

General comments

General comments

Read assignments thoroughly. Make sure you understand what you are asked to do. Answer the questions you are asked.

Read assignments thoroughly. Make sure you understand what you are asked to do. Answer the questions you are asked.

*“determine which **invariant preservation proofs** (if any) would have failed”.*

- Many of you addressed invariant establishment, not preservation.
- Many of you did not say whether a proof would fail or not.

A (hard to follow) proof attempt that does not mention the goal, the hypotheses, and whether the proof is or not successful is difficult to understand and, therefore, evaluate.

Read assignments thoroughly. Make sure you understand what you are asked to do. Answer the questions you are asked.

*“determine which **invariant preservation proofs** (if any) would have failed”.*

- Many of you addressed invariant establishment, not preservation.
- Many of you did not say whether a proof would fail or not.

A (hard to follow) proof attempt that does not mention the goal, the hypotheses, and whether the proof is or not successful is difficult to understand and, therefore, evaluate.

“Use sequent calculus for the proofs, as we did with in the classroom slides.”.

- That was the exception rather than the norm.
- Many proofs were difficult to follow.

Most hand-written documents were easy to read. Thanks!

All the proofs we have been doing have the form of sequents.

Hypotheses \vdash *Goal* is the standard form for a sequent.

Sequents make the scenario (*Hypotheses*) and the objective (*Goal*) clear and non-ambiguous.

All the proofs we have been doing have the form of sequents.

Hypotheses \vdash *Goal* is the standard form for a sequent.

Sequents make the scenario (*Hypotheses*) and the objective (*Goal*) clear and non-ambiguous.

That is what we have been using so far. The assignment was very explicit about this and I clarified it in the classroom.

Many of you sent proofs not adhering to this format. Many proofs were very unclear regarding the initial scenario, what you are trying to prove, and why the steps are well founded!

Is $H \vdash b < b$ a valid deduction?

Is $H \vdash b < b$ a valid deduction?

It depends: if H inconsistent, the deduction is valid.

$x > b, x < 0, b > 0 \vdash b < b$ valid

It is an instance of the inference rule $\perp \vdash Q$

Is $H \vdash b < b$ a valid deduction?

It depends: if H inconsistent, the deduction is valid.

$x > b, x < 0, b > 0 \vdash b < b$ valid

It is an instance of the inference rule $\perp \vdash Q$

$$\frac{b > 0 \vdash b < 0}{\boxed{\phantom{b > 0 \vdash b < 0}}} \text{MON}$$

Is $H \vdash b < b$ a valid deduction?

It depends: if H inconsistent, the deduction is valid.

$x > b, x < 0, b > 0 \vdash b < b$ valid

It is an instance of the inference rule $\perp \vdash Q$

$$\frac{b > 0 \vdash b < 0}{b = 0, b > 0 \vdash b < 0} \text{MON}$$

Failed proofs

$\Gamma \vdash \Delta$ valid if every valuation that makes Γ true makes Δ true as well.

$\Gamma \vdash \Delta$ valid if every valuation that makes Γ true makes Δ true as well.
Enumerating all possible scenarios where Γ holds and, for every one, check if Δ is infeasible. That is why we make proofs.

- $\Gamma \vdash \Delta$ valid if every valuation that makes Γ true makes Δ true as well. Enumerating all possible scenarios where Γ holds and, for every one, check if Δ is infeasible. That is why we make proofs.
- $\Gamma \vdash \Delta$: if Γ true (for a valuation) and Δ false (for the same valuation), sequent not valid: this is a counterexample. If you have a counterexample, the sequent cannot be proven.

$\Gamma \vdash \Delta$ valid if every valuation that makes Γ true makes Δ true as well.

Enumerating all possible scenarios where Γ holds and, for every one, check if Δ is infeasible. That is why we make proofs.

$\Gamma \vdash \Delta$: if Γ true (for a valuation) and Δ false (for the same valuation), sequent not valid: this is a counterexample. If you have a counterexample, the sequent cannot be proven.

From the homework: *"You can either find out a counterexample (a scenario / variable valuation that is consistent with the hypotheses but makes the goal false)..."*

$\Gamma \vdash \Delta$ valid if every valuation that makes Γ true makes Δ true as well. Enumerating all possible scenarios where Γ holds and, for every one, check if Δ is infeasible. That is why we make proofs.

$\Gamma \vdash \Delta$: if Γ true (for a valuation) and Δ false (for the same valuation), sequent not valid: this is a counterexample. If you have a counterexample, the sequent cannot be proven.

From the homework: *"You can either find out a counterexample (a scenario / variable valuation that is consistent with the hypotheses but makes the goal false)..."*

A valuation consistent with the hypotheses gives values to *all* variables for which invariants, axioms, and (selected) guard are true. Many homeworks did not make this explicit.

We are stressing **sound** processes, not a particular result.