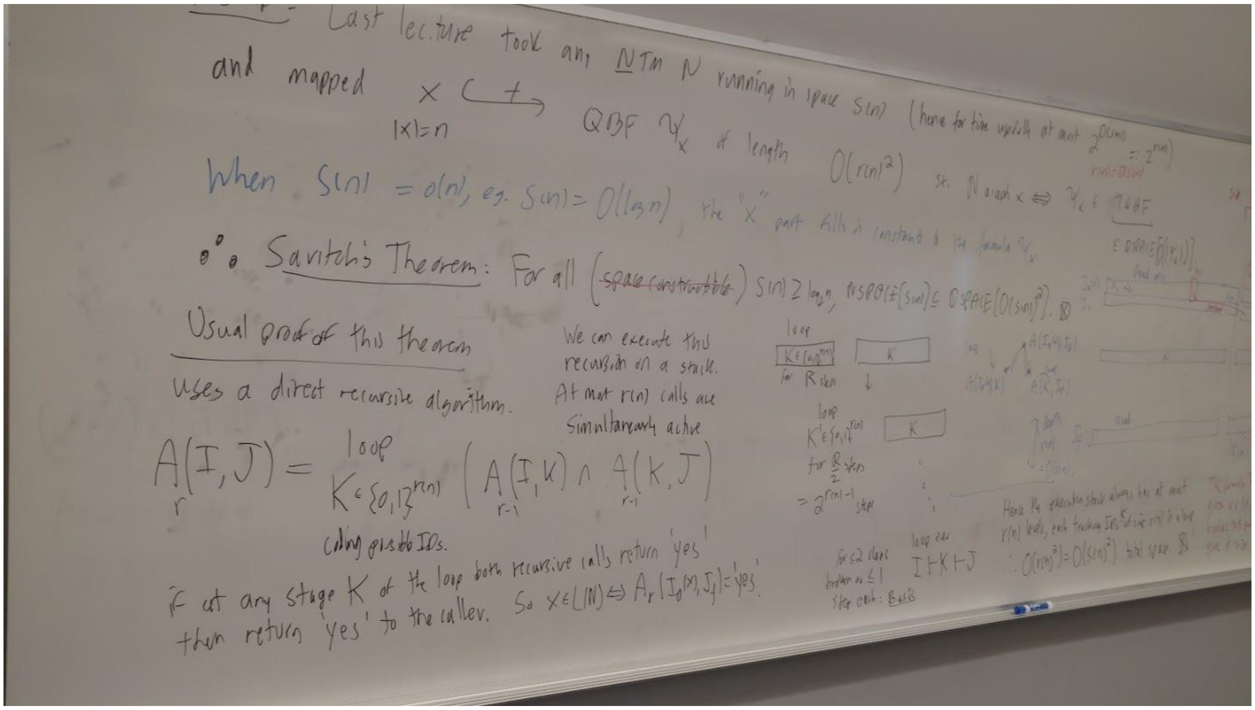
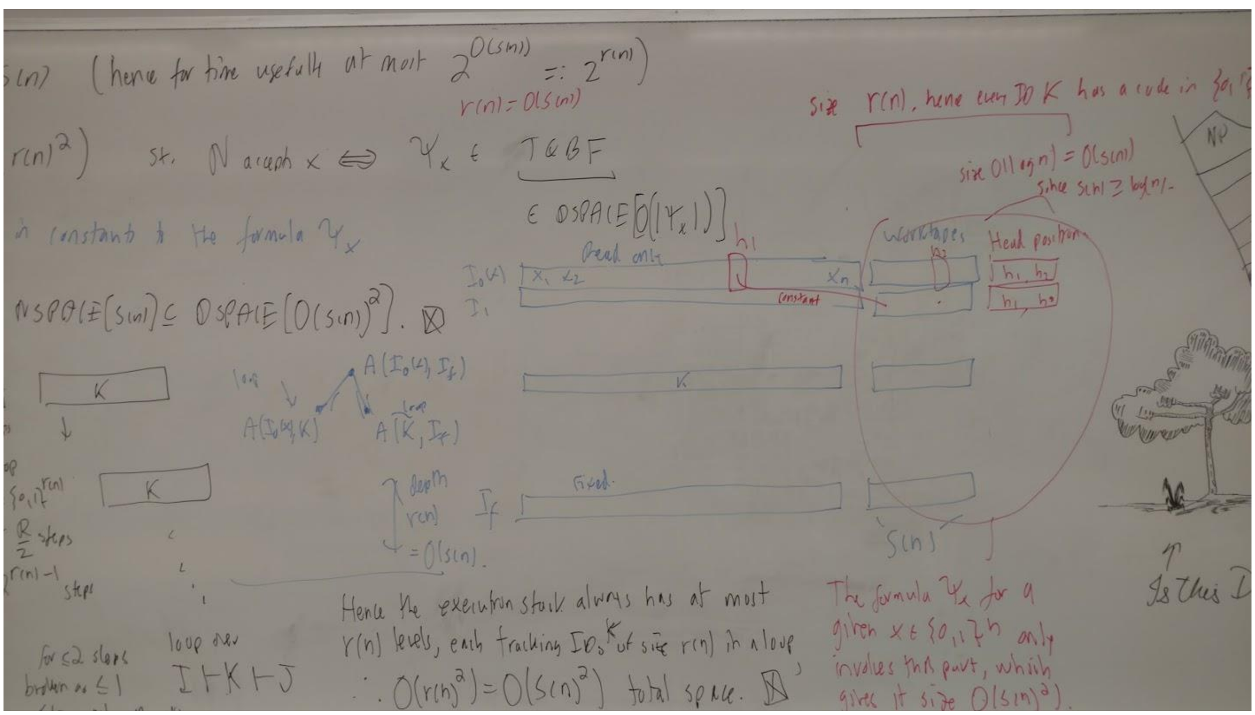
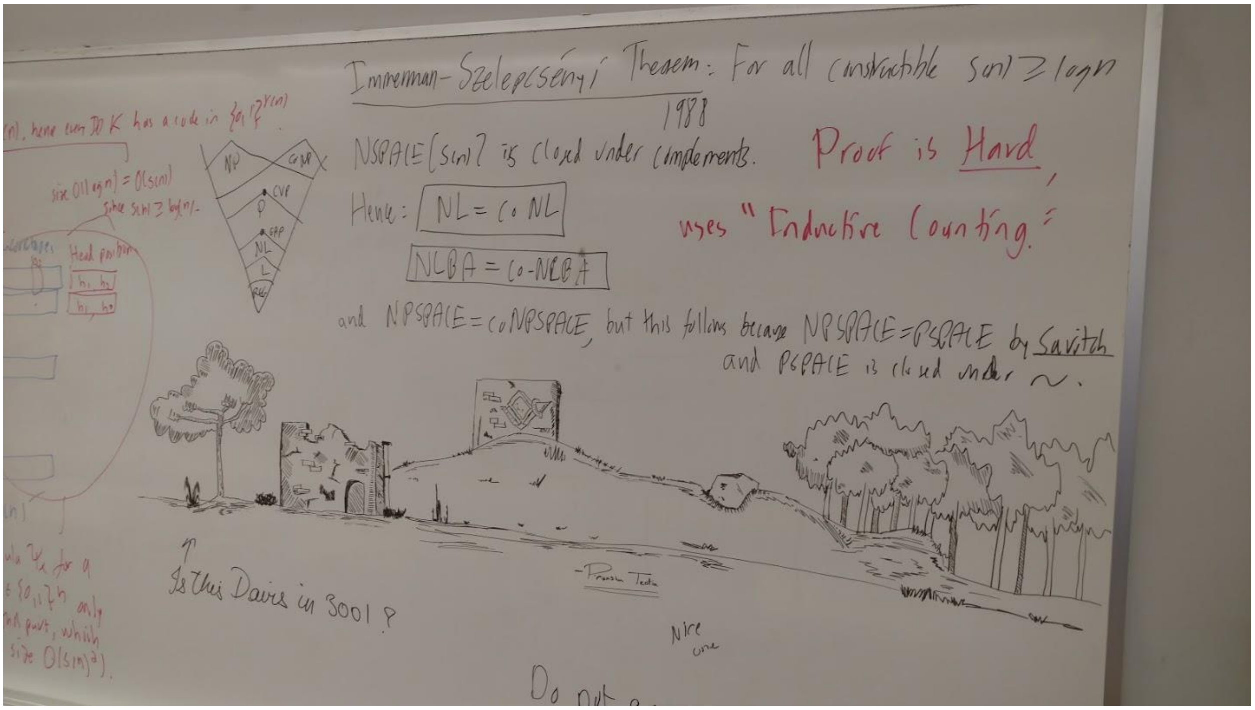
CSE596 Lecture+Recitation Tue. Nov. 12, 2019



