DAA PRACTICE SET

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① COMPLEXITY → $O(n/2) \Leftrightarrow O(n)$
$n > i$ was given in snippet, but i is increamented twice in the 1 given for loop reducing the time to half.

② COMPLEXITY → $O(n^2)$
Both inner & outer loops execute n times
1 value of i → j loops n times
n values of i → j loops $n \times n = n^2$ times
⇒ complexity $O(n^2)$

③ COMPLEXITY → $O(\log n)$
each iteration → i gets halved

④ COMPLEXITY → $O(2) \Leftrightarrow O(1)$ as constant
2 conditional statements each of time complexity $O(1)$ as for both $O(2)$.

⑤ OUTER loop executes :- n times
inner loop executes :- $\log n$ times
for 1 value of i → j executes ($\log n$) times
n values of i → $n \log n$ times executed j

∴ complexity as $O(n \log n)$

⑥ COMPLEXITY → $O(n)$

for input (n) → inner most statement executes $n + \frac{n}{2} + \frac{n}{4} + \cdots 1$ (same value of counter)

so complexity ⇒ $O(n + n/2 + n/4 + \cdots 1) = O(n)$