**Q 3**

**FOUNDATIONS OF ARTIFICIAL INTELLIGENCE**

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**Consider the example 2 from Q1:**

**You start with the sequence ABABAECCEC, or in general any sequence made from A, B, C, and E. You can transform this sequence using the following equalities:**

**AC = E,**

**AB = BC,**

**BB = E,**

**CC = E, and**

**E x = x for any x.**

**For example, ABBC can be transformed into AEC, and then AC, and then E. Your goal is to produce the sequence E.**

**Define an admissible heuristic for the problem and write an A\* algorithm to solve the problem.**

Answer

The admissibility constraint states that the value estimated by an admissible heuristic is neither negative nor an overestimate.

Defining h\*(n) as the true optimal forward cost to reach a goal state from a given node n, we can formulate the admissibility constraint mathematically as follows:

for all n,

0 <= h(n) <= h\*(n).

Additionally, the trivial heuristic is defined as h(n) = 0 and using it reduces A\* search to UCS.

All admissible heuristics dominate the trivial heuristic.

Dominance very intuitively captures the idea of one heuristic being better than another – if one admissible heuristic is dominant over another, it must be better because it will always more closely estimate the distance of a goal from any given state.

**Admissible heuristic for the given problem**