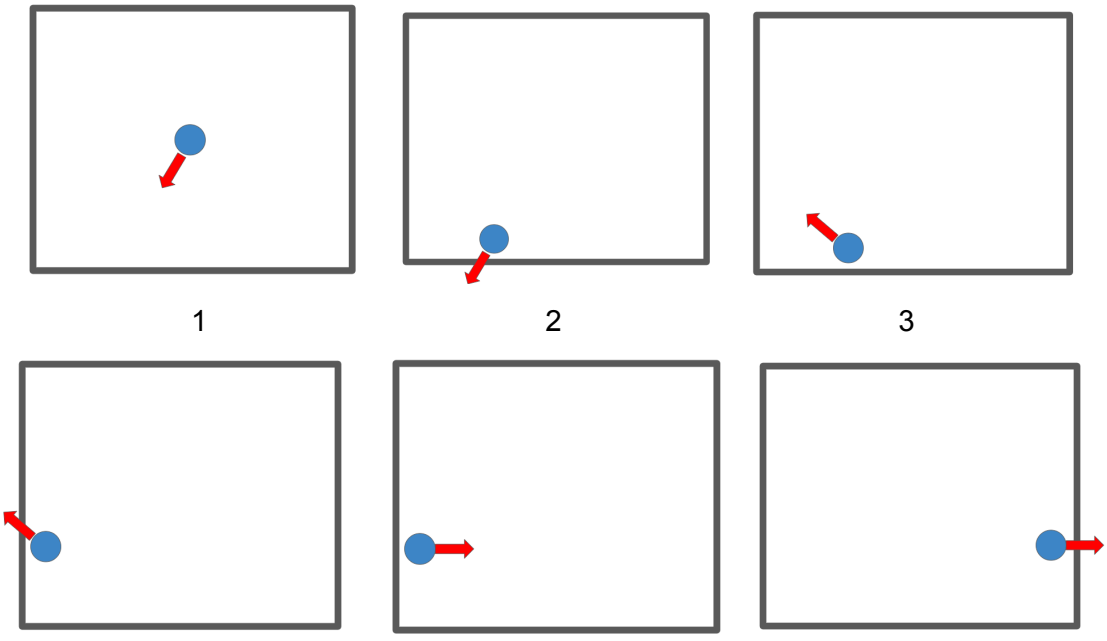
GSoC-2022 JdeRobot

Python Challenge

You will need to accomplish this challenge as part of your GSoC application.

Brownian Motion

Brownian Motion [1] is the random movement of particles in a fluid due to their collision with other atoms or molecules. Certain robot applications like exploration, coverage and swarm dynamics require the use of Brownian Motion. This challenge requires you to implement and simulate Brownian Motion type behavior on a robot.



Steps of Simulation

Steps:

- The robot in the challenge is considered to be a point/circle.
- The robot can be assumed to be present in a square boundary (arena).
- The robot starts in the middle of the arena and moves straight at the start.

- Mostly the robot would keep moving forward. On collision with the boundary, the robot would rotate for a random duration and then keep moving forward in the set direction.

Requirements:

- Your application should implement in python 3 using only the python standard library [2] and numpy. For visualization, matplotlib or pygame can be used.
- You must implement your application like a python module.
- You must provide videos or gif to demonstrate your solution.

Results:

- A python module with your solution.
- A sample application.
- A set of videos or gif.

[1]: An Introduction to Brownian Motion (thoughtco.com)
[2]: https://docs.python.org/3/library/