Puzzle Game Design
State = altered

Introduction

The purpose of this exercise is to create a puzzle game that attempts to test the players skill at least two of the following - Logic, Math, Visual, Language, Physics.

Overview

State = altered is a physics based puzzle game where the objective is to **alter** the states of everything in the environment, which solely comprises of cubes or cube-like structures, in order to guide the ball through to the hoop.

Each cube or cube-like structure in the level can be **altered** to have various properties that changes how the ball behaves when it interacts or collides with it.

State Changes(LMB)

The properties of each and every cube in the environment can be altered to any of the following states but can only have the properties of any one state at any point in time.

State = gravSwitch

If the ball interacts or collides with a cube of this state, gravity is reversed and is switched to the opposite of its current direction. I.e if the current force applied on the ball due to gravity is downward, upon triggering this state, the force applied due to gravity is in the upward direction and vise-versa.
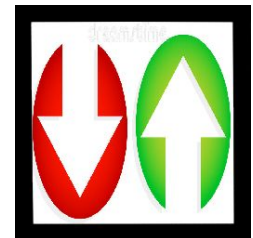
State = bounce

This state enables the ball to bounce off a cube. The bounce amount depends on the force or velocity with which the ball hits the cube of this state and the direction depends on the angle and force with which the ball strikes the cube of this state.

State = forceRight, State = forceLeft, State = forceUp & state = forceDown

These states add a directional force to the ball when it is in contact with the cube. Cubes arranged together can be altered to the same state in order to gain a boost to the force acting upon the ball.
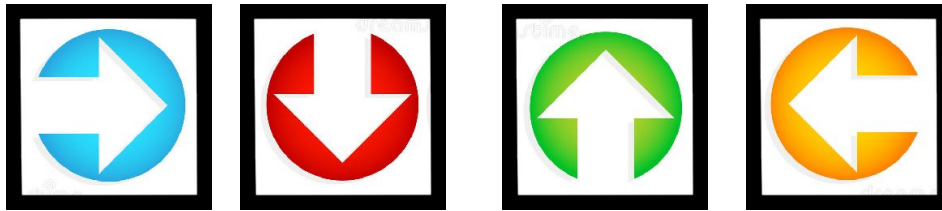
Cube Rotation(LMB)

Each cube can be rotated to angles of 15,30,45,60 and 75 degrees. This can be used to direct the ball to the required and allows for interesting interactions with the current state of the rotated cube or the ones around it. All cubes can be rotated regardless of whether they have a state applied to them or not.

Phases of play

Setup Phase

This is the phase of the game where players are allowed to make changes within the level. These changes include adding different states to each cube and altering their rotational values.

Test Phase

This is where the player can actually observe the ball moving within the level he/she altered and how it behaves. Based on their observations in this phase, players can make changes to the level until they finally manage to achieve their goal of getting the ball through the hoop.

Players can easily switch between these two phases to quickly switch between altering and testing.

