演算法 HW2

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1. Quick Sort Attack
   1. Because the quick sort is to chose a number and then sort the number which is smaller or bigger to the same side.

Therefore, the worst case is that A[r] always chose the biggest or smallest number, then the T(n) = Θ(n2). The best case is that A[r] always chose the number which value is the middle in the data, then the T(n) = Θ(nlogn).And the average is T(n) = Θ(nlogn)

* 1. int \*attack (int n)

{

int \*arr = malloc(n\*sizeof(int))

for(int i = 0 ; i<n;i++)

{

arr[i] = i

}

return arr;

}

In the above quick sorting, we chose the last number in the right side but random. So if a sorted data input to the quick sort, it will cause the worse case.

1. Bubble Sort
   * 1. Because a is the k-th small elements, the index is k.
     2. Because bubble is stable sort , it would not effect the relative relationship of the number. When the number larger than a are sorted to the left side, exchange time is x. And then a sorted to the left side , exchange time is y. The total number of exchanges is x+y.
     3. x+y
     4. Because the core of the bubble is change with the element which is adjacent , it always change in pair of elements.
     5. Look at the function , when the condition is A[j] < A[j - 1], it will do exchange A[j] with A[j-1]”to swap once, and each time it change a pair of elements which are adjacent. Therefore, the numbers of bubble sort swapping is equal to I(A).