



Ministry of Education and Science of the Russian Federation
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Course Final Project Report

Shakey's World

Discipline: History and Methodology of Informatics and Computer Engineering
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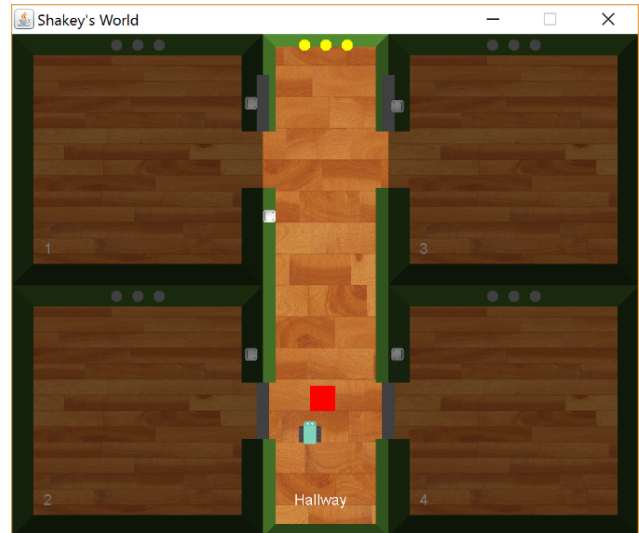
Summary

A program, built in Java, is called "Shakey's World". In this world, there is a robot that can roam around in a digital environment. This robot can open/close doors, push a box around, climb on/off a box, and turn lights on/off.

There are 4 rooms, 1 hallway, 1 robot, and one box. Each room has a door, light switch, and light fixture.

Program Usage

The world of Shakey includes both manual and automatic methods to move Shakey around the environment.



Below is a list of commands, and their description.

Manual Controls

Keyboard Key	Description
↑ ↓ ← →	Move shakey around the room.
d	Open or close a door.
c	Climb up/down from box, if near a box.
l	Turn on a light, if on the box near the light switch.

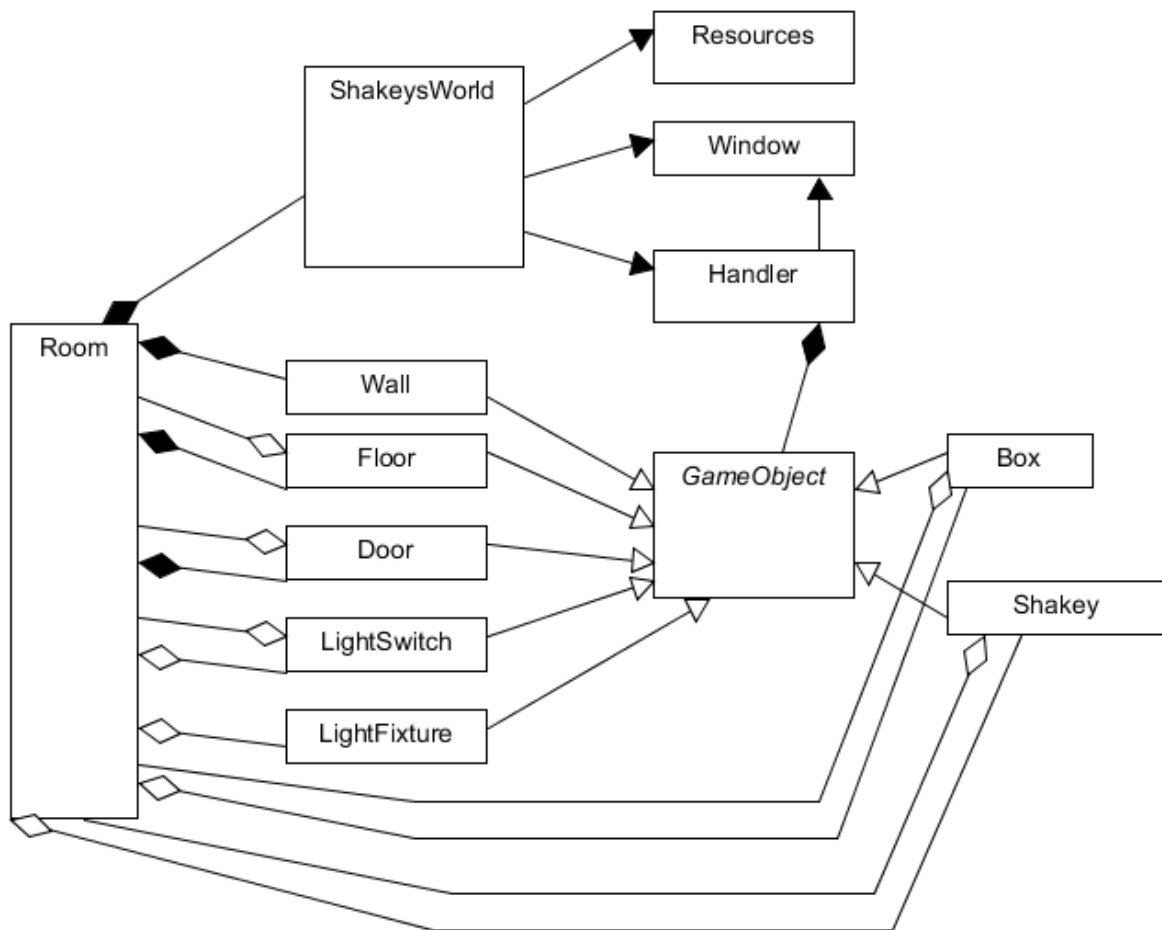
Automatic Controls

Keyboard Key	Description
1 2 3 4	Go to specified room, if in hallway.
h	Go to hallway.
s	1. Move the box to the light switch 2. Climb on the box. 3. Switch the light on/off.

Classes

Below is a layout of the classes contained in the "ShakeysWorld" program. In the next sections, each individual area is discussed in more detail.

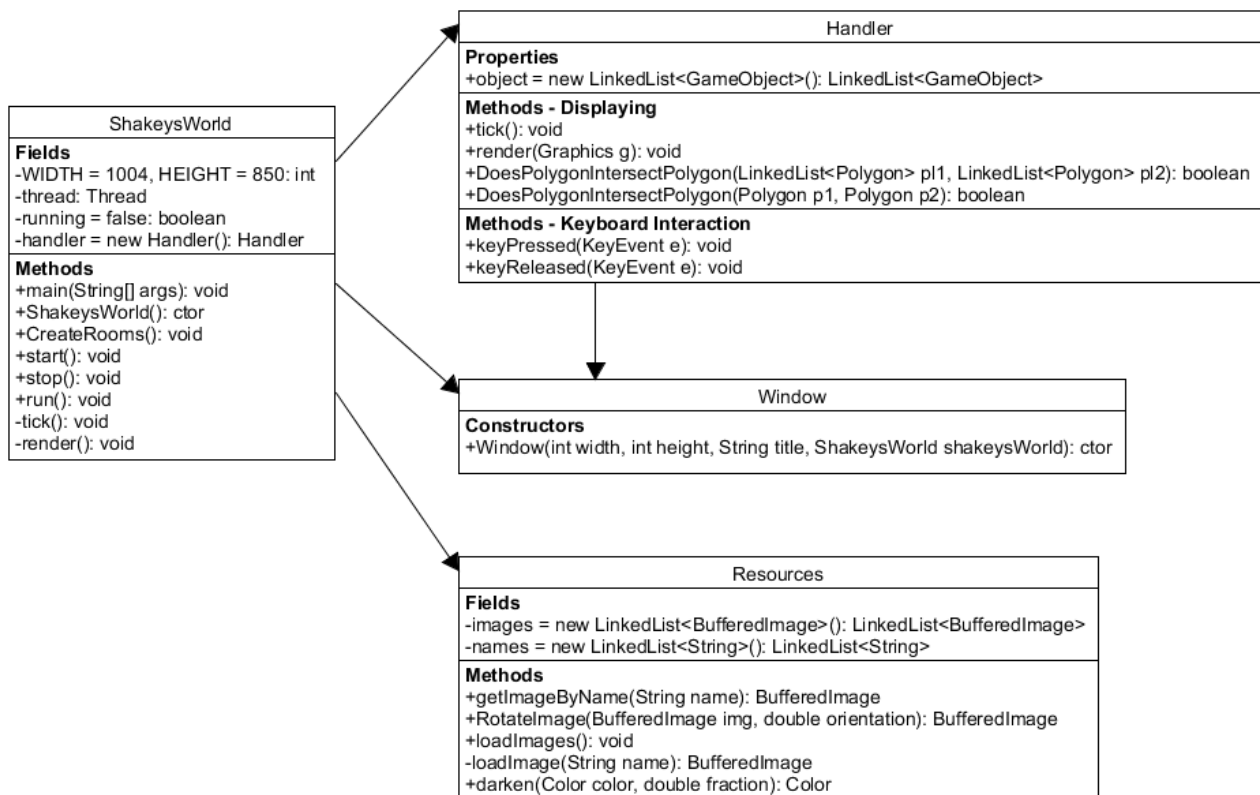
- 1.) The ShakeysWorld class starts the program and creates the environment.
- 2.) All objects in the environment are inherited from the abstract GameObject class.
(examples: Wall, Floor, Shakey, Box)
- 3.) The Room class is used as an organization tool to create the environment for shakey.
- 4.) The Handler handles keyboard events, repositions objects, and renders content to the Window.



