ReflectoRay

Ray Reflection Simulation in Python

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Introduction

Overview

- The Python script simulates the reflection of rays off mirrors.
- Utilizes Turtle graphics for visualization.
- Options to save the simulation as an image or record it as a video.

Script Components

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- `parse_arguments`: Command line argument parsing.
- `load_initial_conditions`: Loading initial conditions from a JSON file.
- `setup_screen`: Setting up the Turtle screen for simulation.
- `draw_mirrors`: Drawing mirrors on the Turtle screen.
- `create_ray`: Creating a Turtle object representing a ray.
- `simulate_rays`: Simulating the reflection of rays off mirrors.

Simulation Process

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- Mirrors, sources, and angles are initialized.
- Turtle graphics used for visualization.
- Rays are simulated, and reflections are calculated.
- Options to save images or record videos.

Run Simulation

Running the Simulation

- Execute the script from the command line.
- Specify optional arguments: `-i` (image) and `-v` (video).
- Initial conditions loaded from `initial_conditions.json`.

Conclusion

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- Turtle graphics provides a simple way to visualize ray reflection.
- Options for saving images and videos enhance the utility of the script.
- Further customization and improvements can be made based on specific requirements.