**Tutorial 9. Student Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student id:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Question 1:** Let X=aabbacab and Y=baabcbb. Find the shortest common super-sequence for X and Y. (Backtracking process is required.)

**Answer** (Basic part, 0.5 point for this exercise.)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | a | a | b | b | a | c | a | b |  |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |
| b | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 |  |
| a | 2 | 2 | 3 | 4 | 5 | 5 | 6 | 7 | 8 |  |
| a | 3 | 3 | 3 | 4 | 5 | 6 | 7 | 7 | 8 |  |
| b | 4 | 4 | 4 | 4 | 5 | 6 | 7 | 8 | 8 |  |
| c | 5 | 5 | 5 | 5 | 6 | 7 | 7 | 8 | 9 |  |
| b | 6 | 6 | 6 | 6 | 6 | 7 | 8 | 9 | 9 |  |
| b | 7 | 7 | 7 | 7 | 7 | 8 | 9 | 10 | 10 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

Backtracking : **B**acaBcBAAb. SCS: bAABcBacaB

**Question 2:** You are trying to decide where to place billboards on a highway that goes East-West for M miles. The possible sites for billboards are given by numbers x1, …, xn, each in the interval [0, M]. If you place a billboard at location xi, you get a revenue ri. You have to follow a regulation: no two of the billboards can be within less than or equal to 5 miles of each other.

Design an algorithm to place billboards at a subset of the sites so that you maximize your revenue subject to this constraint.

**Answer:**

**Define d(i) be the maximum revenue for the first i places (from left)**

**P(i) id the largest j <I such that xi and xj is 5 miles away (xi-xj>5)**

**d(i)=max {ri+d(P(i)), d(i-1)}**