**Developer Test Case**

**Test Cases for Feature : Display Main Menu**

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| **Test Scenario** | **Test Description** | **Test Values** | **Expected**  **Outcome** | **Actual**  **Outcome** | **Justification** |
| **1** | Display Main menu | Run MainMenu.py | Display:  Main Menu  =========  [1] Read and load maze from file  [2] View Maze  [3] Play maze game  [4] Configure current maze  [0] Exit Maze  Enter your input: | Display:  Main Menu  =========  [1] Read and load maze from file  [2] View Maze  [3] Play maze game  [4] Configure current maze  [0] Exit Maze  Enter your input: |  |
| **2** | Test the program on input option 1 | Enter your input: “1”. | Display:  “Option [1] Read and load maze from file”  “Enter the name of the data file:” | Display:  “Option [1] Read and load maze from file”  “Enter the name of the data file:” |  |
| **3** | Test the program on input option 2 | Enter your input: “2”. | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Enter your input: | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Enter your input: |  |
| **4** | Test the program on input option 3 | Enter your input: 3 | Display:  Enter your input:3  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Location of Start (A) = (Row 1, Column 6)  Location of End (B) = (Row 7, Column 1)  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU:. | Display:  Enter your input:3  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Location of Start (A) = (Row 1, Column 6)  Location of End (B) = (Row 7, Column 1)  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU:. |  |
| **5** | Test the program on input option 4. | Enters “4”. | Display:  Option 4 is currently unavaliable  Enter your input: | Display:  Option 4 is currently unavaliable  Enter your input: | Option 4 has popup an error message because our option 4 haven’t started coded yet. |
| **6** | Test the program on input option 0. | Enter your input: “0”  Enter “Yes” on the “Kill app” pop-up message | Display:  A popup message “Exit” will be shown and the program will close. | Display:  A popup message “Exit” will be shown and the program will close. |  |

**Test Cases for Feature #2: Unit Tests for Read and load files**

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| **Test Scenario** | **Test Description** | **Test Values** | **Expected**  **Outcome** | **Actual**  **Outcome** | **Justification** |
| 1 | Test option 2 on “Enter the name of the data file” with input. | Enter the name of the data file: maze.csv | Display:  Number of lines read: 8  Enter anything to return to Main menu | Display:  Number of lines read: 8  Enter anything to return to Main menu |  |
| 2 | Test option 2 on “Enter the name of the data file” with no input. | Enter the name of the data file: | Display:  “Error: please key in the name of the data file:”  Enter anything to return to Main Menu | Display:  “Error: please key in the name of the data file:”  Enter anything to return to Main Menu | There is no input on the file name  So the error message will appear to tell the user to type in name |

**Test Cases for Feature #3: Unit Tests for View maze stored in memory**

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| **Test Scenario** | **Test Description** | **Test Values** | **Expected**  **Outcome** | **Actual**  **Outcome** | **Justification** |
| 1 | Test for displaying maze when list is loaded. | Enter your input: 2 | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X'] | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X'] |  |
| 2 | Test for displaying maze when the storage list is empty. | Enter your input: 2 | Display:  Enter your input: | Display:  Enter your input: | This error occurs because the user hasn’t input the maze.csv file on read and load functions first. Instead the user goes to option 2 straight to view maze while the memory storage list is still empty. Therefore, the view maze will display nothing except it prompt “enter your input” to tell the user to choose other options. |

**Test Cases for Feature #4: Play Maze**

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| **Test Scenario** | **Test Description** | **Test Values** | **Expected**  **Outcome** | **Actual**  **Outcome** | **Justification** |
| 1 | Test option 3 on displaying the maze after option 1 have run the maze.csv fie. | Enter your input:3 | Display:  Enter your input:3  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Location of Start (A) = (Row 1, Column 6)  Location of End (B) = (Row 7, Column 1)  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: | Display:  Enter your input:3  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Location of Start (A) = (Row 1, Column 6)  Location of End (B) = (Row 7, Column 1)  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: |  |
| 2 | Test play maze on A(left) function | Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: A | Display:  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Location of Start (A) = (Row 1, Column 6)  Location of End (B) = (Row 7, Column 1)  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: A  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'A', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: | Display:  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Location of Start (A) = (Row 1, Column 6)  Location of End (B) = (Row 7, Column 1)  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: A  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'A', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: |  |
| 3 | Test play maze on S(down) function | Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: S | Display:  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: S  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'A', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: | Display:  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: S  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'A', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: |  |
| 4 | Test play maze on D(right) function | Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: D | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'A', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: D  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'A', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: D  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: |  |
| 5 | Test play maze on W(up) function | Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: D | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'A', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: W  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'A', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'A', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: W  Move Successful!  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'A', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: |  |
| 6 | Test play maze on completing the game | Control player(A) to ending point(B) | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'A', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: S  Congratulations! You have escaped from the maze!  Enter any keys to return to the Main Menu | Display:  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'A', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press 'W' for UP, 'A' for LEFT, 'S' for DOWN, 'D' for RIGHT, 'M' for MAIN MENU: S  Congratulations! You have escaped from the maze!  Enter any keys to return to the Main Menu |  |
| 7 | Test play maze if the (player) has move to hit the wall | Control player(A) to hit wall | Display error message” Invalid Movement. Please Try again” | Display error message” Invalid Movement. Please Try again” | The user has control player(A) to hit the wall(X). Therefore the error msg had appear. |

