**Logical reasoning and programming, task IV**

(December 18, 2017)

**Problem**

Your task is to create a Prolog program that verifies/checks an input tableau proof.

**Tableau Proof Format**

The tableau proof format is a Prolog representation of Semantic Tableau tree that is similar to the previous task. The structure is following:

\[
\text{proof} \left( \text{NNF formula}, \text{proof of the NNF formula} \right)
\]

where \( \text{NNF formula} \) is some formula that we want to check (it corresponds to top) and \( \text{proof of the NNF formula} \) is its proof in exactly the same format as output proof format of the previous task.

**Program**

You are supposed to upload a program `verifytap.pl`, in an archive, containing a predicate `verify/1`. If `verify/1` is called with a correct tableau proof, then succeeds. Otherwise it fails.

**Example 1**

?- Formula = (fact,-fact),
   Proof = [node(a, fact, and_rule(top),
    [node(b, -fact, and_rule(top),
      [node(c, false, closed_by(a, top), [])]
    ])
   ],
   verify(proof(Formula,Proof)).
no

**Example 2**

?- Formula = (all(X,p(X)) , (-p(c);-p(d))),
   Proof = [node(0, all(X, p(X)), and_rule(top), [node(2, p(c), all_rule(0), [node(3, -p(c);-p(d)), and_rule(top), [node(4, -p(c), or_rule(3), [node(5, false, closed_by(4, 2), [])])
      , node(6, -p(d), or_rule(3), [node(7, p(d), all_rule(0), [node(8, false, closed_by(7, 6), [])])])])])
   ],
   verify(proof(Formula,Proof)).
yes