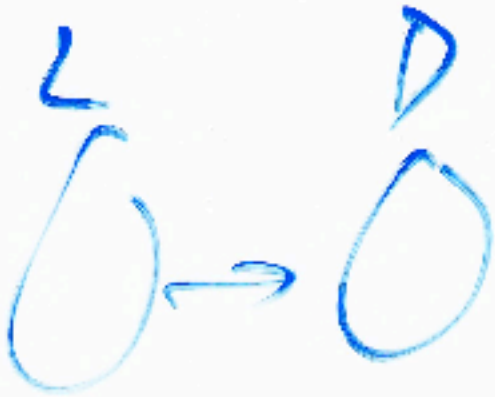
Lecture 15

Some notes on HW #4

$\exists$ decidable D

$\forall$ decidable L

$L \leq_m D$



$x_0 \notin D$

$x_1 \in D$

$f(w)$: runs decider for L

if Y output x_1

else x_0

$A \leq_m B \iff \overline{A} \leq_m \overline{B}$

& A not T. rec.

then B ..

EQ_{TM} neither T. rec nor co-T. rec.

$\overline{A_{prog}} \leq_m$ Uselessprog

$\langle P, w \rangle \rightarrow \langle P', l \rangle$

P' ignores its input

runs P on w

l = line # of "accept" in P

$P'(x)$

[P

ans = $P(w)$

if ans = 1 then return l

else return 0

More on P vs NP

$P = \bigcup_k TIME(n^k)$

$n \log n = O(n^2)$

Given G, a, b $\exists$ path $a \to b$

Sorting is x the 19^{th} largest element in list ...

given matrices A, B i, j

is $(A \cdot B)_{ij} = c$

Shortest path

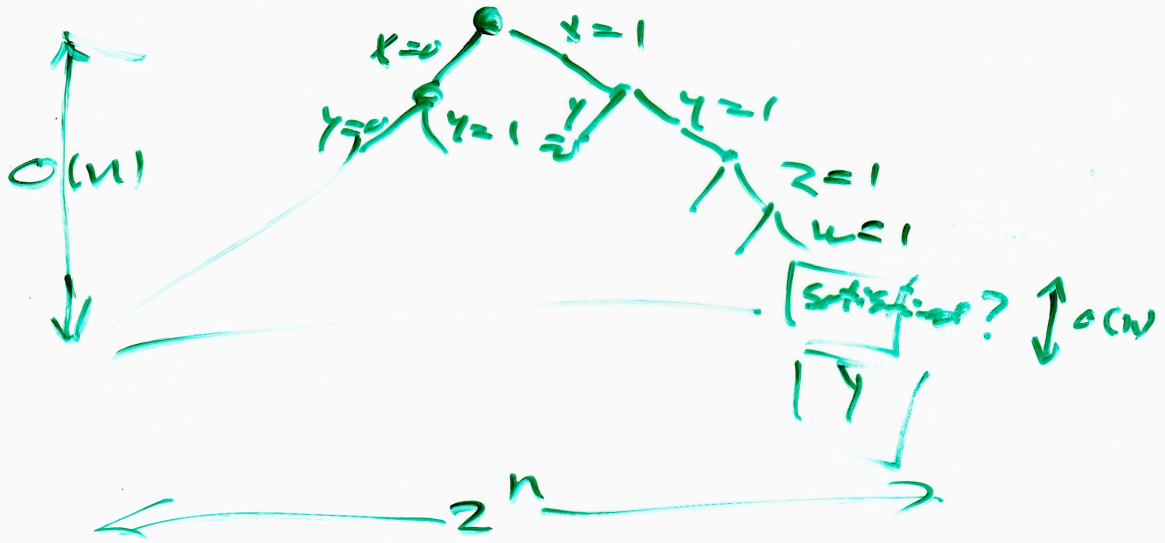
G, a, b, k $\exists$ path $a \to b$ of length $\leq k$

CFL recognition

$O(n^3)$

SAT

$(x \vee y) \wedge (\bar{y} \vee z \vee w) \wedge (x \vee y)$



$NP = \bigcup_{k \geq 1} \text{Nondet-Time}(n^k)$