Repetition

Confusion:

In the CLIPS program,
the state was represented simply by
the amount of water

What is the goal?

The goal is a
Path
to the particular condition of the water jugs

Thus the state is the
Entire Path
to the end condition

To eliminate a node, the path information must be considered

State as Jug Condition

The state is the amount of water in the jugs

Nodes with the same amount of water
cannot be eliminated because
They most likely reached by a different path

What if the duplicate node is eliminated?

Paths to the end condition would be lost

If the new duplicate node is eliminated,
then the shortest path through that condition
would be the solution given

If we were interested in only one solution
Then this would be acceptable

If we are interested in all solutions
Then these nodes cannot be thrown away

State With Path Information

The state:

The *ordered* list of rules leading to the amount of water in the jugs

In a sense, the amount of water is only incidental (but essential) information

Duplicate nodes in this case represent the same path

Elimination of duplicate nodes would not result in lose of solutions

Water Jug Problem

Would the situation ever arise
Where a duplicate path would be created?

NO

Why?

The path is significant and part of the solution

The objects we are applying the rules to have no symmetry

Water Jug Problem

In our case, the two jugs are different

If, for example, there were three jugs
two with 3 gallons
and one with 4 gallons
There are symmetries
and equivalent solutions can arise
(assuming the two 3 gallon jugs are indistinquishable)

For this reason,
In our water jug example,
No check for cycles is necessary
and no elimination of nodes can occur
without lose of solutions
(and we are interested in all solutions)