Example Levels

Example Level 01
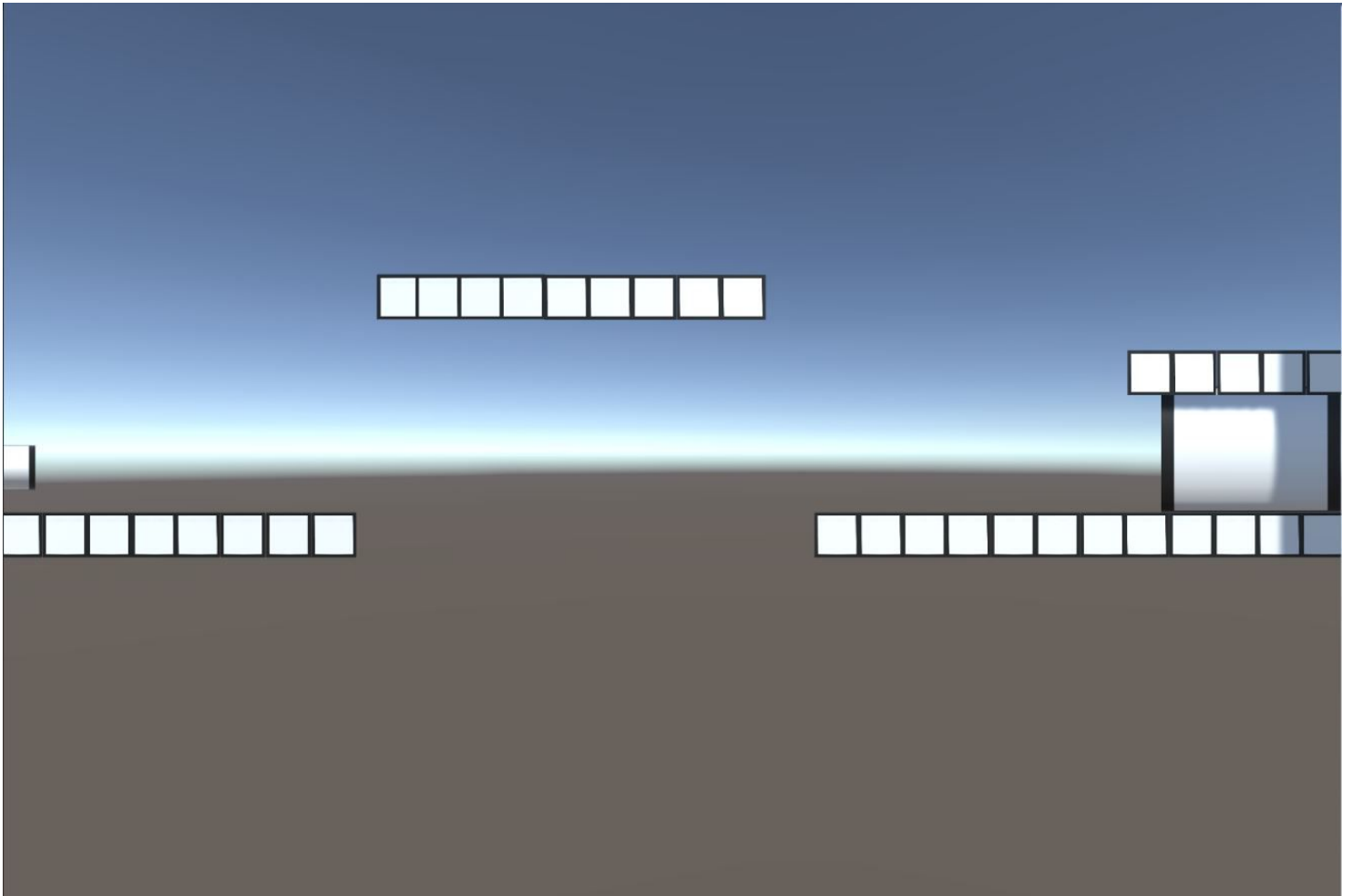
The objective of this level is to get the ball that spawns at the left to the objective on the right.
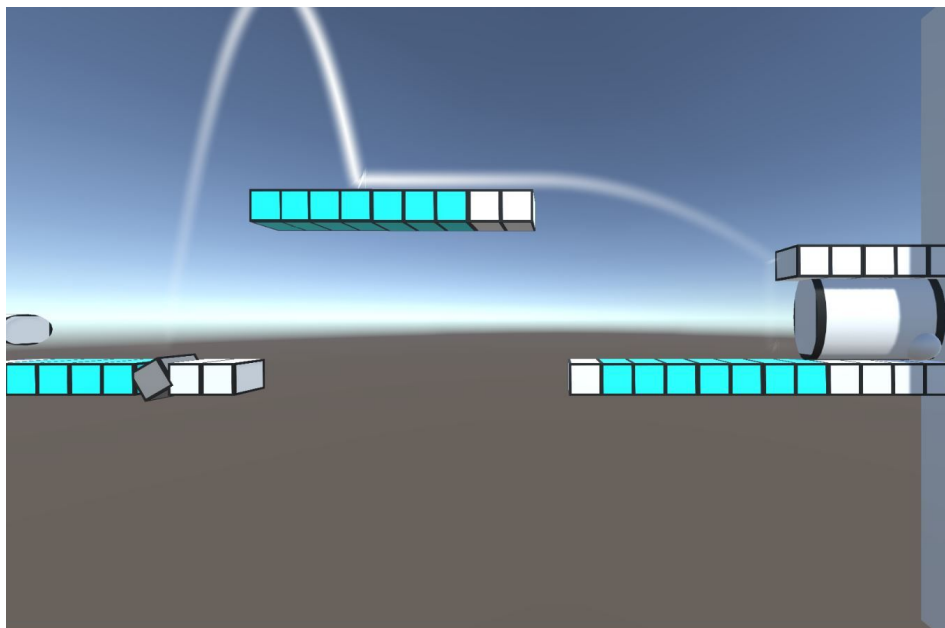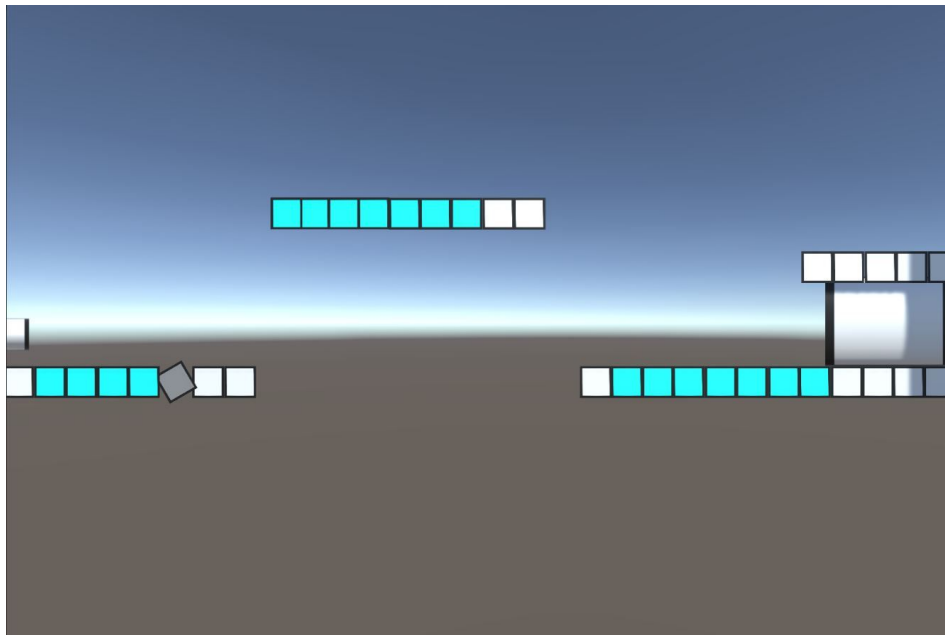
Possible Solution - 01

In this solution, we use only the **forceRight** and **gravSwitch** states.

