# Validation Testing Strategy

#### 1: Add new gizmo

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Select a gizmo from the ‘*Add New Gizmo*’ dropdown menu;

Click an empty tile to place the gizmo;

Repeat with all gizmos;

*Output*:

Gizmos added to the board on the tile clicked.

#### 2: Move gizmo

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Click the ‘*Move’* button;

Click and hold the gizmo to move;

Drag the gizmo to an empty tile and release;

*Output*:

Gizmo moves location while dragging and stays in the tile it was dropped in.

#### 3: Rotate gizmo

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Click the ‘*Rotate’* button;

Click a gizmo to rotate;

*Output*:

Selected gizmo with rotational symmetry appear unchanged;

Otherwise, selected gizmo is rotated 90 degrees clockwise.

#### 4: Delete gizmo

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Click the ‘*Delete*’ button;

Click a gizmo to delete;

*Output*:

Selected gizmo is removed from the game board.

#### 5: Connect Gizmos

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Click ‘*Connect’* button;

Click gizmo A to connect;

Click gizmo B to connect to;

*Outputs*:

Gizmo A triggers action on gizmo B;

In running mode, when a ball hits the first gizmo the second gizmo exhibits action.

#### 6: Connect multiple gizmos as triggers to single gizmo’s action

*Inputs*:

Repeat steps in 5;

Click ‘*Connect’* button again;

Click gizmo C to connect;

Click gizmo B to connect to;

*Outputs*:

Triggering gizmos A and C trigger the connected gizmo B;

In running mode, ball hitting either of the triggering gizmo makes the connected gizmos exhibit action.

#### 7: Connect single gizmo to multiple gizmos actions

*Inputs*:

Repeat steps in 5;

Click ‘*Connect’* button again;

Click gizmo A again to connect;

Click gizmo C to connect to;

*Outputs*:

Triggering gizmo A triggers the other two gizmos B and C;

In run mode, ball hitting the triggering gizmo makes the connected gizmos exhibit action.

#### 8: Connect key press down trigger to gizmo

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Click ‘*Connect’* button;

Press a keyboard key to connect;

Select from prompt ‘*Key Press Down*’;

Click gizmo to connect to;

*Output:*

Pressing chosen key triggers action on the selected gizmo.

#### 9: Connect key press up trigger to gizmo

*Inputs:*

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Click ‘*Connect’* button;

Press a keyboard key to connect;

Select from prompt ‘*Key Press Up*’;

Click gizmo to connect to;

*Output:*

Releasing chosen key triggers action on the selected gizmo.

#### 10: Connect multiple key press to single gizmo

*Inputs*:

Repeat steps in 8 or 9;

Click ‘*Connect’* button again;

Press a keyboard key to connect;

Select from prompt ‘*Key Press Up*’ or ‘*Key Press Down*’;

Click the same gizmo to connect to;

*Output:*

Both key presses (releases) triggers gizmo’ action.

#### 11: Connect key press to multiple gizmos

*Inputs*:

Repeat steps in 8 or 9;

Click ‘*Connect’* button again;

Press the same keyboard key to connect;

Select from prompt ‘*Key Press Up*’ or ‘*Key Press Down*’;

Click different gizmo to connect to;

*Output:*

The key press (release) triggers actions on selected gizmos.

#### 12: Disconnect gizmos

*Inputs*:

Connect two gizmos by following steps in 5;

Run game by following steps in 20;

Verify that that gizmos are connected;

Switch back to building mode;

In ‘*Editing tools*’ menu click ‘*Disconnect’* button;

Click gizmo A to remove connections;

*Output*:

Gizmo A no longer triggers action on the other gizmo.

#### 13: Disconnect multiple gizmos

*Inputs*:

Connect a single gizmo to multiple gizmos by following steps in 7;

Run game by following steps in 20;

Verify that that gizmos are connected;

Switch back to building mode;

Under ‘*Editing tools*’ menu click ‘*Disconnect’* button;

Click gizmo A to remove connections;

*Output*:

Gizmo A no longer triggers actions on gizmos that were connected.

#### 14: Disconnect key press

*Inputs*:

Connect a key press to a gizmo by following steps in 8 or 9;

Run game by following steps in 20;

Verify that that gizmo is connected to key action;

Switch back to building mode;

Under ‘*Editing tools*’ menu click ‘*Disconnect’* button;

Click the same gizmo to remove connections from;

*Output*:

Key no longer triggers action on the gizmo.