Display Engine

The main application is the class "ShakeysWorld". This class calls the following 3 important classes.

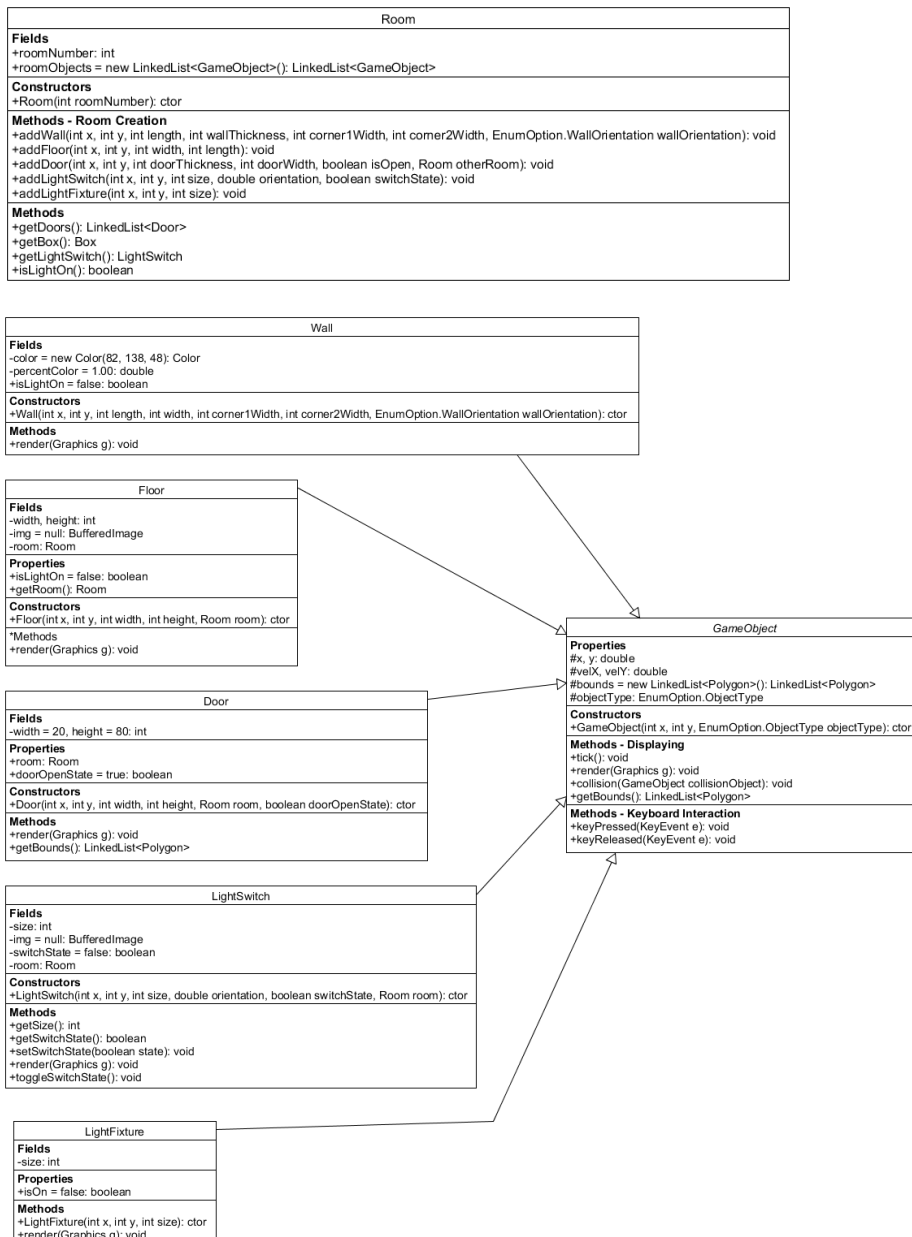
1. **Handler** – Handles all GameObject updates.
 - a. Checks for collision detection between objects.
 - b. Updates all object positions.
 - c. Displays the results using the Window class.
 - d. Handles keyboard input.
2. **Window** – Displays the results to the screen.
3. **Resources** – Handles commonly used code and access to the image files.