The clumped up forceRight states on the left allow for the ball to gain enough acceleration such that when gravity is switched, the ball stays safely below the cubes in the middle. These cubes also are of the forceRight state and thus move the ball towards the other gravSwitch which now changes gravity back to its original state. The last clump of forceRight state cubes now take the ball successfully to the objective.
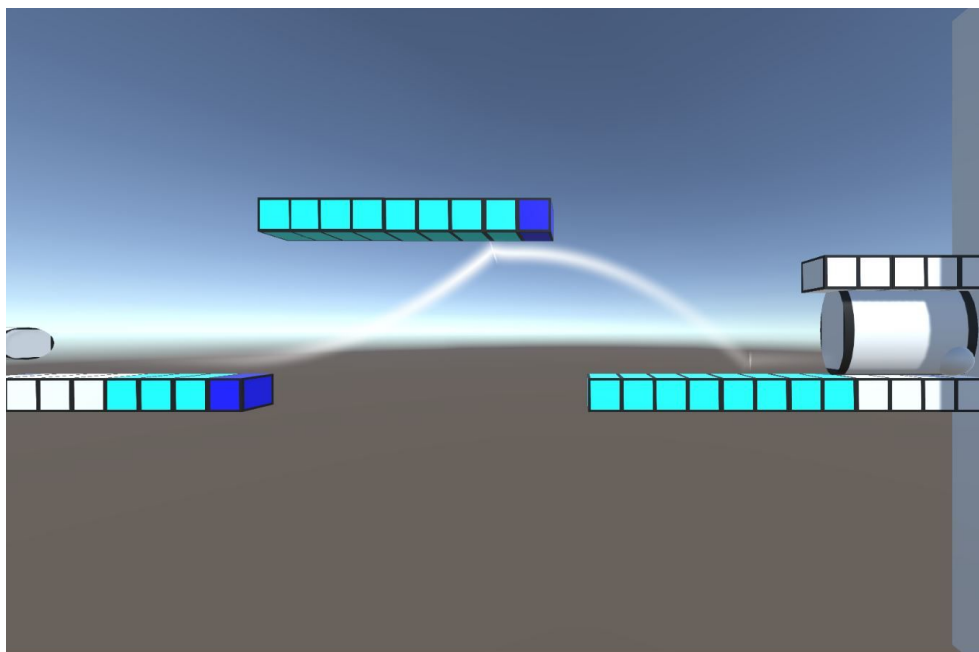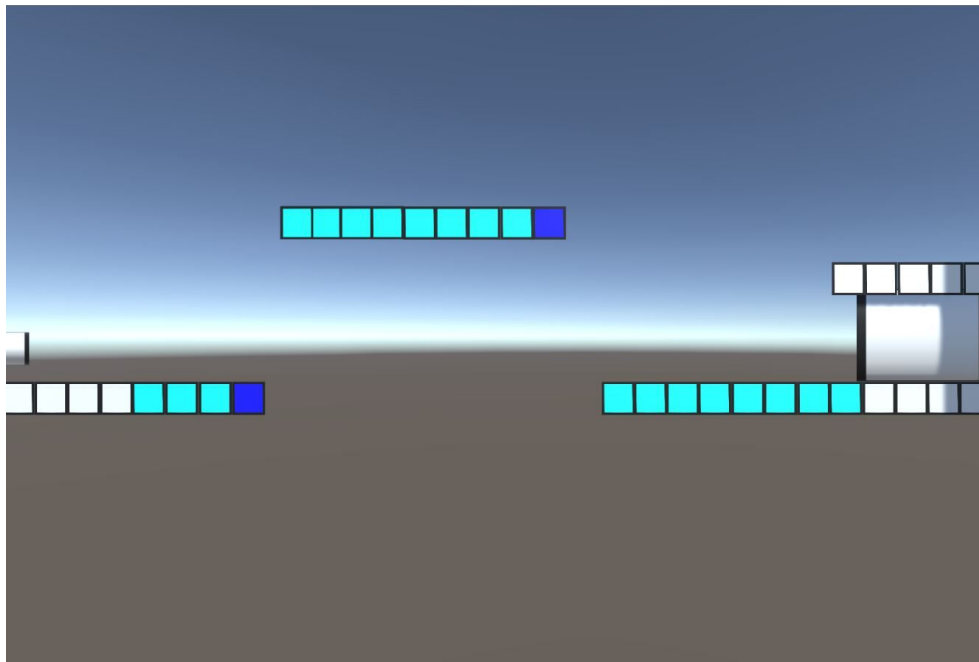
Possible Solution - 02

This solution follows a similar pattern to the first one but instead of using the gravSwitch, we make use of the **bounce state** and also give the cube a rotational value so that when the ball hits it, the ball gets launched high in the air and reaches above the centre clump from which the forceRight takes it all the way to its destination.

