XCS221 Assignment 2

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Artificial Intelligence: Principles and Techniques

Stanford Center for Professional Development

November,2021

1.a

We can construct an example as:

***tryingtounderstandsearchProblems***

and we stablish the following cost set:

[try: 5, ying: 100, rying: 180 tryi: 100, to: 5, understand: 6, understands: 5, ing: 120, search: 5, searchP: 5, searc: 100, Problems: 5, Pro: 4, Problem: 5, Proble: 130, Probl: 10].

For this example, the greedy algorithm would pick *try* rather than *tryi* since the weights of try is only 5 and *tryi* is 100. Then the algorithm will pick *ying* rather than *rying* since the string one has lower weights. Therefore, we will have a false segmentation and we can say that the greedy algorithm is suboptional.

2.a

If we have the following example,

***cp,s,dwn***

with a bigram cost function as,

cost (-BEGIN-,cup)=1 cost(-BEGIN-,cap)=800

cost(cup,is)=9000 cost(cap,is)=1

cost(is,down)=1

The greedy algorithm would return *cup is down* for cost 9002, while the optimal path is *cap is down* for cost 802. It means that the algorithm is sub optional.

3.a

If  are the input´s characters, we can note each state as where we use the previous word, the current string position and the current position.

Then we have two possible actions, ending the word so creating a new word from  to (END) or incrementing and continue, if (CONT). Therefore, our costs for ich possible actions are:

,

Note that our final state is and the initial state is .

3.c

if we had the following bigram cost function and we take account the next definition,

* where is 0.6
* when is 1.0
* who is 0.8
* it was 0.9
* which was 9.0

then,

In the same way,

It is clear that for all states and actions .Also the states, actions, cost, start state, and end test have the same behavior of part *3a* of this assignment.

Now we can define .

3.d

**Is UCS a special case of A\*? Explain why or why not.**

* Yes, it is a special case. Is the case when A\* search has the function

**Is BFS a special case of UCS? Explain why or why not.**

* Yes, it is a special case. Is the case when all step costs are equal, so UCS reproduces BFS.