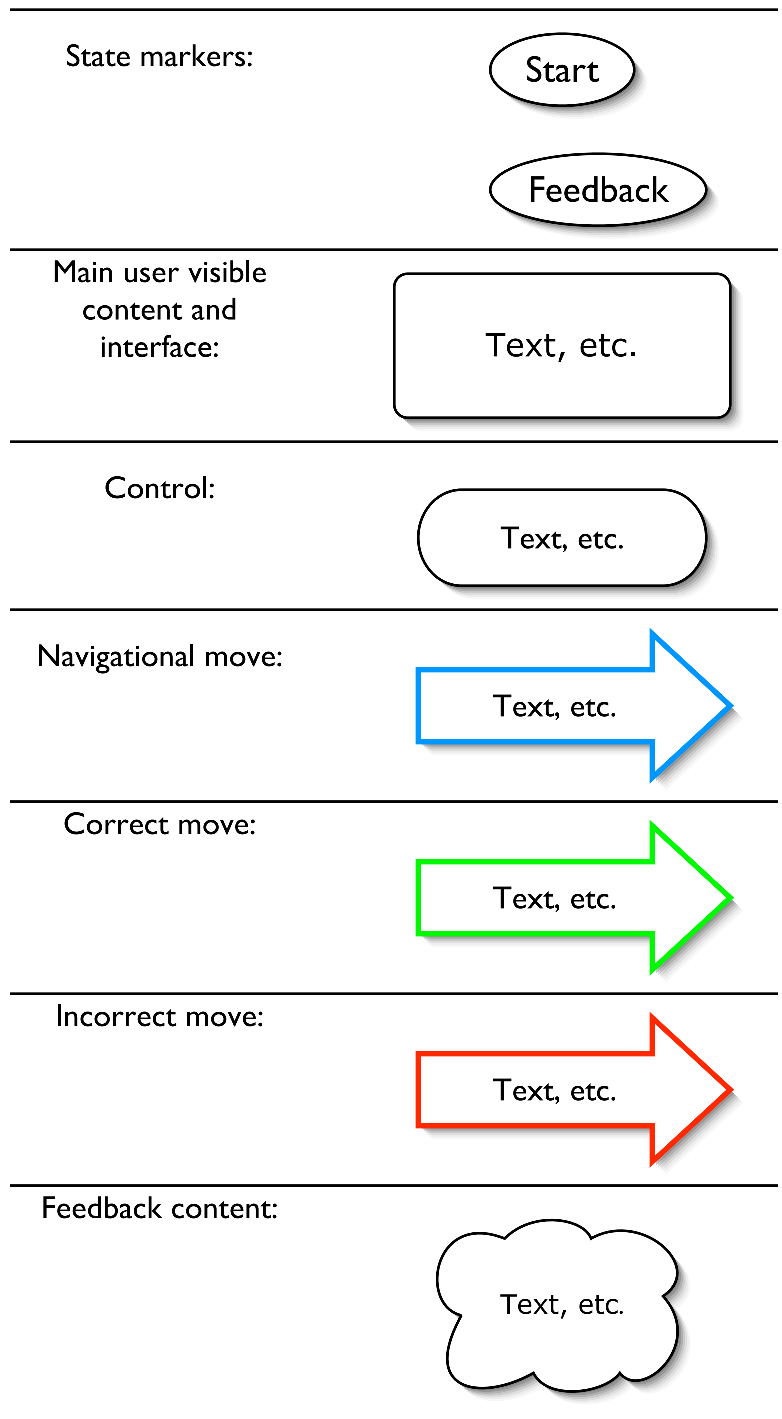
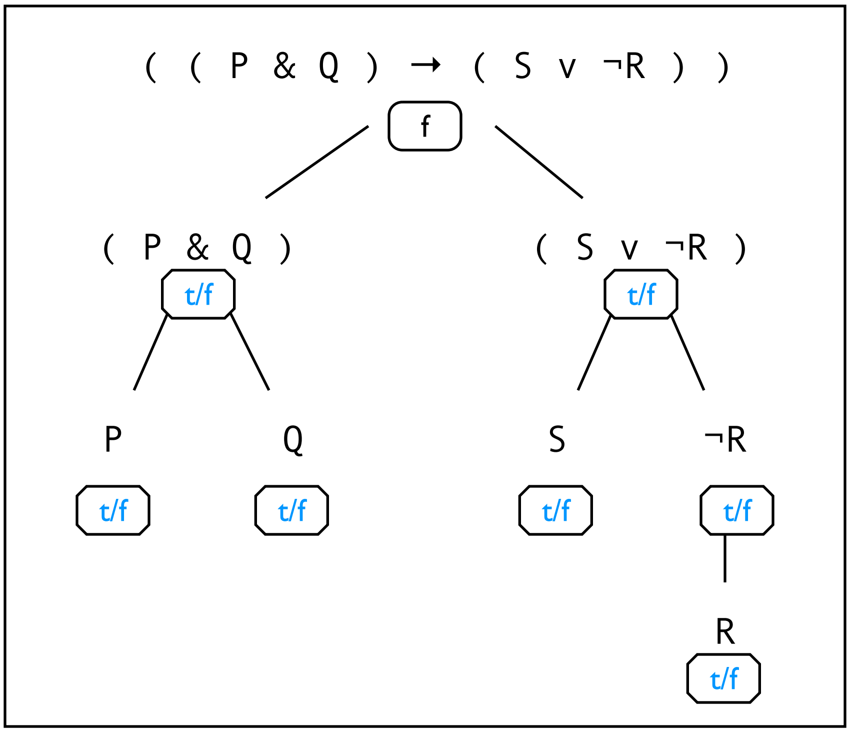
Legend:


