

### Problem 1

1. C Q S A X B T

Min=A

A| C Q S X B T

Min=B

A B| C Q S X T

Min=C

A B C| Q S X T

Min=Q

A B C Q| S X T

Min=S

A B C Q S| X T

Min=T

A B C Q S T X

2. |C| Q S A X B T

C

C |Q| S A X B T

Q>C

C Q |S| A X B T

S>Q, S>C

C Q S |A| X B T

A<S, A<Q, A<C

A C Q S |X| B T

X>S, X>Q, X>C, X>A

A C Q S X |B| T

B<X, B<S, B<Q, B<C, B>A

A B C Q S X |T|

T<X, T>S

A B C Q S T X

### Problem2

a. Initial the first unsorted array n[][]

Initial the second unsorted array n2[][]

for the i equal to 0 at begin and smaller than the length of n[] and i++

and loop again for the j equal 0, j smaller than i and j++

if n[i]==n2[j] that show TRUE

else show break out

big O:  $O(1+n^2) = O(n^2)$

best case: the first element is True

worst case: search  $n^2$  times

if return false, time is constant

if True, time is the fastest.

- b. Initial the first unsorted array `n[i][j]`  
for the `i` equal to 0 at begin and smaller than the length of `n[i]` and `i++`  
and loop again for the `j` equal 0, `j` smaller than `i` and `j++`  
if `n.charAt[i]` equal with `n.charAt[j]` that count is added to 1  
and then show number of each letter from a to z, with letters.

big O =  $O(n^3)$

best case: the first element is True

worst case: need to search `n` times

time is  $n^3$  times

- c. initial row = `n`  
initial column = `m`  
for the `i` equal to length of `n` at begin and smaller than the length of `n[i]` and `i++`  
and loop again for the `j` equal length of `m`, `j` smaller than `i` and `j++`  
use the 2 loops to check every element in the 2D array  
if there are have one element equal to `x` that show True  
else pass

big O:  $O(n \cdot m)$

best case: the all `x` is in beginning

the worst case: have to search  $n \cdot m$  elements

time is constant