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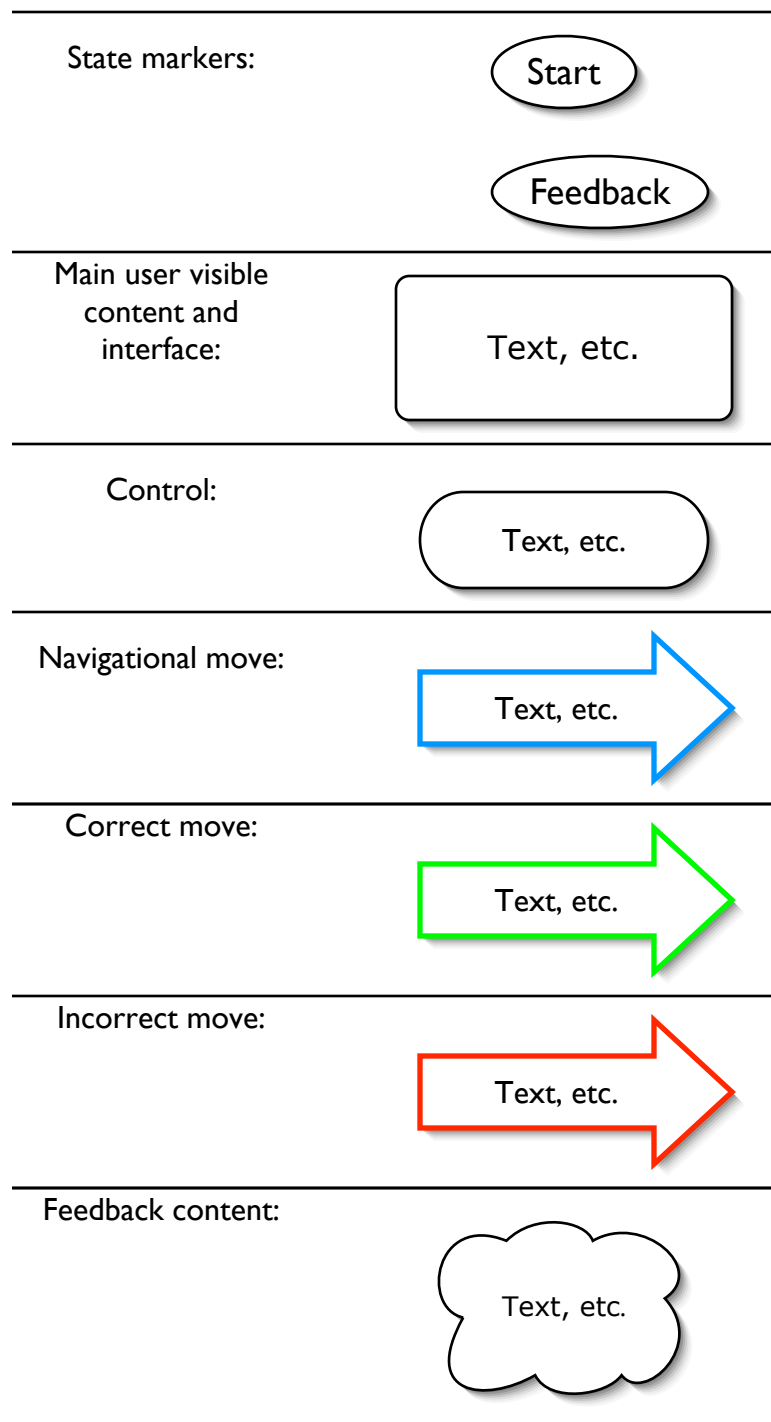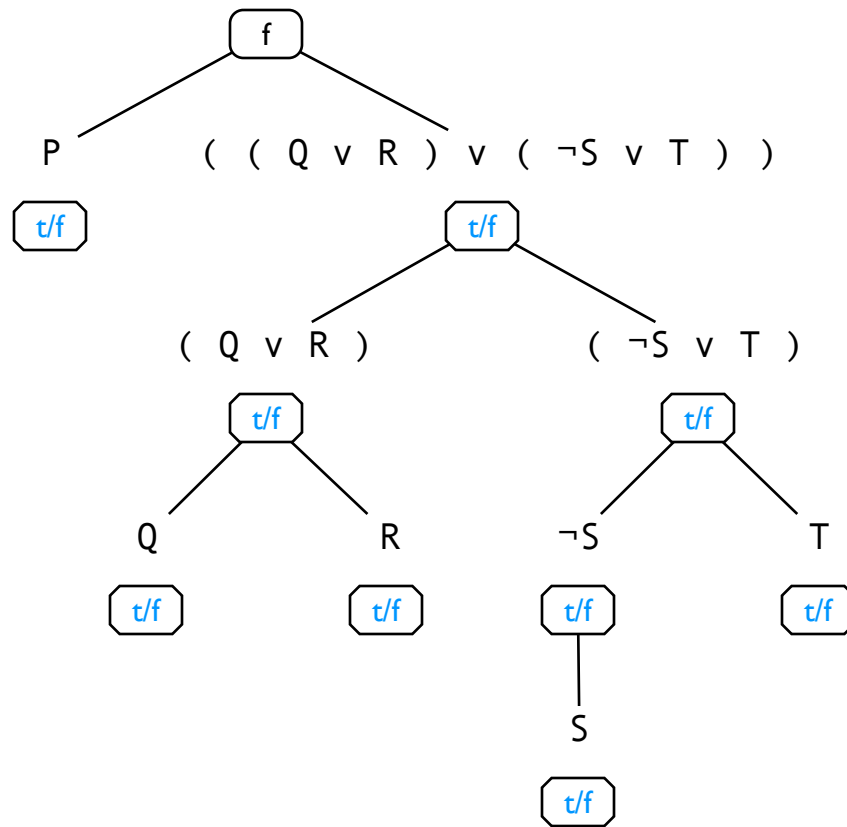
Find a truth-value assignment that makes the formula below false.

