1. **The 15 puzzle.** A frame is 4 tiles high and 4 tiles wide, leaving one unoccupied tile position. Tiles in the same row or column of the open position can be moved by sliding them horizontally or vertically, respectively. The goal of the puzzle is to place the tiles in numerical order.
2. **Cannibals and missionaries problem**. Three missionaries and three cannibals must cross a river using a boat which can carry at most two people, under the constraint that, for both banks, if there are missionaries present on the bank, they cannot be outnumbered by cannibals (if they were, the cannibals would eat the missionaries). The boat cannot cross the river by itself with no people on board.
3. **Tower of Hanoi**. The tower consists of three pegs or towers with *n* (*n>*=3) disks placed one over the other. The objective of the puzzle is to move the stack to another peg following these simple rules. Only one disk can be moved at a time. No disk can be placed on top of the smaller disk.
4. **The *n* queens puzzle**. *n* (*n*>3) chess queens are to be placed on an *n*×*n* chessboard so that no two queens threaten each other (no two queens can share the same row, column, or diagonal).
5. **Water pouring puzzle**. There is a large bucket full of water and two jugs: j1 of volume *n* liters and j2 of volume *m* liters. You are allowed to fill up any empty jug from the bucket, pour all water back to the bucket from a jug or pour from one jug to another. The goal is to have jug j1 with exactly *k* liters of water.
6. **A knight's tour**. The tour is a sequence of moves of a knight on a chessboard (*n*×*n, n*>=8) such that the knight visits every square exactly once. If the knight ends on a square that is one knight's move from the beginning square (so that it could tour the board again immediately, following the same path), the tour is closed; otherwise, it is open.
7. **The traveling salesman problem**. The traveling salesman problem consists of a salesman and a set of cities (*n*). The salesman has to visit each one of the cities starting from a certain one (e.g. the hometown) and returning to the same city. The challenge of the problem is that the traveling salesman wants to minimize the total length (costs) of the trip.