CSE 537- Artificial Intelligence

Project - 3 (Bayesian Networks)

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Command run:

python wordCross.py -q1 -q2 -q3 -q4 -q5

Output

Question 1

Accuracy: 0.311102
Time used: 0.255778 secs

Question 2

Accuracy: 0.089656 (two correct letters)
Accuracy: 0.360026 (at least one correct letter)
Time used: 8.807596 secs.

Question 3

Accuracy: 0.149198
Time used: 0.229887 secs.

Question 4

Accuracy: 0.432673
Time used: 3.208659 secs.

Question 5

Accuracy: 0.465159
Time used: 1.340000 secs

Description

Question 1:-

We are appending the given special character to the start and end of the word. Then we are finding the position where we need to predict the character.
We are then finding the character for which the conditional probability is maximized.

Question 2:-

In this case, we need to predict the two missing characters. For this case, we are using two for loops and trying all combinations. The combination for which the conditional probability is maximized is returned as the solution.

Question 3:-

We have used variable elimination. We carried out summation of hidden variables from left to right to avoid recomputation. We know that we need to sum over either one or 2 variables. So we have pre-calculated on conditional probability tables for one hidden and 2 hidden variables. On a query, we do a table lookup and fetch the values and return the character with the maximum probability.

Question 4:-

Like Question 3, we calculated the individual probabilities of every word and multiplied them. We then returned the character with the maximum probability.

Question 5:-

We are appending the given special character to the start and end of the word. Then we are trying to find the character for which the conditional probability is maximized. In this case the current node depends upon its ancestor and the ancestor of the ancestor. The conditional probabilities are computed considering this case.