Sunday, February 12

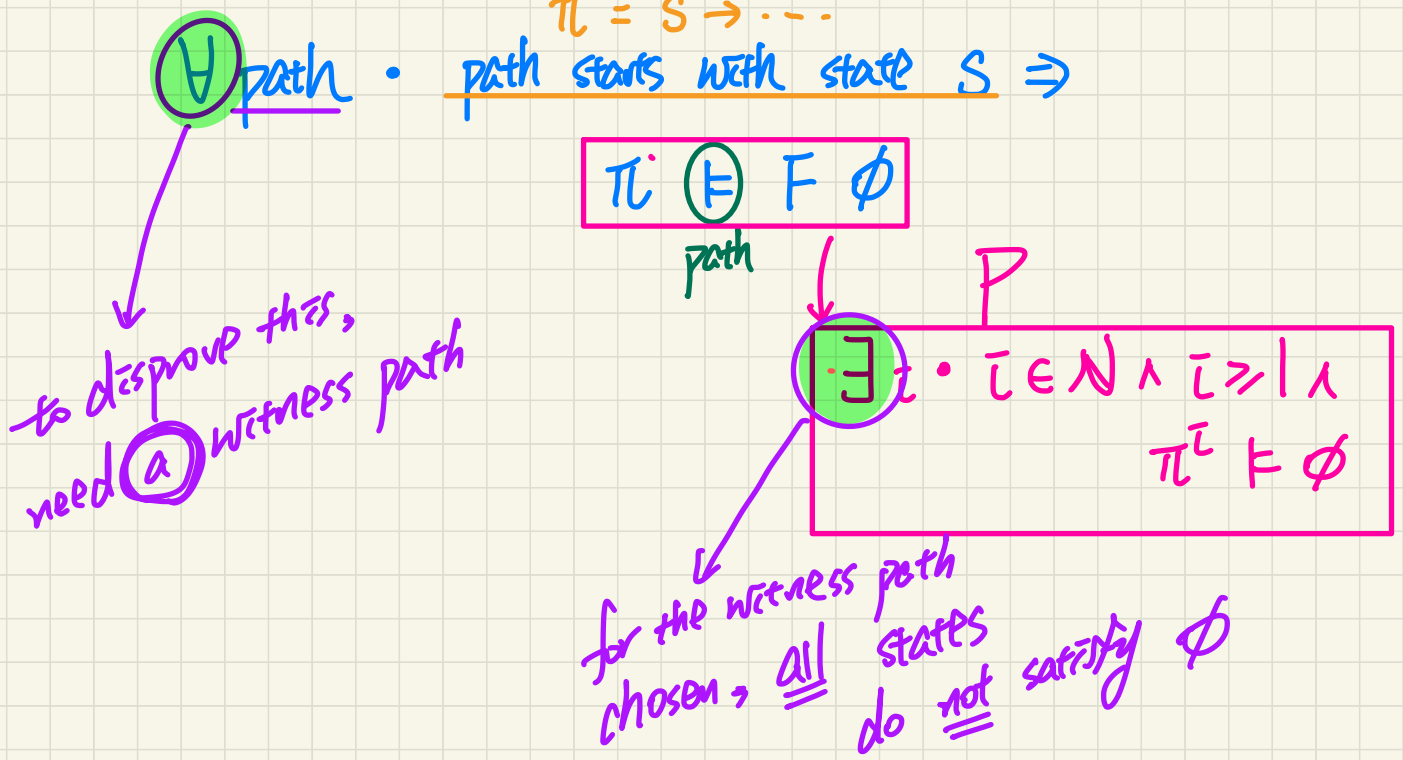
Written Test 1 Review

$\models$

- Consider the following check (where `s` is a state of some model `M`, and `phi` is a syntactically-correct LTL formula):

  s, M |= F phi

  In order to show that the above model satisfaction relation does **not** hold, we need to show that for every path pi (i.e., a witness) of M, phi does not hold at any state in pi.



Prove vs. Disprove model satisfaction of $G\,\phi$.

