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COMPUTER SCIENCE

Paper 1

June 2019

7516/1/PM

Preliminary Material

To be opened and issued to candidates on or after 1 March 2019 subject to the instructions given in the Teachers' Notes (7516/1/TN).

NOTE

- **The Preliminary Material, Skeleton Program and Data Files are to be seen by candidates and their teachers ONLY, for use during preparation for the examination on Tuesday 21 May 2019. They CANNOT be used by anyone else for any other purpose, other than that stated in the instructions issued, until after the examination date has passed. They must NOT be provided to third parties.**

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INFORMATION

- **A Skeleton Program is provided separately by your teacher and must be read in conjunction with this Preliminary Material.**
- **You are advised to familiarise yourselves with the Preliminary Material and Skeleton Program before the examination.**
- **A copy of this Preliminary Material and the Skeleton Program will be made available to you in hard copy and electronically at the start of the examination.**
- **You must NOT take any copy of the Preliminary Material, Skeleton Program and Data Files or any other material into the examination room.**

INSTRUCTIONS FOR CANDIDATES

The question paper is divided into THREE sections.

SECTION A

You will be asked to create a new program and answer questions NOT related to the PRELIMINARY MATERIAL or SKELETON PROGRAM.

SECTION B

Questions will refer to the PRELIMINARY MATERIAL and the SKELETON PROGRAM, but will not require programming.

SECTION C

Questions will use the PRELIMINARY MATERIAL and the SKELETON PROGRAM and may require the `game1.txt`, `game2.txt`, `game3.txt` and `game4.txt` Data Files.

ELECTRONIC ANSWER DOCUMENT

Answers for ALL questions, for ALL sections, must be entered into the word-processed document made available to you at the start of the examination and referred to in the question paper rubrics as the ELECTRONIC ANSWER DOCUMENT.

PREPARATION FOR THE EXAMINATION

You should ensure that you are familiar with this PRELIMINARY MATERIAL and the SKELETON PROGRAM for your programming language.

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AQA BOARD GAME

The SKELETON PROGRAM accompanying this PRELIMINARY MATERIAL is a two-player board game. The players are referred to as Player A and Player B. The board contains 64 squares, arranged in an 8 × 8 grid. The squares containing `X`s are not used. Each player has a maximum of 12 pieces. The number of pieces and their starting positions are determined by the contents of a text file. The pieces' IDs consist of the player's letter and consecutive numbers 1 to 12.

FIGURE 1, on the opposite page, shows a game with 12 pieces that has been loaded from the `game1.txt` text file.

Player A has twelve pieces with IDs `a1` to `a12`, occupying rows 0 to 2.

Player B has twelve pieces with IDs `b1` to `b12`, occupying rows 5 to 7.

