第一次隨堂考

2022/10/6 10:10 – 11:00

以下各題請**簡單說明**答題過程，如僅有答案未附說明不給分

1. Rank the following functions with number in **increasing** order of their growth rate.
   (1)k*n **(2)**n! **(3)**k **(4)**nlogn **(5)**k/n **(6)**log(n^k) **(7)**n^k **(8)**k^n
   Note that **k** is a constant larger than 1.

2. There is an one-dimension integer array with size **n**, please answer the following questions according to the given pseudo codes.
   (1) What is the time complexity to retrieve the k-th element in the array of size **n**?

   ```
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   input:
       integer array: array
   k = 50
   a = array[k] ← this step
   ------------------------------------
   ```

   (A)O(1) **(B)**O(logn) **(C)**O(n) **(D)**O(n^2)

   (2) What is the time complexity to shift all the **n** elements in the array to the right?

   ```
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   input:
       integer array with random number: array
   for(i=n-1;i>=0;i--)
       array[i+1]=array[i]
   array[0] = 0
   ------------------------------------
   ```

   (A) O(1) **(B)**O(logn) **(C)**O(n) **(D)**O(n^2)

3. True or False. Note that K is a constant larger than 1.
   (1) K^{2n} is O(K^n)?

   (2) $(2K)^n$ is O(K^n)?