

COMP4431 Artificial Intelligence

Quiz 03

Suggested Solution

1. a) [1.5 marks]

Sequence : $[A \rightarrow D \rightarrow C \rightarrow E \rightarrow B \rightarrow A]$

Total Distance: $10 (A \text{ to } D) + 8 (D \text{ to } C) + 5 (C \text{ to } E) + 3 (E \text{ to } B) + 2 (B \text{ to } A) = 28$

As 28 is smaller than 31, so the SA algorithm will choose to move to the new solution.

b) [1.5 marks]

Current solution distance: 28

New solution distance: 29

Increase in distance (Δd): $29 - 28 = -1$

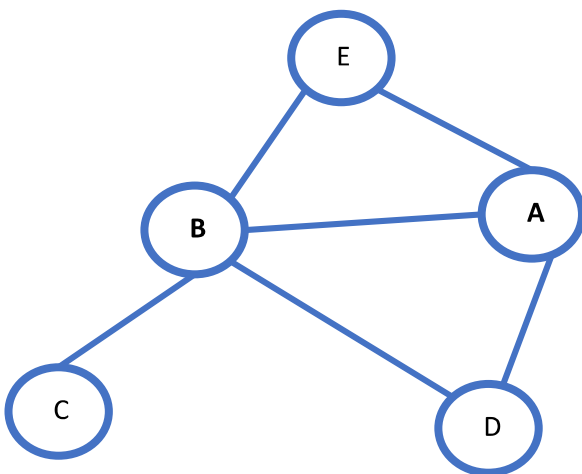
The probability of accepting the new solution is:

$$P = e^{-1/T}$$

The algorithm will choose to accept this new solution with a probability of P . Otherwise, it will reject the new solution and keep the current one.

2. a) [1 mark]

The constraint graph :



b) [1 mark]

Based on the degree heuristic, the first selected attribute will be Region B.

Because it has the highest number of constraints (4) with other regions/ it is the most "connected" region (4) compare to other regions.

c) [1 mark]

Based on the "most-constrained" heuristic, the next selected attribute will be Region A, because it has the fewest legal values left in its domain (only 1 possible color: Green). This makes it the most constrained variable, and assigning it next can help reduce the search space more effectively.