FIGURE 1

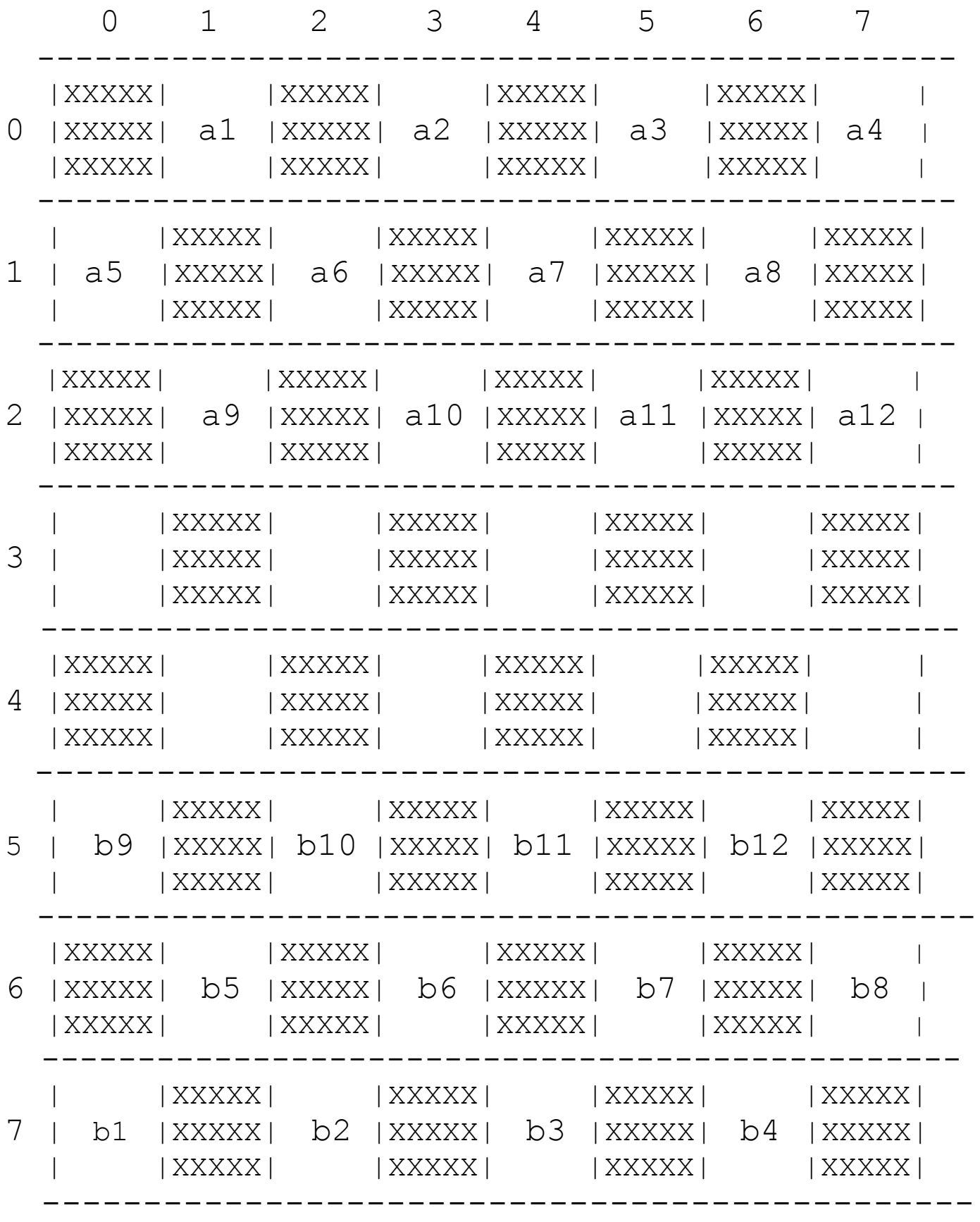

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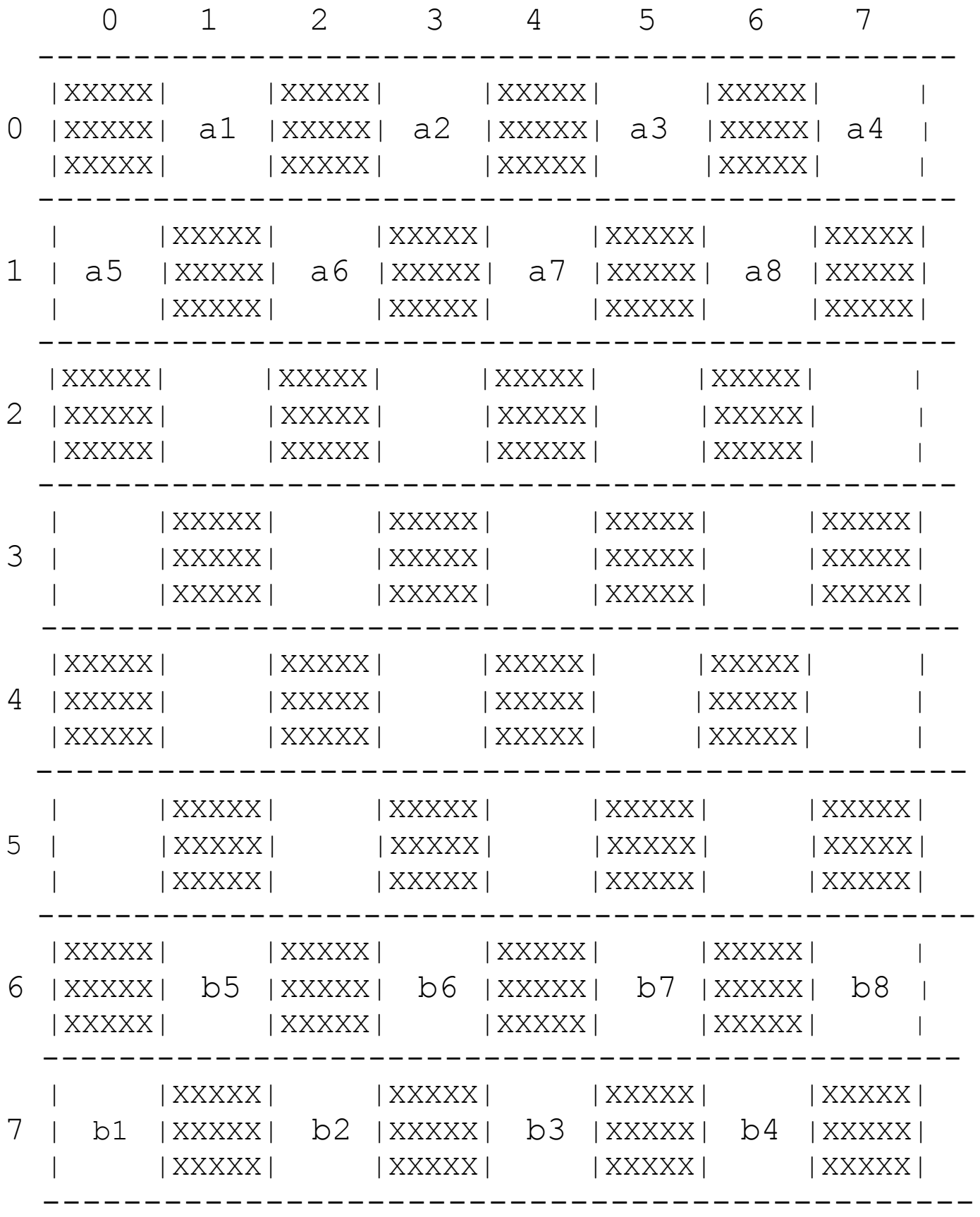
FIGURE 2, on the opposite page, shows a game with eight pieces that has been loaded from the `game2.txt` text file.

Player A has eight pieces with IDs `a1` to `a8`, occupying rows 0 to 1

Player B has eight pieces with IDs `b1` to `b8`, occupying rows 6 to 7

FIGURE 2



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The rules are:

- **Player A always starts.**
- **Players take turns to move.**
- **A move consists of advancing one of the player's own pieces one square forward along the diagonal (left or right) while remaining on the board. For example, in FIGURE 2 piece `a6`, currently at row 1, column 2, could move to row 2, column 1 or row 2, column 3**
- **An alternative move is a jump over one of the player's own pieces that is diagonally immediately in front of the piece to be moved. For example, in FIGURE 2 piece `a2`, currently at row 0, column 3, could move to row 2, column 1 or row 2, column 5**
- **When a piece reaches the opposite end of the board (row 7 for Player A, row 0 for Player B) it is promoted to a dame and the letter of the ID is changed to uppercase. The dame is moved to an empty square in the player's first row (row 0 for Player A, row 7 for Player B). If there is no empty square in the player's first row the dame stays where it is and cannot move.**

The SKELETON PROGRAM presents the user with the current state of the board and shows the possible moves that the player whose turn it is can make.

The player enters the ID of the piece they want to move, followed by the row and column of the board square to which they want to move the piece.

The program confirms if the move was a jump and, if so which piece was jumped over.

When a player has no possible moves available when it is their turn, the game ends and that player has lost the game.

