Enhanced Dynamic Robot Movement Simulation

Objective: Design and implement an advanced simulation environment for a robot navigating through a dynamically created grid. This project aims to deepen understanding of basic programming concepts, object-oriented programming (OOP), algorithms for navigation and pathfinding, task optimization, and safety.

Overview: Develop a simulation for a robot moving through a grid-based environment, considering task optimization strategies and safety to ensure efficient travel and collision avoidance. The simulation should also manage the robot's energy levels and battery status.

Detailed Requirements

1. **Environment Setup**
   - Implement a class Environment that generates a grid of size n x m.
   - Dynamically place obstacles, a start position, and an end position within the grid.
2. **Robot**
   - Implement a class Robot with movement capabilities and tracking of its current position.
   - Include methods to manage the robot's energy levels and battery status.
   - Incorporate task optimization and safety for efficient and safe navigation.
3. **Simulation**
   - Simulate the robot's movement, including logic for task allocation strategies and dynamic path adjustments.
   - Account for energy consumption and manage energy levels to complete tasks.
4. **Visualisation**
   - Use libraries like matplotlib to visualise the grid, obstacles, paths, and the robot's energy levels over time. Example output: