Problem

Let CNF_H = { $\langle\phi\rangle|\ \phi$ is a satisfiable cnf-formula where each clause contains any number of literals, but at most one negated literal}. Show that CNF_H ? P.

Step-by-step solution

Step 1 of 5

$\mathrm{CNF_H}$ = {<∅>| is a satisfiable cnf-formula where each variable appears in at most k places} Hence, $CNF_H \in$ P can be proved by using following approach:

Situation is quite clear as all user needs to find the d**ependability** of CNF on P and NP.

Comment

Step 2 of 5

Consider the following algorithm which can be used for this language:

$N =$ "On input $\langle\varphi\rangle$ where φ is a boolean formula in cnf"

1. If φ don't consists a unit clause $(\sim x)$, assume every literals x will be 1 and $(\sim x)$ will be 0 and accept.

2. Repetition performed until these exists no new $(\sim x)$ unit clause:

3. If φ consist a unit clause $(\sim x)$, remove each clauses that contains $(\sim x)$ from φ and remove every occurrences of x from the clause in φ.

4. If an empty clause is exists in φ, reject.

5. Let every literals x in φ be 1, $(\sim x)$ be 0 and accept.

Comment

Step 3 of 5

Dependability can be viewed as:

1. Consider that $\mathrm{CNF_2} \in \mathrm{P}$

Consider first situation of ϕ and consider it belongs to some x and if there is any $\neg x$ then reject. Consider one more situation of ϕ that will be belonging to some other variable let's say y and here situation will rejected if there is any $\neg y$ otherwise accepted.

• **Two situations are discussed here remove those situation from ϕ and relate those two situations, let's say M and N, to ϕ and call the result**.

This way it is proved that $\mathbf{CNF_2 \in P}$.

Comment

Step 4 of 5

2. Consider another situation $\mathrm{CNF_3} \in \mathrm{P}$

Consider first situation of ϕ and consider it belongs to some p and if there is any $\neg p$ then reject. Consider one more situation of ϕ that will be belonging to some other variable, let's say q and r here situation will rejected if there is any $\neg q$ otherwise accepted.

• **Two situations are discussed here remove those situation from ϕ and relate those two situations, let's say A and B, to ϕ and call the result.**

This way it is proved that $\mathbf{CNF_3} \in \mathbf{P}$.

Comment

Step 5 of 5

Similarly, this situation will be held true for $\mathbf{CNF_H} \in \mathbf{P}$.

Comment