#### 15: Disconnect multiple gizmos from key press

*Inputs*:

Connect a single key press to multiple gizmos by following steps in 11;

Run game by following steps in 20;

Verify that that gizmo is connected to key action;

Switch back to building mode;

Under ‘*Editing tools*’ menu click ‘*Disconnect’* button;

Press key to remove connections from;

Choose from prompt key press/release to disconnect;

*Output*:

Key action no longer triggers any gizmos.

#### 16: Clear board

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Add multiple gizmos to the board;

Click ‘*Clear Board’* button;

*Output*:

All gizmos are removed from the board;

#### 17: Change gravity

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Settings’* menu;

Slide ‘*Gravity’* slider to desired value;

Run game by following steps in 20;

Repeat with different values;

*Output*:

Gravity property of game are changed;

Displayed gravity coefficient is changed to selected value;

In running mode, acceleration of ball downwards is slower/faster depending on selected value.

#### 18: Change surface friction

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Settings’* menu;

Slide ‘*Friction (mu)*’ slider to desired value;

Run game by following steps in 20;

Repeat with different values;

*Output*:

Surface friction property of game is changed;

Displayed surface friction coefficient is changed to selected value;

In running mode, displacement of ball is slower/faster depending on selected value.

#### 19: Change air friction

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Settings’* menu;

Slide ‘*Friction (mu2)*’ slider;

Run game by following steps in 20;

Repeat with different values;

*Output*:

Air friction property of game is changed;

Displayed air friction coefficient is changed to selected value;

In running mode, displacement of ball is slower/faster depending on selected value.

#### 20: Run Game

*Inputs*:

If in building mode, enter running mode;

Click ‘*Start’* button;

*Output*:

Game begins running;

#### 21: Save Game

*Inputs*:

If in building mode, enter running mode;

Click the ‘*Save’* button;

Navigate filesystem for desired location;

Enter the name of the file;

*Output*:

Current board and game state are saved to file under filename.

#### 22: Load Game

*Inputs*

Restart the application;

Enter running mode;

Click the ‘*Open’* button;

Browse the file in filesystem;

Open the file;

*Output*:

Board and game state are loaded and available for running.

#### 23: Reload game board

*Inputs*:

Load game from file;

Add a gizmo to the board;

Switch to running mode;

Open ‘*File’* menu;

Click ‘*Reload’* button;

*Output*:

Game board and state are loaded from the last file opened.

#### 24: Reload game state

*Inputs*:

Load game from file;

Run game by following steps in 20;

Click ‘*Reload’* button;

*Output*:

Game is stopped;

Game state is reloaded using the last file opened.

#### 25: Quit Game

*Inputs*:

If in building mode, enter running mode;

Click ‘*Quit’* button;

*Output*:

Application window is closed, and the process is stopped.

#### 26: Stop Game

*Inputs*:

If in building mode, enter running mode;

Run game by following steps in 20;

Click ‘*Stop’* game button;

*Output*:

Game stops running.

#### 27: Next Tick

*Inputs*:

Stop game when the game is running;

Click ‘*Next tick’* button;

*Output*:

Game board advances by one game tick.

#### 28: Add gizmo error

*Inputs*:

If in running mode, enter building mode;

Select a gizmo from the add gizmos dropdown menu;

Click an occupied tile to place the gizmo;

*Outputs*:

User prompted about error in tile selection;

Gizmo not added to the board on the tile clicked.

#### 29: Open error

*Inputs*:

Click ‘*Open’* button;

Open file of different format;

*Outputs*:

User prompted about error in file selection;

Game board not loaded from file.

#### 30: Reload error

*Inputs*:

Load game from file;

Delete or move the file;

Press ‘*Reload’* button;

*Outputs*:

User prompted about file not found error;

Game board not reloaded.

#### 31: Add absorber

*Inputs*:

If in running mode, enter building mode;

Open the ‘*Editing tools*’ menu;

Select ‘*Absorber’* from the ‘*Add New Gizmo*’ dropdown menu;

Click an empty tile and extend across other empty tiles to place the absorber;

*Output*:

Absorber is added to the board and spans the tiles that were selected.