State markers:
Start
Feedback
Main user visible content and interface:
Text, etc.
Control:
Text, etc.
Navigational move:
Text, etc.
Correct move:
Text, etc.
Incorrect move:
Text, etc.
Feedback content:
Text, etc.

Start

Find a truth-value assignment that makes the formula below false.

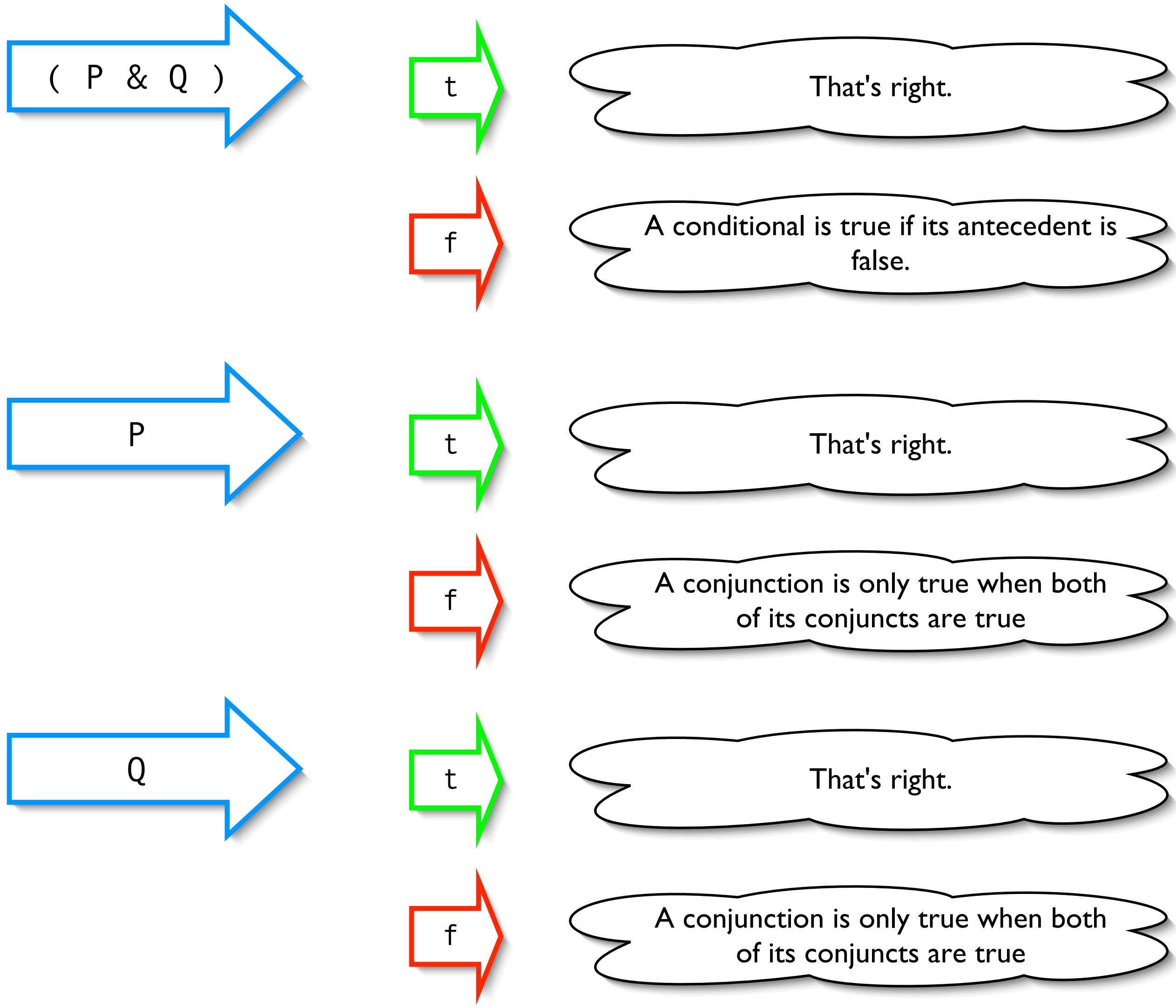
We've provided you with the completed parse tree for the formula. All you need to do is "chase truth down the tree", marking each node as either true or false. Once you've correctly marked each node, you're done.

