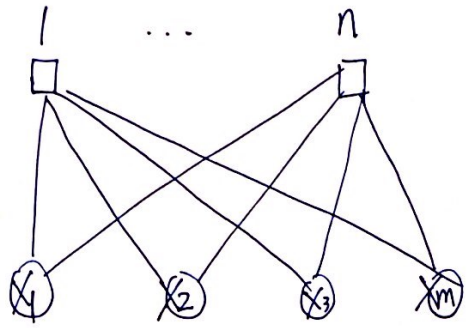
0.(a)



$T_j = \{1, 2\}$ $T_j = \{2, 3\}$ $T_j = \{5, 1, 2\}$ $T_j = \{1, 2, 3\}$

Song Han

Variables :

$X = (X_1, \cdots X_m)$ where the domain of $X_i = \{1, 0\}$ 1 for on, 0 for off

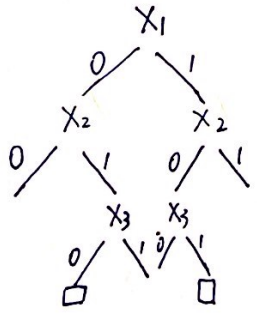
Constraints: m-ary constraint, n such constraints, one for each light

$f_i(X_1 \cdots X_m) =$

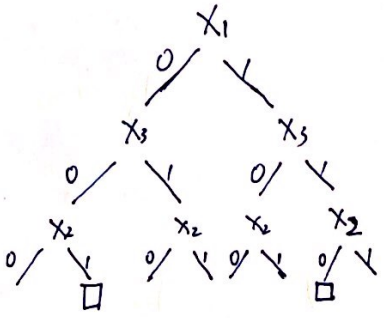
```
sum = 0
for j = 1 : m
    if i ∈ Tj
        sum += Xi
return (sum % 2 == 1)
```

0(b) i. (0, 1, 0) (1, 0, 1), two consistent assignments

ii

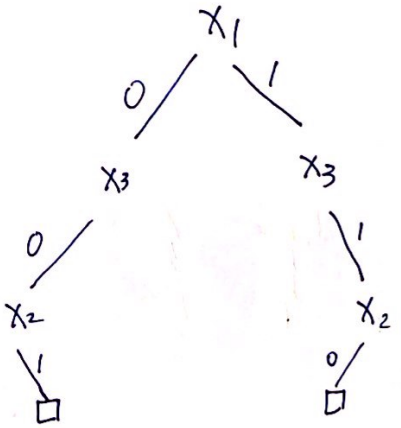


$X_1\ X_2\ X_3$: Backtrack is called 7 times



$X_1\ X_3\ X_2$: Backtrack is called 9 times

iii

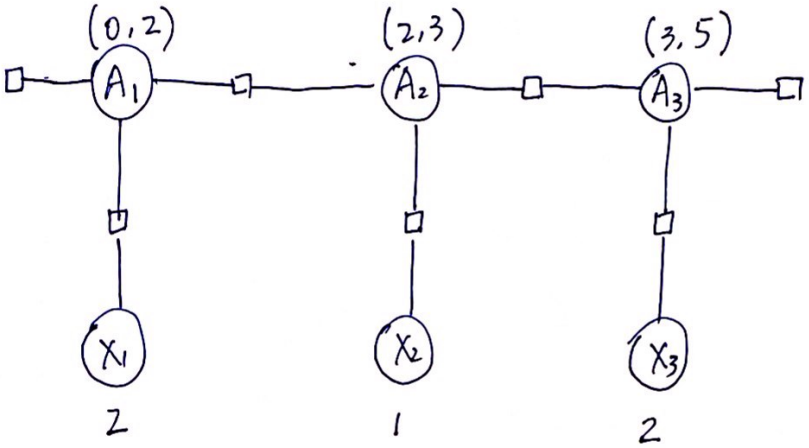


$X_1 = 0 \Rightarrow X_2 = 1 \Rightarrow X_3 = 0$

$X_1 = 1 \Rightarrow X_2 = 0 \Rightarrow X_3 = 1$

X_1 X_3 X_2 with AC_3: backtrack 7 times

2a.



Auxiliary A_i: (input, output) pair ~~to~~ from processing X_i

Potentials:

Process X_i: $A_i[2] = \min(A_i[1] + X_i, 7)$

Consistency: $A_i[1] = A_{i-1}[2]$

input: $A_1[0] = 0$

output: $A_3[2] \leq 6$

```
# Unit limit per quarter.
minUnits 8
maxUnits 10

# These are the quarters that I need to fill. It is assumed that
# the quarters are sorted in chronological order.
register Win2014
register Spr2014

# Courses I've already taken

taken CS106B
taken CS107
taken CS149
taken CS161
taken CS221
taken CS229
taken CS316
taken CS140

# Courses that I'm requesting
request CS142
request CS231A weight 5
request CS246 in Spr2014 weight 2
request CS144 weight 2
request CS147 weight 3
request CS247 after CS147 weight 3
request CS228 weight 2
request CS276
```

Here's the best schedule, it is the result that I wanted

Quarter	Units	Course
Win2014	4	CS231A
Win2014	3	CS147
Win2014	3	CS228
Spr2014	3	CS142
Spr2014	4	CS247
Spr2014	3	CS276