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FIGURE 3, on the opposite page, shows a game with eight pieces that has been loaded from the `game3.txt` **text file.**

FIGURE 3

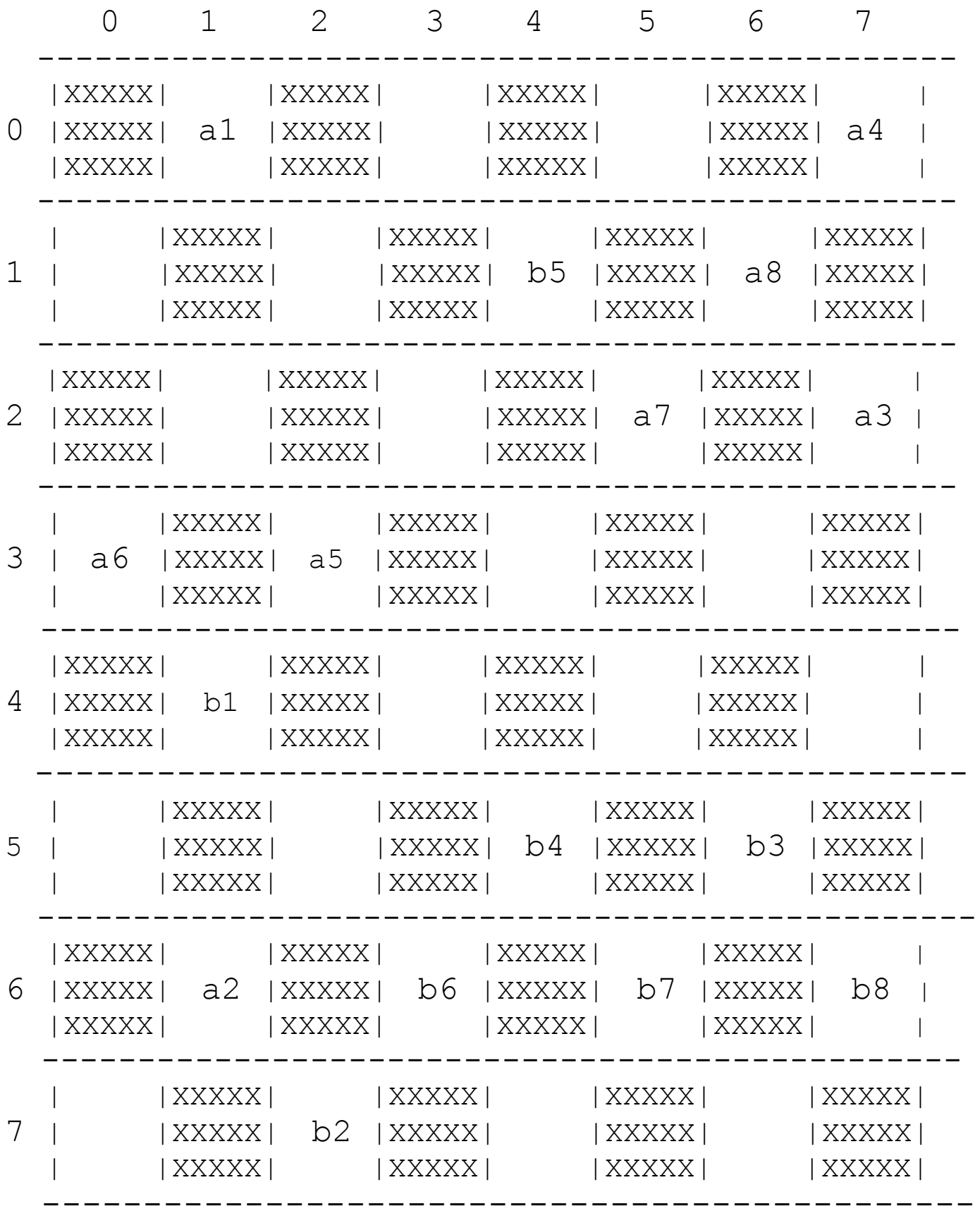

