作业7

假设两个字符串X和Y，X=“abcabac”，Y=“acabcac”。采用动态规划法求X和Y的最长公共子序列。请先列出其动态规划函数，指出初始值，并通过填表来求解该问题，最后给出问题的结论，即最长公共子序列是什么，其长度为多少

(1) 动态规划函数为



(2) 初始值是L(0,\*)=0和L(\*,0)=0

(3) 填L表和S表如下：

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **L** | | **Y** | a | c | a | b | c | a | c |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **X** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| a | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b | 2 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| c | 3 | 0 | 1 | 2 | 2 | 2 | 3 | 3 | 3 |
| a | 4 | 0 | 1 | 2 | 3 | 3 | 3 | 4 | 4 |
| b | 5 | 0 | 1 | 2 | 3 | 4 | 4 | 4 | 4 |
| a | 6 | 0 | 1 | 2 | 3 | 4 | 4 | 5 | 5 |
| c | 7 | 0 | 1 | 2 | 3 | 4 | 5 | 5 | 6 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S** | | **Y** | a | c | a | b | c | a | c |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **X** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| a | 1 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| b | 2 | 0 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| c | 3 | 0 | 3 | 1 | 2 | 2 | 1 | 2 | 1 |
| a | 4 | 0 | 1 | 3 | 1 | 2 | 2 | 1 | 2 |
| b | 5 | 0 | 3 | 3 | 3 | 1 | 2 | 2 | 2 |
| a | 6 | 0 | 1 | 3 | 1 | 3 | 2 | 1 | 2 |
| c | 7 | 0 | 3 | 1 | 3 | 3 | 1 | 2 | 1 |

结论：X和Y的最长公共子序列为acabac，长度为6