20.6. TIME COMPLEXITY CALCULATION FOR LOOP (EG-5).

$//outer\ loop\ executed\ \ n\ times$

$for(i = 0; i \leq n; i = i + 2)\{$

$\quad\quad k = k + 1\ ;\ //\ constant\ time.$

$\}$

$Hence\ it\ is\ fixed\ that\ it\ will\ run\ from\ 0\ to\ n-1\ ,the\ times\ that\ k$

$= k + 1\ will\ be\ printed\ at\ \left(\left\lfloor \frac{n}{2} \right\rfloor\right) + 1\ complexity\ only = O\left(\left(\left\lfloor \frac{n}{2} \right\rfloor\right) + 1\right) = O(n).$

Similarly,

$//outer\ loop\ executed\ \ n\ times$

$for(i = 0; i \leq n; i = i + 3)\{$

$\quad\quad k = k + 1\ ;\ //\ constant\ time.$

$\}$

$\Rightarrow \left(\left\lfloor \frac{n}{3} \right\rfloor\right) + 1\ complexity\ only = O\left(\left(\left\lfloor \frac{n}{3} \right\rfloor\right) + 1\right) = O(n).$

$$//outer\ loop\ executed\ \ n\ times$$

$$for(i = 0; i \leq n; i = i + 4)\{$$

$$k = k + 1\ ;\ //\ constant\ time.$$

}

$$\Rightarrow \left(\left\lfloor \frac{n}{4} \right\rfloor\right) + 1\ complexity\ only = O\left(\left(\left\lfloor \frac{n}{4} \right\rfloor\right) + 1\right) = O(n).$$

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