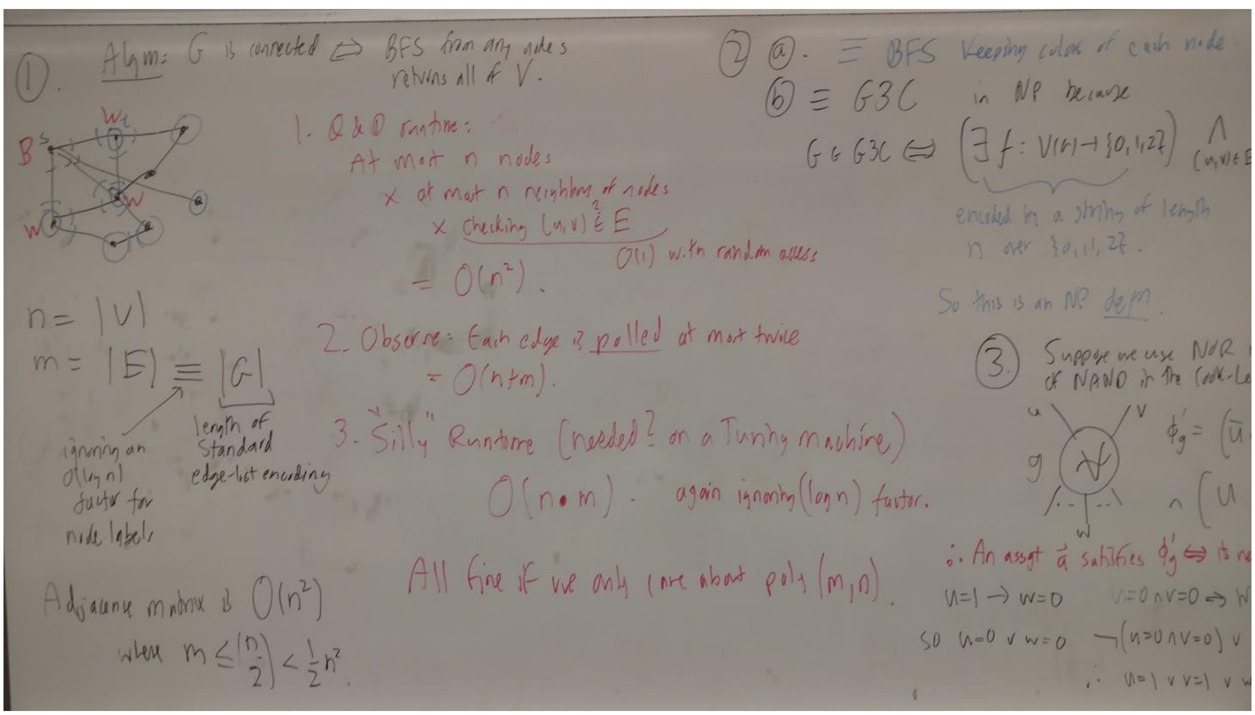
The missing word at upper left is "Recap:"



