solution.

GAME MECHANICS

- The game mechanics can be learned using the provided testing engine.
- The agent's actions are determined by a `turn` method in the `Stacker` class, which processes a JSON object representing the map.

JSON OBJECT STRUCTURE

The JSON object passed to the `turn` method includes information about the surrounding tiles and the agent's current state.

```
{
  "left": { "type": someValue, "level": someValue },
  "up": { "type": someValue, "level": someValue },
  "right": { "type": someValue, "level": someValue },
  "down": { "type": someValue, "level": someValue },
  "type": someValue,
  "level": someValue
}
```

TILE TYPES

- 0 (Empty)
- 1 (Wall): Non-traversable.
- 2 (Block)
- 3 (Gold)

AGENT ACTIONS

The agent can perform one of the following actions each turn:

- Move: "left", "up", "right", "down"
- Interact: "pickup", "drop"

SOLUTION OVERVIEW

The provided `solution.ts` file contains the `Stacker` class, which implements the logic for the agent. Key features include:

- Pathfinding using the A* algorithm.
- Decision-making based on the current state and map layout.
- Handling different tile types and elevation levels.
- Strategies for exploring, picking up blocks, and reaching the goal.

CONCLUSION

The Treasure Hunter Challenge is a comprehensive test of programming skills, requiring efficient algorithms, strategic thinking, and a deep understanding of game mechanics.