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.

(P v ((Q v R) v (¬S v T)))

f

P   ((Q v R) v (¬S v T))

t/f   t/f

(Q v R)   (¬S v T)

t/f   t/f

Q   R   ¬S   T

t/f   t/f   t/f   t/f

S

t/f

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.

P → f → That's right.

t → A disjunction is only false when both of its disjuncts are false.

((Q ∨ R) ∨ (¬S ∨ T)) → f → That's right.

t → A disjunction is only false when both of its disjuncts are false.

(Q ∨ R) → f → That's right.

t → A disjunction is only false when both of its disjuncts are false.

Q → 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.

(¬S ∨ T) → **f** → That's right.

→ **t** → A disjunction is only false when both of its disjuncts are false.

¬S → **f** → That's right.

→ **t** → A disjunction is only false when both of its disjuncts are false.

T → **f** → That's right.

→ **t** → A disjunction is only false when both of its disjuncts are false.

S → **t** → That's right.

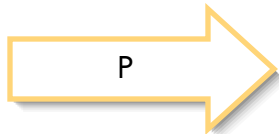→ **f** → A negation is only false when its immediate subformula is true.

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:

temptruthvalueassignment2hint.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

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 (P v ((Q v R) v (¬S v T))) will be false.

A disjunction is false only if both of its disjuncts are false, so P must be assigned that value *f* in this case.

((Q v R) v (¬S v T))

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 (P v ((Q v R) v (¬S v T))) will be false.

A disjunction is false only if both of its disjuncts are false, so ((Q v R) v (¬S v T)) must be assigned that value *f* in this case.

(Q v 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 ((Q v R) v (¬S v T)) will be false.

A disjunction is false only if both of its disjuncts are false, so (Q v R) must be assigned that value *f* in this case.

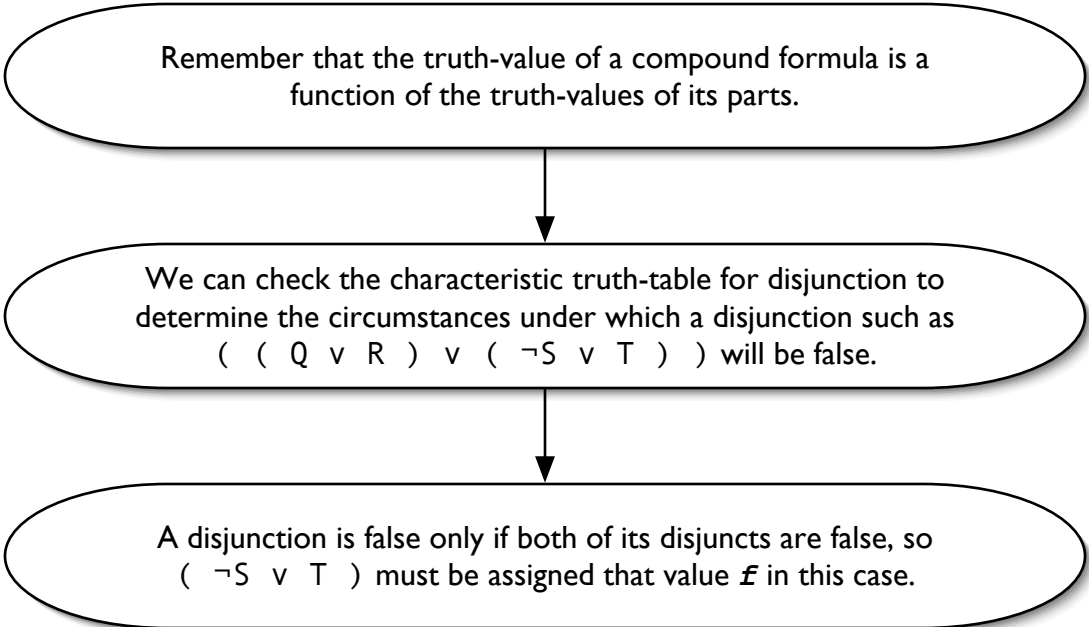(¬S v T)

