14 Lecture - CS402

Important Subjective

1. **What is the purpose of converting an FA to an NFA?**
   Answer: The purpose of converting an FA to an NFA is to account for non-deterministic behavior that cannot be modeled by an FA.

   What is the main difference between an FA and an NFA?
   Answer: The main difference between an FA and an NFA is that an NFA can have multiple transitions for a given input symbol from a single state, while an FA can have only one.

   What are epsilon transitions, and how are they used in an NFA?
   Answer: Epsilon transitions are transitions that occur without consuming an input symbol. They are used in an NFA to allow the machine to transition to multiple states at once, allowing for non-deterministic behavior.

   Can an NFA have fewer states than the FA it was converted from?
   Answer: No, an NFA can have the same number of states or more than the FA it was converted from, but it cannot have fewer states.

   How does converting an FA to an NFA affect the language accepted by the machine?
   Answer: Converting an FA to an NFA does not affect the language accepted by the machine. The NFA will accept the same language as the FA.

   What is the role of the start state in an NFA?
   Answer: The start state is the initial state of the NFA and is where the machine begins processing input symbols.

   Can an NFA have multiple accepting states?
   Answer: Yes, an NFA can have multiple accepting states, while an FA can only have one.

   What is the benefit of using an NFA over an FA?
   Answer: An NFA can model non-deterministic behavior that cannot be modeled by an FA, allowing for a simpler and more concise representation of certain languages.

   Can an NFA have multiple transitions for the same input symbol from a single state?
   Answer: Yes, an NFA can have multiple transitions for the same input symbol from a single state.

   What is the impact of adding epsilon transitions to an FA when converting it to an NFA?
   Answer: Adding epsilon transitions allows the NFA to model non-deterministic behavior, but it may result in a larger machine with more states than the original FA.