1* Intro.   This quickie outputs clauses that are unsatisfiable because they state that there exists a partial ordering on m elements in which no element is maximal. (All backtrack proofs of this fact are known to require $\Omega(2^m)$ steps.)

Variable $j.k$ means that $j \prec k$ in the partial ordering.

This variant uses only the special cases of transitivity where $i \leq k$ and $j < k$.

#**include <stdio.h>**
#**include <stdlib.h>**
   int m;

   $main(\textbf{int } argc, \textbf{char } *argv[\,])$
   {
      register $i,\ j,\ k$;

      ⟨ Process the command line 2* ⟩;
      ⟨ Generate the clauses for irreflexivity 3 ⟩;
      ⟨ Generate the clauses for transitivite 4* ⟩;
      ⟨ Generate the clauses for nonmaximality 5 ⟩;
   }

2* ⟨ Process the command line 2* ⟩ ≡
   if $(argc \neq 2 \vee sscanf(argv[1], \texttt{"\%d"}, \&m) \neq 1)$ {
      $fprintf(stderr, \texttt{"Usage:}_\sqcup\texttt{\%s}_\sqcup\texttt{m\textbackslash n"}, argv[0])$;
      $exit(-1)$;
   }
   $printf(\texttt{"\textasciitilde}_\sqcup\texttt{sat-poset-nomax-b}_\sqcup\texttt{\%d\textbackslash n"}, m)$;
This code is used in section 1*.

3. ⟨ Generate the clauses for irreflexivity 3 ⟩ ≡
   for $(j = 1;\ j \leq m;\ j{+}{+})\ printf(\texttt{"\textasciitilde\%d.\%d\textbackslash n"}, j, j)$;
This code is used in section 1*.

4* ⟨ Generate the clauses for transitivite 4* ⟩ ≡
   for $(i = 1;\ i \leq m;\ i{+}{+})$
      for $(j = 1;\ j \leq m;\ j{+}{+})$
         if $(i \neq j)$ {
            for $(k = i;\ k \leq m;\ k{+}{+})$
               if $(k > j)$ {
                  $printf(\texttt{"\textasciitilde\%d.\%d}_\sqcup\texttt{\textasciitilde\%d.\%d}_\sqcup\texttt{\%d.\%d\textbackslash n"}, i, j, j, k, i, k)$;
               }
         }
This code is used in section 1*.

5. ⟨ Generate the clauses for nonmaximality 5 ⟩ ≡
   for $(j = 1;\ j \leq m;\ j{+}{+})$ {
      for $(k = 1;\ k \leq m;\ k{+}{+})\ printf(\texttt{"}_\sqcup\texttt{\%d.\%d"}, j, k)$;
      $printf(\texttt{"\textbackslash n"})$;
   }
This code is used in section 1*.

6*. Index.

The following sections were changed by the change file: 1, 2, 4, 6.

argc: $\underline{1}$,* 2.*
argv: $\underline{1}$,* 2.*
exit: 2.*
fprintf: 2.*
i: $\underline{1}$.*
j: $\underline{1}$.*
k: $\underline{1}$.*
m: $\underline{1}$.*
main: $\underline{1}$.*
printf: 2,* 3, 4,* 5.
sscanf: 2.*
stderr: 2.*

⟨ Generate the clauses for irreflexivity 3 ⟩   Used in section 1*.
⟨ Generate the clauses for nonmaximality 5 ⟩   Used in section 1*.
⟨ Generate the clauses for transitivite 4* ⟩   Used in section 1*.
⟨ Process the command line 2* ⟩   Used in section 1*.

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