Remember that the truth-value of a compound formula is a function of the truth-values of its parts.
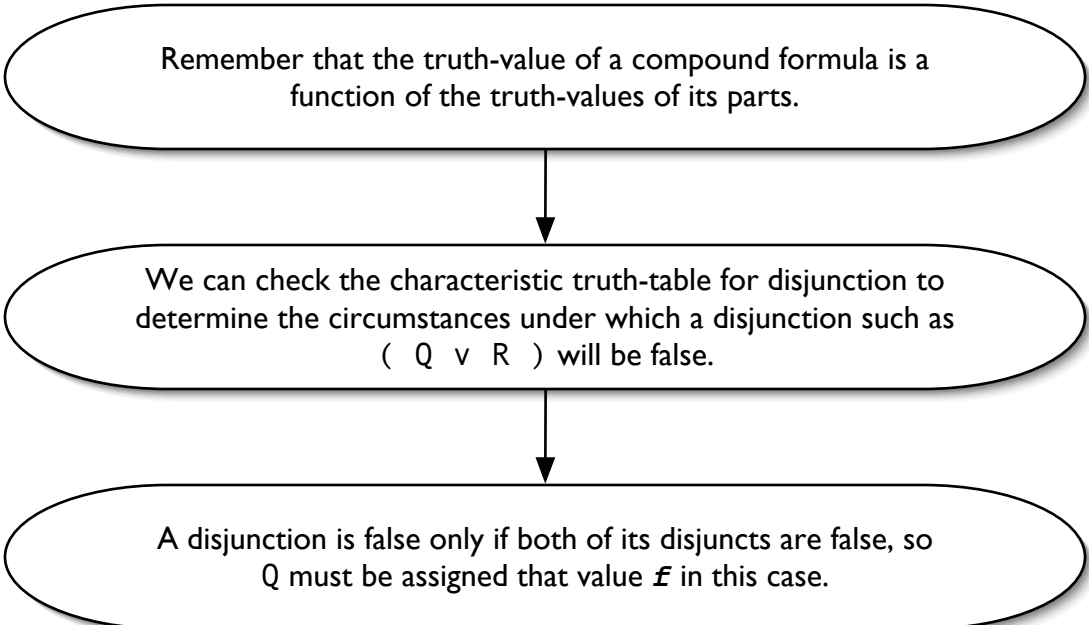
We can check the characteristic truth-table for disjunction to determine the circumstances under which a disjunction such as ((Q v R) v (¬S v T)) will be false.

A disjunction is false only if both of its disjuncts are false, so (¬S v T) must be assigned that value *f* 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 disjunction to determine the circumstances under which a disjunction such as (Q v R) will be false.

A disjunction is false only if both of its disjuncts are false, so Q must be assigned that value *f* in this case.
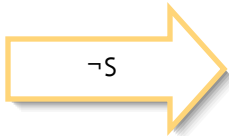
R

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 (Q ∨ R) will be false.

A disjunction is false only if both of its disjuncts are false, so R must be assigned that value **f** 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 ∨ T) will be false.

