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HW 9

1a) () → B → S

1b) ()() → B() → BB → BS → S

1c) u1 = _B_ , u2 = _B(). In both cases, _B, appears at the front of the string but different reducing rules are used.

2) To construct the NFA, create a new start state which connects directly to every state of the DFA. Then for each state of those states redraw the entire DFA. Connect the resulting accept states to another copy of the DFA accept the new accept state is the parent state.

Below shows an example DFA and the resulting NFA. For an arbitrary DFA all of the DFA would need to be drawn following the e-move.
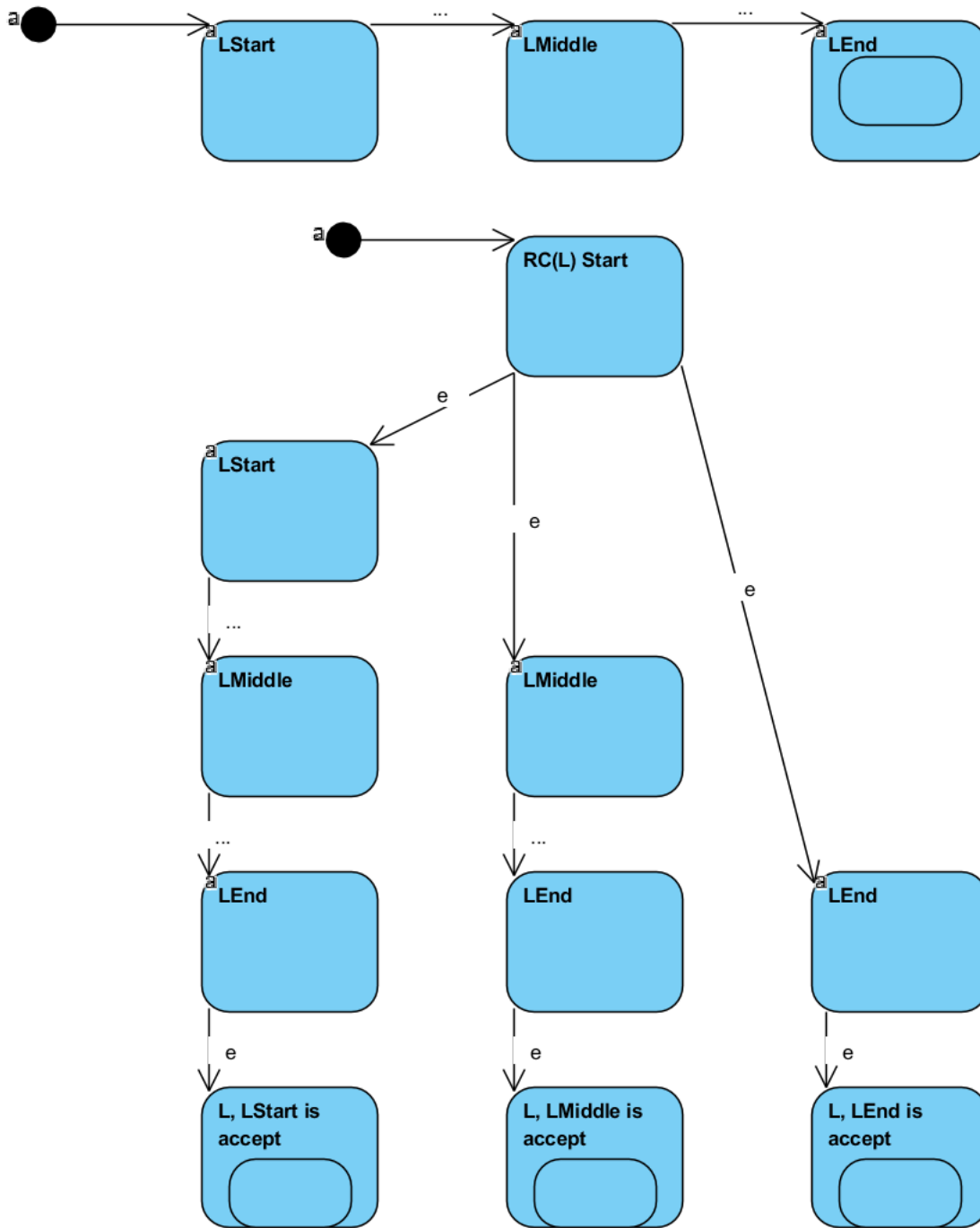
3) A Truing machine that encodes an inner non-halting Turing machine will itself not halt when presented with a string for which the inner machine does not halt. Therefore, it is not recursive. However, the outer machine has no problem accepting whenever the inner machine accepts and so it is recursively enumerable.