2.2 Water Jugs Problem

• Water jugs problem: We have one 3 litre jug, one 5 litre jug and an unlimited supply of water. The goal is to get <u>exactly</u> one litre of water into either jug. Either jug can be emptied or filled, or poured into the other.



- A state in this problem could be represented with just a pair of numbers. The first representing the number of litres of water in the 5 litre (large) jug, and the second representing the number of litres of water in the 3 litre (small) jug.
- The initial state would typically be: (0,0) to represent the fact that both jugs start off empty.
- The final state would similarly be represented as: (0,1).
- The operators for this problem could include:
 - Fill the 5 litre jug to capacity from a water source
 - Fill the 3 litre jug to capacity from a water source
 - Empty the 5 litre jug into a drain
 - Empty the 3 litre jug into a drain
 - Pour from the 3 litre jug into 5 litre jug until capacity reached
 - Pour from the 5 litre jug into 3 litre jug until capacity reached

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