

General description of the body – bar (6V-6) pebble game in three dimensions, as encoded in *FIRST*.

This is not a complete description of the pebble game algorithm, and is meant only as a brief overview for those who are already familiar with pebble games. For example, no description of how to search for pebbles is given.

### A priori

1. Assign each site with 0 neighbors to have 3 free pebbles.
2. Assign each site with 1 neighbor to have 5 free pebbles.
3. Assign each site with 2 or more neighbors to have 6 free pebbles.

### Pebble game

1. Collect 6 free pebbles on vertex 1\*.
2. Try to collect  $n$  free pebbles on vertex 2, which is connected to vertex 1 by  $n$  bars, while holding the 6 pebbles on vertex 1 fixed.
3. If you can collect  $n$  pebbles on vertex 2, then all  $n$  bars are independent constraints. Place all of these pebbles from vertex 2 onto the  $n$  bars.
4. If you fail to collect  $n$  pebbles on vertex 2, then there are redundant bar(s).

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\* It will always be possible to find 6 pebbles, except in the trivial cases of an isolated atom (3 pebbles) or a dead end (5 pebbles).