

Inference at * 1
of proof for Lemma branch-ifthenelse:

1. $b : \mathbb{B}$
2. $P : \text{Top}$
3. $Q : \text{Top}$
 $\vdash \text{if } x:\uparrow b \text{ then } P \text{ else } Q \text{ fi} \sim \text{if } b \text{ then } P \text{ else } Q \text{ fi}$
by ((Branch 0)
CollapseTHEN (Auto·)).

1:

4. $x : \uparrow b$
5. $\text{bool-decider}(b) = (\text{inl } x)$
 $\vdash P \sim \text{if } b \text{ then } P \text{ else } Q \text{ fi}$

2:

4. $y : \neg(\uparrow b)$
5. $\text{bool-decider}(b) = (\text{inr } y)$
 $\vdash Q \sim \text{if } b \text{ then } P \text{ else } Q \text{ fi}$