

z5173405 JIE MEI

Question 3

According to the question, we will set the number of fish of the shore form a sequence $A = \langle A_0, A_1, \dots, A_{100n-1} \rangle$ and the net is described as a sequence $B = \langle B_0, B_1, \dots, B_{n-1} \rangle$. We need to reverse the sequence B to get the B' . Firstly, we place the left end of sequence B' at position 0 of sequence A , then we will compute the $A_0 * B'$ to get the C_0 . In computing the convolution $C_0 = A_0 * B'$, the step 1 to convert both A_0 and B' to polynomial (the time complexity is $O(\log n)$). Step 2 the polynomial applies Discrete Fourier Transform then multiplication them (the time complexity is $O(n \log n)$). Step 3 applies Inverse Fast Fourier Transform for step2 result (the time complexity is $O(n \log n)$). Finally, we will get the sequence C_0 . We set the C_0 is the largest. Secondly, we will move the position to A_1 , we will get the C_1 , then compare to the largest, if large than the largest, set the largest is C_1 . Until move to the last position, we can get the largest position. Above algorithm time complexity is $O(n \log n)$.