Example Level 02
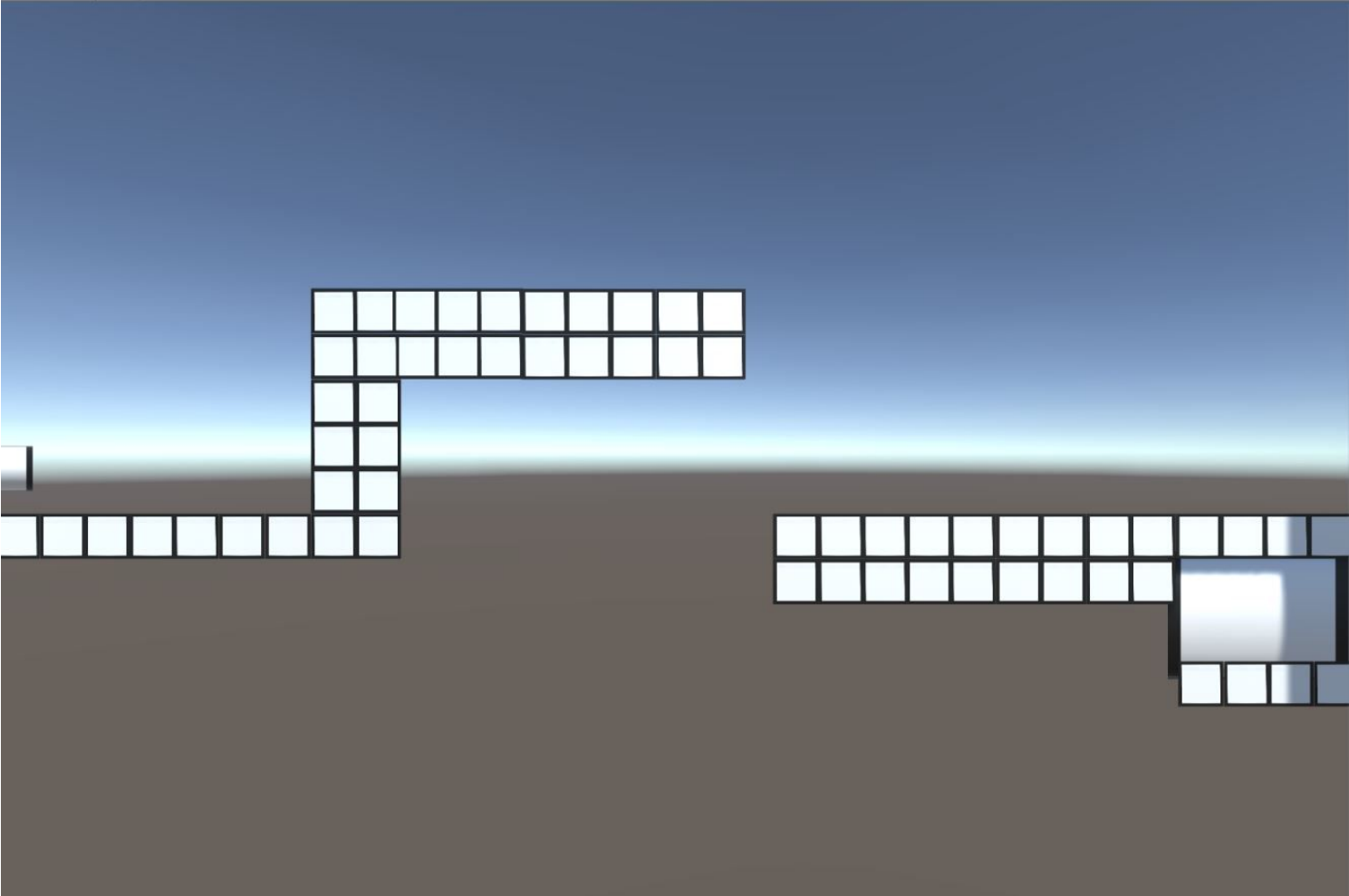
Possible Solution - 01

This solution requires the use of all of the games mechanics including the **forceRight, forceUp**, **forceLeft**, **gravSwitch** and the **bounce** state. It also makes use of the rotation mechanic as well.

