Formulation:

- Initial State
  - For the initial state I would likely have an array of three tuples.
  - The first number of the tuples representing max containment and the second of the tuple telling the current amount.
  - [(12, 0), (8, 0), (3,0)]
- State
  - The state would be updated with the second value of every tuple. The first value would remain untouched.
- Goal
  - The goal would be to have any of the secondary tuple components equal to one.
- Actions
  - Emptying a jug (setting a tuple's second value to 0)
  - Filling a jug (setting a tuple's second value to equal to the first)
  - Pouring one jug into another (adding a tuple's second value to another's second value as high as possible without exceeding the first value)