We worked out Water Jug Problem in the class. It is defined as follows:

You are given two jugs, a 4-gallon one and a 3-gallon one, a pump which has unlimited water which you can use to fill the jug, and the ground on which water may be poured. Neither jug has any measuring markings on it. How can you get exactly 2 gallons of water in the 4-gallon jug ?

There are multiple variants of this problem. Here is one:

You are given three jugs of capacity 8, 5 and 3 gallons. None of the jugs have any measuring markings on them. These jugs are initially filled with 8, 0 and 0 gallons. How can you get exactly 4 gallons of water each in the 8-gallon and 5-gallon jugs ? Note, in this case there is no pump to provide unlimited supply of water to you.

General problems of this type are sometimes collectively known as **decanting problems**.

Trivia: The two jug variant is used in the film *Die Hard: With a Vengeance* (1995). The characters John McClane and Zeus Carver (played by Bruce Willis and Samuel L. Jackson) solve the two jug variant with water from a public fountain in order to try to prevent a bomb from exploding by obtaining 4 gallons of water using only 5-gallon and 3-gallon jugs.