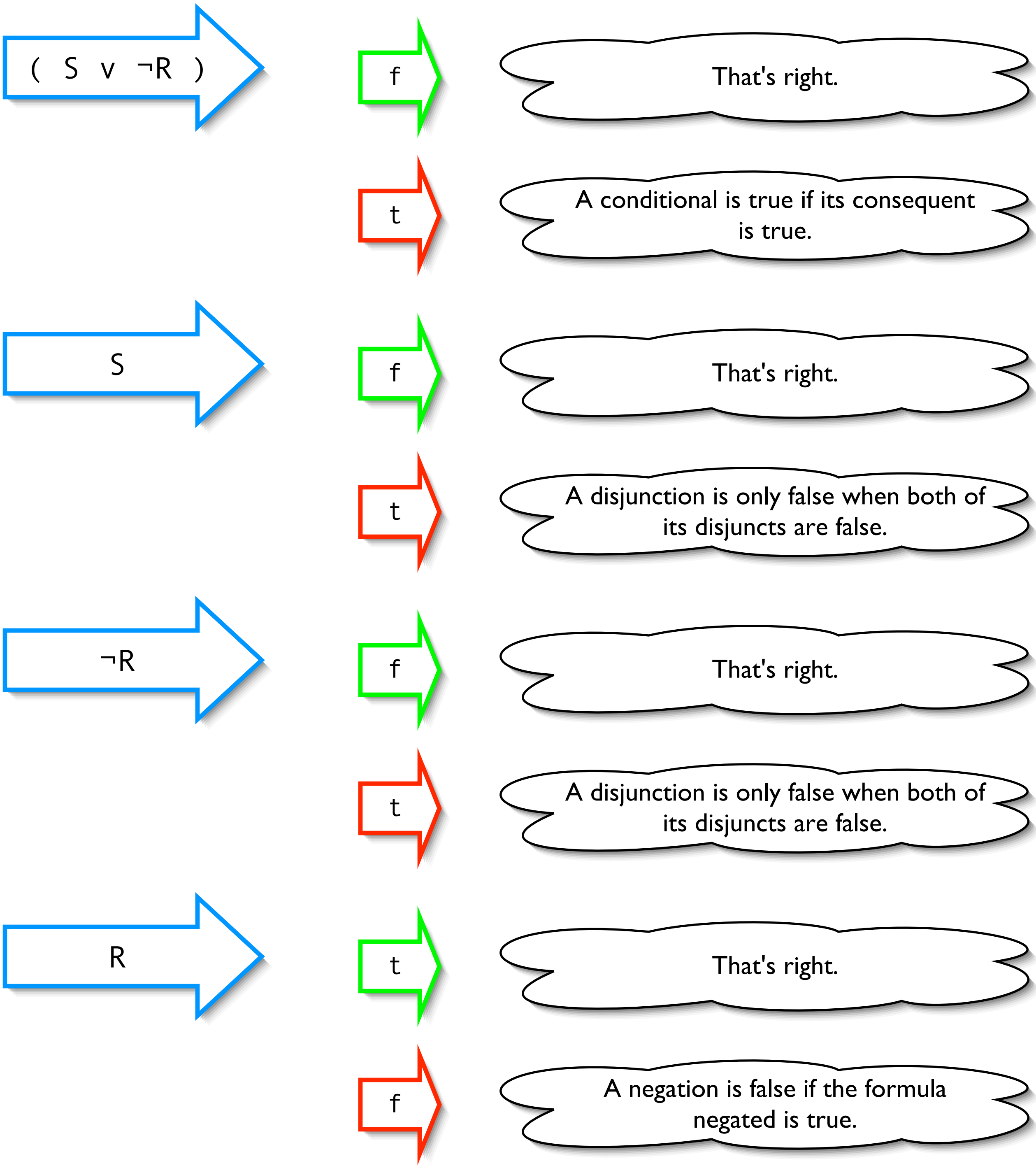


Hint

Items marked as t/f are the comboboxes. The formulae should be visible even after the node has been classified a either true or false, so the formula at the node should not be included in the combobox itself.

Feedback


(P & Q)
t
That's right.
f
A conditional is true if its antecedent is false.
P
t
That's right.
f
A conjunction is only true when both of its conjuncts are true
Q
t
That's right.
f
A conjunction is only true when both of its conjuncts are true


(S v ¬R)
f
That's right.
t
A conditional is true if its consequent is true.
S
f
That's right.
t
A disjunction is only false when both of its disjuncts are false.
¬R
f
That's right.
t
A disjunction is only false when both of its disjuncts are false.
R
t
That's right.
f
A negation is false if the formula negated is true.

Hint

Each hint should contain the following at the bottom, after specific hint content:

Click here to view the characteristic truth-tables for the connectives.

The link should be to the following file:

temptruthvalueassignmenthint.gif

The hint to be displayed at a given stage is that for the first incomplete node, from top to bottom and left to right, i.e., the first in the following order not answered correctly when the hint is requested.

(P & Q)

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for the conditional to determine the circumstances under which a conditional such as ((P & Q) → (S v ¬R)) will be false.

A conditional is false only if its antecedent, in this case (P & Q), is true, and its consequent is false.

$(S \vee \neg R)$

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for the conditional to determine the circumstances under which a conditional such as $((P \& Q) \rightarrow (S \vee \neg R))$ will be false.

A conditional is false only if its antecedent is true, and its consequent, in this case $(S \vee \neg R)$, is false.

P

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for conjunction to determine the circumstances under which a conjunction such as $(P \& Q)$ will be true.

A conjunction is only true if both of its conjuncts are true, so P must be assigned the value ***t*** in this case.

Q

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for conjunction to determine the circumstances under which a conjunction such as (P & Q) will be true.

A conjunction is only true if both of its conjuncts are true, so Q must be assigned the value ***t*** in this case.

S

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for disjunction to determine the circumstances under which a disjunction such as (S v ¬R) will be true.

A disjunction is only false if both of its conjuncts are false, so S must be assigned the value ***f*** in this case.

¬R

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for disjunction to determine the circumstances under which a disjunction such as (S v ¬R) will be true.

A disjunction is only false if both of its conjuncts are false, so ¬R must be assigned the value ***f*** in this case.

R

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.

We can check the characteristic truth-table for negation to determine the circumstances under which a negation such as ¬R will be true.

A negation is only false if the formula negated is true, so R must be assigned the value ***t*** in this case.

Solution: