

Supplementary Information for “A
Theoretically-Sufficient And
Computationally-Practical Technique For
Deterministic Frequency Seriation”

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S1 Text: Pseudo-code representation of the IDSS algorithm

Algorithm 1 Algorithm for IDSS seriation

Require: Input file I format:

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1: Tab-delimited text, column 0 contains assemblage name
2: Remaining columns contain type counts as integers
3: procedure IDSS( $I$ )
4:   Read input file  $I$ 
5:   Calculate relative frequency of each type
6:   Calculate max frequency difference between assemblage pairs
7:   Create list of assemblages  $A$ 
8:   for all triplets of assemblages  $T$  do
9:     if using continuity threshold  $t_c$  then
10:      if max frequency difference  $> t_c$  for pairs  $\in T$  then
11:        Skip triplet
12:      end if
13:    end if
14:    if triplet  $T$  is valid given unimodality for all types then
15:      Store triplet in candidate solutions  $\mathbf{C}$ 
16:    end if
17:     $R \leftarrow$  assemblages  $\notin \mathbf{C}$   $\triangleright$  Remaining assemblages
18:    repeat
19:      for all assemblages  $a \in R$  do
20:        if using continuity threshold  $t_c$  then
21:          if max freq difference  $> t_c$  for  $a$  and all  $\mathbf{C}$  then
22:            Skip assemblage  $a$  for this loop
23:          end if
24:        end if
25:        if assemblage  $a$  + candidate solution  $c \in \mathbf{C}$  then
26:          Replace  $c$  in  $\mathbf{C}$  with  $c + a$ 
27:          Remove  $a$  from  $R$   $\triangleright$  Grow existing solutions
28:        end if
29:      end for
30:    until  $R = \emptyset$  or loop repeats with no changes
31:    for all candidate solutions  $c \in \mathbf{C}$  do
32:      if  $c$  is strict subset of another solution in  $\mathbf{C}$  then
33:        Remove  $c$  from  $\mathbf{C}$ 
34:      end if
35:    end for
36:  end for  $\triangleright \mathbf{C}$  now contains the set of solutions
37:  Output  $\mathbf{C}$  in various formats
38: end procedure
```
