Q6 ; Illustrate the operation of insertion sort

A = 3, 41, 52, 26, 38, 57, 9

3 41 52 ...

3 41 52 | 26

3 26 41 52 | 38, 57, 9

3, 26, 38, 41, 52 | 57, 9

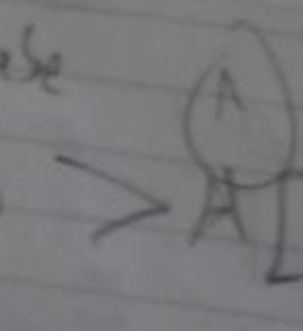
3, 9, 26, 38, 41, 52, 57

Q7 What's the time efficiency? How is it compared to that of the version of the text

for i ← 1 to n-1
    do j ← i - 1
    while j ≥ 0 or A[j] > A[j+1]
        do swap(A[j], A[j+1])
        j ← j - 1

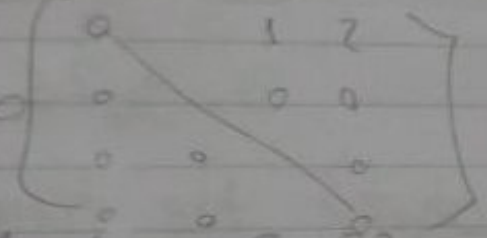
Worst Case
While loop for loop comp ... = n
base comp: ... n

best Case
A[j] > A[j+1]



for i ← 1 to n-2
do
for j ← i+1 to n-1 do
if A[i,j] ≠ A[j,i]
return false.

Symetric =



basic A[i,j] ≠ A[j,i]

Comp = n^2

best case Worst case

Q5 illustrate the operation of insertion sort on the array A = {F, X, A, M, P, L, E}

| F | X | M | P | L | E |

F	M	X	P	L	E
F	M	P	X	L	E
E	F	M	P	X	L

for j ← 1 to n
S ← S + i + 1
return S

S ← S + j + j

input 5 4 3
S = 0 + 1 + 1
S = 2 + 2 + 2
S = 6 + 3 + 3

basic

compl...

$$= \sum_{i=1}^{n} 1 \quad i := n$$

$\Theta(n) = o(n) = n$

Q2 input Array A[0...n-1]

V ← A[0] S ← A[0]

for j ← 1 to n-1 do
if A[i] < V
V ← A[i]
if A[i] > S
S ← A[i]
return S-V

comp...

$= \Theta(n) \quad o(n) = n$

$\sum_{i=1}^{n-1} 2 = 2 \geq 1 = 2$

q1 for i ← 0 to n-1

do

for j ← 0 to n-1

C[I, j] ← 0

for k ← 0 to n-1

do

C[I, j] ← C[I, j] + A[i, j] * B[...]

Return C

A B

1	2		5	6
3	4		7	8

C

(Matrices) (البو لغك مصفوفة)

- basic operatian

C[I, j] ← C[i, j] + A[i, j] * B[...]

بتاعتي اكثر من عملية عناصر ال ماتكس : ضرب

- best case = worst case

كدا كدا عدد المرات بتاعت التكرار هو هو

- The ComPlixity

$$\sum_{i=0}^{n-1} \left[\sum_{j=0}^{n-1} O \left[\sum_{k=0}^{n-1} A[i,j] * B[i,j] \right] \right]$$

n^3

كل واحدة بعمل n

$$\sum_{k=0}^{n-1} 1 \quad n-1-0+1=n \quad \boxed{n^3}$$

constant base