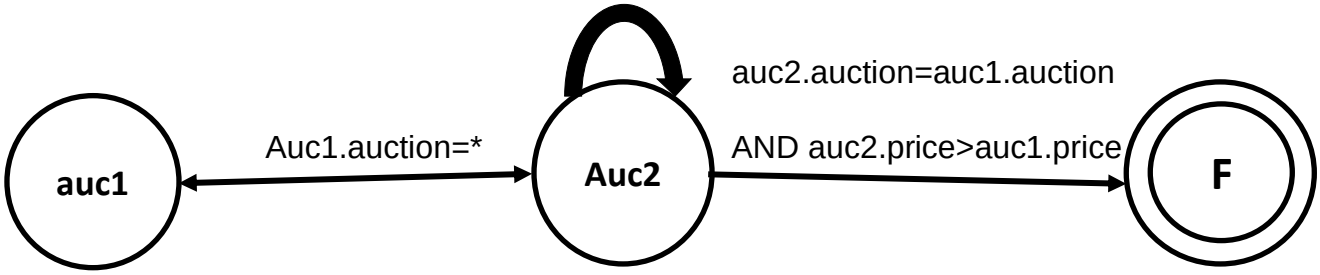
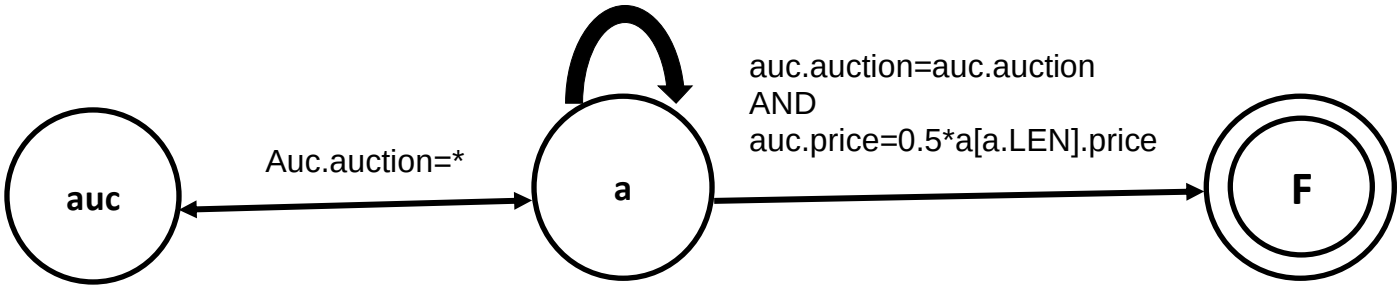
Assignment No 4

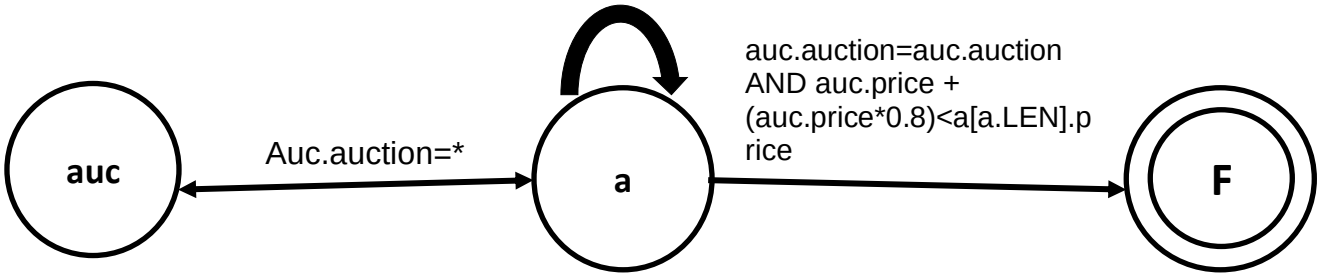
9) **Query 2:**



Query 3:



Query 4:



Exercise 2:

1) - Strict contiguity: Events are immediately contiguous → that can be done by the automaton until now…
   - Skip till next match: Irrelevant events are ignored until next relevant event is read
   - Skip till any match: Nondeterministic decisions on relevant events
   - Partition Contiguity: Events within one partition („[]“) must be contiguous

2) **Strict contiguity:** In the most stringent event selection strategy, two selected events must be contiguous in the input stream. This requirement is typical in regular expression matching against strings, DNA sequences, etc.
   Skip till next match: Emphasis is on broad trends, such as the change in price in the stock market and the rate of depletion of valuable products in retail, as opposed to monotonic behaviors.
   Skip till any match: This category further relaxes the previous requirement with more flexibility in selecting the next relevant event. For each relevant event encountered, it allows non-deterministic decisions between including the event into the Kleene closure and simply skipping it. Such behaviors could be useful in scenarios where skipping some relevant events would prolong the Kleene closure computation, resulting in a longer sequence of events selected.
   Partition Contiguity: sorting of many items based on their parent category.

3) PATTERN clause: specifies which pattern should be matched
   WHERE clause: sets value-based constraints on the events addressed by the pattern
   WITHIN clause: defines a time window over the whole pattern.

4) Two categories of termination criteria:
   1) Termination criteria for contiguity requirement: Kleene closure terminates when the next event in the input or a particular partition fails to satisfy the relevant predicates. However, when event selection is relaxed to skip till next match or further, Kleene closure does not terminate at this point due to its ability to skip irrelevant events.
   2) Termination criteria for relaxed pattern policies: SASE+ offers two ways to terminate each Kleene plus in the pattern:
      Time constraint: If the query has the WITHIN clause, the time window for the entire pattern is also applied to every Kleene plus in the pattern.
      Minimal effort: A second type of termination is to allow Kleene closure to perform minimal computation and then break. It is often used as an optimization to save work.

5) Hidden pattern policy: skip until next match