Environment - Rooms

A room is composed of various objects. Each of these objects is inherited by the "GameObject" class.

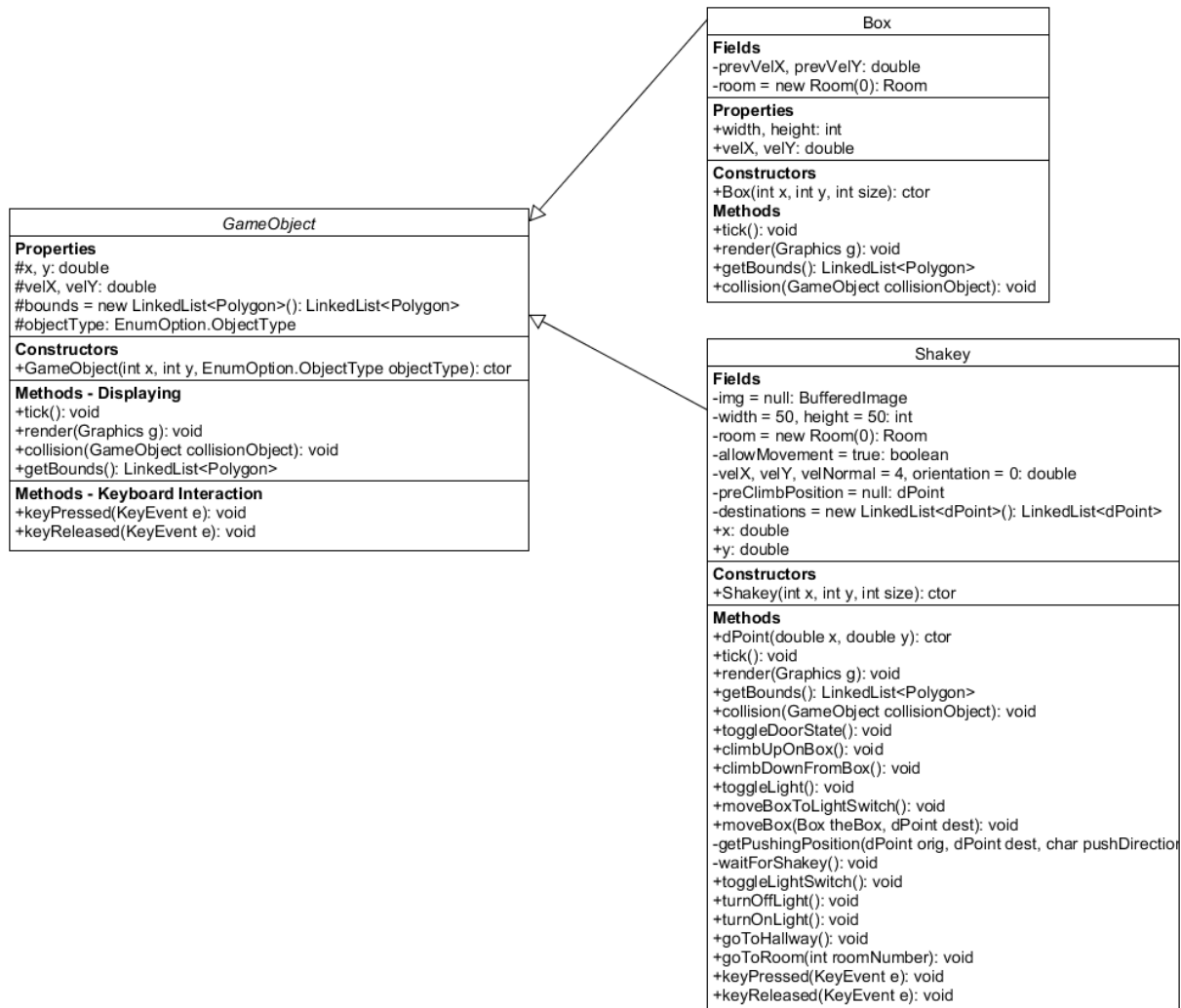
1. **Wall** – The boundaries for each room
2. **Floor** – The background of the room.
3. **Door** – An object that can prevent or allow access to the room.
4. **LightSwitch** – Changes the lighting state of the room.
5. **LightFixture** – Represents the lighting of the room.
6. **GameObject** – The abstract base class for all objects.



