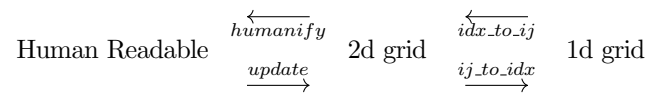


**Documentation:**

There are many different methods that we use to specify a location on the board. They are all often convenient for different reasons. The three ways of representing a location on the board are:

- *human readable*: e.g. a1. This is the normal chess lingo. It is used for I/O.
- *2d grid*: e.g. (1,1). This is useful for specifying moves.
- *flattened grid*: e.g. 4. The board is stored as a string. this is kind of nice, but maybe was a bad idea. Think of it as an immutable 1d array though (because that's what it is).

The transformations between states are depicted in the following diagram:



Here is an outline of the important functions:

**humanify:**

$$(i,j) \mapsto \text{chr}(\text{ord}('a') + j) + \text{str}(4 - i)$$

**update:** (note that this function is “in-place”)

$$h_0 h_1 \mapsto (4 - \text{int}(h_1), \text{ord}(h_0) - \text{ord}('a'))$$

**ij\_to\_idx:**

$$(i,j) \mapsto 4i + j$$

**idx\_to\_ij:**

$$\text{idx} \mapsto \text{divmod}(\text{idx})$$

Here is what the grid looks like:

4	(0,0)=0	(0,1)=1	(0,2)=2	(0,3)=3
3	(1,0)=4	(1,1)=5	(1,2)=6	(1,3)=7
2	(2,0)=8	(2,1)=9	(2,2)=10	(2,3)=11
1	(3,0)=12	(3,1)=13	(3,2)=14	(3,3)=15
	a	b	c	d