Exercise 1.3.46: Forbidden triple for stack generability. Prove that a permutation can be generated by a stack (as in the previous question) if and only if it has no forbidden triple (a, b, c) such that a ¡ b ¡ c with c first, a second, and b third (possibly with other intervening integers between c and a and between a and b).

solution: Suppose that there is a forbidden triple (a, b, c). Item c is popped before a and b, but a and b are pushed before c. Thus, when c is pushed, both a and b are on the stack. Therefore, a cannot be popped before b.

- Numbers are pushed onto stack in accending order.
- stacks are LIFO(Last-in-first-out), so items must be popped in descending order.
- If $a < b$, "a" cannot be above "b" on the stack.
- Therefore, a permutation would not exist when a forbidden triple exists as it contradicts the structure of a stack.

The point c is needed so that after a pop, you can verify if order of a and b are correct(ascending) for a stack. Otherwise, it's hard to tell.