$S, M \models G\,\phi$

$\forall\, \pi \cdot \pi = S \to \cdots \Rightarrow$

$\pi : S \to \cdots \to S_i \to \cdots$

$\pi^i \not\models \phi$ e.g. P, e.g. $X\phi$

to disprove: find a witness i s.t. $i \in \mathbb{N} \wedge i \geq 1 \wedge \pi^i \not\models \phi$

ϕ may be just a prop. atom, or ϕ can be complicated, including temporal operators.

$\pi \models G\,\phi$

$\forall\, i \cdot i \in \mathbb{N} \wedge i \geq 1 \Rightarrow \pi^i \models \phi$

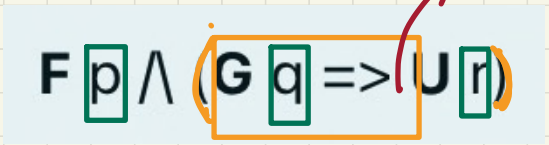
to disprove, give a path $\pi = S_2 \to \cdots$ s.t. $P \notin L(S)$

WTI.

Prove vs. Disprove model, path sat.

you'll only be given options to choose from.

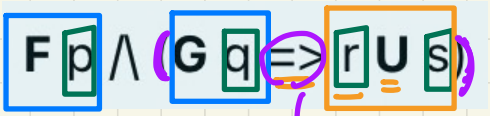
e.g. $S_2 \models X_{\not\in}$



WTI: stick to letters of temporal operators.

Can this be the LHS of U op?

No.



an operator with lower precedence than U

alternatively: (G q ⇒ r) U s

not right :: ⇒ has lower precedence than U.

Operator Precedence

→ Unary temporal X, F, G

Binary temporal U, W, R

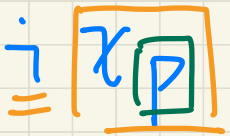
Unary Prop. $\neg$

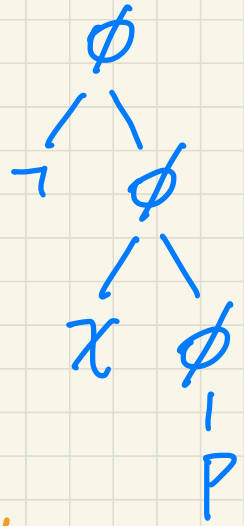
$\wedge$

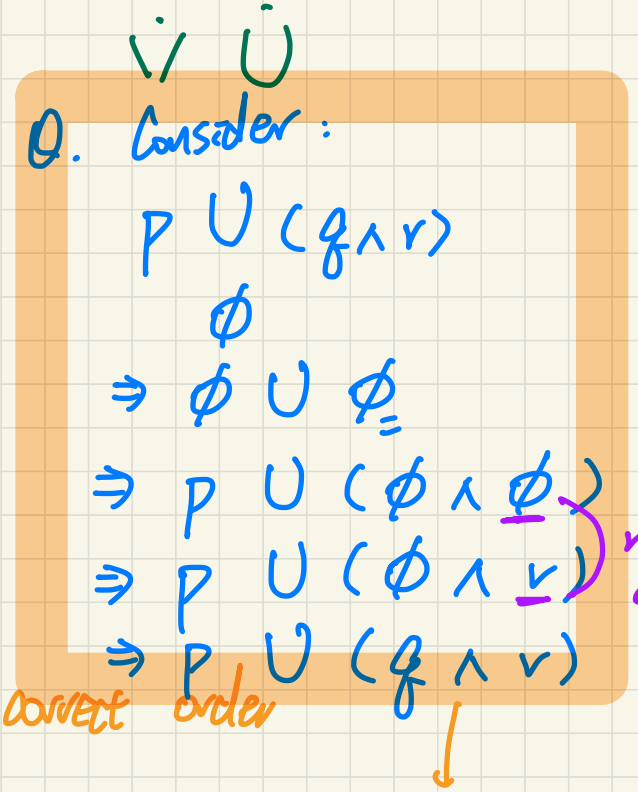
$\vee$

$\Rightarrow$

Assume: questions will not req. a decision on the associativity of $\Rightarrow, X$.







parse trees

LMD

RMD

- drag and drop tiles of derivation steps in correct order

make solution available. -