- Clump of forceRight for momentum.
- forceUp pushes the ball upwards and with the help of the forceRight on top, gets above the platform where forceRightmoves the ball to the platform below.
- Here forceLeft moves the ball onto the gravSwitcher and also provides enough momentum for the ball to go below the previous platform.
- The forceLeft and forceDown provide the ball with enough momentum against the newly reversed gravity to strike the the rotated bounce state cube with enough force to carry it all the way below the platform.
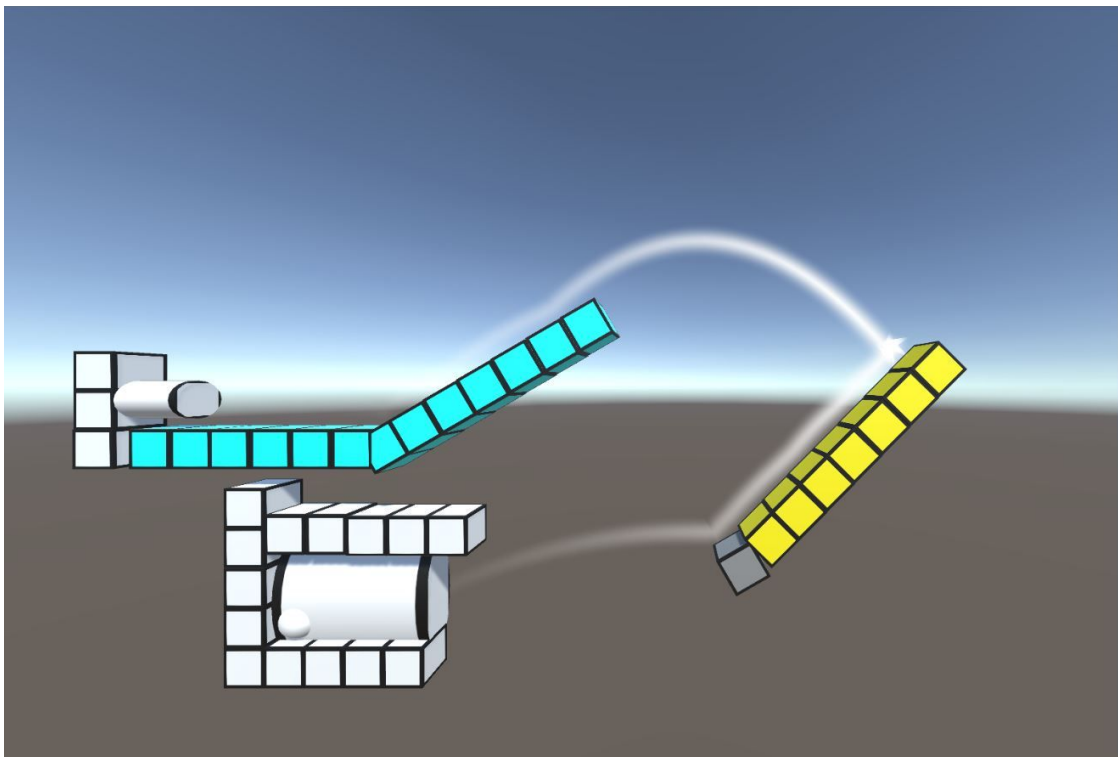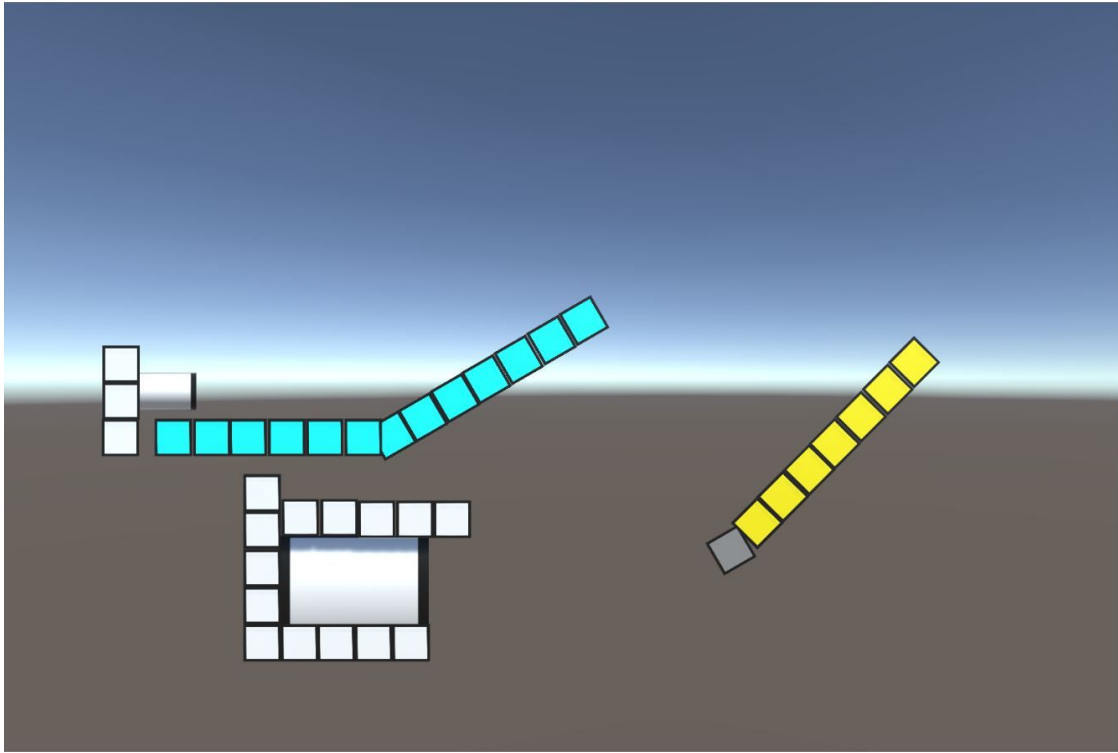- The forceRigth then finishes the job carrying the ball to the objective.
