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CSE 573 — Spring 2014 **Problem Set 1** April 12, 2014

Problem 1

(a).

- **State:** Let the 4 gallon jug as A, the 7 gallon jug as B. The state can be represented as the amount of water in each jug, namely $W(A), W(B)$.
- **Initial State:** $W(A) = 0, W(B) = 0$
- **Goal Test:** The goal is reached when at least one of the following statement is true: $W(A) = 1$, $W(B) = 1$
- **Actions:**
  1. Empty 4 gallon jug: $W(A) \leftarrow 0$.
  2. Empty 7 gallon jug: $W(B) \leftarrow 0$.
  3. Fill 4 gallon jug: $W(A) \leftarrow 4$.
  4. Fill 7 gallon jug: $W(B) \leftarrow 7$.
  5. Pour water from 4 gallon jug to 7 gallon jug.
  6. Pour water from 7 gallon jug to 4 gallon jug.
- **Cost:** The cost is accumualative along the path. Action 1., 2., 5. and 6. has no cost. The cost of action 3. or 4. is the number of water that actually is filled.

(b). **(c)**.

Problem 2

a.

Problem 3

Problem 4