演算法PA2

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1. Data Structure

The input file is composed of several lines. The first line is a number which tell us the number of points on the circle, let’s call it N. After that, N/2 lines will come into our sight, telling us what are the two endpoints of each line. We declare a array called “data” with length N that save the point which it connects to. For example, if 0,2 form a line, we save data[0]=2 and data[2]=0. Next, we declare “M[N][N]” and “S[N][N]”. M[i][j] is used to record the recursive function “mps” so that we can save a great amount of time recalculating the same thing in the recursion. On the other hand, S[i][j] is used to record which case we have chosen to do the recursion (There are four cases in my recursion. To get more info, see the next paragraph.). Finally, the array “result” is declared to save those point we need to select. Meanwhile, the array “sortResult” is basically same as the “result”, but sorted in an increasing order (better output).

1. Method
   1. Original Method

The original method is quite intuitive.

The recursive function would be like :

**M(i,j) = max { [ max( M(i,k) + M(k+1,j) ) for i<=k<j ] , M(i+1,j-1) + 1 }**

The base case is :

**M(i,j) = 0 for i == j,**

**M(i,j) = 0 for i+1 == j , if i is not connected to j,**

**M(i,j) = 1 for i+1 == j , if i is connected to j.**

However, the running time is O(n^3), which is not acceptable when the input is large. Thus, the New Method appears.

* 1. New Method

1. Other Findings