And for the far-right part of the whiteboard:



Recitation part:



ⓐ. $\equiv$ BFS Keeping colors of each node.

ⓑ $\equiv$ G3C in NP because

$G \in G3C \iff \big(\underbrace{\exists f : V(G) \to \{0,1,2\}}_{\text{encoded by a string of length } n \text{ over } \{0,1,2\}}\big) \bigwedge_{(u,v)\in E} f(u) \neq f(v)$

So this is an NP defn.

...m access

twice

...nning machine)

...ignoring (log n) factor.

... poly (m, n).

③. Suppose we use NOR instead of NAND in the Cook-Levin Proof:

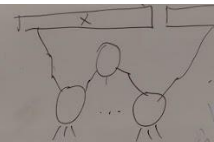
$\phi_g' = (\bar{u} \vee \bar{w}) \wedge (\bar{v} \vee \bar{w}) \wedge (u \vee v \vee w)$

∴ An assgt $\vec{a}$ satisfies $\phi_g' \iff$ its negation a' satisfies ϕ_g

$u=1 \to w=0$ $\quad u=0 \wedge v=0 \Rightarrow w=1$ for NAND.

so $u=0 \vee w=0$ $\quad \neg(u=0 \wedge v=0) \vee w=1$

$\therefore u=1 \vee v=1 \vee w=1$



∴ Flipping All works with NOR in place of NAND.

two

Q3 was fully asking: Can we map x to ϕ_x' so that an assignment a satisfies $\phi_x' \iff$ its flip a' satisfies the original ϕ_x except that a' does not flip the value of w_0 (and a' still has the same values of $x_1 \dots x_n$)?

Key ① Code the verifier $V(x,y)$ to reject when $R(x,y)$ holds rather than accept. Then the "original" construction will have $w_0 = 0$, so flipping all gives $w_0 = 1$.

② Code $V(x,y)$ to read y as y', ie. to flip bits in y.

But we can't declare x to be x' instead because x is given.

③ If $x_i = 1$, instead of using (x_i) as a singleton clause, use $(\bar{x}_i)$.

Is th...