Problem for 1999 September and October

Proposed by Dan Jurca

It is well-known that the set of finite subsets of the set

\[ \mathbb{N} = \{1,2,3,4,5,\ldots\} \]

of natural numbers (positive integers) is denumerable; hence these subsets can be listed in an infinite sequence. Design an algorithm (or write a computer program) which has the following two properties.

1. If \( S \) is a finite subset of \( \mathbb{N} \), then the algorithm (or program) will eventually display \( S \).
2. No finite subset of \( \mathbb{N} \) is displayed more than once.