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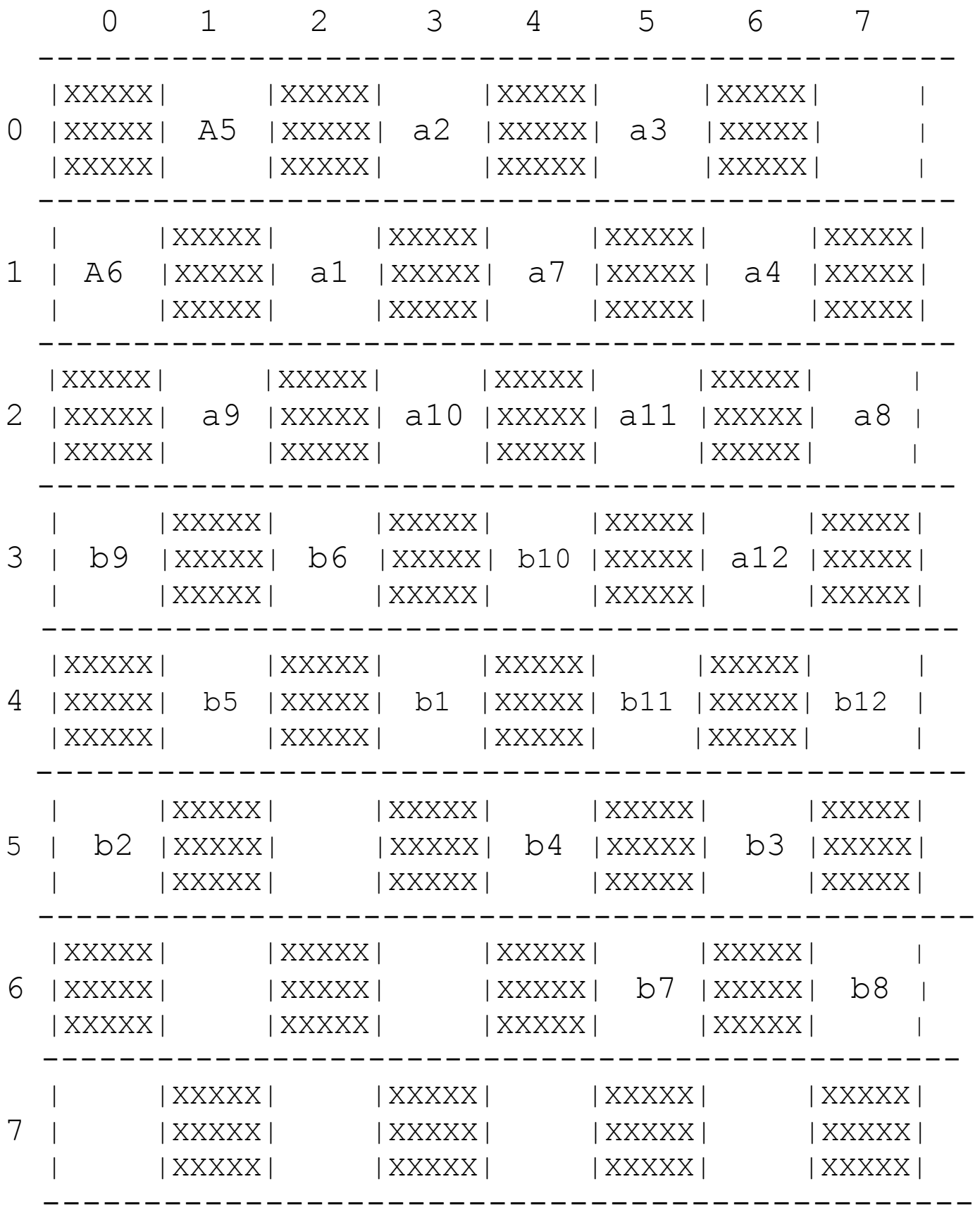
FIGURE 4, on the opposite page, shows a game with 12 pieces that has been loaded from the `game4.txt` text file.

FIGURE 4



END OF PRELIMINARY MATERIAL

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