A disjunction is false only if both of its disjuncts are false, so ¬S must be assigned that value **f** in this case.
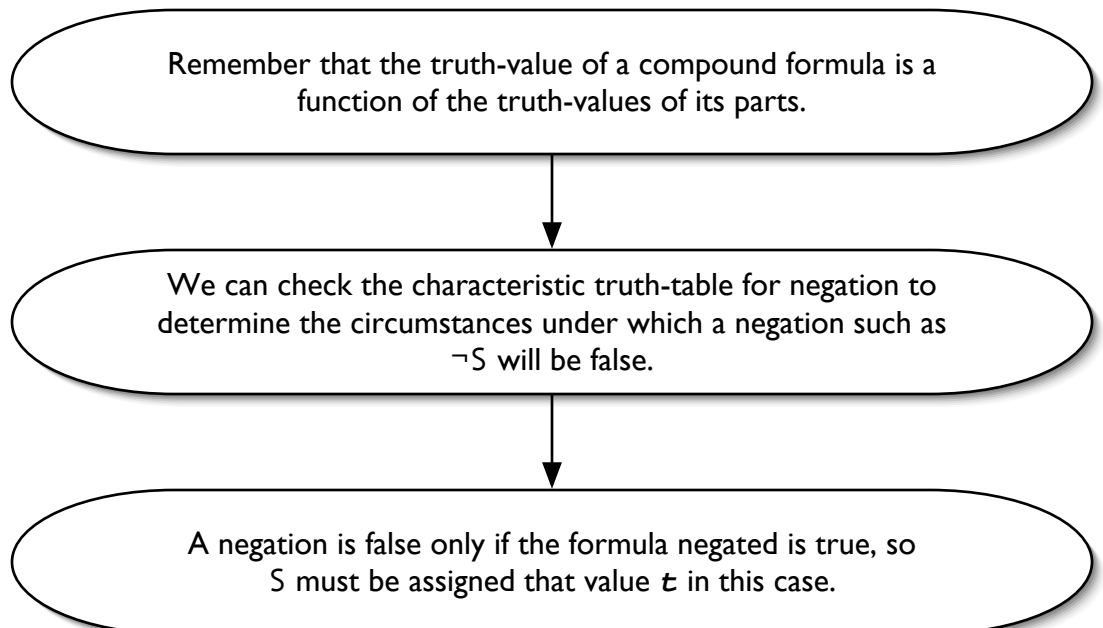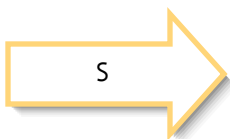
T →

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 ∨ T) will be false.

↓

A disjunction is false only if both of its disjuncts are false, so T must be assigned that value *f* in this case.
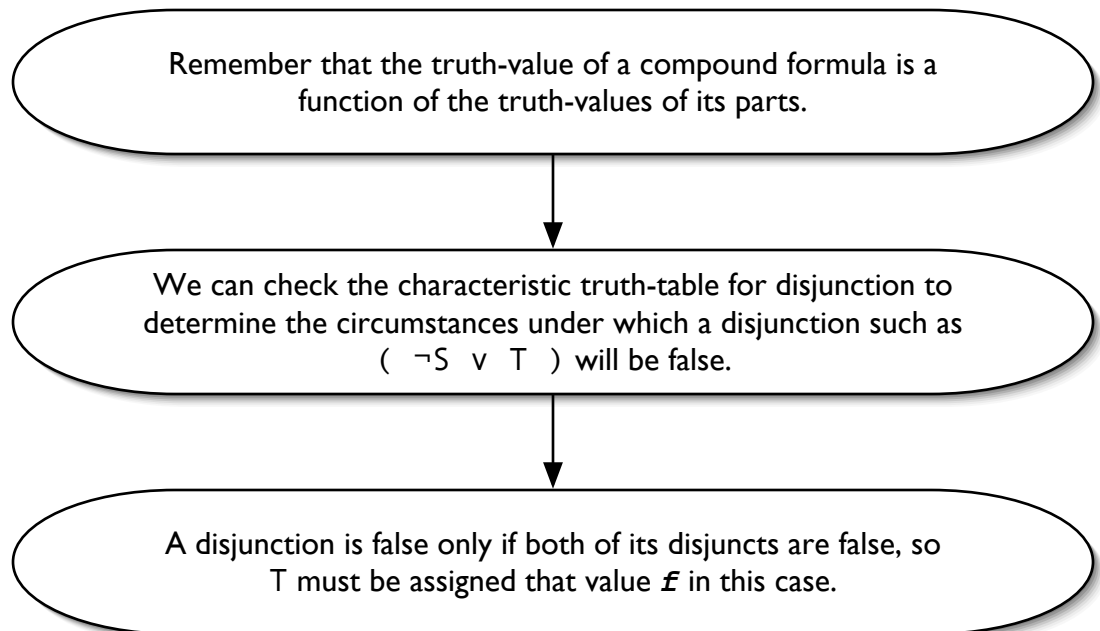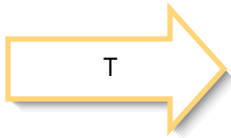
S →

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 negation to determine the circumstances under which a negation such as ¬S will be false.

↓

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

Solution:

(P v ((Q v R) v (¬S v T)))

f

P   ((Q v R) v (¬S v T))

f   f

(Q v R)   (¬S v T)

f   f

Q   R   ¬S   T

f   f   f   f

S

t