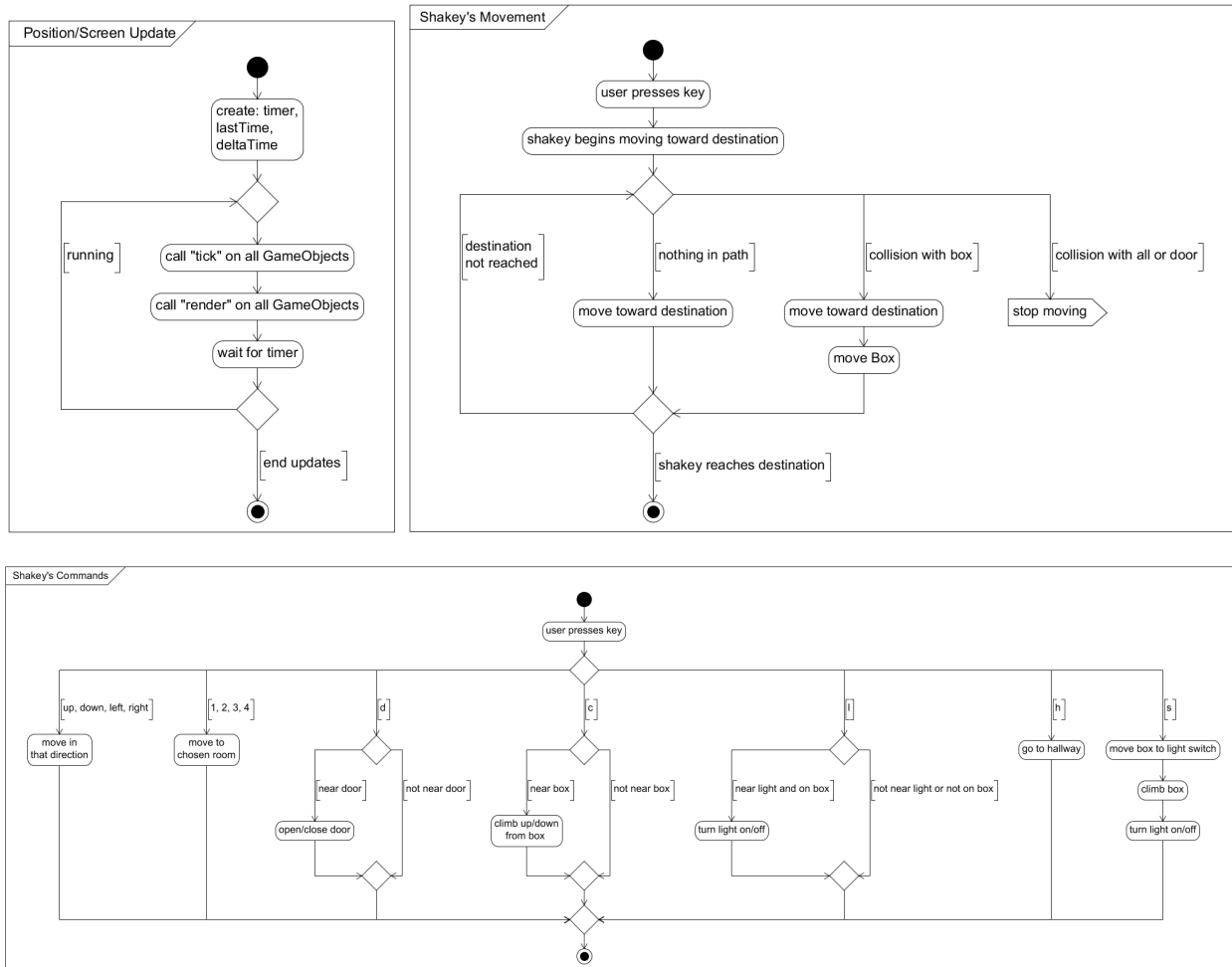
Shakey and Box

The two most important objects in the program are Shakey and the Box.

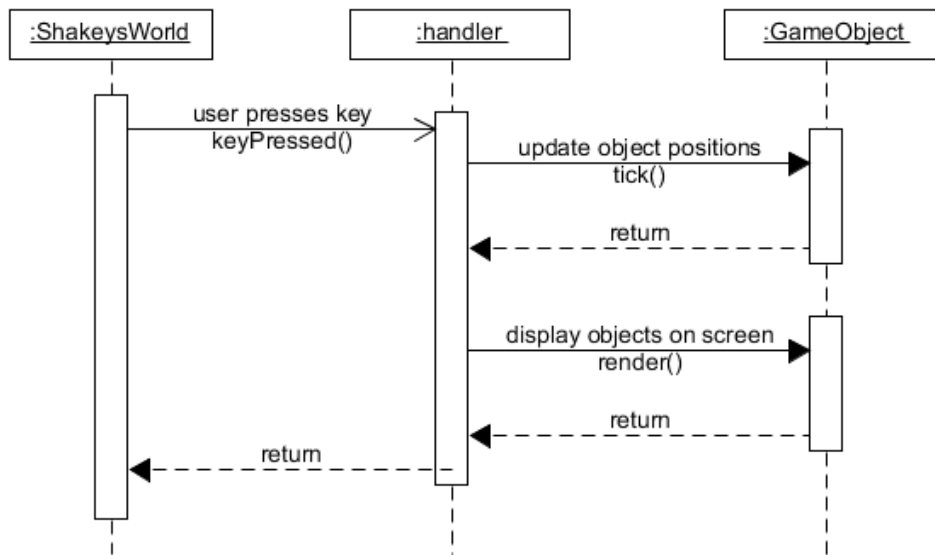
1. **Shakey** – a robot that can be manually or automatically moved around the rooms.
2. **Box** – an object that shakey can push around the rooms. The box is used to reach the light switch.



