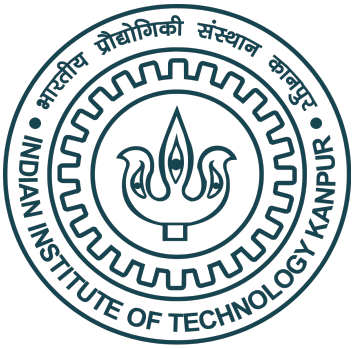

CS771A Assignment 2

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Contents

1 Question 1

1.1 Solution

For splitting the decision tree, we need to consider three different cases

Case 1-: Splitting at the root node
Here first, we need to send an empty string with a given number of characters as our query. Here division mainly works keeping in mind the number of characters in the string

Case 2-: Splitting at any internal node
Here, we first calculate the source of all words that have reached the current node using the following method-
Step 1- Assign all possible characters (i.e 26 alphabets to their frequencies at any given index) and store them in an array.
For eg- Choose an internal node such that we have 5 letter words. Suppose those words are-

- Dream
- Cream
- Apron
- Actor
- Brush

Step 2- Make the following 2D array of size 5*26 such that-

- arr[0][0]= 2 which means letter a (0th index) is present in 2 words at 1st place (0th index)
- arr[0][1] = 2 which means letter b (1st index) is present in 2 words at 1st place (0th index) and so on.

Step 3-Again iterate over all words that reached that node (stored in mywords(dictinory of index of word from original dict i.e. dict_secret and the word) and calculate their weight by adding the corresponding weight of that character For ex-
score of word Dream will be 1 + 2 + 2 + 2 + 2 = 9.
and that of Actor will be 2 + 1 + 1 + 2 + 1 = 7.
and so on.
Step 4- Send the word with the most weight as our query

How to make a node as leaf (stopping criteron)

For making a leaf node, consider the following 2 conditions-:

(I) Depth on this node is greater than max depth.

(II) The total number of words in the node is 1.

Leaf Action:

Return the first word at that node as the query word which will be our final query.

□