

P202 15

procedure *insert* x (x : an integer, a_1, a_2, \dots, a_n : increasing integers)

$i := 0$

while $x \leq a_{n-i}$ and $i \leq n$

$a_{n-i+1} := a_{n-i}$

$i := i+1$

$a_{n-i+1} := x$

{ x has been inserted into the appropriate position}

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procedure *find a mode* (a_1, a_2, \dots, a_n : nondecreasing integers)

mode $:= 0$

$i := 1$

while $i \leq n$

$value := a_i$

$count := 0$

$j := 1$

while $j \leq i$

if $a_j = value$ then $count := count+1$

$j := j+1$

if $count > mode$ then

$mode := count$

mode := value

return *mode*

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a) $O(n^3)$

b) $O(n^5)$

c) $O(n^3 \cdot n!)$

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If $f(x)$ is $\Theta(1)$, then $|f(x)|$ has an upper bound and a lower bound. If we say $C_1 < |f(x)| < C_2$ (C_1 and C_2 are constants), then $C_1 < f(x) < C_2$ or $-C_2 < f(x) < -C_1$.