CS 4820, Spring 2017 Homework 11, Problem 1

Name: Yuxiang Peng

NetId: yp344

Collaborator: jl3455, zl542

(1) $\min \sum_{s \epsilon S} x_s$

$\text{s.t.} \sum_{l:u \epsilon S_l} x_l \geq 1 \; for \; all \; u \in U$

$x_s \in \{0,1\} for \; all \; subsets \; s$

(2) $\min \sum_{v \in V} x_v$

$\text{s.t.} \; x_v + x_u \leq 1$ for all edge $\text{e} = (\text{u}, \text{v})$

$x_v \in \{0,1\} for \; all \; vertices \; v$

(3) $\max \sum_{c \in C} y_c$

$\text{s.t.} \; \text{y}_c \leq x_1 + x_2 + x_3 \; for \; all \; clause$

$\text{c} = (x_1 \cup x_2 \cup x_3)$, use $(1 - \text{x}) \; if \; \bar{x} \; in \; clause$

$y_c \in \{0,1\} for \; all \; clauses \; c, x_i \in \{0,1\} \; for \; all \; variables$

(4) $\max \sum_{e \in E} y_c$

$\text{s.t.} \; \text{y}_c = (x_v - x_u)^2, for \; all \; edge \; e = (u, v)$

$y_e \in \{0,1\} for \; all \; edges \; e, x_v \in \{0,1\} \; for \; all \; vertices \; v$