Table S1. Clause learning algorithm

Clause Learning Algorithm (S, k):

**Input:**
- A set S of already-available labeled sequences
- k: assumed upper-bound length of clauses (a small positive integer)

**Steps:**
1. Enumerate all combination of literals to form conjunction clauses
2. Record the set of (positive and negative) sequences that each clause covers \((n^+_j, n^+_j)\)

**Output:**
- The set of clauses \(C\) and the corresponding sequence index sets \((N^+, N^-)\)