ALGORITHM 83
OPTIMAL CLASSIFICATION OF OBJECTS
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procedure OPTIMUM COVERING FINDER (Pattern, population, set number, set prices, chosen sets, bounds, overflow);
Boolean array Pattern, chosen sets; integer population, set number, bounds; array set prices; label overflow;
begin comment The number of objects in some given set is given by population. The procedure is given a classification of these objects by a collection of overlapping subsets. A cost is assigned to each subset. Then OPTIMUM COVERING FINDER selects the cheapest subcollection such that every object is contained in at least one of the subsets of the sub-collection. set prices[i] carries the cost of subset i. Pattern is an array of size [1: set number, 1: population] such that Pattern[a,b] = does subset a include object b. chosen sets[i] finally carries the answer to the question: Is set i in the cheapest subcollection? The programmer must restrict the amount of space available to the procedure by setting bounds. From experience bounds = set number ↑ 2 suffices to avoid most alarm exits to overflow;
Boolean array C[1: population], D[1: bounds, 1: population], R, S[1: bounds, 1: set number];
integer a, b, d, r, s; 
Boolean procedure HAVE WE A COVERING;
begin procedure ADD to (Q,q,f); integer q;
real f; Boolean array Q;
begin if q = bounds then go to overflow else q := q + 1;
for a := 1 step 1 until set number do Q[q,a] := 0
end; for a := 1 step 1 until population do
C[a] := false;
for a := 1 step 1 until set number do
begin if chosen sets[a] then
for b := 1 step 1 until population do
C[b] := C[b] ∨ Pattern[a,b]
end; for s := 1 step 1 until population do
begin if ¬ C[a] then go to E end
go to found;
E: for d := 1 step 1 until s do
begin for b := 1 step 1 until population do
begin if C[b] ∧ ¬ D[d,b] then go to try another end;
ADD to (R, r, chosen sets[a]);
for b := 1 step 1 until set number do
begin if chosen sets[b] ∧ ¬ S[d,b] then
ADD to (R, r, S[d,a] ∨ a=b)
end; go to F;
try another;
end of for statement labelled E;
ADD to (S, s, chosen sets[a]);
for a := 1 step 1 until population do D[s,a] := C[a];
F: HAVE WE A COVERING := false
end; r := s := 0;
ECONOMISER 2 (HAVE WE A COVERING, set prices, set number, r, R, chosen sets); 
found: end