**Test Cases for Feature #5: Configure Maze**

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| **Test Scenario** | **Test Description** | **Test Values** | **Expected**  **Outcome** | **Actual**  **Outcome** | **Justification** |
| 1 | Test option 4 on displaying the maze after option 1 have run the maze.csv file | Enter your input: 4 | Display:  Enter your input:4  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: | Display:  Enter your input:4  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: |  |
| 2 | Test  'B' to return to ConfigureMenu.  'M' to return to Main Menu: “B” on choice 1 | Input: ‘M’ to return to Main Menu: B | Display:  Enter your options to configure: 1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:B  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: | Display:  Enter your options to configure: 1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:B  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: |  |
| 3 | Test  'B' to return to ConfigureMenu.  'M' to return to Main Menu: “M” on choice 1 | Input: ‘M’ to return to Main Menu: M | Display:  Enter your input: | Display:  Enter your input: |  |
| 4 | Test Choice 1 and create a wall(X) on the passageway(O). | Enter your options to configure: 1  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter  Enter Row: 1  Enter Col: 1 | Display:  Enter your options to configure: 1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:1  Enter Col:1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'X', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: | Display:  Enter your options to configure: 1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:1  Enter Col:1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'X', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: |  |
| 5 | Test Choice 2 and create a passageway(O) on the wall(X). | Enter your options to configure: 2  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter  Enter Row: 1  Enter Col: 1 | Display:  Enter your options to configure: 2  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:2  Enter Col:2  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: | Display:  Enter your options to configure: 2  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:2  Enter Col:2  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: |  |
| 6 | Test Choice 3 and create a passageway(O) on the wall(X). | Enter your options to configure: 3  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter  Enter Row: 1  Enter Col: 1 | Enter your options to configure: 3  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:1  Enter Col:1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'A', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: | Enter your options to configure: 3  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:1  Enter Col:1  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'A', 'O', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: |  |
| 7 | Test Choice 4 and create a passageway(O) on the wall(X). | Enter your options to configure: 4  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter  Enter Row: 0  Enter Col: 2 | Display:  Enter your options to configure: 4  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:0  Enter Col:2  ========================================  ['X', 'X', 'B', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'O', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: | Display:  Enter your options to configure: 4  ========================================  ['X', 'X', 'X', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'B', 'X', 'X', 'X', 'X', 'X', 'X']  Press Enter if you wish to change an item.  'B' to return to ConfigureMenu.  'M' to return to Main Menu:  Enter Row:0  Enter Col:2  ========================================  ['X', 'X', 'B', 'X', 'X', 'X', 'X', 'X']  ['X', 'O', 'O', 'O', 'X', 'O', 'A', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'X', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'X', 'O', 'X']  ['X', 'O', 'X', 'O', 'X', 'O', 'O', 'X']  ['X', 'O', 'X', 'O', 'O', 'O', 'X', 'X']  ['X', 'O', 'X', 'X', 'X', 'X', 'X', 'X']  Configuration Menu  ========================================  [1] Create Wall  [2] Create Passageway  [3] Create start point  [4] Create end point  [0] Exit Main Menu  Enter your options to configure: |  |
| 8 | Test Choice 0 to go back to the main menu | Enter your options to configure: 0 | Display:  Enter your input: | Display:  Enter your input: |  |
| 9 | Test Choice 2 and didn’t input Row and Col | Enter your options to configure: 2  'M' to return to Main Menu:  Enter Row:  Enter Col: | Display:  Please enter a valid value.  Enter your options to configure: | Display:  Please enter a valid value.  Enter your options to configure: | Error message prompt “Please enter a valid value” is because user didn’t key in the row and column and leave it to null. |