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Checkers Game Data Model

The spaces are numbered from top-down from left to right as shown below. An array holds values for what piece is in each position, if any.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  | 9 |  | 17 |  | 25 |  |
|  | 5 |  | 13 |  | 21 |  | 29 |
| 2 |  | 10 |  | 18 |  | 26 |  |
|  | 6 |  | 14 |  | 22 |  | 30 |
| 3 |  | 11 |  | 19 |  | 27 |  |
|  | 7 |  | 15 |  | 23 |  | 31 |
| 4 |  | 12 |  | 20 |  | 28 |  |
|  | 8 |  | 16 |  | 24 |  | 32 |

The Array

The array has a length of 32 since it only keeps track of valid spaces (black spaces). Each element of the array holds a number that represents 5 different states:

* 0: Empty
* 1: Player One Piece
* 2: Player One King
* 3: Player Two Piece
* 4: Player Two King

Valid Moves

If the piece is in an odd row the its valid moves are left: (position – 4) or right: (position + 4). If the piece is in an even row its valid moves are left: (position – 3) or right: (position + 5). If the position is less than or equal to 4 the left move is not an option and if the position is greater than or equal to 29 the right move is not an option. If one of the valid move options is already occupied (element does not equal 0) refer to *Taking a Piece.*

Taking a Piece

If a space that would normally be a valid move is already occupied by one of your pieces, it is not a valid move. It is a valid move if it is occupied by one of your opponent’s piece **and** you could continue moving in the same direction from that piece’s space (“jump” over it). The piece that is jumped is deleted in the process of being jumped.

Reaching the Back Row

If a piece moves to a space where (position % 8) is equal to 0, or ((position % 8) - 1) is equal to 0 the piece has reached the back row and becomes a king. After a standard piece is moved the back row the value held at that index is increased by 1 (2 to 3, or 4 to 5 making the piece a king).

Winning

If the array contains no standard pieces or kings of one side, the other players is declared the winner. Additionally, if one player has no valid moves the other player wins, and if neither player has any valid moves it is declared a draw.