SE 3XA3: Module Interface Specification
Mini-Arcade

Andrew Hum	William Lei	Arshan Khan	Jame Tran
huma3	leim5	khana172	tranj52
400138826	400125240	400145605	400144141

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Table 1: **Revision History**

Date	Version	Notes
3/9/2020	1.0	Arshan and Andrew created document and sections
3/11/2020	1.1	Andrew completed all modules relevant to Maze

Level 1	**Level 2**
Hardware-Hiding Module	
Behaviour-Hiding Module	? *Launcher Modules* Draw Game (Maze) Player Movement (Maze) Menu and Settings (Maze) Draw Game (Pong) Player Movement (Pong) Menu and Settings (Pong) *Flappy Modules*
Software Decision Module	? *Launcher Modules* Maze Generator (Maze) Score Tracking (Maze) Ball Trajectory (Pong) Score Tracking (Pong) *Flappy Modules*

Table 2: Module Hierarchy

1 MIS of Launcher Module

1.1 Interface Syntax

1.1.1 Exported Access Programs

1.2 Interface Semantics

1.2.1 State Variables

1.2.2 Environmental Variables

1.2.3 Assumptions

1.2.4 Access Program Semantics

2 MIS of Maze Generation Module

2.1 Interface Syntax

2.1.1 Exported Access Programs

Name	In	Out	Exceptions
Cell	integer, integer	-	Invalid Input
Cell_genWalls	-	-	-
Maze	integer	-	Invalid Input
Maze_genMaze	-	-	-

2.2 Interface Semantics

2.2.1 State Variables

cellWalls: array of integers - representing walls around the current cell mazeWalls: array of Cell - representing the layout of the maze

2.2.2 Assumptions

Variables should be set before trying to access them
Constructor Cell will be called before genWalls or Maze can be called
Constructor Maze will be called before genMaze can be called

2.2.3 Access Program Semantics

Cell(id, gridLength):
Input: two integers representing the cell ID and the maze dimensions
Transition: initializes the Cell object
Exceptions: Invalid Input they are not positive integers

Cell_genWalls():
Input: None
Transition: adds integers corresponding to neighbouring cells to cellWalls

Exceptions: None

Maze(size):
Input: integer representing the size of the maze
Transition: initializes the Maze Object
Exceptions: Invalid Input size is not a positive integer

Maze_genMaze():
Input: None
Transition: utilizes Prim's Algorithm to randomly remove walls from the maze and manipulates mazeWalls to represent the remaining walls of the maze
Exceptions: None

3 MIS of Score Tracking (Maze) Module

3.1 Interface Syntax

3.1.1 Exported Access Programs

Name	In	Out	Exceptions
saveScore	float	-	Invalid Input
checkRank	float	integer	Invalid Input

3.2 Interface Semantics

3.2.1 State Variables

score: float - represents the user's score once the maze is completed

3.2.2 Assumptions

Variables should be set before trying to access them

3.2.3 Access Program Semantics

saveScore(time):
Input: a float value representing the total elapsed time during the game
Transition: saves the score to the maze scores file
Exceptions: Invalid Input if the input is not a positive float

checkRank(time):
Output: the user's current rank based upon previous scores

Exceptions: Invalid Input if the input is not a positive float

4 MIS of Draw Game (Maze) Module

4.1 Interface Syntax

4.1.1 Exported Access Programs

Name	In	Out	Exceptions
drawMaze	Maze	GUI	Invalid Input
drawCharacter	integer, integer	GUI	Invalid Input
showTime	-	GUI	-

4.2 Interface Semantics

4.2.1 State Variables

charPos: x,y - coordinates of the character's current position
timeElapsed: float - represents the current time elapsed

4.2.2 State Variables

keyDown: captures which key is currently being pressed down

4.2.3 Assumptions

Variables should be set before trying to access them
Maze must be properly initialized before drawTime can be called

4.2.4 Access Program Semantics

drawMaze(Maze):
Input: Maze object used to draw the layout
Output: draws the maze to the output window
Exceptions: Invalid Input if the object is not of type Maze

drawCharacter(startx,starty):
Input: two integers representing the coordinates to draw the character
Transition: adjusts charPos based on keyDown using Player Movement Module
Output: character is drawn according to it's current position of the maze

Exceptions: Invalid input if the integers are not of the correct coordinates

showTime(time):
Input: a float representing the current time elapsed
Output: a clock on the output window representing the current time elapsed
Exceptions: Invalid Input if the input is not a float or negative

5 MIS of Player Movement (Maze) Module

5.1 Interface Syntax

5.1.1 Exported Access Programs

Name	In	Out	Exceptions
moveUp	-	integer, integer	-
moveDown	-	integer, integer	-
moveLeft	-	integer, integer	-
moveRight	-	integer, integer	-

5.2 Interface Semantics

5.2.1 State Variables

charPos: int, int - representing the character's current position as coordinates (x,y)

5.2.2 Environment Variables

None

5.2.3 Assumptions

Variables should be set before trying to access them

5.2.4 Access Program Semantics

moveUp():
Input: None
Transition: Adjust charPos upwards (decrease y coordinate)
Output: two integers representing the new position of the character
Exceptions: None

moveDown():

Input: None
Transition: Adjust charPos downwards (increase y coordinate)
Output: two integers representing the new position of the character
Exceptions: None

moveLeft():
Input: None
Transition: Adjust charPos to the left (decrease x coordinate)
Output: two integers representing the new position of the character
Exceptions: None

moveRight():
Input: None
Transition: Adjust charPos to the right (increase x coordinate)
Output: two integers representing the new position of the character
Exceptions: None

6 MIS of Menu and Settings (Maze) Module

6.1 Interface Syntax

6.1.1 Exported Access Programs

Name	In	Out	Exceptions
drawInterface	integer	GUI	-
checkEvent	float, float, boolean	integer	Invalid Input

6.2 Interface Semantics

6.2.1 State Variables

currState: int - represents the game's current state

6.2.2 Environment Variables

mousePos: the mouse/pointer's current position mouseEvent: captures a mouse event

6.2.3 Assumptions

Variables should be set before trying to access them
If no event is chosen, checkEvent returns a default value 0

If currState is 0, drawInterface does not change

6.2.4 Access Program Semantics

drawInterface(currState):

Input: an integer representing the game's current state

Output: draws the interface corresponding to the current state to the output window

Exceptions: Invalid Input if the input doesn't correspond to a game state

checkEvent(xpos, ypos, clicked):

Input: float values representing the mouse's current position on the screen and if the mouse has been clicked

Transition: determines if the current position represents a specified event

Output: integer representing the current state of the game based on the mouse

Exceptions: Invalid Input if the coordinates are not part of the window

7 MIS of Pong Module

7.1 Interface Syntax

7.1.1 Exported Access Programs

Name	In	Out	Exceptions

7.2 Interface Semantics

7.2.1 State Variables

7.2.2 Environmental Variables

7.2.3 Assumptions

7.2.4 Access Program Semantics

8 MIS of Flappy Module

8.1 Interface Syntax

8.1.1 Exported Access Programs

Name	**In**	**Out**	**Exceptions**

8.2 Interface Semantics

8.2.1 State Variables

8.2.2 Environmental Variables

8.2.3 Assumptions

8.2.4 Access Program Semantics