**PROBLEM 3**

In this solution, we choose the last activity to start each time. This leaves a subset of problems with the same goal, provided that it does not conflict with any other activities. The only subproblem left to solve is to find activities that finish before the selected activity, a1 starts. S1

< f1 f1 being the earliest finish time of any given activity. No activity can have finish times greater than or equal to Sq. All activities that are compatible to a1 must start and end before a1 starts.

Proof

Let the set Ak be a maximum-size subset of mutually compatible activities in set Sk, and let aj be the activity in Ak with the latest start time. If aj = am, we are done, since we have shown that am is in some maximum-size subset of mutually compatible activities of Sk. If aj ≠ am, let the set A’k = Ak – {aj} U {am} be Ak but substituting am for aj. The activities in A’k are do not overlap or conflict with each other, which follows because the activities in Ak do not overlap nor conflict, aj is the last activity in Ak to start, and fm ≤ fj. Since |A’k| = |Ak|, we conclude that A’k is a maximum-size subset of mutually compatible activities of Sk, and it includes am.