

Question 3) (30 Marks)

Formulate the following problem by giving a proper state representation, specifying (1) initial and (2) final states and giving (3) pseudo code of the successor function.

Edit distance is used to measure the difference between two text strings. Basically it gives the minimum cost to transform the first string to be identical to the second string. The transformation is done by repetitive application of available operation. Available operations include addLetter, deleteLetter, and replaceLetter. There is a cost associated with each operation (ca for addition, cd for deletion and cr for replacement). For example, if string X=aabcd and string Y=abcda, and if ca=cd=cr=1 then the minimum distance between X and Y would be achieved by deleting the first "a" from X and inserting an "a" at the end of it, that would be 2 units. We need to develop an intelligent engine to compute the edit distance between two strings.

Question 4) (10 Marks)

Consider the Missionaries and Cannibals problem. Assume we use a vector (a,b,c) for state representation, where "a" is the number of missionaries to the left of the river, "b" is the number of cannibal to left of the river and "c" is the location of the river (0=left, 1=right). The objective is to move everybody to the right side of the river. Write the successor function.

Q#3

State

| | |
|---|---|
| i | j |
|---|---|

State

| | |
|---|---|
| 0 | 0 |
|---|---|

Goal

| | |
|---|---|
| M | N |
|---|---|

Successor Fn

$(x, y) \quad M, N \quad (\text{Cost}, \text{Path})$

if $x = M$ then

$S = (x, y+1)$

Cost = Cost + CA

Path = [Path, ADD];

else if $y = N$ then

$S = (x+1, y)$;

Cost = Cost + CD

Path = [Path, Del];

else

$S = x, y+1, x+1, y, x+1, y+1$

Cost =

| | | |
|-----------|----|---------------------|
| Cost + ca | cd | if $A(x) \neq B(y)$ |
|-----------|----|---------------------|

Then
add cr.

Q#4

States: (a, b, c)

initial state: (0, 0, 0)

Goal state: (1, 1, 1).

Path Cost: Number of crossings.