Alphabet Learning Game Summary

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The Alphabet Learning Game program is a puzzle game designed to help kindergarten and first-grade students learn the English alphabet. The interface (Figure 1) features a score panel in the upper left corner that shows the player’s user name, level, and score. Before a game has been started, the default behavior is to show “Player 1” as the user name and blank values for the level and score. Beneath the score panel is a menu panel with buttons allowing the player to start a new game, save their score, view all saved scores, and quit the game. Most of the window is taken up by the game panel, which, at the start of a new game instructs the user to select a difficulty level by selecting one three buttons labelled “Easy” “Medium” and “Hard”.

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| **Figure 1.** |
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When the “Easy” button is selected, the game panel is replaced with a game board like the one shown in Figure 2. The Level value on the score panel is set to 1, and the Score value is set to 0. In the middle of the game board, on a white background, there are 4 tiles representing a random sequence of consecutive letters from the alphabet. Two of the letters are shown initially, and 2 are shown as blank tiles with black borders. The player has to use their knowledge of the alphabet to deduce which letters belong in the blank spots. Above and below the sequence there are a total of 8 tiles containing different letters, two of which are part of the sequence. These tiles are positioned somewhat randomly to simulate puzzle pieces being spread out of a table. The player must find the tiles that belong in the sequence and move them to their correct spots on the game board by clicking on, dragging, and releasing the tiles. When a tile is moved to the correct spot, it gets locked into place and the player’s score increases by 1. The level is completed when both missing tiles are locked in to their correct spots. At this time, the tiles that are not part of the sequence are animated to “fall” off the screen. See Figure 3, where the letter D is the first to start falling. After that, a new game board is generated, the Level value is increased by 1, and the process is repeated. There is no maximum level.

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| **Figure** **2**. |
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| **Figure 3.** |
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The user can save their current score at any time by pressing the “Save Score” button the menu panel. The first time within a game that this button is pressed, a dialog box will ask the player to enter a user name (Figure 4). The user name can contain letters, numbers, and symbols; the only restriction is that it not be blank. If that user name has already been taken, a dialog box will inform the user and ask for another user name (Figure 5). When a user name is successfully entered, a dialog box shows the user the information that was saved (Figure 6), and the chosen user name is shown at the top of the score panel in blue (Figure 7). Player data is saved to the text file AlphabetGameData.txt. Any time the “Save Score” button is pressed after this, the player’s level and score records will be updated using the same user name. If the “Save Score” button is pressed before a game has started (i.e., before a difficulty button has been pressed on the start panel), no action will occur.

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| **Figure 4.** |
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| **Figure 5.** |
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| **Figure 6.** |
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| **Figure 7.** |
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When the “New Game” button is pressed, a dialog box asks the user if they would like to save their level and score from the current game before starting a new game (Figure 8). If “Yes” is selected, the user is given an opportunity to save their current information, then a new game is started. If “No” is selected, a new game is started without saving. If the dialog box is cancelled, the user returns to their current game.

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| **Figure 8.** |
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When the “View Scores” button is pressed, a dialog box shows all saved scores sorted from highest to lowest (Figure 9).

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| **Figure 9.** |
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If the “Quit” button is pressed while there is no game is session, the application exits immediately. If it is pressed while a game is in session, a dialog box asks the user if they would like to save their score before quitting (Figure 10). If “Yes” is selected, they are given an opportunity to save their score before the application closes. If “No” is selected, the application is immediately closed without saving the user’s information. If the dialog box is cancelled, the user is returned to the current game.

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| **Figure 10.** |
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The “Medium” difficulty level has a sequence of 6 letters with 4 blanks, and has 12 draggable tiles surround the sequence (Figure 11). The “Hard” difficulty level has a sequence of 8 letters with 6 blanks, and 16 surrounding tiles (Figure 12).

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| **Figure 11.** |
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| **Figure 12.** |
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Future improvements for the game include the following:

1. Adding keyboard event handling capabilities so that the game could be played with a keyboard instead of a mouse. For example, the letter tiles could be moved with the arrow keys.
2. Allowing saved games to be resumed.

A UML diagram of the application is saved in the file src/AlphabetGame\_UML.ucls. The file AlphabetGame\_UML\_condensed\_ucls.pdf contains a condensed version of the diagram.