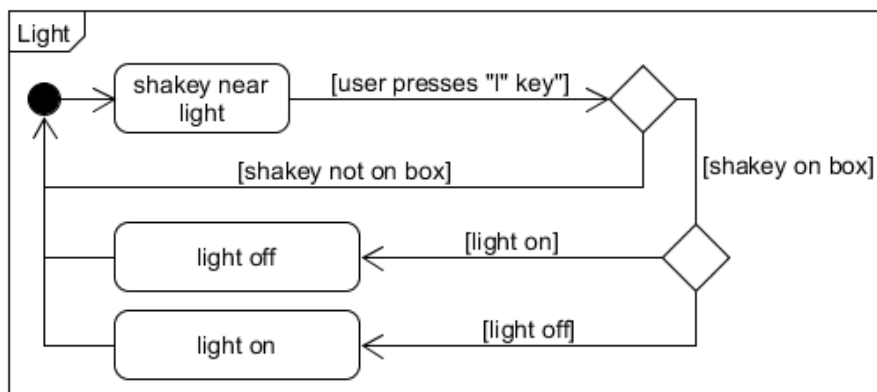
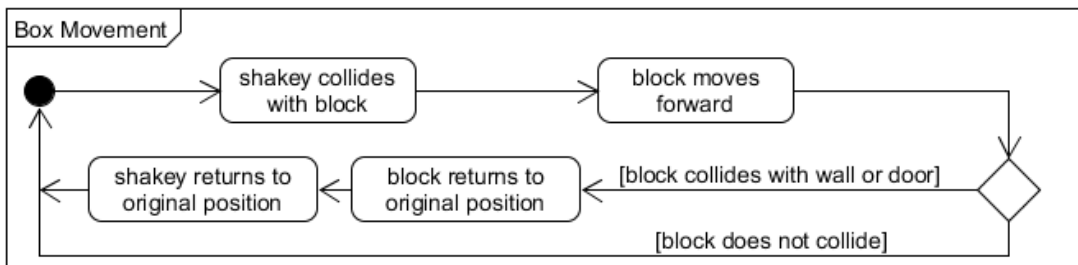
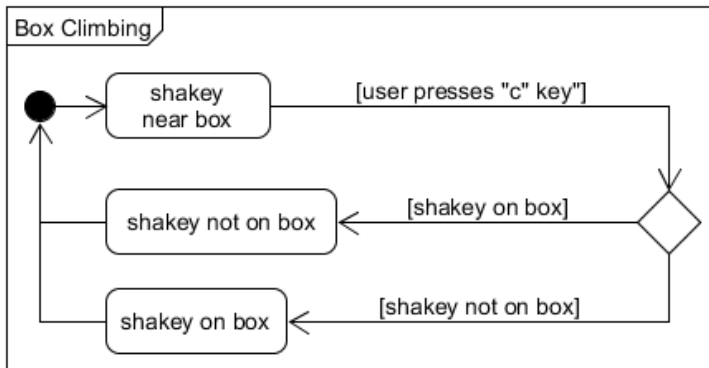
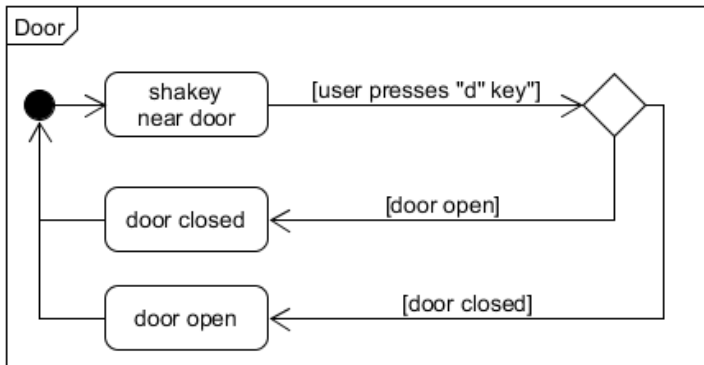
Activities



Interactions



States



Components