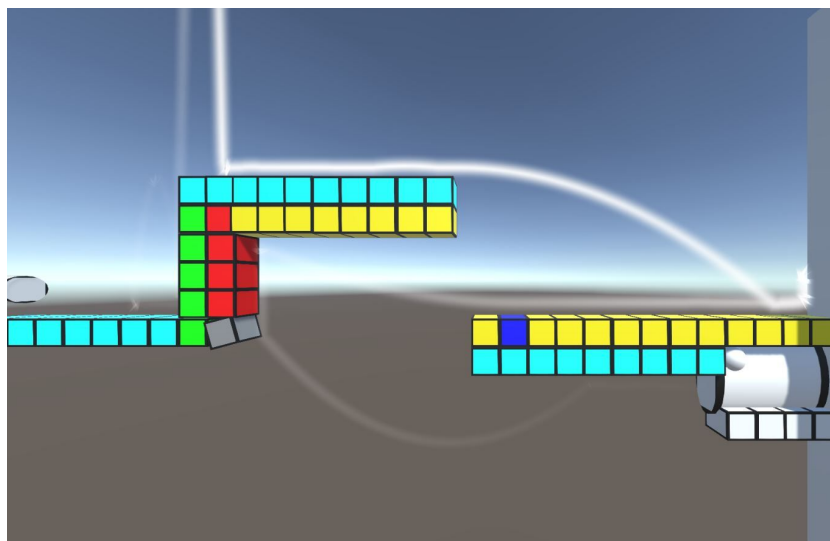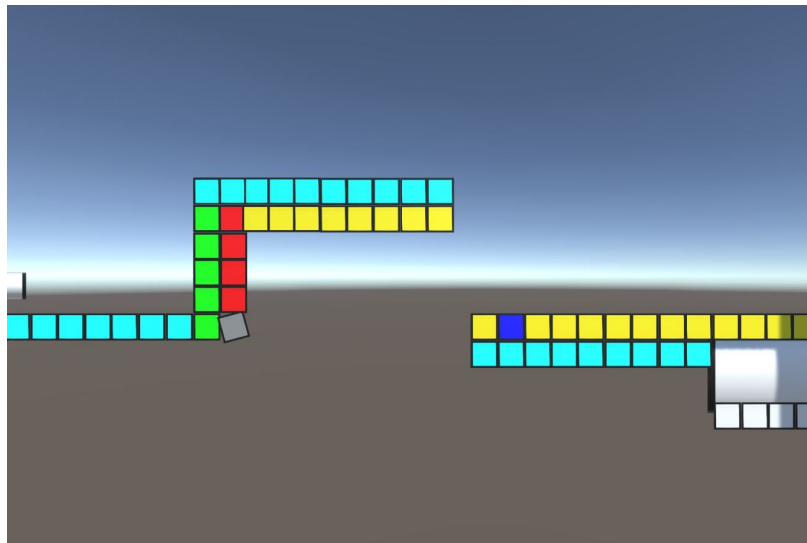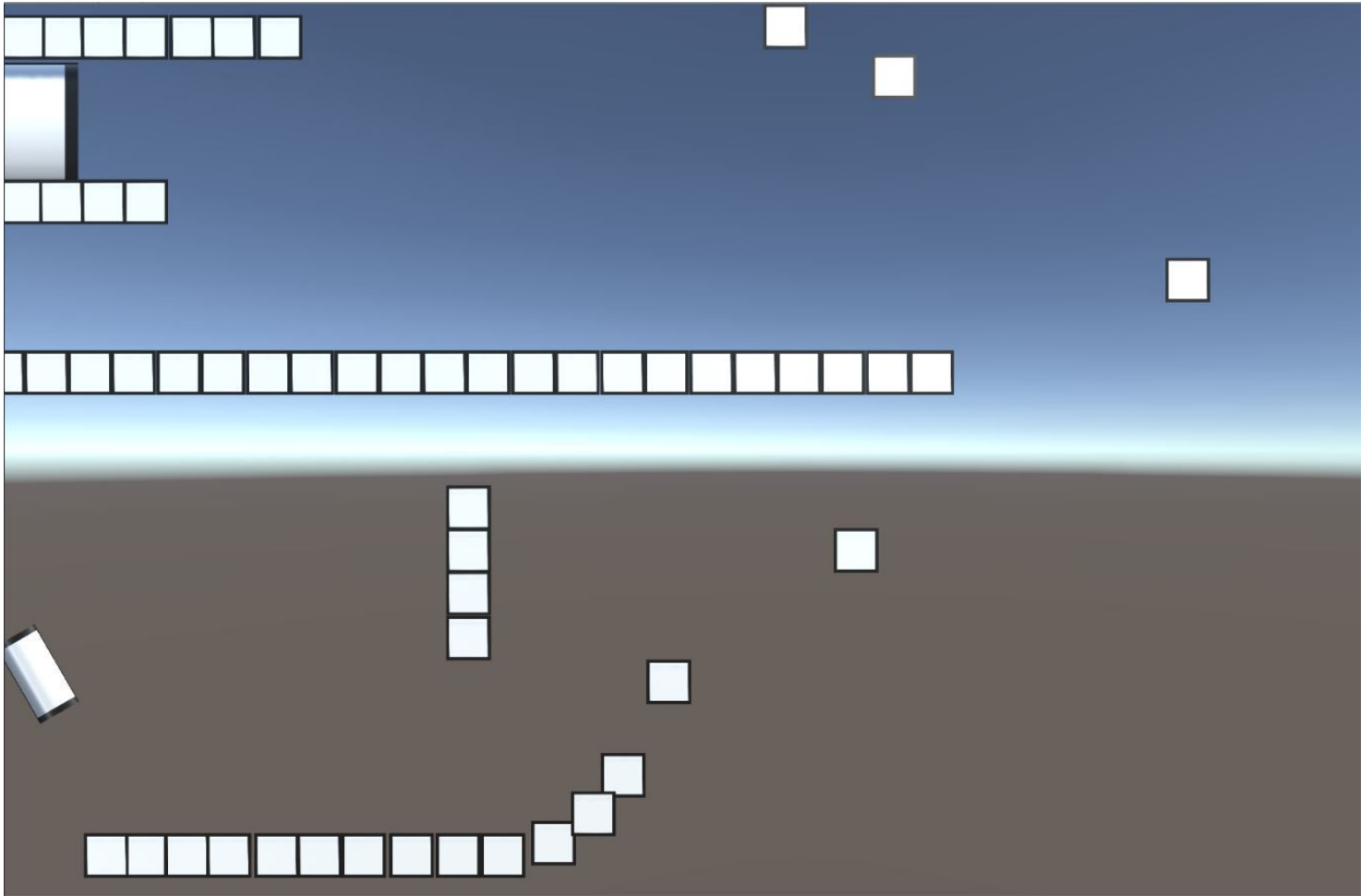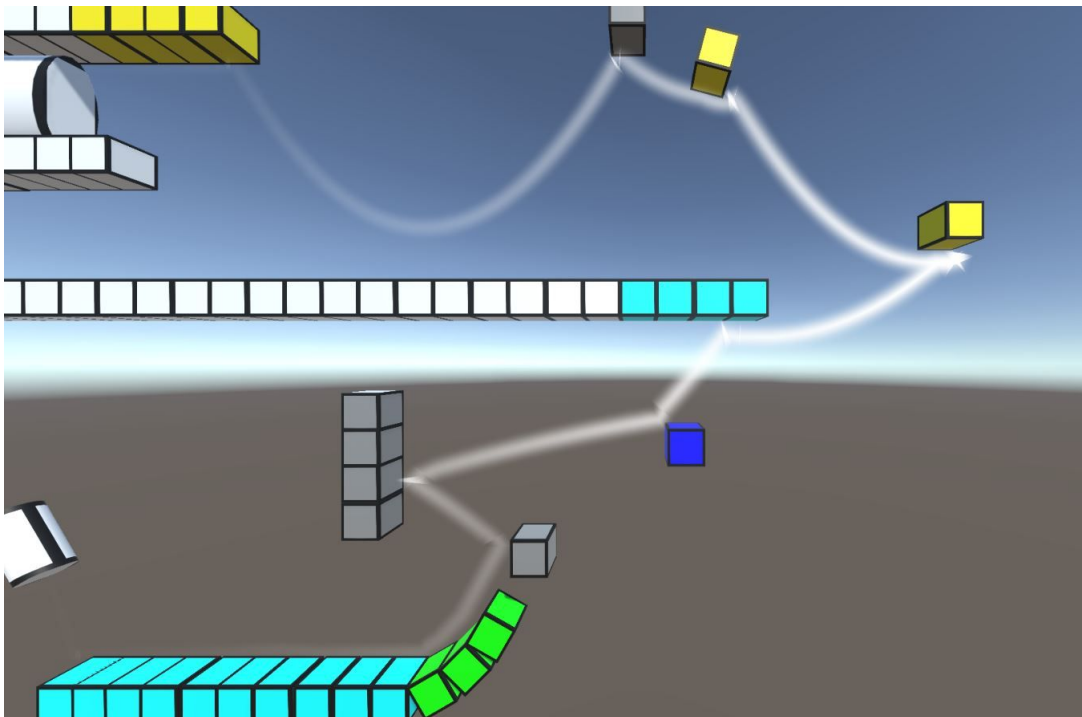
Showcase Levels
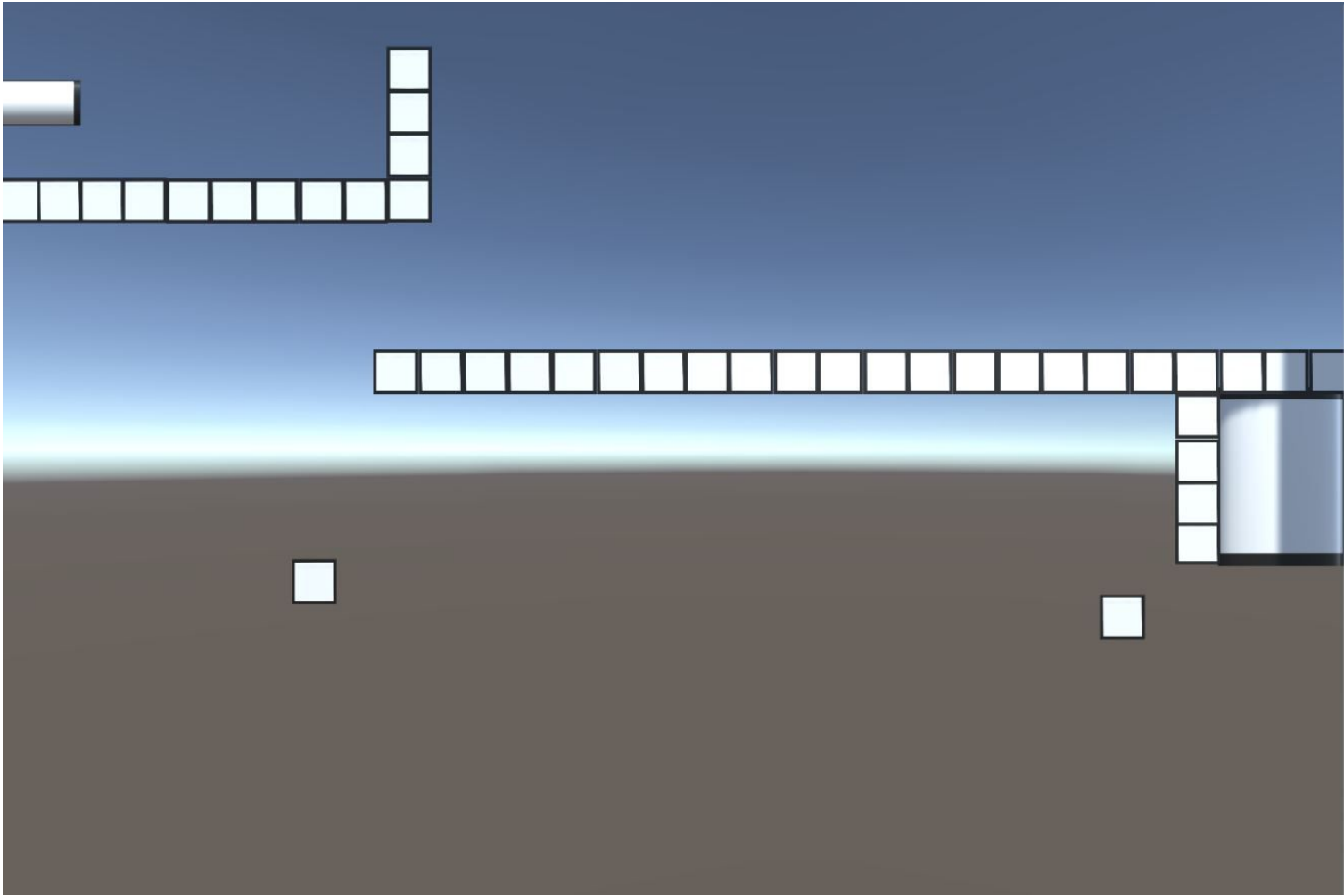
Showcase Level 01
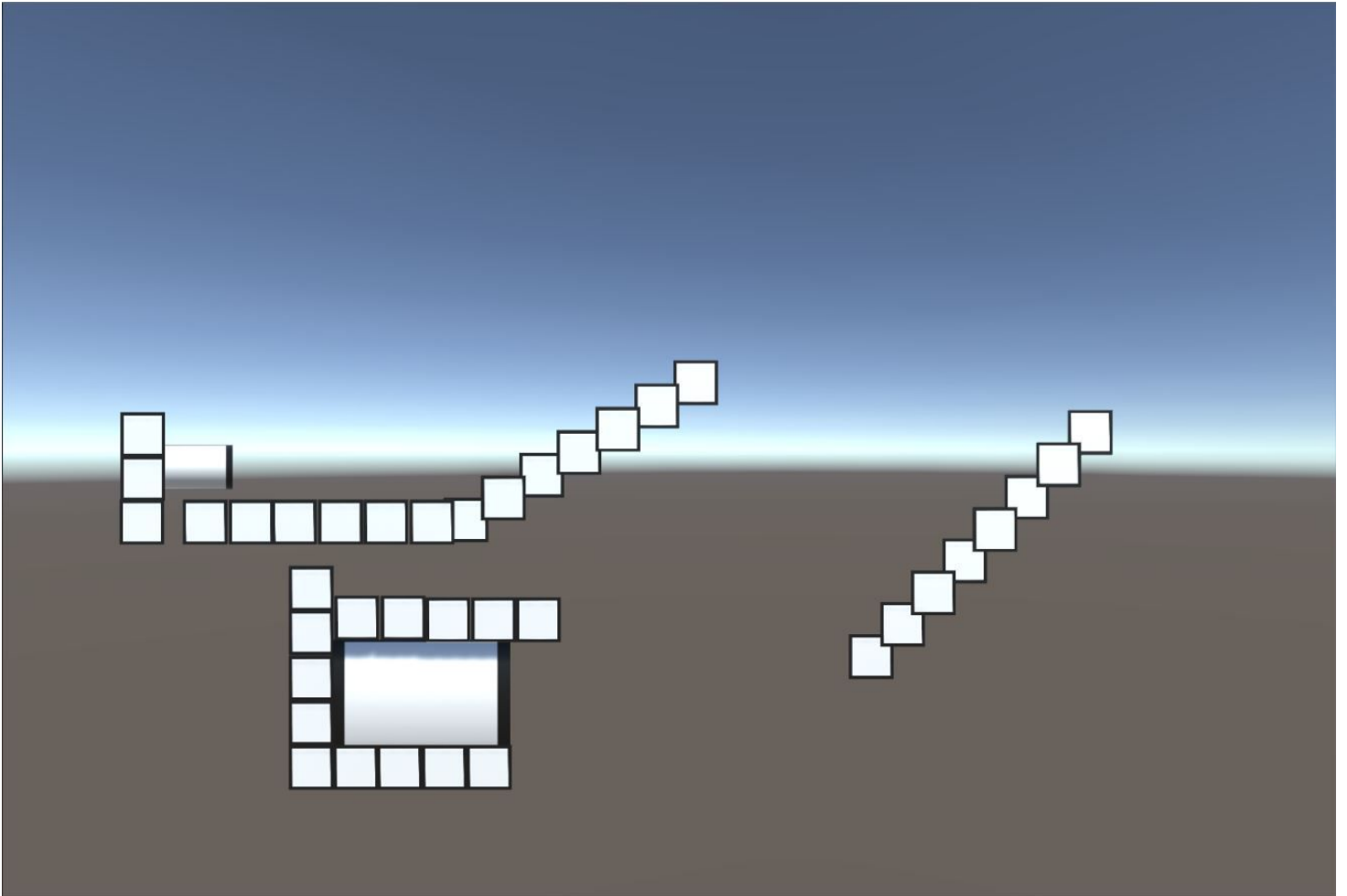
Possible Solution

