classmate

Date

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Homework 12

1] We are assuming that no clause contains both variable as well as its complement.

We create a graph $G_i(V_i, E_i)$ which has 1-1 correspondence with ~~the~~ an instance of minsat where there are C_i clauses set & X_i variables.

For every node in V_i there's also 1-1 correspondence with C_i. For any nodes v_i and v_j there is an edge $(v_i, v_j) \in E_i$ if and only if there ~~are~~ corresponding clauses c_i & c_j where in the variable $x \in X_i$ has it's uncomplemented form in c_i & complemented form in c_j or vice versa. We then ~~to~~ construct a truth assignment using a vertex cover V' where $|V'|$ is ~~twice~~ half the max. vertex cover of G_i. We then construct a truth assignment that causes all $V_i - V'$ clauses to be false.

2] Variables would be v_i for vertex & e_{ij} for the edges.

$v_i = 1$ if it is on the s-side of the cut 0 otherwise

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$e_{ij} = 1$ if it is part of the cut 0 otherwise.

Objective fun^n : $\min \sum_{(i,j) \in E} d_{ij} c_{ij}$

Constraints :- $d_{ij} \geq v_i - v_j \quad \forall\, i,j \in E$

$v_i - v_j = 1$

$v_i, d_{ij} \in \{0,1\} \quad \forall\, i \in V$ & $(i,j) \in E$

3] Our variables would be S_i

Objective function: $\max \sum_{i=1}^{16} \alpha_i (D_i - S_i)$

Constraints :- $S_i \geq 0 \qquad 0 < i \leq 16$

$D_i - S_i \geq 0 \qquad 0 < i \leq 16$

$\sum_{i=1}^{16} S_i \cancel{x} = 720 \qquad 0 < i \leq 16$

4] (a) $r_i \rightarrow$ the power of the i^{th} transmitter would be our variable. $i = 1, \ldots n$.

(b) $\min \sum r_i \qquad i = 1 \cdots n$

(c) $d_{ij} \leq r_i + r_j$

(distance between i^{th} & j^{th} stations)

$\sum_{i=1}^{n-1} i = \frac{n(n-1)}{2}$ constraints