This code package, question3, models a basic 2D particle collision and multiplication simulation. The Direction enum defines the eight possible movement vectors for a particle. Each Particle randomly moves one step in one of these directions during a simulation step, bounded by the Box dimensions, and can check for collision with another particle using a fixed $\mathbf{1.5}$ unit radius. The Box class, which uses the Singleton pattern, manages the collection of particles and runs the simulation logic in its step() method. In each step, every particle moves, and if any two particles collide, a new random particle is generated and added to the box. The Simulation driver initializes the box and iteratively calls the step() and visualize() methods, displaying the particle locations until a maximum of 20 particles is reached.