Showcase Level 02

Possible Solution
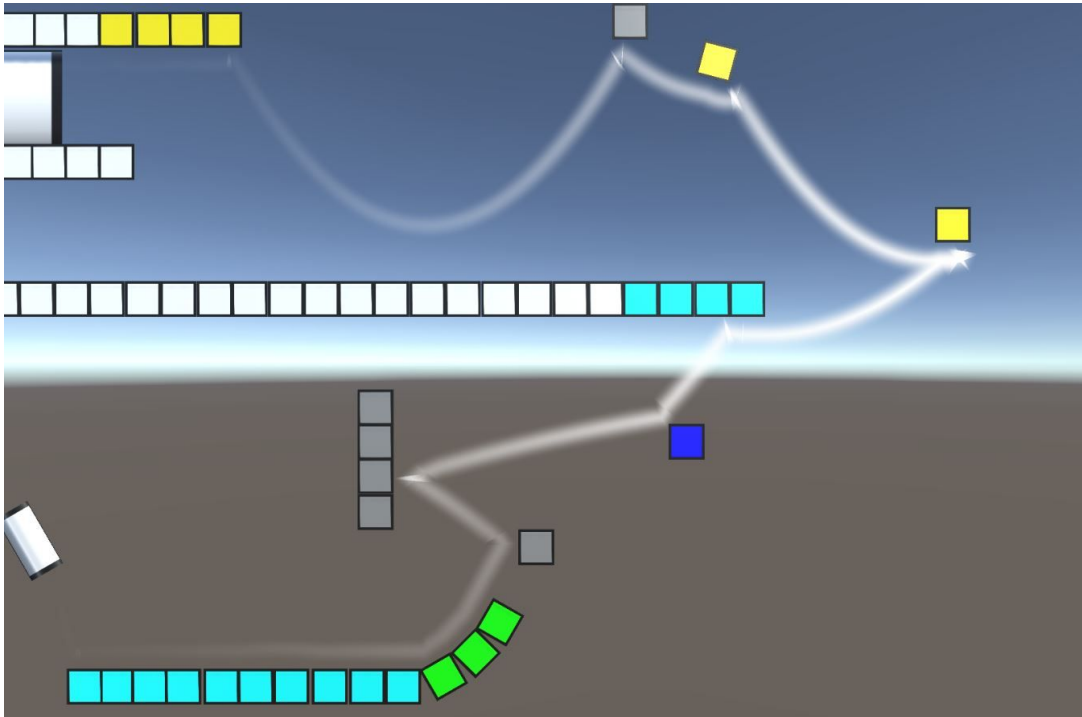
Showcase Level 03

Possible Solution