

### Question 3:

**F:**

In my fsta\_wh1 automaton, I have 5 states:

“None” indicates that we haven’t seen any WH words or complementizers (Q, WH, C).

“QState” indicates that we encountered a Q complementizer.

“WHState” indicates that we encountered a WH-word.

“CState” indicates that we encounter a “plain” complementizer.

“Q\_WH” indicates that we encountered both Q complementizer and WH-word.

The transition:

([QState, None], "\*", None),

([None, QState], "\*", None),

([QState, QState], "\*", None)

handles the rule where “Every Q must c-command at least one wh-word”.

The transition:

([None, WHState], "\*", WHState),

([WHState, None], "\*", WHState),

([WHState, WHState], "\*", WHState),

handles the rule where there can be multiple instances of WHState which can be c-commanded by a Q complementizer.

The transition:

([QState, WHState], "\*", Q\_WH),

handles the rule where “Every Q must c-command at least one wh-word” and “Every wh-word must be c-commanded by a Q complementizer”.

The transition:

([CState, None], "\*", Q\_WH),

handles examples like “generates fsta\_wh1 tree\_1a”, where there is only “plain” complementizer and no Q complementizer or WH-word.

**G:**

In my fsta\_wh2 automaton, I have 6 states:

First five are the same as the fsta\_wh1

“AState” indicates the adjunct state to handle adjuncts (“\*\*”)

The transitions:

All the previous transitions from fsta\_wh1, but I removed ([CState, None], “\*”, Q\_WH), because C doesn’t lead to Q\_WH anymore and we need to make sure the Q-licensing rule isn’t violated while there is an adjunct.

The transition:

([CState, Q\_WH], “\*”, Q\_WH),

([Q\_WH, CState], “\*”, Q\_WH),

Make sure that the “plain” complementizer doesn’t cancel the Q-licensing for a wh-word when there is an adjunct.

The transition:

([None, AState], “\*\*”, AState),

([AState, None], “\*\*”, AState),

([AState, AState], “\*\*”, AState),

Make sure that adjuncts can still work without encountering a Q complementizer or wh-word.

The transition:

([QState, AState], “\*\*”, AState),

([AState, QState], “\*\*”, AState),

Make sure that only Q complementizer that is inside an adjunct can license a wh-word that is also inside an adjunct.

The transition:

([QState, WHState], “\*\*”, Q\_WH)

handles the rule where wh-word that is inside the adjunct are only licensed by a Q complementizer that is also within that adjunct.